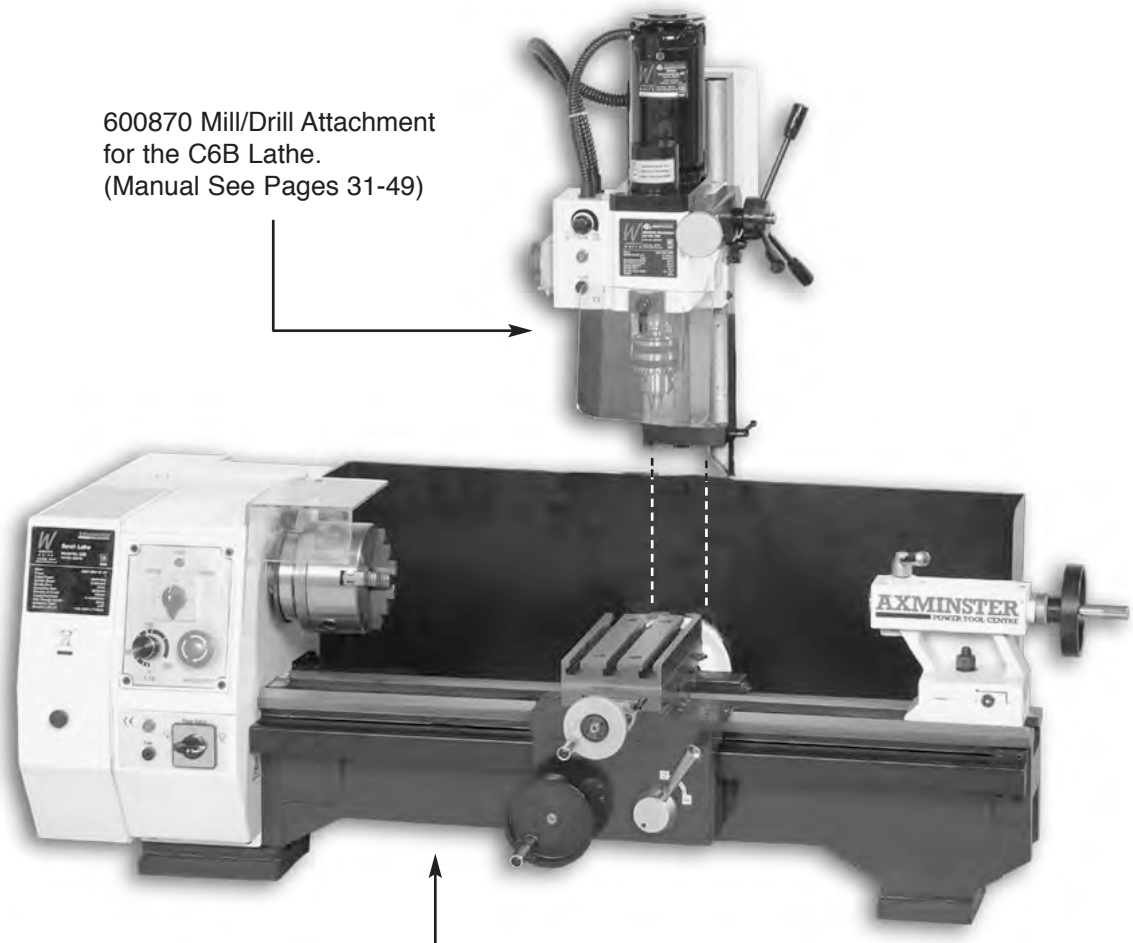
AXMINSTER
POWER TOOL CENTRE

SIEG C6B Variable Speed Lathe



600870 Mill/Drill Attachment
for the C6B Lathe.
(Manual See Pages 31-49)

200100 C6B Variable Speed Lathe.
(Manual See Pages 01-30)

200100

User Manual

AXMINSTER
WHITE

CE
2005

Axminster Reference No:**C6B**

www.axminster.co.uk

Safety Instructions For Lathe

1. **MAKE SURE ALL GUARDS** are in place and that the lathe sits on a flat, stable surface.
2. **BEFORE STARTING THE LATHE** be certain the workpiece has been properly engaged in the chuck, tailstock, center, and that there is adequate clearance for full motion.
3. **ADJUST TOOL POST** to provide proper support for the turning tool you will be using. Test tool post clearance by rotating workpiece by hand before turning lathe on.
4. **SELECT THE TURNING SPEED** which is appropriate for the type of work, material, and tool bit. Allow the lathe to gain its full speed before beginning a cut.
5. **NEVER REVERSE MOTOR DIRECTION** while the lathe is in motion.
6. **DO NOT STOP LATHE USING YOUR HAND** against the workpiece or chuck.
7. **DO NOT LEAVE LATHE RUNNING UNATTENDED** for any reason.
8. **NEVER LEAVE A CHUCK KEY IN THE LATHE CHUCK.**
9. **NEVER OPERATE THE LATHE WITH DAMAGED OR WORN PARTS.** Maintain your lathe in proper working condition. Perform routine inspections and maintenance promptly when called for. Put away adjustment tools after use.
10. **MAKE SURE LATHE IS TURNED OFF**, disconnected from its power source and all moving parts have come to a complete stop before starting any inspection, adjustment, or maintenance procedure.
11. **KEEP LOOSE CLOTHING ARTICLES** such as sleeves, belts or jewelry items away from the lathe and drill spindles.
12. **ALWAYS USE THE PROPER CUTTING TOOLS** for the material you are turning, make certain they are sharp and that they are held firmly in the tool post.
13. **ALWAYS PLACE A BOARD OR PIECE OF PLYWOOD ACROSS THE BEDWAY** when removing or installing chucks to avoid the possibility of a finger pinch occurring between a loose chuck and the edges of the bedway.

CAUTION

No list of safety guidelines can be complete. Every shop environment is different. Always consider safety first, as it applies to your individual working conditions. Use this and other machinery with caution and respect. Failure to do so could result in serious personal injury, damage to equipment or poor work results.

WARNING

Like all power tools, there is danger associated with the Lathe. Accidents are frequently caused by lack of familiarity or failure to pay attention. Use this tool with respect and caution to lessen the possibility of operator injury. If normal safety precautions are overlooked or ignored, serious personal injury may occur.

GROUNDING

In the event of an electrical short, grounding reduces the risk of electric shock by providing a path of least resistance to disperse electric current.The outlet must be properly installed and grounded in accordance with all local codes and ordinances.

SET-UP

Unpacking

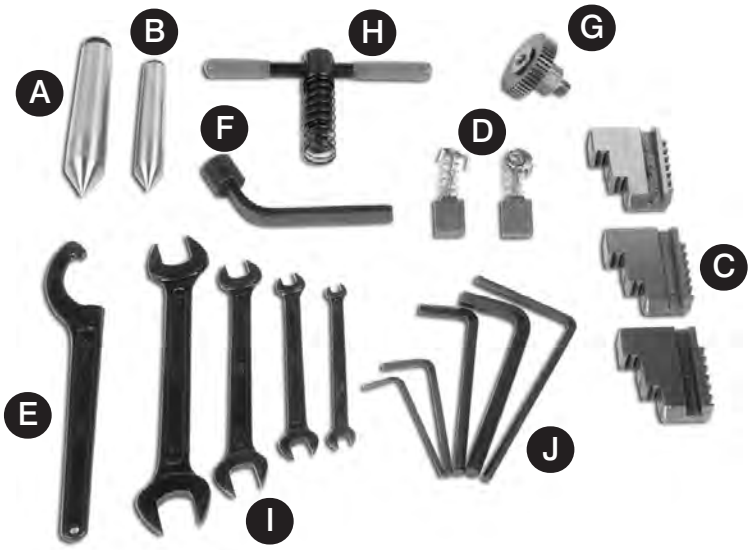
This lathe is shipped from the manufacturer in a carefully packed crate. If you discover the machine is damaged after you've signed for delivery, and the truck and driver has gone, you will need to file a freight claim with the carrier. Save the containers and all packing materials for possible inspection by the carrier or its agent. Without the packing materials, filing a freight claim can be difficult. If you need assistance determining whether you need to file a freight claim, or with the procedure to file one, please contact your dealer.

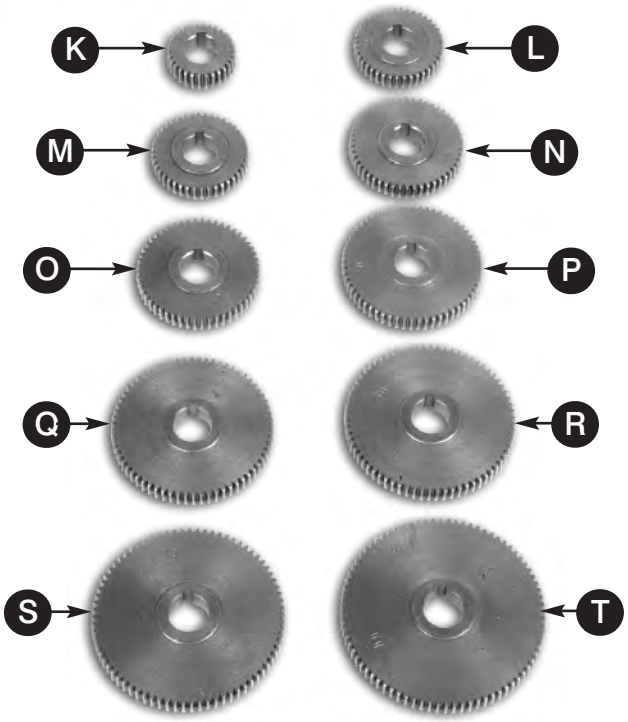
When you are completely satisfied with the condition of your shipment, you should inventory its parts.

Clean Up

The unpainted surfaces are coated with a waxy oil to protect them from corrosion during shipment. Remove this protective coating with a solvent cleaner or citrus-based degreaser. To clean thoroughly, some parts may need to be removed. **For optimum performance from your machine, make sure you clean all moving parts or sliding contact surfaces that are coated.** Avoid chlorine-based solvents as they may damage painted surfaces should they come in contact. Always follow the manufacturer's instructions when using any type of cleaning product.

Lathe Accessory's

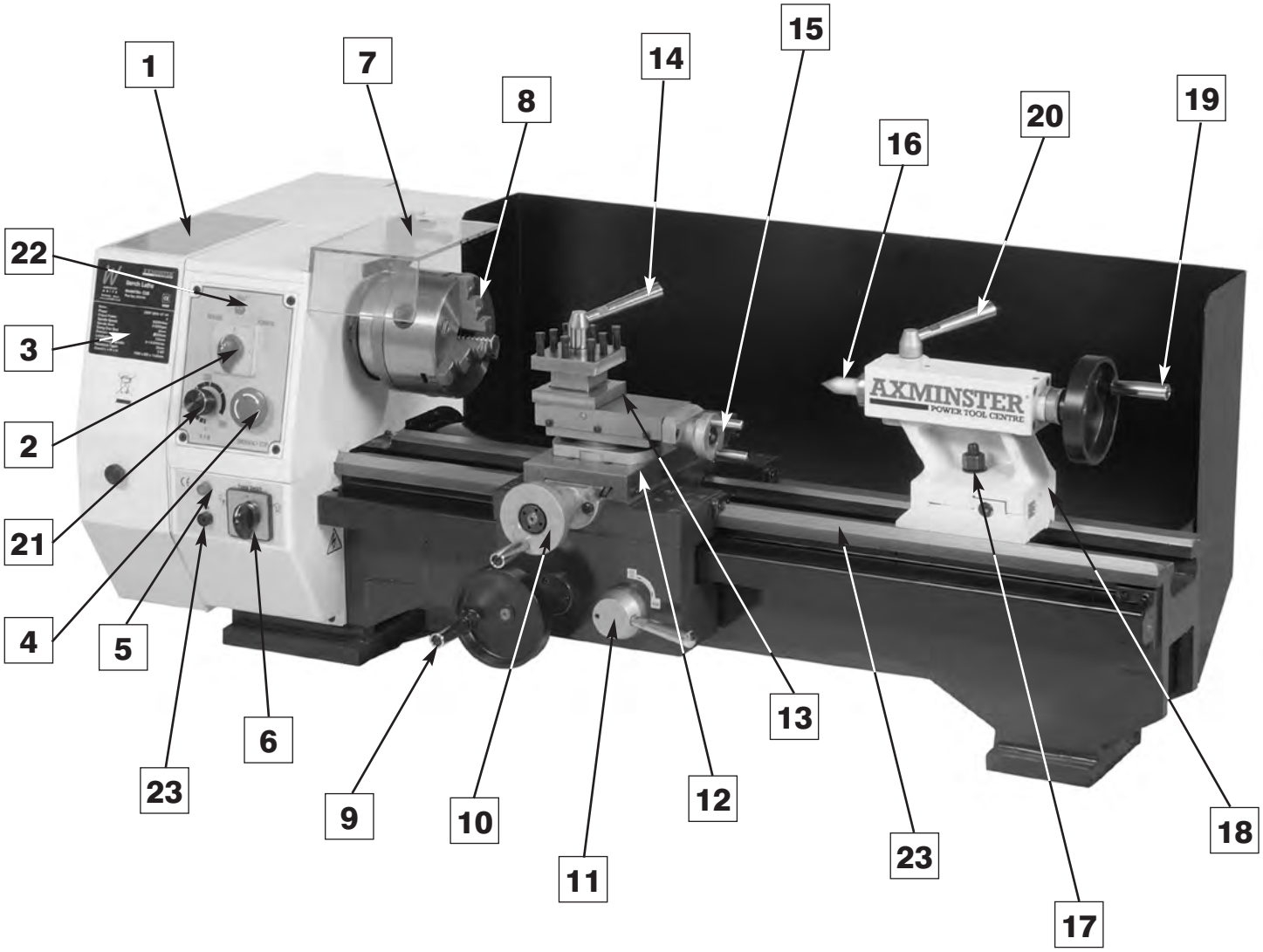




A) 1 No. Tailstock Centre
B) 1 No. Headstock Dead Centre
C) 3 No. External Jaws
D) 2 No. Motor Brushes
E) 1 No. 'C' Spanner
F) 1 No. Spanner for Change Wheel
G) 1 No. Leadscrew Reversing Sprocket
H) 1 No. Chuck Key
I) Set of Spanners 19,14,10,7mm
J) Set of Allen Keys

Gears
K) 1 No. 30 Teeth
L) 1 No. 40 Teeth
M) 2 No. 42 Teeth
N) 1 No. 50 Teeth
O) 1 No. 52 Teeth
P) 1 No. 60 Teeth
Q) 1 No. 66 Teeth
R) 1 No. 70 Teeth
S) 1 No. 75 Teeth
T) 1 No. 80 Teeth

IDENTIFICATION



1. Thread Pitch Gearing & Speed Charts
2. Lathe Forward/Reverse Switch
3. Machine ID/Safety Label
4. Emergency Stop Switch
5. Lathe Power Indicator Light
6. Selector Switch
7. Headstock Eyeshield
8. Lathe Chuck
9. Carriage Feed Handwheel
10. Cross Slide Handwheel
11. Automatic Carriage Feed Lever
12. Compound Slide
13. Tool Post
14. Tool Post Lock Handle
15. Compound Slide Handwheel
16. Tailstock Centre
17. Tailstock Clamp Bolt
18. Tailstock Axis Alignment Indicator
19. Tailstock Barrel Handwheel
20. Tailstock Centre Lock
21. Variable Speed Control Knob
22. Fault Lamp
23. Fuse Cap
24. Lathe Bed

INITIAL START

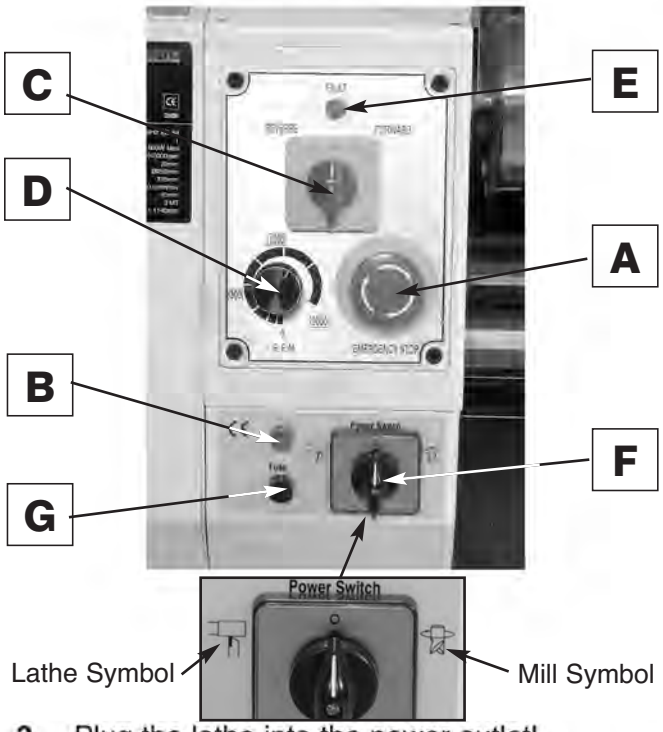
Test Run Lathe

Before continuing to Operate, test run the lathe to make sure it runs properly.

To test run the lathe:

1. Make sure that there is NOT a chuck key inserted in the chuck, and that the lathe eye-shield is in the down position over the lathe chuck. *Make this step a habit that you perform every time you start the lathe.*

2. Familiarize yourself with the lathe controls shown in Figure below. Make sure the STOP button is all the way down before continuing.



3. Plug the lathe into the power outlet!

4. Move the carriage feed lever up to the disengage mode. It is important that the carriage feed is NOT moving and is in the neutral position until later.

5. Turn the to left Selector switch to the "CUTTING" position. The lathe power indicator light should light up. Note—*If it is does not light up, unplug the machine and check the fuse, your power source, and the connections on the machine before attempting to start the lathe. Call our service department if you cannot easily resolve the issue.*

6. Turn the Selector Switch **(F)** to 'Lathe' position. Release the Emergency Stop Switch **(A**) by turning the knob head to right, the Power Indicator Light (**B**, green) lights.
Then selector the Reverse/Forward **(C)** to the left (means the spindle rotate direction is clockwise).

7. Switch on the machine by **GENTLY** turning the Variable Speed Control Knob **(D)** clockwise. A click will be heard as the motor power is turned on, but the spindle will not rotate until the knob is turned clockwise a little further. Speed will increase progressively as the knob is turned.

8. If the lathe over-loads, for example, cutting too much. A Fault Lamp (**E**, yellow) will light. Just turn off the power by switching off the Variable Speed Control Knob **(D)** then switch it on again, the machine restarts.

9. Allow the lathe to run for at least two full minutes to make sure it is running satisfactorily.

10. Press the lathe emergency stop button to turn the lathe *OFF*.

11. After the lathe chuck has come to a complete stop, turn the FWD/REV switch counterclockwise.

12. Stand to the side of the lathe chuck line of rotation. then refer to step (7).

13. Allow the lathe to run for at least two full minutes to make sure it is running satisfactorily.

14. Press the emergency stop button to turn the lathe *OFF*.

15. After the lathe has come to a complete stop, engage the carriage handwheel, rotate the handwheel to center the carriage on the bed, then disengage the handwheel.

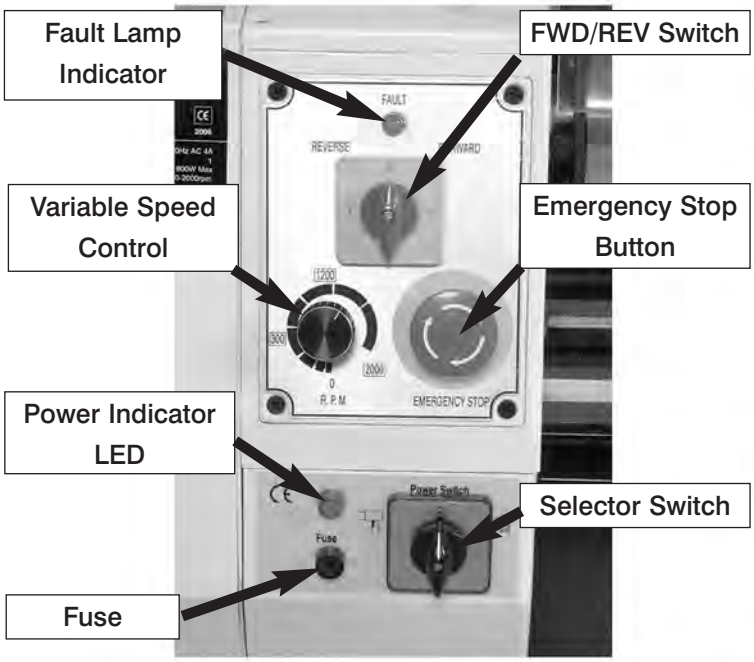
16. Engage the automatic carriage feed lever.

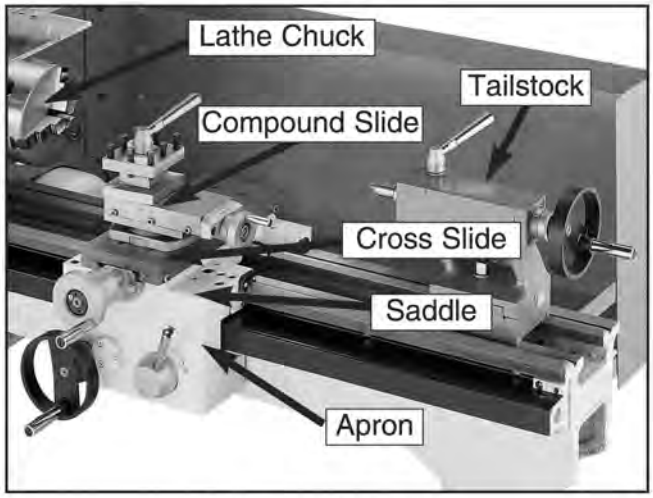
17. Stand to the side of the lathe chuck line of rotation, and press the green button to turn the lathe *ON*.

18. Verify that the carriage moves along the bed, and press the emergency stop button to turn the lathe *OFF*.

OPERATIONS

To get the most out of your machine, please take the time to familiarize yourself with the various controls as shown in Figures below.





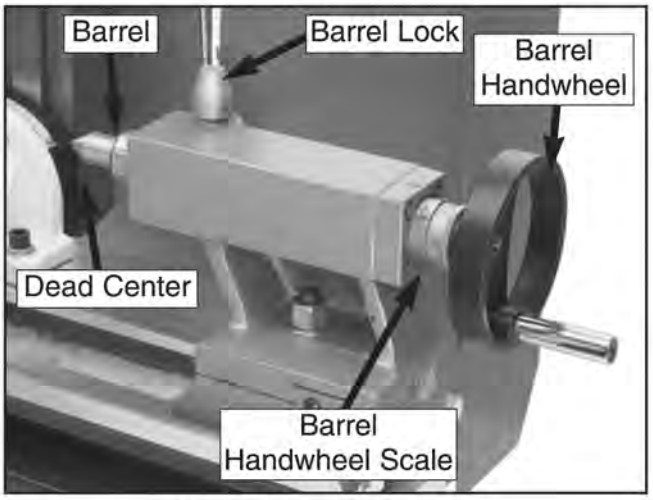
Lathe components

Installing Tailstock Dead Center

There are 2 dead centers included with the Lathe. The smaller dead center is a MT#2 (Morse Taper) and fits in the tailstock barrel.

