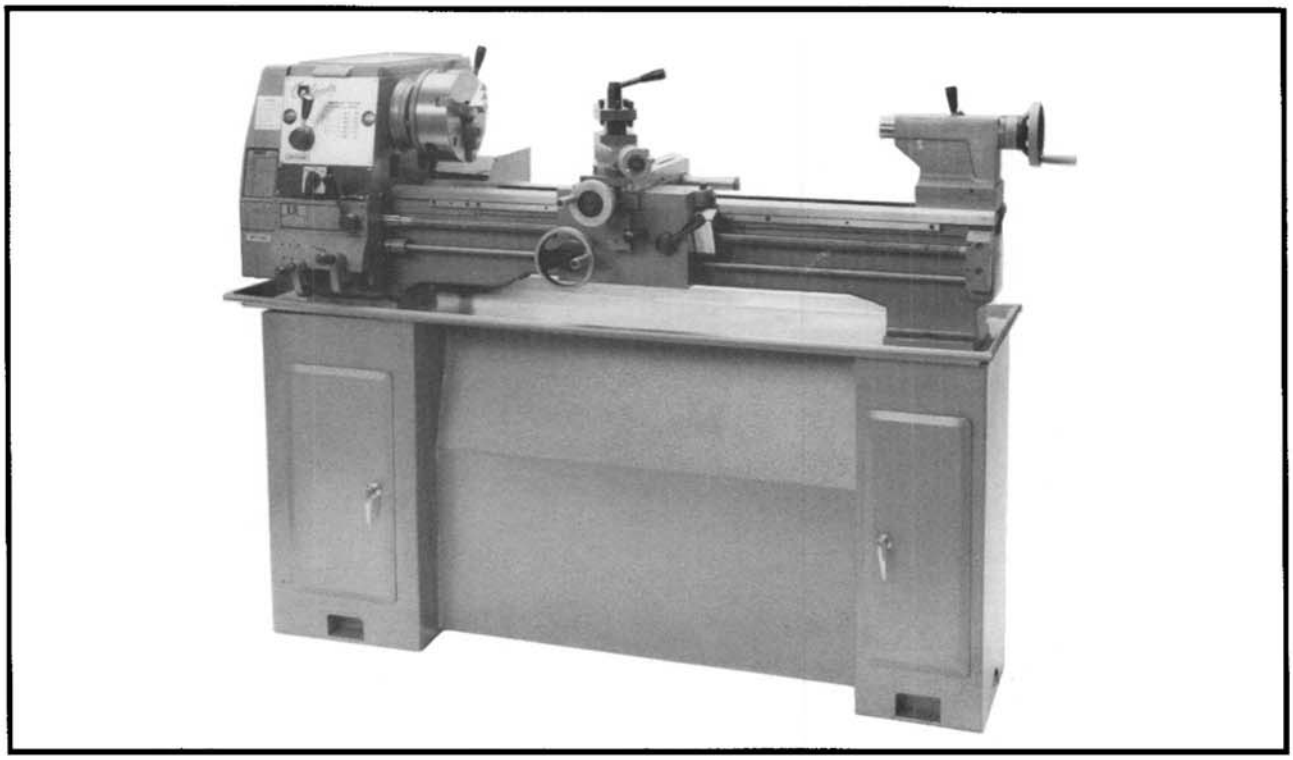
IMPORTS, INC.

12" X 37" GAP-BED METAL LATHE
MODEL G1003
INSTRUCTION MANUAL



GRIZZLY IMPORTS, INC.

REVISED MARCH, 1993. PRINTED IN USA

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.

METALWORKING EQUIPMENT SAFETY INSTRUCTIONS

⚠WARNING

For Your Own Safety Read Instruction Manual Before Operating This Equipment

Metalworking can be fun and rewarding, however it can also be a dangerous activity if safe and proper operating procedures are not followed. Please take the time to review the manual which was supplied with your machine, as well as these general safety instructions. Make sure you have properly assembled and adjusted the machine before operating it the first time. Metalworking requires a certain degree of specialized knowledge. The manual is provided to familiarize you with the features of this machine, but is not intended to be a complete training manual. If you are not familiar with the proper use of this type of machine, consult a trained machinist, refer to books/reference materials, or enroll in training classes in your community.

If you have assembly, adjustment or operation questions, or you cannot find adequate assistance regarding metalworking procedures, please contact Grizzly Industrial's Customer Service:

Grizzly Industrial, Inc.
1203 Lycoming Mall Circle
Muncy, PA 17756
Phone: (570) 546-9663
Fax: 1-800-438-5901
E-Mail: techsupport@grizzly.com
Web Site: http://www.grizzly.com

⚠WARNING

Safety Instructions For Metalworking Machines

1. **KEEP GUARDS IN PLACE** and in working order.
2. **REMOVE ADJUSTING KEYS AND WRENCHES**. Form a habit of checking to see that keys and adjusting wrenches are removed from tool before turning on.
3. **KEEP WORK AREA CLEAN.** Cluttered areas and benches invite accidents.
4. **DON'T USE IN DANGEROUS ENVIRONMENT**. DO NOT use power tools in damp or wet locations, or where any flammable or noxious fumes may exist. Keep work area well lighted.
5. **KEEP CHILDREN AND VISITORS AWAY.** All children and visitors should be kept a safe distance from work area.
6. **MAKE WORK SHOP CHILD PROOF** with padlocks, master switches, or by removing starter keys.
7. **DO NOT FORCE TOOL.** It will do the job better and safer at the rate for which it was designed.
8. **USE RIGHT TOOL.** DO NOT force tool or attachment to do a job for which it was not designed.

⚠WARNING
Safety Instructions For Metalworking Tools

9. **USE PROPER EXTENSION CORD.** Make sure your extension cord is in good condition. Conductor size should be in accordance with the chart below. The amperage rating should be listed on the motor or tool nameplate. An undersized cord will cause a drop in line voltage resulting in loss of power and overheating. Your extension cord must also contain a ground wire and plug pin. Always repair or replace extension cords if they become damaged.

Minimum Gauge for Extension Cords

	LENGTH		
AMP RATING	25ft	50ft	100ft
0-6	16	16	16
7-10	16	16	14
11-12	16	16	14
13-16	14	12	12
17-20	12	12	10
21-30	10	10	No

10. **WEAR PROPER APPAREL.** DO NOT wear loose clothing, gloves, neckties, rings, bracelets, or other jewelry which may get caught in moving parts. Non-slip footwear is recommended. Wear protective hair covering to contain long hair.

11. **ALWAYS USE SAFETY GLASSES.** Everyday eyeglasses only have impact resistant lenses, they are NOT safety glasses.

12. **SECURE WORK.** Use properly secured clamps or vises to hold work while performing the machining operation

13. **DO NOT OVERREACH.** Keep proper footing and balance at all times.

14. **MAINTAIN TOOLS AND MACHINERY WITH CARE.** Keep tools sharp and clean for best and safest performance. Follow instructions for lubricating and changing accessories.

15. **USE RECOMMENDED ACCESSORIES.** Consult the owner's manual for recommended accessories. The use of improper accessories may cause risk of injury.

16. **REDUCE THE RISK OF UNINTENTIONAL STARTING.** On machines with magnetic contact starting switches there is a risk of starting if the machine is bumped or jarred. Always disconnect from power source before adjusting or servicing. Make sure switch is in OFF position before reconnecting.

17. **CHECK DAMAGED PARTS.** Before further use of the tool, a guard or other part that is damaged should be carefully checked to determine that it will operate properly and perform its intended function. Check for alignment of moving parts, binding of moving parts, breakage of parts, mounting, and any other conditions that may affect its operation. A guard or other part that is damaged should be properly repaired or replaced.

18. **NEVER LEAVE MACHINE RUNNING UNATTENDED. TURN POWER OFF.** DO NOT leave machine until it comes to a complete stop.

19. **SOME COOLANTS USED FOR MACHINING MAY CONTAIN HAZARDOUS CHEMICALS.** Read and understand all user information on the coolant container and protect yourself accordingly.

20. **NEVER OPERATE A MACHINE WHEN TIRED, OR UNDER THE INFLUENCE OF DRUGS OR ALCOHOL.** Full mental alertness is required at all times when running a machine.

⚠CAUTION

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

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I. INTRODUCTION

We are proud to bring you the Model G1003 12" x 37" Gap-Bed Metal Lathe. The Model G1003 is part of Grizzly's large family of fine metalworking machinery. When used according to the guidelines set forth in this manual, you can expect years of trouble-free, enjoyable operation and proof of Grizzly's commitment to customer satisfaction.

The Model G1003 is a precision metalworking lathe. This lathe features cast iron construction, 37" V-bed, helical back-gears, speed range of 80-1300 RPM, quick-change gear box, and a complete electrical package. The electrical package consists of a dual-voltage, 1½ HP capacitor start motor, reversible magnetic switch and cord set. All running parts operate on shielded ball bearings and require no maintenance for the life of the bearings. We also offer many accessories for this lathe. Please refer to our current catalog for prices and ordering information.

We are also pleased to provide this instruction manual with the Model G1003 Lathe. This instruction manual was written to guide you through assembly (and, should you need to move the machine, disassembly), review safety considerations and cover general operating procedures. It represents our latest effort to produce the best documentation possible. If you have any constructive criticisms or comments that you feel we should include in our next printing, please write to us at the address below.

Manager, Technical Documentation
Grizzly Imports, Inc.
P.O. Box 2069
Bellingham, WA 98227-2069

Finally, we stand behind our machines. We have two excellent regional service departments at your disposal should the need arise. If you have any service questions or parts requests, please call or write to us at the appropriate location listed below.

If you live West of the Mississippi River, contact:
P.O. Box 2069
Bellingham, WA 98227
Phone (206) 647-0801

If you live East of the Mississippi River, contact:
2406 Reach Road
Williamsport, PA 17701
Phone (717) 326-3806

II. COMMENTARY

As with any tool or machine, a complete understanding of how this lathe operates is necessary for safe operation. Please take the time to read this manual thoroughly. If you do not understand something, **DO NOT** operate this machine. Contact us first for assistance or advice. Grizzly cautions that although our Safety Rules are extensive, they aren't necessarily comprehensive. The bottom line on safety is this: Make sure a setup or operation is safe *as it applies to your situation.*

We would also like to state that the specifications, drawings and photographs in this manual represent the Model G1003 as supplied when this manual was prepared. We are meticulous with our manuals; however, product changes or discrepancies can occur. Whenever possible, we send manual updates to all owners of a particular tool or machine. Should you receive one, please insert the new information with the old and keep it for reference.

We recommend that you keep a copy of our current catalog for complete information regardi Grizzly warranty and return policy. Should you need additional technical information relating this machine, parts, or general assistance, please contact the appropriate regional servi department.

We also believe additional information sources are very important to better realize the full potenti of this machine. Trade journals, metalworking magazines or your local library are excellent plac to start.

Again, thanks for choosing Grizzly.

III. SAFETY RULES FOR ALL TOOLS

There is a certain amount of danger associated with the use of this machine. Operating it wi respect and caution will considerably lessen the possibility of personal injury. If these safe precautions are ignored, injury to the operator or others in the area could occur.

The Model G1003 was designed specifically for metal turning in industrial, precision operation This machine should never be modified or used for any other purpose than that for which was intended. As well as being dangerous, modifications or improper use of the Model G10(will void all warranties.

1. **KNOW YOUR MACHINE**. Read the owner's manual carefully. Learn the machine's capabilities and limitations as well as the specific potential hazards associated with it.

2. **KEEP ALL GUARDS IN PLACE** and in working order.

3. **GROUND ALL NON-INSULATED TOOLS**. If the machine has a three-prong plug, it should be plugged into a grounded three-hole electrical receptacle. If an adapter is used to accommodate a two-prong receptacle, the adapter plug must be attached to a known ground. Never remove the grounding prong from the plug.

4. **REMOVE ADJUSTING KEYS AND WRENCHES**. Develop the habit of checking to see that keys and adjusting wrenches are removed from the machine before turning it on.

5. **KEEP WORK AREA CLEAN.** Cluttered areas and benches invite accidents.

6. **AVOID DANGEROUS ENVIRONMENTS.** Do not use power tools in damp or wet locations, or expose them to rain. Keep work area well lighted.

7. **MAINTAIN A SHOP "SAFE ZONE"**. Keep all visitors a safe distance from the work area.

8. **MAKE WORKSHOP CHILD-PROOF.** Use padlocks, lockable master switches, or remove starter keys.

9. **DO NOT FORCE MATERIAL INTO THE MACHINE.** It will do the job better and safer at the rate for which it was designed.

10. **USE THE RIGHT TOOL**. Do not use a tool or attachment to do a job that it was not designed to do.

11. **WEAR PROPER APPAREL.** Do not wear loose clothing, gloves, neckties or jewelry that may get caught in moving parts. Non-slip footwear is also recommended. Wear a hat or hair covering to contain long hair.

12. **USE SAFETY GLASSES AND EAR PROTECTION**. Also, use a dust mask or respirator if an operation produces fine filings or chips.

13. **SECURE WORK**. Use clamps or fixtures to hold work piece. It is safer than using your hands and frees both hands to operate the machine.

14. **DO NOT OVERREACH.** Keep proper footing and balance at all times.

15. **MAINTAIN MACHINE IN TOP CONDITION.** Keep cutting edges sharp and clean for safest, most accurate performance. Follow instructions for lubricating and changing accessories.

16. **DISCONNECT MACHINE** from power source before inspecting, servicing or changing accessories.

17. **USE RECOMMENDED ACCESSORIES**. Refer to the current catalog for recommended accessories. The use of improper accessories may be hazardous.

18. **AVOID ACCIDENTAL STARTING.** Make sure switch is in the "OFF" position before plugging in power cord.

19. **NEVER STAND OR LEAN ON MACHINE.** Serious injury could occur if the machine is tipped or if the cutting edge is accidentally touched.

20. **INSPECT MACHINE BEFORE EACH USE.** Before each use of the machine, any part that is damaged should be repaired or replaced. Check for proper alignment, binding, mounting, and any other conditions that may affect machine operation. Perform maintenance service promptly when called for.

21. **DIRECTION OF FEED**. Generally, feed work into a blade or cutter *against* the direction of rotation.

22. **NEVER LEAVE MACHINE RUNNING UNATTENDED — TURN POWER OFF**. Do not leave machine until it comes to a complete stop.

23. **DO NOT OPERATE MACHINE WHILE UNDER THE INFLUENCE** of drugs, or any medication that will affect your competence or judgement.

24. **DO NOT WORK IN HASTE** or operate machine if you are mentally or physically fatigued.

25. **IF THERE IS SOMETHING YOU DO NOT KNOW OR UNDERSTAND, DO NOT OPERATE MACHINE!** Ask for help first. Confusion can be dangerous.

26. **BAD HABITS ARE DANGEROUS.** Periodically review all safety procedures.

IV. UNPACKING

Your lathe and accessories have arrived in a crate on a small pallet. If you find damage to the components after you've signed the delivery receipt and the truck and driver have gone, you will need to file a freight claim with the carrier. Save the containers and all packing material for inspection by the carrier or their agent. Without the packing material, filing a freight claim could be difficult. Of course, if you ever need advice in this matter, please call us.

To uncrate your lathe, you'll need a hammer and pry-bar. Remove the nails from the bottom end of the wooden uprights, and lift the crate off the pallet. ***Note:*** This will require two people. Next, you will find that the lathe is anchored to its shipping pallet by bolts through its mounting brackets. Before you remove the bolts, take a careful inventory of the lathe and any accessories you may have ordered.

V. PIECE INVENTORY

After the crate has been removed from the pallet, you now have clear access to the lathe itself, a 4-jaw chuck, face plate, chip pan, and a toolbox. On the lathe, there should be:

- A 3-jaw chuck;
- A follow rest mounted in the carriage;
- The steady rest secured to the ways;
- The turret tool post mounted on the compound slide.

And the toolbox should contain:

- A pouch of metric Allen wrenches;
- A combination wrench, sized 14mm and 17mm at either end;
- An American Rocker tool post assembly;
- A 30-tooth change gear for metric threading;
- A 32-tooth change gear for metric threading;
- A wrench for each chuck;
- A square wrench for the turret tool post;
- A set of extra jaws for the 3-jaw chuck;
- Two MT #3 centers;
- A center reducing sleeve—from MT#5 to MT#3 (for spindle);
- A factory inspection record of the machine.

If anything is missing, call or write to the appropriate regional service department listed in the Introduction. If anything is damaged, please follow the procedures described in the "Unpacking" section at the top of this page.

