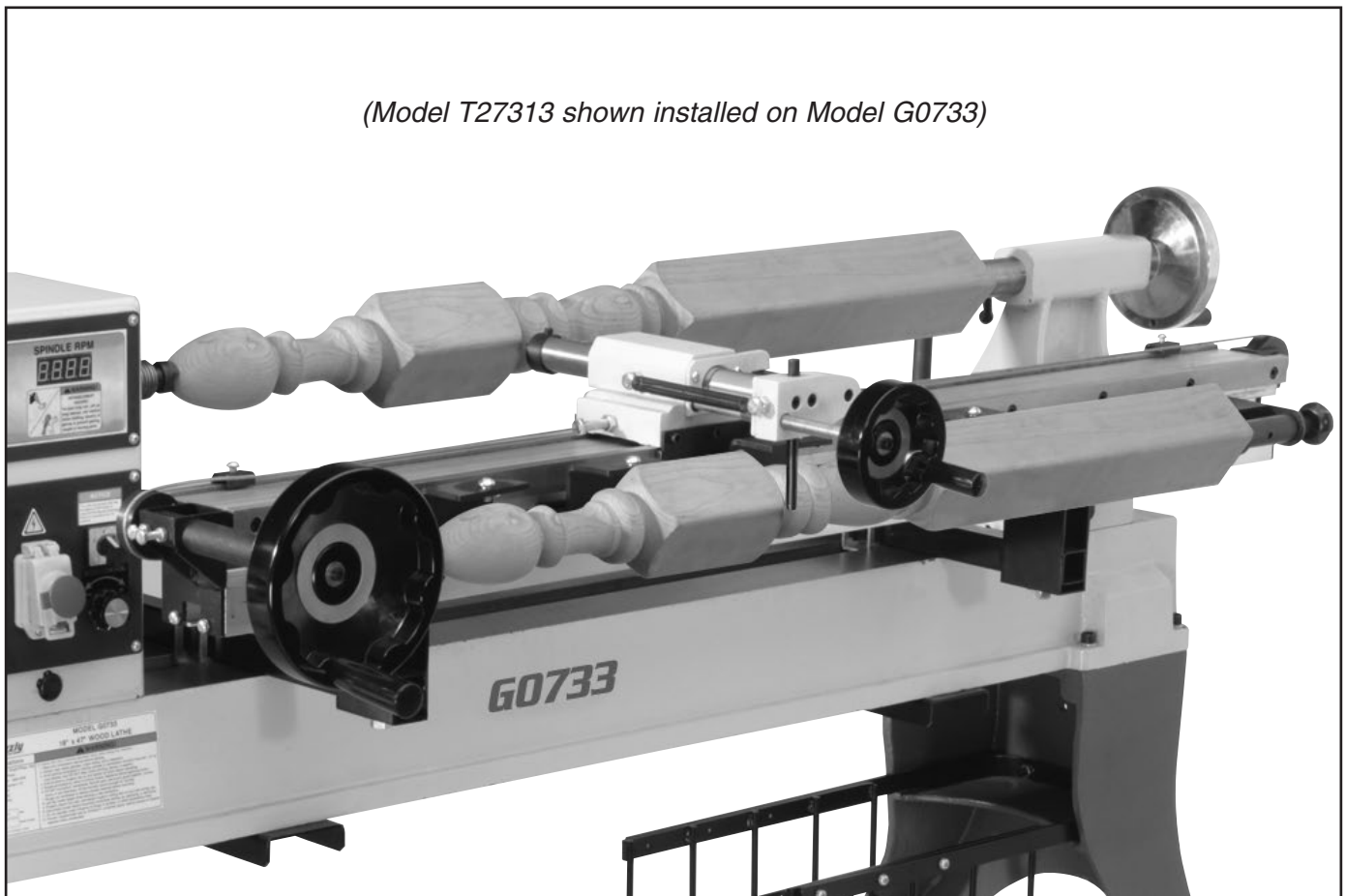


Grizzly **Industrial, Inc.**®

MODEL T27313 **WOOD LATHE COPY ATTACHMENT** **OWNER'S MANUAL** *(For models manufactured since 01/15)*

(Model T27313 shown installed on Model G0733)



COPYRIGHT © MARCH, 2015 BY GRIZZLY INDUSTRIAL, INC.
**WARNING: NO PORTION OF THIS MANUAL MAY BE REPRODUCED IN ANY SHAPE
OR FORM WITHOUT THE WRITTEN APPROVAL OF GRIZZLY INDUSTRIAL, INC.**
#BB17314 PRINTED IN CHINA

V1.03.15



WARNING!

This manual provides critical safety instructions on the proper setup, operation, maintenance, and service of this machine/tool. Save this document, refer to it often, and use it to instruct other operators.

Failure to read, understand and follow the instructions in this manual may result in fire or serious personal injury—including amputation, electrocution, or death.

The owner of this machine/tool is solely responsible for its safe use. This responsibility includes but is not limited to proper installation in a safe environment, personnel training and usage authorization, proper inspection and maintenance, manual availability and comprehension, application of safety devices, cutting/sanding/grinding tool integrity, and the usage of personal protective equipment.

The manufacturer will not be held liable for injury or property damage from negligence, improper training, machine modifications or misuse.



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.

Table of Contents

INTRODUCTION.....	2
Machine Description.....	2
Contact Info.....	2
Manual Accuracy.....	2
Controls & Components.....	3
SECTION 1: SAFETY.....	4
Safety Instructions for Machinery.....	4
Additional Safety for Copy Attachments.....	6
SECTION 2: SETUP.....	7
Unpacking.....	7
Needed for Setup.....	7
Inventory.....	7
Cleanup.....	8
Site Considerations.....	9
Assembly.....	10
SECTION 3: OPERATIONS.....	14
Operation Overview.....	14
Workpiece Inspection.....	15
Copy Attachment Tips.....	15
Copy Stylus.....	16
Cutting Tool.....	16
Basic Operation.....	17
SECTION 4: ACCESSORIES.....	19
SECTION 5: MAINTENANCE.....	20
Schedule.....	20
Cleaning & Protecting.....	20
Lubrication.....	20
SECTION 6: SERVICE.....	21
Troubleshooting.....	21
Cable Tension.....	22
Gib Adjustment.....	22
SECTION 7: PARTS.....	23
Main Breakdown.....	23
Longitudinal Drive Breakdown.....	25
Carriage Breakdown.....	26
WARRANTY & RETURNS.....	29

INTRODUCTION

Machine Description

The Model T27313 Wood Lathe Copy attachment is part of Grizzly's growing family of fine wood-working and metalworking machinery. When used according to the guidelines stated in this manual, you can expect years of trouble-free, enjoyable operation.