To install the tailstock dead center:

1. Familiarize yourself with the tailstock components shown below.



Tailstock components

2. Make sure that the MT#2 dead center and tailstock barrel are clean and free of any dirt, dust, grease or oil. These parts will last longer and remain accurate when properly cleaned before each assembly. Morse tapers will not interlock when dirt or oil are present on the mounting surfaces.

3. Insert the end of the dead center into the tailstock barrel, as shown below, until it seats tight enough that it will not rotate when turned by hand. *Note—do not worry about pushing the dead center into the barrel too far. The force of the center contacting a mounted workpiece will fully seat the taper when the handwheel is tightened.*

4. Tighten the barrel lock to prevent the tailstock barrel from moving during operation.



Inserting dead center into tailstock barrel

Removing Tailstock Dead Center

To remove the tailstock dead center:

1. Use the barrel handwheel to move the tailstock barrel all the way back into the tailstock until the handwheel will no longer turn.

2. Pull the dead center out of the tailstock barrel.

Adjusting Tailstock Longitude Position

The tailstock on the Lathe clamps to the bed with the nut shown below. This nut allows the tailstock to be positioned longitudinally along the bed and then locked in place.



Tailstock clamp bolt

To adjust the tailstock longitude position:

1. Use a 17mm wrench to loosen the tailstock clamp bolt.

2. With your hands, move the tailstock into position along the bed.

3. Tighten the tailstock clamp bolt to secure the tailstock into position.

3. Insert the end of the dead center into the tailstock barrel, as shown below, until it seats tight enough that it will not rotate when turned by hand. *Note—do not worry about pushing the dead center into the barrel too far. The force of the center contacting a mounted workpiece will fully seat the taper when the handwheel is tightened.*

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Inserting dead center into tailstock barrel

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Adjusting Cross Slide

The cross slide is only designed to move perpendicular to the longitudinal axis of the lathe, and it features a scale on the handwheel that displays graduations of one thousandths of 25mm (0.025mm).

To adjust the cross slide:

1. Using the handwheel, back the cross slide away from your starting point by at least 0.4mm, then move the cross slide forward to your starting point. *Note—this procedure will clear any free movement (or backlash) in the lead screw so your handwheel scale reading will be accurate.*

2. Hold the handwheel still and turn the scale so the "0" mark lines up with the ".000" mark on the cross slide, as shown in Figure below. As long as you avoid backlash by continuing to move the cross slide in the same direction, the scale on the handwheel will be accurate.



Adjusting handwheel scale

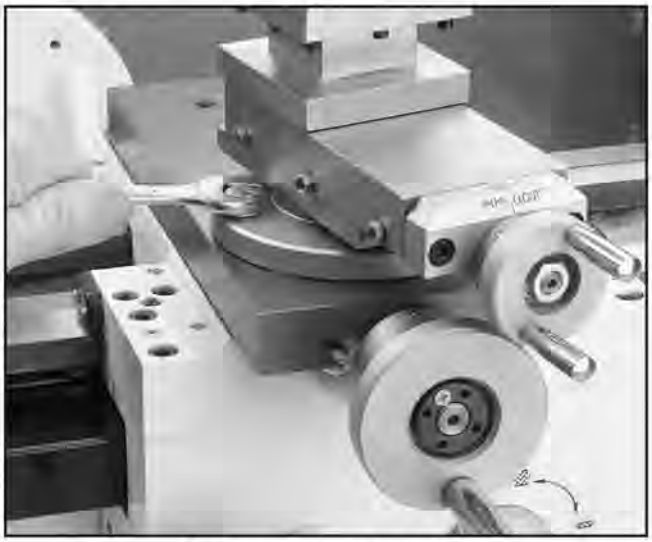
3. After moving the cross slide backward after your operation, remember to clear the backlash before moving the cross slide forward to the "0" mark for the next cut.

Adjusting Compound Slide

Similar to the cross slide, the compound slide features a scale that displays graduations of one thousandths of 25mm(0.025mm). Unlike the cross slide, the compound slide can be rotated to a set angle and then it can be moved back and forth along the axis of that angle.

To adjust the compound slide:

1. Loosen the compound slide bolts shown below to allow it to be rotated.



Compound slide bolts

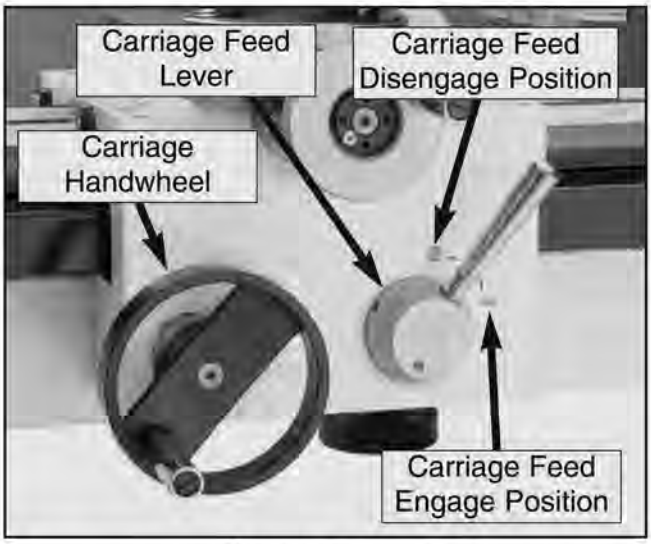
2. Rotate the compound slide to the angle needed for your procedure.

3. Tighten the compound slide bolts, and check the angle again to make sure it did not move during tightening.

4. Use the compound slide handwheel to move the tool back and forth along the axis of the new angle. Similar to adjusting the cross slide handwheel, make sure the threads are engaging and all backlash has been cleared before you set the handwheel scale to "0", or it will not be accurate.

Adjusting Carriage

Like most lathes, the longitudinal movement of the carriage (carriage feed) on the Lathe can be controlled both manually and automatically. Before proceeding, take a closer look at the carriage controls shown below



Carriage controls

To move the carriage feed manually:

1. Push the carriage feed handwheel toward the carriage to engage the gear on the lead screw.

2. Rotate the handwheel clockwise to move the carriage right and rotate the handwheel counterclockwise to move the carriage left.

3. Set the handwheel scale in the same manner as described in the "Adjusting Cross Slide" instructions, and be sure to account for the backlash.

To use the automatic carriage feed:

1. Select the desired feed rate you need by looking at the charts on the lathe drive cover. When new, The Lathe is geared for a carriage feed rate of 0.1mm per revolution.

   Use the manual feed handwheel to position the carriage to your desired starting point and set the scale on the handwheel to "0".

2. Move the carriage feed lever down to engage the half-nut, which in turn, makes the automatic carriage feed active.

3. Pull out the carriage manual feed handwheel to unlock it so it does not rotate when the automatic carriage feed is engaged.

The carriage feed will now move forward or backward, depending on which direction you have selected for lathe rotation.

Understanding Gear Charts

The Lathe can be geared for a variety of different feed rates, so charts are placed on the drive cover of the lathe that explain how to set up the gear combinations for each type of carriage feed application. These applications are broken into two categories of charts—turning and threading.

Turning Chart—The speeds given on the turning chart represent standard speeds for most types of turning applications. See below.

mm / ↻	⟷ 0.1	⟷ 0.2
V D	33 80	50 80
F E	90 25	90 33
G L	G 90	G 90

Turning chart

Threading Charts—By arranging the gears as shown on the charts, you can set up the carriage feed to cut any of the thread pitches displayed. See below.

mm / 艹	0.4	0.5	0.6	0.7	0.8	1
G D	G 80	G 80	G 80	G 80	G 52	G 66
F E	30 80	30 60	30 50	42 60	60 80	60
L═G	75 G	80 G	80 G	80 G	75 G	G 80

mm / 艹	1.25	1.5	1.75	2	2.5	3
G D	G 52	G 66	G 80	G 70	G 80	G 80
F E	75 80	75 80	70 80	80	75 80	75 25
L═G	60 G	50 G	40 G	G 40	30 G	80 G

1"/n / 艹	10	11	14	19
G D	G 80	G 80	G 80	G 80
F E	66 40	60 40	75 50	50 40
L G	52 G	52 G	66 G	75 G

1"/n / 艹	20	22	40	44
G D	G 60	G 80	G 80	G 80
F E	66 80	60 80	33 52	30 52
L G	52 G	52 G	80 G	80 G

Threading charts

This is how to read the feed rate charts:

1. The box in the upper left-hand corner of each chart tells whether that chart represents carriage feed movement for standard or imperial threads. These boxes are shaded below.

mm	1.25	1.5	1.75
G D	G 52	G 66	G 80
F E	75 80	75 80	70 80
L=G	60 G	50 G	40 G

1"/n	10	11
G D	G 80	G 80
F E	66 40	60 40

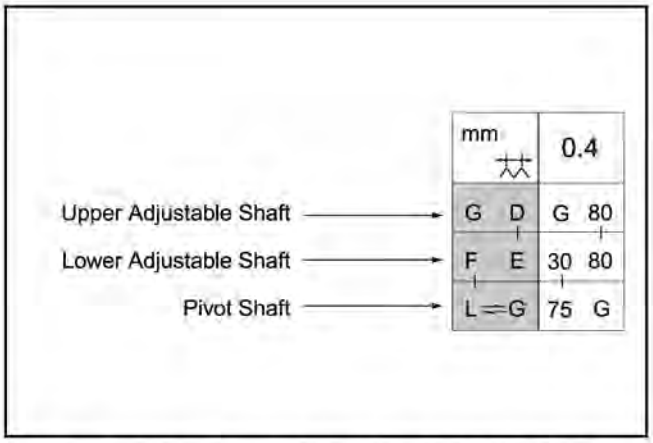
The shaded box indicates whether the chart is for standard or imperial threads

2. The boxes in the top row of each chart (excluding the box in the left-hand corner) shows the thread pitches listed on that chart. These boxes are shaded below.

mm	0.4	0.5	0.6	0.7	0.8	1
G D	G 80	G 80	G 80	G 80	G 52	G 66
F E	30 80	30 60	30 50	42 60	60 80	60
L=G	75 G	80 G	80 G	80 G	75 G	G 80

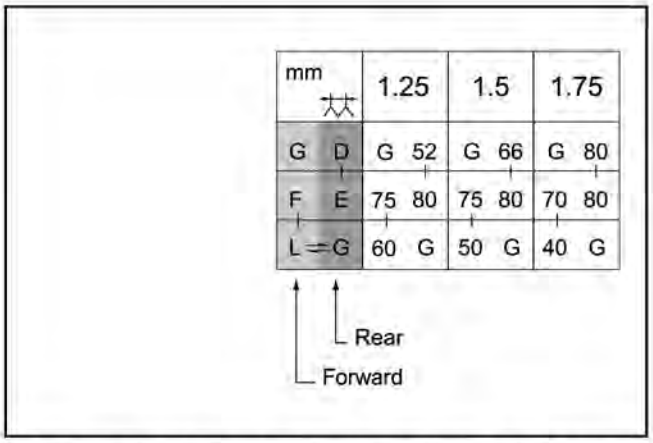
The shaded boxes show the thread pitches listed on this chart

3. The boxes on the left-hand column (excluding the box in the upper left-hand corner) represent the gear positions on each shaft. These boxes are shaded below and the shafts are called out with arrows.



The shaded boxes show the thread pitches listed on this chart

4. Each shaft has room for two positions to mount the gears—a forward position and a rear position. Figure below separates these positions into different shades for you to understand better.



The shaded boxes show the thread pitches listed on this chart

Both forward and rear positions must be filled on the shaft in order for the gears to work properly. A good example of this is the blank spot "G," as shown in the chart above. Although the chart shows this as a blank spot, there should actually be a spacer in this position on the machine. This spacer is only reflects ACTIVE gear positions.

NOTICE

On some setups, smaller gears must be used as spacers on the adjustable shafts.

5. The lines between gears "D" & "E" and gears "F" & "L" on the chart below indicate where the gears should be in mesh.

mm	0.4	0.5	0.6
G D	G 80	G 80	G 80
F E	30 80	30 60	30 50
L⇌G	75 G	80 G	80 G

The shaded boxes highlight the gear mesh lines

6. The boxes shaded below represent the actual gear combinations required to cut the thread pitches.

mm	1.25	1.5	1.75	2	2.5	3
G D	G 52	G 66	G 80	G 70	G 80	G 80
F E	75 80	75 80	70 80	80	75 80	75 25
L⇌G	60 G	50 G	40 G	G 40	30 G	80 G

The shaded boxes show specific gear setups

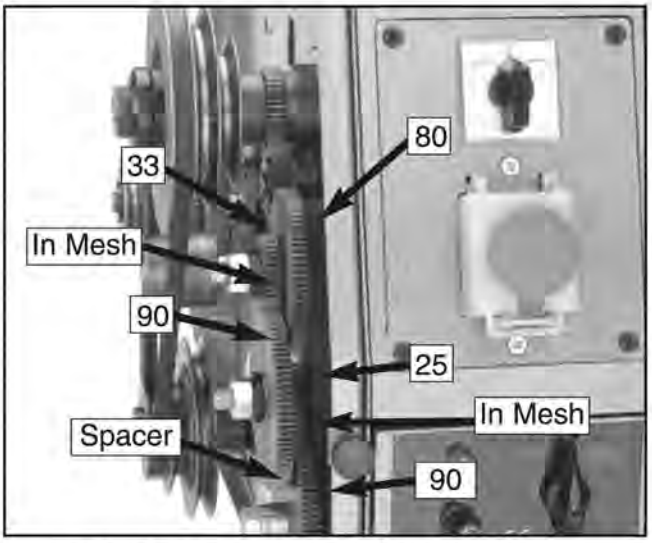
Here is a real-world example of a gear setup as shown on the chart:

When the lathe is shipped from the factory, it is geared for a carriage feed rate of 0.1mm per spindle revolution, or the gear combination shaded below.

mm	0.1	0.2
V D	33 80	50 80
F E	90 25	90 33
G L	G 90	G 90

Chart showing gear setup for 0.1mm

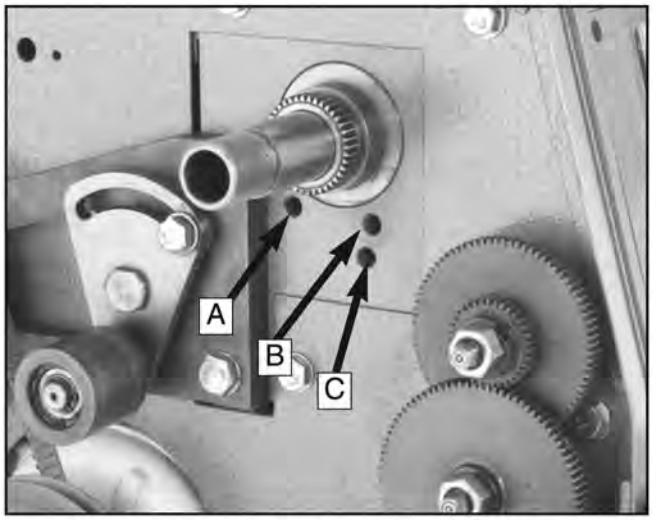
Figure below shows a profile of the 0.1mm feed rate actual gear setup on the machine. Notice how the gears mesh together in the locations displayed on the chart.



Actual gear setup for 0.1mm feed rate

Reverse Threading

The Lathe can be setup to turn left-handed threads by adding another fixed-shaft gear and moving the original fixed-shaft gear to another mounting location. Figure below shows the three mounting locations for fixed-shaft gears (spindle drive pulley is removed for clarity). For illustration purposes, we label these mounting positions A, B & C.



Fixed-shaft gear mounting positions

To set up the gears for reverse threading:

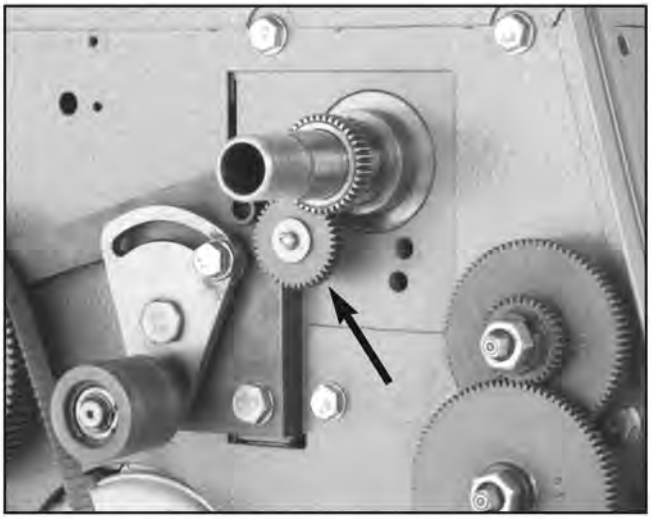
1. **Disconnect the lathe from the power source!**

2. Locate the extra fixed-shaft gear (shown in Figure below) in your inventory of loose parts.



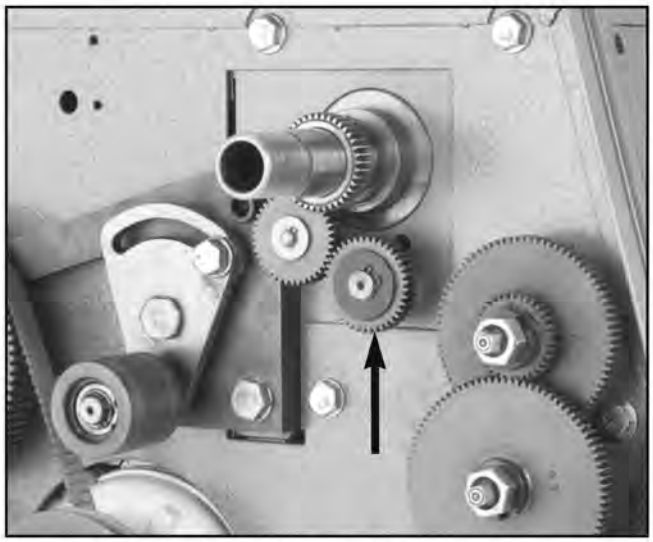
Extra fixed-shaft gear

3. Thread the extra fixed-shaft gear into mounting location “A” as shown below.



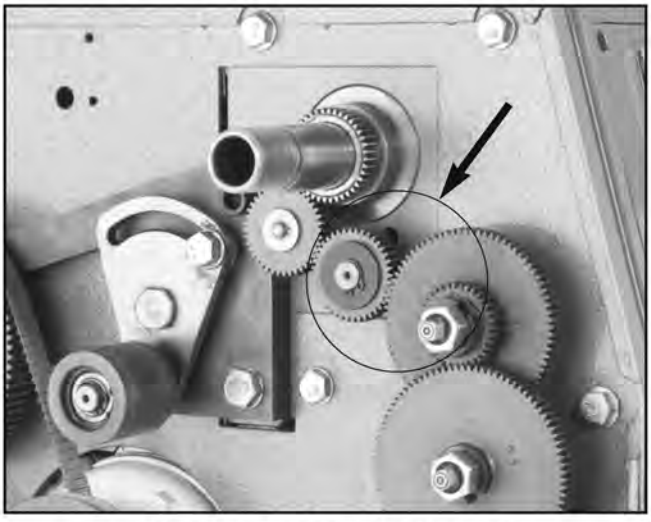
Extra fixed-shaft gear mounted in position “A”

4. When the machine is shipped, a fixed-shaft gear is in position "B". Remove that fixed-shaft gear from mounting location "B" and thread it into mounting location "C" as shown below.



Fixed-shaft gear mounted in position "C"

5. Loosen the cap screw on the gear bracket, and pivot the bracket so the top gear meshes with the fixed-shaft gear that is in position "B," as shown below.



All gears in mesh for reverse threading operations

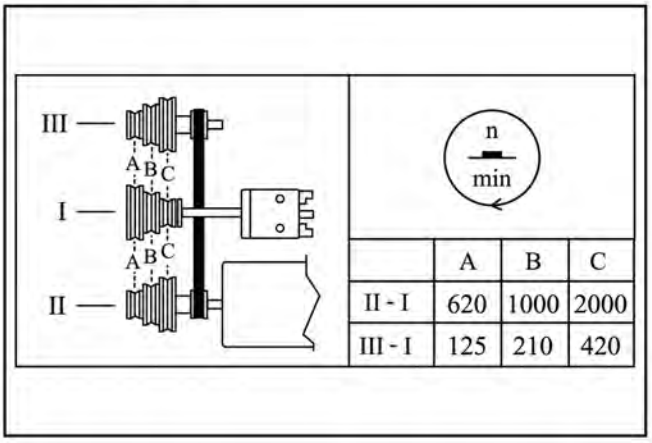
6. Tighten the cap screw in the gear bracket to keep it from pivoting.

7. Spin the lathe chuck by hand to ensure that the gears do not bind.

8. Replace the cover and test run the machine before proceeding with your specific operation.

Changing Speeds (C6 ONLY)

The Lathe features 6 speeds—125, 210, 420, 620, 1000 & 2000 RPM. (May have some small changes due to the power frequency.)These speeds can be changed by positioning the V-belt in different sheaves on the drive pulleys, as illustrated in the speed change chart on the machine label or in below.

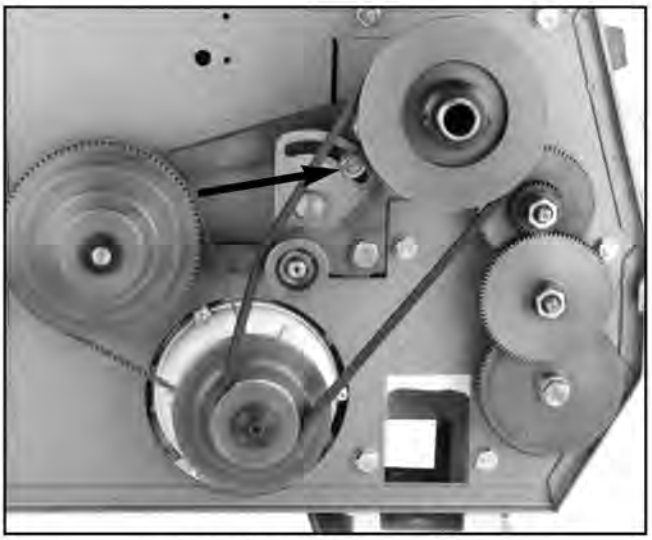


	A	B	C
II - I	620	1000	2000
III - I	125	210	420

Speed change chart

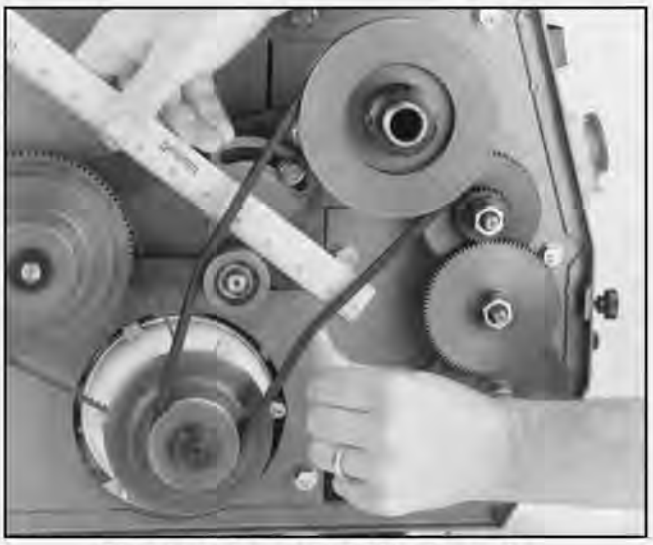
To change the belt position on the pulleys:

1. **Disconnect the lathe from the power source!**
2. Open the drive belt cover.
3. Loosen the bolt on the tensioner bracket (shown in Figure below) with a 19mm wrench.