VI. CLEANUP

All of the unpainted surfaces of your lathe have been treated with a thick, brown rust preventative to protect them from corrosion during shipment. The best way to remove this substance is with common paint thinner (mineral spirits) and plenty of clean rags. Do not use gasoline or other petroleum-based solvents because of their extremely low flash points. Nor should you use chlorine-based solvents—if you happen to splash some onto a painted surface, you'll ruin the finish. Before cleaning, please acknowledge the following safety rules when working with solvents:

- Read and follow all directions and warnings on the solvent label.
- Work only in a well ventilated area.
- Do not work near any type of open flame (e.g., pilot lights, kerosene heaters, and so on).
- **DO NOT** smoke while working with flammable material.
- Rags from the cleaning process are quite combustible. Dispose of waste towels so they do not create a fire hazard.

VII. SITE PLANNING

When adding heavy machinery to your shop, there are at least four major points to consider in deciding whether your workspace can handle the increased load. These include live floor loading, safe working clearances, lighting, and electrical requirements for the motor. We will review floor loading, working clearances, lighting and general electrical needs here. Specific electrical requirements will be covered in more detail in the following section.

Your total live floor loading, i.e., people, furniture and machines, should not exceed the maximum safe live load capacity designed into your floor. A 4" concrete floor typically found in a garage or a basement should be acceptable. A wood floor in a factory or commercial building is likely to be adequate, as is a floor in a commercial steel building. In any event, make sure the floor is structurally sound before you set up your lathe. You are cautioned that wood floors used in residential construction may be marginal, particularly in older homes. If you are unsure about the maximum live load capacity of your shop floor, consult with a structural engineer or architect.

Working clearances between machines and obstacles should also be considered when designing a new shop or adding machines to an existing shop. When planning your shop space, think of the kinds of work you'll be doing as well as the size of the material. The relative position of each machine for efficient material processing should also be considered. In any event, be sure to allow yourself sufficient room for a safe workplace.

Lighting and electrical planning are also very important. Lighting should be sufficient to eliminate shadow and bright enough to prevent eye strain. Electrical circuits should be dedicated or powered sufficently to handle combined motor amp loads. Outlets should be located near each machine so that power cords or extension cords will not obstruct traffic paths. Be sure to observe local electrical codes for proper installation if you add new lighting, outlets, or circuits.

VIII. ELECTRICAL SERVICE REQUIREMENTS

Wiring instructions for both voltages are included as an insert with this manual. For your convenience, the G1003 is pre-wired for 220V operation.

A. CIRCUIT LOADING

Your new Model G1003 Lathe will operate on either 110/115 volts or 220/230 volts, single phase power. The 1½ HP motor will draw roughly 18 amps at 110/115 volts or 9 amps at 220/230. These loads aren't excessive; however, if you operate this lathe on any circuit that is already close to capacity, it might blow a fuse or trip a circuit breaker. If an unusual load does not exist, however, and power failure still occurs, consult a qualified electrician. Otherwise, consider a dedicated circuit for your lathe.

B. GROUNDING

This lathe must be grounded. This lathe is equipped with a power cord with a ground wire. Please ensure that the lathe is continuously grounded from the motor to the machine frame and then to a known ground. Verify that any existing outlet and circuit you intend to use is actually grounded. If it is not, it will be necessary to run a separate 12 AWG copper ground wire from the outlet to a known ground. If you're adding a new circuit, ensure that the circuit is grounded to the grounding terminal in your electrical service panel. Under no circumstances should the grounding pin from any three-pronged plug be removed.

C. GENERAL INFORMATION

Fusing Fuse at 30 amps for 110/115V service, or 20 amps for 220/230V service. Fuses rated higher will not adequately protect this motor. **Note**: Any equipment returned to Grizzly that shows evidence of being over-fused will be repaired or replaced totally at the customers expense, *regardless of the present warranty status.*

Extension Cords If used, extension cords must be rated Hard Service (grade S) or better. Conductor size must be 14 AWG (110/115V) or 12 AWG (220/230V) for cords up to 50 feet long. Your extension cord must also contain a grouind wire and plug pin. Always repair or replace extension cords if they become damaged.

D. A WORD OF CAUTION

In this section we have covered some basic electrical requirements for the safe operation of your Model G1003 Metal Lathe. As with the safety rules in the preceding section, these requirements are not necessarily comprehensive. Further, you must be sure that your particular electrical configuration complies with state and local codes. The best ways to ensure compliance are to check with your local municipality or licensed electrician.

IX. ASSEMBLY/DISASSEMBLY

Should you need to store, relocate, or otherwise move your lathe, it is possible that you may need to disassemble all or part of the machine. After all, it weighs nearly half a ton; it will certainly be easier to move in pieces. On the other hand, if it isn't necessary to take your machine apart, don't. This section is intended for those who need to make the machine lighter for transportation, and for those who simply want to become more familiar with the lathe.

A. CARRIAGE AND TAILSTOCK

Before you begin, make sure the machine is unpluggged.

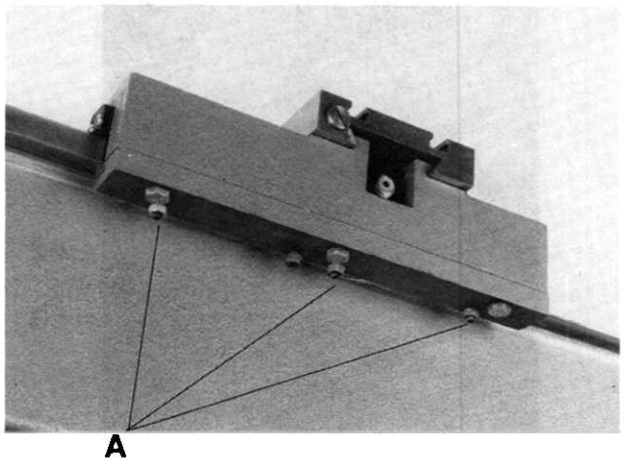


Figure 1

1. Remove the tailstock first. This is accomplished by removing the nut from the botttom of the tailstock clamp that holds the tailstock assembly in place on the bedways. Lift the tailstock straight up from the bed.

2. Next, loosen, but do not remove, the setscrews and checknuts (located at "A" in Figure 1) holding the gib to the carriage. The setscrews will require a 3mm Allen wrench for removal, and the checknuts will require a 10mm wrench.

3. Turn the Forward/Reverse switch on, then off. This eliminates any remaining charge in the capacitor.

4. Remove the sheet metal cover surrounding the motor compartment.

5. Open the motor terminal wiring box. Take note of all existing connections, then label them exactly as they are. Disconnect the wires. Loosen the bushing at the terminal box and remove the power cord from the motor.

6. Remove motor from mounting bracket. You'll need a 12mm wrench for the four bolts on the bracket.

7. Now remove the mounting bracket itself. Use a 6mm Allen wrench to remove the cap screws.

8. On the bottom rib of the headstock casting, inside the motor compartment, are three more 6mm cap screws. These are for perpendicular adjustment of the headstock in relation to the bed. For now, just remove the center cap screw and leave the other two loose.

B. END GEAR & GEARBOX

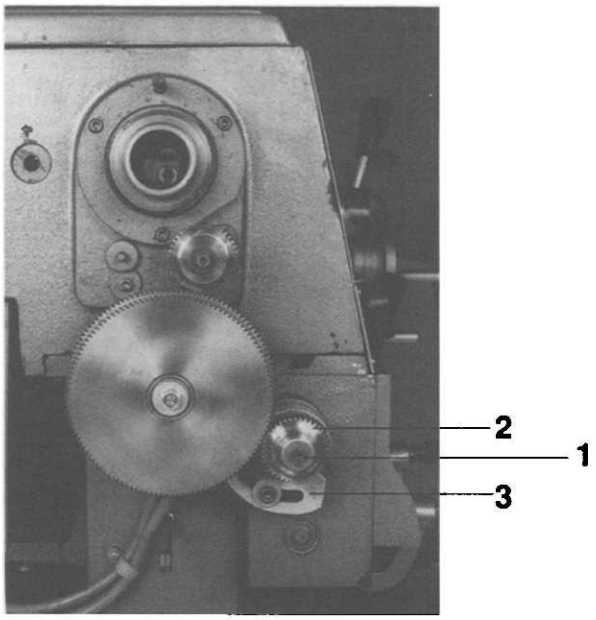


Figure 2

1. Unscrew the two knurled knobs on the cast cover and remove the cast cover from the end of the machine.

2. Using a 5mm Allen wrench, remove the lower gear on the gearbox drive train (#1 in Figure 2). This gear is keyed to its shaft—be careful not to lose the key when the gear comes off.

3. Removal of the idler gear (#2) and the swing bracket (#3) are next. This will be easier if you treat the gear and the bracket as one unit. To loosen the swing bracket, you will need a 6mm Allen wrench. This bracket assembly was designed for a very tight fit to keep the gears enmeshed. As a result, it will require an extra—but careful—effort to remove it. After you've loosened the cap screws, rock the bracket assembly back and forth to work it free of its hub. It may be necessary to spray a penetrating oil to ease movement. In any case, *do not attempt to pry the bracket assembly from its hub.*

4. The wiring harness connecting the control panel to the magnetic contactor compartment has a small clamp on it about halfway between these two areas. Remove this clamp now.

5. At the end of the machine are two of the four cap screws that hold the headstock assembly to the bed. Loosen these with an 8mm Allen wrench.

C. GAP INSERT AND CHUCK

1. **This step is optional.**
   The gap insert is removed by unscrewing the four 8mm cap screws and lifting the insert out of the bed. Since the lathe was painted after it was assembled, you may need to tap the edges of the insert with a dead-blow hammer to break the paint line and dislodge the insert. *(**Note**: There are two threaded guide studs near the middle of the insert. Do not remove these.)* After the insert is removed, clean all its surfaces and spray them with a metal lubricant/sealer such as Top-Cote®. Then return the insert to the bed.

2. With a 6mm Allen wrench, remove the follow rest. It is attached to the carriage with two cap screws.

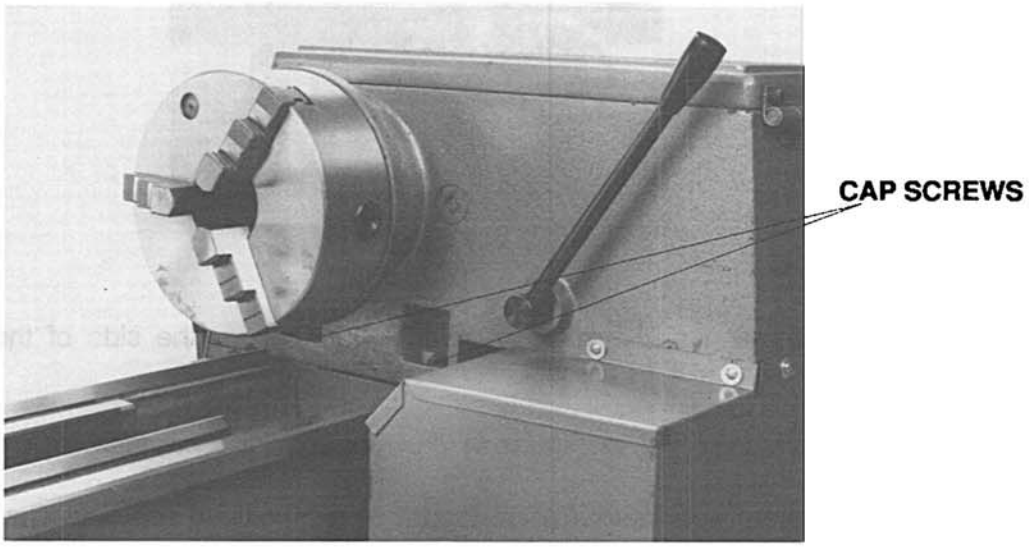


Figure 3

3. Chuck removal is next. Any time you have to remove the chuck, develop the habit of placing a softwood or plywood board on top of the ways to prevent machine damage should you drop the chuck. Open the access door to the back gears and engage the detent. This locks the spindle. Then insert a chuck wrench into one of the holes, and gently tap it counterclockwise to loosen it. When loose, carefully unscrew chuck from spindle.

4. At the end of Section IX.B, you loosened two cap screws (of four) that hold the headstock assembly to the bed. The other two screws, visible in Figure 3, may also be loosened now.

D. CARRIAGE, APRON AND HEADSTOCK

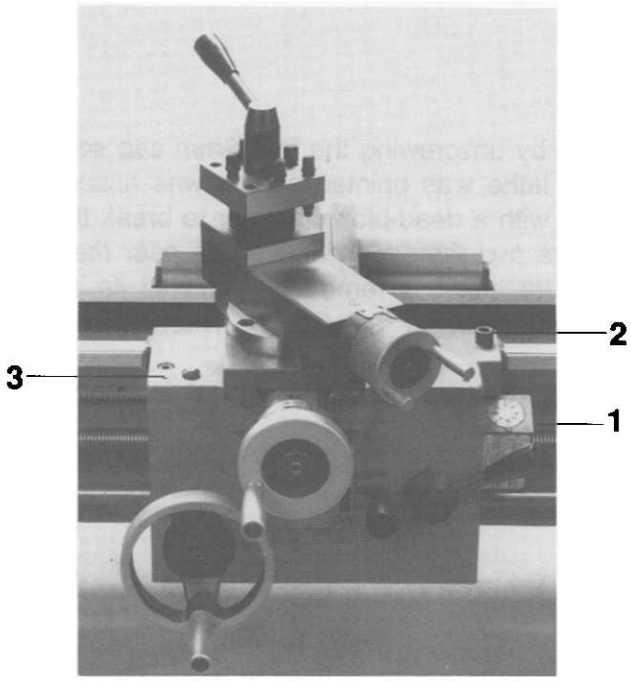


Figure 4

1. Remove the threading dial indicator (#1 in Figure 4) from the side of the apron. One 5mm cap screw holds it in place.

2. Loosen the cap screw (#2 in Figure 4) that engages the carriage lock.

3. There are two 4mm setscrews ("A" in Figure 5) on the feed rod hub. Carefully remove these and the spring and ball under each of them. Put them in a safe place.

4. The lead screw and feed rod are secured to their respective driving hubs by slotted spring-steel pins (roll pins). Drive these pins out with a small drift.

5. Remove the two 6mm cap screws ("X" in Figure 6) from the bearing block that hold the lead screw and feed rod. This block is pinned to the bed casting. Pull the pin straight off the block, then gently remove the block itself. Then free the rods from the block.

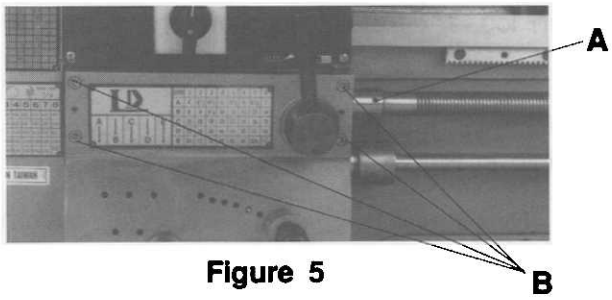


Figure 5

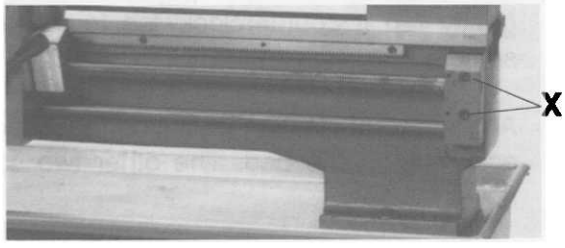


Figure 6

6. Carefully pull the lead screw through the open half-nuts and remove it from the machine.

7. Repeat this process with the feed rod, keeping in mind that the feed rod has a worm gear keyed to it that will fall off as the rod is withdrawn. Be ready to catch this gear.

8. Next, remove the four 5mm cap screws ("B" in Figure 5) that secure the cover of the quick change gearbox.

9. After you remove the cover, you will see three 6 mm cap screws. You can remove the gearbox itself by unscrewing these cap screws. The frame casting of the gearbox is pinned to the bed casting. Remove the frame by pulling it straight up.

10. On top of the carriage are two 6mm cap screws that hold the apron in place. Remove these now. The apron is pinned to the carriage top casting; remove this by pulling straight down. One pin is shown at #3 in Figure 4; the other is obscured by the compound slide's dial handle.

11. Slide the carriage off the bed casting.

NOTE: The purpose of the following two steps is to ensure the protection of the seating surface on the headstock where it engages the bed casting, and to prevent the spindle bearing lubricant from leaking. *Please do not deviate from the instructions in steps 12 and 13.*

12. You are about to remove the headstock assembly. You'll need wood blocking, roughly 8" x 8" x 18" long, to rest the headstock on after removal. You don't necessarily need an 8" x 8" construction beam; you can stack-laminate 2 x 10s to achieve an acceptable substitute. However, don't simply stack loose lumber without gluing the individual pieces together or otherwise securing them to form a solid chunk of wood.