The Model T27313 is a wood lathe duplicator capable of mass-producing many shapes of the same design. The T27313 is designed to be mounted to the G0733, G0462, G0584 and G5979 wood lathes. Mounting hardware and cutting tool are provided with the Copy attachment.

Contact Info

We stand behind our machines. If you have any questions or need help, use the information below to contact us. Before contacting, please get the serial number and manufacture date of your machine. This will help us help you faster.

Grizzly Technical Support
1203 Lycoming Mall Circle
Muncy, PA 17756
Phone: (570) 546-9663
Email: techsupport@grizzly.com

We want your feedback on this manual. What did you like about it? Where could it be improved? Please take a few minutes to give us feedback.

Grizzly Documentation Manager
P.O. Box 2069
Bellingham, WA 98227-2069
Email: manuals@grizzly.com


Manual Accuracy

We are proud to provide a high-quality owner's manual with your new machine!

We made every effort to be exact with the instructions, specifications, drawings, and photographs contained inside. Sometimes we make mistakes, but our policy of continuous improvement also means that **sometimes the machine you receive will be slightly different than what is shown in the manual.**

If you find this to be the case, and the difference between the manual and machine leaves you confused about a procedure, check our website for an updated version. We post current manuals and manual updates for free on our website at www.grizzly.com.

Alternatively, you can call our Technical Support for help. Before calling, please write down the **Manufacture Date** and **Serial Number** stamped into the machine ID label (see below). This information helps us determine if updated documentation is available for your machine.

		MODEL GXXXX MACHINE NAME	
SPECIFICATIONS		▲ WARNING!	
Motor:	To reduce risk of serious injury when using this machine:		
Specification:	1. Read manual before operation.		
Specification:	2. Wear safety glasses and respirator.		
Specification:	3. Make sure machine is properly adjusted/setup and		
Specification:	4. power is connected to grounded circuit before starting.		
Weight:	5. Make sure the motor has stopped and disconnect		
	6. power before adjustments, maintenance, or service.		
	7. DO NOT expose to rain or dampness.		
	8. DO NOT modify this machine in any way.		
	9. Do not use while under the influence of drugs or alcohol.		
	10. Maintain machine carefully to prevent accidents.		

Manufactured for Grizzly in Taiwan

Manufacture Date: _____

Serial Number: _____



Controls & Components



Refer to **Figure 1** and the following descriptions to become familiar with the basic controls of this machine.

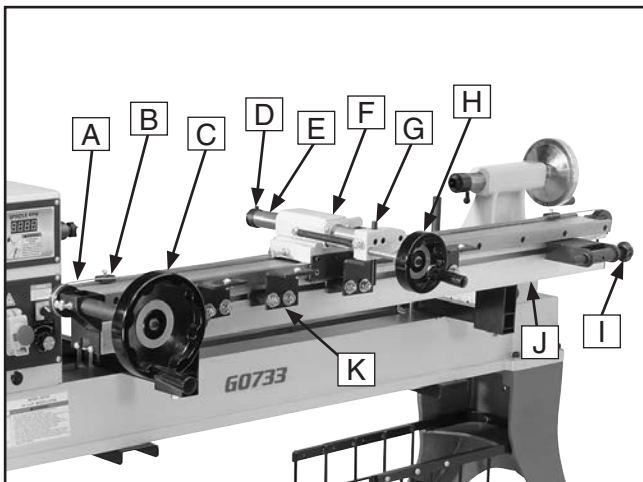


Figure 1. T27313 controls and components.

- A. Longitudinal Feed Cable:** Cable that connects carriage to longitudinal feed wheel allowing carriage to travel along copy attachment bed.
- B. Adjustable Carriage Stop:** Limits carriage travel along length of copy attachment bed.
- C. Longitudinal-Feed Handwheel:** Rotating clockwise moves carriage to the left, rotating counterclockwise moves carriage to the right.
- D. Tool Locking Collar:** Hardware that keeps cutting tool locked in place.
- E. Quill:** Moves cutting tool mounted in the carriage toward or away from the workpiece.
- F. Carriage:** Main housing for quill, cutting tool, and tool locking collar. Moves longitudinally along copy attachment bed.
- G. Stylus:** Controls depth of cut.
- H. Crossfeed Handwheel:** Controls crossfeed leadscrew, which sets maximum cutting tool depth. Turning clockwise decreases cutting depth and turning counterclockwise increases cutting depth.
- I. Tail Center Adjustment Knob:** Adjusts position of tail center. Used to hold master spindle in place.
- J. Bed:** Main body of copy attachment to which all other parts attach.
- K. Template Support:** Brackets that allow templates to securely mount to copy attachment.




SECTION 1: SAFETY

For Your Own Safety, Read Instruction Manual Before Operating This Machine

The purpose of safety symbols is to attract your attention to possible hazardous conditions. This manual uses a series of symbols and signal words intended to convey the level of importance of the safety messages. The progression of symbols is described below. Remember that safety messages by themselves do not eliminate danger and are not a substitute for proper accident prevention measures. Always use common sense and good judgment.

 **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. It may also be used to alert against unsafe practices.

NOTICE This symbol is used to alert the user to useful information about proper operation of the machine.

Safety Instructions for Machinery

WARNING

OWNER'S MANUAL. Read and understand this owner's manual **BEFORE** using machine.