Tensioner adjustment bolt

4. Move the pulley bracket away from the belt.
5. Position the belt into the pulley sheaves that dictate the speed required for your operation.
6. Move the pulley bracket into the belt and tension it until there is about 12mm deflection on the side of the belt that is opposite of where the tensioner is making contact. *Figure below* shows how to check for proper tension by using a ruler and your thumb. *Note—only moderate pressure is needed to check belt tension!*



Checking for proper V-belt tension

7. Replace the drive belt cover.

CAUTION

Some threading operations may damage the lead screw if performed at high speeds. Always use the slowest speed possible for your particular operation!

LATHE MAINTENANCE

Lubrication

Your C6B bench lathe is a precision tool. In order to maintain this precision and prolong its useful life, it is advised that you follow the recommended daily and periodic maintenance tables printed below.

For lubricating your machine, we recommend that you use a manual oiler (oil can) filled with ISO 68 or SAE 20W non-detergent oil or similar lubricant.

Ball fittings—Shown to the right, ball fittings are responsible for the majority of the machine lubrication. To lubricate ball fittings, depress the ball with the tip of the oil can nozzle and squirt a little oil inside the fitting. Make sure to clean the outside of the ball fitting before and after each use to keep out contaminants.



Lubrication ball fittings

Daily and Periodic Maintenance

Daily Pre-use

1. Using an oil can with a narrow nozzle, oil all the oil points on the machine, incl.
A) Saddle (4), B) tailstock (2), C) traverse slide (1), D) compound slide (2), E) leadscrew gearbox (2), and F) leadscrew end bearing (1).
2. Move the traverse and compound slides to give access to their drive shaft threads and lightly coat with oil, work the oil up the threads to lubricate the thread followers.
3. Spray-oil the slides and the lathe bed, exercise the saddle and the slides to spread the oil to all surfaces, both hidden and visible.
4. Spray up under the rack cover to lubricate the rack. (G)
5. Apply oil to the change gears and their axle mountings. (H)

Daily after-use

1. Clean all swarf and chips away from the machine bed, slide surfaces, and the tool post.
2. Exercise the slides and ensure no swarf etc., is lodged in the drive shaft tunnels.
3. If you have been using 'suds' make sure the machine is thoroughly dried off. Clear the suds tray of all swarf and chips, especially around the drain.
4. Check the tool, ensure it is usable the next time, if not re-sharpen or replace the tool tip.
5. Lightly oil spray all the machine beds and surfaces, and the tailstock barrel.
6. Clean and lightly oil any tools you may have been using (centres, drill chucks, spanners chuck keys etc, and put them away.
7. Switch off the power supply. Disconnect the plug.
8. Cover the machine over with a dust cloth.

Weekly

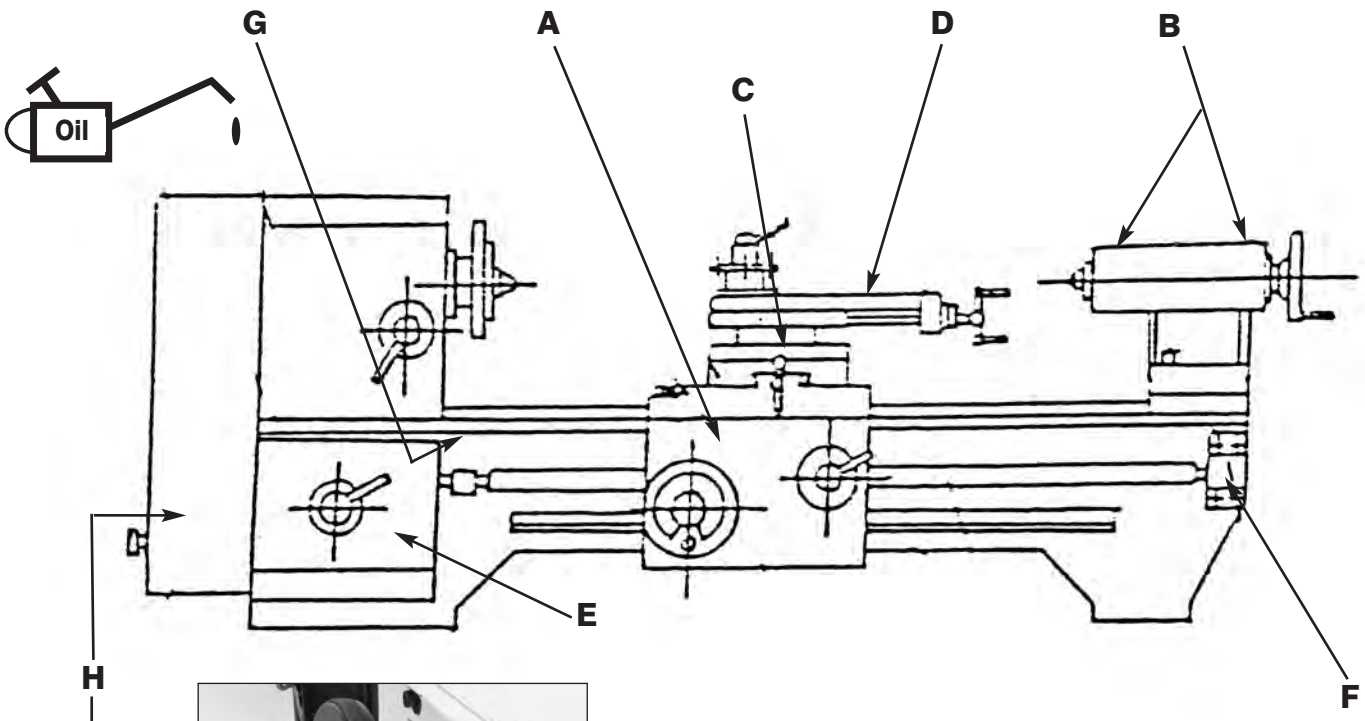
a) Check the belt tension.
b) Check the tautness of the slides.
c) Check the level of the suds reservoir. (if you are using suds).

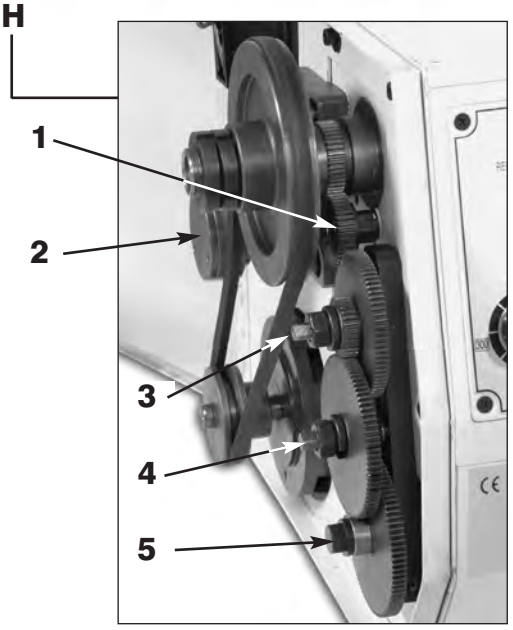
Accessories
May we recommend the following products for use with your C6B

Grease - Rocol Saphire 2 (Part number: 810129).
Lubricant - Rocol Slideway lubricant spray (Part Number: 810141).
Cutting Fluid - Rocol Multisol cutting fluid (Part Number: 810140).

There are numerous accessories listed for the machine listed in the Axminster catalogue in section 2.

LATHE MAINTENANCE (OIL LUBRICATION POINTS)



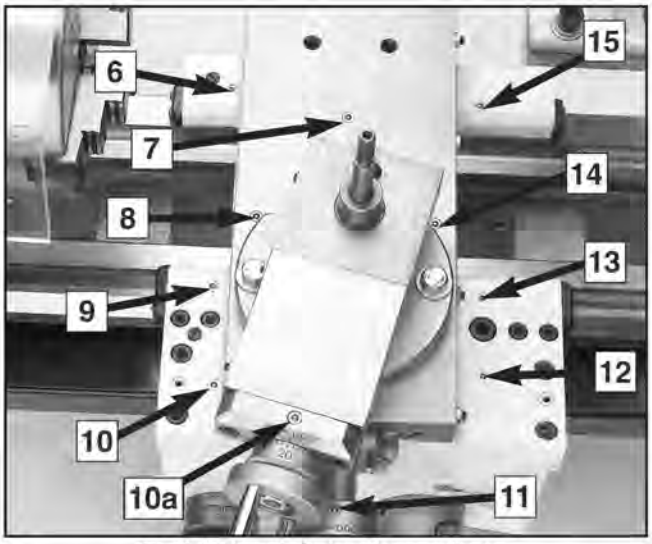


Change Gear

1. Fixed Shaft Gear
2. Synchronised Counter Pulley
3. Upper Adjustable Shaft
4. Lower Adjustable Shaft
5. Pivot Shaft

LATHE MAINTENANCE

6. Bed Guide
7. Cross Slide Leadscrew
8. Bed Guide
9. Bed Guide
10. Apron
10a Compound Slide Leadscrew
11. Cross Slide Leadscrew Support
12. Apron
13. Bed Guide
14. Bed Guide
15. Bed Guide



Ball fitting lubrication points

Gears—Apply a minimal amount of oil to the teeth of the end gears after assembly and each 8 hours of actual use. Avoid getting oil on the belt or pulleys when lubricating. Also, regularly apply lubrication to all the ball fittings drive box.

Long Leadscrew—Apply a minimal amount directly on the rack every 8 hours of actual use.

Carriage Rack—Apply a minimal amount directly on the rack every 8 hours of actual use.

Checking V-Belt

To ensure optimum power transmission from the motor, the V-belts must be in good condition and must operate under proper tension. The belts should be checked for cracks, fraying, and wear at least every 3 months—more often if the machine is used daily.

The check the V-belt:

1. **Unplug the lathe from its power source!**
2. Open the drive cover.
3. Note the condition of the V-belt. If the V-belt is cracked, frayed, or glazed; it should be replaced.

SERVICE ADJUSTMENTS

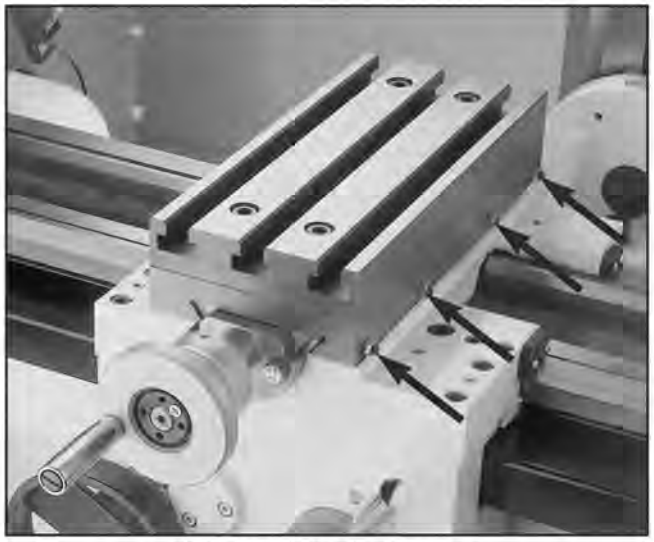
Gibs

There are three gib adjustments for the lathe—the cross-slide gib, the compound slide gib and the apron gib.

NOTICE

When adjusting gibs, keep in mind that the goal of gib adjustment is to remove unnecessary sloppiness without causing the slides to bind. Loose gibs may cause poor finishes on the workpiece and may cause undue wear on the slide. Over-tightening may cause premature wear on the slide, leadscrew and nut.

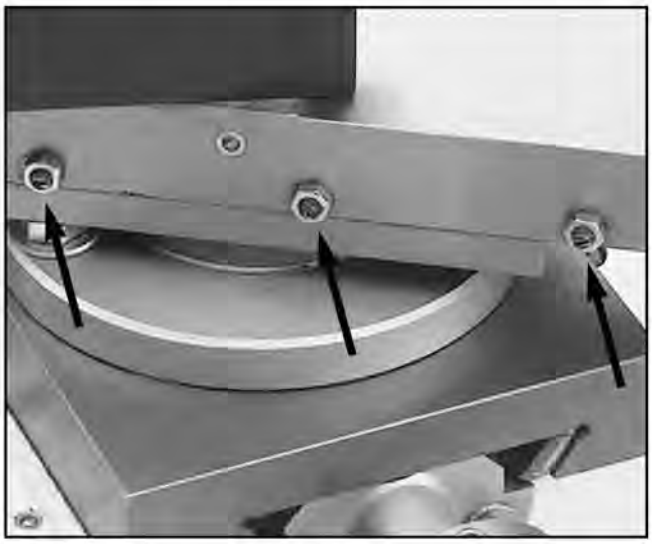
Cross-slide Gib—The gib on the cross-slide is adjusted by tightening or loosening the 4 gib screws located on the right-hand side of the slide. See Figure below. Before adjusting the gib screws, loosen their jam nuts.



Cross slide gib screws

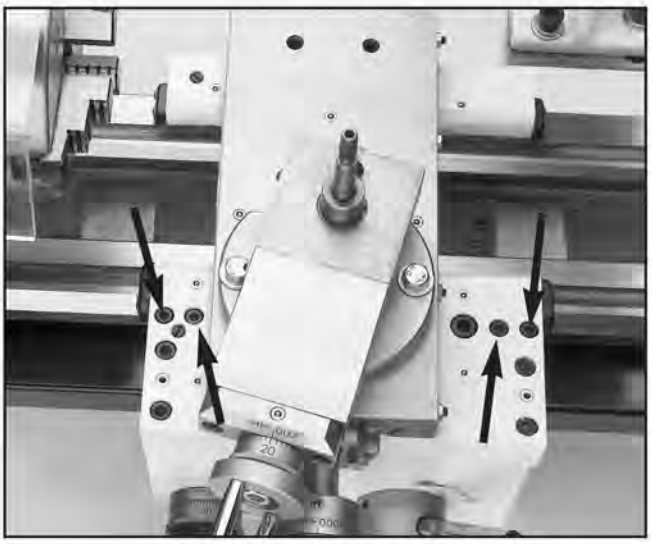
The gib is held in place by the setscrews. *DO NOT overtighten.* The gib is properly adjusted when a slight drag is detected while turning the hand crank. This drag should be evenly distributed among the 4 setscrews, so adjust each screw until a slight drag is detected while the hand crank is turned.

Compound Gib—The gib on the compound has 3 screws that maintain tension on the slide. These screws are held in place with retaining nuts. To adjust, loosen the retaining nuts and then tighten the screws as needed. When proper tension has been detected by turning the hand crank on the compound, tighten the retaining nuts while maintaining the position of the screw with an Allen® wrench as in Figure below.



Compound slide gib screws

Saddle Gibs—There are 4 tensioning screws for both the front and rear saddle gibs. Before making adjustments to the saddle gib, ensure that the front lock lever is loose by turning it counterclockwise. See Figures below. It is important the screws are tightened evenly. A slight drag should be detected while turning the hand crank at the end of the lathe.



Front saddle gib screws



Rear saddle gib screws

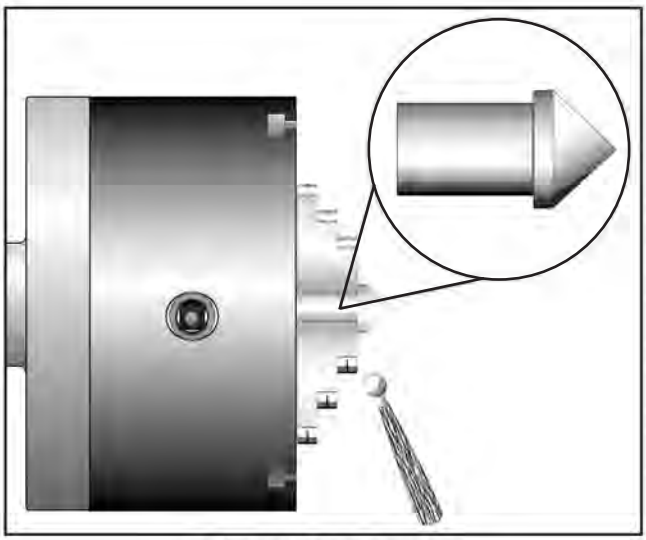
Aligning Tailstock

The tailstock on the Lathe is aligned with the headstock at the factory. However, at times you may wish to misalign the tailstock for certain operations; then, realign it when you are finished.

To align the tailstock:

1. Center drill a 150mm long piece of round cold rolled stock on both ends. Set it aside for use in **step 4.**

2. Make a dead center by turning a shoulder to make a shank, then flip the piece over in the chuck and turn a 60° point. See Figure below. *Note—As long as it remains in the chuck, the point of your center will be accurate to your spindle axis. Keep in mind that the point will have to be refinished whenever it is removed and returned to the chuck.*

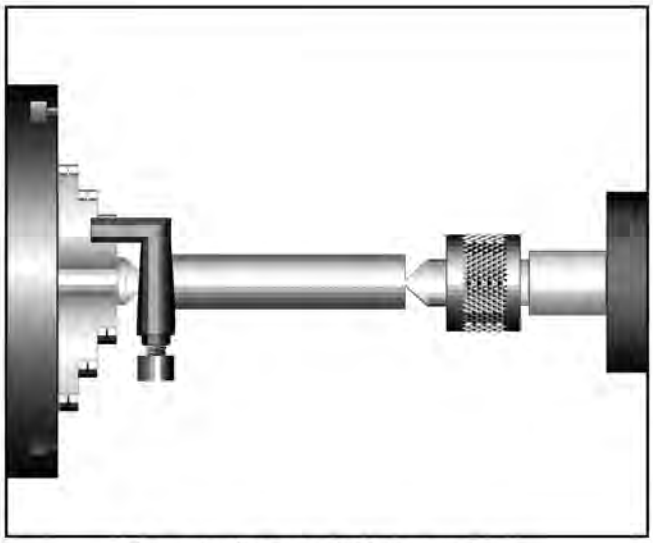


Finished dead center

3. Place a center in your tailstock.

4. Attach a lathe dog to the bar stock and mount it between the centers. See Figure below.

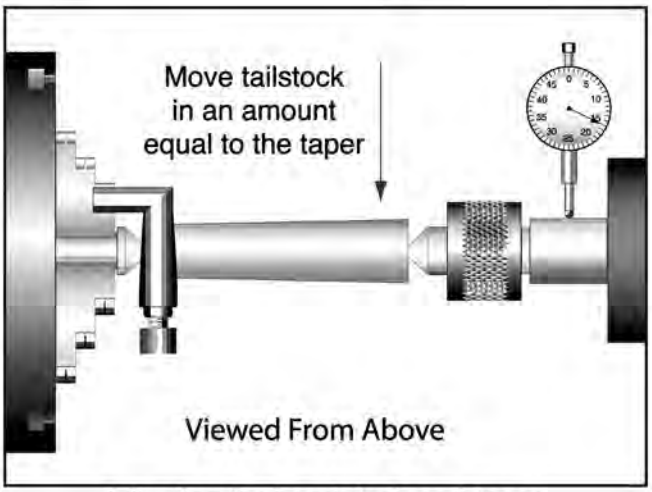
5. Turn approximately 0.25mm off of the diameter.



Bar stock mounted on centers

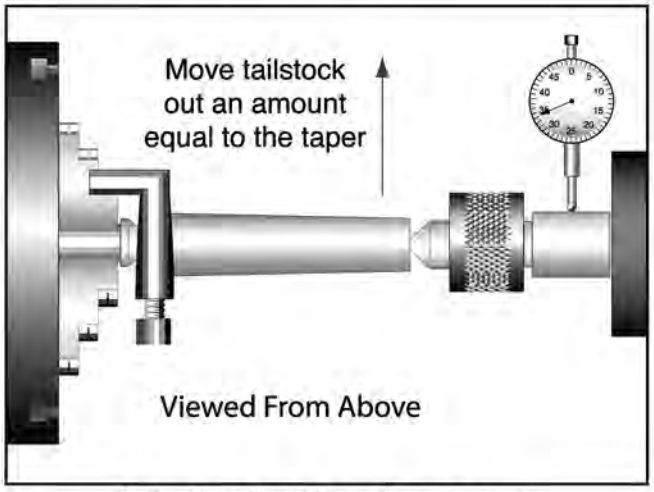
NOTICE

Before making adjustments to the tailstock, mount a dial indictor so that the dial plunger is on the tailstock barrel. See Figure below.



