WOODSTOCK

SHOP FOX®

INTERNATIONAL

MODEL M1020

14 X 40 GEAR HEAD LATHE

INSTRUCTION MANUAL

Phone: (360) 734-3482 • On-Line Technical Support: tech-support@shopfox.biz

#6767PC

Printed in China

WARNING

Some dust created by power sanding, sawing, grinding, drilling, and other construction activities contains chemicals known to the State of California to cause cancer, birth defects or other reproductive harm. Some examples of these chemicals are:

- Lead from lead-based paints.
- Crystalline silica from bricks, cement, and other masonry products.
- Arsenic and chromium from chemically treated lumber.

Your risk from these exposures varies, depending on how often you do this type of work. To reduce your exposure to these chemicals: work in a well ventilated area, and work with approved safety equipment, such as those dust masks that are specially designed to filter out microscopic particles.

Contents

USE THE QUICK GUIDE PAGE LABELS TO SEARCH OUT INFORMATION FAST!

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INTRODUCTION

Woodstock Technical Support

We stand behind our machines! In the event that questions arise about your machine, parts are missing, or a defect is found, please contact Woodstock International Technical Support at (360) 734-3482 or send e-mail to: **tech-support@shopfox.biz**. Our knowledgeable staff will help you troubleshoot problems and send out parts for warranty.

If you need the latest edition of this manual, you can download it from **http://www.shopfox.biz**.
If you still have questions after reading the latest manual, or if you have comments please contact us at:

Woodstock International, Inc.
Attn: Technical Support Department
P.O. Box 2309
Bellingham, WA 98227

About Your New 14 x 40 Gear Head Lathe

Your new **SHOP FOX®** 14 x 40 Gear Head Lathe has been specially designed to provide many years of trouble-free service. Close attention to detail, ruggedly built parts and a rigid quality control program assure safe and reliable operation.

The Model M1020 Gear Head Lathe has precision ground induction hardened ways, removable gap with 40" between centers and a micro-adjusting carriage stop. The 3HP 220V motor drives a 12 speed spindle. The four-way turret style tool post assures rigid tool holding and accurate positioning. The Model M1020 includes a coolant pump, steady and follow rests, three- and four-jaw chucks, a 12" faceplate, MT#3 and MT#5 dead centers. The lathe is made of cast iron throughout and has flame-hardened headstock gears.

Woodstock International, Inc. is committed to customer satisfaction in providing this manual. It is our intent to make sure all the information necessary for safety, ease of assembly, practical use and durability of this product be included.

Specifications

Motor	3 HP, 14A, 220V, Single-Phase
Overall Length	80"
Overall Width	29 1/2"
Footprint	73 1/2" x 19"
Height	45"
Feed Rod Diameter	3/4"
Bed Width	10 1/4"
Swing Over Bed	14"
Swing Over Gap	20"
Swing Over Saddle	8 1/2"
Distance Between Centers	40"
Height of Centerline	40 1/8"
Compound Travel	3 1/2"
Cross Slide Travel	7"
Tailstock Barrel Travel	4 7/8"
Leadscrew	8 TPI
Spindle Nose	D1-4 Camlock
Spindle Bore	1 1/2"
Spindle Taper	MT#5
Tailstock Taper	MT#3
Spindle Speeds	40, 60, 85, 115, 160, 230, 325, 460, 650, 910, 1280, 1800 RPM
Feed Rate Range	40@ 0.0012" - 0.029"
Thread Range (Inch)	40@ 4-12 TPI
Thread Range (Metric)	22@ 0.45 - 7.5mm
Bed Ways	Induction Hardened
Headstock Gears	Flame Hardened
Bearings	Tapered Roller
Approximate Machine Weight	2491 lbs.

Controls and Features

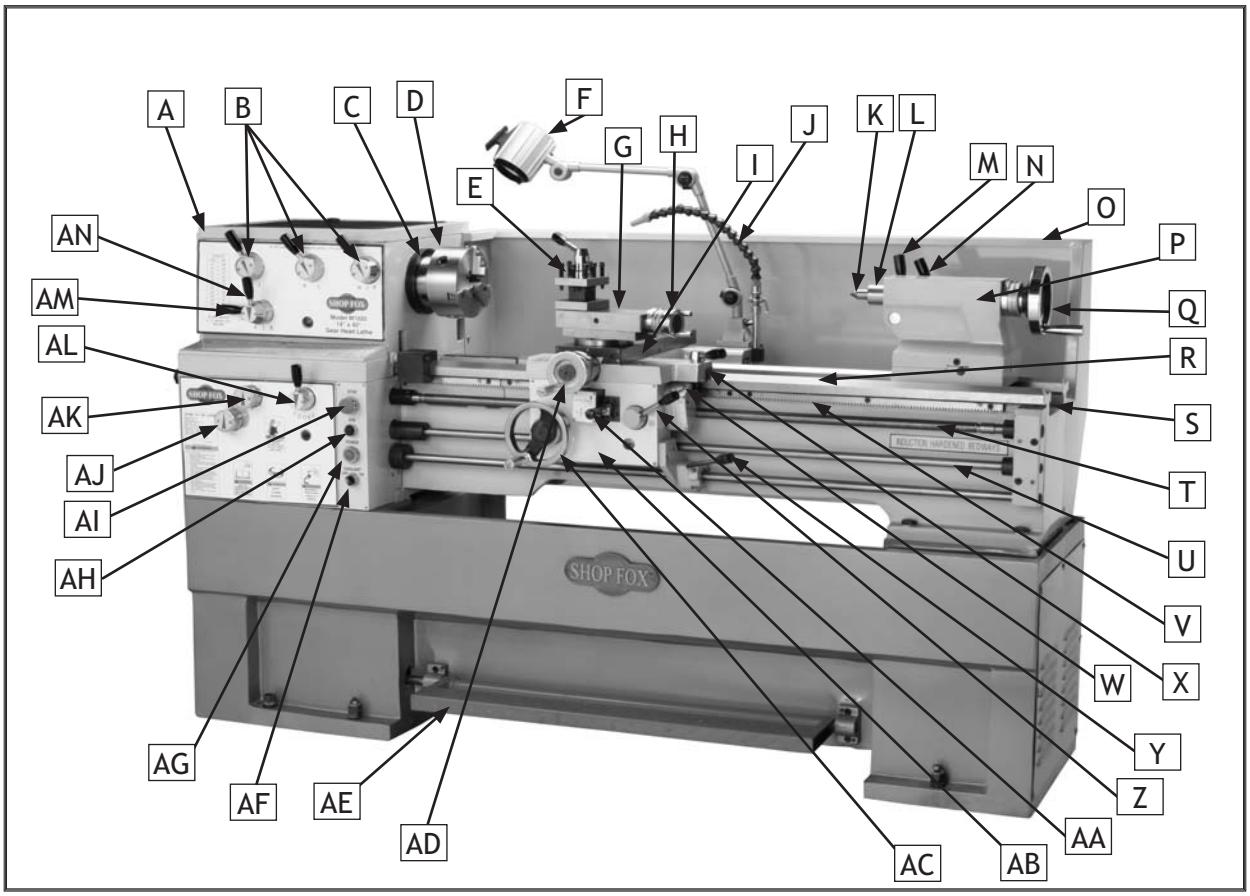


Figure 1. The Model M1020 Lathe

A. Headstock
B. Spindle Speed Levers
C. Spindle
D. Three-Jaw Chuck
E. Four-Way Tool Post
F. Work Light
G. Compound Rest
H. Compound Handwheel
I. Cross Slide
J. Coolant Hose
K. Dead Center
L. Quill
M. Quill Lock
N. Tailstock Lock
O. Splash Guard
P. Tailstock
Q. Tailstock Handwheel
R. Bed Ways
S. Bed
T. Lead Screw
U. Feed Rod
V. Rack
W. Thread Dial
X. Carriage Saddle
Y. Spindle ON/OFF
Z. Half-Nut Lever
AA. Power Feed Lever
AB. Carriage Apron
AC. Longitudinal Feed Handwheel
AD. Cross Feed Handwheel
AE. Foot Brake
AF. Coolant Pump ON/OFF
AG. Power Light
AH. Jog Button
AI. Emergency Stop
AJ. Feed Rod Lock Knob
AK. Feed/Lead Selector Knob
AL. A/B Feed/Lead Selector Lever
AM. Lead Screw/Feed Rod Directional Lever
AN. C,D,E, and F Feed/Lead Selector Lever

SAFETY

READ MANUAL BEFORE OPERATING MACHINE. FAILURE TO FOLLOW INSTRUCTIONS BELOW WILL RESULT IN PERSONAL INJURY.

⚠DANGER Indicates an imminently hazardous situation which, if not avoided, WILL result in death or serious injury.

⚠WARNING Indicates a potentially hazardous situation which, if not avoided, COULD result in death or serious injury.

⚠CAUTION Indicates a potentially hazardous situation which, if not avoided, MAY result in minor or moderate injury.

NOTICE This symbol is used to alert the user to useful information about proper operation of the equipment, and/or a situation that may cause damage to the machinery.

Standard Safety Instructions

1. **Thoroughly read the Instruction Manual before operating your machine.** Learn the applications, limitations and potential hazards of this machine. Keep the manual in a safe and convenient place for future reference.

2. **Keep work area clean and well lighted.** Clutter and inadequate lighting invite potential hazards.

3. **Ground all tools.** If a machine is equipped with a three-prong plug, it must be plugged into a three-hole grounded electrical receptacle or grounded extension cord. If using an adapter to aid in accommodating a two-hole receptacle, ground using a screw to a known ground.

4. **Wear eye protection at all times.** Use safety glasses with side shields or safety goggles that meet the appropriate standards of the American National Standards Institute (ANSI).

5. **Avoid dangerous environments.** Do not operate this machine in wet or open flame environments. Airborne dust particles could cause an explosion and severe fire hazard.

6. **Ensure all guards are securely in place** and in working condition.

7. **Make sure switch is in the *OFF* position** before connecting power to machine.

8. **Keep work area clean,** free of clutter, grease, etc.

9. **Keep children and visitors away.** Visitors must be kept at a safe distance while operating unit.

10. **Childproof your workshop** with padlocks, master switches or by removing starter keys.

11. **Stop and disconnect the machine when cleaning, adjusting or servicing.**

12. **Do not force tool.** The machine will do a safer and better job at the rate for which it was designed.

13. **Use correct tool.** Do not force machine or attachment to do a job for which it was not designed.

14. **Wear proper apparel.** Do not wear loose clothing, neck ties, gloves, jewelry, and secure long hair away from moving parts.

15. **Remove chuck keys, rags, and tools.** Before turning the machine on, make it a habit to check that all chuck keys and wrenches have been removed.

16. **Avoid using an extension cord.** But if you must use one, examine the extension cord to ensure it is in good condition. Immediately replace a damaged extension cord. Always use an extension cord that uses a ground pin and connected ground wire. Use an extension cord that meets the amp rating on the motor nameplate. If the motor is dual voltage, be sure to use the amp rating for the voltage you will be using. If you use an extension cord with an undersized gauge or one that is too long, excessive heat will be generated within the circuit, increasing the chance of a fire or damage to the circuit.

17. **Keep proper footing and balance** at all times.

18. **Lock the mobile base from moving before feeding the workpiece into the machine**.

19. **Do not leave machine unattended.** Wait until it comes to a complete stop before leaving the area.

20. **Perform machine maintenance and care.** Follow lubrication and accessory attachment instructions in the manual.

21. **Keep machine away from open flame.** Operating machines near pilot lights or open flames creates a high risk if dust is dispersed in the area. Dust particles and an ignition source may cause an explosion. Do not operate the machine in high-risk areas, including but not limited to, those mentioned above.

22. **If at any time you are experiencing** difficulties performing the intended operation, stop using the machine! Then contact our technical support or ask a qualified expert how the operation should be performed.

23. **Be aware that certain materials may cause an allergic reaction in people and animals**, especially when exposed to fine dust. Make sure you know what type of material dust you will be exposed to and the possibility of an allergic reaction.

24. **Habits—good and bad—are hard to break.** Develop good habits in your shop and safety will become second-nature to you.

Additional Safety Instructions for Gear Head Lathes

⚠WARNING

READ and understand this entire instruction manual before using this machine. Serious personal injury may occur if safety and operational information is not understood and followed. DO NOT risk your safety by not reading!

⚠CAUTION

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

1. **Read and understand this manual before operating this machine.**

2. **Do not clear chips by hand.** Use a brush, and never clear chips while the lathe is turning.

3. **Always select the right cutter for the job**, and make sure they are **sharp.** The right tool decreases strain on the lathe components and provide a better finish.

4. **Always remove chuck key.** Never walk away from the lathe with the key in the chuck.

5. **Make sure workpiece is properly held in chuck before starting lathe.** A workpiece thrown from the chuck will severely injure you or a bystander.

6. **Turn lathe *OFF* before changing speeds.** The lathe must be turned ***OFF*** and the spindle brought to a complete stop before changing gears.

7. **Get assistance when installing large chucks.** Large lathe chucks are very heavy and sometimes awkward to hold.

8. **Avoid a severe pinch hazard!** Protect your hands and the precision ground ways. Always use a chuck cradle or piece of plywood over the ways of the lathe.

9. **Make sure workpiece has adequate clearance before starting machine.** Check tool and tool post clearance, chuck clearance, and saddle clearance before starting the lathe.

10. **Always use the appropriate feed and speed rates.**

11. **Never attempt to slow or stop the lathe chuck by using your hand.**

12. **During lathe operation always maintain your attendance.** Never walk away while its running.

13. **Tie up long hair.** Long hair down in a ponytail still poses a risk of entanglement with moving parts.

14. **Release any automatic feeds** after completing a job.

Avoiding Potential Injuries

Figure 2. Protecting the bed ways and working safely with electricity.

Figure 3. Always wear safety glasses.

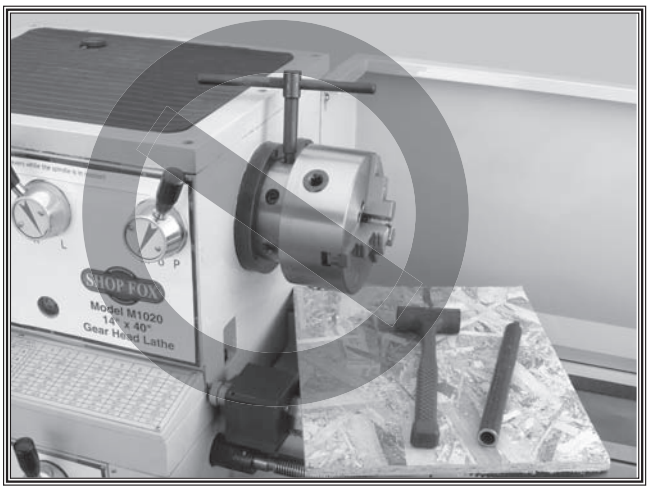


Figure 4. Never walk away from chuck key when inserted in spindle or chuck.

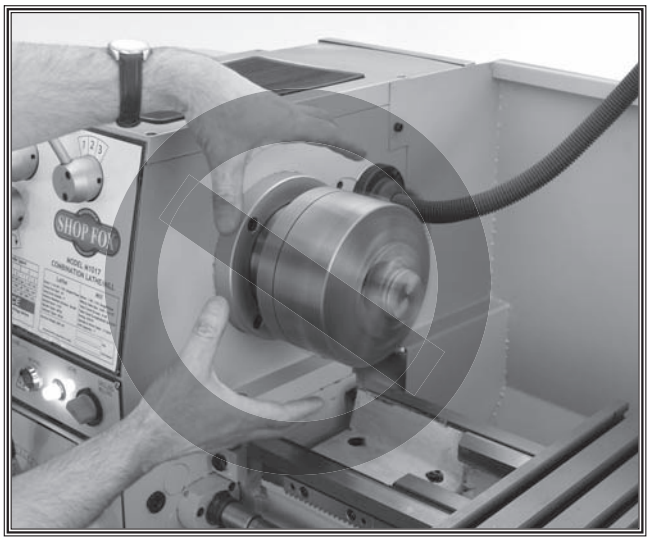


Figure 5. Never use hands to stop spindle.

220V Operation

The **SHOP FOX®** Model M1020 is prewired for 220 volt, single-phase operation. You will need a NEMA-style 6-20 plug and outlet (**see Figure 6**).

The motor supplied with your new gear head lathe is rated at 3 HP and will draw approximately 14 amps during 220 volt operation.

For 220V operation, only connect your machine to a circuit that is protected by a 20 amp circuit breaker.

⚠ **CAUTION:** Using a circuit breaker rated higher than 20 amps will increase the risk of fire!

Keep in mind that a circuit being used by other machines or tools at the same time will add to the total load being applied to the circuit. Add up the load ratings of all machines on the circuit. If this number exceeds the rating of the circuit breaker or fuse, use a different circuit.

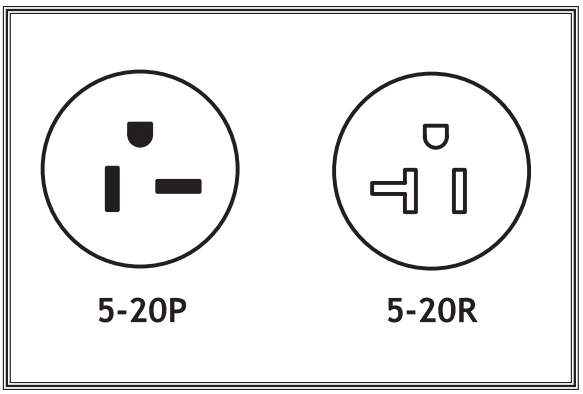


Figure 6. Typical 220V 20 Amp 3-prong plug and outlet.

Extension Cords

We do not recommend using an extension cord for 220V equipment. Instead, arrange the placement of your machinery and installed wiring to eliminate the need for extension cords. If you must use an extension cord, please use the following guidelines:

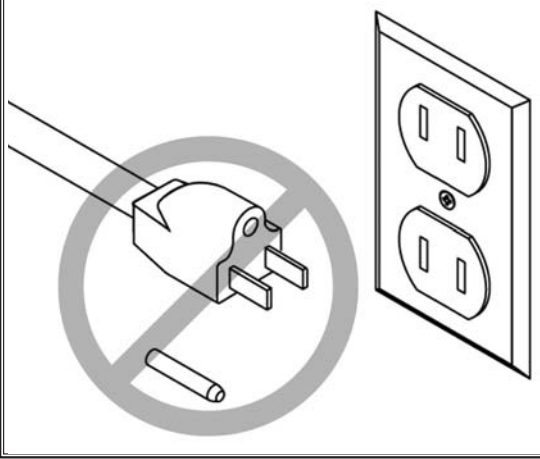
- Use cords rated for Standard Service
- Never exceed a length of 50 feet
- Use cords with 12 ga. wire or bigger
- Ensure cord has a ground wire and pin
- Do not use cords in need of repair

Grounding

This machine must be grounded! The electrical cord supplied with this machine does not come with a 220 volt plug. Use a plug with a ground pin. If your outlet does not accommodate a ground pin, have it replaced by a qualified electrician or have an appropriate adapter installed and grounded properly. An adapter with a grounding wire does not guarantee the machine will be grounded. A ground source must be verified.

⚠WARNING

This equipment must be grounded. Verify that any existing electrical outlet and circuit you intend to plug into is actually grounded. If it is not, it will be necessary to run a separate 12 AWG copper grounding wire from the outlet to a known ground. Under no circumstances should the grounding pin be removed from any three-pronged plug or serious injury may occur.



SET UP

Unpacking

The **SHOP FOX®** Model W1020 has been carefully packaged for safe transporting. If you notice the machine has been damaged, please contact your authorized **SHOP FOX®** dealer immediately.

Items Needed for Set Up

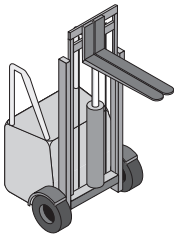
The following items are needed, but not included, to setup your machine:

- Fork Lift
- Precision Level
- Safety Glasses (for each person)
- Solvent for cleaning
- Shop Rags for cleaning

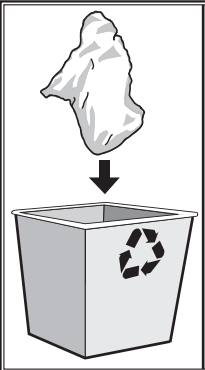
⚠WARNING

READ and understand this entire instruction manual before using this machine. Serious personal injury may occur if safety and operational information is not understood and followed. DO NOT risk your safety by not reading!

⚠WARNING



The Model M1020 weighs approximately 2491 lbs. Serious personal injury may occur if safe moving methods are not followed. You will need power lifting equipment and assistance to remove this machine from the crate. Otherwise, serious personal injury may occur.



⚠WARNING

SUFFOCATION HAZARD!

Immediately discard all plastic bags and packing materials to eliminate choking/suffocation hazards for children and animals.

Inventory

The following is a description of the main components shipped with the **SHOP FOX®** Model M1020. Lay the components out to inventory them.

Main Contents (Figure 7) **QTY**
A. Model M1020 Gear Head Lathe.....1

Large Wooden Box Contents (Figure 8)
B. 12" Faceplate 1
C. 8" Four-Jaw Universal Chuck 1
D. Four-Jaw Chuck Key 1
E. Hardware Bag
- Camlock Studs 3
- Camlock Stud Set Screws 3

Small Wooden Box (Figure 8)
F. Cast Iron Foot Pads 6

Tool Box Content (Figure 9)
G. Tool Box.....1
H. Oil Can 1
I. Open End Wrenches 9/11, 10/12, 12/14, 17/19.....4
J. Slotted Screwdriver 1
K. Phillips Head Screwdriver.....1
L. Three-Jaw Chuck Jaws 3
M. Hex Wrenches 2.5, 3, 4, 5, 6, 8MM 6
N. Tapered Pins 2
O. Handwheel Handles 2
P. MT#3 Dead Centers.....2
Q. MT#5-#3 Morse Taper Sleeve 1
R. Three-Jaw Chuck Key.....1
S. Tool Post Wrench.....1
T. Gears 30T, 32T, 40T, 40T.....4

If any parts appear to be missing, examine the packaging carefully to be sure those parts are not among the packing materials. If any parts are missing, find the part number in the back of this manual and contact Woodstock International, Inc. at (360) 734-3482 or at tech-support@shopfox.biz

NOTICE

When ordering replacement parts, refer to the parts list and diagram in the back of the manual.

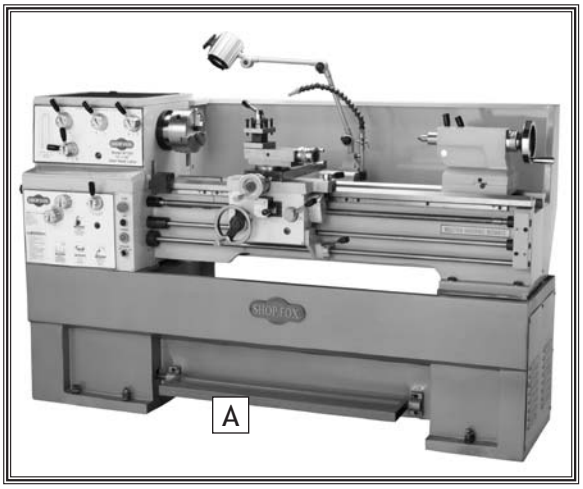


Figure 7. Main contents.

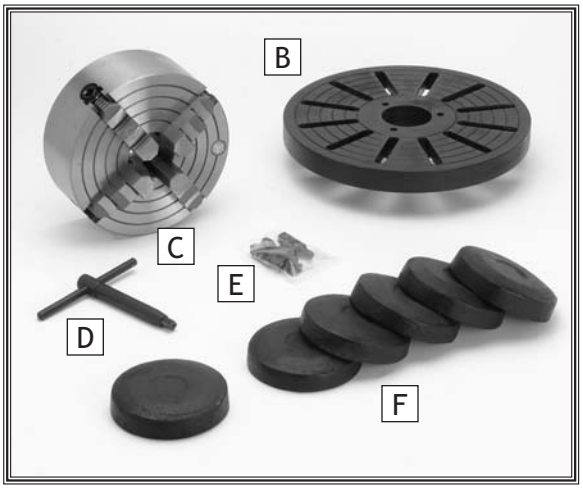


Figure 8. Large and small box contents.

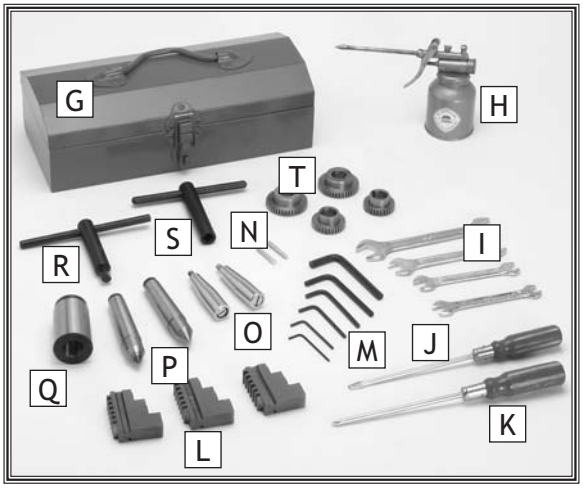


Figure 9. Tool box contents.

Cleaning Machine

The table and other unpainted parts of your Gear Head Lathe are coated with a waxy grease that protects them from corrosion during shipment. Clean this grease off with a solvent cleaner or citrus-based degreaser. DO NOT use chlorine-based solvents such as brake parts cleaner or acetone—if you happen to splash some onto a painted surface, you will ruin the finish.

⚠CAUTION

ALWAYS work in well-ventilated areas far from possible ignition sources when using solvents to clean machinery. Many solvents are toxic when inhaled or ingested. Use care when disposing of waste rags and towels to be sure they DO NOT create fire or environmental hazards.

⚠WARNING

NEVER use flammables such as gas or other petroleum-based solvents to clean your machine. These products have low flash points and present the risk of explosion and severe personal injury!

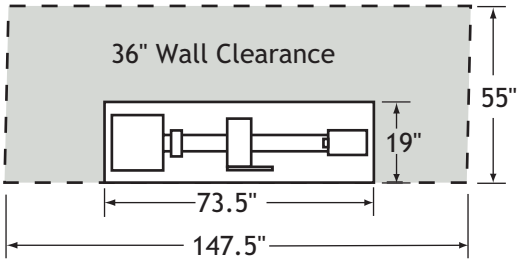


Figure 10. Minimum wall clearances.

Machine Placement

- **Floor Load:** Your Gear Head Lathe represents a large load (2491 Lbs.) distributed in a 73½" x 19" footprint. We recommend placing this machine on concrete floors only.

- **Working Clearances:** Consider existing and anticipated needs, size of material to be processed through the machine, and space for auxiliary stands, work tables or other machinery when establishing a location for your gear head lathe (see **Figure 10**).

- **Lighting:** Lighting should be bright enough to eliminate shadow and prevent eye strain.

- **Electrical:** Electrical circuits must be dedicated or large enough to handle amperage requirements. Outlets must be located near each machine, so power or extension cords are clear of high-traffic areas. Follow local electrical codes for proper installation of new lighting, outlets, or circuits.

⚠WARNING

MAKE your shop "child safe." Ensure that your workplace is inaccessible to youngsters by closing and locking all entrances when you are away. NEVER allow untrained visitors in your shop when assembling, adjusting or operating equipment.

Mounting Lathe on Shop Floor

Although not required, we recommend that you mount your new machine to the floor. Because this is an optional step and floor materials may vary, floor mounting hardware is not included. Generally, you can either bolt your machine to the floor or mount it on machine mounts. Both options are described below. Whichever option you choose it will be necessary to use a precision level to level your machine.

Bolting to Concrete Floors

Lag shield anchors with lag bolts (**Figure 11**) and anchor studs (**Figure 12**) are two popular methods for anchoring an object to a concrete floor. We suggest you research the many options and methods for mounting your machine and choose the best that fits your specific application.

NOTICE

Anchor studs are stronger and more permanent alternatives to lag shield anchors; however, they will stick out of the floor, which may cause a tripping hazard if you decide to move your machine at a later point.

Using Machine Mounts

Using machine mounts, shown in **Figure 13**, gives the advantage of fast leveling and vibration reduction. The large size of the foot pads distributes the weight of the machine to reduce strain on the floor.