13. Now remove the four bolts that you had loosened in previous steps. Remove the headstock and place it gently on the wood block. Make sure it is level. Be aware of any shims that may have fallen out during headstock removal; you may need these to level the headstock later when you reassemble the machine. Now is also a good time to clean up any remaining parts that may still have cosmolene on them.

To reassemble your machine, simply reverse the procedures in the preceding pages, starting with Step 13 above.

X. LEVELING AND ALIGNMENT

To ensure precision operation, your G1003 Lathe must be perfectly level. This section covers the necessary steps to achieve a level lathe as the basis for further adjustments and calibration.

1. First, the lathe must be mounted to its stand. The stand can either be purchased from Grizzly (see current catalog for more information) or fabricated yourself. When designing your own stand, keep in mind that the net weight of the lathe is close to 1000 lbs.

2. To begin leveling, place a good level (a machinist's level is ideal, though a high-quality carpenter's level will do) longitudinally along the ways. It may be necessary to insert shims between the floor and the headstock or tailstock end of the base to make the lathe level along its length.

3 When the lathe is level along this axis, lay a combination square across the ways to establish a perpendicular leveling reference. Now lay the level across the ways along the blade of the square. It may be necessary to insert shims between the floor and the front or rear edges of the base to make the lathe level across its width.

4. Double check accuracy in both directions to ensure that the machine didn't tilt in one plane or the other during the leveling process.

A. AXIAL ALIGNMENT

There are a variety of ways to obtain precision alignment of headstock and tailstock. However, due to space restrictions, we can only list one. By suggesting this particular method, we are not implying it is the best way. Nor is it the worst. However, it is reliable, has been tested by actual machinists, and is very efficient. With the method described in the steps below, it is possible to achieve accuracy of ±.0001". For this method you will need a dial indicator, a micrometer, and round bar stock about 18" long and 1½" - 2" in diameter.

1. Mount the bar stock in the 3-jaw chuck.

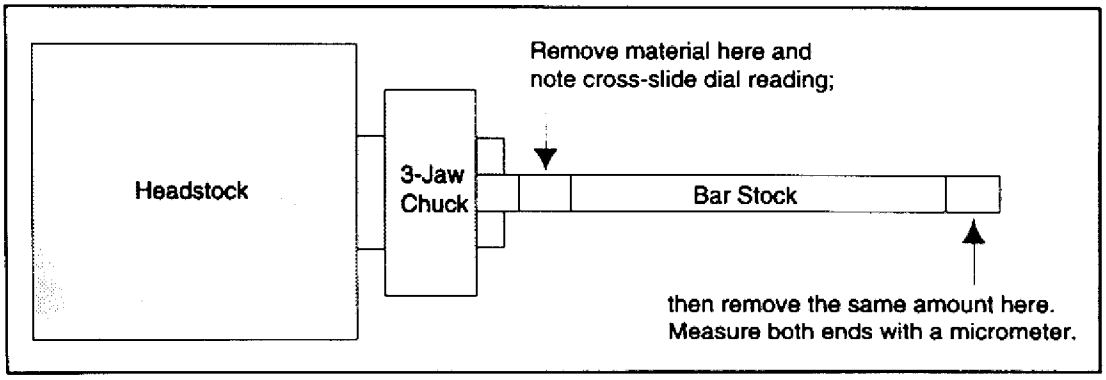
2. With the dial indicator mounted in the carriage cross-slide, determine the amount of runout from the headstock end of the bar stock to the tailstock end. If runout is within .01", go directly to Step 4. Consider this a coarse adjustment.

3. At the extreme outside edge of the headstock casting are the three cap screws (introduced in section IX.A) you'll be making fine adjustments with. The center cap screw is the only one of the three that is actually screwed into the bed casting—the other two are screwed into the headstock casting only; their ends rest on the bed casting. So, the center screw acts as a pivot and the other two are adjusters. Use these screws along with the dial indicator to achieve the nominal tolerance of .01" in Step 2.

4. Now remove a small amount of material (e.g., .01") for approximately 1" at the right end of the bar stock. Note the reading of your cross-slide dial.

5. Next, retract the cutting tool, move the carriage to the left end of the bar stock, and remove the same amount of material from the left end of the bar stock. Use the same cross-slide dial reading as you did in Step 4.

6. Measure both ends of the bar stock with the micrometer and note any deviations. Adjust with the cap screws noted in Step 3 and repeat Steps 4 & 5 until deviations are eliminated or within allowable tolerances.



B. SHIMMING

Although the headstock has been aligned horizontally (as in the previous section), it is not necessarily aligned in its vertical plane. Precision shimming is a way to correct this. **Note:** *This section assumes that the headstock has been properly aligned.*

1. If the headstock is slightly higher than the tailstock, first determine the exact amount of deflection using the method described in the previous section.

2. When you have determined the amount of deflection, insert shims of this thickness under each of the four corners of the tailstock casting, between the tailstock casting and the tailstock base.

3. Check your results and adjust as necessary.

4. If the headstock is slightly lower than the tailstock, place shims (equal to the thickness of the measured deflection) under each of the four corners of the headstock casting.

5. Test your results and adjust as necessary.

XI. CONTROLS

This section introduces the various controls of your Model G1003 Lathe. As in previous sections, different assemblies and groups of controls will be introduced pictorially, with reference in the accompanying text.

A. HEADSTOCK GROUP

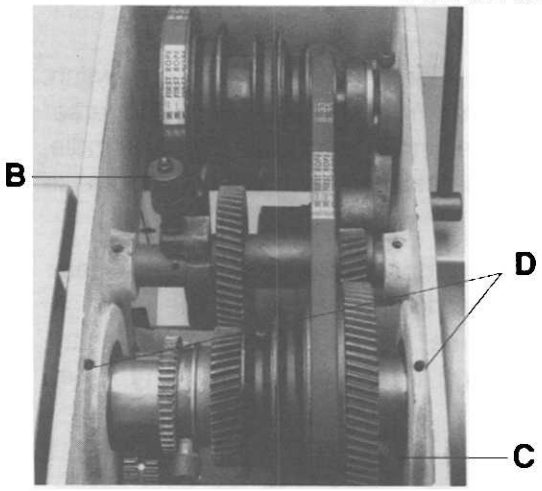


Figure 7

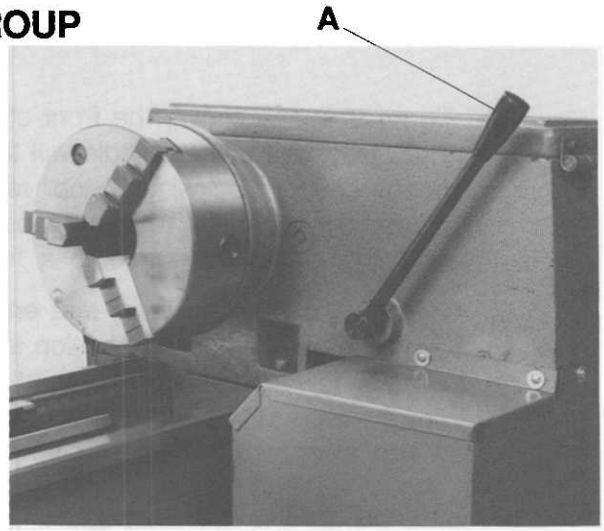


Figure 8

1. "A" in Figure 8 is the *belt tension lever.* This lever positions the intermediate pulleys on the drive line. Shifting the lever rearward tightens the belts; shifting forward loosens them. Generally, it is good practice to keep the belts untensioned when you're not using the lathe.

2. "B" in Figure 7 is the *back gear engagement pawl.* This lever engages the back gearing on the main spindle gears. Pull up on the pawl to disengage it, then pull it toward you to engage the back gears.

3. "C" in Figure 7 is the *back gear spindle lock.* In normal operation, the driven spindle pulley and the first back gear are connected by a pin. However, if speeds within the range of back-gearing are selected, this first back-gear must be disengaged or the spindle will lock. Unlock this back gear by unscrewing the large fastener on the gear. When you are finished, don't forget to engage the lock.

4. "D" in Figure 7 are *oil holes.* Obviously, these aren't controls, but this is where shaft lubrication takes place for the headstock group.

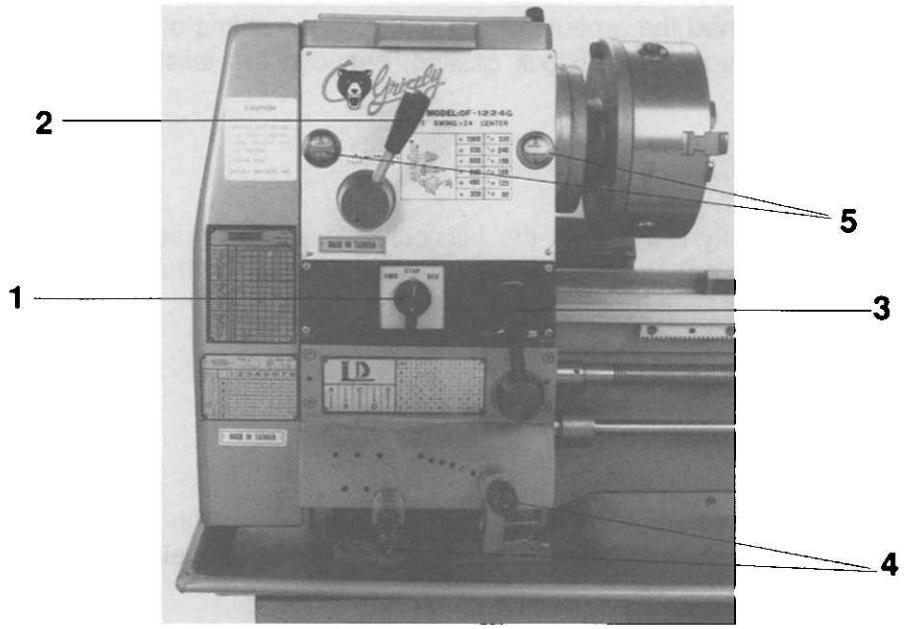


Figure 9

5. Figure 9 above shows the front of the headstock. #1 in Figure 9 is the direction switch. "Forward" means the spindle will turn clockwise as viewed from the end gear. "Reverse" means counterclockwise. "Stop" really means neutral; i.e., no power gets to the spindle, but that doesn't mean rotation stops immediately. **Note**: Before reversing directions, please allow the spindle to come to a full stop.

6. #2 in Figure 9 is the lever that engages the gearing that drives the quick-change gear box. This lever in the up position is neutral; shifted to the right, it will cause the carriage to move toward the work; shifted to the left, it will cause the carriage to move away from the work. **CAUTION: Although you may disengage this gear train at any time, do not engage it while the spindle is turning.**

7. #3 in Figure 9 is the lever that allows selection of either the feed rod or the lead screw for carriage movement. (The lever in step 6 automatically engages both.) Shift the lever to the right to select the lead screw, to the left for the feed rod, and leave it in the middle for neutral.

   To save wear on the lead screw, try to use the lead screw only when cutting threads. Otherwise, use the feed rod.

9. The levers at #4 in Figure 9 are speed selectors. When you're cutting threads, though, these levers, in conjunction with the chart on the gear case cover, select the number of revolutions the spindle will turn per inch of linear travel. The lever on the left has a range of A - E, and the right lever has a range of 1 - 8. As your selections increase from low (A and 1) to high (E and 8), the thread pitch gets finer. For example, a setting of A and 1 will move the carriage one inch for every four turns of the spindle. When set at E and 8, it will take 112 turns of the spindle to get the carriage to move one inch.

10. #5 in Figure 9 are the sight gauges for the spindle bearing oil reservoirs. Correct oil level is when the meniscus of the oil is approximately in the middle of the window.

    Note: If it becomes necessary to drain the oil from their reservoirs, these windows are the only access openings available. Simply pry the window out (they are mounted in rubber grommets) and have plenty of rags handy to wipe up any spillage. Oil will come out, but to reduce the chances of gushing, run the lathe a few minutes prior to draining. This will disperse the oil and will give you a bit more control over clean-up.

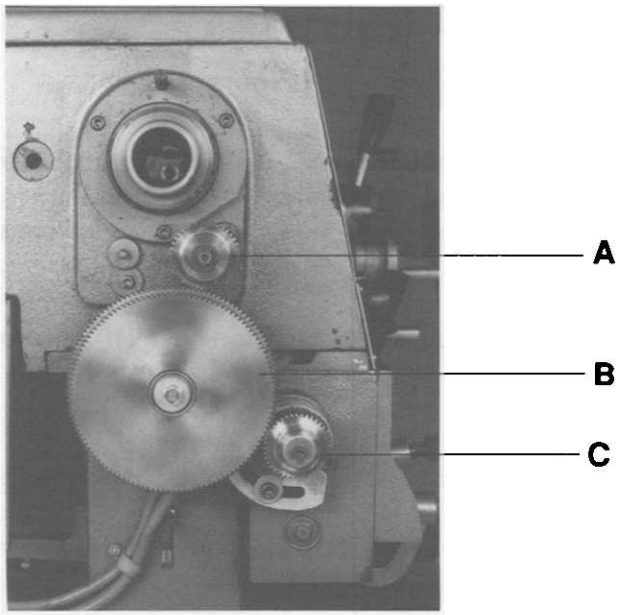


Figure 10

11. "A" in Figure 10 is the upper change gear.

14. "B" in Figure 10 is the middle combination gear (120/127 teeth).

15. "C" in Figure 10 is the lower change gear.

B. CARRIAGE AND APRON

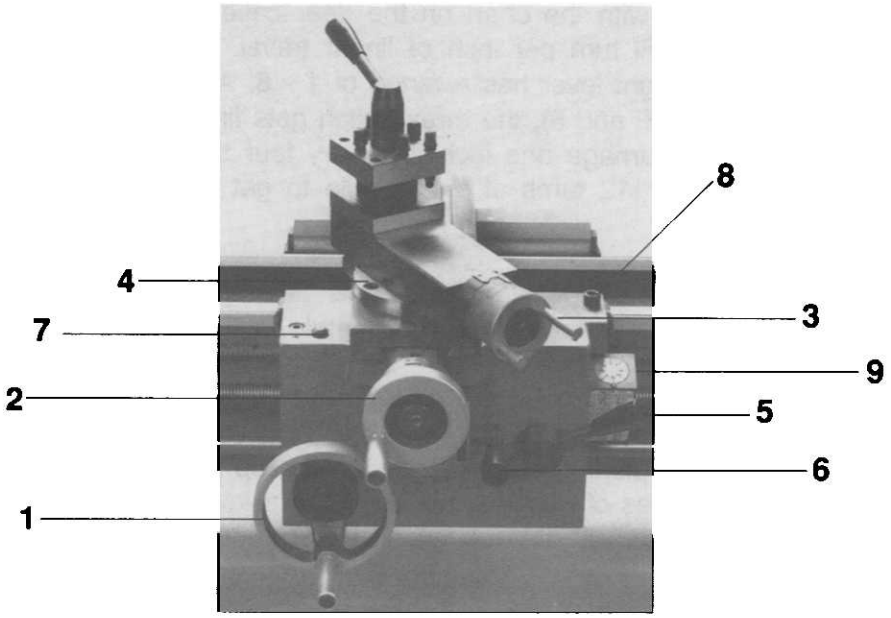


Figure 11

1. #1 in Figure 11 is the *longitudinal dial.* Turning this dial moves the carriage along the bed. For calibration purposes, the graduated sleeve in back of the handle can be turned independently of the dial by holding the handle of the dial with one hand and turning the sleeve with the other.

2. #2 in Figure 11 is the *cross-slide dial.* Turning this dial moves the cross-slide across the bed. Calibration of this dial's graduated sleeve is done in the same way as for the longitudinal dial.

3. #3 in Figure 11 is the *compound slide dial.* Its graduated sleeve is also adjustable.

4. The two 6mm cap screws at #4 lock the compound slide in place. One cap screw is not visible in this photo.

5. #5 in Figure 11 is the *lead screw engagement lever.* Pushing the lever down engages the carriage to the lead screw. **WARNING: Do not engage the carriage to the lead screw if the lead screw is not turning. Also: Do not engage the lead screw if the feed rod is in use.**

6. #6 in Figure 11 is the *feed direction lever.* If the feed rod is running forward and you push the lever down, the cross slide will move across the bed (toward the workpiece). If the feed rod is running forward and you pull the lever up, the carriage will move along the bed (toward the headstock).