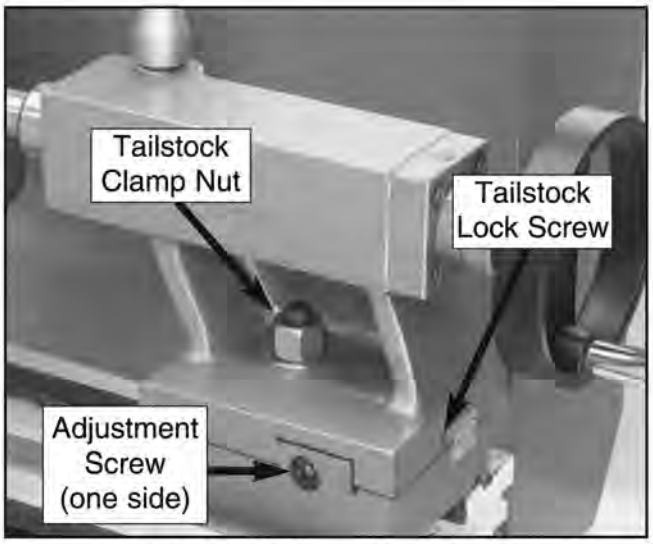
Adjusting for headstock end taper

6. Measure the workpiece with a micrometer. If the stock is fat at the tailstock end, the tailstock needs to be moved toward you the amount of the taper. See **Figure above.** If the stock is thinner at the tailstock end, the tailstock needs to be moved away from the operator by at least the amount of the taper. **See Figure below.**



Adjusting for tailstock end taper

7. Loosen the tailstock clamp nut and the lock screw shown in Figure below.



Tailstock offset adjustment screw

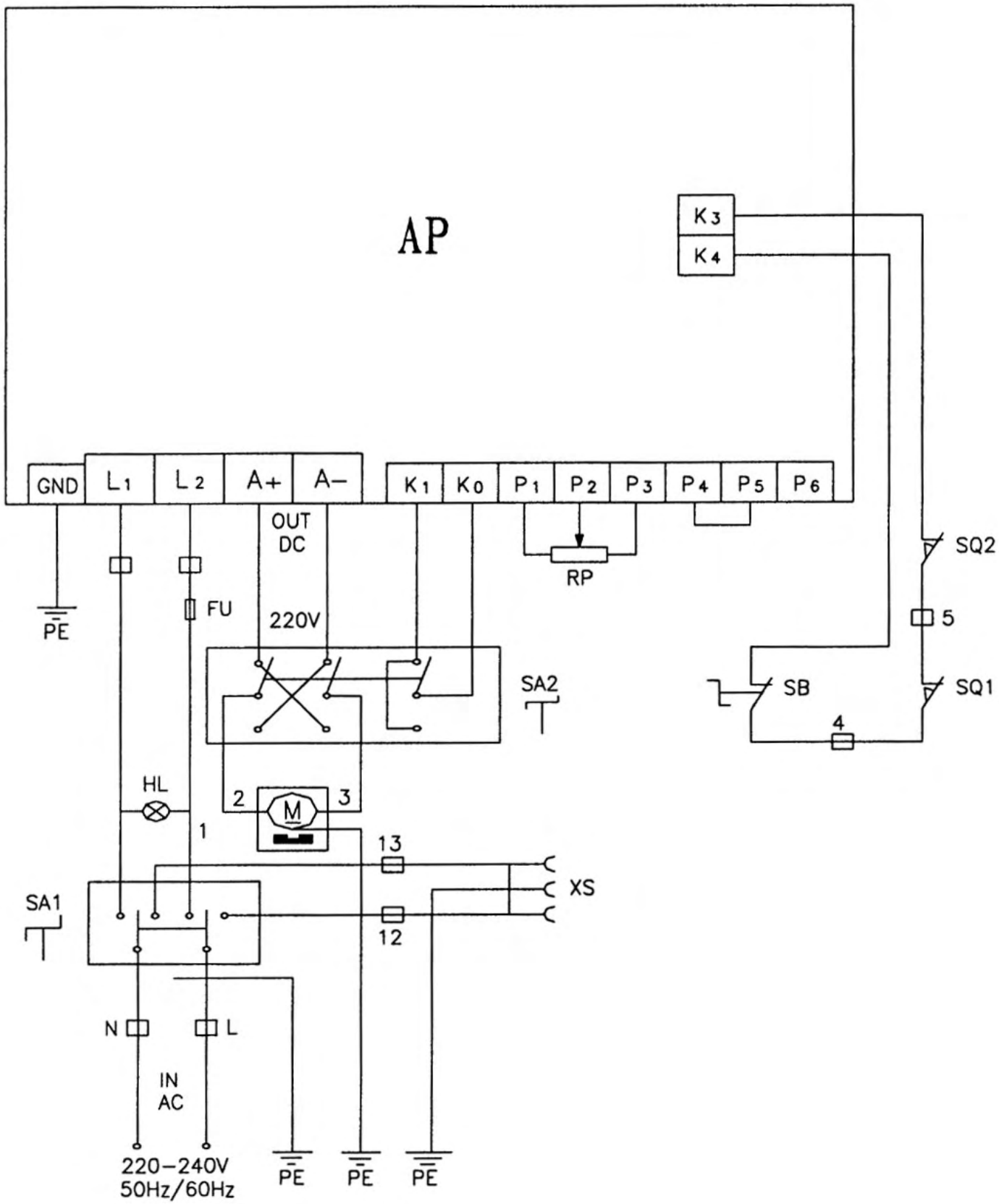
8. Use the tailstock adjustment screws on both sides to adjust move the tailstock offset by the amount of the taper.

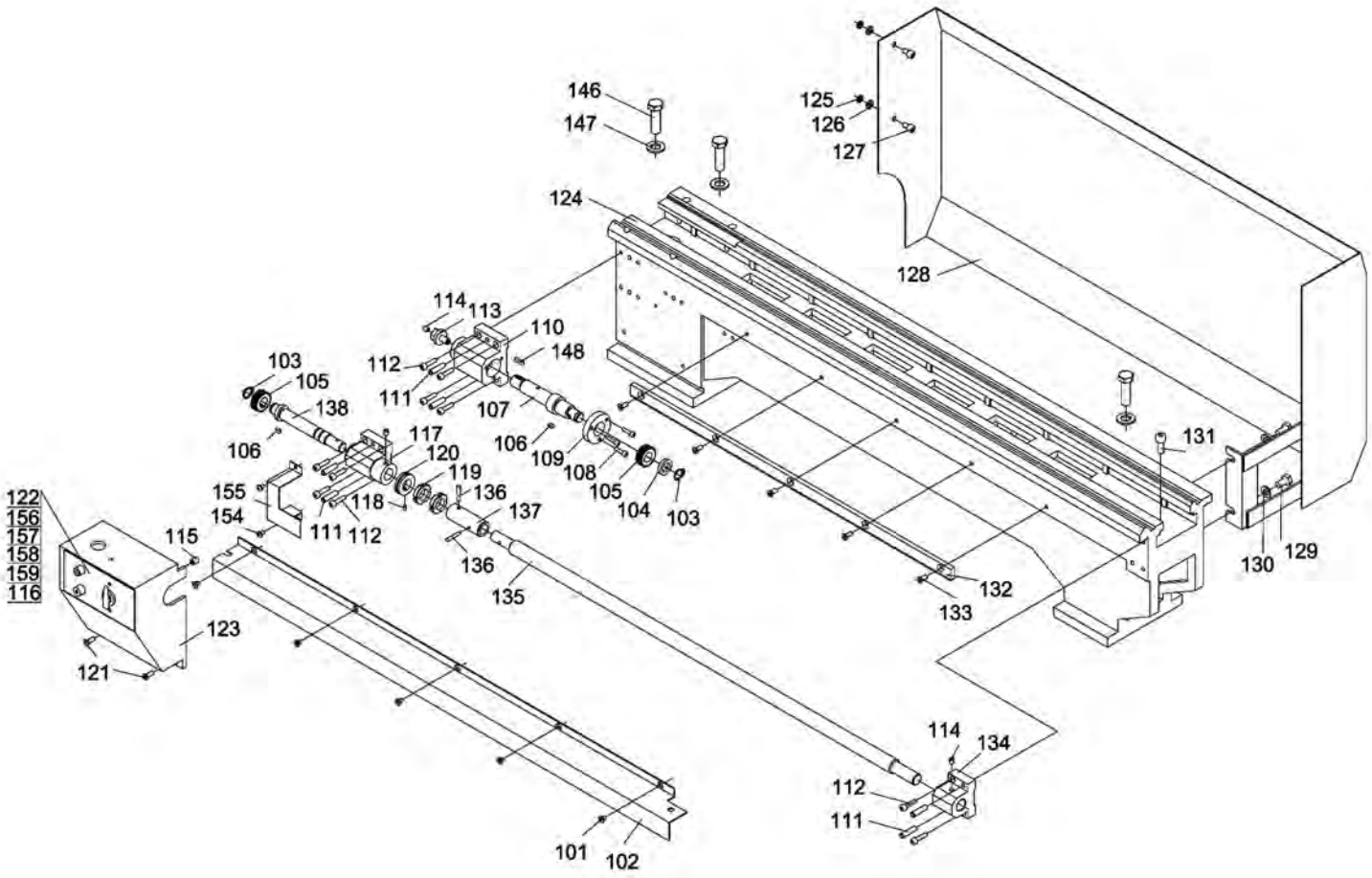
9. Tighten the clamp nut, lock screw and adjustment screws. Be careful not to move the tailstock out of position when tightening the adjustment screws.

10. Turn another 0.25mm off of the stock and check for taper. Repeat **steps 7-9** as necessary until the desired amount of accuracy is achieved.

Bearing Preload

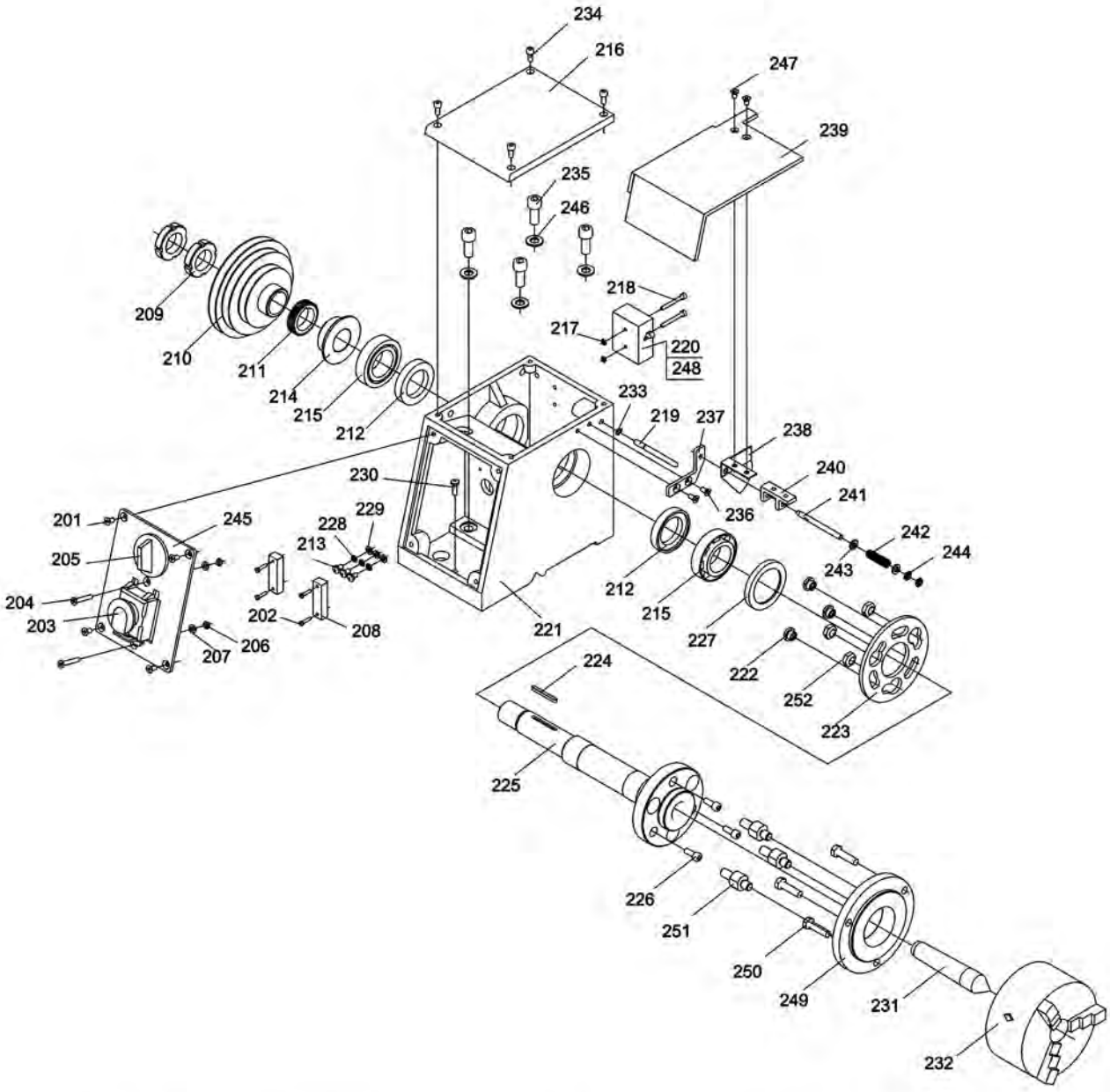
This lathe is shipped from the factory with the bearing preload already set. If the preload requires resetting for whatever reason, please contact our service department for further instructions.


AP
K3
K4
GND
L1
L2
A+
A−
K1
K0
P1
P2
P3
P4
P5
P6
OUT
DC
RP
SQ2
PE
FU
220V
5
SA2
SB
SQ1
4
HL
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50Hz/60Hz
PE
PE
PE



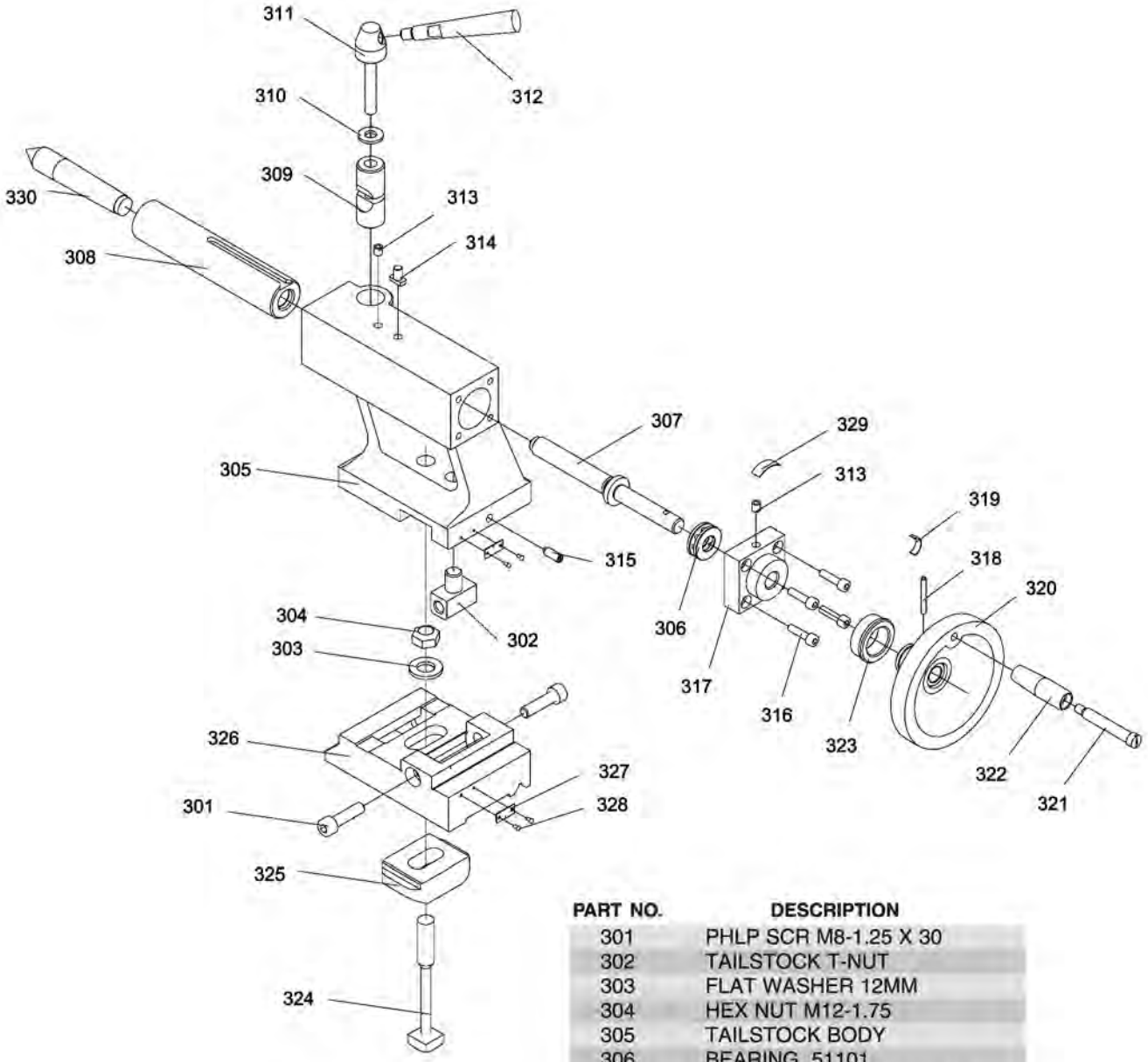
PART NO.	DESCRIPTION
101	PHLP HD SCR M5-.8 X 8
102	LEADSCREW COVER
103	EXT RETAINING RING 14MM
104	CHANGE GEAR SPACER
105	SMALL GEAR
106	KEY 4 X 4 X 8
107	CHANGE GEAR SHAFT
108	PHLP HD SCR M4-.7 X 16
109	ADJUSTING DISC
110	SHAFT SUPPORT
111	TAPER PIN 6 X 26
112	PHLP HD SCR M5-.8 X 20
113	BOLT (WITH SHOULDER)
114	OIL CUP 6
115	BLOCK FOR SWITCH
116	PHLP HD SCR M4-.7 X 8
117	LEADSCREW SUPPORT L
118	PHLP HD SCR M4-.7 X 8
119	ROUND NUT
120	STEEL WASHER
121	PHLP HD SCR M5-.8 X 14
122	SWITCH LABEL
123	SHAFT COVER
124	BED

PART NO.	DESCRIPTION
125	HEX NUT M6-1.0
126	FLAT WASHER 6MM
127	HEX BOLT M6-1 X 10
128	SPLASH GUARD
129	PHLP SCR M8-1.25 X 15
130	FLAT WASHER 8MM
131	PHLP SCR M8-1.25 X 20
132	RACK
133	PHLP HD SCR M5-.8 X 12
134	LEADSCREW SUPPORT R
135	LONG LEADSCREW
136	ROLL PIN 4 X 25
137	SLEEVE JOINT
138	JOINT SHAFT
146	HEX BOLT M12-1.75 X 40
147	FLAT WASHER 12MM
148	KEY 4 X 4 X 16
154	PHLP HD SCR M4-.7 X 16
155	SMALL GEAR PROTECT
156	GREEN LAMP
157	FUSE BOX
158	FUSE
159	SELECTOR SWITCH

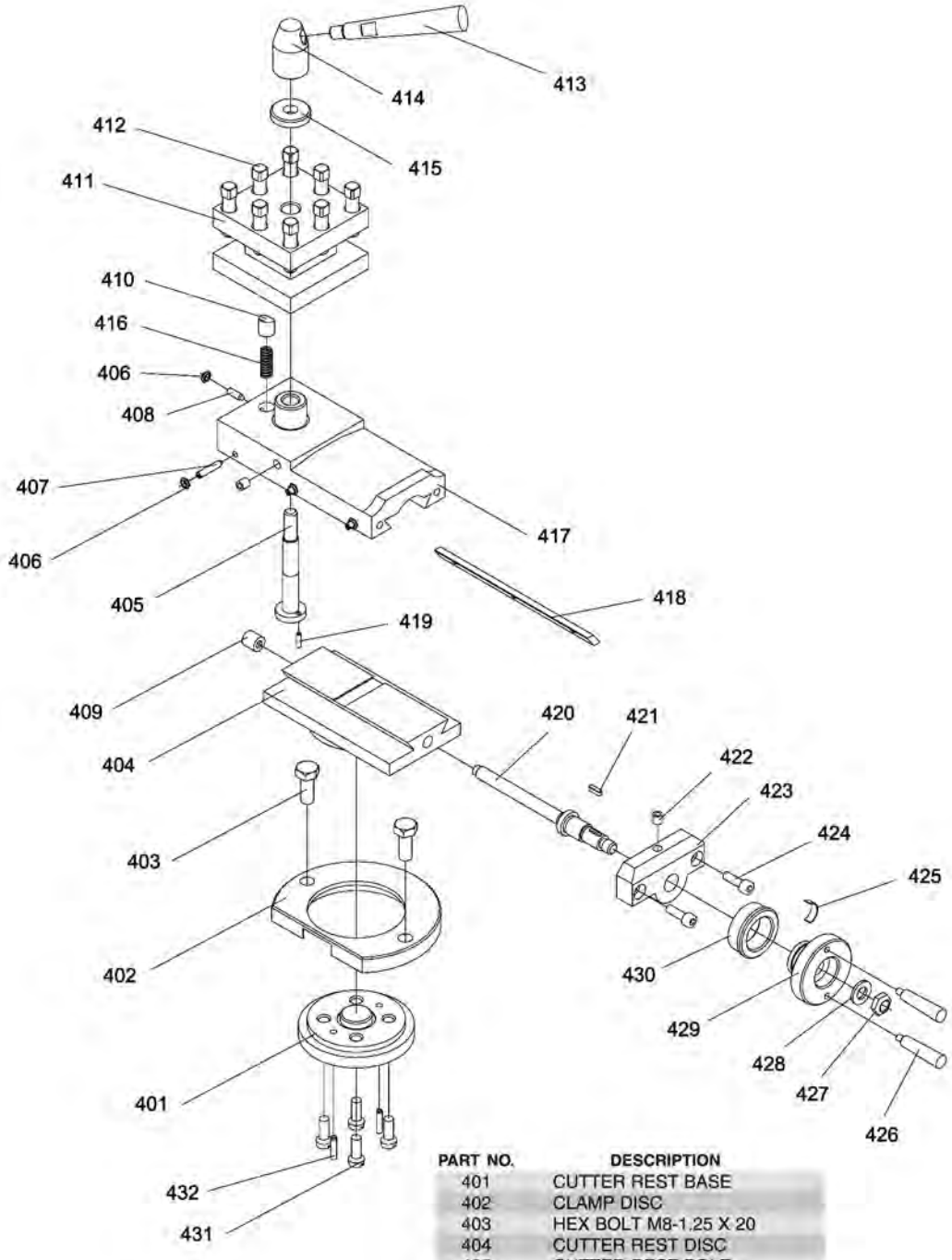


PART NO.	DESCRIPTION
201	PHLP HD SCR M5-.8 X 10
202	PHLP HD SCR M3-.5 X 14
203	POWER SWITCH W/STOP
204	PHLP HD SCR M5-.8 X 30
205	FWD/REV SWITCH
206	HEX NUT M5-0.8
207	FLAT WASHER 5MM
208	CONNECTOR
209	ROUND NUT M27-1.5
210	SPINDLE PULLEY
211	SPINDLE GEAR
212	OIL RING
213	PHLP HD SCR M5-.8 X 8
214	SPINDLE SPACER
215	BEARING 32007
216	SPINDLE BOX COVER
217	HEX NUT M4-0.7
218	PHLP HD SCR M4-.7 X 35
219	PIN SHAFT
220	BOX FOR MICRO SWITCH
221	HEAD STOCK BODY
222	FIXING NUT
223	ROTATABLE SPACER
224	KEY 4 X 4 X 40
225	SPINDLE
226	PHLP HD SCR M6-1 X 16