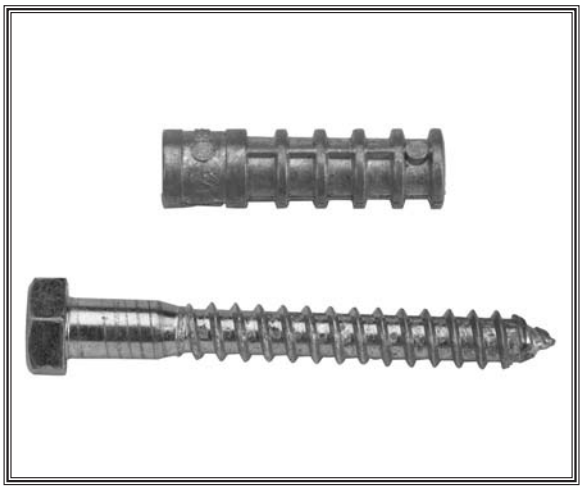


Figure 11. Typical lag shield anchor and lag bolt.

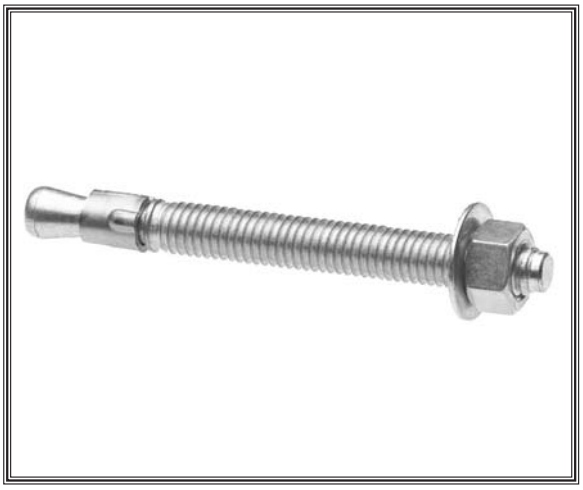


Figure 12. Typical anchor stud.

Figure 13. Machine mount example.

Handwheel Handles

To attach the handles to the handwheels, do these steps:

1. Using the screwdriver, attach the handles (**Figure 14**) to the threaded hole in the handwheels.

2. Be sure the handle is snug so that it does not come loose during operation.

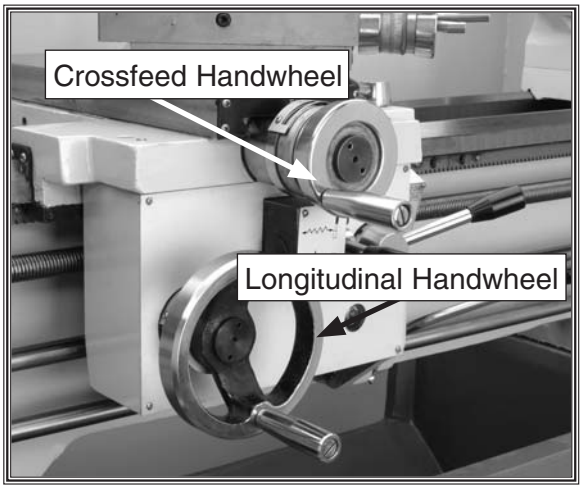


Figure 14. Longitudinal and crossfeed handle locations.

Test Run

The purpose of the test run is to make sure lathe is wired correctly and the motor is working properly before proceeding with additional set up. Check to make sure that any auto feed is not engaged, the chuck is secure in the spindle, and there are no loose parts around the spindle. Set the lathe to the slowest RPM before the test run. Refer to **Setting RPM** on **Page 33** and **Lubrication** on **Page 39** before doing the test run.

To begin the start up procedure, do these steps:

1. Make sure there are no obstructions around or underneath the spindle.

2. Set the lathe to the slowest RPM. See **Page 33** for adjusting RPM.

3. Put on safety glasses, and make sure any bystanders are wearing safety glasses and are out of the way.

4. Plug the lathe into the power outlet and rotate the ON/OFF switch to turn the mill ***ON***, but make sure that your hand stays over the switch. The lathe should run smoothly, with little or no vibration or rubbing noises.

   - If you hear squealing or grinding noises, turn the machine ***OFF*** immediately. Wait for the spindle to stop moving, unplug the machine, and correct any problems before further operation.

   - If the source of an unusual noise or vibration is not readily apparent, contact our technical support for help at (360) 734-3482 or contact us online at **tech-support@shopfox.biz**.

OPERATIONS

General

The Model M1020 will perform many types of operations that are beyond the scope of this manual. Many of these operations can be dangerous or deadly if performed incorrectly.

The instructions in this section are written with the understanding that the operator has the necessary knowledge and skills to operate this machine. **If at any time you are experiencing difficulties performing any operation, stop using the machine!**

If you are an inexperienced operator, we strongly recommend that you read books, trade articles, or seek training from an experienced lathe operator before performing any unfamiliar operations. **Above all, your safety should come first!**

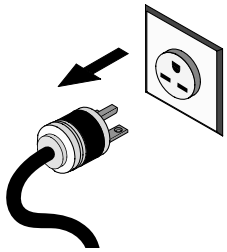
WARNING

Always wear safety glasses when operating the Gear Head Lathe. Failure to comply may result in serious personal injury.

Turning On Power

Once plugged in, and the master switch on the back of the lathe is turned ON, the lathe is always on. The green "Power" light will be lit to indicate a live connection. If you press the emergency stop button, the power light will go out and cut power to machine operations only. Twisting the EMERGENCY STOP button and letting it pop out will restore power to machine operations. To cut power to the machine entirely, you will need to turn the main switch on the back of the machine OFF and unplug the lathe from the outlet.

WARNING



DO NOT investigate problems or adjust the Gear Head Lathe while it is running. Wait until the machine is turned off, unplugged and all working parts have come to a complete stop before proceeding!

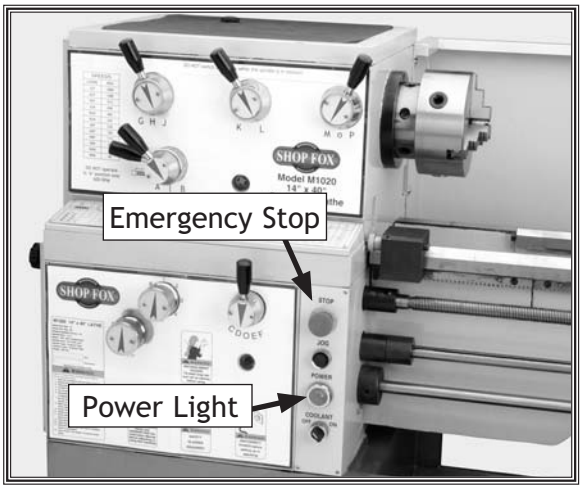


Figure 15. Power light and emergency stop locations.

Three-Jaw Direct Mount Scroll Chuck

Three-jaw scroll chucks feature hardened steel jaws that self-center the workpiece within 0.002"-0.003". An extra set of jaws is included for machining larger workpieces. The three-jaw direct mount scroll chuck featured in these instructions has three cam-lock studs that mount directly to the chuck and hold the chuck tight to the spindle nose.

The instructions listed below are written with the expectation that the operator has the necessary knowledge and skills for general lathe operations.

To remove or mount your three-jaw direct mount scroll chuck you will need the following tools:

- Chuck Key
- Dead Blow Hammer
- A Chuck Cradle or a piece of plywood large enough to span the bedways and support the weight of the chuck
- Breaker Bar (optional)

To remove the existing chuck, do these steps:

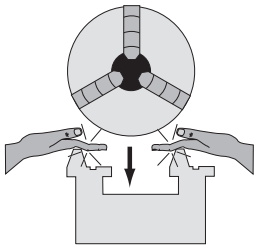
1. **Unplug the lathe!**

2. Lay a chuck cradle or protective layer of plywood over the bedways to protect the precision ground surfaces from damage and to prevent fingers from being pinched (see **Figure 15**).

3. Loosen the 3 cam-locks by turning the chuck key counterclockwise until the mark on the cam-lock aligns with the single mark on the spindle nose in **Figure 16.** This will be approximately one-third of a turn. If you look carefully, you will see the cam-lock rise up out of the spindle nose. If the cam-lock stud does not freely release from the cam-lock, wiggle the cam-lock until the cam-lock stud releases.

   Note: These cam-locks may be very tight. A breaker bar may be used to add leverage.

⚠WARNING



PINCH HAZARD! Protect your hands and precision ground bedways with plywood when removing lathe chuck! The heavy weight of a falling chuck can cause serious injury.

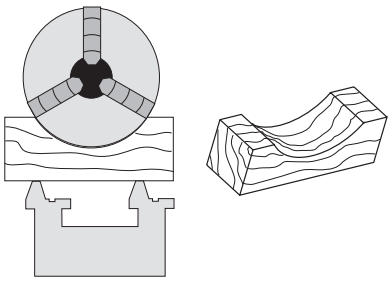


Figure 15. Simple chuck cradle made of scrap lumber.

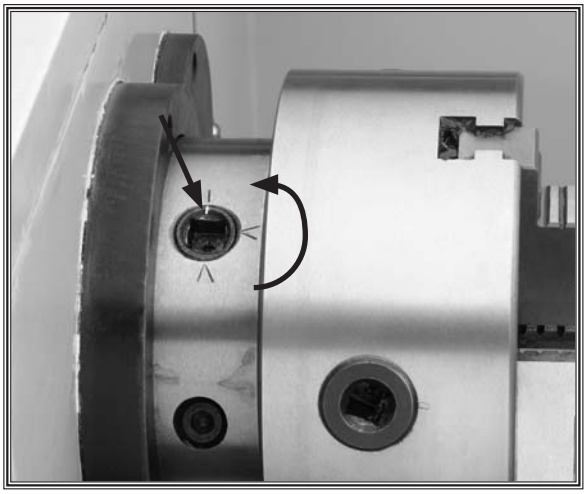


Figure 16. Loosening the cam-locks.

OPERATIONS

4. Using a dead blow hammer or other soft mallet, lightly tap around the outer circumference of the chuck body to break the chuck free from the cam-locks and from the spindle nose taper.

5. With a rocking motion, carefully remove the chuck from the spindle nose (see **Figure 17**).

⚠CAUTION

Large chucks are very heavy. Always get assistance when removing or installing large chucks to prevent personal injury or damage to the chuck or lathe.

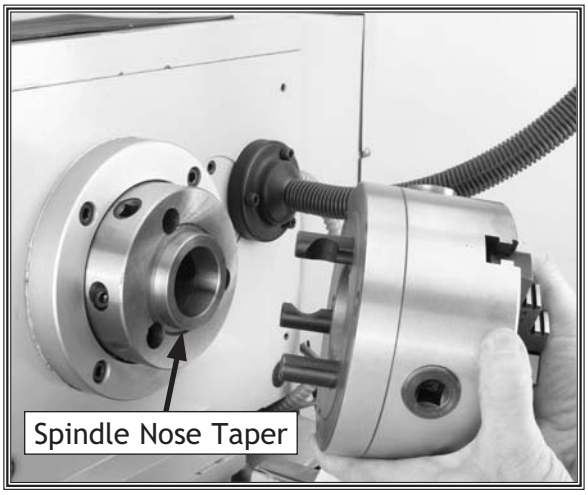


Figure 17. Installing and removing a small chuck.

To install the three-jaw scroll chuck, do these steps:

1. **Unplug the lathe!**

2. Lay a chuck cradle or protective layer of plywood over the bedways to protect the precision ground surfaces from damage and to prevent fingers from being pinched.

3. If the three-jaw scroll chuck does not have the cam-lock studs assembled, screw the cam-lock studs into the chuck body.

4. Using your calipers, measure the height of the cam-lock studs from the previously installed chuck (see **Figure 18**).

Figure 18. Measuring height of cam-lock studs.

5. Adjust the cam-lock studs in the three-jaw chuck to match the measurement from the previous chuck.

   Note: Trial-and-error adjustment will be needed if you do not have a previous cam-lock stud to reference.

6. Once the proper length is obtained, thread the cap screws into lock the cam-lock studs into position.

7. Lift the chuck, and insert the studs onto the spindle nose (see **Figure 17**).

8. Tighten each cam-lock clockwise until you feel the cam-lock engage the cam-lock stud. Continue to turn until you can't turn any further. You will see the chuck body draw-up to the spindle nose. Ideally the cam-lock mark will fall between the two pointed arrows on the spindle nose (see **Figure 19**).

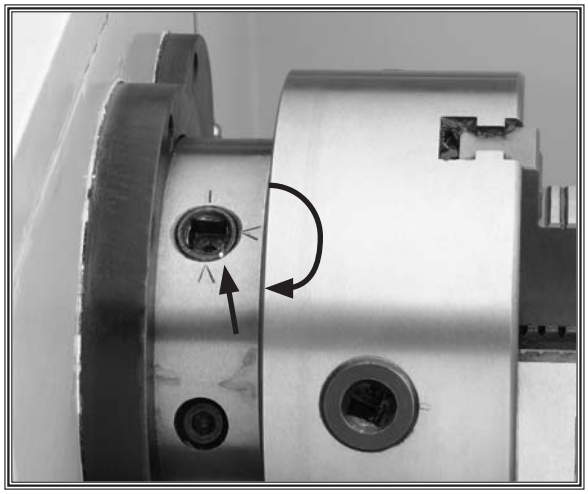


Figure 19. Tightening the cam-locks.

To load a workpiece, do these steps:

1. With the chuck key, open the jaws so the workpiece lays flat against the chuck face and jaw step, or fits in the through hole. For jaw and work holding options, see **Figure 20**.

2. Turn each jaw until it makes contact with the workpiece.

3. Turn the chuck by hand to make sure you have even contact with all three jaws and the workpiece is not off center.

   - If the workpiece is off center, loosen the jaws and adjust the workpiece.

   - If the workpiece is seated correctly, tighten the jaws.

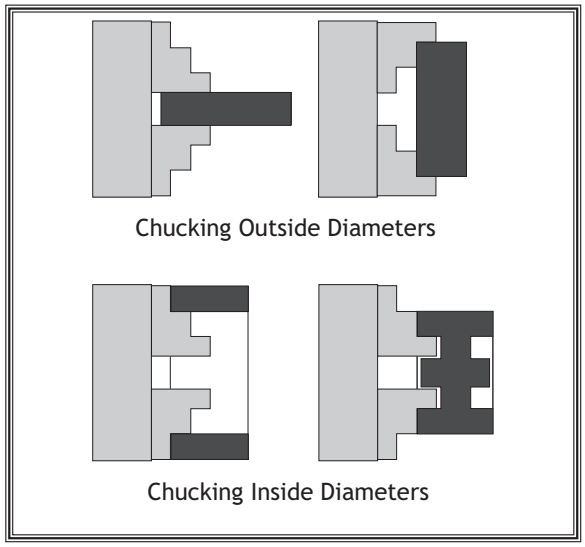


Figure 20. Loading a workpiece.

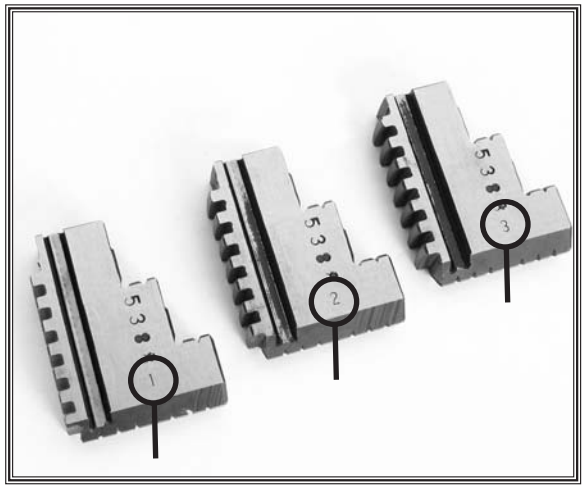
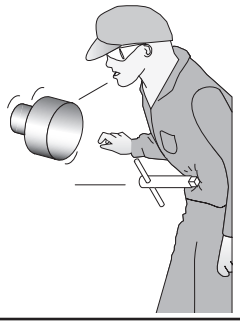


Figure 21. Jaw number identification.

WARNING



Securely clamp your workpiece and remove the chuck key! Thrown objects from a lathe can cause serious injury or death to the operator and to bystanders many feet away.

Replacing Jaws

Three-jaw scroll chucks come with two sets of hardened steel jaws. The outside jaws are used to hold the workpiece from the outer diameter. The inside jaws are for holding larger work usually from the inside diameter. The inside jaws can hold a workpiece from the outside when held in the central position (see **Figure 20**).

The jaws are numbered 1–3 and must be installed in this sequence (see **Figure 21**).

To remove a set of jaws, do these steps:

1. **Unplug the lathe!**

2. Identify the jaw position by the number usually stamped on the side of the jaw (see **Figure 22**).

   Note: The chuck should have a mark near the jaw guide that corresponds to the jaw number. If it does not, locate the jaw number on the jaw and mark the chuck to identify that position (see **Figure 22**). The reference numbers may be stamped in an area that is not readily visible. As soon as you find the number on the jaw, make some kind of reference mark on the corresponding jaw guide.

3. Turning the chuck key counterclockwise, back the jaws out of the chuck body. They will be released from the scroll thread in a reverse sequence.

4. Set the jaws aside in a safe place.

To install a set of jaws, do these steps:

1. **Unplug the lathe!**

2. Identify the jaw by the number stamped on the side. (refer to **Figure 22**).

3. Locate the corresponding jaw guide on the chuck body (see **Figure 23**).

4. Insert the chuck key into the chuck.

5. Look into the jaw guide and you will see the scroll rotating as you turn the chuck key. When the leading thread of the scroll comes into view at the top of the #1 jaw guide, stop turning the chuck key (see **Figure 24**).

6. Slide jaw #1 into the jaw guide until it stops.

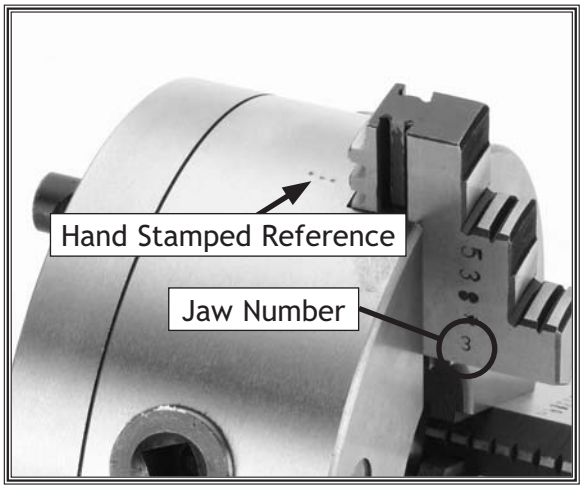


Figure 22. Stamped marks identifying jaw guide and corresponding jaw number.

Figure 23. This chuck has jaw references on the inside of the jaw guide. (Chuck removed from spindle for clarity).

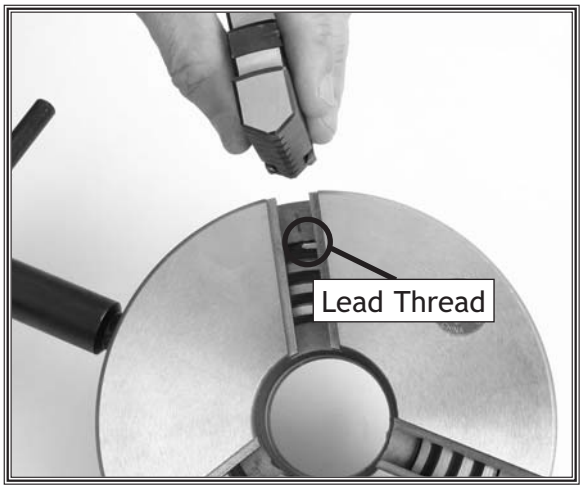


Figure 24. Lead thread on scroll.

7. Turn the chuck key so the leading thread of the scroll picks up the first thread on the jaw. When the lead thread engages, you will see the jaw being drawn to the center of the chuck (see **Figure 25**).

8. Continue to turn the chuck key until the leading thread of the scroll comes to the second jaw guide.

9. Repeat **Steps 5-7** with jaw #2.

10. Continue to turn the chuck key until the leading thread of the scroll comes to the third jaw guide. (see **Figure 26**).

11. Repeat **Steps 5-7** with jaw #3.

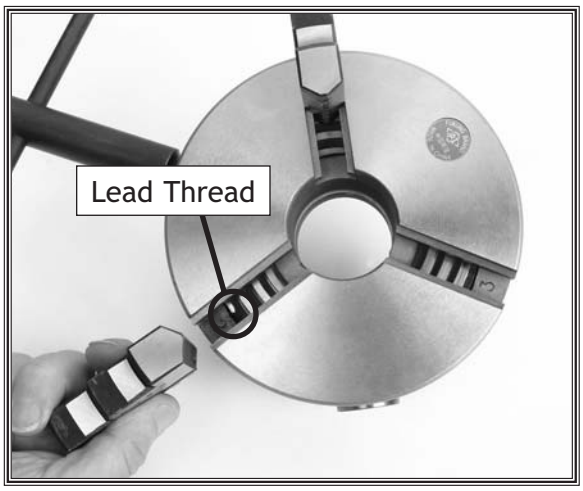


Figure 25. Lead thread coming in to view for jaw #2.

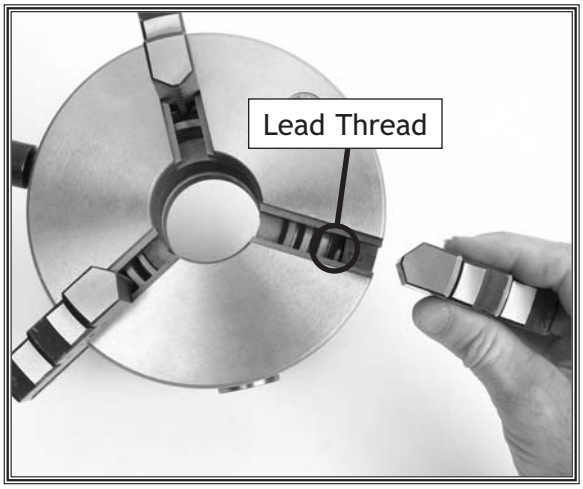


Figure 26. Lead thread coming in to view for jaw #3.

Four-Jaw Direct Mount Independent Chuck

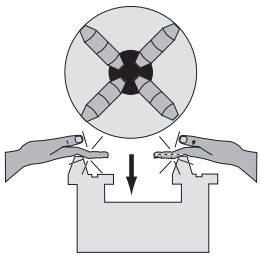
Four-jaw chucks feature hardened steel jaws that are adjusted independently. Each jaw can be removed from the chuck body and reversed. Independent jaw adjustment and reversal allows for a wide range of work holding versatility.

The four-jaw direct mount independent chuck featured in these instructions mounts the same way as the three-jaw chuck. Refer to the three-jaw chuck instructions beginning on **page 17.**

⚠CAUTION

Large chucks are very heavy. Always have assistance when removing or installing large chucks to prevent personal injury or damage to the chuck or lathe.

⚠WARNING



PINCH HAZARD! Protect your hands and precision ground bedways with plywood when removing lathe chuck! The heavy weight of a falling chuck can cause serious injury.

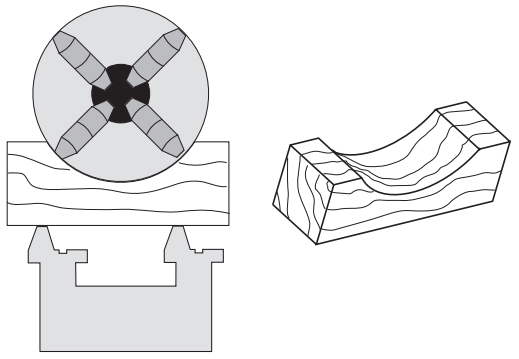


Figure 27. Simple chuck cradle made of scrap lumber.

To load a workpiece, do these steps:

1. Using the chuck key, open each jaw so the workpiece will lay flat against the chuck face.

2. Support the workpiece.

3. Lock the tailstock and then turn the tailstock quill so the dead center makes contact with the centerpoint of your workpiece.

4. Turn each jaw until it just makes contact with the workpiece.

5. Tighten each jaw in small increments. After you have adjusted the first jaw, continue tightening in opposing sequence (see **Figures 28 & 29**). Check frequently to make sure you have not wandered off your center point due to applying too much pressure to a single jaw.

6. After the workpiece is held in place, back the tailstock away and rotate the chuck by hand. The center point will move if the workpiece is out of center (see **Figure 30**).

7. Make fine adjustments by slightly loosening one jaw and tightening the opposing jaw until the workpiece is precisely aligned.

8. Use a lower RPM when machining heavy eccentric workpieces.

Figure 28. Centering workpiece.

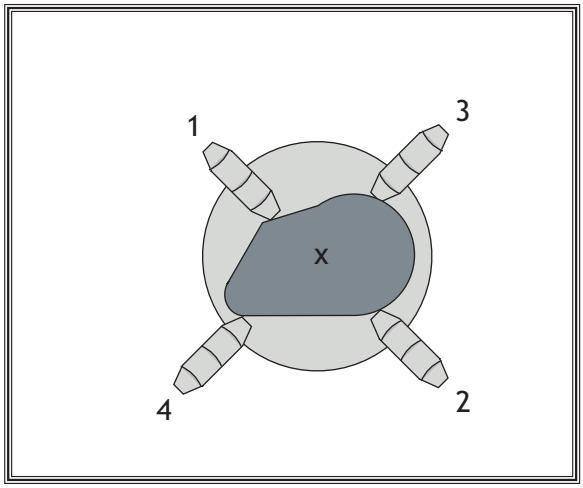


Figure 29. Jaw tightening sequence.

Figure 30. Properly held workpiece for offset machining at low RPM.

Faceplate

The faceplate can be used to turn non-cylindrical parts or for off-center turning by clamping the workpiece to the faceplate.

To install the faceplate, do these steps:

Installing the faceplate follows the same steps as any of the lathe chucks. Install according to the instructions for three-jaw chucks found on page 17**Pon page 17 on page 17**.

To load a workpiece, do these steps:

1. Support the workpiece.

2. Slide the tailstock to the workpiece.

3. Lock the tailstock and then turn the tailstock quill so the dead center makes contact with the centerpoint of your workpiece. For more information refer to **Centers** in this section on page 29**Pon page 29.**

4. Lock the tailstock quill when sufficient pressure is applied to hold the workpiece in place. Depending on the workpiece, some additional support may be needed.

5. Secure the workpiece with a minimum of three independent clamping devices (see **Figure 31**). Failure to follow this step may lead to deadly injury to yourself or bystanders. Take into account rotation and the cutting forces applied to the workpiece when clamping to the faceplate. **Make sure your clamping application will not fail!**

6. Use a lower RPM when machining heavy eccentric

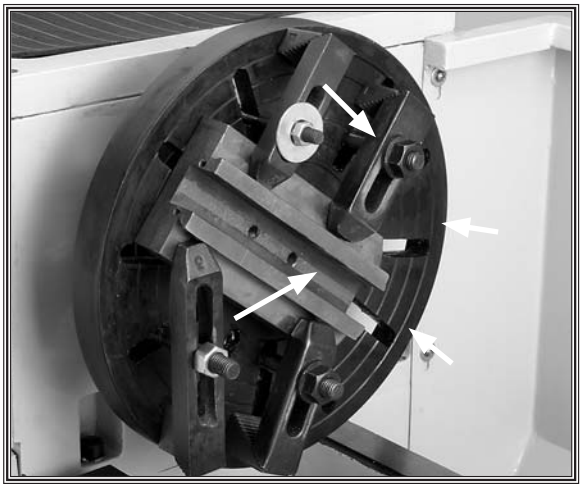
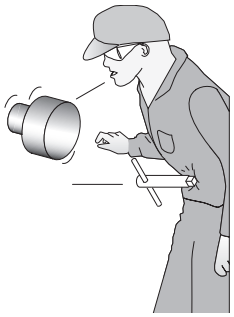


Figure 31. Faceplate with properly clamped eccentric in four locations.

⚠WARNING

Use a minimum of three independent clamping devices when turning eccentric workpieces. Failure to provide adequate clamping will cause workpiece to eject.

⚠WARNING



Securely clamp your workpiece and remove the chuck key! Thrown objects from a lathe can cause serious injury or death to the operator and to bystanders many feet away.

Gap Removal

The Model M1020 comes equipped with a gap section below the spindle that can be removed for turning large diameter parts or when using a large diameter faceplate.