7. #7 in Figure 11 is the *oil filler plug.* This will be covered in greater detail in the "Lubrication" section later in the manual.

8. #8 in Figure 11 is a longitudinal locking stud; i.e., when the stud is engaged, the carriage will not move along the bed.

8. #9 is the the threading dial indicator. If you don't intend to use it, it can be removed by unscrewing the 5mm cap screw holding the indicator in place. However, if the threading dial indicator will be used, please keep the following points in mind:

    - The lead screw may be engaged at any time while cutting a thread that is a whole number multiple of the pitch of the screw.

    - Threads that are even numbers but aren't whole-number multiples of the pitch should be chased with the threading dial indicator starting at an even number on the dial.

    - Odd-numbered threads must always be chased beginning with the same number on the indicating dial.

    - When cutting uniquely-sized threads, engage the lead screw and *do not disengage it until the thread is completely finished.* After the first pass, ease off the cross-feed dial, reverse the spindle until the cutting tool is clear of the work, then make another pass. Repeat this as necessary.

    - ***Never*** disengage any of the gears in the drive line to the lead screw for any reason. As in previous sections, if spindle reversal is necessary, stop the machine first, then reverse the motor.

C. TAILSTOCK

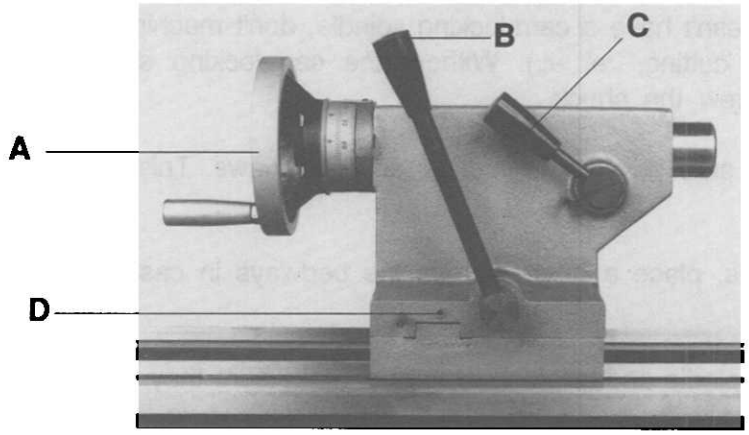


Figure 12

1. "A" in Figure 12 is the *tailstock handwheel.* Turning it clockwise moves the quill out; turning it counterclockwise moves it in. The graduated sleeve is adjustable for calibration.

2. "B is the *tailstock locking lever.* When the lever is up, the tailstock is locked to the bed; moving the lever down unlocks it. The degree of friction for this lever can be adjusted by either tightening or loosening the locknut on the stud under the tailstock.

3. "C" in Figure 12 is the *quill locking lever.* It operates in the same way as the tailstock locking lever.

4. "D" is the adjustment screw used for tailstock alignment.

XII. LATHE SAFETY

Earlier in this manual we covered important safety information for all tools. This section will cover information specific to the metal lathe.

1. Remove chuck keys and all adjustment tools as soon as adjustments are completed.

2. Never change quick-change gears or directional gears while the spindle is turning.

3. Never reverse motor direction with the motor running.

4. Disconnect the machine before performing any maintenance.

5. When doing faceplate work, ensure that the work is sufficiently balanced.

6. Inspect chucks and faceplate regularly. If they are improperly seated, do not operate the lathe.

7. Make sure all electrical connections are sound before operating the lathe.

8. Never use fingers to apply grease to open gearing. Use a stick or spreader instead.

9. Since this machine doesn't have a cam-locking spindle, don't machine in reverse (a.k.a. "climb cutting," "back cutting," et al.). Without the cam-locking spindle, this sort of machining could unscrew the chuck.

10. When possible, make sure stock is fully engaged in the jaws. This extends the life of the jaws.

11. When changing chucks, place a board across the bedways in case the chuck should slip.

12. Frequently check the spindle and tailstock centers to make sure they are true and parallel to the bed.

13. As a rule, do not cover the machine—a cover could create condensation.

14. Keep the motor cover in place at all times.

15. Habits—good and bad—are hard to break. Develop good habits and shop safety will become second nature to you.

XIII. MAINTENANCE

This section will cover how to access the major adjustment points. As with good safety habits, good maintenance habits will enhance the machine's performance and predictability in any machining operation.

A. GIBS

There are three main gibs to be covered in this section: The carriage gib, the cross-slide gib, and the compound slide gib. And, although technically it isn't a gib, we'll include the nut on the cross-slide screw because it is used in conjunction with the gib.

The Carriage Gib

Access to the carriage gib is gained from the rear of the carriage. See Figure 1, page 7. Adjustment is accomplished by turning the 3mm setscrews and tightening or loosening the 10mm checknuts. There is also a 5mm cap screw here that is used for this gib adjustment. When adjusting this gib, keep the following two points in mind:

1. The goal of this adjustment is to keep the carriage as tight as possible on the bed without binding;

2. Since you'll be sliding the carriage along the bed frequently to check your adjustments, make sure the bed is adequately lubricated.

The Cross-Slide Gib

This gib is tapered. It can be adjusted by turning both cap screws at either end of the gib as shown in Figure 13 below.

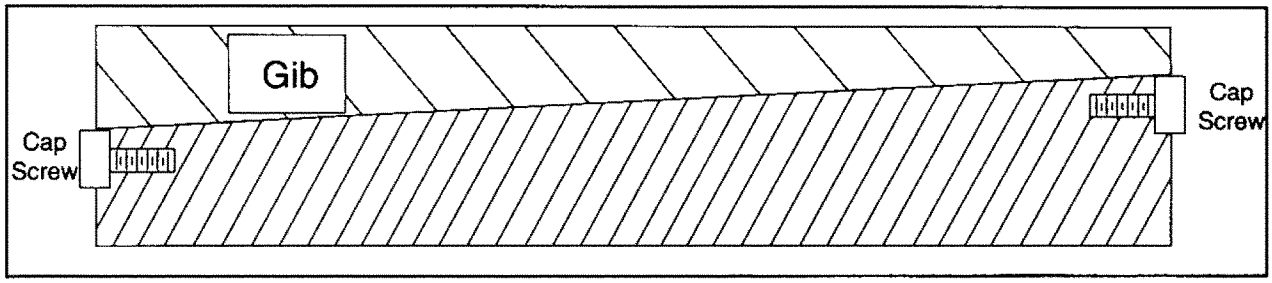


Figure 13

Note: If you tighten one of the cap screws, you must loosen the other by the same amount.

The Compound Slide Gib

The compound slide gib is adjusted exactly the same way as the cross-slide gib.

The next step is the adjustment of the nut on the cross-slide screw. On top of the slide is a 6mm cap screw and on either side of it are two 4mm cap screws. As the cross-slide gib is being adjusted, loosen these three screws. Then, when the cross-slide operates smoothly, do the following:

1. Back the cross-slide up fully. This ensures that the axis of the screw and the axis of the nut it travels through are parallel. Then adjust the 6mm cap screw first to the desired height.

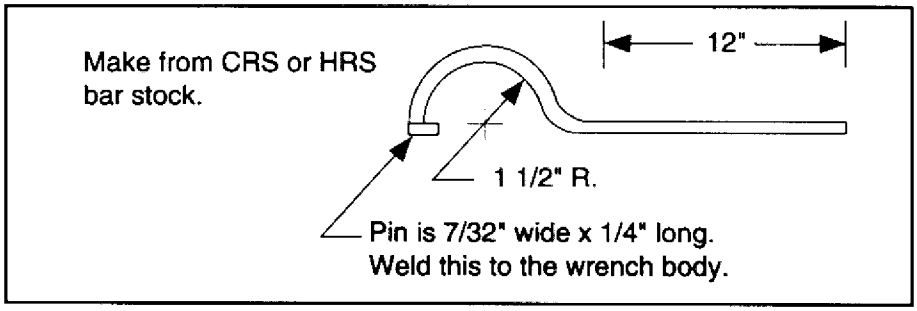
2. Now slowly advance the two 3mm cap screws down to lock the block in place. Try to operate the cross-slide. If it won't move or if it binds, you have probably over-torqued one or both of the cap screws. Loosen them both and try again.

3. When the cross-slide operates smoothly, loosen one of the 3mm cap screws approximately $^1/_{10}$ of a turn, and tighten its mate by the same amount. Be very careful not to overdo this final step—premature wear could result.

B. BEARING PRE-LOAD

The purpose of pre-loading the spindle bearings is very similar to applying a small pre-load to the carriage gib—the idea is to eliminate unnecessary play while maintaining freedom of movement. However, a bit more precision is required here, as you will see in following procedures.

Before you begin, you will need two spanner wrenches. Whether you buy them or make them yourself, they should look like the ones in the sketch below.



Generally speaking, you should pre-load the spindle bearings during initial setup and every two years after. Otherwise, you should do it whenever the spindle is removed from the machine (e.g., when a belt is replaced). Keep the following points in mind when pre-loading your bearings:

- The locknuts you are about to adjust have a circumference of 9.42";
- One full turn of the locknut advances it 0.0625";
- The optimum amount of pre-load is between 0.002" and 0.004"

You will need some way of measuring this amount of pre-load on the spindle. One method is described below.

1. At a convenient location on the rim of a locknut, scribe two lines 0.1" apart.

2. Now, if you turn the locknut 0.1" according to the lines you've scribed, you know you've advanced the nut along the thread by 0.00625" (0.1 x 0.0625).

With that in mind, let's apply the pre-load.

1. Begin with one of the locknuts off. It would also help to remove the chuck from the headstock.

2. Mount a dial indicator in the tool post. Loosen the locknut to the point where you can get repeatable readings on your dial indicator.

3. Slowly tighten the locknut, observing your dial indicator. The moment there is no play between the spindle and the bearing, note where your first mark is—this is where you begin the crucial measurement.

4. Remember that optimum pre-load is between 0.002" and 0.004". Tighten locknut until you are within this range.

5. Now install the second locknut and lock it next to the nut you just adjusted, making sure the adjusted nut doesn't move.

C. BELTS

For changing belts, a 33" "B" belt is required.

1. Drain the oil from both of the spindle bearing oil cellars.

2. Remove anything mounted to the spindle.

3. Remove the jackshaft that holds the two back-gear spurs and the back-gear shifter. Two 4mm socket head setscrews at each end secure the shaft/bushing assemblies in the headstock casting. Be careful when you remove these assemblies and note the position of the eccentrics at the ends of the shafts. See Figure 14 below.

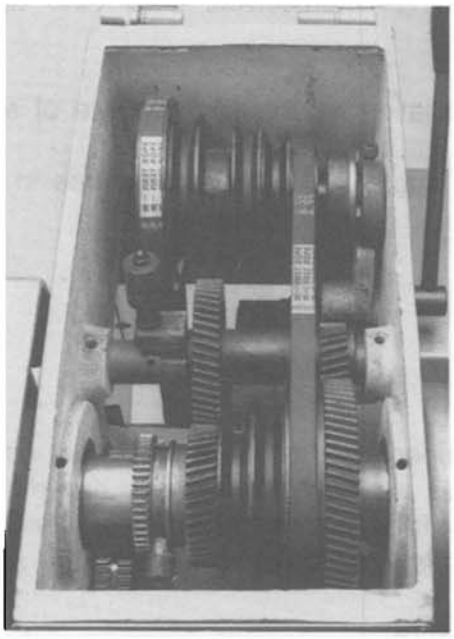


Figure 14

4. As you can see from Figure 14, it will be necessary to feed the new belt through the yoke. The easiest way to do this is to remove the hinge pin that this speed-change pulley swings on. A single 4mm setscrew secures the hinge pin, located in the lower rear of the compartment.

5. Now install the new belt, reassemble the speed-change unit, and remount it in the machine.

6. Remove the two locknuts from the spindle.

7. Now remove both the right and left-hand bearing caps with a 5mm Allen wrench. **Note:** If you're careful while removing these caps, you can save and re-use the fiber washers they're seated on. If you happen to tear them, though, they must be replaced.

8. The speed-change pulley must now be removed. As you can see in Figure 14, this pulley is secured to the spindle in two places: on the right, by the back-gear spur, and on the left, by a locking collar. The two setscrews on the pulley are for access only; they do not hold anything together internally. For now just loosen the 3mm setscrew on the collar to the left.

9. The gear that drives the lead screw is keyed to the spindle, but is free to move back and forth. Be careful during re-assembly not to damage the shifting dog.

10. Now that everything is loose, position two wood sticks (about 1" x 1") between the back-gear spur and the headstock casting wall. Position the gear with the keyway up. This will prevent pushing the gear key through the right oil seal in Step 11.

11. Position a piece of scrap wood on the end of the spindle. With a brass hammer, tap the spindle until it is free of the gears. Carefully "walk" the spindle out.

12. When the spindle is clear of the left side of the headstock casting, slip the new belt into place.

13. Before you reassemble anything, inspect the spindle bearing oil cellars and the areas around them, and the bearings themselves. Clean the area with mineral spirits, if necessary.

14. Reposition the spindle. Installation will be the opposite of steps 1-11.

15. Pre-load the bearing stack according to the procedures in Section B.

16. Refill the oil cellars.

D. LUBRICATION

This lathe was shipped with proper spindle bearing lubricant already in place. However, it's a good idea to visually inspect this lubricant. If you have any doubts about its integrity, replace it. This section will deal with specifically where and when to lubricate your lathe. **Note:** *The motor bearings and the bearings on the rear speed change pulley assembly require no lubrication.*

Perform Daily or After Each Use

1. Lubricate all ways, slides, and screws with general purpose oil. Wipe the oil on with a towel or use the oil caps, as appropriate.

2. Grease the open gears that drive the quick-change gearbox.

3. Check the spindle oil level and condition at the sight windows. A low oil level should

be brought up to the middle of the sight glass. Again, if there is any indication that the oil is degraded or otherwise contaminated, drain it, flush the cellar with mineral spirits, and replace the oil.

Weekly or After Five Machine Uses

1. Pour about a tablespoon each of general purpose oil in the oil cup for the quick-change gearbox, and the oil cup on the apron.

2. Oil the tailstock at the small oil cap fittings provided.

3. There are bronze bearings in the speed change pulley. Lubricate these by removing the 4mm setscrew in the pulley and adding 10-15 drops of general purpose oil.

4. Grease the back gears and the open gearing within the headstock. You'll need a grease gun to apply grease to the axle and pinion on this gear set.

Annually or After 200 Hours of Continuous Use

1. Drain spindle bearing oil cellars and flush with mineral spirits. Refill with a general purpose, detergent machine oil. As stated in Section XI.A, Step 10, access to these reservoirs is gained directly through the oil level windows.

2. Remove apron from carriage and drain old oil. After making sure the interior of the apron casting is clean (use mineral spirits, if necessary), refill with 10-12 ounces of general purpose oil.

XIV. CLOSURE

The following pages contain general machine specifications, parts diagrams and lists, and Warranty and Return information for your Model G1003 Metal Lathe.

If you need parts or help in assembling your machine, or if you need operational information, we encourage you to call the appropriate Regional Service Department. Our highly trained service technicians will be glad to help you.

If you have any comments or concerns dealing specifically with this manual, please write to our Bellingham, Washington location using the address listed in the Introduction.

XV. MACHINE DATA

GRIZZLY MODEL G1003 12" x 37" GAP-BED METAL LATHE

Design Type ..... Bench Model

Overall Dimensions:
Height ..... (Without Stand) 30"
Length ..... 70"
Width ..... 30"
Bed Width ..... 7½"
Spindle Bore ..... 1 9/16"
Spindle Taper ..... M.T. #5
Tailstock Taper ..... M.T. #3
Shipping Weight ..... 1000 lbs.
Net Weight ..... 850 lbs.