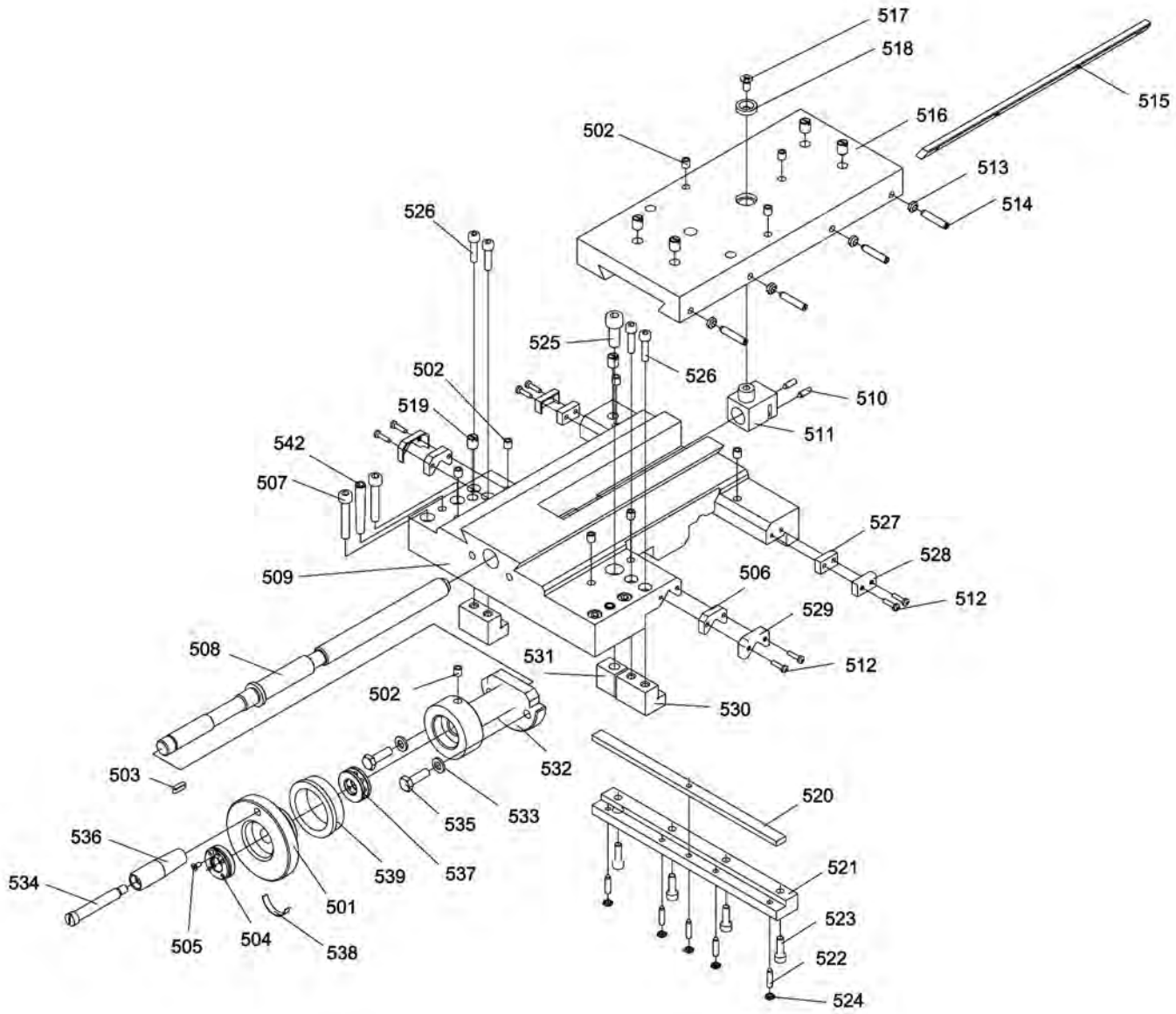
PART NO.	DESCRIPTION
227	FRONT BEARING COVER
228	LOCK WASHER 5MM
229	EXT TOOTH WASHER M5
230	PHLP HD SCR M5-0.8 X 16
231	SPINDLE CENTER MT3
232	3-JAW CHUCK D=125MM
233	EXT RETAINING RING 6MM
234	PHLP HD SCR M5-.8 X 12
235	PHLP SCR M10-1.5 X 25
236	PHLP HD SCR M5-.8 X 10
237	SUPPORT
238	LIMIT BLOCK
239	CHUCK GUARD
240	FIXING SUPPORT
241	SMALL SHAFT
242	COMPRESS SPRING
243	FLAT WASHER 6MM
244	HEX NUT M6-1.0
245	PLATE FOR SWITCHES
246	FLAT WASHER 10MM
247	PHLP HD SCR M5-.8 X 8
248	MICROSWITCH
249	3-JAW CHUCK FLANGE
250	HEX BOLT M8-1.25 X 30
251	PLUG BOLT
252	HEX NUT M10-1.5



PART NO.	DESCRIPTION
301	PHLP SCR M8-1.25 X 30
302	TAILSTOCK T-NUT
303	FLAT WASHER 12MM
304	HEX NUT M12-1.75
305	TAILSTOCK BODY
306	BEARING 51101
307	TAILSTOCK LEADSCREW
308	TAILSTOCK SLEEVE
309	TUBULAR CLAMP
310	FLAT WASHER 8MM
311	CLAMP BOLT
312	HANDLE
313	OIL CUP
314	T-TAPY FLAT KEY
315	PHLP HD SCR M6-1 X 16
316	PHLP HD SCR M5-.8 X 20
317	TAILSTOCK END COVER
318	CYLINDER PIN 4*30
319	SPRING BOW
320	HAND WHEEL
321	HANDLE BOLT
322	HANDLE SLEEVE
323	INDEX RING
324	SQ HD BOLT M12 X 100
325	TAILSTOCKCLAMP PLATE
326	BASE
327	ZERO POSITION LABEL
328	LABEL RIVET
329	INDICATE LABEL
330	TAILSTOCK CENTER MT2

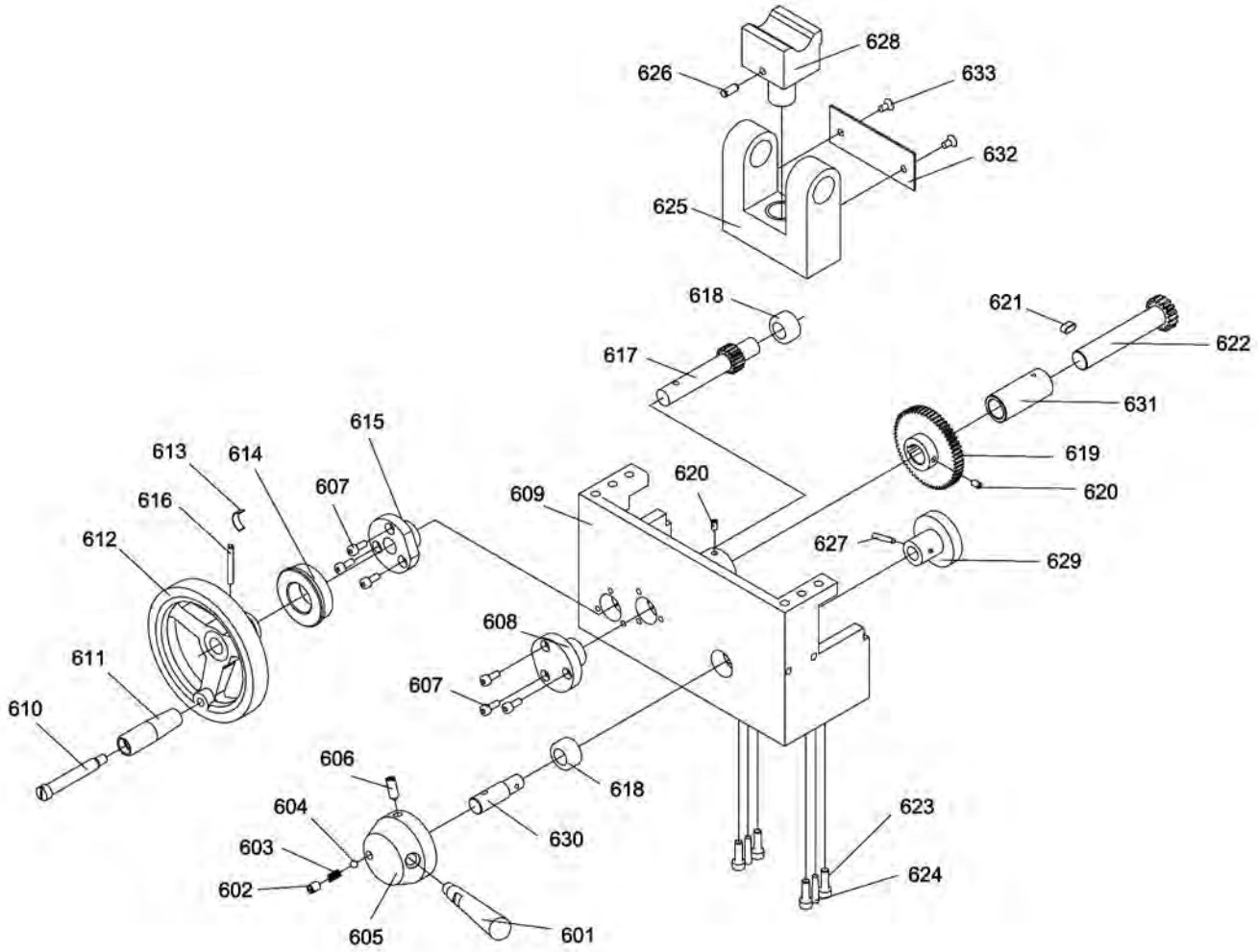


PART NO.	DESCRIPTION
401	CUTTER REST BASE
402	CLAMP DISC
403	HEX BOLT M8-1.25 X 20
404	CUTTER REST DISC
405	CUTTER REST BOLT
406	HEX NUT M4-0.7
407	PHLP HD SCR M4-.7 X 20
408	PHLP HD SCR M4-.7 X 12
409	OIL CUP 10
410	FIXING PIN
411	SQUARE CUTTER REST
412	PHLP SCR M8-1.25 X 30
413	HANDLE
414	HANDLE BASE
415	HANDLE SPACER
416	SPRING 0.5 X 3.5 X 17
417	CUTTER REST CARRIAGE
418	PAD IRON GIB
419	CYLINDER PIN 3 X 10
420	CARRIAGE LEAD SCREW
421	KEY 3 X 3 X 10
422	OIL CUP 6
423	LEADSCREW SUPPORT
424	PHLP HD SCR M5-0.8 X 16
425	SPRING PLATE
426	HANDLE
427	HEX NUT M8-1.25
428	FLAT WASHER 8MM
429	CARRIAGE HANDWHEEL
430	INDEX RING
431	PHLP HD SCR M6-1 X 16
432	CYLINDER PIN 4 X 16

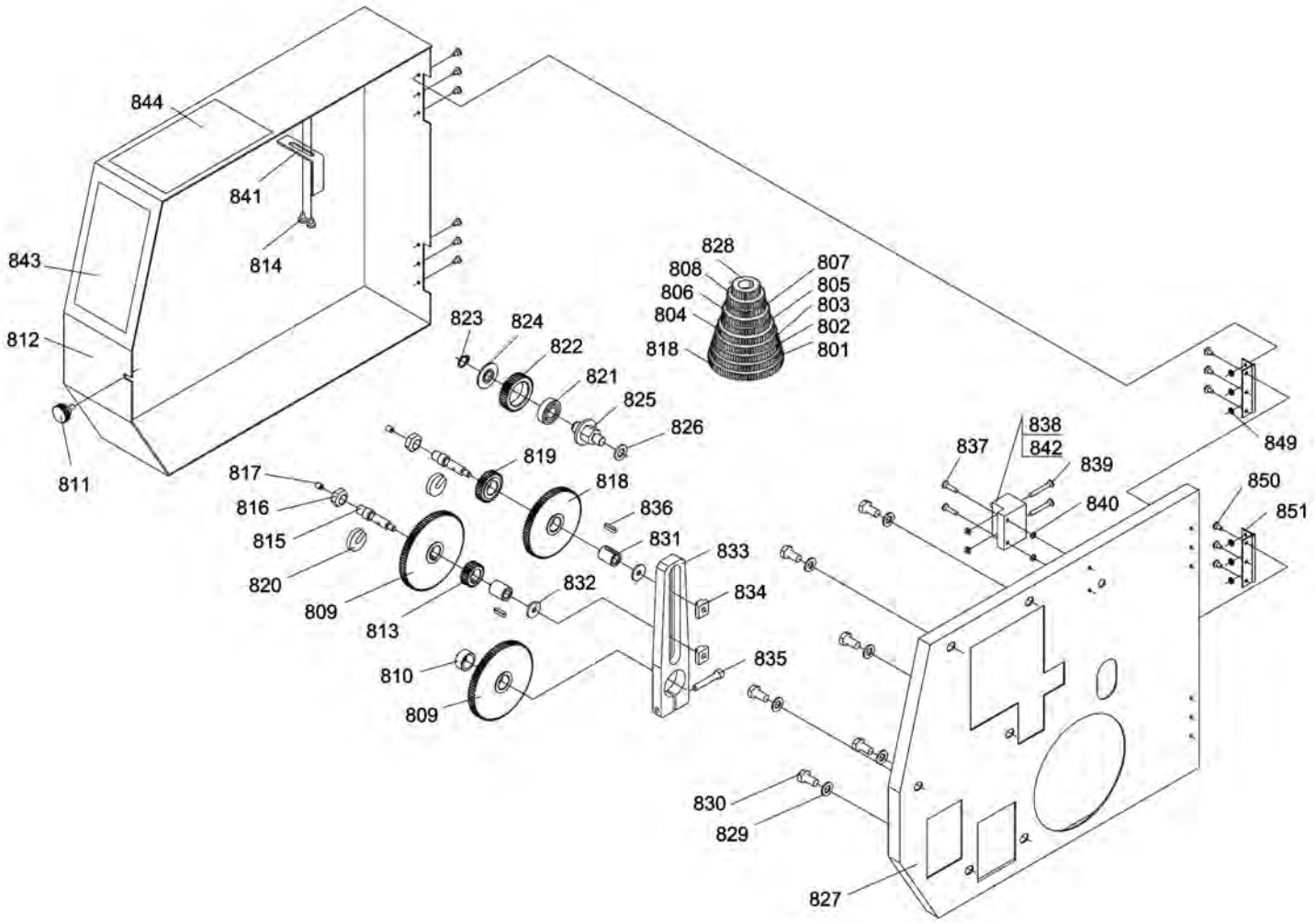


PART NO.	DESCRIPTION
501	HAND WHEEL
502	OIL CUP 6
503	KEY 4 X 4 X 12
504	ROUND NUT
505	PHLP HD SCR M3-.5 X 6
506	OIL-STOPPING FELT
507	PHLP HD SCR M6-1.0 X 35
508	SADDLE LEADSCREW
509	SADDLE
510	PHLP HD SCR M4-.7 X 12
511	CLEARANCE NUT
512	PHLP HD SCR M3-.5 X 12
513	HEX NUT M5-0.8
514	PHLP HD SCR M5-.8 X 26
515	PAD IRON GIB
516	CROSS SLIDE
517	PHLP HD SCR M5-.8 X 10
518	CROSS SLIDE SPACER
519	PHLP SCR M8-1.25 X 10
520	GIB STRIP

PART NO.	DESCRIPTION
521	REAR-CLAMP PLATE
522	PHLP HD SCR M4-.7 X 16
523	PHLP HD SCR M5-.8 X 16
524	HEX NUT M4-0.7
525	PHLP SCR M8-1.25 X 20
526	PHLP HD SCR M5-.8 X 20
527	OIL-STOPPING FELT
528	PROTECTING PANEL
529	PROTECTING PANEL
530	FRONT-CLAMP PLATE
531	BRAKING PLATE
532	LEADSCREW SUPPORT
533	FLAT WASHER 6MM
534	HANDLE BOLT
535	HEX BOLT M6-1 X 20
536	HANDLE SLEEVE
537	BEARING 8101
538	SPRING PLATE
539	INDEX RING
542	ROLL PIN 6 X 45

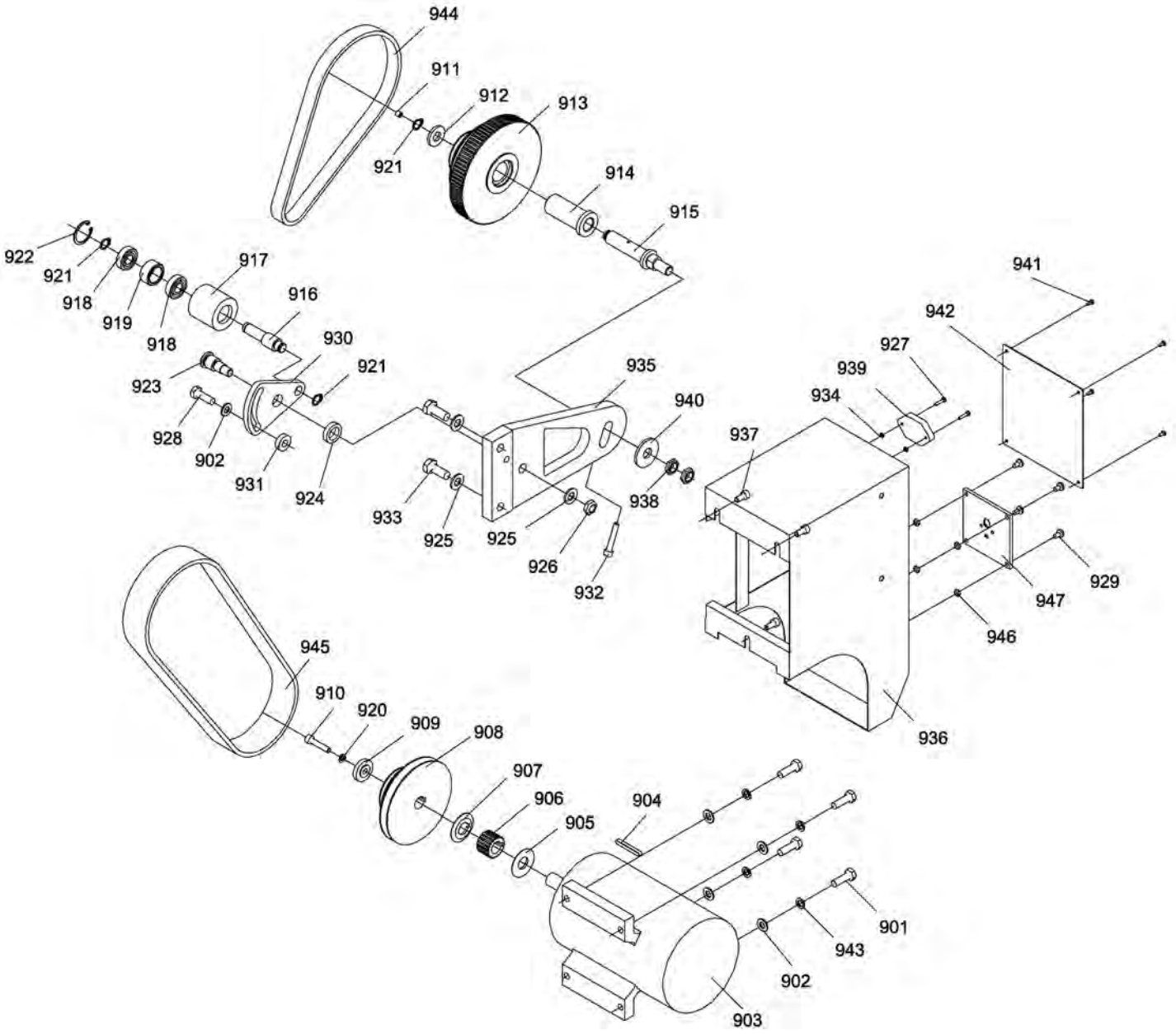


PART NO.	DESCRIPTION
601	HANDLE
602	PHLP HD SCR M6-1 X 8
603	COMPRESS SPRING
604	STEEL BALL 5
605	HANDLE SEAT
606	PHLP HD SCR M6-1 X 16
607	PHLP HD SCR M4-.7 X 10
608	SHAFT SLEEVE
609	APRON BODY
610	HANDLE BOLT
611	HANDLE SLEEVE
612	HAND WHEEL
613	SPRING PLATE
614	INDEX RING
615	SMALL SHAFT SLEEVE
616	SPRING PIN 4 X 30
617	SMALL GEAR SHAFT
618	SHAFT SLEEVE
619	GEAR
620	PHLP HD SCR M4-.7 X 8
621	KEY 5 X 5 X 10
622	GEAR SHAFT
623	PHLP HD SCR M5-.8 X 16
624	ROLL PIN 4 X 22
625	HALF NUT BASE
626	ROLL PIN 5 X 12
627	ROLL PIN 3 X 20
628	HALF NUT
629	SLOTTED DISC
630	ROTATING SHAFT
631	SHAFT SLEEVE
632	MOVING PLATE
633	PHLP HD SCR M4-.7 X 8



PART NO.	DESCRIPTION
801	GEAR Z:72
802	GEAR Z:70
803	GEAR Z:68
804	GEAR Z:66
805	GEAR Z:60
806	GEAR Z:50
807	GEAR Z:48
808	GEAR Z:45
809	GEAR Z:90
810	WASHER
811	KNURLING BOLT
812	GEAR BOX COVER
813	GEAR Z:25
814	SCREW M5 X16
815	BOLT
816	NUT M12
817	OIL CUP 6
818	GEAR Z:80
819	GEAR Z:33
820	OPEN WASHER
821	BEARING 6001
822	INTERMEDIATE GEAR Z:40
823	CHECK RING 12
824	WASHER

PART NO.	DESCRIPTION
825	FIXED SHAFT BOLT
826	WASHER
827	GEAR BOX SUPPORT PLATE
828	GEAR Z:40
829	WASHER 8
830	BOLT M8 X 16
831	SLIDING BEARING
832	WASHER
833	GEAR REST
834	SQUARE NUT
835	SCREW M6 X 35
836	KEY 4 X 16
837	SCREW M4 X16
838	MICRO SWITCH
839	SCREW M4 X 30
840	NUT M4
841	LIMITED PLATE
842	MICRO SWITCH'S BOX
843	MAIN LABEL
844	CHANGING GEAR LABEL
849	HEX NUT M4-.7
850	PHLIP HD SCR M6-1.0 X 4
851	HINGE

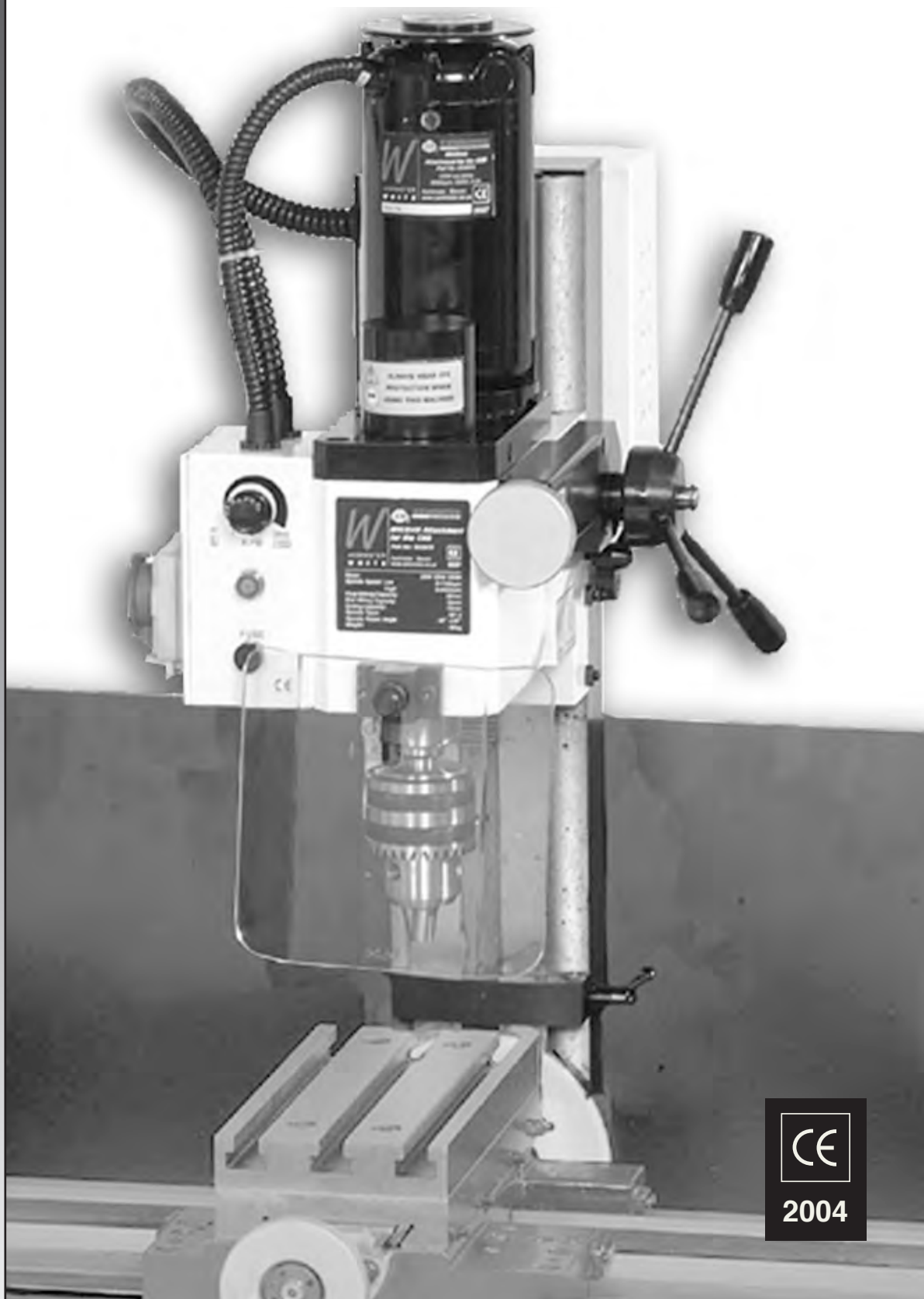


PART NO.	DESCRIPTION
901	HEX BOLT M8-1.25 X 30
902	FLAT WASHER 8MM
903	AC MOTOR
904	KEY 5 X 5 X 40
905	MOTOR SHAFT SPACER
906	DRIVE PULLEY
907	KEYWAY SHAFT SPACER
908	MOTOR PULLEY
909	CHECK RING
910	PHLP HD SCR M6-1.0 X 30
911	OIL CUP 6
912	GREAT WASHER
913	COUNTER PULLEY
914	SLIDE BEARING
915	ARM SHAFT
916	BEARING ARBOR
917	TENSION PULLEY
918	BEARING 6001
919	SPACER
920	LOCK WASHER 6MM
921	EXT RETAINING RING 12MM
922	EXT RETAINING RING 28MM
923	PIVOT
924	PIVOT SPACER