The gap is installed, then ground at the factory during lathe assembly for precise fit and alignment. Factors during the remaining assembly apply additional forces to the gap; therefore, replacing the gap to the original position will be very difficult. **If you choose to remove the gap, we don't recommend attempting to replace it.**

To remove the gap, do these steps:

1. Find the two taper pin nuts located on the bed of the gap (see **Figure 32**).

2. Using an open-ended wrench, tighten the nut. This will cause the taper pin to release. Remove the taper pin and repeat for the second nut.

3. Remove the four socket head cap screws.

4. Tap the outside of the gap with a dead blow hammer to loosen, and remove the gap section.

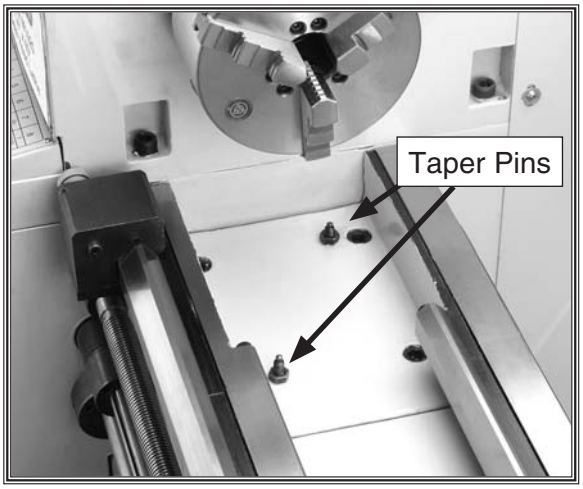


Figure 32. Lathe gap.

Tailstock

The tailstock (**Figure 33**) of the Model M1020 lathe can be used to support workpieces with the use of a live or dead center. It can drill or bore holes in the center of a part, using a drill chuck fitted with a #3 taper and a drill, or bypass the drill chuck and use a #3 tapered shank drill. It can also be used for cutting shallow tapers by using the offset adjustment.

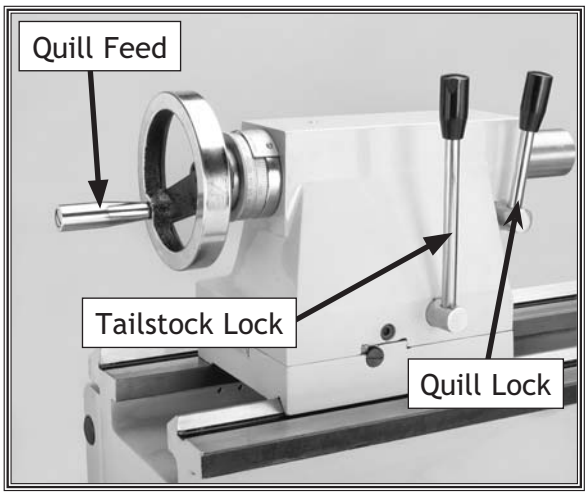


Figure 33. Tailstock and quill lock handles in locked position.

To operate the tailstock, do these steps:

1. Slide the tailstock to the desired position.
2. Pull up on the tailstock lock handle to lock the tailstock in place.

To operate the tailstock quill, do these steps:

1. With the tailstock locked, push down the quill lock handle to unlock.
2. Turn the quill feed handle clockwise to feed/move the quill towards the spindle, or counterclockwise to move away from the spindle.
3. Pull up on the quill lock handle to lock the quill in place.

Drilling with the Tailstock

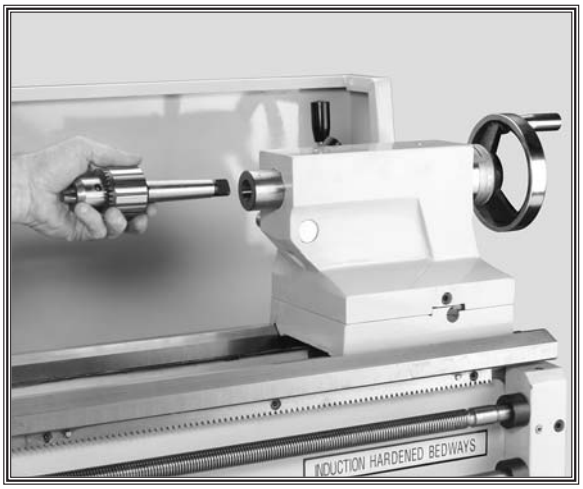


Figure 34. Setting up tailstock for drilling.

To install the tapered drill chuck, do these steps:

1. With the tailstock locked, push down to unlock the quill lock handle.
2. Turn the quill feed handle clockwise to extend the quill about one inch.
3. Insert a tapered drill arbor (**Figure 34**), or the tapered drill shank (**Figure 35**), into the quill until the taper is firmly seated. The matching tapers hold the arbor.
4. Turn the quill feed handle clockwise to feed the drill bit into the rotating workpiece.
5. To remove the chuck taper, turn the quill feed handle counterclockwise until the chuck is pushed out from the tailstock taper.

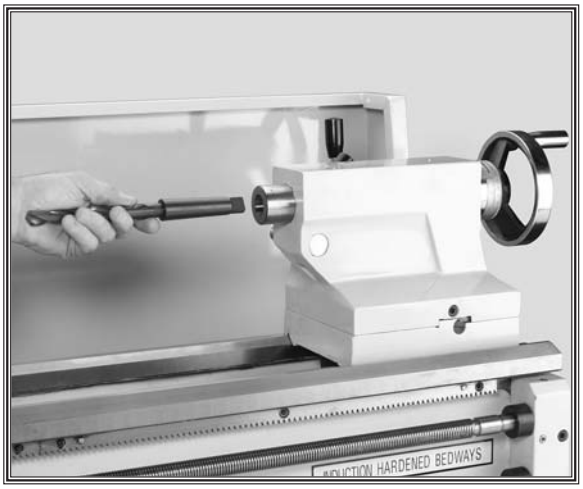


Figure 35. Tapered shank drill fitting into quill taper.

Cutting Shallow Tapers with the Tailstock

The tailstock can be offset to cut a shallow taper on a part.

To set up the tailstock to cut tapers, do these steps:

1. Lock the tailstock in position.
2. Loosen the set screw located just above the adjustment screw (see **Figure 36**).
3. Alternately loosen and tighten the two side adjustment screws until desired offset is indicated on the scale (see **Figure 37**).
4. Tighten each set screw to lock the setting.

To return the tailstock back to original position, repeat the process until the centered position is indicated on the scale.

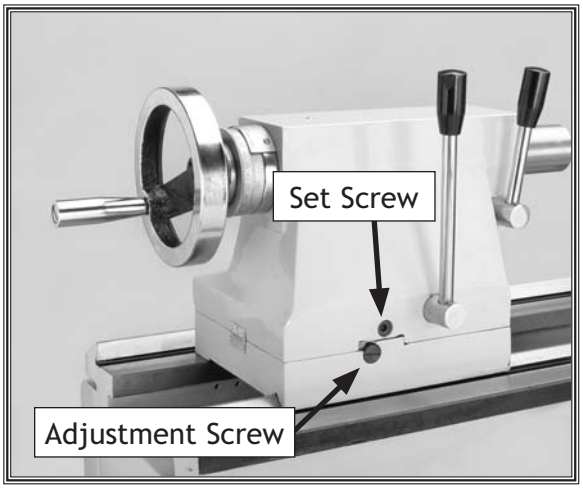


Figure 36. Tailstock off-set adjustments.

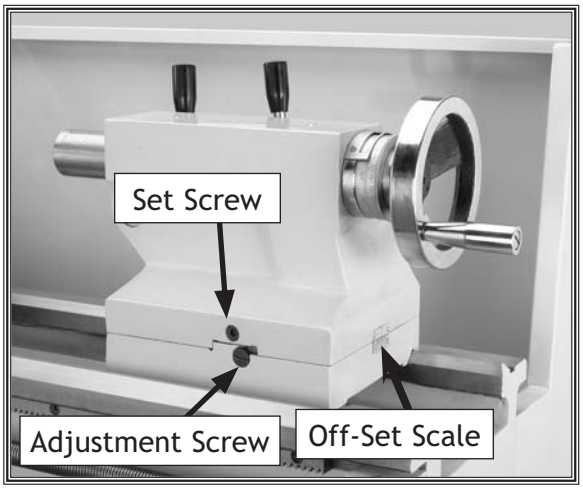


Figure 37. Off-set scale.

Tailstock Alignment

The tailstock on the Model M1020 is aligned at the factory with the headstock. We recommend that you take the time to ensure that the tailstock is aligned to your own desired tolerances.

To align the tailstock, do these steps:

1. Using a precision level on the bedways, make sure the lathe is level side-to-side and front-to-back. If the lathe is not level, correct this condition before proceeding.
2. Get two pieces of steel round stock, 2.00" in diameter x 6.00" long.
3. Center drill both ends of one piece of the round stock. Set it aside for use in **Step 6.**
4. Using the other piece of stock, make a dead center by turning a shoulder to make a shank. Flip the piece over in the chuck and turn a 60° point (see **Figure 38**).

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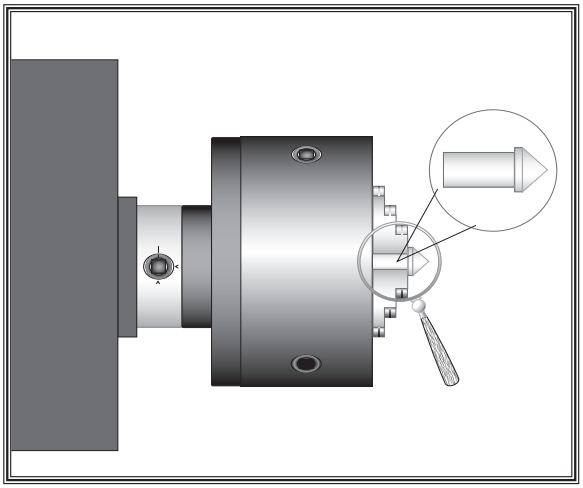


Figure 38. Tailstock centering dead center.

Note: As long as the dead center remains in the chuck, the point of your center will remain true to the spindle axis. Keep in mind that the point will have to be refinished whenever it is removed and returned to the chuck. For more information refer to **Centers** on **Page 29** in this section.

5. Place the live center in the tailstock.

6. Attach a lathe dog to the bar stock and mount it between centers (see **Figure 39**).

7. Turn approximately 0.010" off the diameter.

8. Measure the stock with a micrometer.

- If the stock is fat at the tailstock end, the tailstock needs to be moved toward the operator half the distance of the amount of the taper (see **Figure 40**).
- If the stock is thinner at the tailstock end, the tailstock needs to be moved away from the operator half the distance of the amount of the taper (see **Figure 41**).

9. Mount a dial indicator so the dial plunger is on the tailstock barrel before making adjustments to the tailstock.

10. Refer to **Cutting Shallow Tapers With The Tailstock** on **Page 27** for making adjustments to the tailstock center. Turn another 0.010" off of the diameter and check for a taper. Repeat this process as necessary until the desired amount of accuracy is achieved.

Figure 39. Checking tailstock alignment.

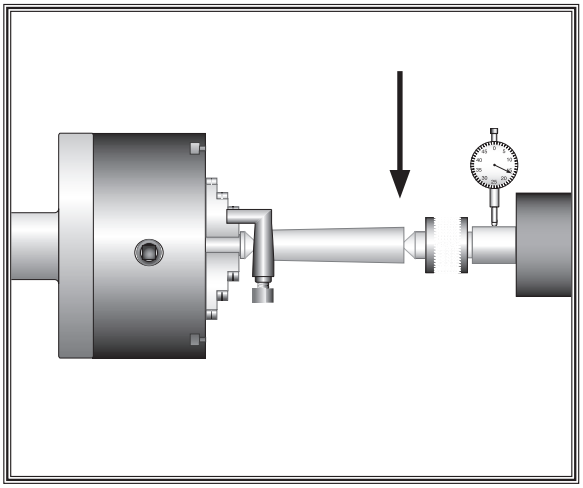


Figure 40. Tailstock adjustment option #1.

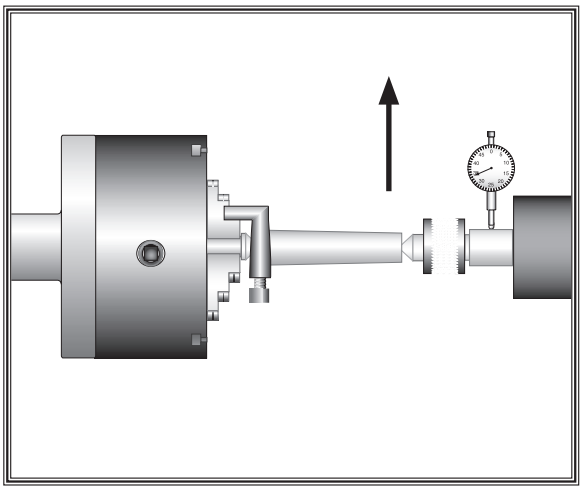


Figure 41. Tailstock adjustment option #2.

Centers

The dead center is used in the tailstock to support workpieces. When used in the tailstock, make sure to keep the dead center tip and workpiece lubricated.

The Model M1020 lathe is supplied with two MT#3 dead centers–one HSS and one is carbide tipped. The supplied MT#5-#3 sleeve fits into the spindle taper to hold the a MT#3 center.

To install a dead or live center, do these steps:

1. Feed the quill out about 1" so that the dead center can be inserted.

2. Insert the dead center into the quill opening. Matching tapers provide the locking action (see **Figure 42**).

3. Move the tailstock into position and lock in place.

4. Feed the quill into the workpiece.

   Note: Make sure there is a center drilled hole in the end of workpiece for the dead center.

5. Lock the quill into place once the live center and the part rotate together. The quill may need to be adjusted during operation.

6. To remove the dead center, retract the quill until the dead center pops free.

The dead center can also be used in the spindle. The most common application is when using the faceplate (see **Figure 43**).

To install the dead center in the spindle, do these steps:

1. Remove the chuck from the spindle.

2. Install the dead center in the spindle sleeve.

3. Install the sleeve and center into the spindle opening.

4. Attach the faceplate to the spindle.

   Note: When using the dead center in the spindle, use a lathe dog so that your part will rotate with the spindle and not spin on the dead center tip.

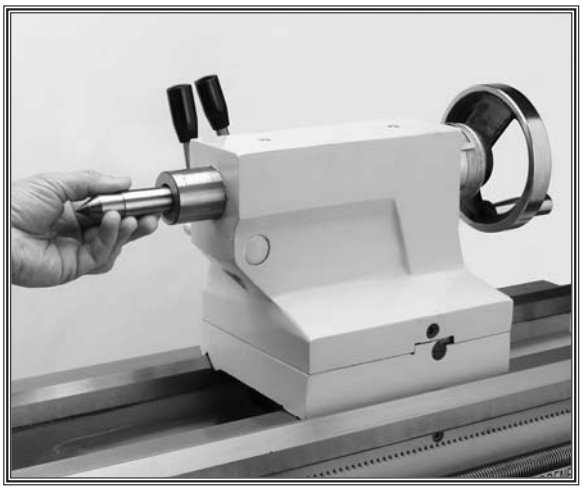


Figure 42. Inserting dead center.

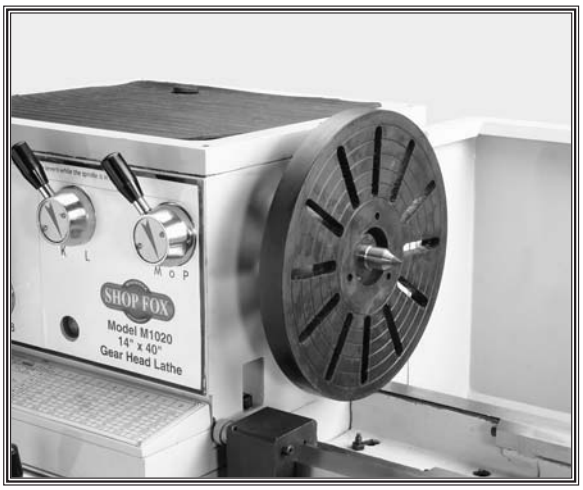


Figure 43. Typical faceplate and dead center setup.

NOTICE

Failure to keep dead center point well lubricated will damage dead center and workpiece.

Steady Rest

The steady rest serves as a support for long shafts (l/d ratio of 3:1 or greater). The steady rest can be placed anywhere along the length of the part.

To install/use the steady rest, do these steps:

1. Place the steady rest on the lathe bedways so the triangular notch fits over the angled portion of the rear bedway.

2. Loosen the three set screws so the finger position can be adjusted (see **Figure 44**).

3. Loosen the knurled screw and open the steady rest so a workpiece can fit inside of the fingers (see **Figure 45**).

4. Position the steady rest where desired. Tighten the bolt at base of the steady rest to secure in place.

5. Close the steady rest so that the workpiece is inside the fingers and tighten the knob.

6. Set fingers snug to the workpiece and secure by tightening the three socket head cap screws. Fingers should be snug and allow rotational movement of the workpiece. Lubricate the finger tips with an anti-seize grease during operation.

7. After prolonged use, the fingers will show wear. Either mill or file the tips for a new contact surface.

Figure 44. Steady rest adjustments.

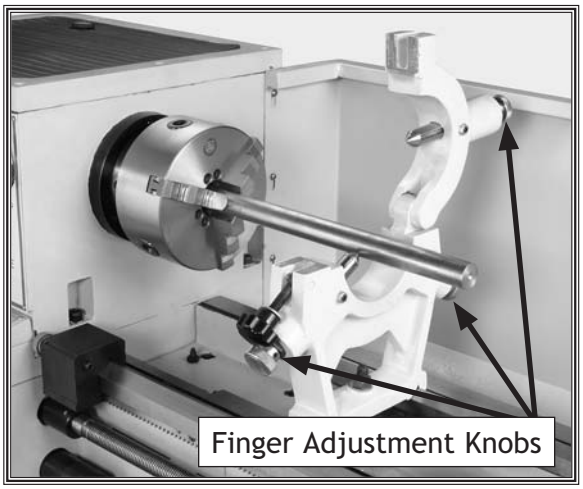


Figure 45. Positioning workpiece in steady rest.

Follow Rest

The follow rest in **Figure 46** is mounted on the saddle and follows the movement of the tool. It can be attached/removed by two socket head cap screws located at the base of the follow rest. The follow rest requires only two fingers as the cutting tool acts as the third. The follow rest is used on long, slender parts to prevent flexing of the workpiece from the pressure of the cutting tool.

The sliding fingers are set similar to those of the steady rest —free of play but not binding. Always lubricate during operation. Remove the follow rest from the saddle when not in use. After prolonged use, the fingers will need to be milled or filed to cleanup the contact surface.

Figure 46. Follow rest attachment.

Setting Compound Slide

The compound slide is used to cut tapers on parts or to set the proper infeed angle when threading. It may also be used to cut specific lengths longitudinally, when set parallel to the spindle axis.

The compound slide handwheel has a graduated dial for precise inch feed increments. The base of the compound slide has a graduated scale for angular setup.

To set the angular position, do these steps:

1. Loosen the two cap screws, one on each side of the compound slide (see **Figure 47**).

2. Rotate the compound slide to the desired angular position. Use the scale at the base of the slide and the indicator marks on the carriage to set the position.

3. Tighten the two cap screws. Be sure to not overtighten, as you may strip threads.

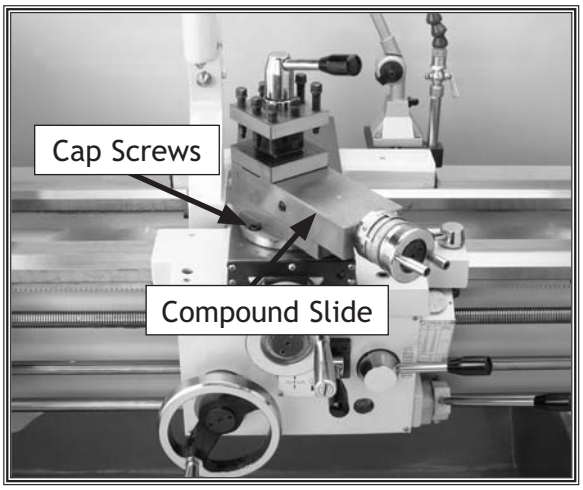


Figure 47. Compound slide set at an angle.

Four-Way Tool Post

The four-way tool post is mounted on top of the compound slide, and allows a maximum of four tools to be loaded simultaneously.

The four-way tool post allows for quick indexing to new tools. This is accomplished by rotating the top handle counterclockwise and then rotating the tool post to the desired position. Rotate the top handle clockwise to lock the tool into position.

To load the tool post, do these steps:

1. Choose the desired cutting tool.

2. Loosen the tool post bolts so that the cutting tool can fit underneath the tool post bolts.

3. Use a minimum of two tool post bolts to hold down the cutting tool and tighten firmly (see **Figure 48**).

4. Repeat **Steps 1-3** for the three remaining openings, as needed.

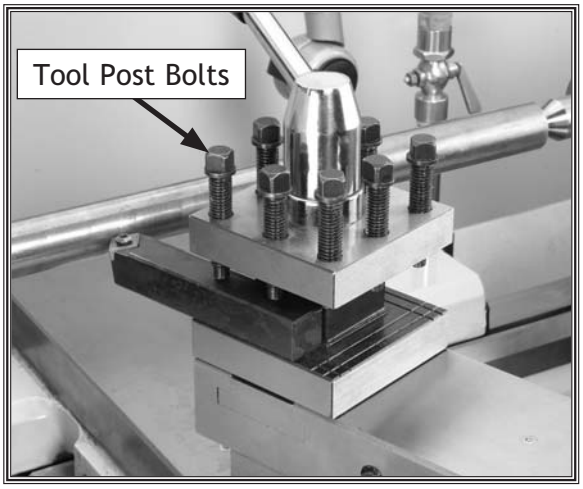


Figure 48. Tool holder and tool post.

NOTICE

Immediately remove tool post wrench after use. Tool post wrench could be picked up by chip and thrown.

Foot Brake

The Model M1020 lathe comes equipped with a foot brake (see **Figure 49).** The foot brake is intended to be used primarily as a time saving tool. The best method for using the foot break is turn the spindle ***OFF*** and then apply pressure to the foot brake with your foot, slowing the spindle to a stop.

Stepping on the foot brake while the spindle is ***ON*** will kill the power to the spindle control lever and will bring the spindle to a stop. Stopping the spindle in this manner is harder on the machine and should be reserved for panic situations. Once stopped, the control lever will then need to returned to the neutral position. The power light will show the power is still ON. Only the circuit to the spindle control lever has been interrupted.

Note: Do not confuse this feature with the emergency stop button. The emergency stop button cuts power to the machine and must be reset to restore power to the lathe.

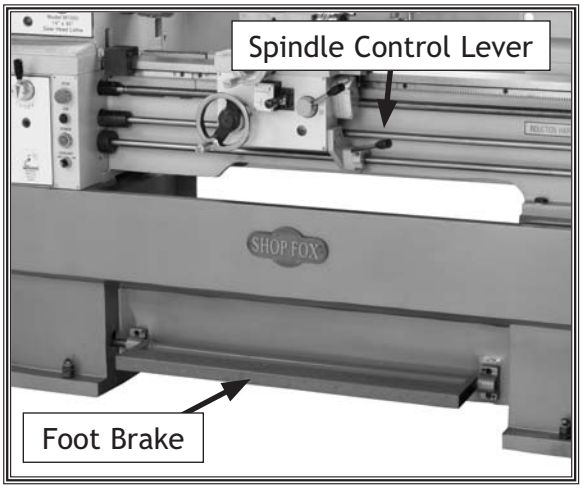


Figure 49. Foot brake and spindle control lever.

Manual Feed

You can manually move the cutting tool around the lathe by three methods. This section will review the individual controls on the carriage and provide descriptions of their uses (see **Figure 50**).

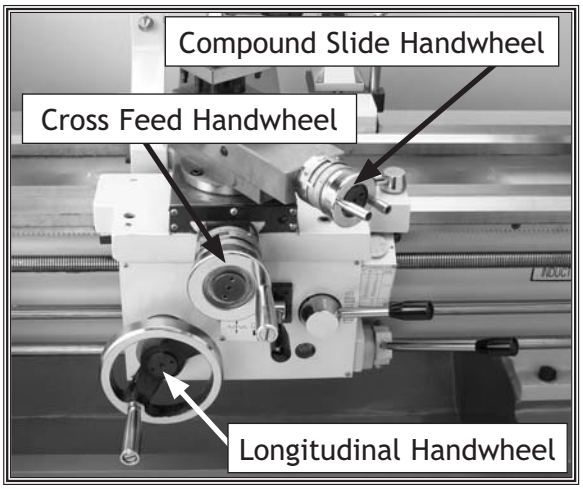


Figure 50. Carriage Controls.

Longitudinal Handwheel

The longitudinal handwheel moves the carriage left or right along the bed. This control is helpful when setting up the machine for turning or when manual movement is desired during turning operations.

Cross Feed Handwheel

The cross slide handwheel moves the top slide toward and away from the work. Turning the dial clockwise moves the slide toward the workpiece. The graduated dial can be adjusted by holding the handwheel with one hand and turning the dial with the other.

Compound Slide Handwheel

The compound slide handwheel controls the position of the cutting tool relative to the workpiece. The compound slide is adjustable for any angle within its range. The graduated dial is adjustable using the same method as the dial on the cross slide. Angle adjustment is controlled by cap screws on the base of the compound slide.

Setting RPM

To determine the needed RPM:

1. Use the table in **Figure 52** to determine the cutting speed required for the material of your workpiece.

⚠WARNING

Failure to follow RPM and feed rate guidelines may threaten operator safety from ejected parts or broken tools.

2. Determine the final diameter, in inches, for the cut you are about to take.

   Note: For this step you will need to average out the diameters or work with the finish diameter for your calculations.

3. Use the following formula to determine the needed RPM for your operation:

   (Cutting Speed x 4)/Diameter of cut = RPM

4. With the calculated RPM, examine the spindle speed chart in **Figure 53** or on front of the headstock, to find the closest match. **Note:** In most cases you will need to make a judgement call on which way to go with the RPM.

5. Make sure the spindle is completely stopped before proceeding.

6. Move the spindle speed selectors to the appropriate RPM setting. Refer to **Figure 53** for available RPM and the selector combinations.

   Note: You may need to rotate the spindle by hand to get the levers to properly engage.

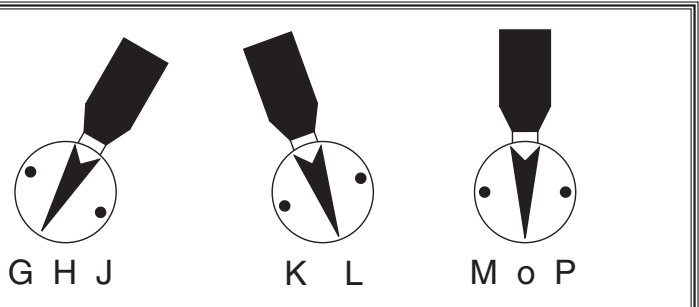


Figure 51. Spindle Speed Selectors.

Cutting Speeds for High Speed Steel (HSS) Cutting Tools	
Workpiece Material	Cutting Speed (sfm)
Aluminum & alloys	300
Brass & Bronze	150
Copper	100
Cast Iron, soft	80
Cast Iron, hard	50
Mild Steel	90
Cast Steel	80
Alloy Steel, hard	40
Tool Steel	50
Stainless Steel	60
Titanium	50
Plastics	300-800
Wood	300-500

Note: For carbide cutting tools, double the cutting speed. These values are a guideline only. Refer to the *MACHINERY'S HANDBOOK* for more detailed information.

Figure 52. Cutting speed table for HSS cutting tools.

SPEEDS	
LEVERS	RPM
JLP	1800
GLP	1280
HLP	910
JLM	650
GLM	460
HLM	325
JKP	230
GKP	160
HKP	115
JKM	85
GKM	60
HKM	40

Figure 53. RPM chart.

Start Up and Spindle Break-in Procedures

It is essential to closely follow the proper break-in procedures to ensure trouble free performance. Complete this process once you have familiarized yourself with all instructions in this manual.

To begin the start up and break-in procedure, do these steps:

1. Check oil levels in headstock and apron. Follow all lubrication procedures highlighted in **Lubrication** in the **MAINTENANCE** section on **Page 39** of this manual.

2. Make sure there are no obstructions around or underneath the spindle.

3. Turn the spindle ON/OFF switch to either the FORWARD or REVERSE position and verify the spindle rotates in the proper direction.