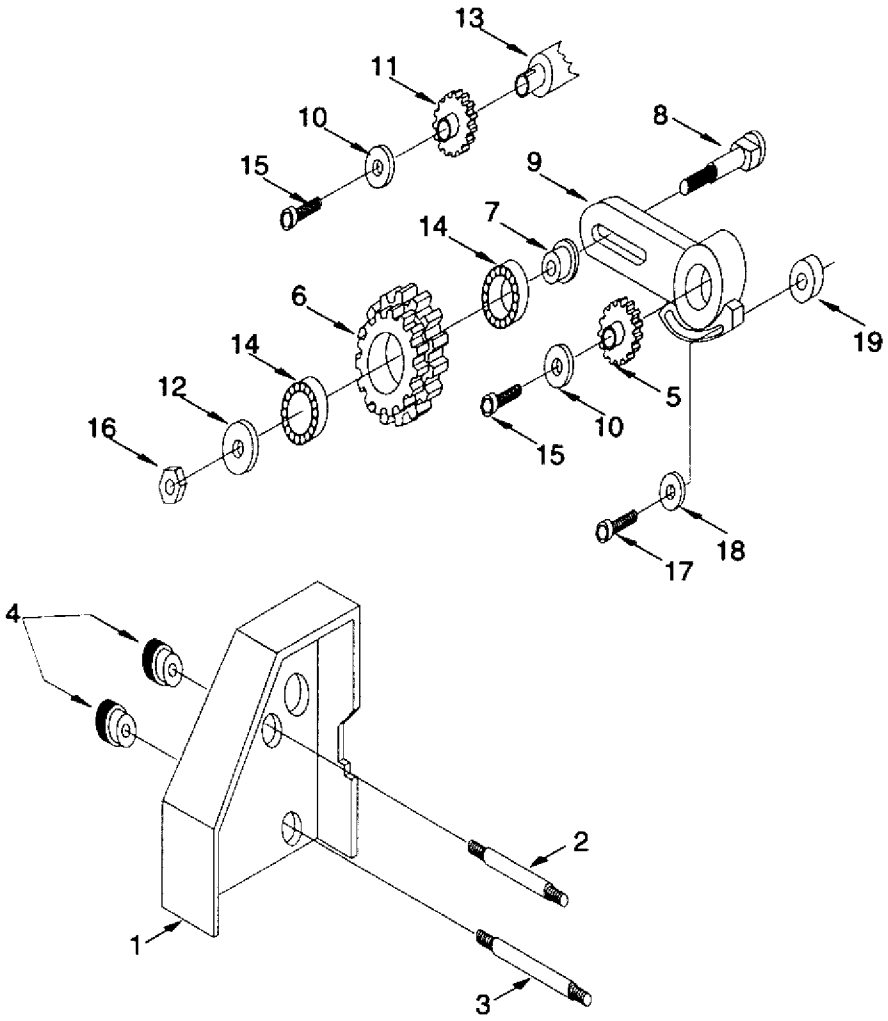
Capacities:
Swing Over Bed ..... 12"
Swing Over Gap ..... 18"
Swing Over Saddle ..... 6"
Distance Between Centers ..... 37"
Top Slide Travel ..... 3½"
Cross Slide Travel ..... 6¾"
Tailstock Barrel Travel ..... 4"
Spindle Speeds (RPM) 70, 110, 160, 170, 240, 300, 360, 420, 640, 650, 900, 1400

Construction ..... Cast Iron

Motor:
Horsepower ..... 1½ HP
Phase Type/Voltage ..... Single Phase;110V/220V
Amps 18/9
Cycle and RPM 60 Hertz/1720RPM
Switch ..... Magnetic, Reversible
Power Transfer ..... Belt Drive
Bearings ..... Shielded, Permanently Lubricated

Specifications, while accurate, are subject to change without notice.

XVI. PARTS DIAGRAM, END GEAR & COVER



XVII. PARTS LIST, END GEAR & COVER

Ref. No.	Part No.	Description
1	P1003601	End Cover
2	P1003602	Cover Stud
3	P1003603	Cover Stud
4	P1003604	Cover Set Knob
5	P1003605	Driven Gear (40T)
6	P1003606	Idler Gear
7	P1003607	Bushing
8	P1003608	Idler Gear Axle
9	P1003609	Lever Quadrant
10	P1003610	Special Washer
11	P1003605	Driven Gear (40T)

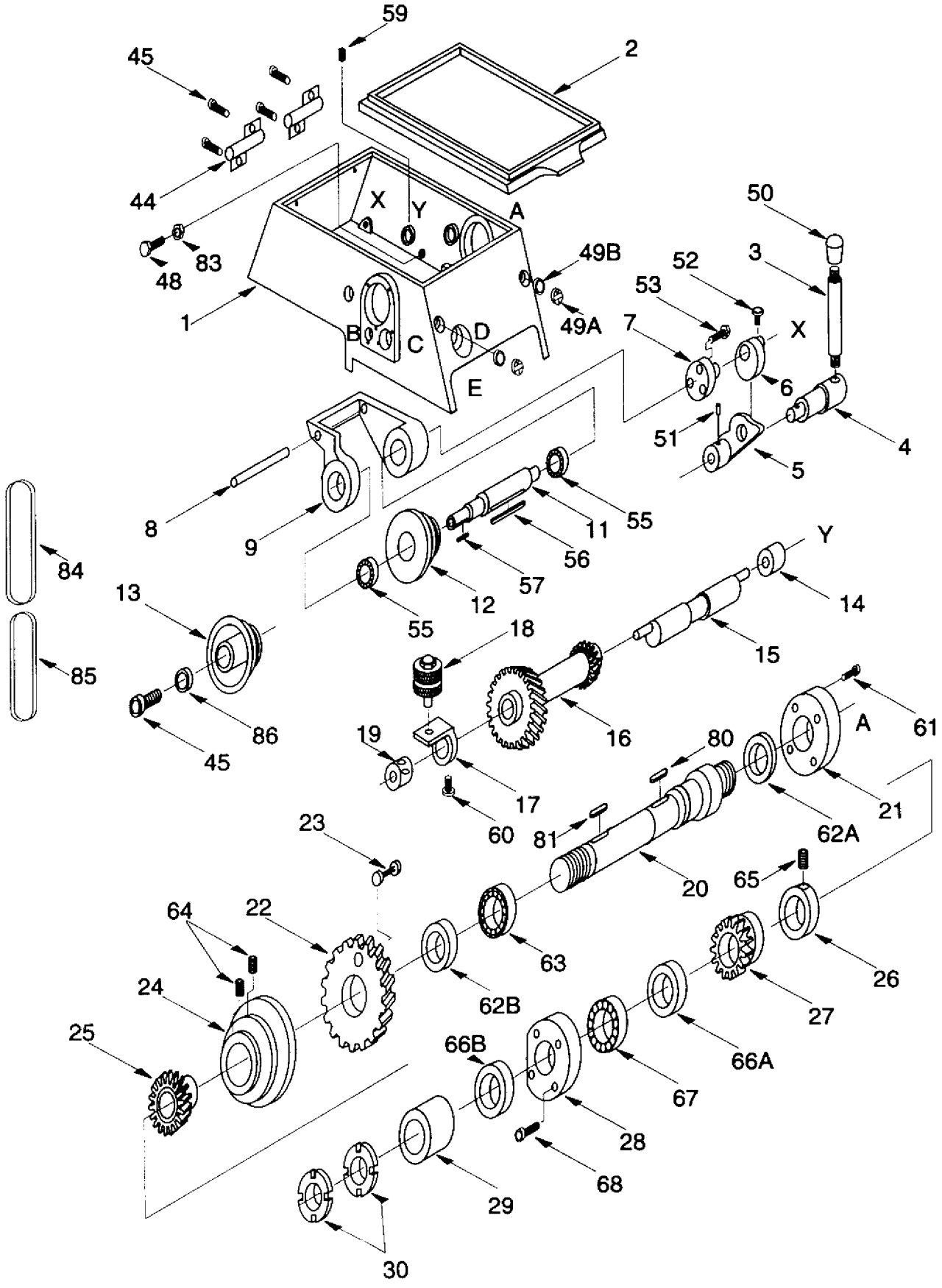
Ref. No.	Part No.	Description
11A	P1003605A	Driven Gear (30T; not shown)
11B	P1003605B	Driven Gear (32T; not shown)
12	P1003612	Special Washer
13	P1003613	Train Shaft
14	P6202ZZ	Bearing (6202)
15	PSB26M	Cap Screw M6-1.0x12 mm
16	PN02M	Hex Nut M10 - 1.5
17	PSB45	Cap Screw M8-1.25x45 mm
18	PW06	Flat Washer 1/4"
19	P1003619	Spacer

XVIII. PARTS LIST, HEADSTOCK

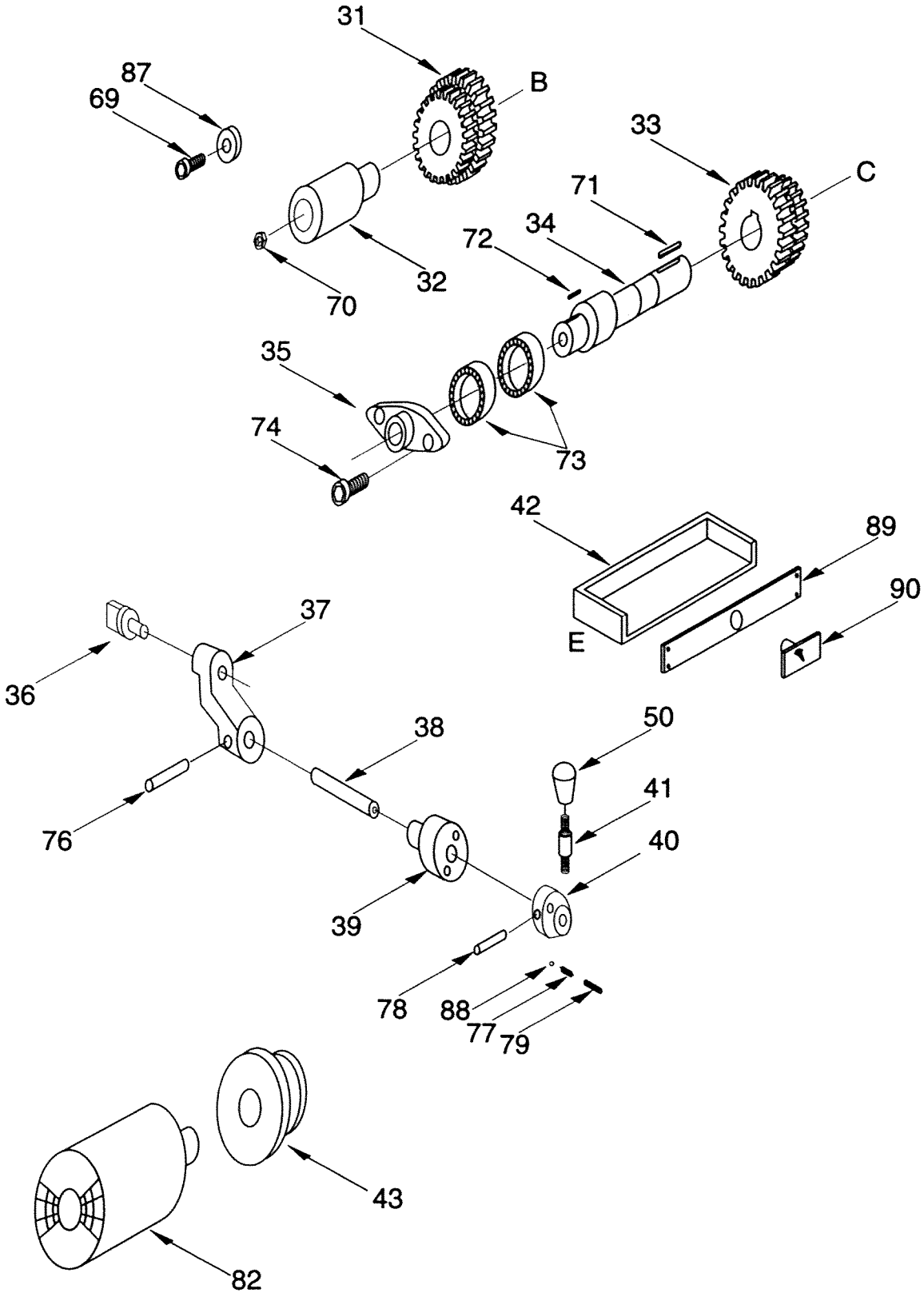
Ref. No.	Part No.	Description
1	P1003001	Headstock Casting
2	P1003002	Headstock Cover
3	P1003003	Locking Lever
4	P1003004	Shaft
5	P1003005	Bracket
6	P1003006	Cam
7	P1003007	Bearing Cap
8	P1003008	Shaft
9	P1003009	Arm
11	P1003011	Pulley Shaft
12	P1003012	3 V-Belt Pulley
13	P1003013	2 V-Belt Pulley
14	P1003014	Bushing
15	P1003015	Cam Shaft
16	P1003016	Rear Axle Gear
17	P1003017	Shift Bushing
18	P1003018	Locating Device
19	P1003019	Locating Bushing
20	P1003020	Main Spindle
21	P1003021	Front Bearing Cap
22	P1003022	Helical Gear
23	P1003023	Locking Bolt Assembly
24	P1003024	Spindle Pulley
25	P1003025	Helical Gear
26	P1003026	Collar
27	P1003027	Shifting Gear
28	P1003028	Rear Bearing Cap
29	P1003029	Spacer
30	P1003030	Spanner Nut
31	P1003031	Idler Gear
32	P1003032	Shaft
33	P1003033	Gear
34	P1003034	Train Shaft
35	P1003035	Bearing Cap
36	P1003036	Gear Shifter
37	P1003037	Shifting Crank
38	P1003038	Knob Shaft
39	P1003039	Bushing
40	P1003040	Direction Control
41	P1003041	Control Lever
42	P1003042	Switch Box
43	P1003043	Motor Pulley
44	P1003044	Hinge
45	PSB26M	Cap Screw M6-1.0 x 12 mm

Ref. No.	Part No.	Description
48	PB07M	Hex Bolt M8-1.25 x 25 mm
49A	P1003049A	Oil Level Window
49B	P1003049B	Gasket
50	P1003050	Knob
51	P1003051	Roll Pin
52	PSB31M	Cap Screw M8-1.25 x 25 mm
53	PB02M	Hex Bolt M6-1.0 x 12 mm
55	P6204	Bearing (6204)
56	P1003056	Key
57	P1003057	Key
59	PSS16	Setscrew 1/4" - 20 x 1/2"
60	PSB14	Cap Screw 3/8" - 16 x 1"
61	PSB02	Cap Screw M6-1.0 x 20 mm
62A	P1003062A	Seal (80-100-12)
62B	P1003062B	Seal (60-80-12)
63	P1003063	Tapered Roller Bearing (30212)
64	PSS16M	Setscrew M8-1.25 x 10 mm
65	PSS02M	Setscrew M6-1.0 x 6 mm
66A	P1003066A	Seal (55-75-12)
66B	P1003066B	Seal (65-85-12)
67	P1003067	Tapered Roller Bearing (30211)
68	PSB32M	Cap Screw M6-1.0 x 17 mm
69	PSB26M	Cap Screw M6-1.0 x 12 mm
70	P1003070	Grease Zerk
71	P1003071	Key
72	P1003072	Key
73	P6203ZZ	Bearing (6203)
74	PSB01M	Cap Screw M6-1.0 x 16 mm
76	P1003076	Roll Pin
77	P1003077	Spring
78	P1003078	Roll Pin
79	PSS17M	Setscrew M8-1.25 x 6 mm
80	P1003080	Key
81	P1003081	Key
82	P1003082	Motor
83	PN03M	Hex Nut M8-1.25
84	PVB32	V-Belt (B-32)
85	PVB33	V-Belt (B-33)
86	PW06	Flat Washer 1/4" - 20
87	P1003087	Special Washer
88	P1003088	Ball
89	P1003089	Switch Mounting Plate
90		