PART NO.	DESCRIPTION
925	FLAT WASHER 10MM.
926	HEX NUT M10-1.5
927	PHLP HD SCR M3-.5 X 14
928	HEX BOLT M8-1.25 X 25
929	PHLP HD SCR M5-.8 X 8
930	FAN-SUPPORT
931	ADJ SLOT SPACER
932	PHLP HD SCR M6-1.0 X 35
933	HEX BOLT M10-1.5 X 25
934	HEX NUT M5-0.8
935	PULLEY SUPPORT
936	MOTOR COVER
937	PHLP HD SCR M6-1 X 12
938	ARM SHAFT NUT
939	SOCKET OUTLET
940	SUPPORT SPACER
941	PHLP HD SCR M3-.5 X 6
942	ELECTRIC TOP COVER
943	LOCK WASHER 8MM
944	TIMING BELT 1.5 X 124 X 15
945	V-BELT M-30 3L300
946	HEX NUT M5-0.8
947	MAIN POWER SOCKET

AXMINSTER
POWER TOOL CENTRE

Mill Attachment for the C6B Lathe



2004

078009

User Manual

AXMINSTER
WHITE

DECLARATION OF CONFORMITY

The undersigned, Ole Stilling authorised
by Shanghai SIEG Machinery Co., Ltd.
No.555 Caofeng Rd., South to No. 17 Bridge of
Caoan Rd., Shanghai

declares that this product:

X2

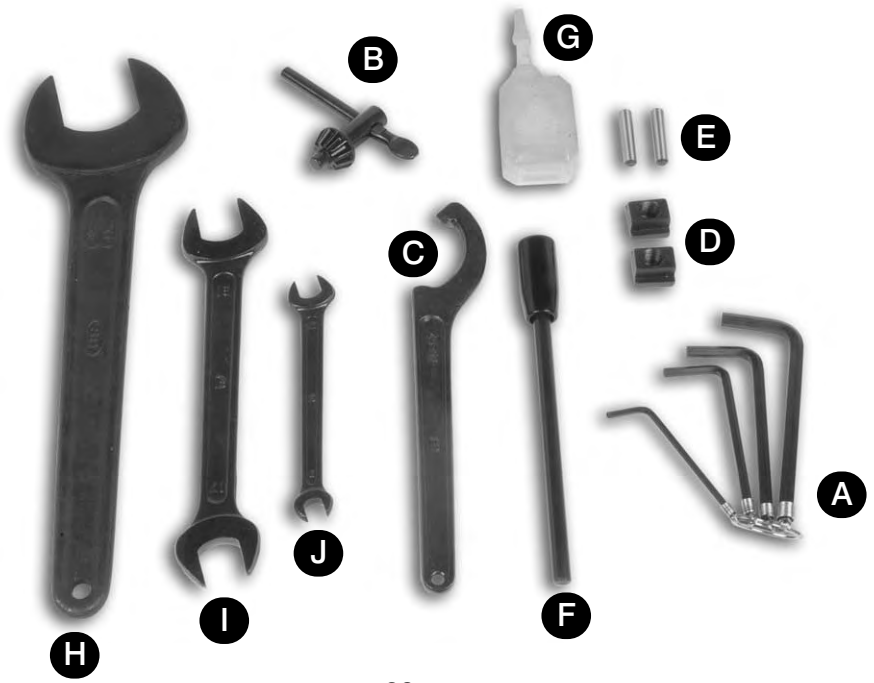
manufactured by Shanghai SIEG Machinery Co.
is in compliance with the following standards or
standardisation documents in accordance with
Council Directives

EN55014-1:2000, EN55014-2:1997
EN61000-3-2:2000, EN61000-3-3:1995

(89/336/EEC amended by 93/68/EEC)

WHAT'S IN THE BOX

Quantity	Item			Model Number
1 No.	Mill with Chuck and M12 Draw Bar fitted			X2
Box containing:-				
1 No.	Set of Allen Keys	(A)	1 No.	Mill Support Casting
1 No.	Chuck Key	(B)	1 No.	Tilt Housing Casting
1 No.	'C' Spanner	(C)	1 No.	36mm Nut
2 No.	'T' Slot Keepers	(D)	3 No.	M8x30 Caphead bolts
2 No.	Steel Pins	(E)		and washers
1 No.	Tommy Bar	(F)	4 No.	M8x35 Caphead bolts
1 No.	Oiling Bottle	(G)		and washers
1 No.	36mm Spanner	(H)	1 No.	Mill/Drill Table
1 No.	19mm Spanner	(I)	1 No.	M10 Drawbar
1 No.	10mm Spanner	(J)	1 No.	3/8" Drawbar



WHAT'S IN THE BOX

⚠ **Please read the Instruction Manual prior to using your new machine; as well as the installation procedure, there are daily and periodic maintenance recommendations to help you keep your machine on top line and prolong its life. Keep this Instruction Manual readily accessible for any others who may also be required to use the machine.**

Having unpacked you machine and its accessories, please check the contents against the equipment list "What's in the box", if there are any discrepancies, please contact Axminster Power Tool Centre using the procedures laid down in the catalogue. Please dispose of the packaging responsibly, much of the material is bio-degradable. The machine and its accessories will arrive coated with heavy corrosion preventative grease. This will need to be cleaned from the machine, its components and accessories prior to it being set up and commissioned. Use coal oil, paraffin or a proprietary degreaser to remove the barrier grease. Be warned, it will stain if you splash it on clothing etc., wear overalls, coverall et al., rubber gloves are also a good idea, as is eye protection if your cleaning process tends to be a little bit enthusiastic. After cleaning, lightly coat the exposed metal surfaces of the machine with a thin layer of light machine oil. N.B If you used paraffin/kerosene make sure you apply this thin film sooner rather than later.

SPECIFICATIONS

Axminster No	**600870**
Motor	**230V a.c. 50 Hz. 220V d.c. 350W**
Quill Travel	**30mm**
Spindle Speeds	**Low Gear 0-1100rpm (variable) High Gear 0-2500 rpm (variable)**
Spindle Taper	**No. 3 MT**
Draw Bar Threads	**M10,3/8"**
Drilling Capacity	**13mm**
End Mill Capacity	**16mm**
Face Mill Capacity	**30mm**
Weight	**35kg**

DEFINITIONS

'X' Axis. This is the axis described by the work table as it is moved side to side. Normally, movement that moves the tool to the right in the workpiece is referred to as +ve 'X', and movement that moves the tool to the left in the workpiece is referred to as –ve 'X'. Where the initial position of the tooling and the worktable is designated 0,0. (Horizontal plane only).

'Y' Axis. This is the axis described by the work table as it is moved from front to back. (Traverse) Normally movement that moves the tool to the front in the workpiece is referred to as-ve 'Y', and movement that moves the tool to the rear in the workpiece is referred to as+ve 'Y'. Where the initial position of the tooling and the worktable is designated 0,0.(Horizontal plane only).

'Z' Axis This is the axis described by the worktable in the vertical plane. (Not possible with this machine). However, to establish a point in space, the co-ordinates can be transferred to the 'tip' of the tooling, whereby, if we assume that the tool and the worktable in their initial positions, where designated 0,0,0, (Horizontal and vertical planes) any point above the tool tip is referred to as +ve 'Z', and any point below the tool tip is referred to as -ve 'Z'

DISCONNECT THE LATHE FROM THE MAINS SUPPLY

1) Remove the four Phillip screws and pull out the electrical back plate to the rear of the lathe and lay the circuit board to one side. (See fig 1 & 2)

(NOTE. Be careful when lifting out the electrical circuit board as it contains delicate components)

2) Locate a 5mm allen key and 10mm spanner, remove the two caphead bolts and nuts that secures one side of the splash guard to the headstock. (See fig 3 & 4)

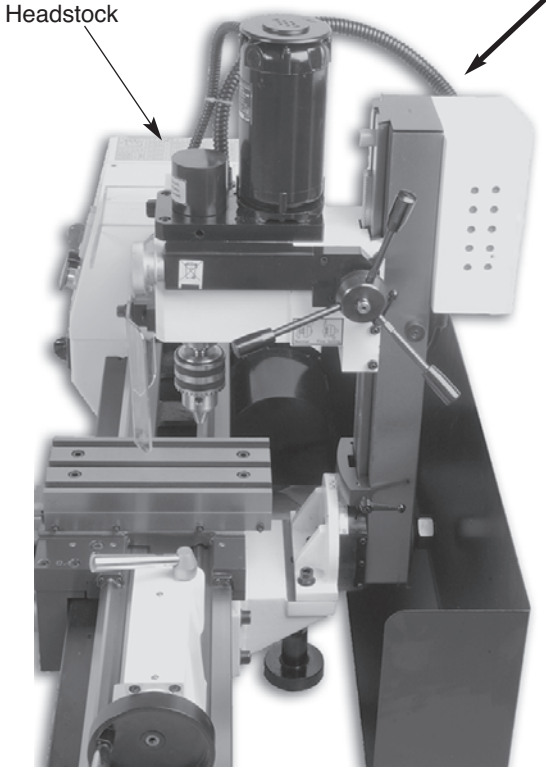
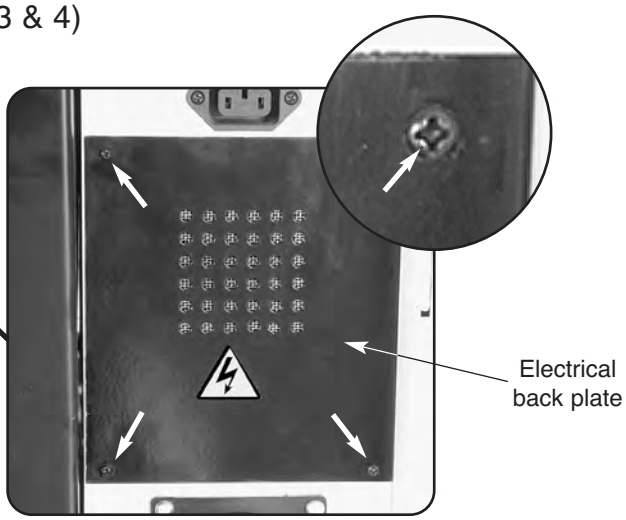


Fig 1



Remove the four Phillip screws and lift out the electrical panel



Fig 2



Fig 3



Fig 4

Remove the two caphead bolts and nuts that secures one side of the splash guard to the headstock

INITIAL ASSEMBLY - REMOVING THE SPLASH GUARD



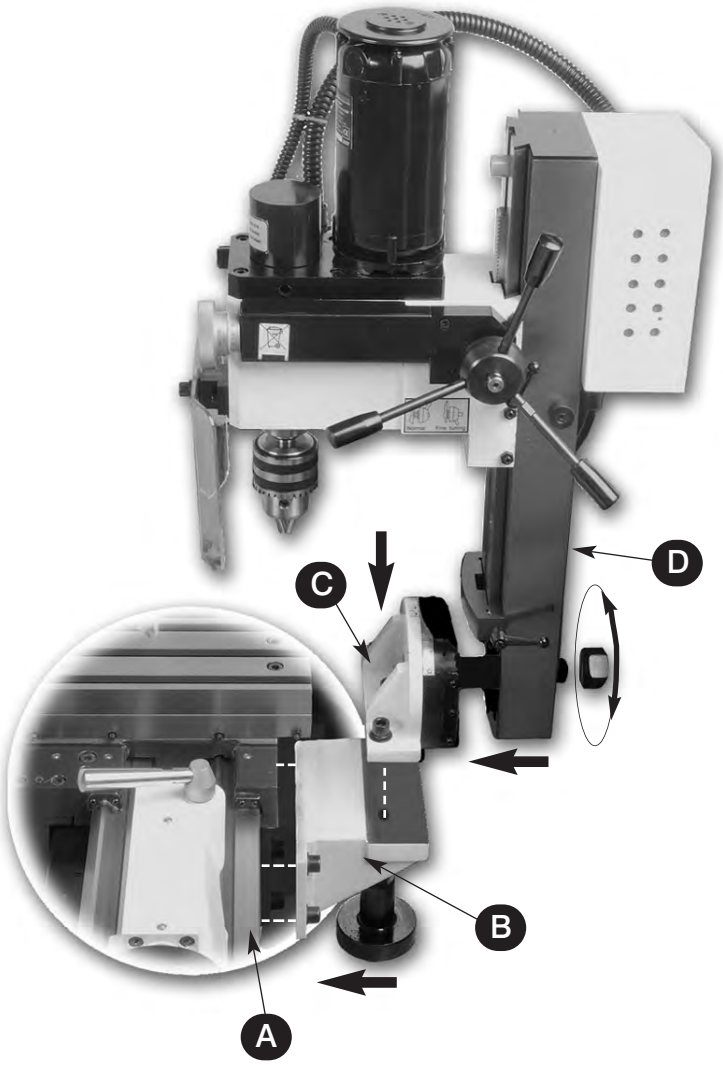
3) Loosen the two bolts and washers which clamps the opposite end of the splash guard to the side of the lathe bed, below the tailstock. (See fig 5)

4) Remove the splash guard and place safely aside.

INITIAL ASSEMBLY - MOUNTING THE MILL

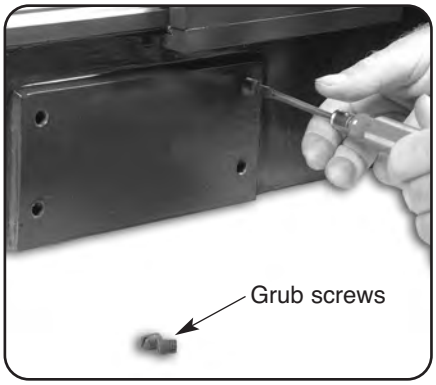
WARNING

When mounting the Mill to the Lathe, we strongly advise you get the assistance of another person because of the weight of the machine.



A

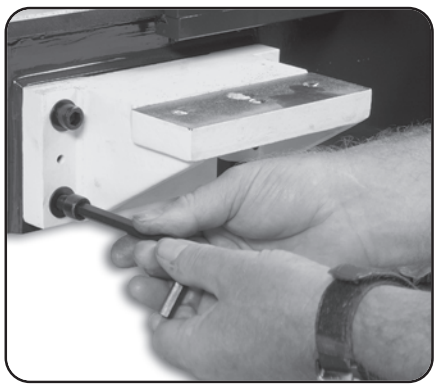
Step 1



Remove the four grub screws to the side of the lathe bed and place safely aside.

B

Step 2



Locate the angle support casting and four M8x35 caphead bolts and washers. Secure the angle support to the side of the lathe bed. **DO NOT OVERTIGHTEN**

INITIAL ASSEMBLY - FITTING THE MILL



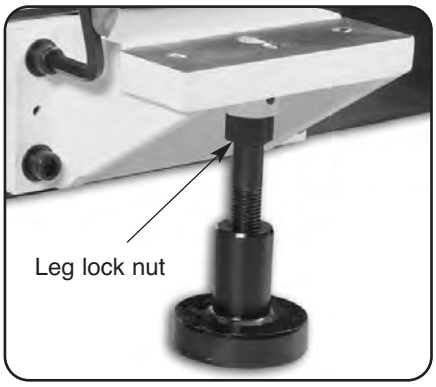
TWO MAN ASSEMBLY



WARNING HEAVY

Step 3

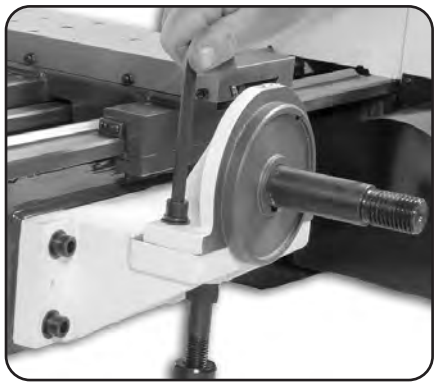
B



Tip the lathe forward and have your assistant thread the support leg up into the angle support casting. Adjust the support leg until it makes contact with the surface of your bench or stand, tighten the lock nut to lock the leg in position.

Step 4

C

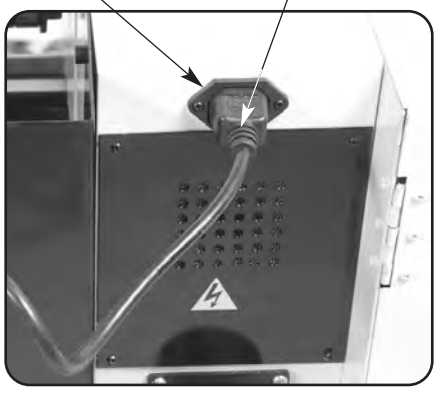


Locate the tilt housing casting and three M8x30 caphead bolts and washers. Offer up the pre-drilled holes with the holes in the support casting and secure in place using the M8 bolts and washers.

Lathe socket

Mill power plug

Step 6



Insert the Mill's power plug into the socket in the rear of the lathe as shown.

Step 5

D



Lift the mill assembly and slide it over the tilt housing shaft until it is flush against the tilt housing. Locate the 36mm nut and spanner and lock the mill assembly in position.
DO NOT OVER TIGHTEN

Make sure that everything is secure then replace the splash guard as described on pages 34-35.

INITIAL TESTING

Please read the section entitled Identification and Parts description so that you may more easily identify the parts to which reference is made in the text.

Testing

When the Mill is mounted to your satisfaction, proceed as follows:-

a) Close the chuck jaws

b) Check the millhead is 'locked' in position on the column.

c) Check that all loose items are removed from the worktable.

d) Set the worktable approximately mid-positioned under the chuck jaws.

e) Check the speed control is switched OFF (fully anti-clockwise).

f) Rotate the Lathe/Mill selector switch on the lathe's control panel to the milling position.

g) Select L (Low) on the gear box.

h) Connect the machine to the mains supply, open the switch shroud and press the on button (Green), check the green power light comes on, lower the lid of the switch shroud (Do Not Close).

i) Turn the Speed Control Switch On (Clicks On).

j) Check the Amber LED (Fault Light) is illuminated and the green light is illuminated.

k) Turn the Speed Control to Off (Clicks Off), the Amber LED is now Off and the Green light stays on.

l) Turn the Speed Control Switch On and advance until the Chuck starts to rotate.

m) While it's running press the Emergency Stop button, check the machine stops, check that the green light and the Amber LED is on. Disengage the Emergency Stop button by opening the switch shroud, turn the Speed Control Switch to Off (All lights are off).

n) Press the on button, turn the Speed Control On and advance until the chuck starts to rotate.

o) Over a period of approximately 5 minutes advance the speed in stages to maximum, run at maximum for at least 2 minutes, check that there is nothing untoward, (no excessive vibration, speed progression is smooth etc.). Stop the spindle and change the gear selector to H (High), carry out the previous check.

p) If all the above checks are correct, stop the spindle, (turn the speed control to zero and press the Off button (Red). Push the Tri-lever feed handle in (if necessary 'joggle' the feed to enable the gears to mesh), exercise the quill up and down, check the movement is smooth and precise.

q) With the Tri-lever engaged, raise and lower the quill using the fine feed control. Check the movement is smooth and precise, there are no hard spots and the feed doesn't bind up. Disengage the tri-lever by pulling the assembly back.

r) Ensure the head lock clamp is loosened and exercise the rise and fall, driving the head up and down the tool post. Check the movement is smooth and tight. Leave the head fairly well down the tool post for the next check.

s) Loosen the 36mm tilt clamp bolt, to the rear of the tool post and tilt the tool post to the left or right, clamp the tool post in an arbitrary position and tighten the bolt. Check that the tool post remains locked in place.

t) If all the above checks are correct, your mill is now ready for use.

PARTS IDENTIFICATION AND DESCRIPTION

Please take some time to identify the various parts of your machine so that you are familiar with the terminology we will use to enable you to set up and operate your Mill safely and correctly.

Main tool post This is the column of the mill, it is an 65 x 50 bar with a dovetail slide machined on the front onto which the milling head is mounted, the lower part there is pre-drilled hole which sides over the tilt housing shaft and secured in place by a 36mm nut. On the left side of the post a scale, graduated in mm's, is mounted to read against a pointer mounted on the head casting.

Rise and fall mechanism Rise and fall, there is a dovetail slide machined on each side of the the headbox support column which mounts a through shaft. A pinion gear is mounted on the shaft inside the headbox that meshes with a rack on the support column driving the pinion shaft will cause the headbox to rise and fall up and down the headbox support column. The part of the shaft protruding from the headbox has a hole through it to mount the tri-lever feed assembly.

Tilt housing The tilt housing is mounted to the base casting using 3 M8x30 caphead bolts and washers. The tool post is mated to the housing and clamped by a 36mm nut. The main tool post can tilt 45 (degrees) from the vertical either left or right. There is a pointer and a scale mounted on the housing to give an indication of the amount of tilt that has been applied.

Milling head **This is the 'milling machine' and the descriptions of its various parts and components are detailed as follows:-**

Milling head casting The main casting to which all the components are attached. The head has a dovetail housing machined at the rear, which allows the casting to be fitted to the Main Tool Post. The left side of the dovetail slide is fitted with a gybe strip to maintain the fit.