4. Set the spindle speed to the lowest RPM, refer to section **Setting RPM** on **Page 33.**

5. Turn the lathe ***ON*** and let it run for a minimum of 10 minutes.

6. Turn the lathe ***OFF***, change gears to the next highest RPM and repeat this step for each RPM setting.

NOTICE

Failure to follow start up and spindle break-in procedures will likely cause rapid deterioration of spindle and other related parts.

NOTICE

Check all oil levels and lubrication points before starting lathe. Excessive wear will result on moving parts not lubricated!

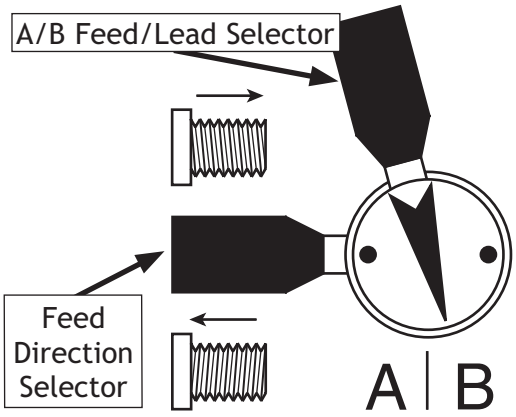


Figure 54. Feed direction and A/B feed/lead selector.

Power Feed

The carriage has longitudinal and cross slide power feed capabilities.

To engage the power feed, do these steps:

1. Move the feed direction lever to the desired setting. The arrow above the screw thread icon indicates the direction of longitudinal feed. Cross feed directions are as follows: when the arrow points to the left, the cross feed is away from the spindle axis; when arrow points to the right, the cross feed is towards the spindle axis (see **Figure 54**).

   Note: These instructions are valid with a counter-clockwise rotation of the spindle. All directions reverse when spindle rotation is reversed.

NOTICE

Feed rate is based on spindle RPM. High feed rates combined with high spindle speeds result in a rapidly moving carriage or cross slide. Pay close attention to the feed rate you have chosen and keep your hand poised over the ON/OFF switch. Failure to fully understand this will cause the carriage to crash into the spindle.

2a. Push the power feed lever shown in **Figure 55** to the left and down to engage the cross feed.

2b. Pull the power feed lever to the right and up to engage the longitudinal feed.

3. Return the lever to the center position to stop the power feed.

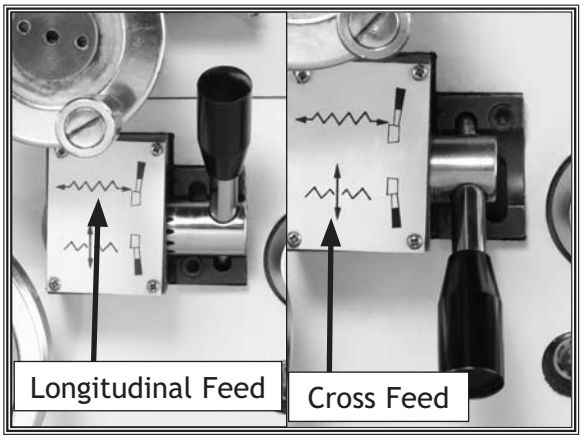


Figure 55. Power feed lever settings.

Setting Feedrate

1. Turn the spindle ***OFF*** and wait until it comes to a complete stop before making any gear changes.

2. Move the feed rod lock knob to the open position (see **Figure 56**). This will disengage the feed rod so gears can be changed.

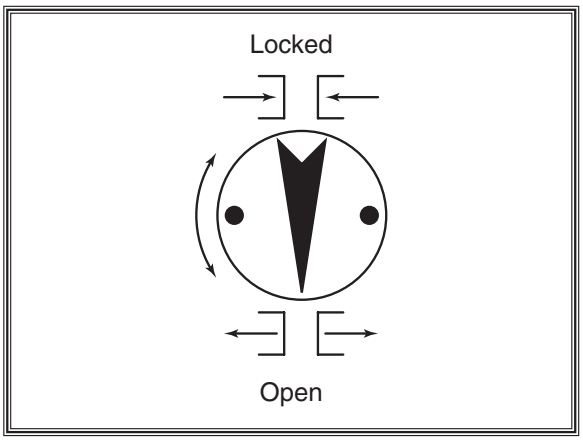


Figure 56. Feed rod lock knob.

3. Examine the feed/thread chart (**Figure 57**) to determine the correct lever combination for the desired feedrate.

4. Feeds rates are controlled by the combination of three different switches. The A/B feed/lead selector in **Figure 58,** the 1-8 feed rod selector, and the C,D E,F feed/lead selector combinations in **Figure 58.**

5. For example: To set the lathe to the slowest feed rate of 0.0011" per inch, locate 0.0011 on the chart. The lever combination on the chart is B, F and 8. Set the appropriate levers to these positions.

Note: You may need to rotate the chuck by hand or move the longitudinal handwheel to get selectors and gears to engage.

6. Return the feed rod lock knob to the locked position to engage the feed rod.

NOTICE

Make sure all power feed settings are disengaged before starting the lathe! Thoroughly familiarize yourself with all the controls and their functions before using power feed!

mm	127 40 120 32	127 40 120 40	127 30 120 40

	1	3	6	3	1	2	3
AC	7.5	6.0	5.0	4.8	4.5	4.0	
BC	3.75	3.0	2.5	2.4	2.25	2.0	1.8
AE		1.5	1.25	1.2		1.0	0.9
BE		0.75		0.6		0.5	0.45

TPI / in/rev			1	2	3	4	5	6	7	8
127 40 40	A	C	4	4 1/2	5	5 1/2	5 3/4	6	6 1/2	7
		D	.0271	.0241	.0217	.0197	.0189	.0181	.0167	.0155
127 25 50	A	C	8	9	10	11	11 1/2	12	13	14
		D	.0136	.0121	.0109	.0099	.0095	.0091	.0084	.0078
	B	C	16	18	20	22	23	24	26	28
		D	.0068	.0060	.0054	.0049	.0047	.0045	.0042	.0039
	A	E	32	36	40	44	46	48	52	56
		F	.0040	.0035	.0032	.0029	.0028	.0027	.0025	.0023
	B	E	64	72	80	88	92	96	104	112
		F	.0020	.0018	.0016	.0015	.0014	.0013	.0012	.0011

Figure 57. Feed and Thread Chart in IPR, TPI and metric pitch.

Thread Settings

The Model M1020 lathe is capable of cutting inch and metric threads. Most inch threads can be cut without changing out gears. Metric threads and a few inch threads require that you change the gears. This will be explained in the next sub-section. Below are instructions for setting levers and changing gears for threading.

To determine thread settings, do these steps:

1. Determine the threads per inch (TPI) for inch threads or pitch for metric threads.

2. Examine the appropriate thread chart. For inch threads and metric threads (see **Figure 57**) or examine chart on the front of the headstock (see **Figure 59**).

3. Find the corresponding thread info from the chart and work to the left and up to determine the correct lever settings.

   Example: To cut 20 TPI thread, the handle combination would be "B, C and 3".

4. Move the feed rod lock knob to the open position (see **Figure 56**).

5. Move the selectors to the appropriate letter/number setting by rotating the handle left or right.

6. Move the feed direction selector to the desired direction for movement (see **Figure 54**).

7. Move the feed rod lock knob to the locked position.

   Note: The spindle must be ***OFF*** to make changes that affect the gear box. You may also need to rotate the spindle by hand or move the apron right/left to get gears to engage properly.

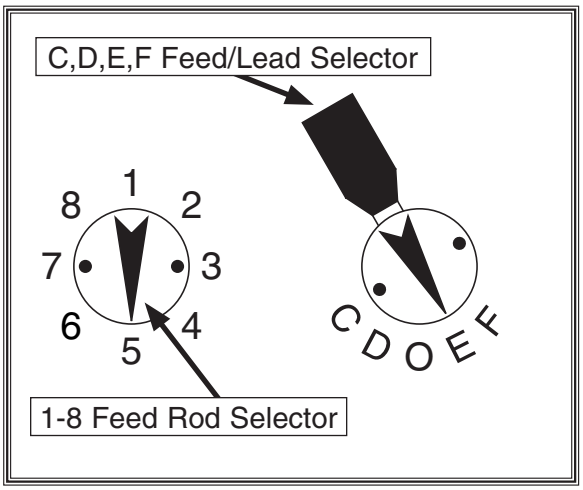


Figure 58. Feed rod/lead screw selector

Figure 59. Metric thread chart.

Changing Gears for Feed/ Threads

The Model M1020 lathe comes with the 25T, 127T, & 50T gears installed. This set of gears will cover most feeds and inch threads. The 30T, 32T, and two 40T gears are provided so that additional feeds and inch/metric threads may be cut.

To change the gears, do these steps:

1. **Disconnect the machine from the power source.**

2. Open the end cover door to expose the headstock gears.

3. Loosen the hex nut on the pivot just below the large gear in **Figure 60, Item A**.

4. Drop the large gear set out of its mesh and temporarily lock in place by tightening the hex nut loosened in **Step 3.**

5. Remove the cap screw in **Figure 60, Item B** or **C**, depending on which gear is to be changed.

   Note: To loosen the cap screw, it may be necessary to wedge a small piece of wood between the two gears to keep them from spinning.

6. Install the new gear(s) and tighten in place with the cap screw removed in **Step 5.** DO NOT overtighten. These cap screws merely hold the gear in place. Overtightening will make them harder to remove later.

7. Loosen the hex nut in **Figure 60, Item A**, and move the gear set up until the larger gears mesh with the smaller gears. Tighten the nut to hold the large gear set in place. Make sure there is a gap of 0.001"-0.002" between gears.

   Note: Setting the gears too tight will cause excessive wear and noise. Setting the gears too loose may cause slippage and possibly break gear teeth.

8. Close the end cover door and reconnect power to the machine.

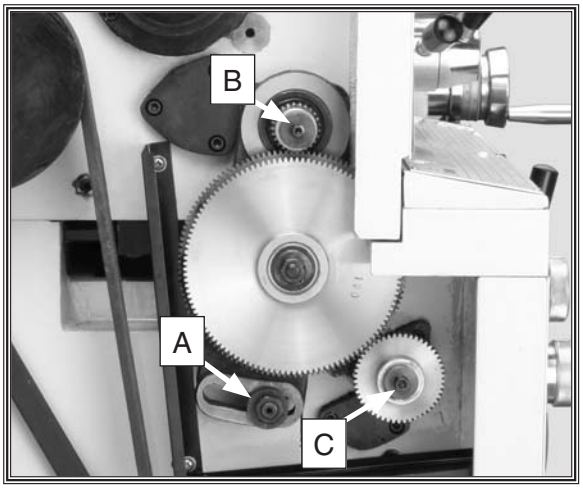


Figure 60. Gear change locations.

Threading Operation

1. Set the compound rest to the appropriate angle for the given thread you want to cut. For a Unified National Series thread, this is 29° off of vertical to spindle axis.

2. Set the tool tip perpendicular to the workpiece and center it vertically.

3. Make sure the thread dial is engaged with the lead screw. If not, use a hex key wrench to loosen the screw and rotate the thread dial until the gear engages with the lead screw, then tighten the screw to hold the dial in place.

4. Select the RPM you want to use. A slower RPM will give you more time to react especially if threading over a short distance or threading up to a shoulder.

5. Set the feed direction lever for either right or left-handed threads.

6. Examine the thread charts (inch or metric), see **Figure 62**, and then set the feed rate selectors to the appropriate settings.

7. Turn ***ON*** the spindle to verify settings. Check to see that the lead screw is turning and verify that the apron moves in the correct direction by engaging the half nut lever shown in **Figure 61**.

8. Once you are confident the settings are correct, disengage the half nut and turn ***OFF*** the spindle.

9. Examine the thread dial chart to determine which numbers (on the thread dial) will engage the half nut.

   Note: There are a total of eight marks on the thread dial, including the numbers 1-4. Any mark can be used to cut even numbered threads. Use the numbered lines, 1, 2, 3, or 4 to cut odd numbered threads. To maintain accuracy and consistency, engage the half nut on the same mark on each pass. Failure to start on the same number each time may lead to cutting off the thread made in the previous pass.

10. If cutting metric threads, you will not use the thread dial. Once the half nut is engaged, you must leave it engaged until the threads are complete.

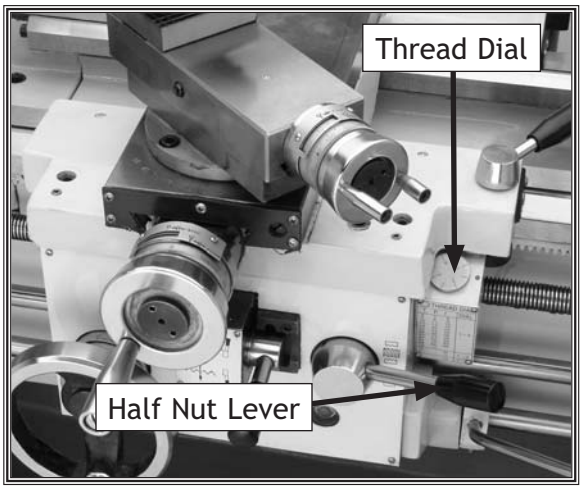


Figure 61. Halfnut and thread dial locations.

THREAD DIAL			
T.P.I.			DIAL
4	5	6	1-4
7	8	9	
10	11	12	
13	14	16	
18	20	22	
23	24	26	
28	32	36	
40	44	46	
48	52	56	
64	72	80	
88	92	96	
104	112		
	4-1/2	5-1/2	1 or 3
	6-1/2	1-11/2	
		5-3/4	1

Figure 62. Thread dial chart.

NOTICE

Failure to follow RPM and feed rate guidelines in this manual will put undue strain on moving parts, shorten tool life, and create poor workpiece results.

MAINTENANCE

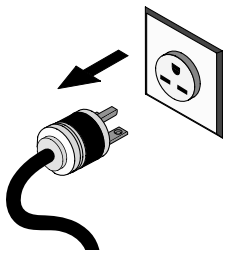
General

Regular periodic maintenance on your **SHOP FOX®** Model M1020 will ensure its optimum performance. Make a habit of inspecting your machine each time you use it.

Check for the following conditions and repair or replace when necessary:

- Loose mounting bolts.
- Worn switch or safety features.
- Worn or damaged cords and plugs.
- Damaged V-belt.
- Any other condition that could hamper the safe operation of this machine.

WARNING



MAKE SURE that your machine is unplugged during all maintenance procedures! If this warning is ignored, serious personal injury may occur.

Cleaning

Make sure to unplug the lathe before cleaning it. Clean your machine every day or more often as needed. Remove chips as they accumulate. Chips left on the machine soaked with water based coolant will eventually invite oxidation and gummy residue to build up around moving parts. Cleaning will help keep your lathe running smoothly. Always be safe and responsible with the use and disposal of cleaning products.

Lubrication

The headstock, gear box and apron uses 20W non-detergent gear oil or an equivalent lubricant. The oil level should be kept at the indicator mark in the sight glasses, as shown in **Figures 63 & 65** After three months of operation, drain the oil completely and refill. (It will be necessary to remove the L bracket to access the gear box drain shown in **Figure 64**). After that, change the headstock oil on an annual basis or more frequently if heavier machine use requires it.

For other lubrication, we recommend you use the manual oiler (oil can supplied with the lathe) filled with ISO 68 or SAE 20W non-detergent oil or similar lubricant.

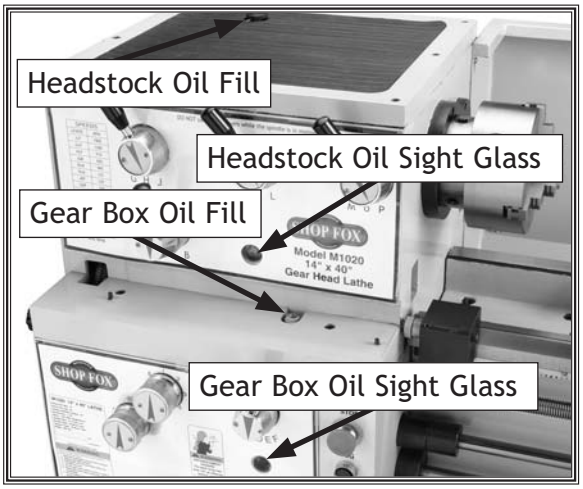


Figure 63. Oil sights and filler locations.

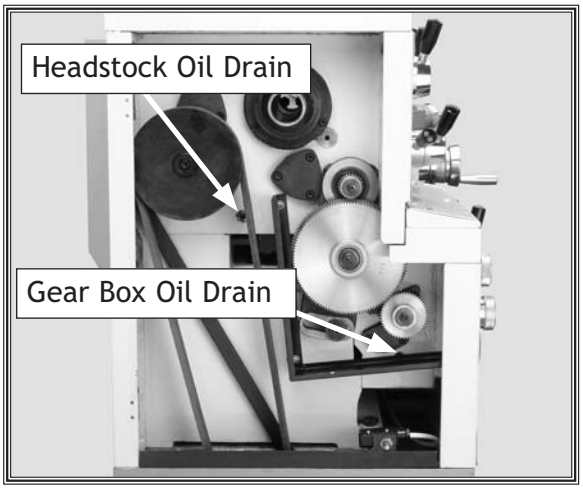


Figure 64. Headstock and gear box drain locations.

Ball fittings, shown in **Figure 66**, are responsible for the majority of the machine lubrication. To lubricate ball fittings, clean the outside of the ball fitting, depress the ball with the tip of the oil can nozzle and squirt a little oil inside the fitting.

To lubricate the following areas every day, do these steps:

1. Wipe off the oil port before and after oiling to keep out contaminants.

2. Oil the areas daily shown by arrows in **Figure 66**, with one to two shots of SAE 20W non-detergent oil or equivalent. Some areas may require fewer or more shots depending on use. These areas include:

   - Cross Slide
   - Compound Rest
   - Carriage
   - Tailstock
   - Lead Screw and Feed Rod
   - Cross Feed Handwheel

Coolant System

The coolant pump and reservoir are located in the base under the cover on the right hand side of the base.

To perform regular maintenance on the coolant system, do these steps:

1. Remove the access cover.

2. Empty the old coolant and remove large chips from 1st and 2nd stage separators. Clean out any remaining debris.

3. Fill the reservoir with approximately three gallons of coolant solution. Closely follow the coolant manufacturer's instructions for mixing.

4. Open the valve on the coolant nozzle.

5. Turn the coolant pump ***ON*** to prime the coolant system and to see if the coolant is cycling properly.

6. Replace the access cover.

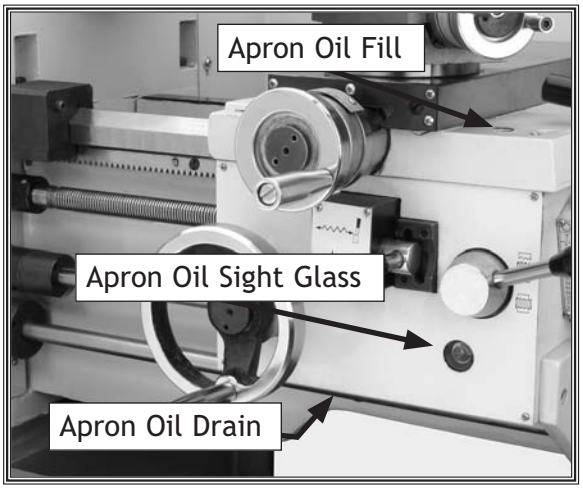


Figure 65. Apron lubrication references.

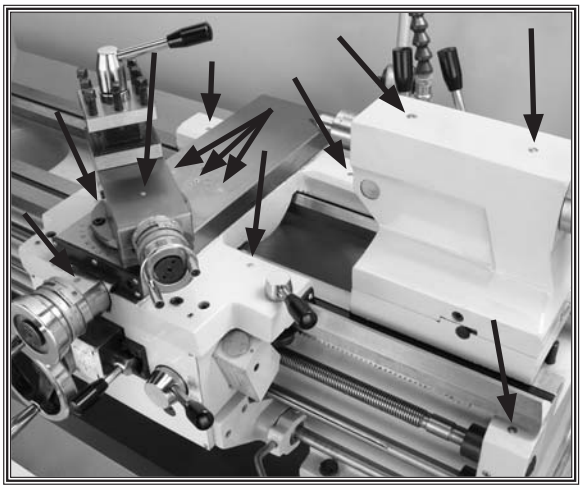


Figure 66. Ball fitting locations.

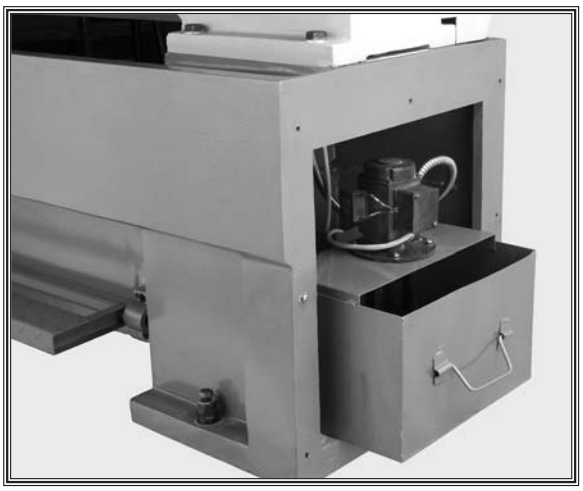


Figure 67. Coolant pump and reservoir.

NOTICE

Failure to follow lubrication guidelines will lead to rapid deterioration of lathe components.

Maintenance Schedule

Every 6-8 Hours of Running Time:

- Lubricate all ball fittings.
- Clean and wipe down lathe.

Every Week:

- Check coolant level and condition replenish or replace when needed.

Every Year:

- Replace headstock, gear box, and apron gear oil.
- Inspect V-Belt and replace if needed.

Maintenance Notes

DATE	MAINTENANCE PERFORMED

SERVICE

General

This section covers the most common service adjustments or procedures that may need to be made during the life of your machine.

If you require additional machine service not included in this section, please contact Woodstock International Technical Support at (360) 734-3482 or send e-mail to: **tech-support@shopfox.biz**.

Cross Feed Backlash

Backlash is the amount of play found in a lead screw. It can be found by turning the cross slide handwheel in one direction, and then turning the handwheel the other direction. When the cross slide begins to move, the backlash has been taken up.

To remove excessive backlash, do these steps:

1. Tighten the socket head cap screw in small increments (see **Figure 68**).

2. Test after each adjustment until the backlash meets the needs of the operator and operation.

   Note: Avoid the temptation to overtighten the socket head cap screw. Overtightening will cause excessive wear to the sliding block and lead screw.

Gibs

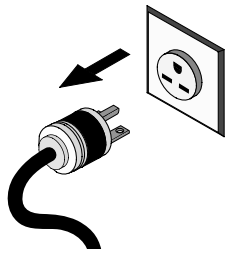
The saddle, cross feed, compound rest, and tailstock gibs can all be adjusted on the Model M1020 lathe.

Note: When adjusting gibs, keep in mind that the goal of gib adjustment is to remove 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, lead screw, and nut.

To adjust the saddle gib, do these steps:

1. Loosen four hex nuts found at the bottom rear of the cross slide and back off one full turn each (see **Figure 69**).

⚠WARNING



MAKE SURE that your machine is unplugged during all service procedures! If this warning is ignored, serious personal injury may occur.

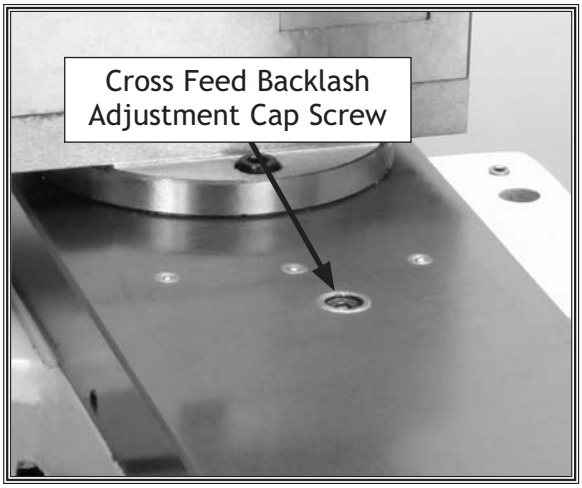


Figure 68. Cross feed backlash adjustment socket head cap screw.

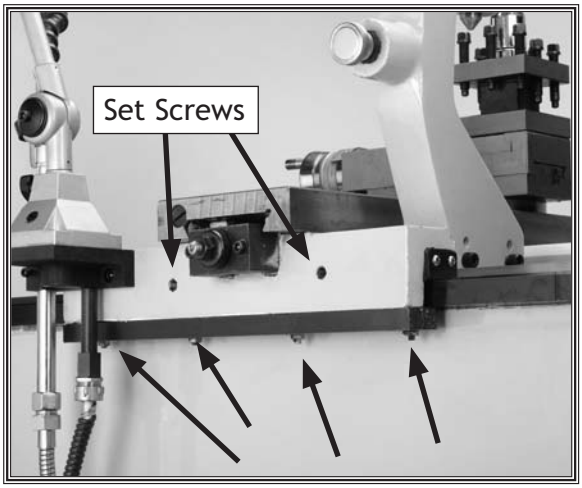


Figure 69. Saddle gib adjustments.

SERVICE

2. Turn the two set screws with a hex wrench until a slight resistance is felt. DO NOT overtighten.

3. Move the carriage with the handwheel to feel the current drag. Adjust set screws until the desired drag is achieved.

   Note: Overtightening will cause excessive premature wear on the gibs.

4. Tighten the four hex nuts.

To adjust the cross feed gib, do these steps:

1. Loosen the rear gib screw approximately one turn. (see **Figure 70**).

2. Tighten the front gib screw a quarter turn (see **Figure 71**).

3. Turn the cross feed handwheel to feel the current drag and adjust the front screw until the desired drag is achieved.

To adjust the compound rest gib, do these steps:

1. Loosen the rear gib screw approximately one turn.

2. Tighten the front gib screw a quarter turn.

3. Turn the cross feed handwheel to feel the current drag and adjust the front screw until the desired drag is achieved.

To adjust the tailstock lock, do these steps:

1. Move the tailstock lock handle to the unlocked position.

2. Slide the tailstock to an area that will allow access to the hex nut under the tailstock block.

3. Tighten the tailstock hex nut 1/4 turn. Test to see that sufficient clamping pressure is applied so the tailstock will not move. Repeat as necessary (see **Figure 72**).

To adjust the tailstock gib, do this step:

1. Take up play in the tailstock by tightening the two gib screws (**Figure 72**) on either side of the tailstock base.

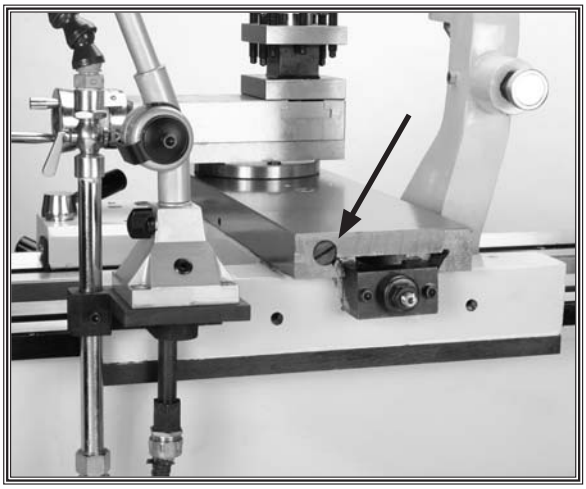


Figure 70. Rear cross feed gib screw.

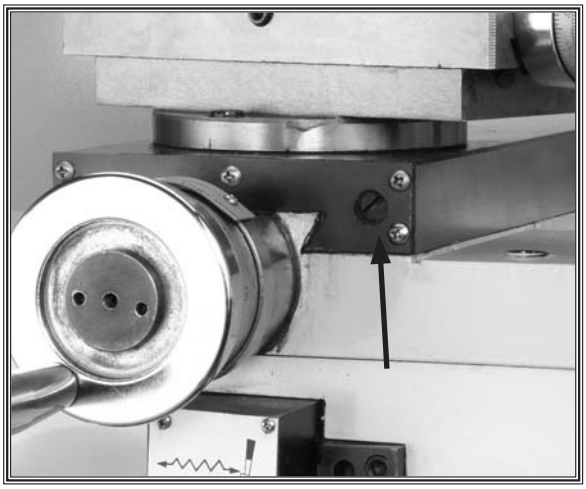


Figure 71. Front cross feed gib screw.