TRAINED OPERATORS ONLY. Untrained operators have a higher risk of being hurt or killed. Only allow trained/supervised people to use this machine. When machine is not being used, disconnect power, remove switch keys, or lock-out machine to prevent unauthorized use—especially around children. Make workshop kid proof!

DANGEROUS ENVIRONMENTS. Do not use machinery in areas that are wet, cluttered, or have poor lighting. Operating machinery in these areas greatly increases the risk of accidents and injury.

MENTAL ALERTNESS REQUIRED. Full mental alertness is required for safe operation of machinery. Never operate under the influence of drugs or alcohol, when tired, or when distracted.

ELECTRICAL EQUIPMENT INJURY RISKS. You can be shocked, burned, or killed by touching live electrical components or improperly grounded machinery. To reduce this risk, only allow qualified service personnel to do electrical installation or repair work, and always disconnect power before accessing or exposing electrical equipment.

DISCONNECT POWER FIRST. Always disconnect machine from power supply **BEFORE** making adjustments, changing tooling, or servicing machine. This prevents an injury risk from unintended startup or contact with live electrical components.

EYE PROTECTION. Always wear ANSI-approved safety glasses or a face shield when operating or observing machinery to reduce the risk of eye injury or blindness from flying particles. Everyday eyeglasses are **NOT** approved safety glasses.



WARNING

WEARING PROPER APPAREL. Do not wear clothing, apparel or jewelry that can become entangled in moving parts. Always tie back or cover long hair. Wear non-slip footwear to avoid accidental slips, which could cause loss of workpiece control.

HAZARDOUS DUST. Dust created while using machinery may cause cancer, birth defects, or long-term respiratory damage. Be aware of dust hazards associated with each workpiece material, and always wear a NIOSH-approved respirator to reduce your risk.

HEARING PROTECTION. Always wear hearing protection when operating or observing loud machinery. Extended exposure to this noise without hearing protection can cause permanent hearing loss.

REMOVE ADJUSTING TOOLS. Tools left on machinery can become dangerous projectiles upon startup. Never leave chuck keys, wrenches, or any other tools on machine. Always verify removal before starting!

USE CORRECT TOOL FOR THE JOB. Only use this tool for its intended purpose—do not force it or an attachment to do a job for which it was not designed. Never make unapproved modifications—modifying tool or using it differently than intended may result in malfunction or mechanical failure that can lead to personal injury or death!

AWKWARD POSITIONS. Keep proper footing and balance at all times when operating machine. Do not overreach! Avoid awkward hand positions that make workpiece control difficult or increase the risk of accidental injury.

CHILDREN & BYSTANDERS. Keep children and bystanders at a safe distance from the work area. Stop using machine if they become a distraction.

GUARDS & COVERS. Guards and covers reduce accidental contact with moving parts or flying debris. Make sure they are properly installed, undamaged, and working correctly.

FORCING MACHINERY. Do not force machine. It will do the job safer and better at the rate for which it was designed.

NEVER STAND ON MACHINE. Serious injury may occur if machine is tipped or if the cutting tool is unintentionally contacted.

STABLE MACHINE. Unexpected movement during operation greatly increases risk of injury or loss of control. Before starting, verify machine is stable and mobile base (if used) is locked.

USE RECOMMENDED ACCESSORIES. Consult this owner's manual or the manufacturer for recommended accessories. Using improper accessories will increase the risk of serious injury.

UNATTENDED OPERATION. To reduce the risk of accidental injury, turn machine **OFF** and ensure all moving parts completely stop before walking away. Never leave machine running while unattended.

MAINTAIN WITH CARE. Follow all maintenance instructions and lubrication schedules to keep machine in good working condition. A machine that is improperly maintained could malfunction, leading to serious personal injury or death.

CHECK DAMAGED PARTS. Regularly inspect machine for any condition that may affect safe operation. Immediately repair or replace damaged or mis-adjusted parts before operating machine.

MAINTAIN POWER CORDS. When disconnecting cord-connected machines from power, grab and pull the plug—NOT the cord. Pulling the cord may damage the wires inside. Do not handle cord/plug with wet hands. Avoid cord damage by keeping it away from heated surfaces, high traffic areas, harsh chemicals, and wet/damp locations.

EXPERIENCING DIFFICULTIES. If at any time you experience difficulties performing the intended operation, stop using the machine! Contact our Technical Support at (570) 546-9663.



Additional Safety for Copy Attachments

WARNING

MAIN INJURY HAZARDS: Death or crushing injury from getting entangled in rotating lathe spindle or workpiece; death, blindness, or broken bones from being struck by a workpiece that breaks apart or comes loose during rotation, turning tool kickback, or flying wood chips. To minimize your risk of these hazards, always heed the following warning information:

LATHE OPERATIONS. Refer to your lathe owner's manual for all lathe related operations.

PROPER SETUP. Ensure copy attachment is properly setup and adjusted before operating.

INTEGRITY OF STOCK. Verify each workpiece is free of knots, splits, nails, or foreign material to ensure it can safely rotate on spindle without breaking apart or causing turning tool kickback.

WORKPIECE PREPARATION. Before mounting, cut off waste portions with a bandsaw or other tool to ensure workpiece has no large edges to catch turning tool, and it will rotate without dangerous wobbling.

SECURING LOCKS. Verify tool rest, headstock, and tailstock are secure before turning lathe **ON**.

SECURING WORKPIECE. An improperly secured workpiece can fly off spindle with deadly force. Use proven setup techniques and always verify workpiece is well-secured before starting lathe.

ADJUSTMENT TOOLS. Remove all chuck keys, wrenches, and adjustment tools before turning lathe **ON**. A tool left on the lathe can become a deadly projectile when spindle is started.

SAFE CLEARANCES. Before starting spindle, verify workpiece has adequate clearance by hand-rotating it through its entire range of motion.

EYE/FACE PROTECTION. Always wear a face shield and safety glasses when operating lathe.

PROPER APPAREL. Do not wear gloves, necktie or loose clothing. Keep long hair away from rotating spindle.

NEW SETUPS. Test each new setup by starting spindle rotation at the lowest speed and standing to the side of the lathe until workpiece reaches full speed and you can verify safe rotation.