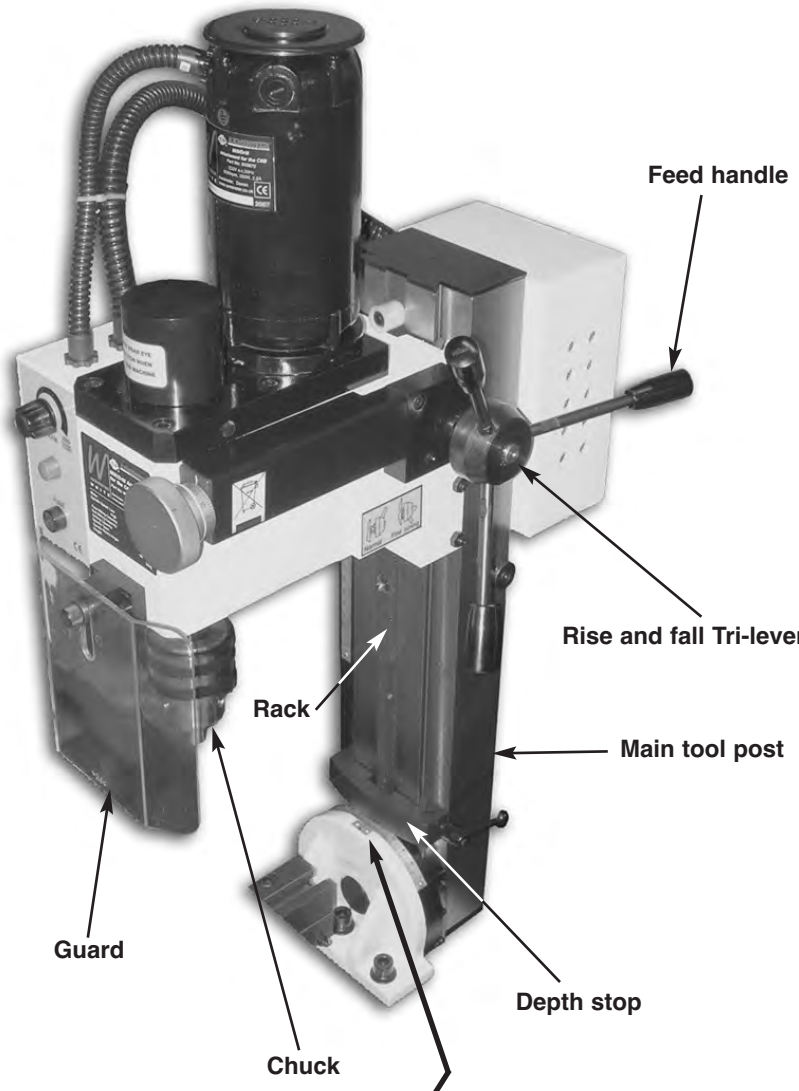
Head clamp Located to the right side of the main tool post above the gybe strip adjusters and locknuts is an handled bolt that clamps the gybe strip against the slide to effect a locking action for the rise and fall of the head. (See page 42)

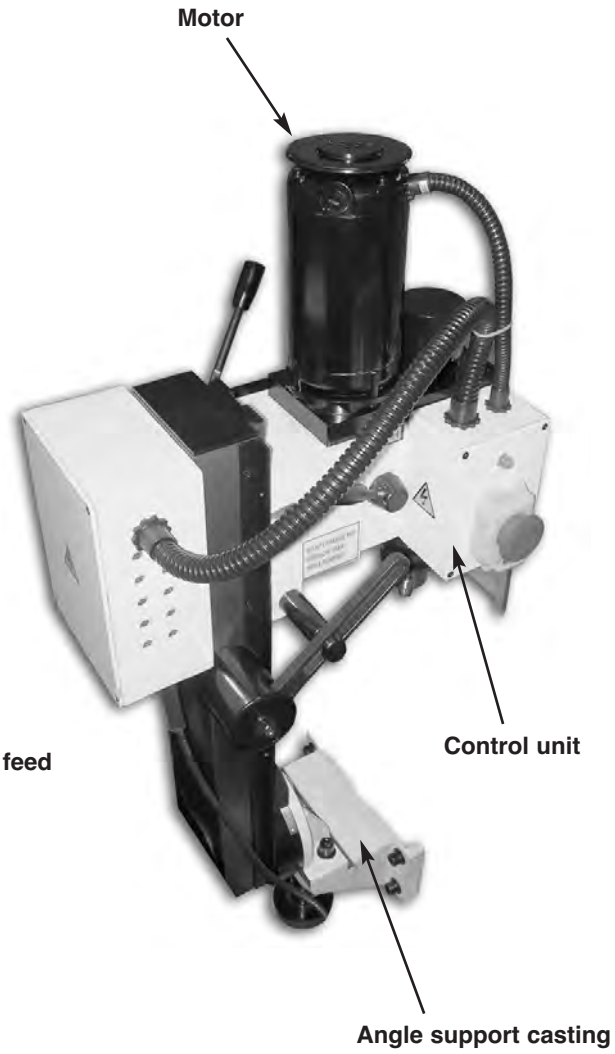
Motor and gearbox The motor and gearbox assembly are mounted above the main head casting at the top of the arbor sleeve. The motor drive is geared through to the spindle with an intermediate 2:1 gearbox.

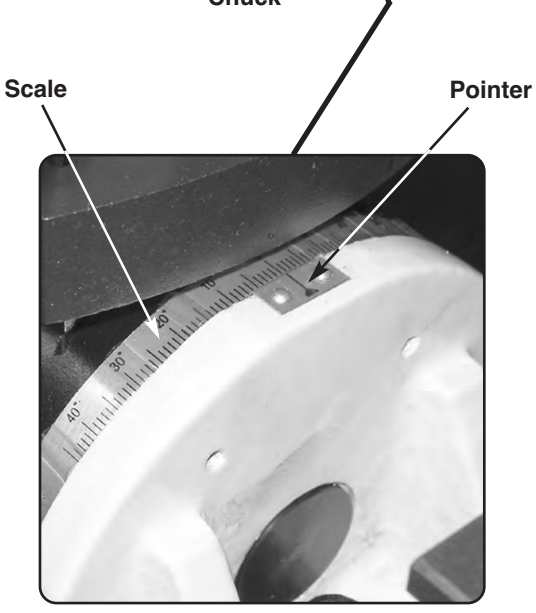
Gear change lever The gear change lever allows the selection of the high or low ratio of the gear train. The speed of the spindle is then governed by the speed control on the motor panel. (You may have to 'joggle' the chuck/tool to aid the meshing action).

Motor A 220V d.c. motor rated at 350W.

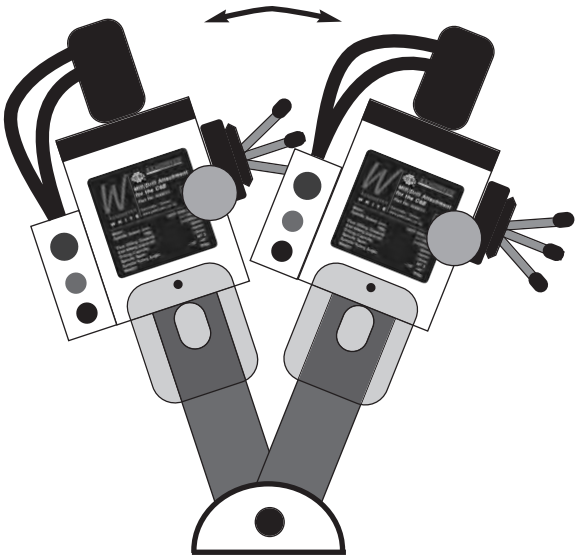
MACHINE ILLUSTRATION OF THE MILL







Tilt housing assembly



0-45˚tilt either direction

Tri-Lever feed

Three levered handle that is used to drive the quill (and hence the chuck or the tool) up and down. The boss of the handle is fitted to the end of a 'splined' gear shaft. This 'splined' gear is, in turn, engaged in the rack cut into the quill body. The other end of the 'splined' shaft is engaged in a contra-wound spring, this provides counter balance to the weight of the quill, arbor, chuck and drill, giving a more controlled 'feel' during drilling operations. It also retracts the quill when drilling is completed.

Fine feed assembly

The fine feed assembly floats around the splined gear shaft that drives the quill up and down. When the action of the fine feed mechanism is required; pushing the tri-lever feed handle in 'engages' the knob of the fine feed control meshes the gearing (you may have to 'joggle' the feed handle to aid the meshing action) between the splined shaft and the fine feed control shaft; this enables the spindle to be driven by the fine feed control wheel with greater precision. Behind the boss of the fine feed control wheel handle is a graduated ring (thimble) so that the movement of the quill can be measured. The thimble is held to the drive shaft by friction, and can be pre-positioned to establish a predetermined start or stop dimension.

Quill hold pocket

The size of the machine precludes any 'fancy' locking mechanism for the quill. There is a blind pocket on the spindle that accepts the tommy bar supplied in the tool kit, to enable the spindle to be held in position whilst the draw bar is loosened.

Draw bar cover

A moulded plastic cover that clips into the top of the Motor Gearbox assembly, to afford protection from the rotating top of the draw bar, when the quill is at the top of its travel.

Draw bar (unseen)

This is a metal rod, threaded at one end and with an 19mm squared shank and flange machined on the other. It is fitted through the spindle mandrel to hold the fitted tool/tooling hard into the No. 3 MT taper of the spindle shaft.

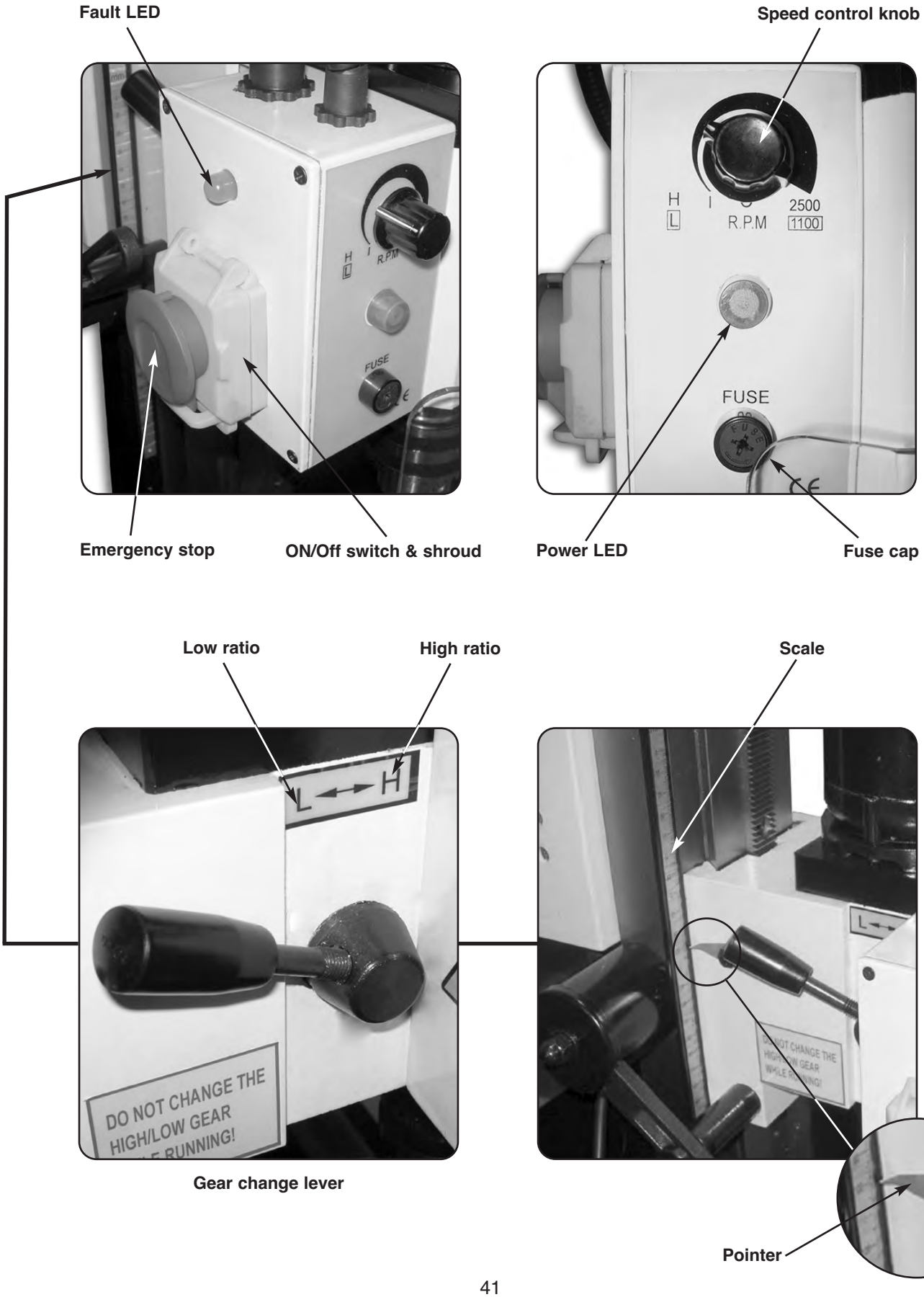
Motor control panel

Power On LED
Green LED that indicates that power is available to the motor. i.e. mains is applied, fuse is intact and the Emergency stop switch is not activated.

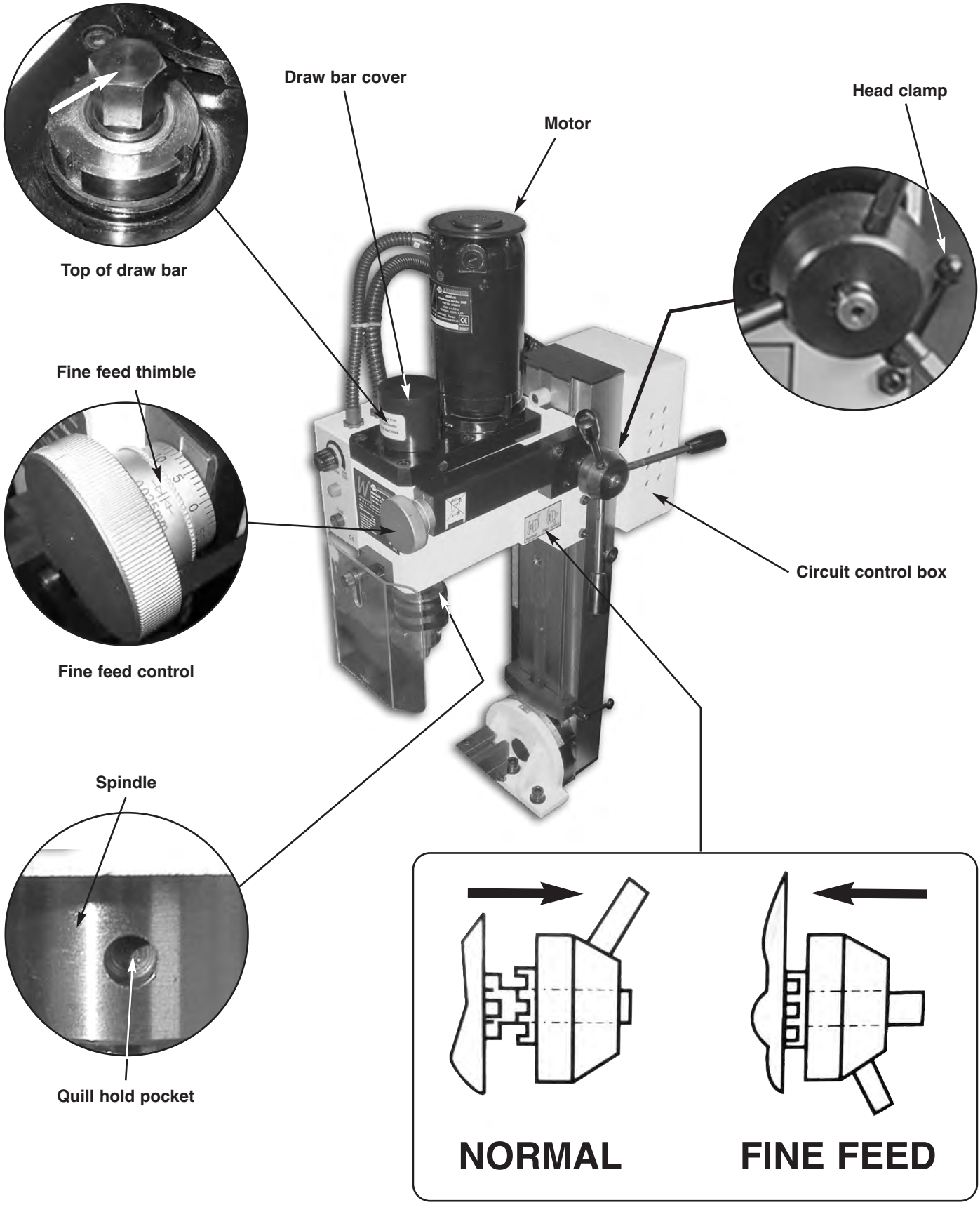
Fault LED (marked UNNORMAL)
Amber LED that indicates that there is a fault or an incorrect control sequence. i.e. the chuck guard interlock has been activated or the speed control is activated. The Motor will not run if the fault LED is illuminated. If the safety interlock is activated, the safety interlock will remain in force until the interlock is reset and the start sequence re-initiated.

Fuse Cap
Access cap for the 20mm fuse cartridge (1 Amp 250V) Speed Control Knob Round raised ridge knob connected to the circuit that controls the spindle speed (0-1100 rpm or 0-2500 depending upon the gearbox selection).

MACHINE ILLUSTRATION OF THE MILL



MACHINE ILLUSTRATION OF THE MILL



To engage the fine feed control push the tri-lever assembly in until it meshes with the bevel gear. Pulling the tri-lever back will disengage the fine feed control.

GENERAL OPERATING INSTRUCTIONS



Warning Do not operate the mill in any function unless the head clamping lever is tightened.

TOOL CHANGING

Note. The taper socket in the spindle mandrel does not have a 'drive flat' and all tooling, including the drill chuck is secured and driven by the taper lock and the draw bar.

Make sure the power is switched off or better still remove the power from the machine.

Locate and put to hand the 19mm A/F spanner and the tommy bar. Remove the Draw Bar Cover. Hold the quill immovable by inserting the tommy bar into the quill hold pocket and loosen the draw bar. Unscrew two or three turns and then strike sharply with a hammer (preferably a copper face, to prevent the head of the draw bar peining over) this will break the lock between the tool and the spindle tapers .

Unscrew the draw bar from the tool. **Ensure the tool is supported**, i.e. will not fall onto the workpiece/table et al. When it is free put the tool carefully aside, remove the draw bar, check the thread, check the taper and the thread of the new tool are clean and undamaged, introduce the new tool into the taper, re-insert the draw bar and screw into the top of the tool.

Screw in the draw bar finger tight. Hold the quill immovable and tighten with the spanner. **DO NOT OVERTIGHTEN**. Replace the draw bar cover.

Remove all tooling and reconnect the machine. Ensure the tool path is clear, switch on, and check that the tool is correctly seated, is running true etc. If all is O.K, proceed.

GERERAL SAFETY POINTS

Milling (all cases)	Ensure the workpiece is securely clamped to the table.
Along the longitudinal Axis (X)	Ensure that the quill is locked in position before milling is commenced. Ensure the traverse slide lock is tightened.
Along the Traverse Axis (Y)	Ensure that the quill is locked in position before milling is commenced. Ensure the worktable lock is tightened.
Milling or Drilling Vertically (Z)	Ensure the traverse slide and the worktable locks are tightened.

SETTING AND ADJUSTMENTS

Milling head adjustment

The Milling Head is mounted over a dovetail section. In order to maintain the 'tightness' of the fit; between the sloping surface of the component and its mating surface, on the right hand side, a gybe strip has been inserted. To adjust the gybe strip, use the supplied allen key and spanner, release the lock nuts and screw the gybe strip grubscrews clockwise to compensate for any slackness or anti-clockwise to loosen the movement. Check, using the rise and fall drive feed handles, that the head moves smoothly, If not, repeat the adjustments until the movement is smooth and tight over the whole of the travel.

MILL TABLE ASSEMBLY

The Mill/Drill includes a milling table as an accessory. To install the milling table the compound slid must be removed from the cross slide from the lathe bed. Once installed, the milling table can move back and forth with the cross slide. Follow the instruction below to install table.

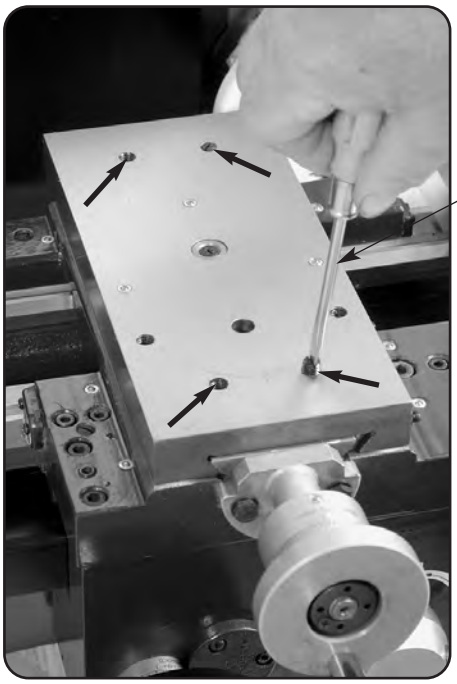
Fig A

1) Using a 12mm spanner remove the two bolts that secures the compound slide to the cross slide, remove the compound slide and place safely aside. (See fig A)



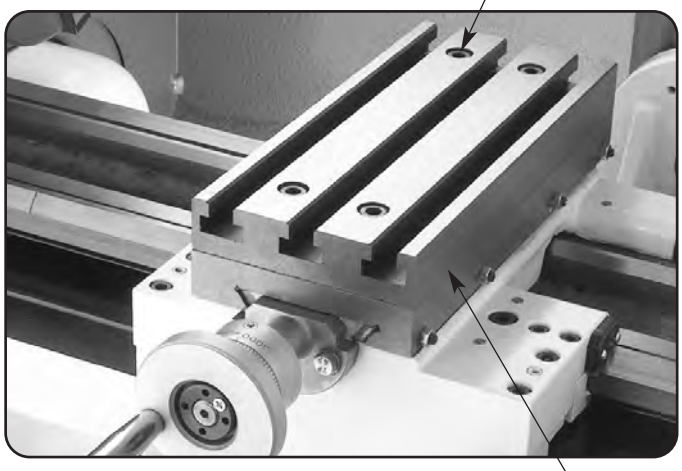
Remove the two bolts using a 12mm spanner, remove the compound slide from the cross slide.

Fig B



2) Using a Phillips screwdriver remove the four grub screws from the cross slide and place safely aside. (See fig B)

Fig C



3) Locate the milling table and the supplied caphead bolts. Lower the table onto the cross slide, line up the holes and insert and secure the table using a 6mm allen key. (See fig C)

MAINTENANCE

Your Mill is a precision tool. In order to maintain this precision and prolong its useful life, it is advised that you follow the recommended daily and periodic maintenance tables printed below.

Daily and Periodic Maintenance

Daily

1. Carry out a visual inspection. Repair any damage immediately. Minor damage to the beds should be taken out with an oilstone.
2. Move the worktable and the traverse feed back and forth by hand, check that the movement is smooth.
3. Spread a light film of oil over the worktable and the traverse slide bed.
4. Oil the end bearings of the drive shafts. Squirt oil onto the slide faces of mating components.
5. Exercise the components to ensure the oil is spread over both visible and obscure surfaces.