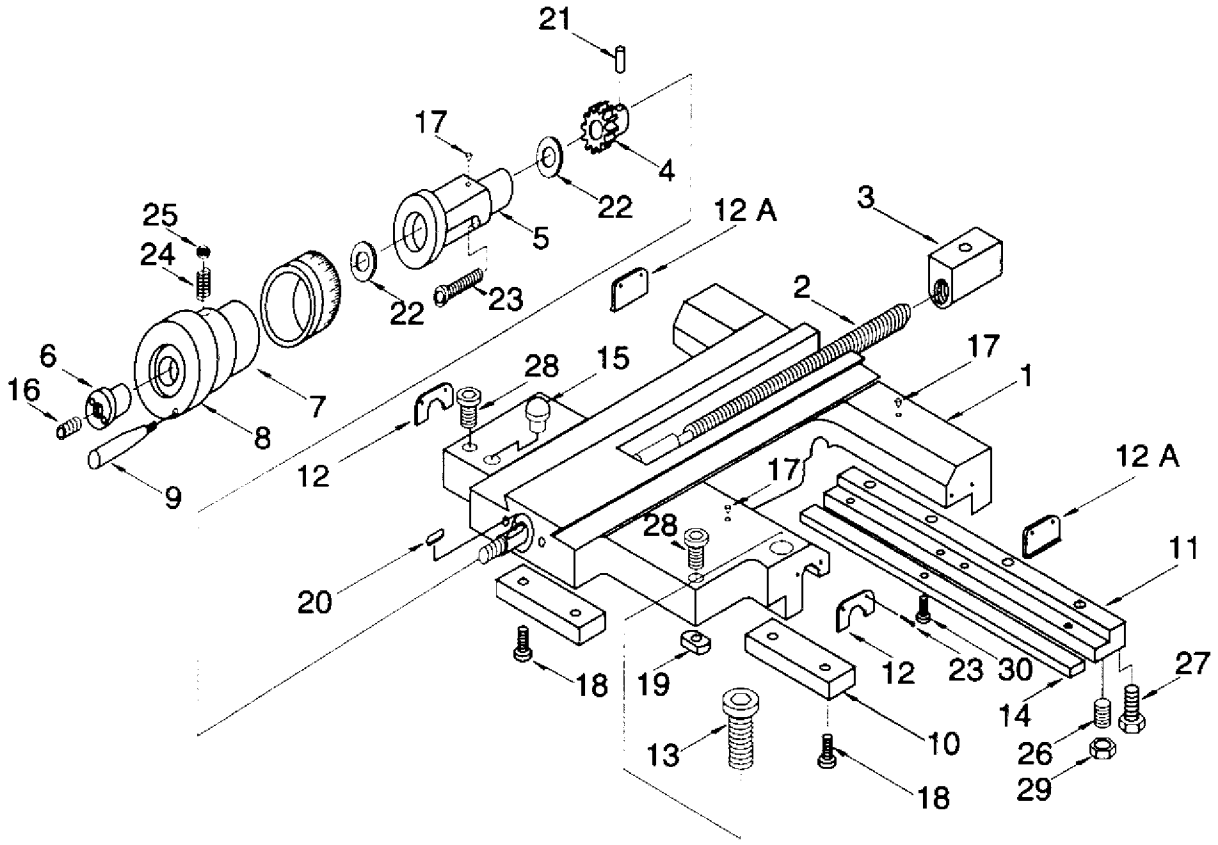
XIX. PARTS DIAGRAM, HEADSTOCK—PART A



XX. PARTS DIAGRAM, HEADSTOCK—PART B



XXI. PARTS DIAGRAM, CARRIAGE

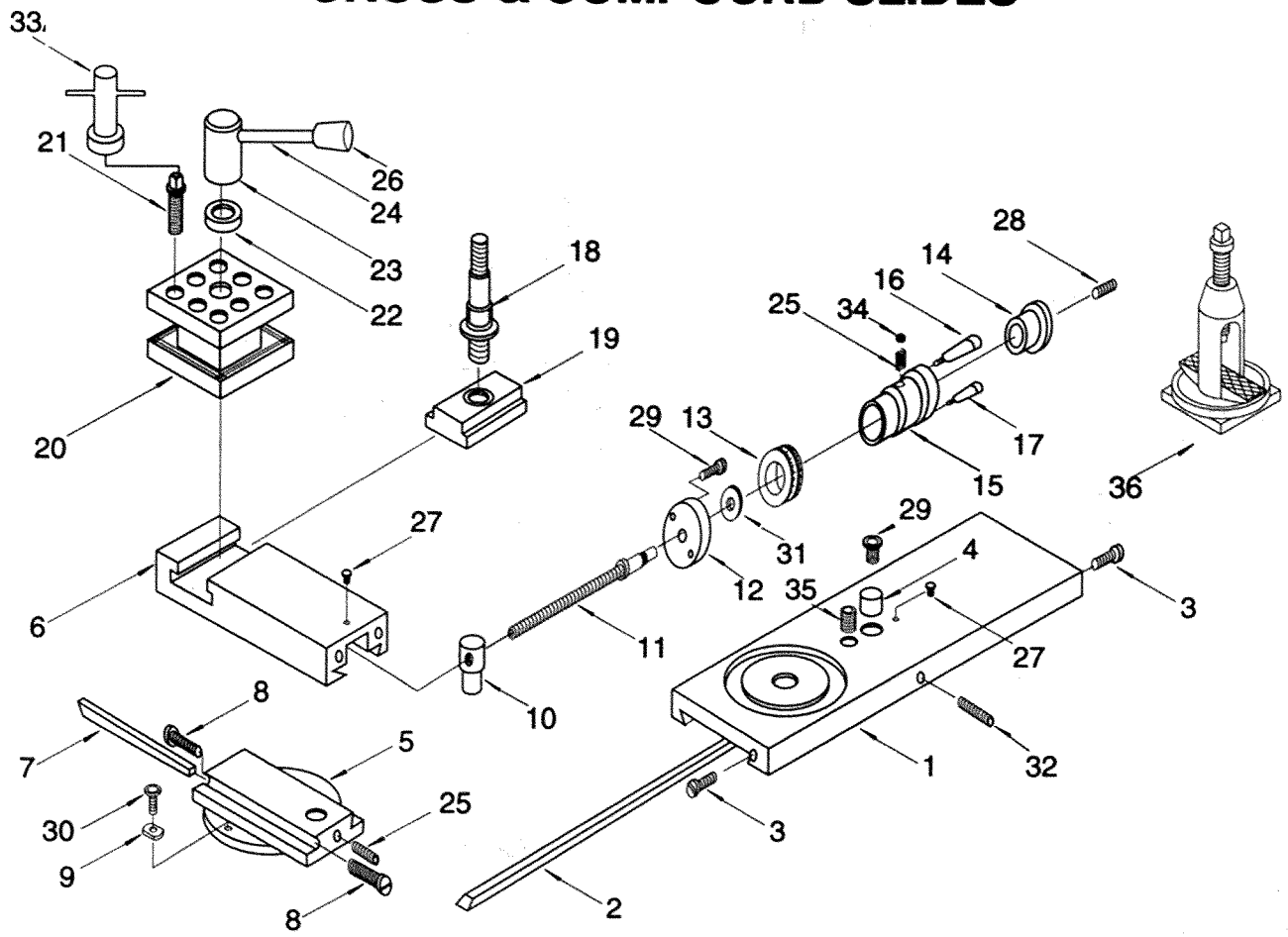


XXII. PARTS LIST, CARRIAGE

Ref. No.	Part No.	Description
1	P1003101	Main Carriage Casting
2	P1003102	Cross Feed Screw
3	P1003103	Cross Feed Nut
4	P1003104	Cross Feed Pinion
5	P1003105	Cross Feed Screw Bushing
6	P1003106	Spanner Nut
7	P1003107	Cross Feed Dial
8	P1003108	Cross Feed Handle
9	P1003109	Hand Knob
10	P1003110	Front Clamp
11	P1003111	Rear Clamp
12	P1003112	V-Wiper
12A	P1003112A	Wiper
13	P1003113	Carriage Lock Bolt
14	P1003114	Gib
15	P1003115	Oil Plug

Ref. No.	Part No.	Description
16	PSS15M	Setscrew M8-1.25 x 16 mm
17	P1003117	Oil Cap
18	PSB11M	Cap Screw M8-1.25 x 16 mm
19	P1003119	Carriage Lock Nut
20	PK17M	Key 5 x 5 x 9
21	P1003121	Roll Pin
22	P1003122	Thrust Bearing
23	PS06	PH Screw #10-24 x 3/8"
24	P1003124	Spring
25	P1003125	Ball
26	PSS11M	Setscrew M6-1.0 x 16 mm
27	PB07M	Hex Bolt M8-1.25 x 25 mm
28	PSB34M	Cap Screw M8-1.25 x 34 mm
29	PN01M	Hex Nut M6-1.0
30	PSB01M	Cap Screw M6-1.0 x 16 mm

XXIII. PARTS DIAGRAM, CROSS-& COMPOUND SLIDES



XXIV. PARTS LIST, CROSS- & COMPOUND SLIDES

Ref. No.	Part No.	Description
1	P1003201	Cross Slide
2	P1003202	Cross Slide Gib
3	P1003203	Gib Adjustment Screw
4	P1003204	Screw Set Bushing
5	P1003205	Swivel
6	P1003206	Compound Slide
7	P1003207	Compound Slide Gib
8	P1003208	Gib Adjustment Screw
9	P1003209	Swivel Lock Nut
10	P1003210	Compound Nut
11	P1003211	Compound Screw
12	P1003212	Compound Screw Bushing
13	P1003213	Compound Dial
14	P1003106	Spanner Nut
15	P1003215	Compound Handle
16	P1003216	Long Handle
17	P1003217	Short Handle
18	P1003218	Tool Post Pin

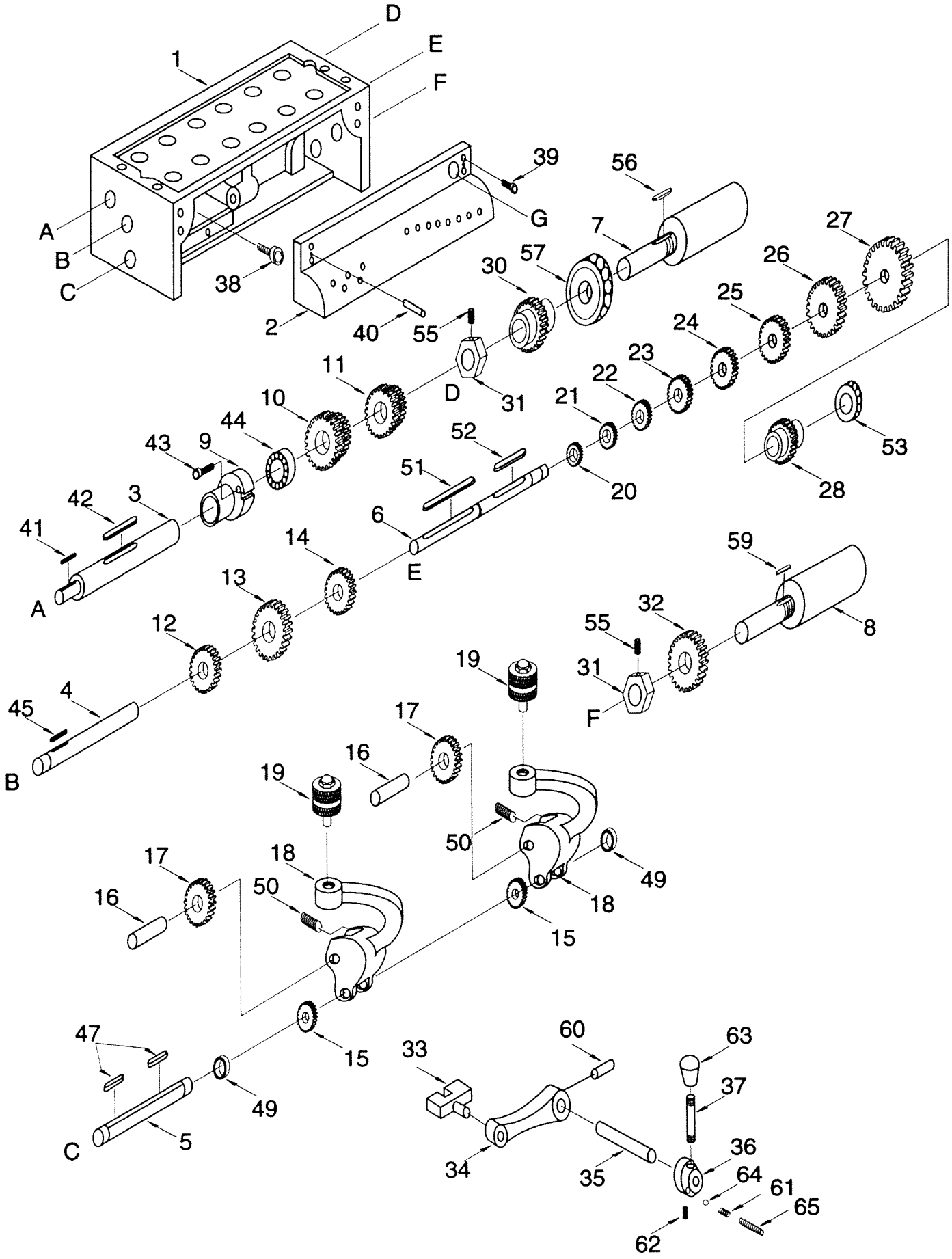
Ref. No.	Part No.	Description
19	P1003219	T-Slot Clamp Nut
20	P1003220	Tool Post
21	P1003221	Set Bolt
22	P1003222	Spacer
23	P1003223	Tool Post Clamp
24	P1003224	Clamp Lever
25	P1003124	Spring
26	P1003050	Knob
27	P1003117	Oil Cap
28	PSS18M	Setscrew M12-1.75x12mm
29	PSB14M	Cap Screw M8-1.25x20mm
30	PSB11M	Cap Screw M8-1.25x16mm
31	P1003231	Thrust Bearing
32	PSS09M	Setscrew M8-1.25x20 mm
33	P1003233	Tool Post Wrench
34	P1003125	Ball
35	PSS09M	Setscrew M8-1.25x20 mm
36	P1003236	Rocker Tool Post Assembly

XXV. PARTS LIST, GEAR BOX

Ref. No.	Part No.	Description
1	P1003701	Gear Box
2	P1003702	Cover
3	P1003703	Spindle Shaft
4	P1003704	Spindle Shaft
5	P1003705	Shifting Shaft
6	P1003706	Spindle Shaft
7	P1003707	Lead Screw Shaft
8	P1003708	Feed Shaft
9	P1003709	Bearing Cap
10	P1003710	Gear 16T/32T
11	P1003711	Gear 16T/32T
12	P1003712	Gear 16T
13	P1003713	Gear 16T/32T
14	P1003714	Gear 16T/32T
15	P1003715	Gear 16T
16	P1003716	Shaft
17	P1003717	Gear 36T
18	P1003718	Gear Change Handle
19	P1003719	Gear 16T
20	P1003720	Gear 16T
21	P1003721	Gear 18T
22	P1003722	Gear 19T
23	P1003723	Gear 20T
24	P1003724	Gear 22T
25	P1003725	Gear 24T
26	P1003726	Gear 26T
27	P1003727	Gear 28T
28	P1003728	Shifting Gear
29	P1003729	Thrust Nut
30	P1003730	Gear 24T
31	P1003731	Thrust Nut
32	P1003732	Gear 24T
33	P1003733	Gear Shifter

Ref. No.	Part No.	Description
34	P1003734	Shifting Crank
35	P1003735	Shaft
36	P1003736	Gear Change Lever
37	P1003737	Control Lever
38	PSB28M	Cap Screw M6-1.0 x 15 mm
39	PPSB01M	Cap Screw M6-1.0 x 16 mm
40	PRP06M	Roll Pin 5 x 24
41	PK17M	Key 5 x 5 x 9 mm
42	P1003742	Key
43	PSB01M	Cap Screw M6-1.0 x 16 mm
44	P6203ZZ	Bearing (6203)
45	P1003745	Key
47	P1003747	Key
49	P6202ZZ	Bearing (6202)
50	PSS02M	Setscrew M6-1.0 x 6 mm
51	PK16M	Key 5 x 5 x 67 mm
52	P1003752	Key
53	P6203ZZ	Bearing (6203)
55	PSS01M	Setscrew M6-1.0 x 10 mm
56	PK17M	Key 5 x 5 x 9 mm
57	P1003757	Thrust Bearing
58	PSS01M	Setscrew M6-1.0 x 10 mm
59	P1003759	Key
60	PRP27M	Roll Pin 5 x 28 mm
61	P1003761	Spring
62	PRP29M	Roll Pin 5 x 45 mm
63	P1003050	Knob
64	P1003064	Ball
65	PSS02M	Setscrew M6-1.0 x 6 mm