ROUGHING. Use correct cutting tool. Take light cuts, use low speeds.

SHARP CUTTING TOOLS. Only use sharp cutting tools— they cut with less resistance than dull tools. Dull cutting tools can catch or grab and cause workpiece to break apart.

STOPPING SPINDLE. Always allow spindle to completely stop on its own. Never put hands or another object on spinning workpiece.

ADJUSTMENTS/MAINTENANCE. Make sure wood lathe is turned **OFF**, disconnected from power, and all moving parts are completely stopped before doing adjustments or maintenance.

MEASURING WORKPIECE. Only measure workpiece after it has stopped. Trying to measure a spinning workpiece increases entanglement risk.



SECTION 2: SETUP

Unpacking

Your machine was carefully packaged for safe transportation. Remove the packaging materials from around your machine and inspect it. If you discover any damage, *please call us immediately at (570) 546-9663 for advice.*

Save the containers and all packing materials for possible inspection by the carrier or its agent. *Otherwise, filing a freight claim can be difficult.*

When you are completely satisfied with the condition of your shipment, inventory the contents.



Needed for Setup

The following are needed to complete the setup process, but are not included with your machine.

Description	Qty
• Additional People	1
• Safety Glasses	1
• Cleaner/Degreaser (Page 8)	As Needed
• Disposable Shop Rags.....	As Needed
• Screwdriver Phillips #2	1
• Wrench or Socket 16mm.....	1
• Hex Wrench 4mm.....	1
• Feeler Gauge	1
• Machinist's Square	1

Inventory

The following is a list of items shipped with your machine. Before beginning setup, lay these items out and inventory them.

If any non-proprietary parts are missing (e.g. a nut or a washer), we will gladly replace them; or for the sake of expediency, replacements can be obtained at your local hardware store.

Box 1 (Figure 2)	Qty
A. Copy Attachment.....	1
B. Longitudinal-Feed Handwheel.....	1
C. Support Arm Clamping Plates.....	2
D. Support Arms (Short)	2
E. Support Arms (Tall)	2
F. Hardware Bag (Not Shown).....	1
—T-Bolts M10-1.5 x 100	2
—T-Bolts M10-1.5 x 45	2
—Cutting Tool	1
—Support Arm Clamps	2
—Fender Washers 8mm	2
—Hex Nuts M8-1.25	2

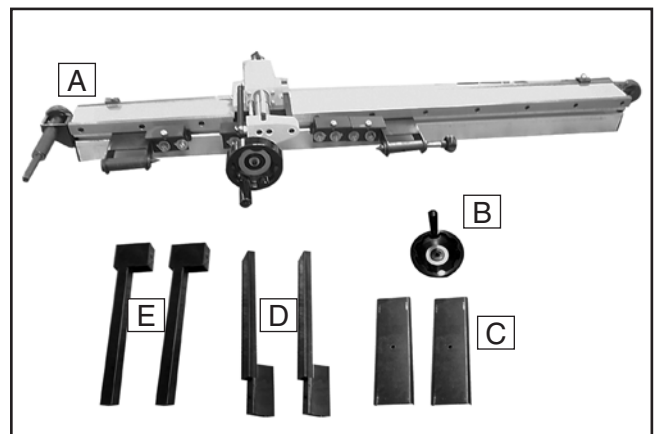


Figure 2. T27313 inventory.

NOTICE

If you cannot find an item on this list, carefully check around/inside the machine and packaging materials. Often, these items get lost in packaging materials while unpacking or they are pre-installed at the factory.



Cleanup

The unpainted surfaces of your machine are coated with a heavy-duty rust preventative that prevents corrosion during shipment and storage. This rust preventative works extremely well, but it will take a little time to clean.

Be patient and do a thorough job cleaning your machine. The time you spend doing this now will give you a better appreciation for the proper care of your machine's unpainted surfaces.

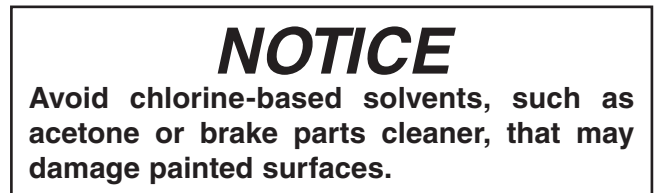
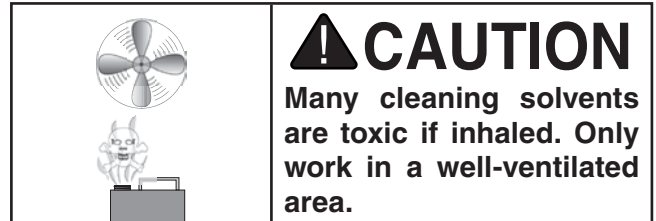
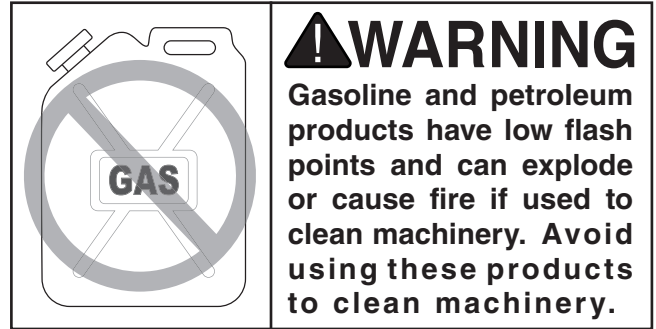
There are many ways to remove this rust preventative, but the following steps work well in a wide variety of situations. Always follow the manufacturer's instructions with any cleaning product you use and make sure you work in a well-ventilated area to minimize exposure to toxic fumes.