Daily after-use

1. Clean all swarf and chips away from the machine bed, slide surfaces, and the tool post.
2. Exercise the slides and ensure no swarf etc., is lodged in the drive shaft tunnels. If you have been using a coolant make sure the machine is thoroughly dried off.
3. Check the tool, ensure it is usable the next time, if not re-sharpen or replace the tool tip.
4. Lightly oil spray all the machine beds and surfaces.
5. Clean and lightly oil any tools you may have been using (drill chucks, spanners, chuck keys etc), and put them away.
6. Switch off the power supply. Disconnect the plug.
7. Cover the machine over with a dust cloth.

Weekly

1. Move the traverse slide fully back to give access to the tunnel, blow out to make sure all swarf is cleared away and heavily spray oil the tunnel, exercise the slide to work the oil into the drive thread and to lubricate the dog.
2. Spray oil the slide and the worktable bed, exercise the worktable to spread the oil to all surfaces, both hidden and visible.
3. Spray oil the underside of the machine onto the drive screws, exercise to ensure the oil is coating all components.
4. Clean and spray oil the rise and fall drive screw, exercise to ensure all parts are coated.
5. Check the movement of the worktable, the traverse slide and the head, check they are smooth and ‘tight’, if necessary reset the gybe strips until the movements are smooth and tight.
6. Wipe the quill outer sleeve clean and lightly oil, exercise the quill to spread the oil in the sleeve bushes.

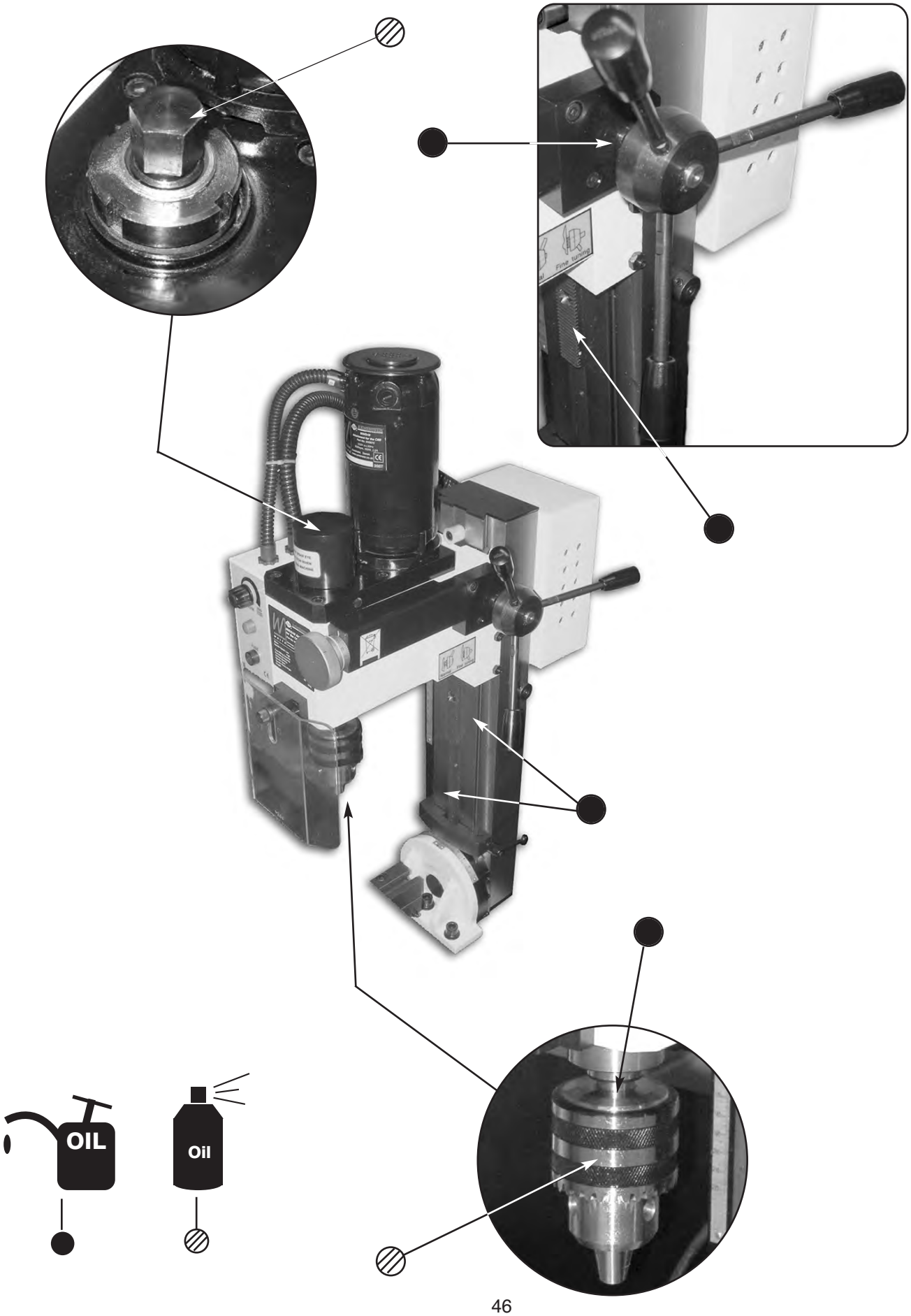
Monthly

a) Give the motor a good ‘blow through’ to remove any dust, dirt etc,
b) Check all the interlocks function correctly.

Accessories

There are numerous accessories for the machine listed in the Axminster catalogue.
Some are illustrated at the rear of this manual. (See page 47)

MAINTENANCE OILING POINTS



MILL ACCESSORIES

Rotary Milling Vice for Micro Mill 55mm

Part No: (100034)



Axminster Micro Mill Collets

#2MT 6mm collet
Part No: (100023)



#2MT 10mm collet
Part No: (100024)



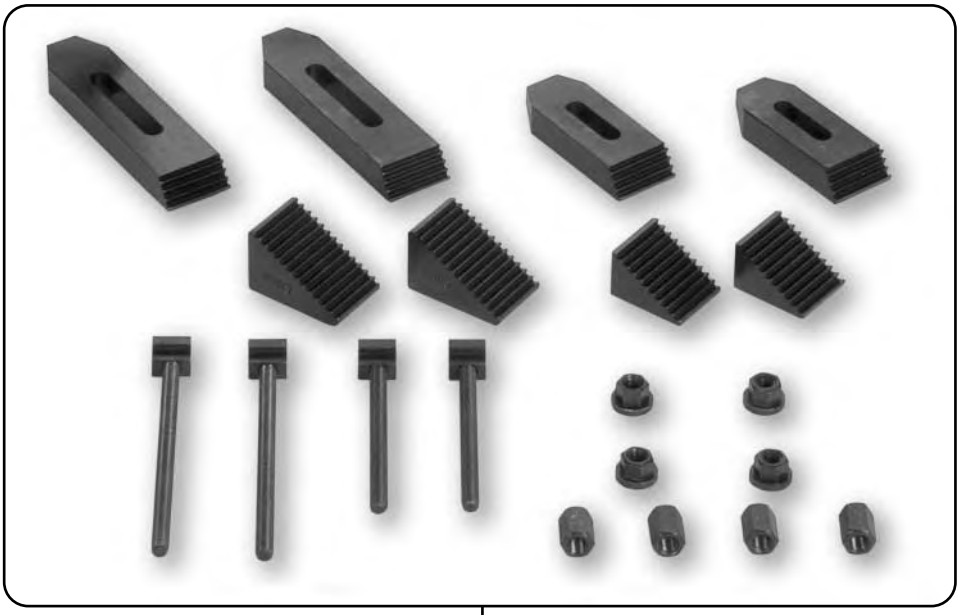
50mm Release Vise

Quick vice 50mm
Part No: (100022)





Axminster Power Tools Catalogue



Micro Mill Clamping Kit

Clamping kit
Part No: (100033)

Axminster Bull Nose Slot Drills



Metric Screwed Shank Two Flute Bull Nose Slot Drills

Order No	Description
610170-14	Bull Nose Slot Drill 3mm
610171-14	Bull Nose Slot Drill 4mm
610172-14	Bull Nose Slot Drill 6mm
610173-14	Bull Nose Slot Drill 8mm
610168-14	Bull Nose Slot Drill 10mm

Axminster HSS End Mills



Metric Screwed Shank Three Flute End Mills.

Order No	Description
610177-14	3mm End Mill
610178-14	4mm End Mill
610179-14	6mm End Mill
610180-14	8mm End Mill
610174-14	10mm End Mill

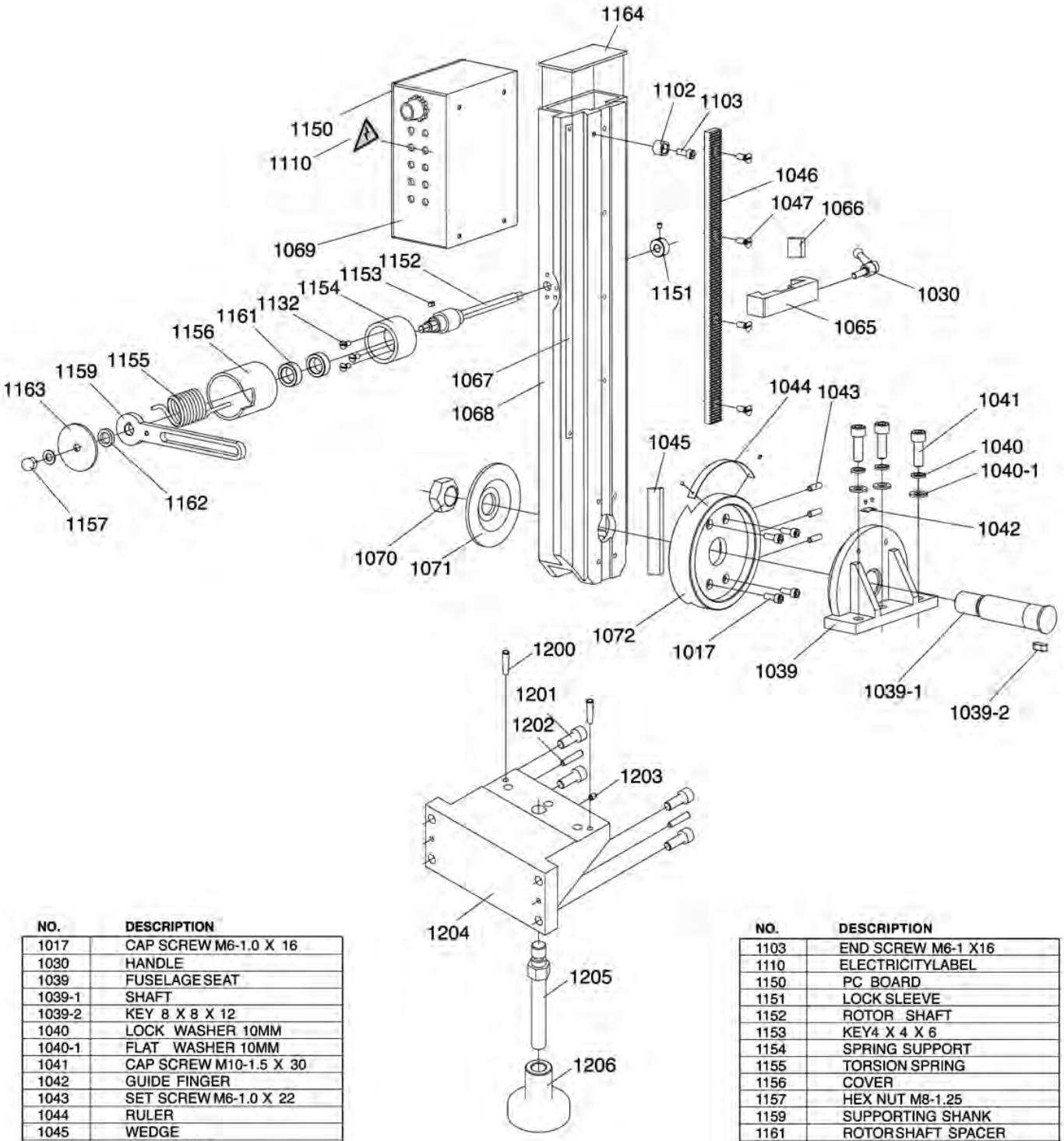
Axminster HSS Slot Drills



Metric Screwed Shank Two Flute Slot Drills.

Order No	Description
610184-14	Slot Drill 3mm
610185-14	Slot Drill 4mm
610186-14	Slot Drill 6mm
610187-14	Slot Drill 8mm
610181-14	Slot Drill 10mm

PARTS BREAKDOWN FOR THE MILL

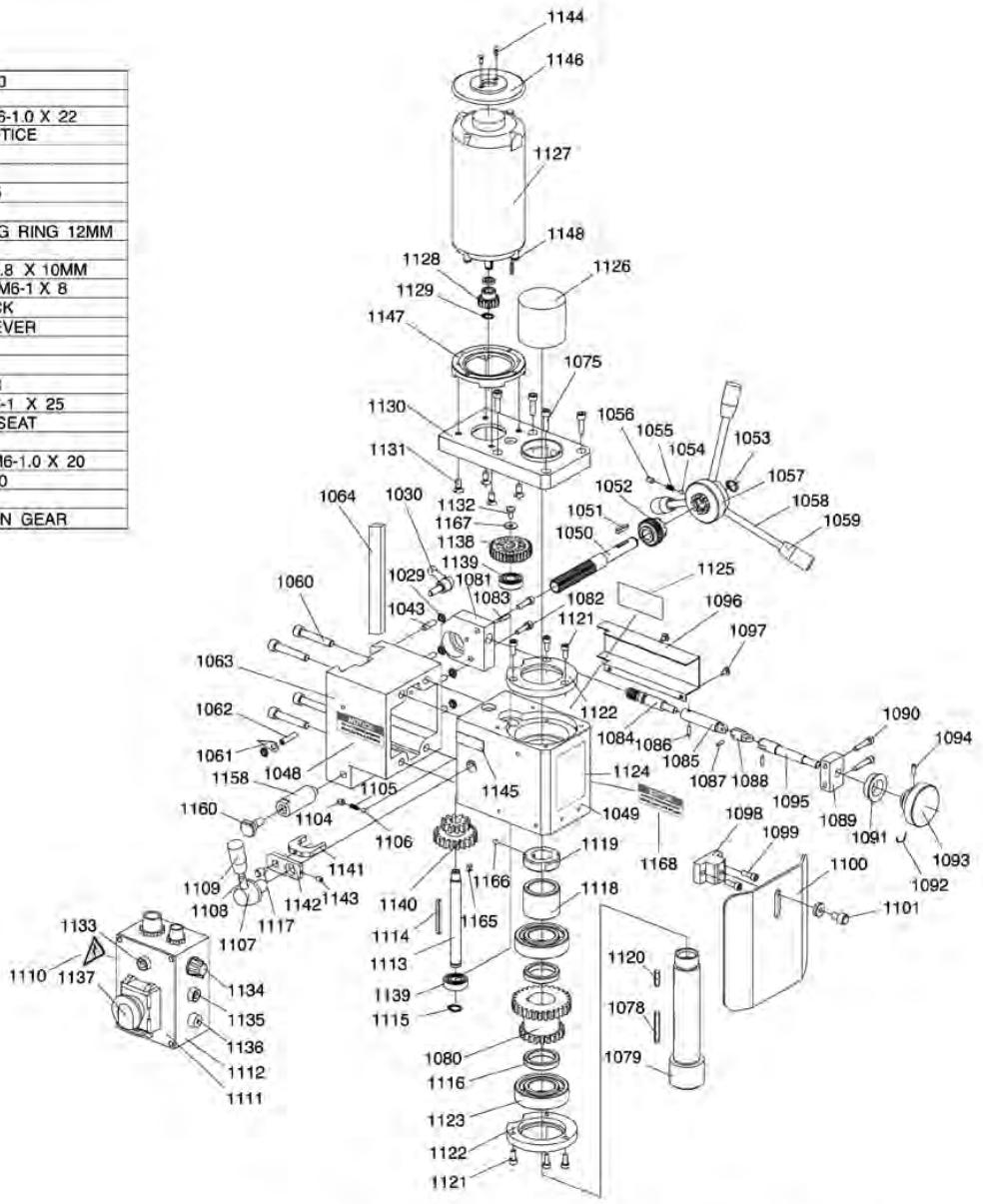


NO.	DESCRIPTION
1017	CAP SCREW M6-1.0 X 16
1030	HANDLE
1039	FUSELAGE SEAT
1039-1	SHAFT
1039-2	KEY 8 X 8 X 12
1040	LOCK WASHER 10MM
1040-1	FLAT WASHER 10MM
1041	CAP SCREW M10-1.5 X 30
1042	GUIDE FINGER
1043	SET SCREW M6-1.0 X 22
1044	RULER
1045	WEDGE
1046	GEAR RACK
1047	CAP SCREW M6-1 X 12
1065	LIMIT BLOCK
1066	WEDGE
1067	RULER
1068	FUSELAGE
1069	ELECTRIC BOX
1070	LOCK NUT M12-1.75
1071	BIG WASHER
1072	CONNECTING STRUT
1102	UPPER END WASHER

NO.	DESCRIPTION
1103	END SCREW M6-1 X16
1110	ELECTRICITYLABEL
1150	PC BOARD
1151	LOCK SLEEVE
1152	ROTOR SHAFT
1153	KEY4 X 4 X 6
1154	SPRING SUPPORT
1155	TORSION SPRING
1156	COVER
1157	HEX NUT M8-1.25
1159	SUPPORTING SHANK
1161	ROTOR SHAFT SPACER
1162	SHANK COVER SPACER
1163	SHANK COVER
1164	TOP COVER
1200	ROLL PIN 6 X 30
1201	PHLP HD SCR M10-1.5 X 40
1202	ROLL PIN 6 X 30
1203	PHLP HD SCR M6-1 X 8
1204	SUPPORT
1205	SUPPORT BOLT
1206	SUPPORT PLATE

PARTS BREAKDOWN FOR THE MILL

NO.	DESCRIPTION
1029	HEX NUT M6-1.0
1030	HANDLE
1043	SET SCREW M6-1.0 X 22
1048	HIGH/LOW NOTICE
1049	SPINDLE BOX
1050	PINION
1051	KEY4 X 4 X 25
1052	BEVEL GEAR
1053	EXT RETAINING RING 12MM
1054	BALL 5 MM
1055	SPRING 0.8 X 0.8 X 10MM
1056	PHLP HD SCR M6-1 X 8
1057	HANDLE STOCK
1058	OPERATING LEVER
1059	LEVER CAP
1060	CAP SCREW
1061	GUIDE FINGER
1062	CAP SCREWM6-1 X 25
1063	SPINDLE BOX SEAT
1064	WEDGE
1075	CAP SCREW M6-1.0 X 20
1078	KEY5 X 5 X 40
1079	SPINDLE
1080	TRANSMISSION GEAR



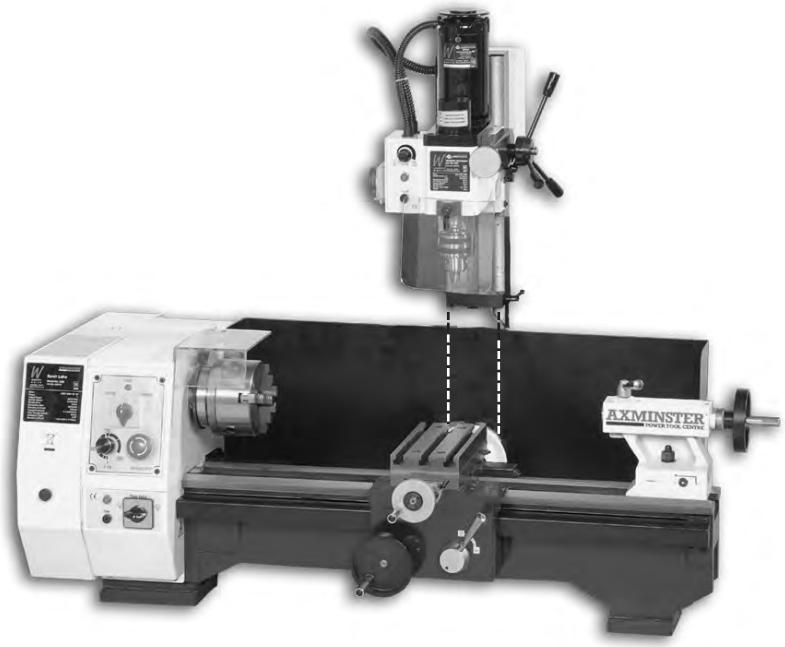
NO.	DESCRIPTION
1081	SUPPORT BLOCK
1082	PHLP HD SCR M5-.8 X 20
1083	PIN 4 X 15
1084	WORM
1085	SLEEVE
1086	ROLLPIN 3 X 12
1087	ROLLPIN 3 X 12
1088	ADJUSTABLE UNION
1089	BRACKET
1090	PHLP HD SCR M5-.8 X 25
1091	DIAL
1092	SPRINGSTEEL1.0
1093	SMALL HAND WHEEL
1094	PHLP HD SCR M5-.8 X 16
1095	SMALL SHAFT
1096	COVER
1097	PHLP HD SCR M4-.7 X 6
1098	DUST COVER SUPPORT
1099	PHLP HD SCR M5-.8 X 16
1100	DUST GUARD
1101	CLAMP BOLT M6-1X12
1104	SET SCREW M6-1X6
1105	SPRING 0.8X 4.8 X10MM
1106	BALL 5 MM

NO.	DESCRIPTION
1107	HANDLE SEAT
1108	DBL HD BOLT M8-1.25 X 70
1109	KNOB
1110	ELECTRICITY LABEL
1111	CONTROLLER
1112	LABEL ON CONTROLLER
1113	SHAFT I
1114	KEY 4 X 4 X 45
1115	INT RETAINING RING 12MM
1116	SPACING RING
1117	SMALL SHAFT
1118	SPACING RING
1119	SPINDLE NUT
1120	KEY 5 X 5 X 30
1121	CAP SCREW M5-.8 X 8
1122	BEARING COVER
1123	BALL BEARING 80206
1124	MAIN LABLE
1125	FINE FEEDING LABEL
1126	PROTECTING COVER
1127	MOTOR
1128	MOTORGEAR
1129	EXT RETAINING RING 9MM
1130	MOTORSEAT

NO.	DESCRIPTION
1131	FLAT HD SCR M6-1 X 12
1132	PHLP HD SCR M5-.8 X 8
1133	LAMP
1134	SPEED CONTROL KNOB
1135	SWITCH
1136	FUSE BOX
1137	STOP SWITCH
1138	GEAR
1139	BALL BEARING 80101
1140	TRANSMISSION GEAR
1141	BAR
1142	LINKING BOARD
1143	SET SCREW M5-0.8X 8
1144	TAPPING SCREW 2.9 X 8MM
1145	H/L LABEL
1146	MOTOR COVER
1147	MOTOR FLANGE
1148	PHLP HD SCR M6-1.0X10
1158	PROP
1160	SHANK SCREW
1165	PHLP HD SCR M3-.5 X 6
1166	PHLP HD SCR M6-1 X 8
1167	FLAT WASHER 5MM
1168	DEPTH STOP NOTICE

200100

SIEG C6B Variable Speed Lathe



Axminster Reference No: ***C6B***

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