XVI. PARTS DIAGRAM, GEARBOX

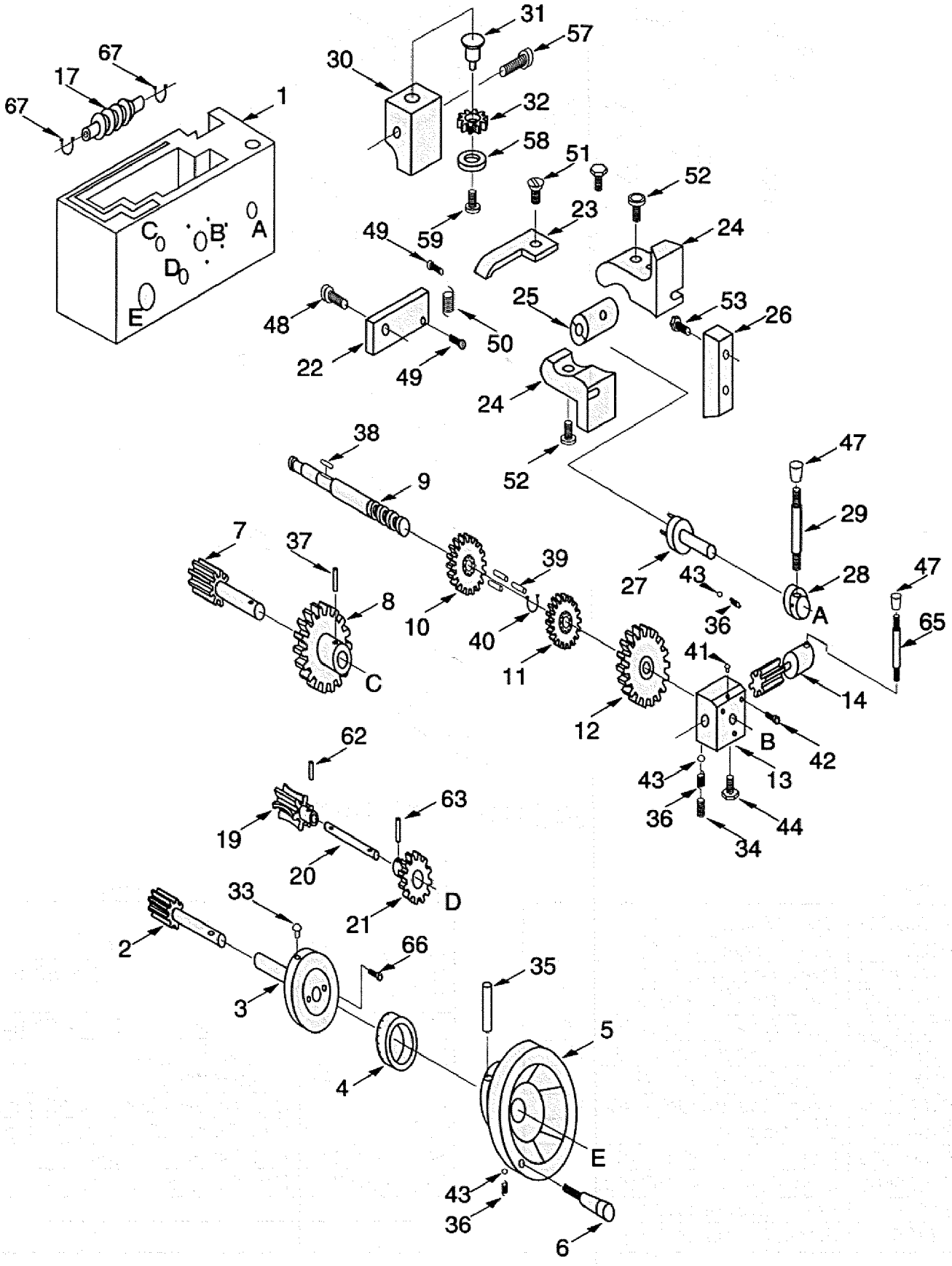


XXVII. PARTS LIST, APRON

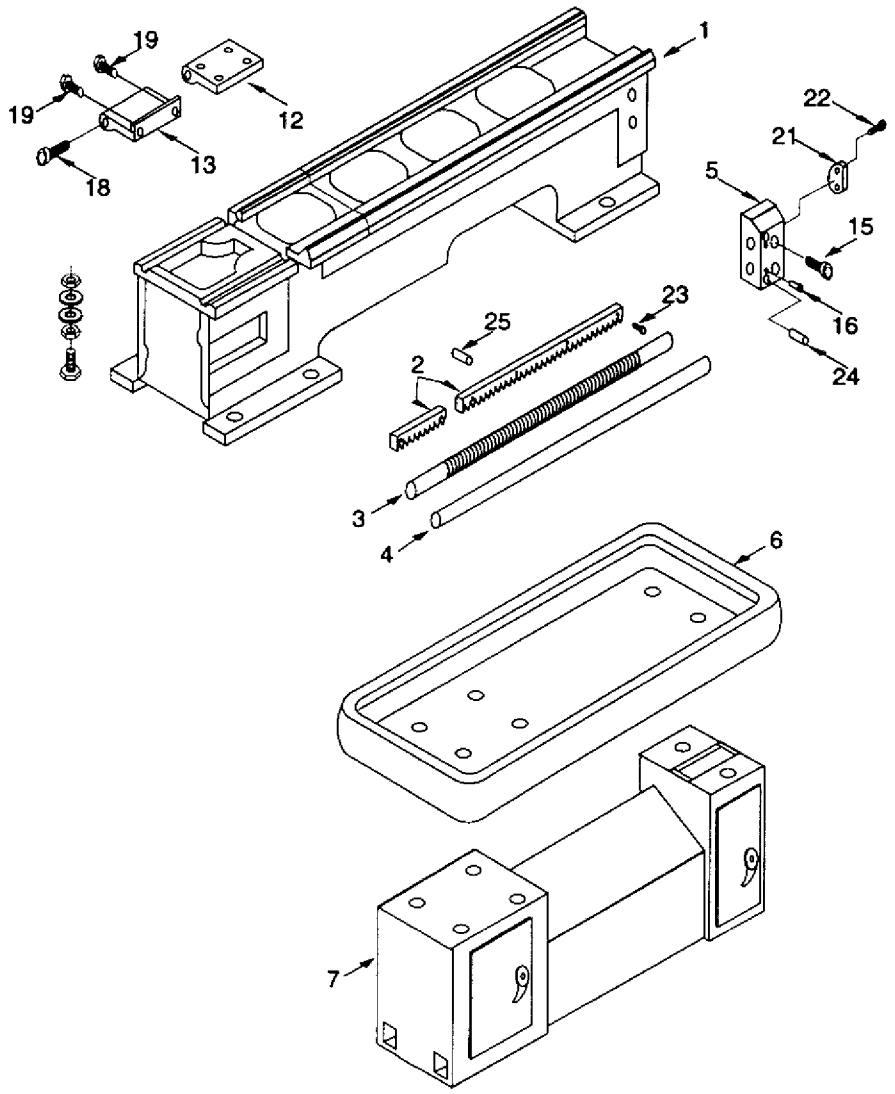
Ref. No.	Part No.	Description
1	P1003301	Apron Body
2	P1003302	Gear Shaft
3	P1003303	Bushing
4	P1003304	Handwheel Dial
5	P1003305	Handwheel
6	P1003306	Handle
7	P1003307	Gear Shaft
8	P1003308	Gear
9	P1003309	Pull-Push Lever
10	P1003310	Clutch Gear
11	P1003311	Clutch Gear
12	P1003312	Clutch Gear
13	P1003313	Bracket
14	P1003314	Pinion Shaft
15	P1003315	Control Plate
16	P1003316	Auto Feed Lever
17	P1003317	Worm
19	P1003319	Worm Gear
20	P1003320	Shaft
21	P1003321	Gear
22	P1003322	Locating Plate
23	P1003323	Control Plate
24	P1003324	Half-Nut Clutch
25	P1003325	Half-Nut
26	P1003326	Half-Nut Gib
27	P1003327	Half-Nut Cam
28	P1003323	Half-Nut Handle
29	P1003329	Handle Lever
30	P1003330	Thread Indicator Body
31	P1003331	Thread Indicator Shaft
32	P1003332	Indicator Gear 32T
33	P1003117	Oil Cap

Ref. No.	Part No.	Description
34	PSS17M	Setscrew M8 x 1.25 x 6 mm
35	PRP30M	Roll Pin 5 x 50 mm
36	P1003336	Spring
38	P1003338	Key
39	P1003339	Pin
40	PEC05M	E-Clip 12 mm
41	P1003117	Oil Cap
42	PSB29M	Cap Screw M6 - 1.0 x 40 mm
43	P1003143	Ball
44	P1003144	Special Hex Bolt
47	P1003050	Knob
48	P1003348	Special Screw
49	PS01	Phillips Screw 3/16" - 24 x 1/2"
50	P1003350	Spring
51	P1003051	C.S. Ph. Hd. Screw 1/4"-20x3/8"
52	PSB26M	Cap Screw M6-1.0 x 12 mm
53	PB08M	Hex Bolt M6-1.0 x 20 mm
57	PSB30M	Cap Screw M6-1.0 x 45 mm
58	PW06	Flat Washer 1/4" - 20
59	PSB26M	Cap Screw M6-1.0 x 12 mm
62	PRP27M	Roll Pin 5 x 28 mm
63	PRP22M	Roll Pin 4 x 32 mm
64	P1003364	Exterior Snap Ring 28 mm
65	P1003365	Stud
66	PSB01M	Cap Screw M6-1.0 x 16 mm
67	P1003367	Retaining Ring

XXVIII. PARTS DIAGRAM, APRON



XXIX. PARTS DIAGRAM, BED

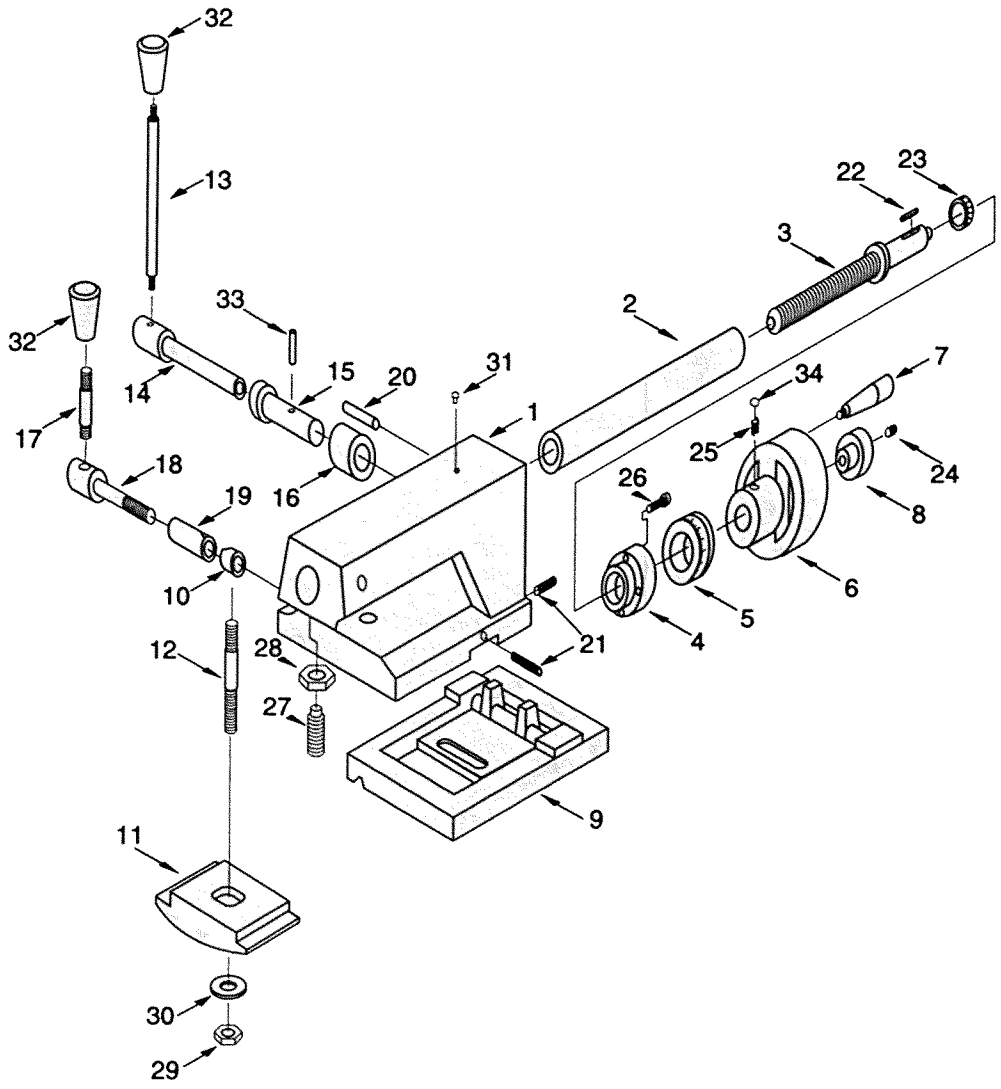


XXX. PARTS LIST, BED

Ref. No.	Part No.	Description
1	P1002501	Bed (Model G1002)
1	P1003501	Bed (Model G1003)
2	P1002502	Rack (Model G1002)
2	P1003502	Rack (Model G1003)
3	P1002503	Lead Screw (Model G1002)
3	P1003503	Lead Screw (Model G1003)
4	P1002504	Feed Rod (Model G1002)
4	P1003504	Feed Rod (Model G1003)
5	P1003505	End Bracket
6	P1002506	Chip Pan (Model G1002)
6	P1003506	Chip Pan (Model G1003)
7	G1184	Stand (Model G1002)
7	G1185	Stand (Model G1003)

Ref. No.	Part No.	Description
12	P1003512	Top Motor Plate
13	P1003513	Bottom Motor Plate
15	PSB05M	Cap Screw M8-1.25 x 50 mm
16	P1003117	Oil Cap
18	PSB44M	Cap Screw M10-1.25 x 28 mm
19	P5003519	Special Hex Bolt
21	P5003521	Shaft Retainer
22	PSB33M	Cap Screw M5-0.8 x 12 mm
23	PSB02M	Cap Screw M6-1.0 x 20 mm
24	PRP34M	Roll Pin 6 x 55 mm
25	PRP07M	Roll Pin 6 x 20 mm

XXXI. PARTS DIAGRAM, TAILSTOCK

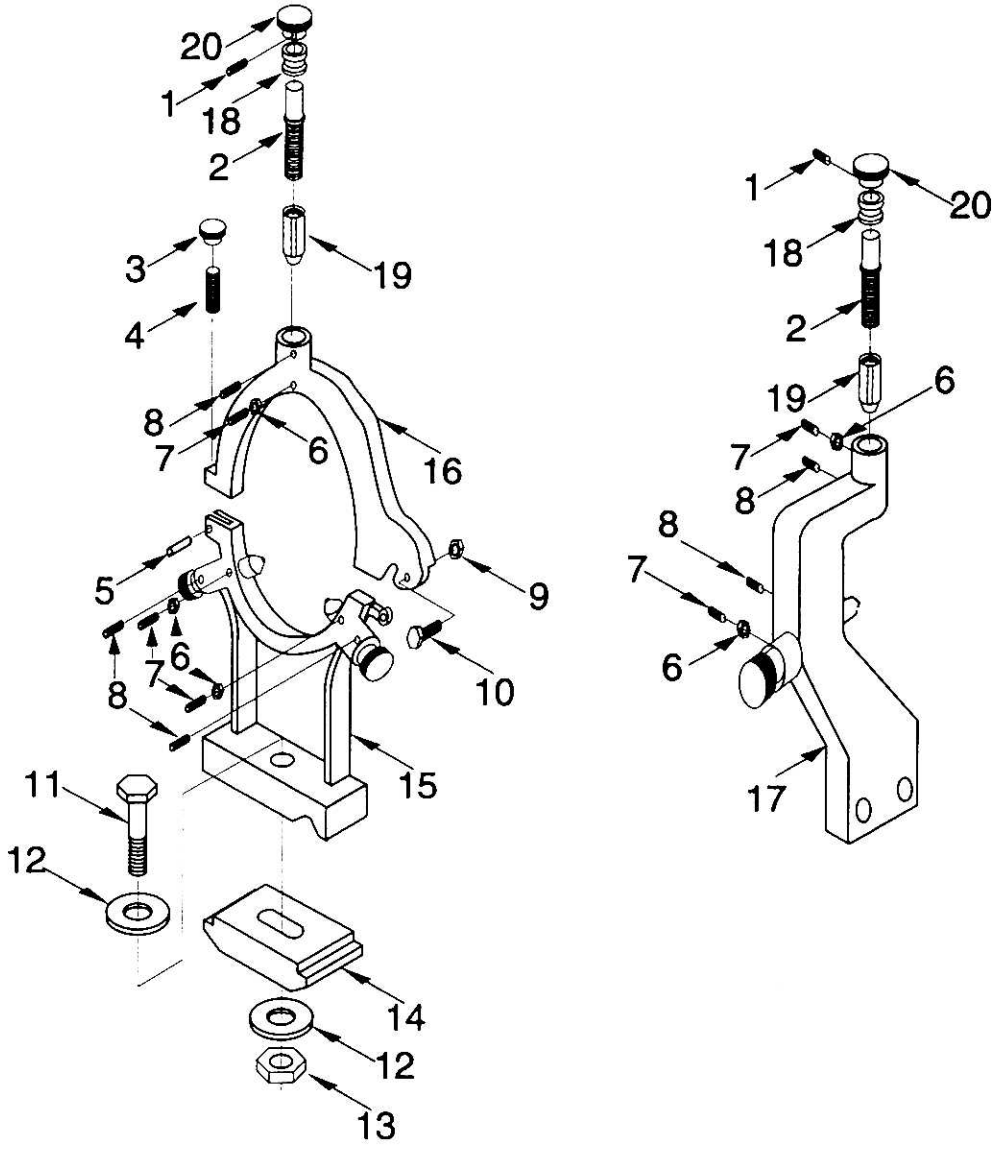


XXXII. PARTS LIST, TAILSTOCK

Ref. No.	Part No.	Description
1	P1003401	Tailstock Casting
2	P1003402	Tailstock Spindle
3	P1003403	Lead Screw
4	P1003404	Lead Screw Bushing
5	P1003107	Dial
6	P1003406	Tailstock Handwheel
7	P1003407	Handle
8	P1003106	Spanner Nut
9	P1003409	Tailstock Base
10	P1003410	Short Clamp Bushing
11	P1003411	Tailstock Clamp
12	P1003412	Clamp Stud
13	P1003413	Clamp Handle Lever
14	P1003414	Clamp Shaft
15	P1003415	Eccentric Bushing
16	P1003416	Eccentric Sleeve
17	P1003417	Locking Lever
18	P1003418	Locking Handle