Before cleaning, gather the following:

- Disposable rags
- Cleaner/degreaser (WD-40 works well)
- Safety glasses & disposable gloves
- Plastic paint scraper (optional)

Basic steps for removing rust preventative:

1. Put on safety glasses.
2. Coat the rust preventative with a liberal amount of cleaner/degreaser, then let it soak for 5–10 minutes.
3. Wipe off the surfaces. If your cleaner/degreaser is effective, the rust preventative will wipe off easily. If you have a plastic paint scraper, scrape off as much as you can first, then wipe off the rest with the rag.
4. Repeat **Steps 2–3** as necessary until clean, then coat all unpainted surfaces with a quality metal protectant to prevent rust.



T23692—Orange Power Degreaser

A great product for removing the waxy shipping grease from your machine during clean up.



Figure 3. T23692 Orange Power Degreaser.



Site Considerations

Physical Environment

The physical environment where the machine is operated is important for safe operation and longevity of components. For best results, operate this machine in a dry environment that is free from excessive moisture, hazardous chemicals, airborne abrasives, or extreme conditions. Extreme conditions for this type of machinery are generally those where the ambient temperature range is outside 41°–104°F; the relative humidity range is outside 20–95% (non-condensing); or the environment is subject to vibration, shocks, or bumps.

Space Allocation

Consider the largest size of workpiece that will be processed through this machine and provide enough space around the machine for adequate operator material handling or the installation of auxiliary equipment. With permanent installations, leave enough space around the machine to open or remove doors/covers as required by the maintenance and service described in this manual. **See below for required space allocation.**

Weight Load

Make sure that the surface upon which the machine is placed will bear the weight of the machine, additional equipment that may be installed on the machine, and the heaviest workpiece that will be used. Additionally, consider the weight of the operator and any dynamic loading that may occur when operating the machine.

Lighting

Lighting around the machine must be adequate enough that operations can be performed safely. Shadows, glare, or strobe effects that may distract or impede the operator must be eliminated.

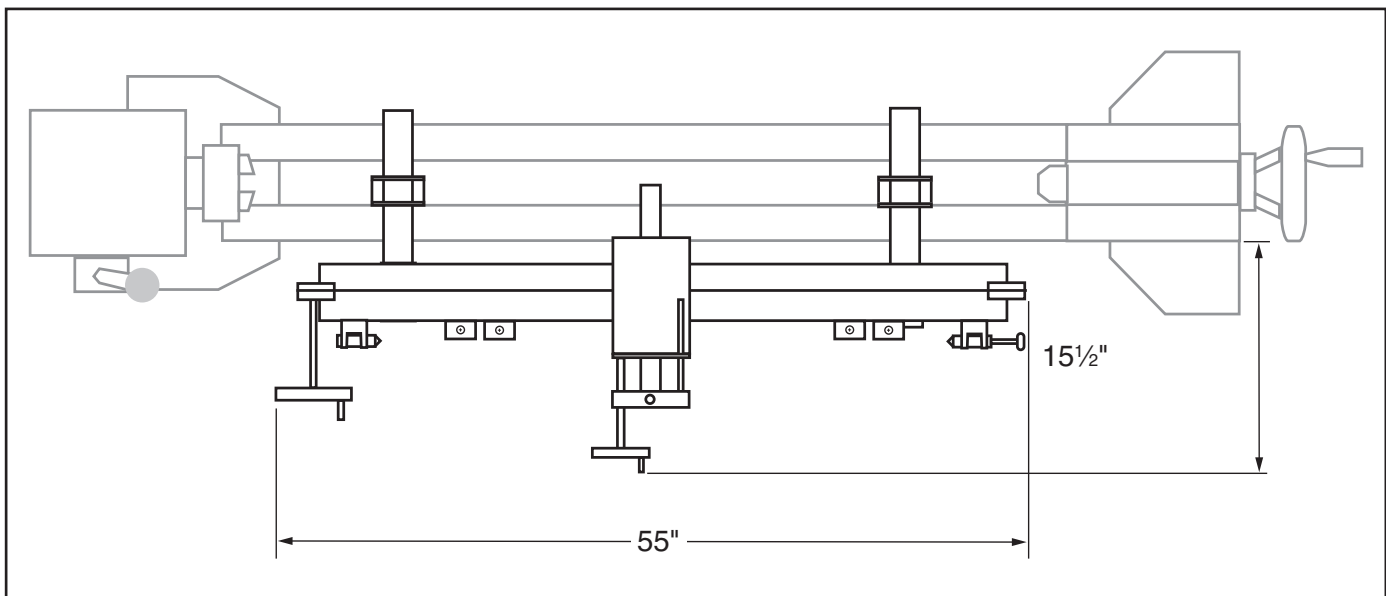
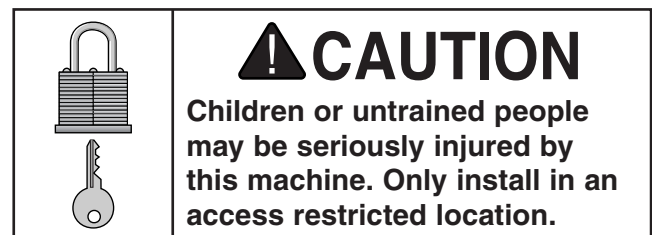


Figure 4. Working clearances (Model T27313 shown attached to example wood lathe).



Assembly

The assembly process consists of selecting the appropriate support arm orientation, mounting the support arms and copy attachment bed, and finally aligning the copy attachment. The alignment procedures are critical to the proper operation of the copy attachment, DO NOT skip these procedures.

NOTICE

All assembly and adjustment instructions assume that your lathe is axially aligned, i.e., headstock and tailstock are centered on the same axis. Consult your lathe owner's manual for proper procedure.

NOTICE

Selecting correct support arm orientation is critical to ensure that cutting tool will be positioned at spindle centerline.

Selecting Support Arm Setup

The support arms must be oriented in a specific way depending on which lathe the copy attachment will be mounted. **Figure 5** shows the support arm orientation for each of the four wood lathes onto which the model T27313 mounts. The arms will be mounted on top of the lathe bed with the mounting holes extending approximately 6" past it.