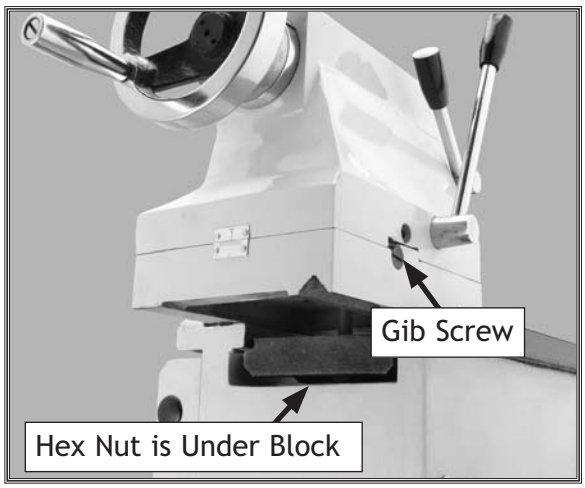


Figure 72. Tailstock nut and gib adjustment.

Replacing V-Belt

To replace the V-belts on the lathe, do these steps:

1. **Disconnect the power to the lathe.**

2. Open the end cover door on the headstock and the lower cover at the headstock end of the lathe.

3. Remove the tension off the old V-belts by loosening the motor mount hex nut (see **Figure 73**).

4. Remove the old belts and install the new ones. Always replace these belts in pairs.

5. Tighten the motor mount hex nut until 8 lbs. of force applied to the belts causes approximately 3/4" of deflection.

6. Close end cover door and install lower cover. Then reconnect the machine to its power source.

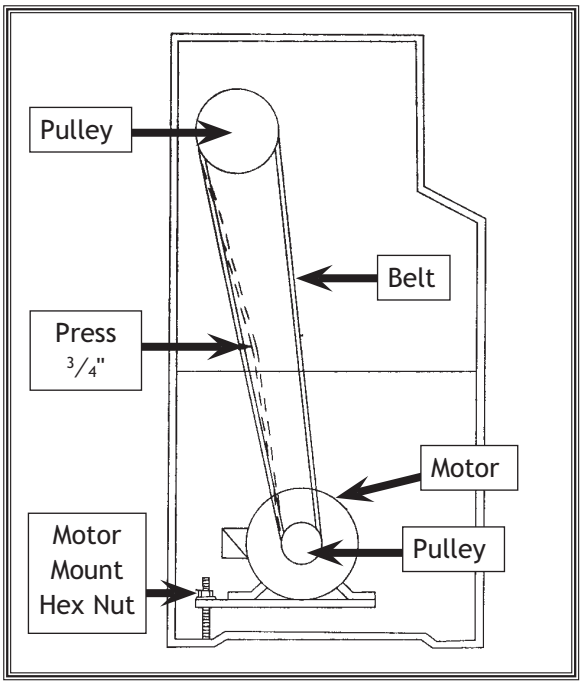


Figure 73. V-belt adjustments.

Electrical Parts and Wiring Diagram

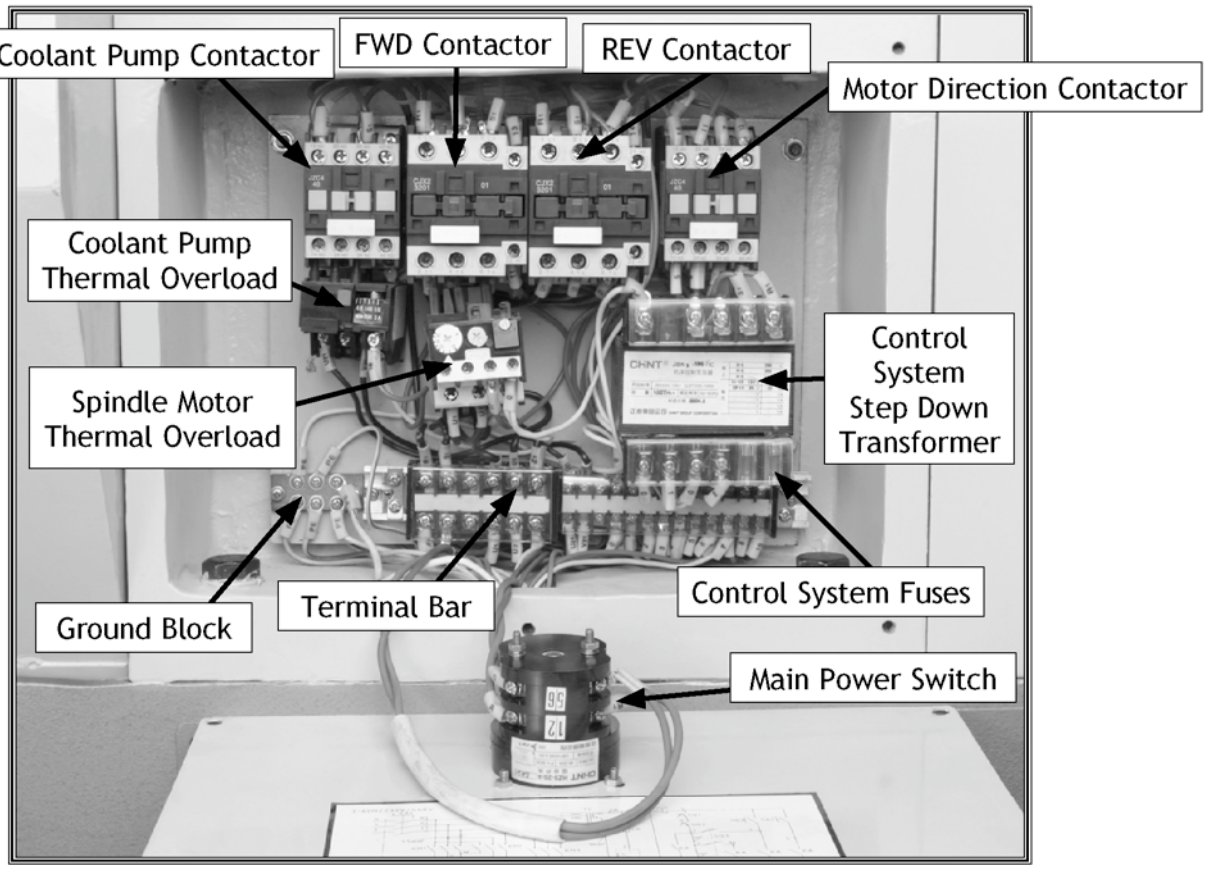


Figure 74. M1020 Electrical panel.

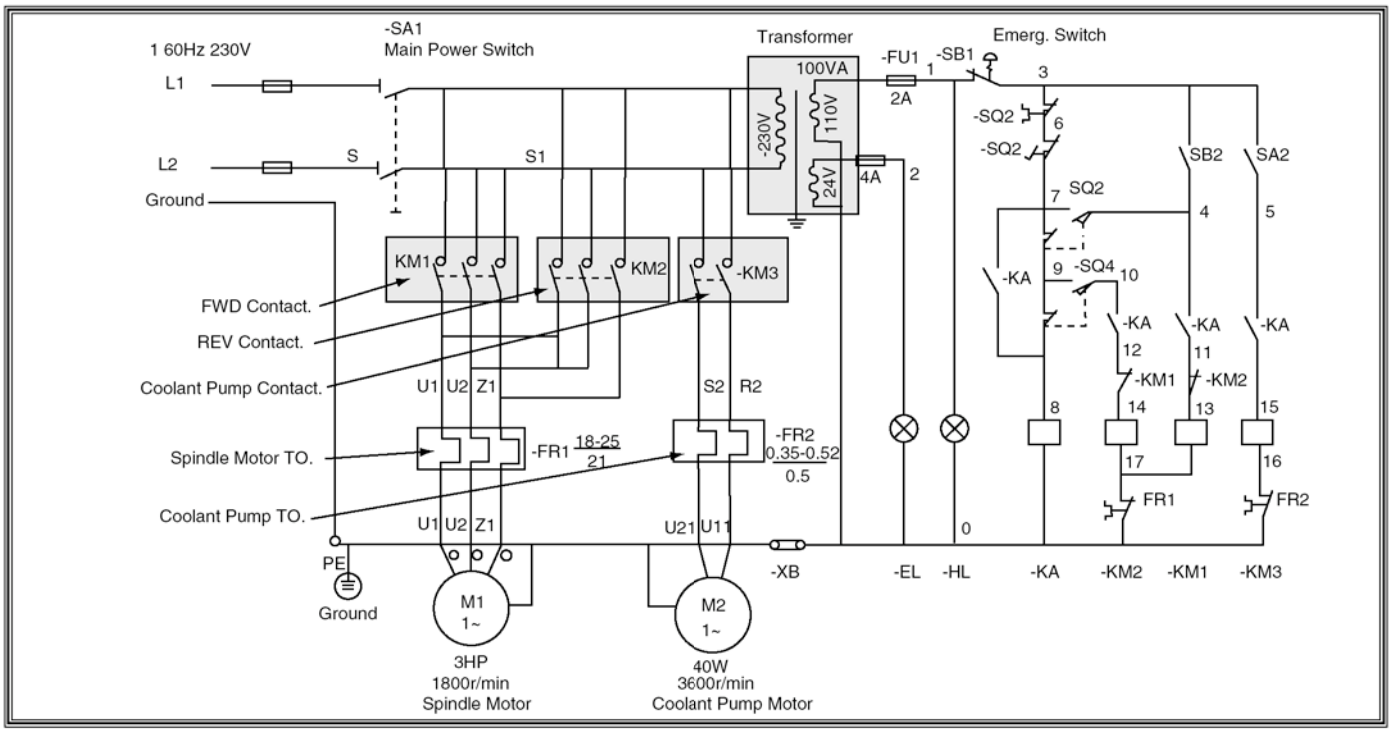


Figure 75. M1020 Electrical schematic.

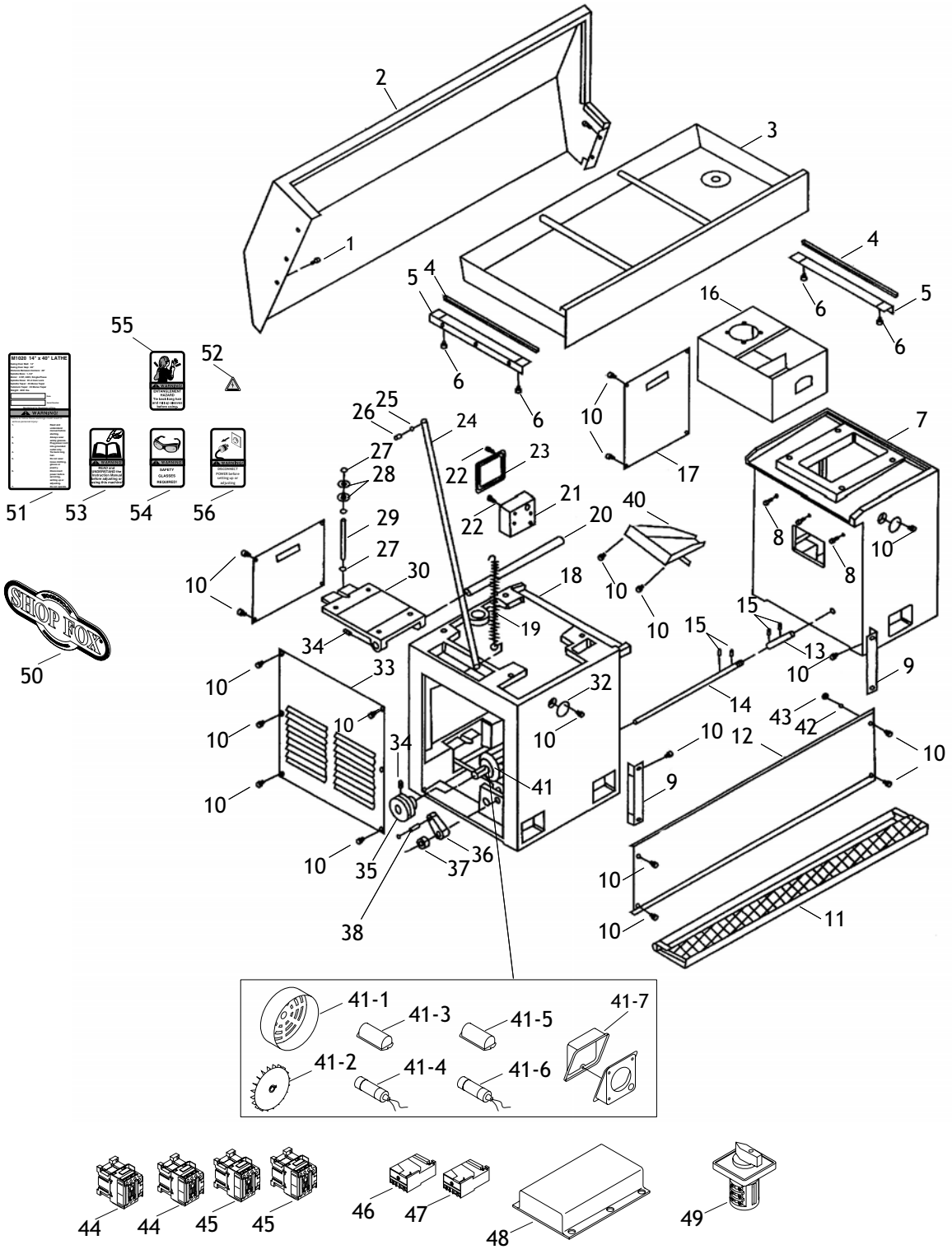
Troubleshooting

This section covers the most common Gear Head Lathe problems. DO NOT make any adjustments until the Gear Head Lathe is unplugged and moving parts have come to a complete stop.

SYMPTOM	POSSIBLE CAUSE	CORRECTIVE ACTION
Motor will not start.	1. Low voltage. 2. Open circuit in motor or loose connections. 3. Faulty start capacitor.	1. Check power supply for proper voltage. 2. Inspect all lead connections on motor and magnetic switch for loose or open connections. 3. Replace start capacitor.
Fuses or circuit breakers trip open.	1. Short circuit in line cord or plug. 2. Short circuit in motor or loose connections. 3. Incorrect fuses or circuit breakers in power supply.	1. Inspect cord or plug for damaged insulation and shorted wires and replace extension cord. 2. Inspect all connections on motor for loose or shorted terminals or worn insulation. 3. Install correct fuses or circuit breakers.
Motor overheats.	1. Motor overloaded. 2. Air circulation through the motor restricted.	1. Reduce load on motor. 2. Clean out motor to provide normal air circulation.
Carriage hard to move.	1. Carriage lock is tightened down. 2. Chips have loaded up on bedways. 3. Bedways are dry and in need of lubrication. 4. Longitudinal stops are interfering. 5. Gibs are too tight.	1. Check to make sure table locks are fully released. 2. Frequently clean away chips that load up during turning operations. 3. Lubricate bedways and handles. 4. Check to make sure that stops are floating and not hitting the center stop. 5. Loosen gib screw(s) slightly.
Loud, repetitious noise coming from machine.	1. Chuck is hitting the carriage or tool post.	1. Shut lathe *OFF!* Hit emergency stop button or step on foot pedal.
Machine is loud when cutting. Overheats or bogs down in the cut.	1. Excessive depth of cut. 2. RPM or Feed Rate wrong for operation. 3. Dull cutters.	1. Decrease depth of cut. 2. Refer to RPM Feed rate chart for appropriate rates. 3. Sharpen or replace cutters.
Tailstock quill will not feed out of tailstock.	1. Quill lock is tightened down.	1. Unlock.
Bad surface finish.	1. Wrong RPM or feed rate. 2. Dull tooling or poor tool selection. 3. Too much play in gibs.	1. Adjust for appropriate RPM and feed rate. 2. Sharpen tooling or select a better tool for the intended operation. 3. Tighten gibs.
Gear change levers will not shift into position.	1. Gears not aligned in headstock.	1. Rotate spindle by hand until gear falls into place.
Can't remove tapered tool from quill.	1. Quill had not retracted all the way back into the tailstock. 2. Debris was not removed from taper before inserting into quill.	1. Turn the quill handwheel until it forces taper out of quill. 2. Always make sure that taper surfaces are clean.

PARTS

Base Assembly

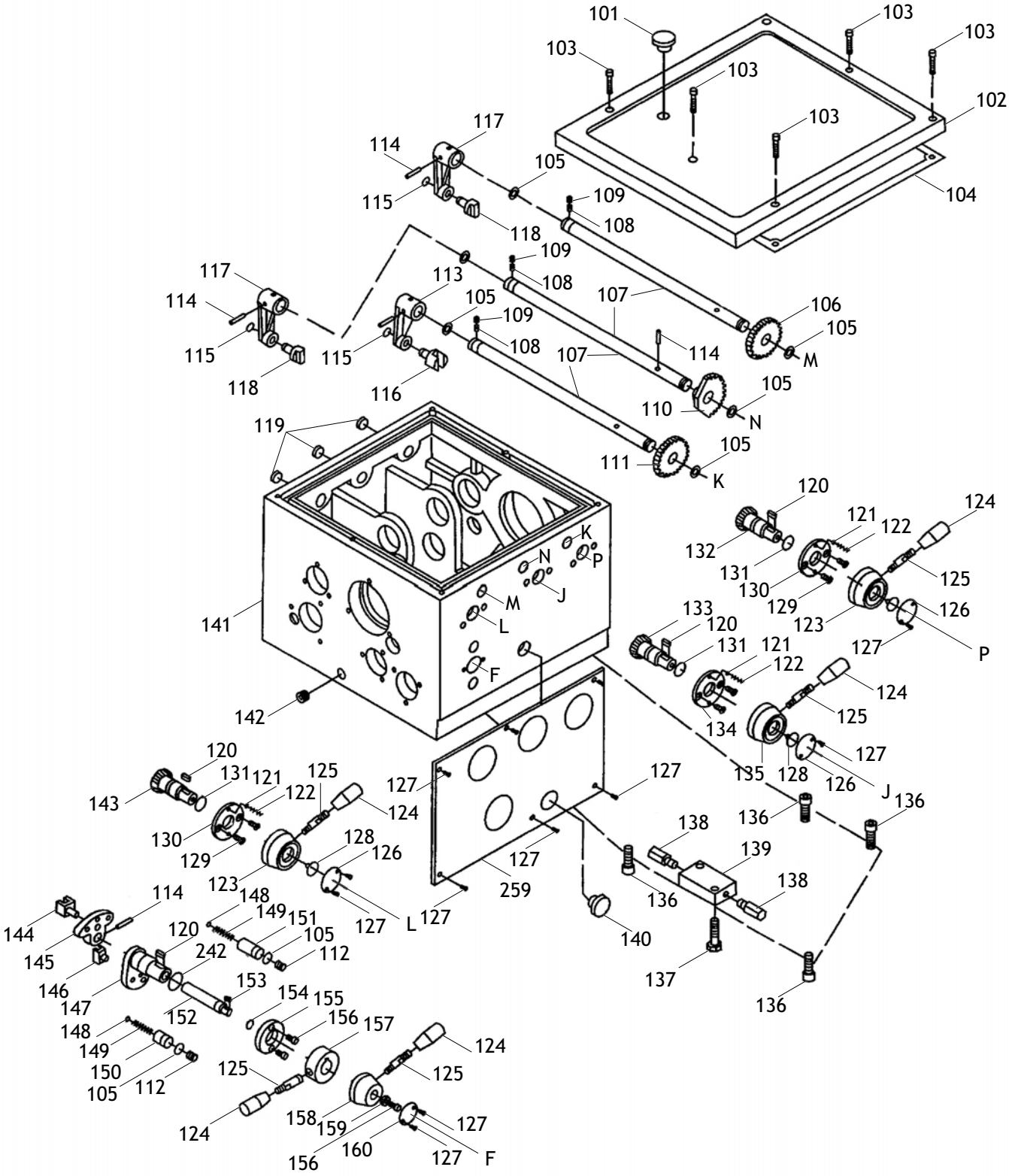


Base Parts List

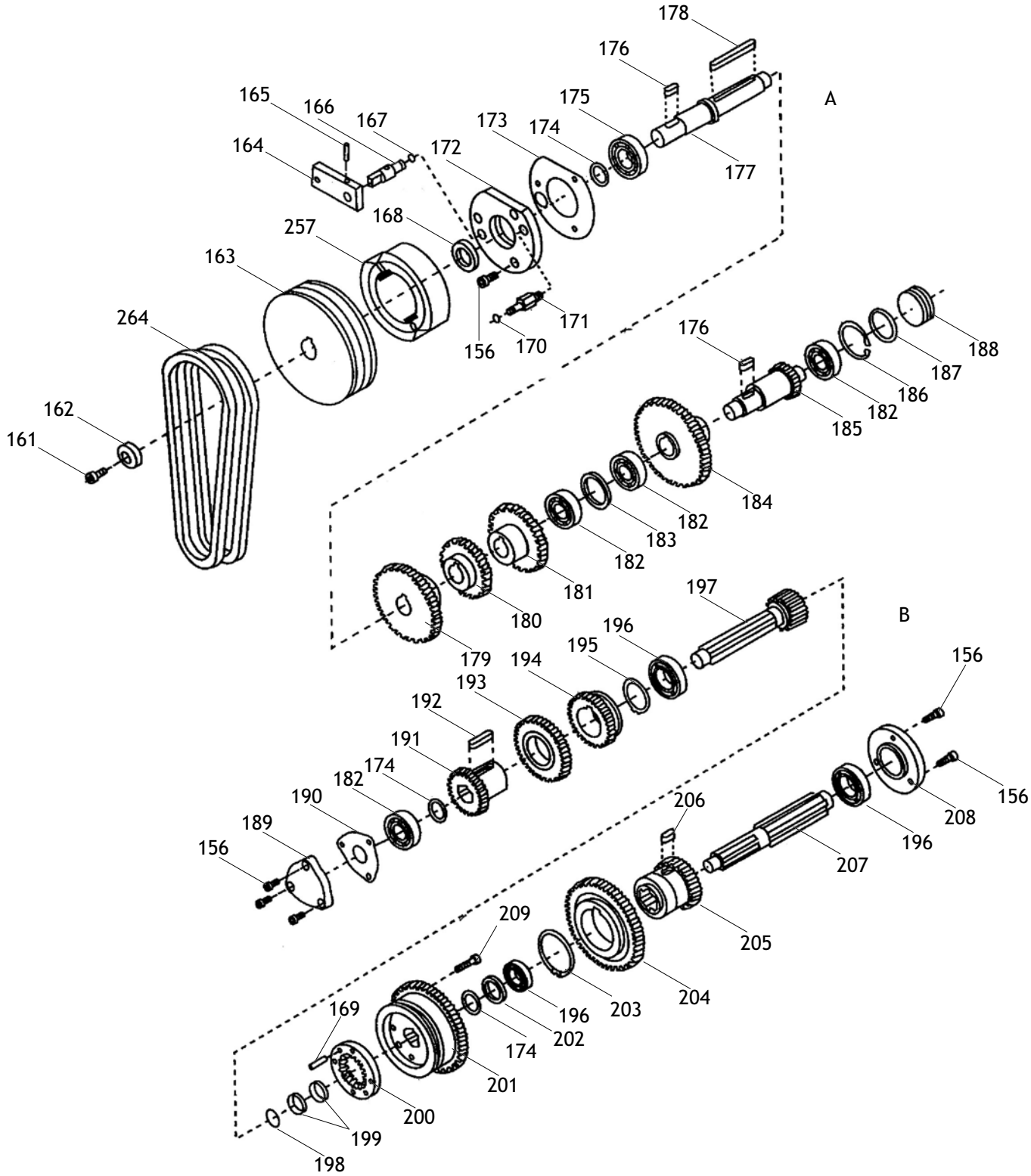
REF	PART #	DESCRIPTION
1	XPS68M	PHLP HD SCR M6-1 X 10
2	XM1020002	SPLASH GUARD
3	XM1020003	CHIP TRAY
4	XM1020004	GUIDE
5	XM1020005	BRACKET
6	XPS68M	PHLP HD SCR M6-1 X 10
7	XM1020007	PEDESTAL (RIGHT)
8	XPSB04M	CAP SCREW M6-1 X 10
9	XM1020009	BRACKET
10	XPS68M	PHLP HD SCR M6-1 X 10
11	XM1020011	BRAKE PEDAL
12	XM1020012	FRONT PLATE
13	XM1020013	SHAFT
14	XM1020014	SHAFT
15	XPRP24M	ROLL PIN 5 X 16
16	XM1020016	COOLANT TANK
17	XM1020017	COVER
18	XM1020018	PEDESTAL (LEFT)
19	XM1020019	SPRING
20	XM1020020	SHAFT
21	XM1020021	SWITCH BOX
22	XPS68M	PHLP HD SCR M6-1 X 10
23	XM1020023	SWITCH BOX COVER
24	XM1020024	CONNECTOR BAR
25	XPR04M	EXT RETAINING RING 6MM
26	XM1020026	PIN
27	XPN09M	HEX NUT M12-1.75
28	XPW06M	FLAT WASHER 12MM
29	XM1020029	THREADED ROD 12MM
30	XM1020030	MOTOR MOUNTING BRACKET
32	XM1020032	COVER

REF	PART #	DESCRIPTION
33	XM1020033	COVER
34	XPSS20M	SET SCREW M8-1.25 X 8
35	XM1020035	PULLEY
36	XM1020036	LINK
37	XM1020037	LINK NUT
38	XM1020038	SHAFT PIN
40	XM1020040	TRAY
41	XM1020041	MOTOR 3HP 14A 220V
41-1	XM1020041-1	FAN COVER
41-2	XM1020041-2	FAN
41-3	XM1020041-3	CAPACITOR COVER
41-4	XM1020041-4	CAPACITOR 30MFD 400VAC
41-5	XM1020041-5	CAPACITOR COVER
41-6	XPC150A	CAPACITOR 150MFD 250VAC
41-7	XM1020041-6	WIRING BOX
42	XPW03M	FLAT WASHER 6MM
43	XPN01M	HEX NUT M6-1
44	XM1020044	CONTACTOR JZC440
45	XM1020045	CONTACTOR CJX23201
46	XM1020046	OVERLOAD RELAY 0.35-0.52
47	XM1020047	OVERLOAD RELAY 18-25
48	XM1020048	TRANSFORMER
49	XM1020049	MAIN POWER SWITCH
50	XM1020050	SHOP FOX LOGO PLATE
51	XM1020051	MACHINE ID LABEL
52	XLABEL04	LABEL, ELECTRICITY
53	XLABEL08	LABEL, READ MANUAL
54	XLABEL01	LABEL, SAFETY GLASSES
55	XLABEL09	LABEL, LOOSE CLOTHING
56	XLABEL02	LABEL, UNPLUG POWER