Ref. No.	Part No.	Description
19	P1003419	Long Clamp Bushing
20	P1003420	Lever Stud
21	PSS19	Setscrew 5/16" - 18 x 1/4"
22	PK17M	Key 5 x 5 x 9 mm
23	P1003423	Thrust Bearing
24	PSS15M	Setscrew M12-1.75x12mm
25	P1003124	Spring
26	PSB02M	Cap Screw M6-1.0x20 mm
27	P1003427	Special Setscrew M8-1.25x20mm
28	PN03M	Hex Nut M8 - 1.25
29	PN09M	Hex Nut M12 - 1.75
30	P1003430	Special Washer
31	P1003117	Oil Cap
32	P1003050	Knob
33	P1003433	Roll Pin
34	P1003125	Ball

XXXIII. TOOL REST PARTS DIAGRAMS



XXXIV. TOOL REST PARTS LIST

Ref. No.	Part No.	Description
1	PSS02M	Setscrew M6-1.0 x 6 mm
2	P1003902	Adjustment Screw
3	P1003903	Knob
4	P1003904	Stud
5	PRP06M	Roll Pin 5 x 24 mm
6	PN01M	Hex Nut M6 x 1.0
7	P1003907	Special Setscrew
8	PSS02M	Setscrew M6-1.0 x 6 mm
9	PN01M	Hex Nut M6 - 1.0
10	PB29M	Hex Bolt M6 - 1.0 x 30mm

Ref. No.	Part No.	Description
11	PB27	Hex Bolt ½" - 13 x 2½"
12	PW01	Flat Washer ½"
13	PN13	Hex Nut ½" - 13
14	P1003411	Clamp
15	P1003915	Lower Rest Casting
16	P1003916	Upper Rest Casting
17	P1003124	Follow Rest Castng
18	P1003918	Bushing
19	P1003919	Mounted Brass Bearing
20	P1003920	Knob

G1002/1003 WIRING DIAGRAM

NOTE: There are two motor types that are wired according to the following 110 volt and 220 volt diagrams. The only difference in motor types is the wire color/number coding. Motor Type One is identified by wires of 6 different colors. Motor Type Two is identified by wires of 4 different colors and 2 gray wires. The following is a wire color/number coding break-down by motor type.

Motor Type One

Motor Wire # / Color

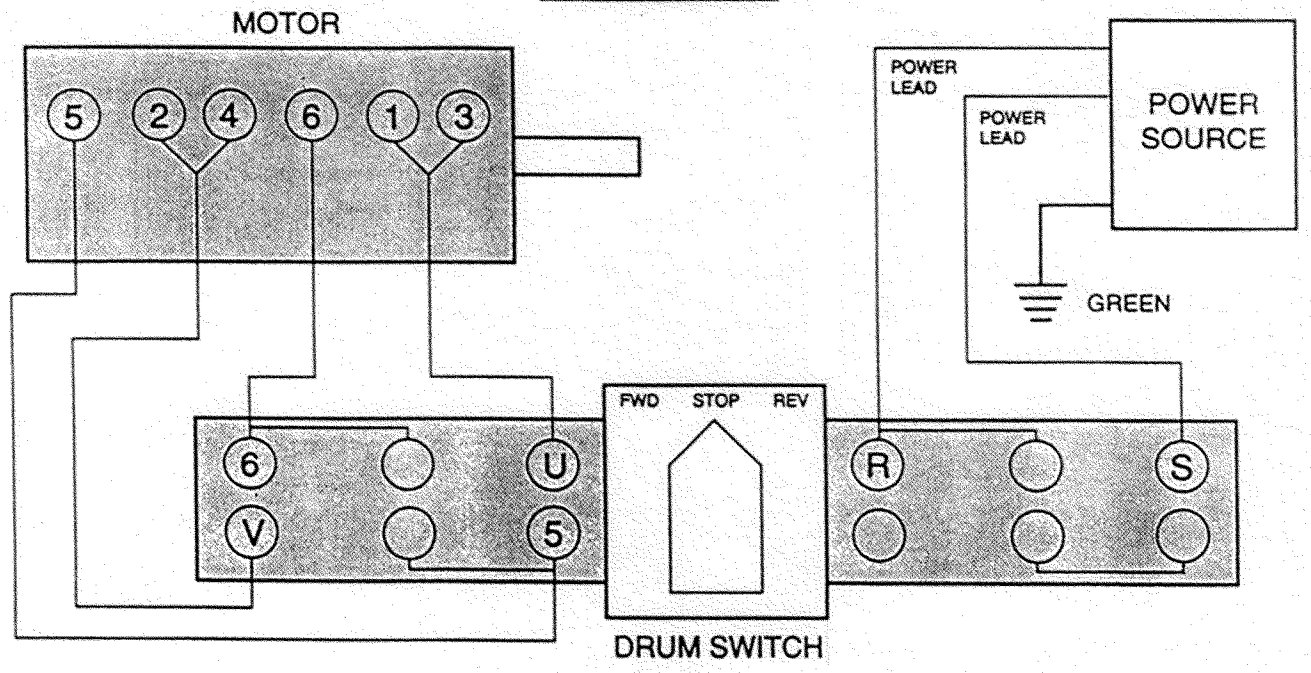
1 / BLACK
2 / RED
3 / YELLOW
4 / GRAY
5 / WHITE
6 / BLUE

Motor Type Two

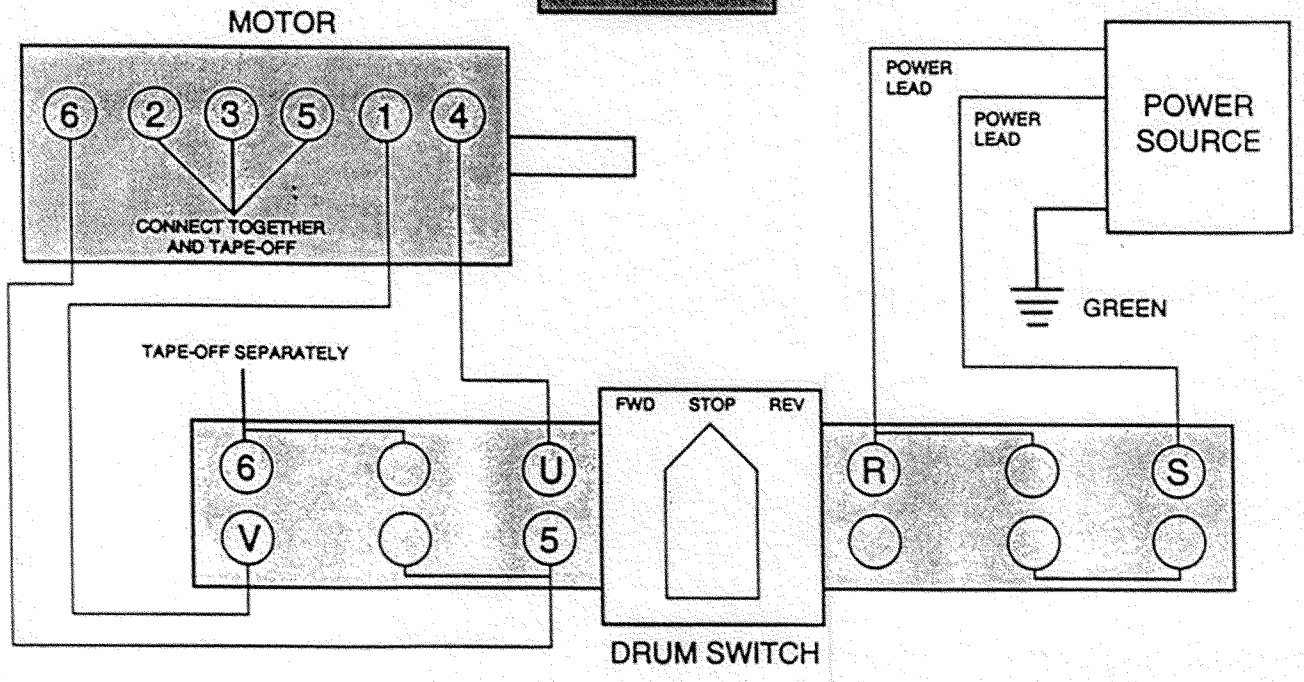
Motor Wire # / Color

1 / WHITE
2 / YELLOW
3 / BLACK
4 / RED
5 / GRAY
6 / GRAY

110 VOLT

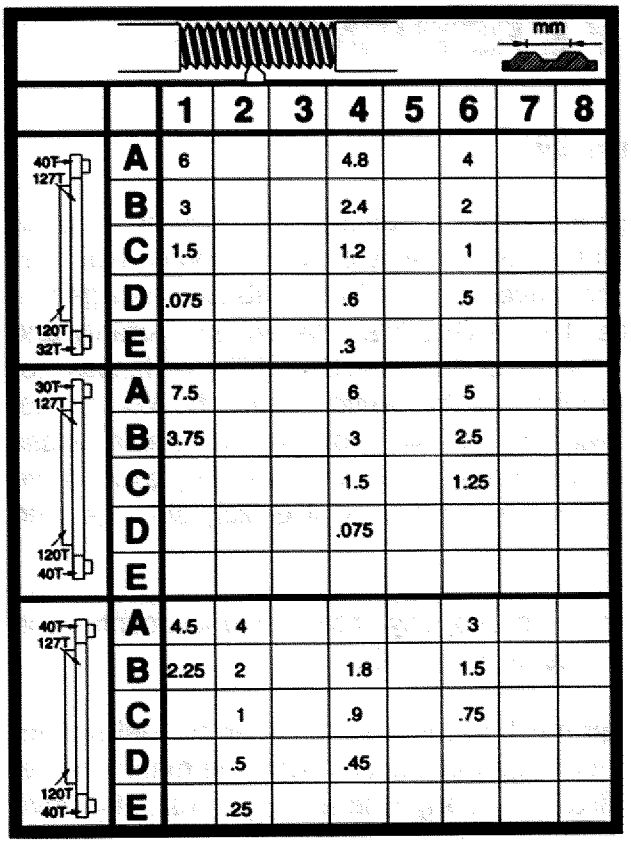


220 VOLT



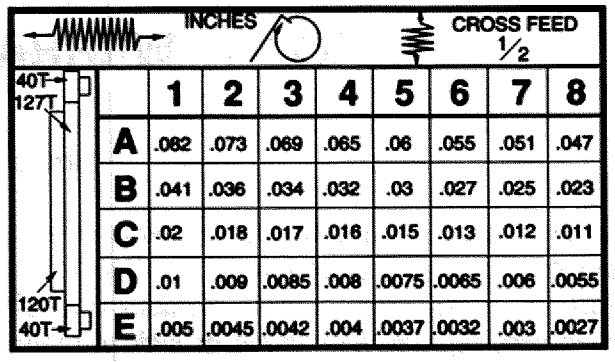
NOTE: Green wire from the cord is grounded to the motor casing. To reverse rotation, switch the positions of wires #5 and #6 comming from the motor.

XXXV. LABELS & CHARTS



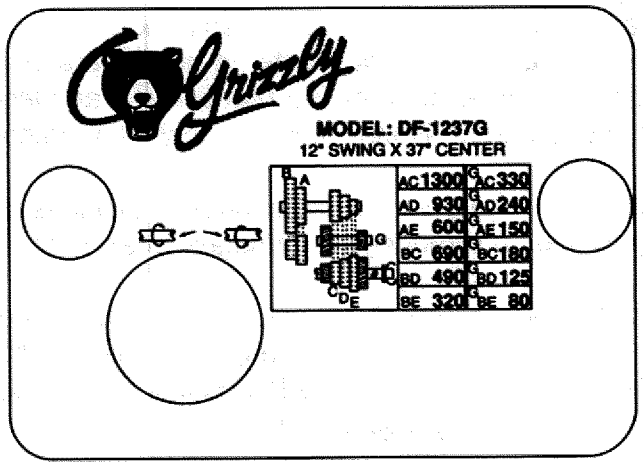
	1	2	3	4	5	6	7	8
A	6			4.8		4		
B	3			2.4		2		
C	1.5			1.2		1		
D	.075			.6		.5		
E				.3				
A	7.5			6		5		
B	3.75			3		2.5		
C				1.5		1.25		
D				.075				
E								
A	4.5	4				3		
B	2.25	2		1.8		1.5		
C		1		.9		.75		
D		.5		.45				
E		.25						

P1003902 Metric Thread Pitch Chart

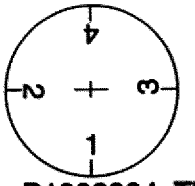


	1	2	3	4	5	6	7	8
A	.082	.073	.069	.065	.06	.055	.051	.047
B	.041	.036	.034	.032	.03	.027	.025	.023
C	.02	.018	.017	.016	.015	.013	.012	.011
D	.01	.009	.0085	.008	.0075	.0065	.006	.0055
E	.005	.0045	.0042	.004	.0037	.0032	.003	.0027

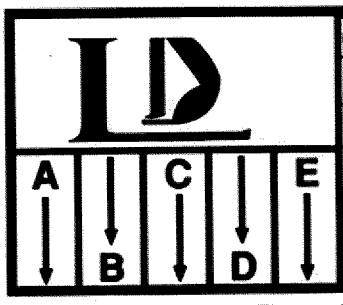
P1003901 Feed Rate Chart



P1003903 Headstock Label



P1003904 Thread Chase Dial



LEVER	1	2	3	4	5	6	7	8
A	4	4 1/2	4 3/4	5	5 1/2	6	6 1/2	7
B	8	9	9 1/2	10	11	12	13	14
C	16	18	19	20	22	24	26	28
D	32	36	38	40	44	48	52	56
E	64	72	76	80	88	96	104	112

P1003905 Inch Thread Chart

INDICATOR TABLE					
TPI	SCALE	TPI	SCALE	TPI	SCALE
4	1-8	12	1-8	38	1-8
4 1/2	1/2, 3/4	13	1-4	40	
4 3/4	1	14	1-8	44	
5	1-4	16		48	
5 1/2	1/2, 3/4	18		52	
6	1-8	19	1-4	56	
6 1/2	1/2, 3/4	20	1-8	64	
7	1-4	22		72	
8	1-8	24		76	
9	1-4	26		80	
9 1/2	1/2, 3/4	28		96	
10	1-8	32		104	
11	1-4	36		112	

P1003906
Thread Indicator Chart

XXXVI. WARRANTY & RETURNS

Limited Warranty

Grizzly Imports, Inc. (Grizzly) warrants every product it sells for a period of 90 days on all parts and one year on all electric motors to the original purchaser from the date of purchase. This warranty does not apply to defects due directly or indirectly to misuse, abuse, negligence, accidents, repairs, alterations or lack of maintenance. This is Grizzly'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 or represent that the merchandise complies with the provisions of any law or acts unless the manufacturer so warrants. In no event shall Grizzly's liability under this warranty exceed the purchase price paid for the product and any legal actions brought against Grizzly 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.

To take advantage of this warranty, the product or part must be returned to either our Bellingham or Williamsport warehouse, freight prepaid. Proof of purchase must accompany the merchandise. The manufacturers reserve the right to change specifications at any time as they constantly strive for better quality equipment.

We make every effort to ensure that our products meet high quality and durability standards and we hope you never need to use this warranty.