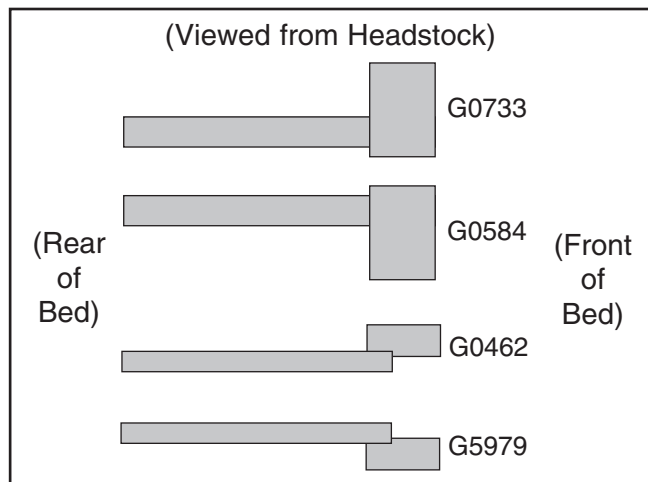


Figure 5. Support arm orientation and matching lathe.

Mounting Support Arms

1. DISCONNECT MACHINE FROM POWER!
2. Mount (2) support arms perpendicular to, and on top of, lathe bed with (2) support arm clamping plates, (2) support arm clamps, (2) M8-1.25 x 150 carriage bolts, (2) 8mm fender washers, and (2) M8-1.25 knobs. Carriage bolt head should be on top of support arm clamp, and support arm clamping plates should be below lathe bed (see **Figure 6**).

Note: Leave knobs finger tight so support arm assembly can slide across lathe bed.

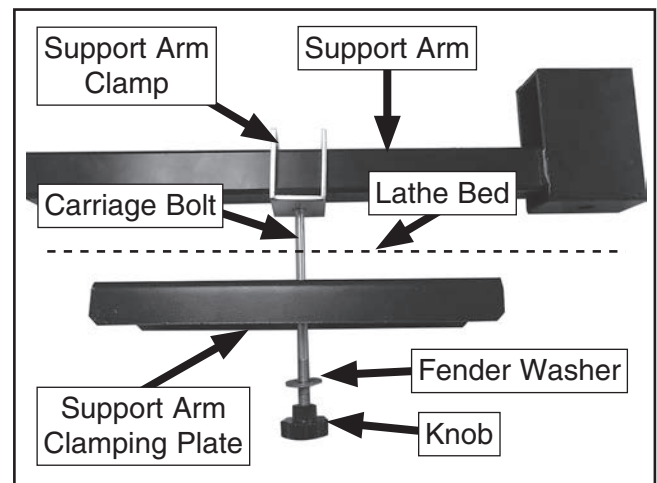


Figure 6. Example of support arm assembly setup for G0733 wood lathe.



- Adjust support arm assemblies so they are centered on points measuring 20% of distance across lathe bed from headstock to tailstock (see **Figure 7**). Front of support arms should extend beyond front of lathe bed by about 6".

— Some minor degree of variation may be necessary to eliminate any interference to normal operation of lathe.

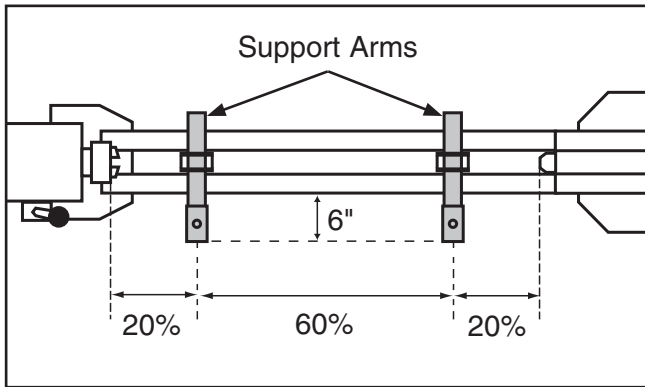


Figure 7. Attachment locations for support arms.

- Tip copy attachment upside down so bottom channel is facing upwards, then slide (2) M10-1.5 x 100 T-bolts into channel (see **Figure 8**).

— If using short support arms, use (2) M10-1.5 x 45 T-bolts.

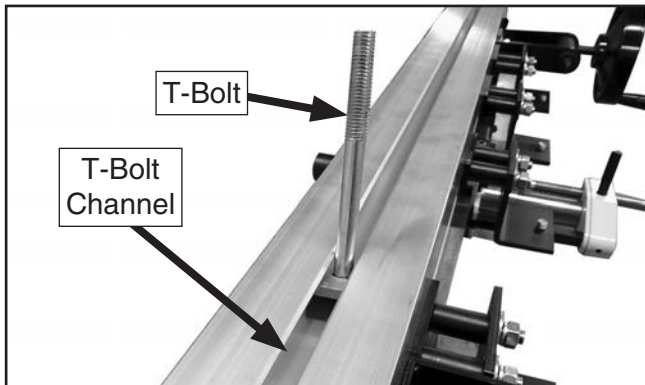


Figure 8. T-bolt installed into slot on bottom of copy attachment (1 of 2).

- Turn copy attachment right side up, then insert T-bolts into support arm holes.

- Mount copy attachment so tool will reach correct starting point for desired cut.
- Install (2) 10mm flat washers and (2) M10-1.5 hex nuts onto T-bolts installed in **Step 4**. Then tighten support arm assembly knobs.

— Make certain copy attachment does not block access to lathe controls. Some lateral adjustment can be made to assure clearance if necessary (see **Figure 9**).

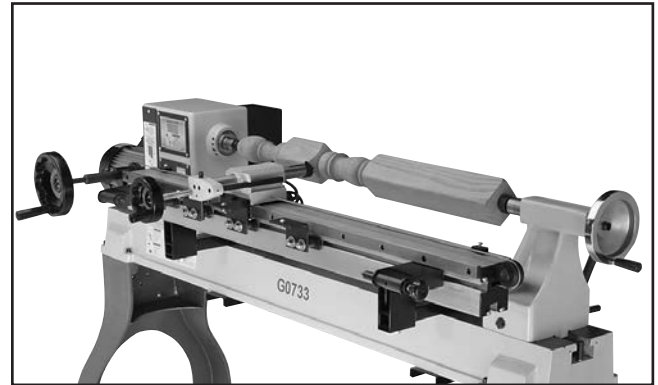


Figure 9. Example of copy attachment mounted on lathe without obstructing lathe controls.