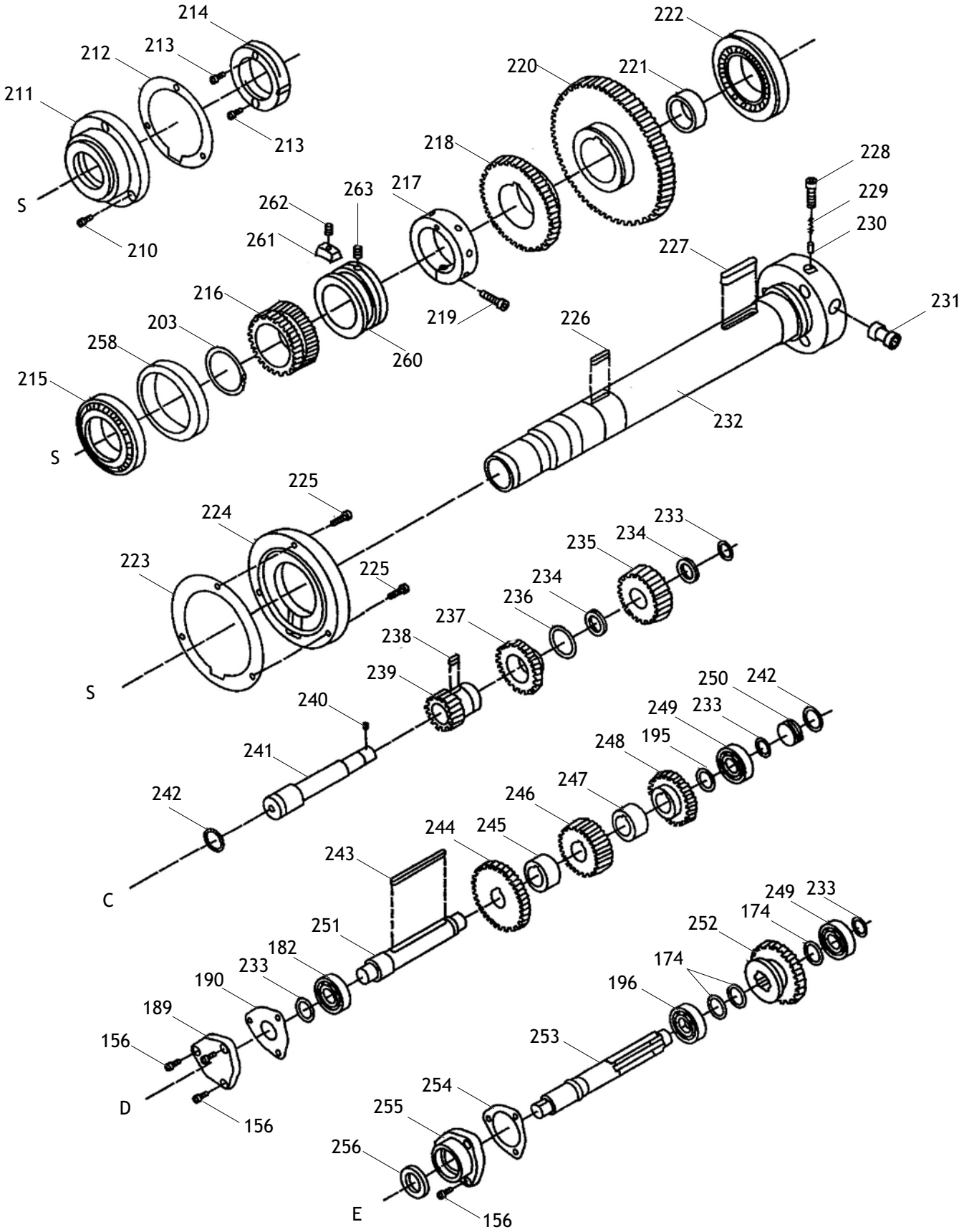
Headstock Assembly



Headstock Assembly



Headstock Assembly



Headstock Parts List

REF	PART #	DESCRIPTION
101	XM10200101	PLUG
102	XM10200102	HEADSTOCK COVER
103	XPSB48M	CAP SCREW M6-1 X 35
104	XM10200104	GASKET
105	XM10200105	O-RING 14 X 2.65
106	XM10200106	GEAR 38T
107	XM10200107	SHAFT
108	XPSS01M	SET SCREW M6-1 X 10
109	XPSS02M	SET SCREW M6-1 X 6
110	XM10200110	GEAR 48T
111	XM10200111	GEAR 43T
112	XPSS15M	SET SCREW M12-1.75 X 12
113	XM10200113	SHIFT ARM
114	XPRP05M	ROLL PIN 5 X 30
115	XPR03M	EXT RETAINING RING 12MM
116	XM10200116	SHIFT FORK
117	XM10200117	SHIFT ARM
118	XM10200118	GEAR SHIFTER
119	XM10200119	PLUG
120	XPK08M	KEY 5 X 5 X 16
121	XM10200121	STEEL BALL
122	XM10200122	SPRING
123	XM10200123	HANDLE BODY
124	XM10200124	HANDLE CAP
125	XM10200125	HANDLE LEVER
126	XM10200126	LEVER NAME PLATE
127	XPS12M	PHLP HD SCR M3-.5 X 6
128	XPW03M	FLAT WASHER 6MM
129	XPSB26M	CAP SCREW M6-1 X 12
130	XM10200130	POSITION PLATE
131	XM10200131	O-RING 19 X 2.65
132	XM10200132	GEAR SHAFT 22T
133	XM10200133	GEAR SHAFT 17T
134	XM10200134	POSITION PLATE
135	XM10200135	HANDLE BODY
136	XPSB111M	CAP SCREW M12-1.75 X 35
137	XM10200137	ALIGNMENT BOLT M10 X 40
138	XM10200138	ALIGNMENT BOLT
139	XM10200139	ALIGNMENT BLOCK
140	XM10200140	OIL SIGHT GLASS 20
141	XM10200141	HEADSTOCK CASTING
142	XM10200142	DRAIN PLUG
143	XM10200143	GEAR SHAFT 27T
144	XM10200144	SHAFT FORK
145	XM10200145	SHIFTING CRANK
146	XM10200146	SHAFT FORK
147	XM10200147	SHIFTING CRANK
148	XM10200148	STEEL BALL
149	XM10200149	SPRING
150	XM10200150	SHAFT

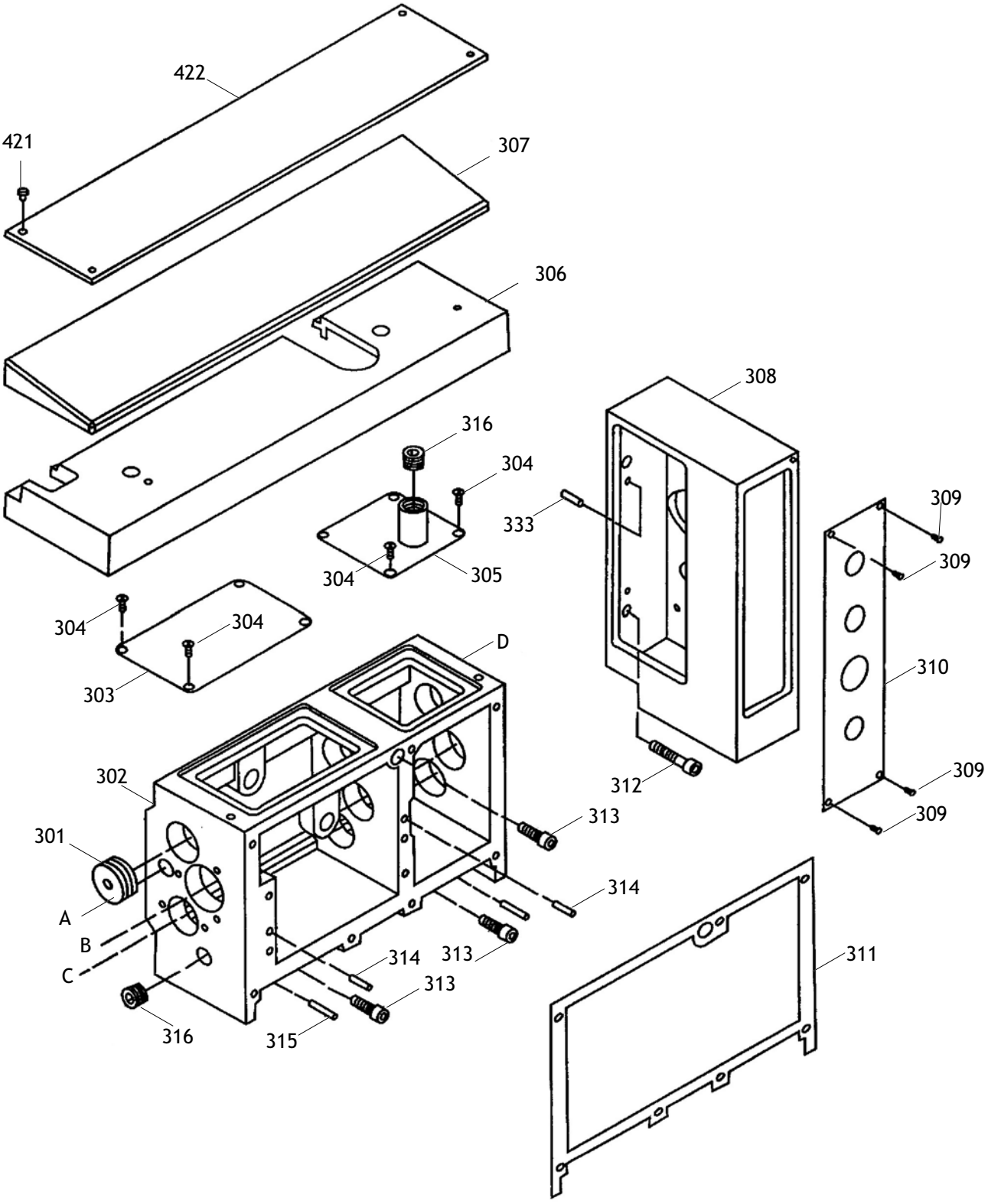
REF	PART #	DESCRIPTION
151	XM10200151	SHAFT
152	XM10200152	SHAFT
153	XPK05M	KEY 4 X 4 X 10
154	XM10200154	O-RING 10.6 X 2.65
155	XM10200155	COLLAR
156	XPSB26M	CAP SCREW M6-1 X 12
157	XM10200157	COLLAR
158	XM10200158	HANDLE BODY
159	XPW03M	FLAT WASHER 6MM
160	XM10200160	INDICATOR DISK
161	XPSB14M	CAP SCREW M8-1.25 X 20
162	XPW01M	FLAT WASHER 8MM
163	XM10200163	PULLEY
164	XM10200164	BREAK BLOCK
165	XPRP24M	ROLL PIN 5 X 16
166	XM10200166	BRAKE ACTUATOR SHAFT
167	XPR03M	EXT RETAINING RING 12MM
168	XM10200168	SPACER SD25 X 45 X 7
169	XPRP46M	ROLL PIN 6 X 28
170	XPR39M	EXT RETAINING RING 8MM
171	XM10200171	BRAKE RETAINING STUD
172	XM10200172	COVER
173	XM10200173	GASKET
174	XPR11M	EXT RETAINING RING 25MM
175	XP6205	BALL BEARING 6205ZZ
176	XM10200176	KEY 8 X 8 X 20
177	XM10200177	SHAFT
178	XM10200178	KEY 8 X 8 X 72
179	XM10200179	GEAR 50T
180	XM10200180	GEAR 37T
181	XM10200181	GEAR 43T
182	XP6204	BALL BEARING 6204ZZ
183	XPW13M	FLAT WASHER 20MM
184	XM10200184	GEAR 57T
185	XM10200185	GEAR SHAFT 20T
186	XPR25M	INT RETAINING RING 47MM
187	XM10200187	O-RING 40 X 2.65
188	XM10200188	PLUG
189	XM10200189	BEARING CAP
190	XM10200190	BEARING CAP GASKET
191	XM10200191	GEAR 28T
192	XM10200192	KEY 8 X 8 X 38
193	XM10200193	GEAR 41T
194	XM10200194	GEAR 34T
195	XPR23M	EXT RETAINING RING 40MM
196	XP6005	BALL BEARING 6005ZZ
197	XM10200197	GEAR SHAFT 21T
198	XPR18M	EXT RETAINING RING 17MM
199	XM10200199	BALL BEARING 61803

Headstock Parts List

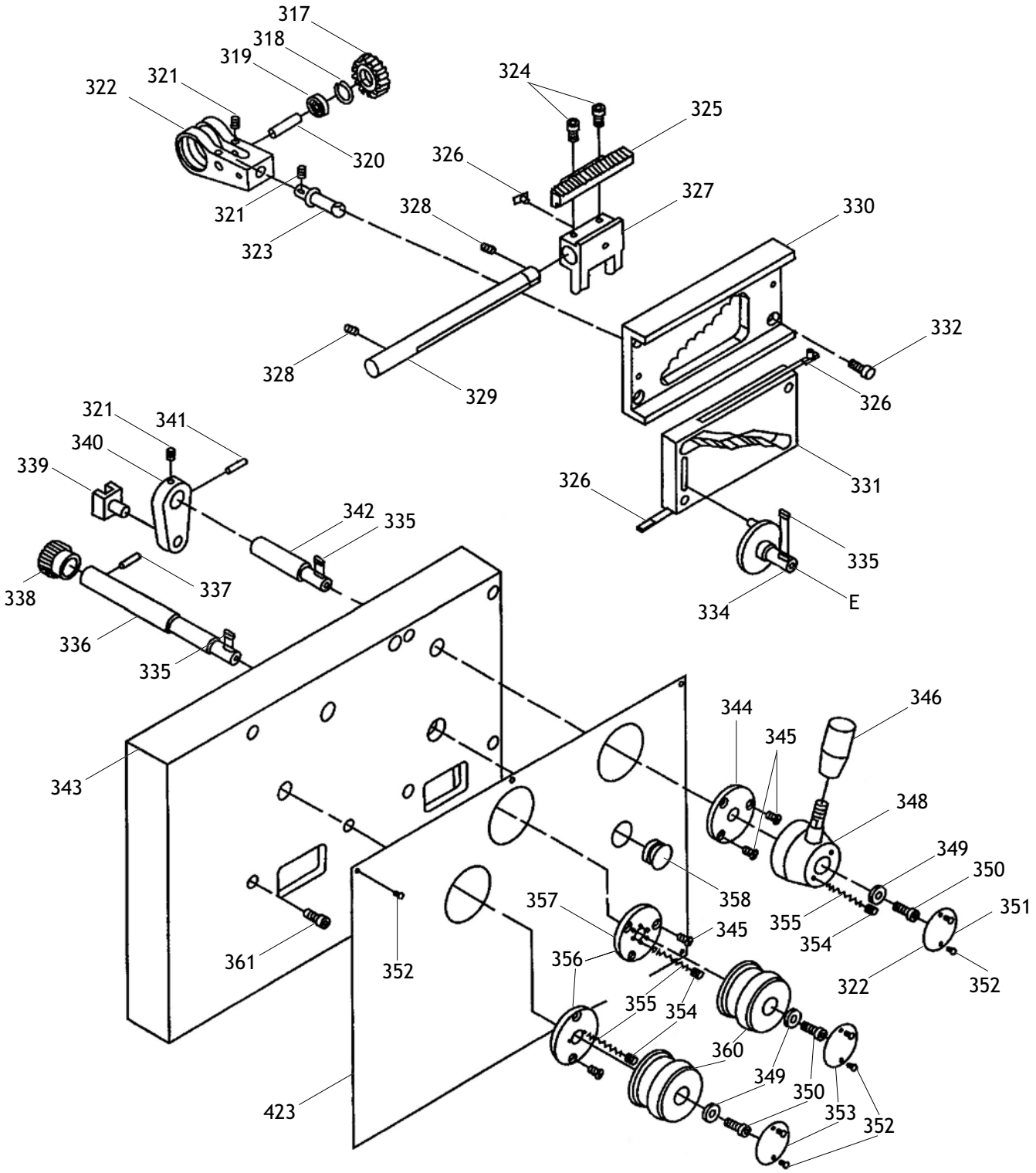
REF	PART #	DESCRIPTION
200	XM10200200	GEAR 21T
201	XM10200201	GEAR 58T
202	XPW19M	FLAT WASHER 25MM
203	XM10200203	EXT RETAINING RING 55MM
204	XM10200204	GEAR 59T
205	XM10200205	GEAR 31T
206	XM10200206	KEY 10 X 10 X 18
207	XM10200207	SPLINE SHAFT
208	XM10200208	COVER
209	XPSB48M	CAP SCREW M6-1 X 35
210	XPSB01M	CAP SCREW M6-1 X 16
211	XM10200211	COVER
212	XM10200212	GASKET
213	XPSB33M	CAP SCREW M5-.8 X 12
214	XM10200214	COLLAR
215	XM10200215	ROLLER BEARING 32011
216	XM10200216	GEAR 38T
217	XM10200217	LOCK COLLAR
218	XM10200218	GEAR 59T
219	XPSB13M	CAP SCREW M8-1.25 X 30
220	XM10200220	GEAR 87T
221	XM10200221	COLLAR
222	XM10200222	ROLLER BEARING 30212
223	XM10200223	GASKET
224	XM10200224	COVER
225	XPSB02M	CAP SCREW M6-1 X 20
226	XPK42M	KEY 6 X 6 X 30
227	XM10200227	KEY 10 X 10 X 55
228	XPSB11M	CAP SCREW M8-1.25 X 16
229	XM10200229	SPRING
230	XM10200230	CAMLOCK SET PIN
231	XM10200231	CAMLOCK
232	XM10200232	SPINDLE

REF	PART #	DESCRIPTION
233	XPR09M	EXT RETAINING RING 20MM
234	XM10200234	SPACER
235	XM10200235	GEAR 32T
236	XM10200236	EXT RETAINING RING 37MM
237	XM10200237	GEAR 32T
238	XPK08M	KEY 5 X 5 X 16
239	XM10200239	GEAR 32T
240	XPSS04M	SET SCREW M6-1 X 12
241	XM10200241	SHAFT
242	XM10200242	O-RING 25 X 2.65
243	XM10200243	KEY 6 X 6 X 90
244	XM10200244	GEAR 42T
245	XM10200245	COLLAR
246	XM10200246	GEAR 32T
247	XM10200247	COLLAR
248	XM10200248	GEAR 32T
249	XM10200249	BALL BEARING 6004
250	XM10200250	PLUG
251	XM10200251	SHAFT (D)
252	XM10200252	GEAR 38T
253	XM10200253	SPLINE SHAFT (E)
254	XM10200254	HOUSING GASKET
255	XM10200255	HOUSING
256	XM10200256	SPACER SD25 X 40 X 7
257	XM10200257	BRAKE SHOE ASSEMBLY
258	XM10200258	COLLAR
259	XM10200259	NAME PLATE
260	XM10200260	BALANCE SPACE
261	XM10200261	BALANCE BLOCK
262	XPSS04M	SET SCREW M6-1 X 12
263	XPSS14M	SET SCREW M8-1.25 X 12
264	XPVA67	V-BELT PVA67

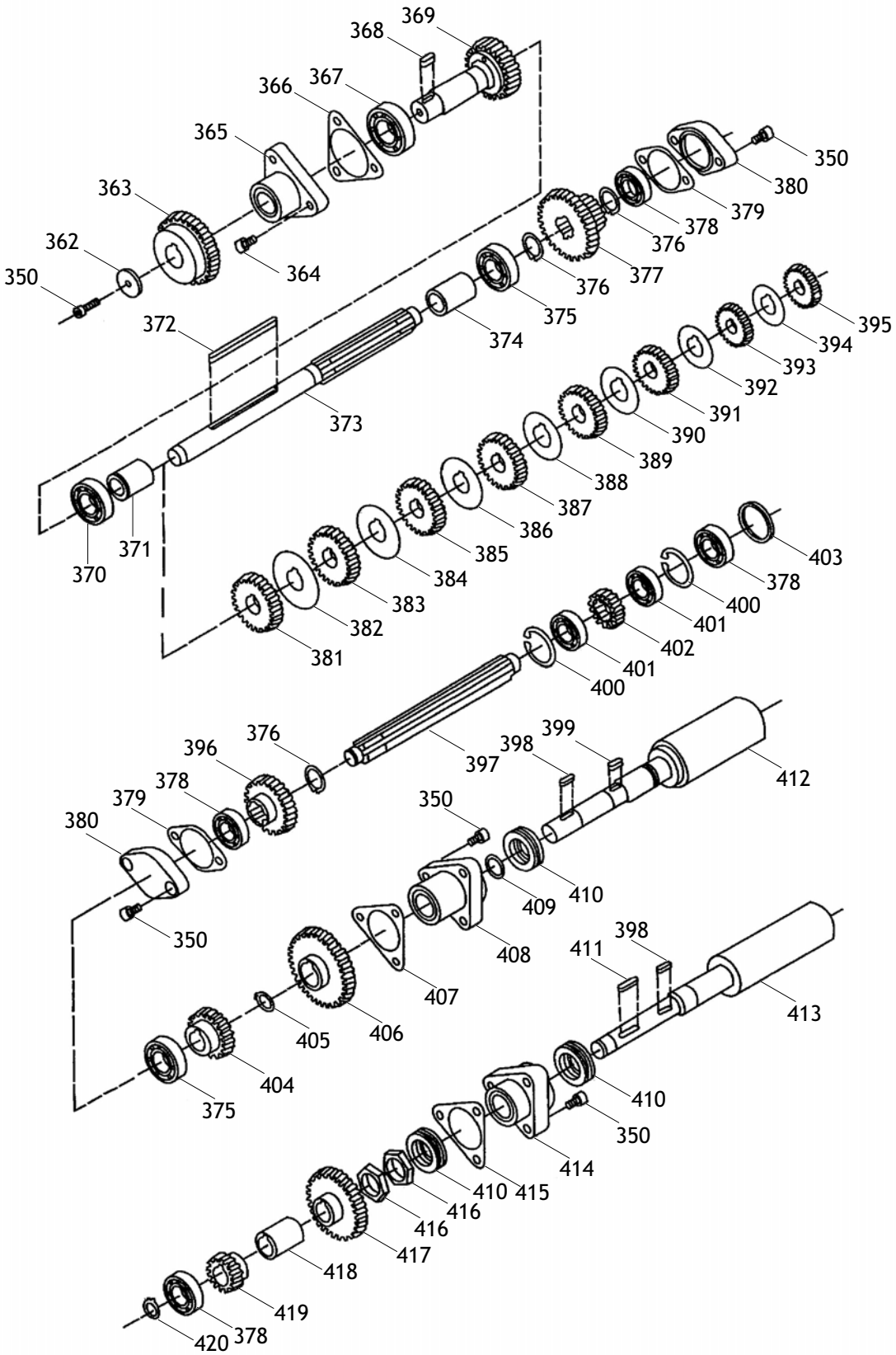
Gearbox Assembly



Gearbox Assembly



Gearbox Assembly



Gearbox Parts List

REF	PART #	DESCRIPTION
301	XM10200301	PLUG
302	XM10200302	GEARBOX CASTING
303	XM10200303	FRONT COVER
304	XPFH19M	FLAT HD SCR M4-.7 X 10
305	XM10200305	OIL COVER
306	XM10200306	COVER
307	XM10200307	TOP COVER
308	XM10200308	BRACKET
309	XPS12M	PHLP HD SCR M3-.5 X 6
310	XM10200310	ELECTRICAL PLATE
311	XM10200311	GEARBOX GASKET
312	XPSB12M	CAP SCREW M8-1.25 X 40
313	XPSB31M	CAP SCREW M8-1.25 X 25
314	XPRP03M	ROLL PIN 5 X 20
315	XPRP27M	ROLL PIN 5 X 28
316	XM10200316	PLUG
317	XM10200317	GEAR 16T
318	XPR08M	EXT RETAINING RING 19MM
319	XM10200319	BALL BEARING 6198
320	XM10200320	SHAFT
321	XPSS03M	SET SCREW M6-1 X 8
322	XM10200322	SHIFTER
323	XM10200323	SHAFT
324	XPSB02M	CAP SCREW M6-1 X 20
325	XM10200325	RACK
326	XM10200326	SHIFT KEY
327	XM10200327	SHIFT FORK
328	XPSS03M	SET SCREW M6-1 X 8
329	XM10200329	SHAFT
330	XM10200330	LOCATING PLATE
331	XM10200331	CONTROL PLATE
332	XPSB26M	CAP SCREW M6-1 X 12
333	XM10200333	ROLL PIN 8 X 30
334	XM10200334	SHIFT HUB
335	XPK05M	KEY 4 X 4 X 10
336	XM10200336	SHAFT
337	XPRP03M	ROLL PIN 5 X 20
338	XM10200338	GEAR 26T
339	XM10200339	SHIFT FORK
340	XM10200340	SHIFT LEVER
341	XPRP03M	ROLL PIN 5 X 20
342	XM10200342	SHAFT
343	XM10200343	COVER
344	XM10200344	LOCATING DISK
345	XPFH07M	FLAT HD SCR M5-.8 X 10
346	XM10200346	HANDLE
347	XM10200347	HANDLE SHAFT
348	XM10200348	SHIFT HUB
349	XPW09M	FLAT WASHER 7MM
350	XPSB01M	CAP SCREW M6-1 X 16

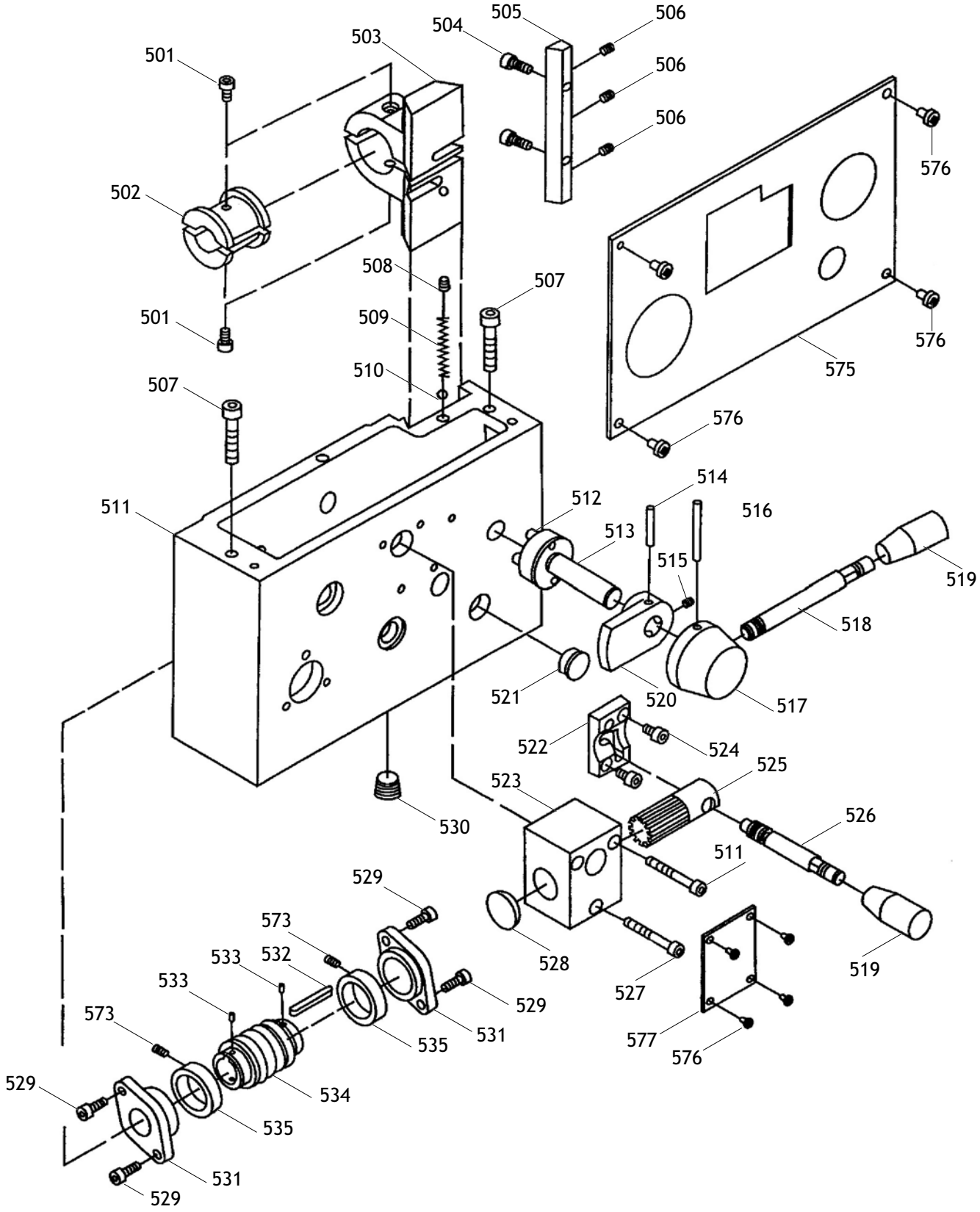
REF	PART #	DESCRIPTION
350	XPSB01M	CAP SCREW M6-1 X 16
351	XM10200351	INDICATOR DISK
352	XPS12M	PHLP HD SCR M3-.5 X 6
353	XM10200353	INDICATOR DISK
354	XPSS20M	SET SCREW M8-1.25 X 8
355	XM10200355	SPRING
356	XM10200356	STEEL BALL
357	XM10200357	LOCATING DISK
358	XM10200358	OIL SIGHT
359	XM10200359	LOCATING DISK
360	XM10200360	SHIFT HUB
361	XPSB48M	CAP SCREW M6-1 X 35
362	XPW09M	FLAT WASHER 7MM
363	XM10200363	GEAR 50T
364	XPSB02M	CAP SCREW M6-1 X 20
365	XM10200365	FLANGE
366	XM10200366	GASKET
367	XP6004	BALL BEARING 6004ZZ
368	XPK19M	KEY 5 X 5 X 14
369	XM10200369	GEAR SHAFT ASSEMBLY
370	XM10200370	BALL BEARING 6002
371	XM10200371	SHAFT COLLAR
372	XM10200372	KEY 5 X 5 X 75
373	XM10200373	SHAFT
374	XM10200374	SHAFT COLLAR
375	XP6003	BALL BEARING 6003ZZ
376	XPR09M	EXT RETAINING RING 20MM
377	XM10200377	GEAR 16T/32T
378	XM10200378	BALL BEARING 6202
379	XM10200379	GASKET
380	XM10200380	FLANGE
381	XM10200381	GEAR 28T
382	XM10200382	KEYED WASHER 52MM
383	XM10200383	GEAR 26T
384	XM10200384	KEYED WASHER 48.5MM
385	XM10200385	GEAR 24T
386	XM10200386	KEYED WASHER 45MM
387	XM10200387	GEAR 23T
388	XM10200388	KEYED WASHER 43MM
389	XM10200389	GEAR 22T
390	XM10200390	KEYED WASHER 41.5MM
391	XM10200391	GEAR 20T
392	XM10200392	KEYED WASHER 38MM
393	XM10200393	GEAR 18T
394	XM10200394	KEYED WASHER 34.5MM
395	XM10200395	GEAR 16T
396	XM10200396	GEAR 26T
397	XM10200397	SPLINE SHAFT
398	XPK19M	KEY 5 X 5 X 14
399	XM10200399	KEY 6 X 6 X 14