- Congratulations, your copy attachment has been successfully installed. It must now be aligned for parallelism. Please proceed to **Rough Alignment** on **Page 12**.



Performing Rough Alignment

Once the copy attachment bed is attached to the support arms, the entire assembly must be adjusted parallel with the lathe to function correctly.

The following procedures provide details on the process of adjusting the copy attachment to achieve parallelism.

CAUTION

Use caution when handling copy attachment cutting tool. Its sharp edges could cause cuts if handled improperly.

To perform rough alignment:

1. DISCONNECT MACHINE FROM POWER!
2. Prepare two gauge boards approximately 1 $\frac{1}{8}$ " thick, 6–8" wide and 2–3" long.
3. Clamp gauge boards onto lathe bed, one at headstock and other at tailstock.
4. Place a machinist's square centered on tailstock on top of gauge board and measure 3" toward copy attachment bed (see **Figure 10**). Place a precise mark across width of wood. Repeat with gauge board located at headstock.

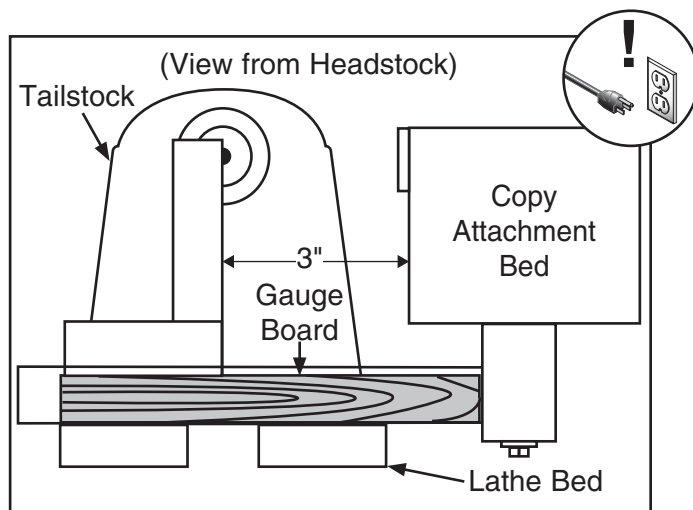


Figure 10. Use of gauge boards for alignment.

5. Loosen (2) knobs securing support arm assemblies, then slide copy attachment bed over boards until leading edge is even with marks on both left and right sides (see **Figure 10**).
6. Tighten (2) knobs securing support arm assemblies to lathe bed.
7. Remove gauge boards.
8. Install longitudinal-feed handwheel with (1) M6-1 x 12 cap screw and (1) 6mm flat washer (see **Figure 11**).

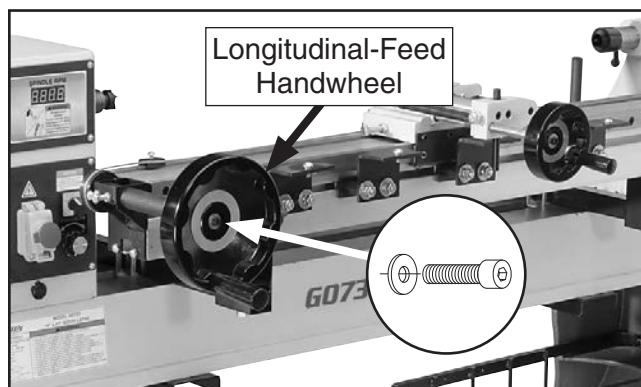


Figure 11. Longitudinal-feed handwheel installed on copy attachment.

9. Install cutting tool into arbor and tighten pre-installed collar set screw (see **Figure 12**).



Figure 12. Securing cutting tool.

10. Rough alignment is now complete. Please proceed to **Performing Final Alignment** on **Page 13**.



Performing Final Alignment

Final alignment of the lathe and copy attachment must be precise to ensure they are parallel. Before completing the following steps, mount a turning square blank between the centers of your lathe.

The turning square blank should be as long as the maximum center-to-center distance of your lathe to ensure the greatest degree of accuracy. It is critical that the turning square blank is perfectly centered and as near-perfectly straight as possible.

WARNING

Avoid wearing loose-fitting clothing, jewelry, or other personal items that could be caught in moving parts of the machinery while adjusting or operating this machine. Serious personal injury could result if this warning is ignored.

To perform final alignment:

1. DISCONNECT MACHINE FROM POWER!
2. Move carriage to one end of copy attachment and advance cross-feed handwheel until cutting tool nearly touches side of blank (see **Figure 13**).

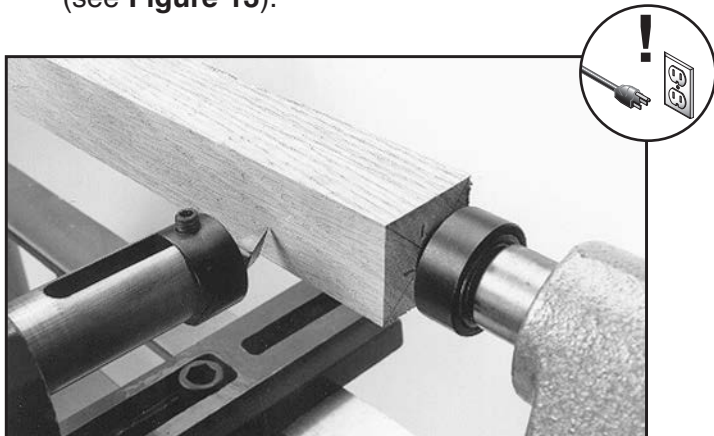


Figure 13. Aligning lathe to copy attachment.

3. Without changing position of turning blank, slowly turn longitudinal feed handwheel to move carriage toward opposite end of lathe. Use a feeler gauge or another precision spacer to check that the distance between cutter and turning square is consistent (see **Figure 14**).