Gearbox Parts List

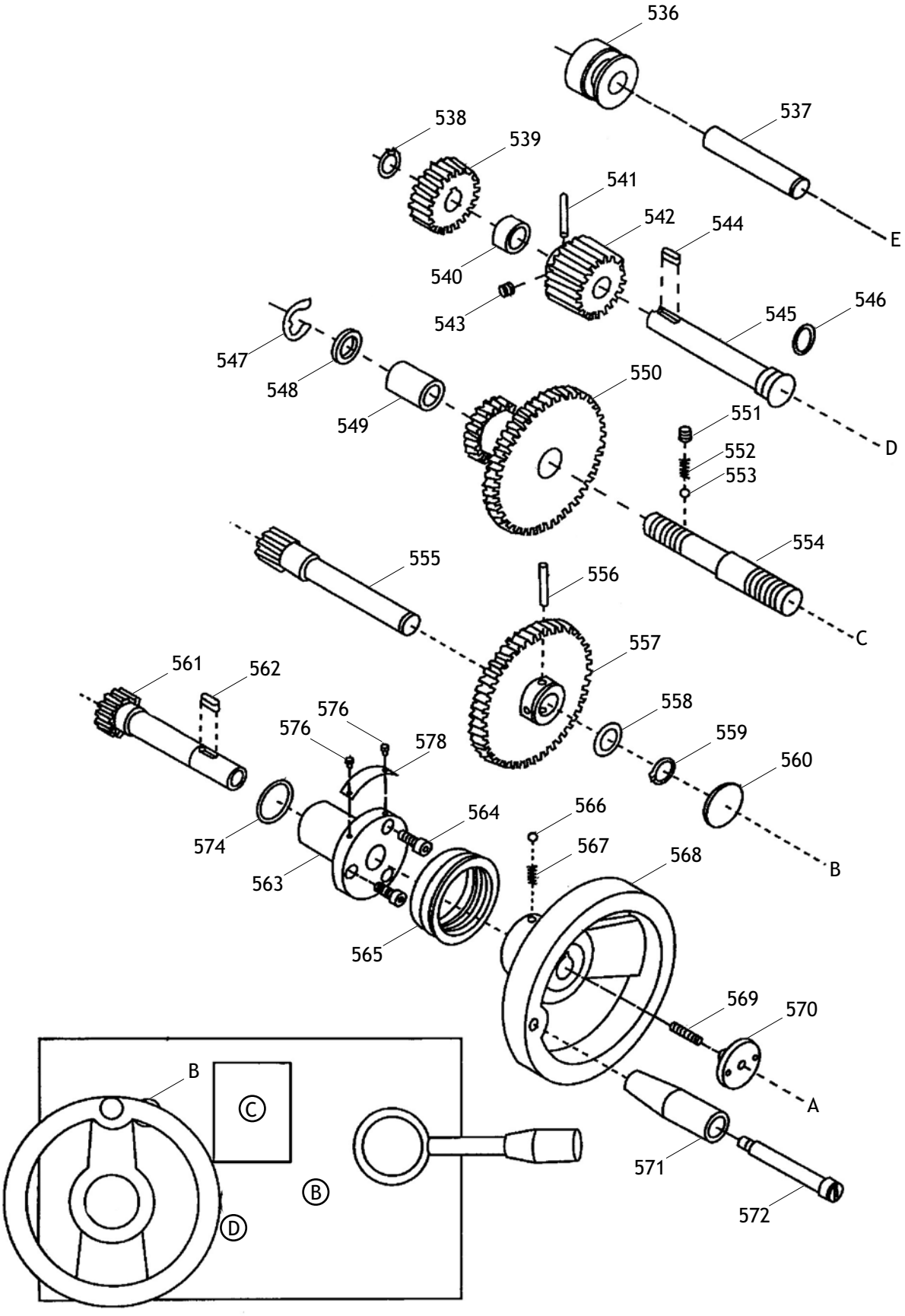
REF	PART #	DESCRIPTION
400	XPR29M	INT RETAINING RING 32MM
401	XM10200401	BALL BEARING 61804
402	XM10200402	GEAR 16T
403	XM10200403	FLAT WASHER 30MM
404	XM10200404	GEAR 21T
405	XPR05M	EXT RETAINING RING 15MM
406	XM10200406	GEAR 36T
407	XM10200407	GASKET
408	XM10200408	FLANGE
409	XM10200409	O-RING 15 X 2.65
410	XM10200410	BALL BEARING 8104
411	XPK34M	KEY 5 X 5 X 20

REF	PART #	DESCRIPTION
412	XM10200412	SHAFT
413	XM10200413	SHAFT
414	XM10200414	FLANGE
415	XM10200415	GASKET
416	XPN17M	HEX NUT M20-1.5
417	XM10200417	GEAR 32T
418	XM10200418	COLLAR
419	XM10200419	GEAR 16T
420	XPR05M	EXT RETAINING RING 15MM
421	XM10200421	RIVET 2 X 4
422	XM10200422	SPEED CHART
423	XM10200423	NAME PLATE

Apron Assembly



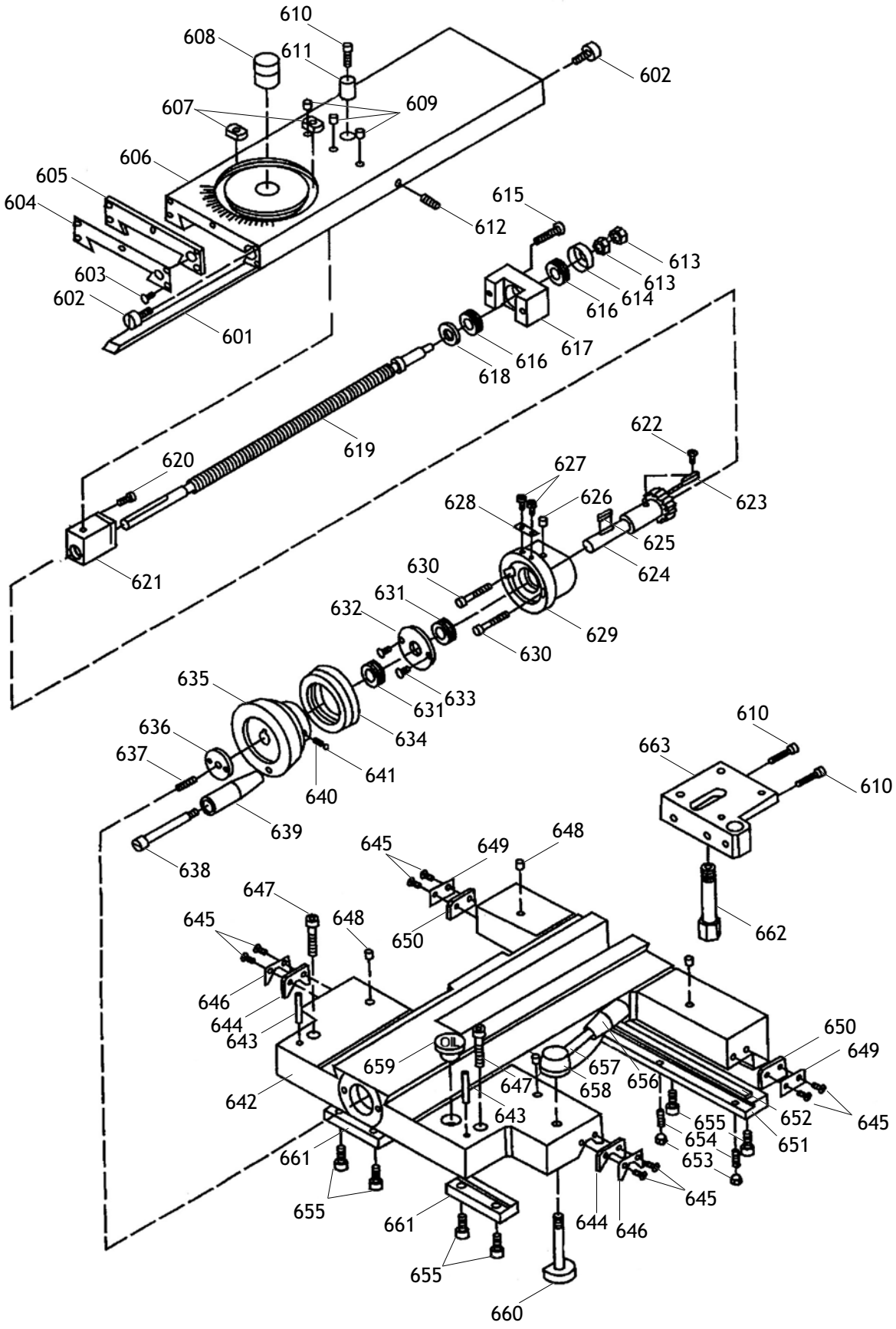
Apron Assembly



Apron Parts List

REF	PART #	DESCRIPTION
501	XPSB04M	CAP SCREW M6-1 X 10
502	XM10200502	HALF NUT
503	XM10200503	BRACKET
504	XPSB01M	CAP SCREW M6-1 X 16
505	XM10200505	GIB
506	XPSS01M	SET SCREW M6-1 X 10
507	XPSB12M	CAP SCREW M8-1.25 X 40
508	XPSS20M	SET SCREW M8-1.25 X 8
509	XM10200509	SPRING
510	XM10200510	STEEL BALL
511	XM10200511	CASTING
512	XM10200512	PIN
513	XM10200513	HALF NUT CAM
514	XPRP10M	ROLL PIN 5 X 36
515	XPSS02M	SET SCREW M6-1 X 6
516	XPRP30M	ROLL PIN 5 X 50
517	XM10200517	HUB
518	XM10200518	HANDLE SHAFT
519	XM10200519	HANDLE
520	XM10200520	SAFETY CATCH
521	XM10200521	SIGHT GLASS 12
522	XM10200522	BRACKET
523	XM10200523	BLOCK
524	XPSB26M	CAP SCREW M6-1 X 12
525	XM10200525	SPLINE SHAFT
526	XM10200526	HANDLE SHAFT
527	XPSB30M	CAP SCREW M6-1 X 45
528	XM10200528	PLUG
529	XPSB01M	CAP SCREW M6-1 X 16
530	XM10200530	DRAIN PLUG
531	XM10200531	FLANGE
532	XM10200532	KEY 5 X 5 X 56
533	XPRP14M	ROLL PIN 3 X 6
534	XM10200534	WORM
535	XM10200535	COLLAR
536	XM10200536	BUSHING
537	XM10200537	SHAFT
538	XPR06M	EXT RETAINING RING 16MM
539	XM10200539	GEAR 22T
540	XM10200540	COLLAR
541	XPRP10M	ROLL PIN 5 X 36
542	XM10200542	GEAR 24T
543	XPSS02M	SET SCREW M6-1 X 6
544	XPK20M	KEY 5 X 5 X 15
545	XM10200545	SHAFT
546	XM10200546	O-RING 17 X 1.8
547	XPR03M	EXT RETAINING RING 12MM
548	XM10200548	BUSHING
549	XM10200549	COLLAR
550	XM10200550	CLUSTER GEAR 50T/20T
551	XPSS20M	SET SCREW M8-1.25 X 8
552	XM10200552	SPRING
553	XM10200553	STEEL BALL
554	XM10200554	SHAFT
555	XM10200555	SHAFT
556	XPRP05M	ROLL PIN 5 X 30
557	XM10200557	GEAR 50T
558	XM10200558	BUSHING
559	XPR06M	EXT RETAINING RING 16MM
560	XM10200560	PLUG
561	XM10200561	SHAFT
562	XPK20M	KEY 5 X 5 X 15
563	XM10200563	WHEEL FLANGE
564	XPSB01M	CAP SCREW M6-1 X 16
565	XM10200565	INDICATOR RING
566	XM10200566	STEEL BALL
567	XM10200567	SPRING
568	XM10200568	HANDWHEEL
569	XPSS12M	SET SCREW M6-1 X 25
570	XM10200570	WHEEL STUD
571	XM10200571	HANDLE SLEEVE
572	XM10200572	HANDLE LEVER
573	XPSS05M	SET SCREW M5-.8 X 10
574	XM10200574	O-RING 25.8 X 3.55
575	XM10200575	APRON LABEL
576	XPS12M	PHLP HD SCR M3-.5 X 6
577	XM10200577	THREAD DIAL LABEL
578	XM10200578	INDICATOR LABEL

Carriage Assembly

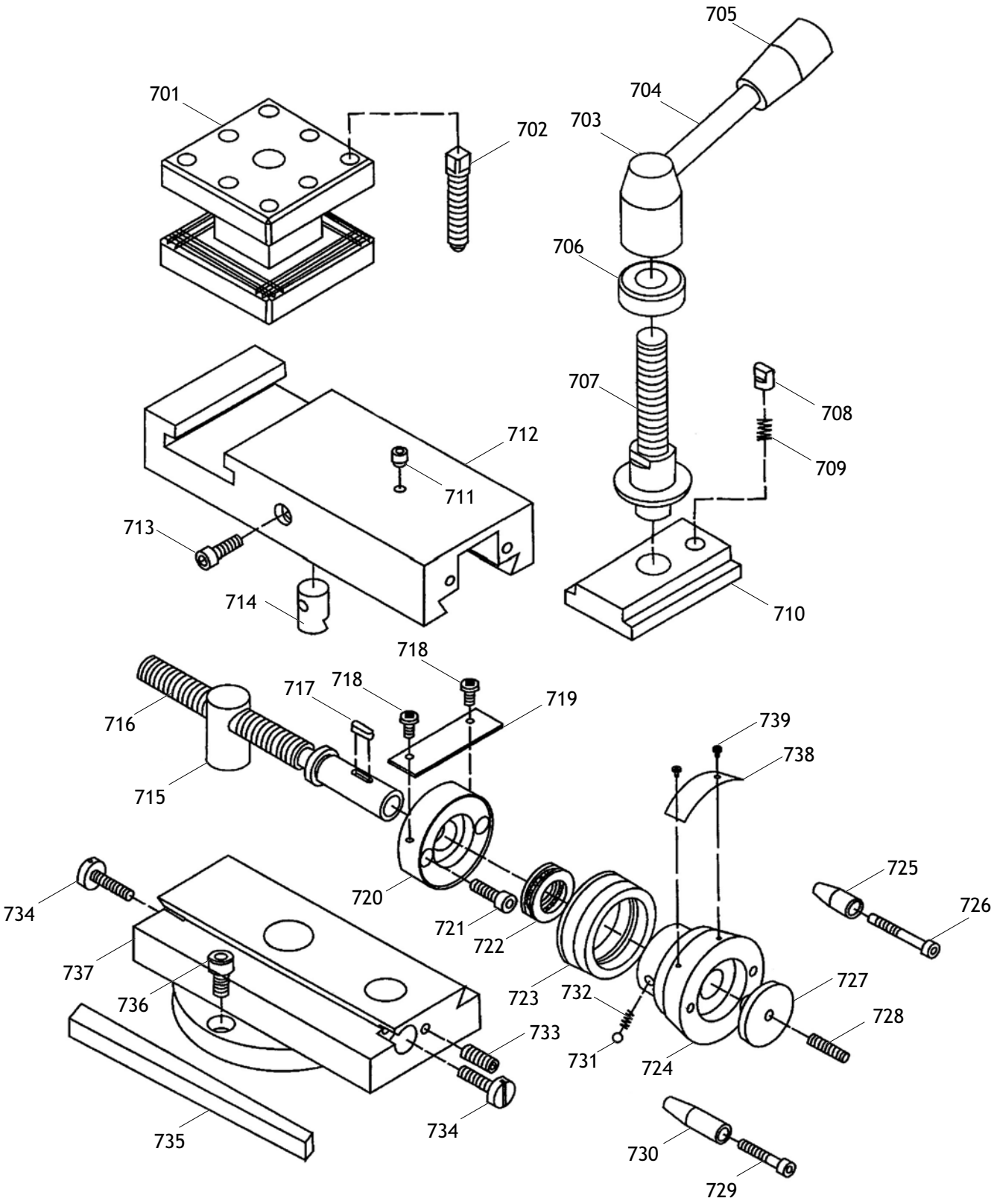


Carriage Parts List

REF	PART #	DESCRIPTION
601	XM10200601	GIB
602	XM10200602	GIB ADJUSTING SCREW
603	XPS09M	PHLP HD SCR M5-.8 X 10
604	XM10200604	PLATE
605	XM10200605	PLATE WIPER
606	XM10200606	CROSS SLIDE BODY
607	XM10200607	CLAMP NUT
608	XM10200608	HUB
609	XM10200609	BALL FITING
610	XPSB02M	CAP SCREW M6-1 X 20
611	XM10200611	SLEEVE
612	XPSS20M	SET SCREW M8-1.25 X 8
613	XPN02M	HEX NUT M10-1.5
614	XM10200614	BEARING CAP
615	XPSB07M	CAP SCREW M6-1 X 30
616	XP8101	THRUST BEARING 8101
617	XM10200617	BLOCK
618	XM10200618	SPACER
619	XM10200619	LEAD SCREW
620	XPSB26M	CAP SCREW M6-1 X 12
621	XM10200621	CROSS FEED NUT
622	XPS49M	PHLP HD SCR M3-.5 X 5
623	XPK23M	KEY 5 X 5 X 25
624	XM10200624	GEAR SHAFT
625	XPK48M	KEY 4 X 4 X 20
626	XM10200626	BALL FITTING
627	XPS12M	PHLP HD SCR M3-.5 X 6
628	XM10200628	INDICATOR LABEL
629	XM10200629	HOUSING
630	XPSB29M	CAP SCREW M6-1 X 40
631	XP8102	THRUST BEARING 8102
632	XPW08M	FLAT WASHER 16MM

REF	PART #	DESCRIPTION
633	XPS09M	PHLP HD SCR M5-.8 X 10
634	XM10200634	INDEX RING
635	XM10200635	COMPOUND HANDWHEEL
636	XM10200636	COVER SCREW
637	XPSS12M	SET SCREW M6-1 X 25
638	XM10200638	HANDLE LEVER
639	XM10200639	HANDLE SLEEVE
640	XM10200640	SPRING 0.7 X 5 X 9
641	XM10200641	STEEL BALL
642	XM10200642	SADDLE
643	XPRP32M	ROLL PIN 6 X 40
644	XM10200644	PLATE WIPER
645	XPS09M	PHLP HD SCR M5-.8 X 10
646	XM10200646	PLATE
647	XPSB12M	CAP SCREW M8-1.25 X 40
648	XM10200648	BALL FITTING
649	XM10200649	PLATE
650	XM10200650	PLATE WIPER
651	XM10200651	REAR PRESSURE PLATE
652	XM10200652	GIB
653	XPLN03M	LOCK NUT M6-1
654	XPSS25M	SET SCREW M6-1 X 20
655	XPSB14M	CAP SCREW M8-1.25 X 20
656	XM10200656	HANDLE KNOB M10 X 50
657	XM10200657	HANDLE SHAFT
658	XM10200658	HUB
659	XM10200659	OIL CAP
660	XM10200660	LOCK STUD
661	XM10200661	FRONT PRESSURE PLATE
662	XM10200662	CONNECTED TUBE
663	XM10200663	LAMP BRACKET

Tool Post Assembly

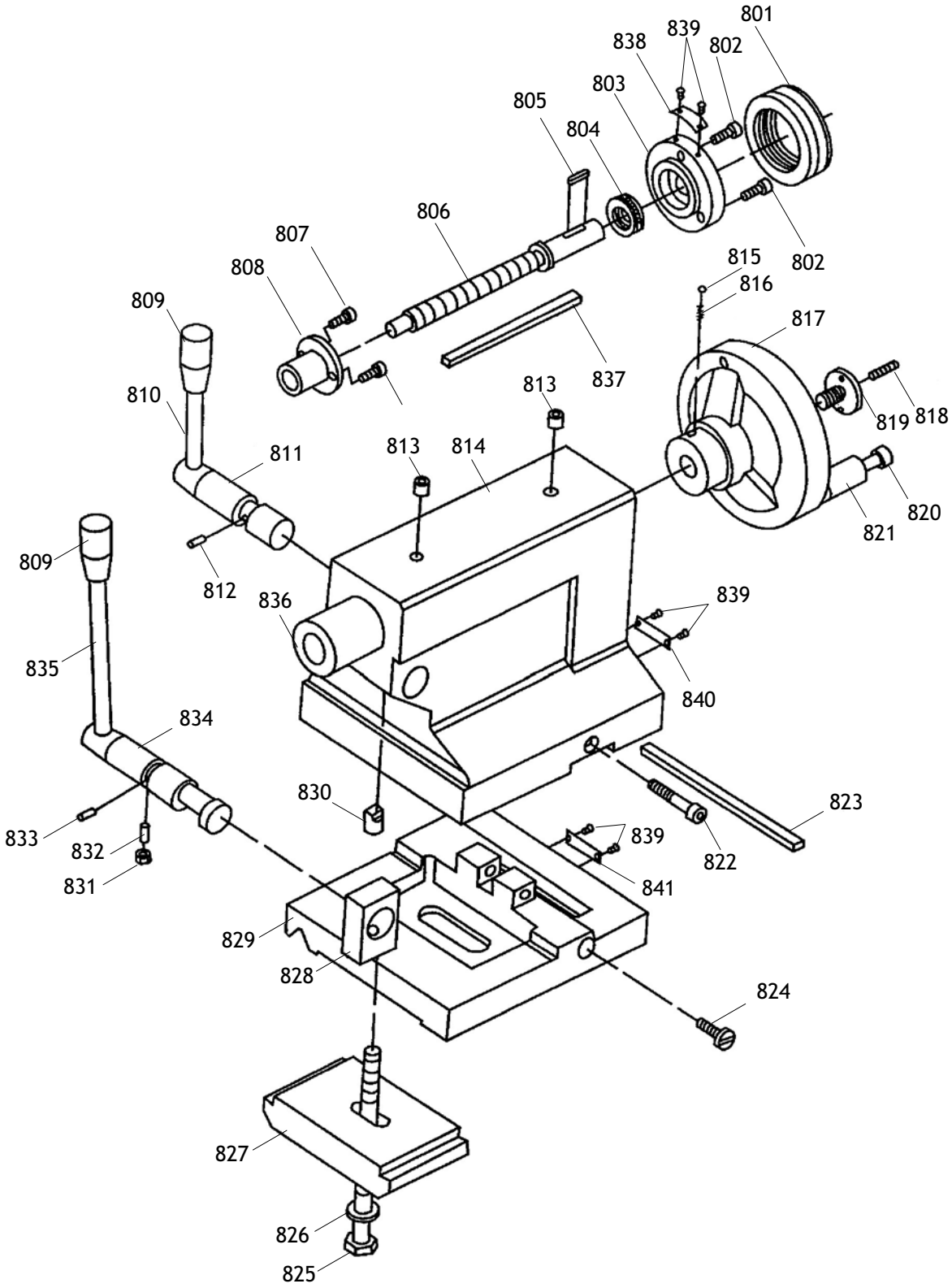


Tool Post Parts List

REF	PART #	DESCRIPTION
701	XM10200701	TOOL POST
702	XM10200702	TOOL LOCK SCREW 10 X 50
703	XM10200703	HANDLE HUB
704	XM10200704	HANDLE SHAFT
705	XM10200705	HANDLE
706	XM10200706	SPACER
707	XM10200707	TOOL POST PIN
708	XM10200708	TOOL POST PIN
709	XM10200709	SPRING 1 X 8 X 11
710	XM10200710	CLAMP NUT
711	XM10200711	BALL FITTING
712	XM10200712	COMPOUND SLIDE
713	XPSB02M	CAP SCREW M6-1 X 20
714	XM10200714	POSITION PIN
715	XM10200715	THREADED PIN
716	XM10200716	COMPOUND SCREW
717	XPK97M	KEY 4 X 4 X 14
718	XPS12M	PHLP HD SCR M3-.5 X 6
719	XM10200719	SCALE
720	XM10200720	SCREW BUSHING

REF	PART #	DESCRIPTION
721	XPSB02M	CAP SCREW M6-1 X 20
722	XP8103	THRUST BEARING 8103
723	XM10200723	INDEX RING
724	XM10200724	HANDWHEEL
725	XM10200725	HANDLE
726	XPSB38M	CAP SCREW M5-.8 X 25
727	XM10200727	COVER SCREW
728	XPSS12M	SET SCREW M6-1 X 25
729	XPSB78M	CAP SCREW M5-.8 X 40
730	XM10200730	HANDLE
731	XM10200731	STEEL BALL 6
732	XM10200732	SPRING 0.7 X 5 X 5
733	XPSS11M	SET SCREW M6-1 X 16
734	XM10200734	GIB ADJUSTING SCREW
735	XM10200735	GIB
736	XPSB11M	CAP SCREW M8-1.25 X 16
737	XM10200737	SWIVEL SLIDE
738	XM10200738	SCALE
739	XPS12M	PAN HEAD SCREW M3-.5 X 6

Tailstock Assembly

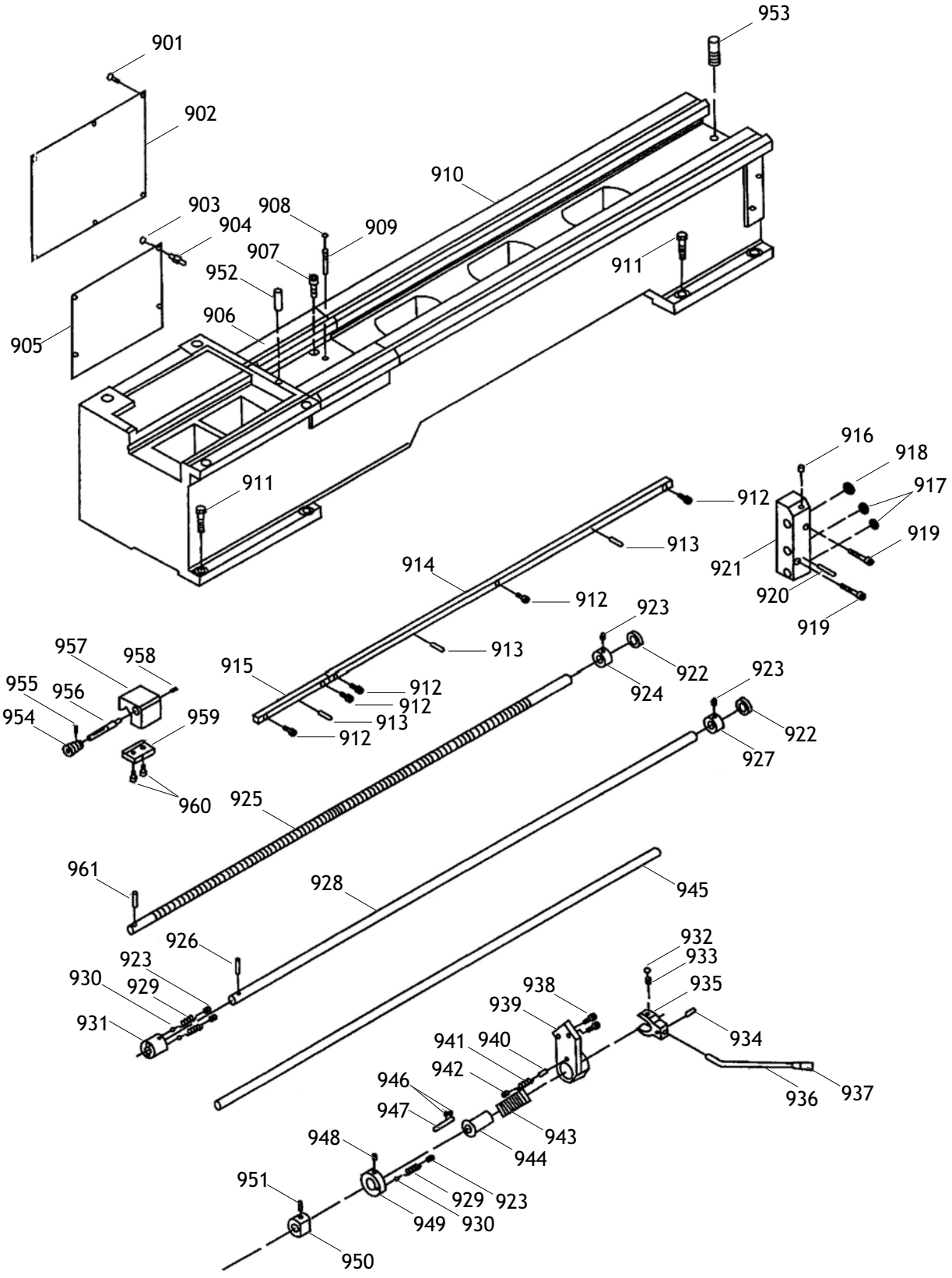


Tailstock Parts List

REF	PART #	DESCRIPTION
801	XM10200801	INDEX RING
802	XPSB02M	CAP SCREW M6-1 X 20
803	XM10200803	HUB
804	XP8103	THRUST BEARING 8103
805	XPK48M	KEY 4 X 4 X 20
806	XM10200806	FEED SCREW
807	XPSB01M	CAP SCREW M6-1 X 16
808	XM10200808	FLANGE
809	XM10200809	HANDLE
810	XM10200810	LEVER HANDLE
811	XM10200811	ECCENTRIC SHAFT
812	XPRP59M	ROLL PIN 5 X 12
813	XM10200813	OILER 10
814	XM10200814	TAILSTOCK BODY
815	XM10200815	BALL FITTING
816	XM10200816	SPRING 0.7 X 5 X 12
817	XM10200817	HANDWHEEL
818	XPSS18M	SET SCREW M12-1.75 X 12
819	XM10200819	WHEEL SCREW
820	XM10200820	HANDLE LEVER
821	XM10200821	HANDLE SLEEVE

REF	PART #	DESCRIPTION
822	XPSB128M	CAP SCREW M8-1.25 X 70
823	XM10200823	GIB
824	XM10200824	GIB ADJUSTING SCREW
825	XPSB101M	CAP SCREW M12-1.75 X 90
826	XPW06M	FLAT WASHER 12MM
827	XM10200827	TAILSTOCK CLAMP PLATE
828	XM10200828	BLOCK
829	XM10200829	TAILSTOCK BASE
830	XM10200830	STOP PIN
831	XPN01M	HEX NUT M6-1
832	XPSS11M	SET SCREW M6-1 X 16
833	XPRP59M	ROLL PIN 5 X 12
834	XM10200834	ECCENTRIC SHAFT
835	XM10200835	LEVER HANDLE
836	XM10200836	QUILL
837	XM10200837	KEY 3 X 6 X 55
838	XM10200838	INDICATOR LABEL
839	XPS12M	PHLP HD SCR M3-.5 X 6
840	XM10200840	INDICATOR LABEL
841	XM10200841	INDICATOR LABEL

Bed Assembly

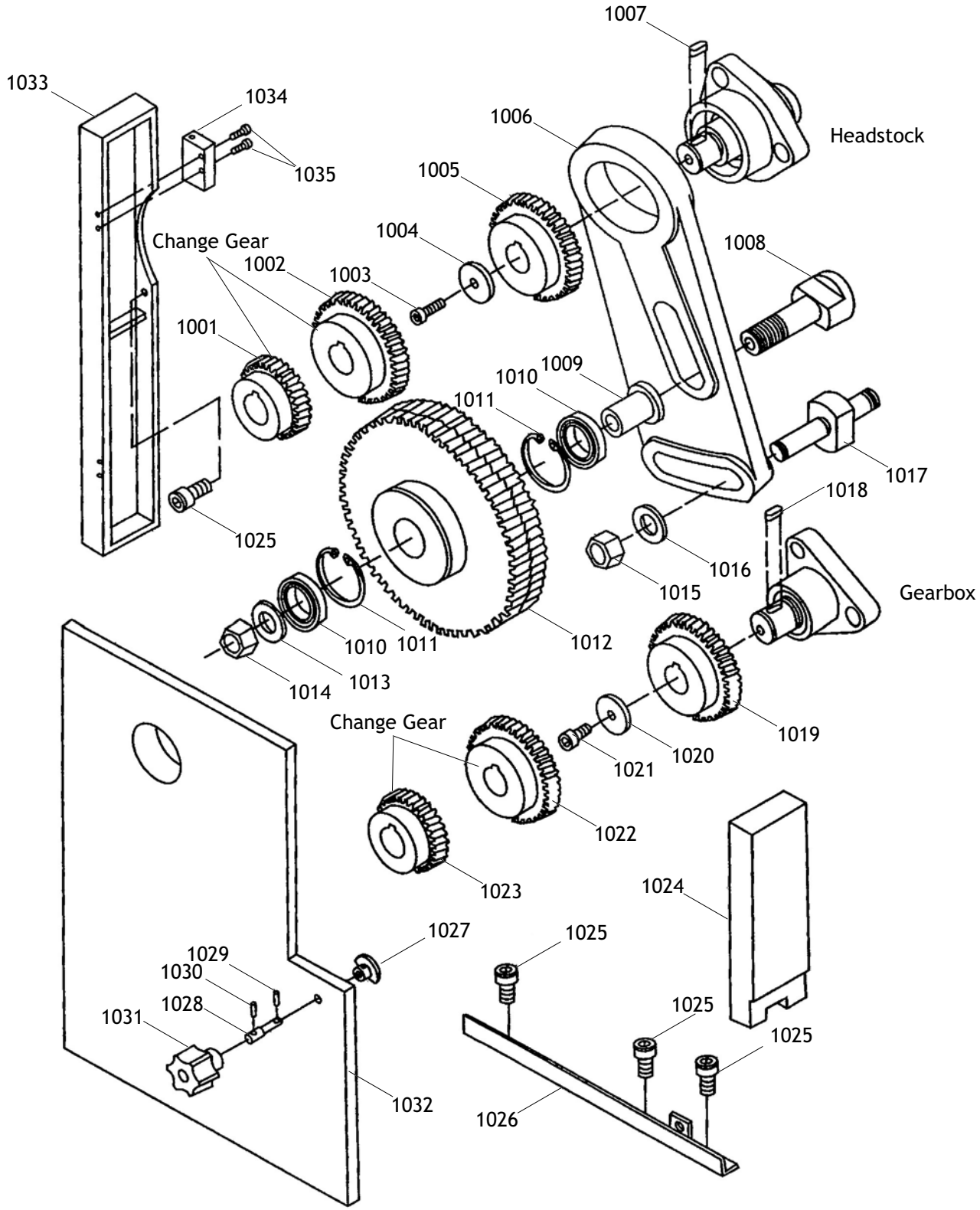


Bed Parts List

REF	PART #	DESCRIPTION
901	XPS39M	PHLP HD SCR M8-1.25 X 10
902	XM10200902	ELECTRICAL BOX COVER
903	XPN03M	HEX NUT M8-1.25
904	XM10200904	STUD
905	XM10200905	ELECTRICAL PLATE
906	XM10200906	GAP
907	XPSB92M	CAP SCREW M12-1.75 X 40
908	XPN03M	HEX NUT M8-1.25
909	XPRP48M	ROLL PIN 8 X 60
910	XM10200910	BED
911	XPB51M	HEX BOLT M16-2 X 50
912	XPSB06M	CAP SCREW M6-1 X 25
913	XPRP10M	ROLL PIN 5 X 36
914	XM10200914	RACK (LONG)
915	XM10200915	RACK (SHORT)
916	XM10200916	BALL FITTING
917	XM10200917	PLUG
918	XM10200918	PLUG
919	XPSB60M	CAP SCREW M8-1.25 X 55
920	XPRP48M	ROLL PIN 8 X 60
921	XM10200921	END BRACKET
922	XP8104	THRUST BEARING 8104
923	XPSS16M	SET SCREW M8-1.25 X 10
924	XM10200924	COLLAR
925	XM10200925	LEAD SCREW
926	XPRP10M	ROLL PIN 5 X 36
927	XM10200927	COLLAR
928	XM10200928	FEED SHAFT
929	XM10200929	SPRING
930	XM10200930	STEEL BALL
931	XM10200931	CLUTCH

REF	PART #	DESCRIPTION
932	XPN01M	HEX NUT M6-1
933	XPSS25M	SET SCREW M6-1 X 20
934	XPRP42M	ROLL PIN 3 X 20
935	XM10200935	CONTROL FORK
936	XM10200936	CONTROL HANDLE
937	XM10200937	HANDLE
938	XPSB01M	CAP SCREW M6-1 X 16
939	XM10200939	CONTROL BRACKET
940	XM10200940	PIN
941	XM10200941	SPRING 1.2 X 6 X 20
942	XPSS20M	SET SCREW M8-1.25 X 8
943	XM10200943	SPRING 3 X 35 X 70
944	XM10200944	SLEEVE
945	XM10200945	SPINDLE CONTROL SHAFT
946	XM10200946	SET SCREW M3-.5 X 6
947	XM10200947	KEY 5 X 5 X 56
948	XPSS01M	SET SCREW M6-1 X 10
949	XM10200949	COLLAR
950	XM10200950	SHIFT COLLAR
951	XPSS11M	SET SCREW M6-1 X 16
952	XM10200952	PIN
953	XM10200953	PIN
954	XM10200954	INDEX RING
955	XPRP14M	ROLL PIN 3 X 6
956	XM10200956	SHAFT
957	XM10200957	BRACKET
958	XPSS04M	SET SCREW M6-1 X 12
959	XM10200959	PLATE
960	XPSB01M	CAP SCREW M6-1 X 16
961	XPRP10M	ROLL PIN 5 X 36

End Gear Assembly

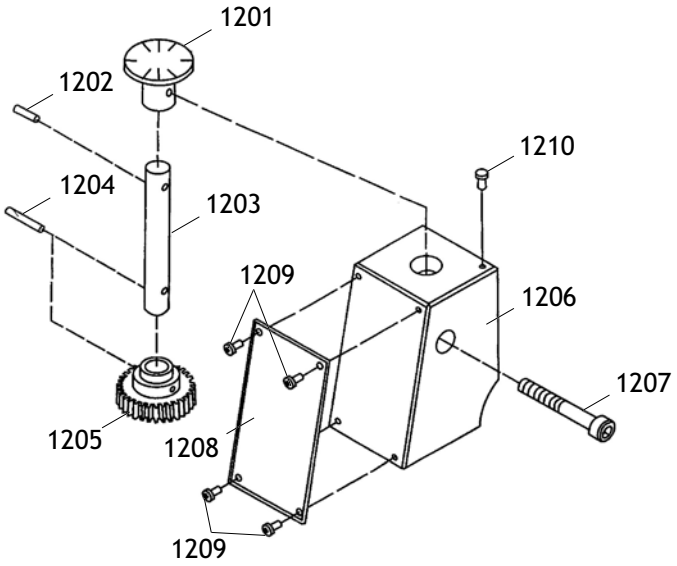


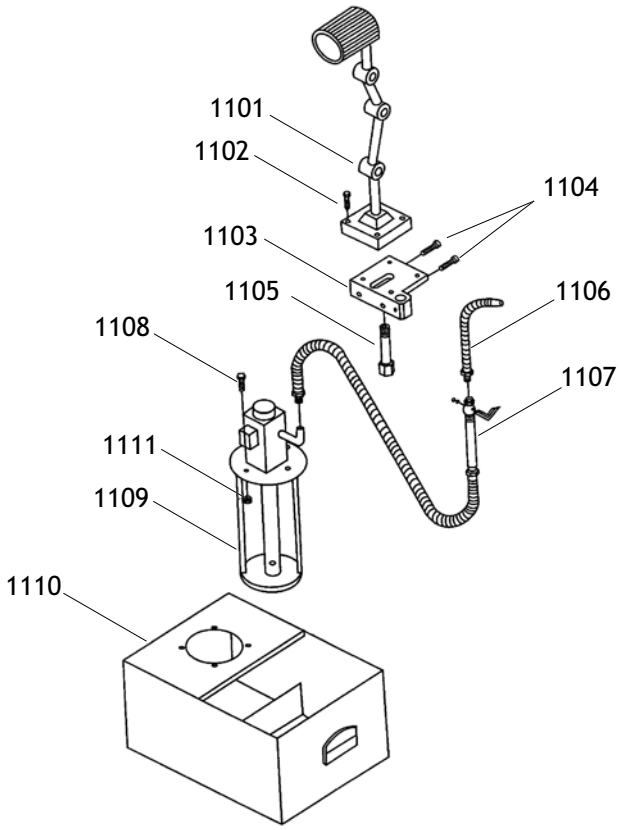
End Gear Parts List

REF	PART #	DESCRIPTION
1001	XM10201001	GEAR 30T
1002	XM10201002	GEAR 40T
1003	XPSB24M	CAP SCREW M5-.8 X 16
1004	XPW03M	FLAT WASHER 6MM
1005	XM10201005	GEAR 25T
1006	XM10201006	QUADRANT
1007	XPK19M	KEY 5 X 5 X 14
1008	XM10201008	THREAD SHAFT
1009	XM10201009	COLLAR
1010	XM10201010	BALL BEARING 6103
1011	XPR21M	INT RETAINING RING 35MM
1012	XM10201012	GEAR 120/127
1013	XPW04M	FLAT WASHER 10MM
1014	XPN02M	HEX NUT M10-1.5
1015	XPN09M	HEX NUT M12-1.75
1016	XPW06M	FLAT WASHER 12MM
1017	XM10201017	STUD
1018	XPK19M	KEY 5 X 5 X 14

REF	PART #	DESCRIPTION
1019	XM10201019	GEAR 50T
1020	XPW03M	FLAT WASHER 6MM
1021	XPSB01M	CAP SCREW M6-1 X 16
1022	XM10201022	GEAR 32T
1023	XM10201023	GEAR 40T
1024	XM10201024	FRONT PLATE
1025	XPSB14M	CAP SCREW M8-1.25 X 20
1026	XM10201026	PLATE
1027	XM10201027	DOOR LATCH
1028	XM10201028	SHAFT
1029	XPRP01M	ROLL PIN 4 X 18
1030	XPRP04M	ROLL PIN 4 X 24
1031	XM10201031	STAR KNOB, PINNED
1032	XM10201032	CHANGE GEAR COVER
1033	XM10201033	REAR PLATE
1034	XM10201034	PLATE
1035	XPSB04M	CAP SCREW M6-1 X 10

Coolant, Worklight, & Thread Dial Assembly



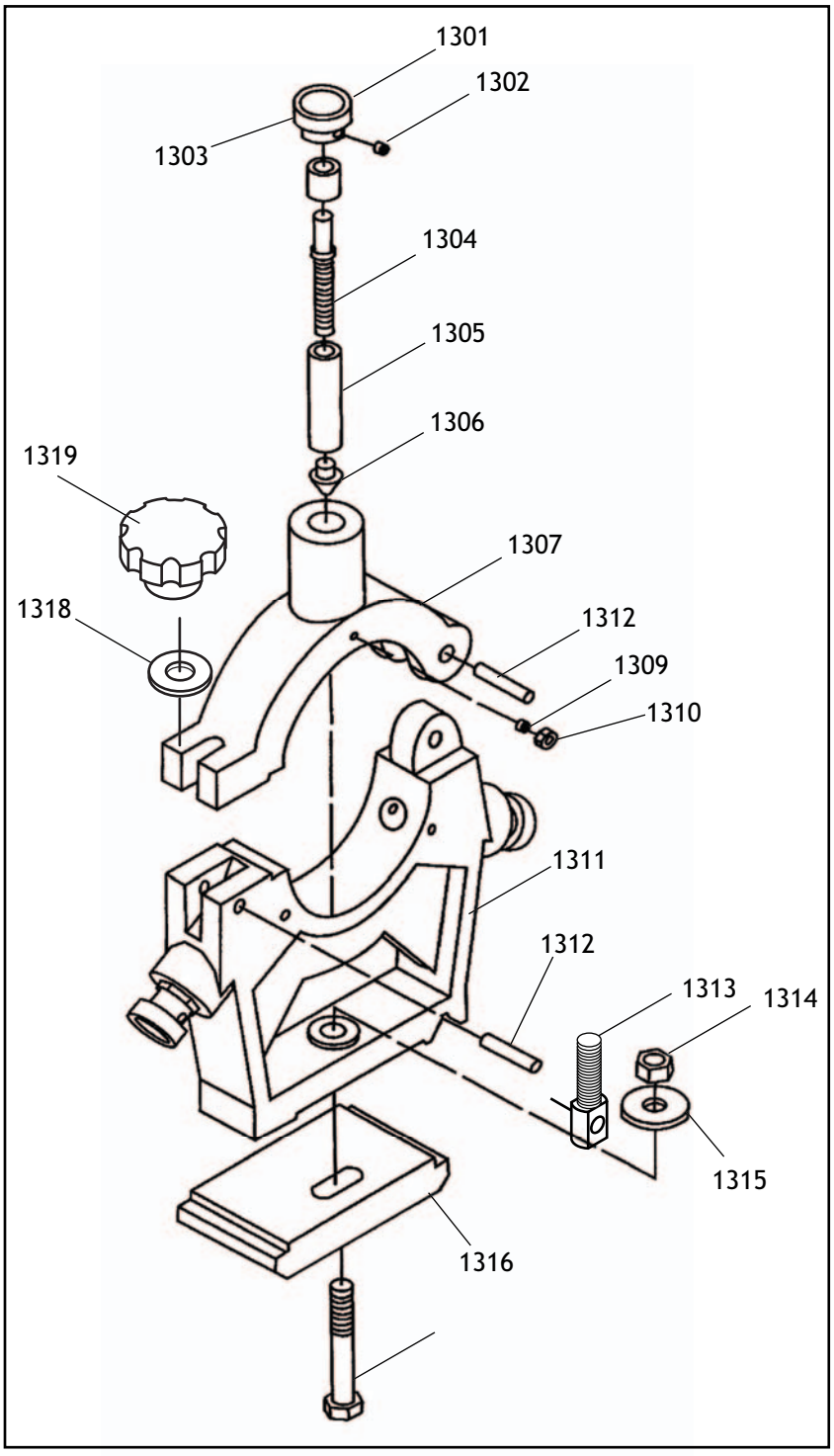


Coolant, Worklight, & Thread Dial Parts List

REF	PART #	DESCRIPTION
1101	XM10201101	WORK LIGHT
1102	XPS15M	PHLP HD SCR M6-1 X 14
1103	XM10201103	LAMP BRACKET
1104	XPSB02M	CAP SCREW M6-1 X 20
1105	XM10201105	CONNECTED TUBE
1106	XM10201106	COOLANT DEVICE
1107	XM10201107	RUBBER TUBE
1108	XPSB38M	CAP SCREW M5-.8 X 25
1109	XM10201109	COOLANT PUMP 1/8 HP
1110	XM10201110	WATER TANK
1111	XPN06M	HEX NUT M5-.8

REF	PART #	DESCRIPTION
1201	XM10201201	DIAL
1202	XPRP61M	ROLL PIN 3 X 12
1203	XM10201203	SHAFT
1204	XPRP42M	ROLL PIN 3 X 20
1205	XM10201205	GEAR 32T
1206	XM10201206	BODY
1207	XPSB30M	CAP SCREW M6-1 X 45
1208	XM10201208	NAME PLATE
1209	XPS12M	PHLP HD SCR M3-.5 X 6
1210	XM10201210	RIVET 2 X 4

Steady & Follow Rest Assemblies



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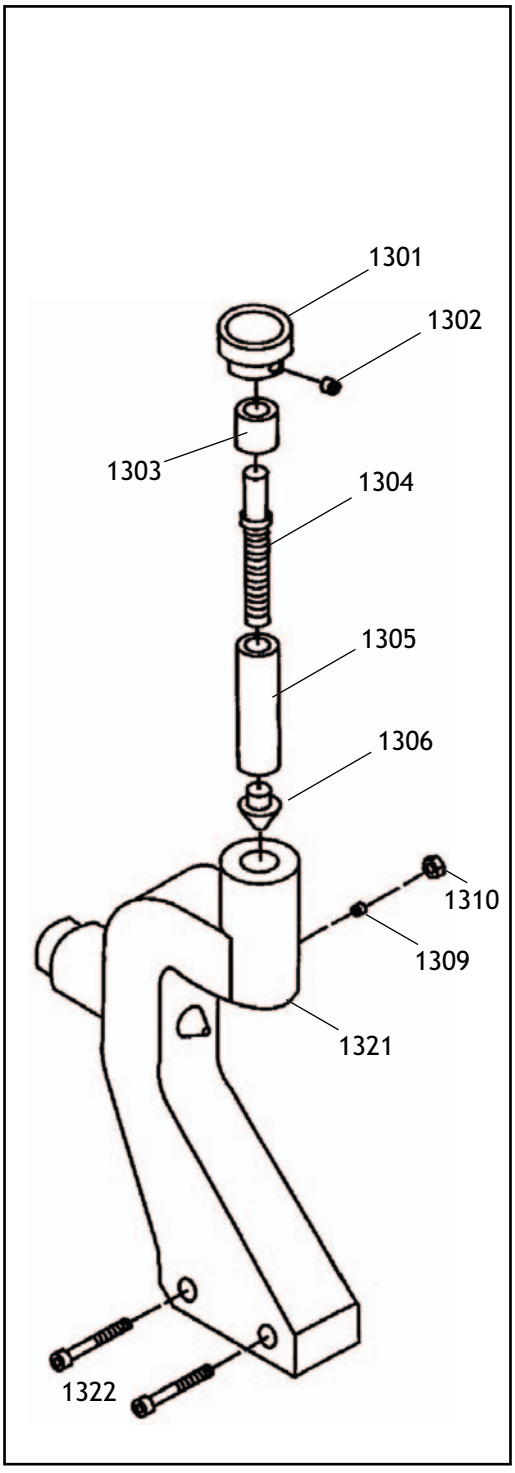

1323

Steady & Follow Rest Parts List

REF	PART #	DESCRIPTION
1301	XM10201301	KNOB
1302	XPSS02M	SET SCREW M6-1 X 6
1303	XM10201303	BUSHING
1304	XM10201304	SPECIAL SCREW
1305	XM10201305	SLEEVE
1306	XM10201306	BRASS FINGER
1307	XM10201307	UPPER BODY CASTING
1309	XPSS25M	SET SCREW M6-1 X 20
1310	XPN01M	HEX NUT M6-1
1311	XM10201311	LOWER BODY CASTING
1312	XM10201312	ROUND PIN 4 X 20

REF	PART #	DESCRIPTION
1313	XM10201313	LOCK BOLT M8-1.25
1314	XPN09M	HEX NUT M12-1.75
1315	XPW06M	FLAT WASHER 12MM
1316	XM10201316	CLAMP PLATE
1317	XPB43M	HEX BOLT M12-1.75 X 75
1318	XPW01M	FLAT WASHER 8MM
1319	XM10201319	STAR KNOB M8-1.25
1320	XM10201320	STEADY REST COMPLETE ASS'Y
1321	XM10201321	BODY CASTING
1322	XM10201322	CAP SCREW M8-1.25 X 60
1323	XM10201323	FOLLOW REST COMPLETE ASS'Y

Warranty

Woodstock International, Inc. warrants all **SHOP FOX®** machinery to be free of defects from workmanship and materials for a period of two years from the date of original purchase by the original owner. This warranty does not apply to defects due directly or indirectly to misuse, abuse, negligence or accidents, lack of maintenance, or reimbursement of third party expenses incurred.

Woodstock International, Inc. will repair or replace, at its expense and at its option, the **SHOP FOX®** machine or machine part which in normal use has proven to be defective, provided that the original owner returns the product prepaid to the **SHOP FOX®** factory service center or authorized repair facility designated by our Bellingham, WA office, with proof of their purchase of the product within two years, and provides Woodstock International, Inc. reasonable opportunity to verify the alleged defect through inspection. If it is determined there is no defect, or that the defect resulted from causes not within the scope of Woodstock International Inc.'s warranty, then the original owner must bear the cost of storing and returning the product.

This is Woodstock International, Inc.'s sole written warranty and any and all warranties that may be implied by law, including any merchantability or fitness, for any particular purpose, are hereby limited to the duration of this written warranty. We do not warrant that **SHOP FOX®** machinery complies with the provisions of any law or acts. In no event shall Woodstock International, Inc.'s liability under this warranty exceed the purchase price paid for the product, and any legal actions brought against Woodstock International, Inc. shall be tried in the State of Washington, County of Whatcom. We shall in no event be liable for death, injuries to persons or property or for incidental, contingent, special or consequential damages arising from the use of our products.

Every effort has been made to ensure that all **SHOP FOX®** machinery meets high quality and durability standards. We reserve the right to change specifications at any time because of our commitment to continuously improve the quality of our products.

WARRANTY REGISTRATION

Name_____

Street_____

City _____State_____Zip_____

Phone Number_____E-Mail_____FAX_____ _____

MODEL #_____SERIAL #_____DEALER NAME_____ PURCHASE DATE _/ /__

The following information is given on a voluntary basis and is strictly confidential.

1. How did you first learn about us?

___Advertisement
___Friend
___Mail order Catalog
___Local Store
___World Wide Web Site

___Other_____

2. Which of the following magazines do you subscribe to.

___Cabinetmaker
___WOOD
___Family Handyman
___Wooden Boat
___Fine Homebuilding
___Woodshop News
___Woodsmith
___Today's Homeowner
___Home Handyman
___Woodwork
___Journal of Light Construction
___Woodworker
___Old House Journal
___Woodworker's Journal
___Popular Mechanics
___Workbench
___Popular Science
___American How-To
___Popular Woodworking
___Other_____

3. Which of the following woodworking/remodeling shows do you watch?

___Backyard America
___The New Yankee Workshop
___Home Time
___This Old House
___The American Woodworker
___Woodwright's Shop
___Other_____

4. What is your annual household income?

___$20,000-$29,999
___$60,000-$69,999
___$30,000-$39,999
___$70,000-$79,999
___$40,000-$49,999
___$80,000-$89,999
___$50,000-$59,999
___$90,000 +

5. What is your age group?

___20-29
___50-59
___30-39
___60-69
___40-49
___70 +

6. How long have you been a woodworker?

___0 - 2 Years
___8 - 20 Years
___2 - 8 Years
___20+ Years

7. How would you rank your woodworking skills?

___Simple
___Advanced
___Intermediate
___Master Craftsman

8. How many **SHOP FOX®** machines do you own? _____

9. What stationary woodworking tools do you own? Check all that apply.

___Air Compressor
___Panel Saw
___Band Saw
___Planer
___Drill Press
___Power Feeder
___Drum Sander
___Radial Arm Saw
___Dust Collector
___Shaper
___Horizontal Boring Machine
___Spindle Sander
___Jointer
___Table Saw
___Lathe
___Vacuum Veneer Press
___Mortiser
___Wide Belt Sander
___Other_____

10. Which benchtop tools do you own? Check all that apply.

___1" x 42" Belt Sander
___6" - 8" Grinder
___5" - 8" Drill Press
___Mini Lathe
___8" Table Saw
___10" - 12" Thickness Planer
___8" - 10" 14 x 40 Gear Head Lathe
___Scroll Saw
___Disc/Belt Sander
___Spindle/Belt Sander
___Mini Jointer
___Other_____

11. Which portable/hand held power tools do you own? Check all that apply.

___Belt Sander
___Orbital Sander
___Biscuit Joiner
___Palm Sander
___Circular Saw
___Portable Planer
___Detail Sander
___Saber Saw
___Drill/Driver
___Reciprocating Saw
___Miter Saw
___Router
___Other_____

12. What machines/supplies would you like to see?

_____
_____
_____
_____

13. What new accessories would you like Woodstock International to carry?

_____
_____

14. Do you think your purchase represents good value?

___Yes
___No

15. Would you recommend **SHOP FOX®** products to a friend?

___Yes
___No

16. Comments:_____

_____
_____
_____
_____

CUT ALONG DOTTED LINE

FOLD ALONG DOTTED LINE

Place
Stamp
Here

WOODSTOCK INTERNATIONAL INC.
P.O. BOX 2309
BELLINGHAM, WA 98227-2309

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TAPE ALONG EDGES--PLEASE DO NOT STAPLE