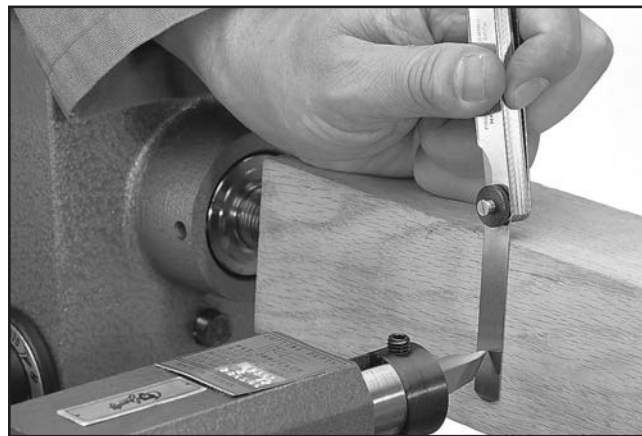


Figure 14. Example of using precision spacer.

- If cutting tool does not maintain a consistent distance from turning square at both ends of longitudinal movement, loosen support arm assembly knobs and carefully adjust bed until cutting tool is an equal distance from turning square at both ends of its longitudinal movement. Then tighten support arm assembly knobs.
4. Continue to test and adjust copy attachment until it is evenly spaced along length of turning square.
 5. Once adjustments are complete, ensure all mounting bolts are securely tightened.

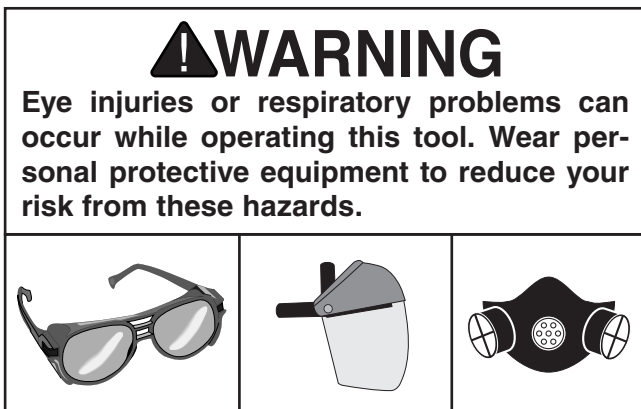


SECTION 3: OPERATIONS

Operation Overview

The purpose of this overview is to provide the novice machine operator with a basic understanding of how the machine is used during operation, so the machine controls/components discussed later in this manual are easier to understand.

Due to the generic nature of this overview, it is **not** intended to be an instructional guide. To learn more about specific operations, read this entire manual and seek additional training from experienced machine operators, and do additional research outside of this manual by reading "how-to" books, trade magazines, or websites.



To complete a typical operation, the operator does the following:

1. Examines workpiece to make sure it is suitable for cutting.
2. Adjusts cutting tool and stylus to make sure they are aligned.
3. Puts on safety glasses, face shield, and a respirator.
4. Turns lathe **ON**.
5. Gradually advances cutting tool over multiple passes; until stylus makes contact with template.
6. Turns lathe **OFF** immediately after turning is complete and waits for workpiece to completely stop before removing it.
7. Repeats **Steps 1–6** to complete all copies.

NOTICE

If you are not experienced with this type of machine, **WE STRONGLY RECOMMEND** that you seek additional training outside of this manual. Read books/magazines or get formal training before beginning any projects. Regardless of the content in this section, Grizzly Industrial will not be held liable for accidents caused by lack of training.



Workpiece Inspection

Some workpieces are not safe to turn or may require modification before they are safe to turn. **Before turning a workpiece, inspect all workpieces for the following:**

- **Workpiece Type:**
This machine is intended for cutting natural and man-made wood products, and some plastics. Never attempt to cut any metal, stone, or rubber workpiece; cutting these materials can lead to machine damage or severe injury.
- **Foreign Objects:**
Nails, staples, dirt, rocks and other foreign objects are often embedded in wood. While cutting, these objects can become dislodged and hit the operator, cause tool grab, or break the turning tool, which might then fly apart. Always visually inspect your workpiece for these items. If they can't be removed, DO NOT turn the workpiece.
- **Large/Loose Knots:**
Loose knots can become dislodged during the turning operation. Large knots can cause a workpiece to completely break in half during turning and cause machine damage and personal injury. Choose workpieces that do not have large/loose knots.
- **Excessive Warping:**
Workpieces with excessive bowing or twisting are unstable and unbalanced. Never turn these workpieces at high speed, or instability will be magnified and the workpiece can be ejected from the lathe causing impact injuries. Only turn concentric workpieces!

Copy Attachment Tips

- To reduce whip and vibration of relatively narrow copy spindles, we recommend operating the longitudinal handwheel with your left hand and backing up the spinning workpiece with your right. DO NOT attempt to grip the workpiece too tightly while it is turning.
- If the cut you are producing is too rough, try increasing the rotation speed of your lathe (not to exceed the maximum recommended speed for the size of material you are turning) and take a lighter cut. See your lathe's instruction manual for recommended speeds.
- As with any other surfacing operation, we recommend taking multiple passes, rather than trying to remove too much wood all at once. This is much safer and will also result in improved cutting results.
- When making copies, always move the stylus so it follows the template or master profile "downhill". Trying to move the stylus "uphill" along the template will cause the stylus and cutter to dig into the template and workpiece.
- To avoid unnecessary waste of expensive premium materials, we strongly recommend you turn a test piece before attempting duplication on your finish material. Make adjustments as required.
- You can save time during duplication by removing the corners from all of the spindles you plan on creating before activating the copy attachment. You will need to make the cuts with a lathe chisel on your tool rest, prior to installing the copy attachment.



Copy Stylus

To ensure the greatest level of precision while copying from a template or a master spindle, it is essential that the copy stylus is properly positioned at the underside of the carriage. When adjusting the stylus, keep in mind that its follower edge should be centered on the template or master profile, so the narrowest point fits securely.

To adjust stylus:

1. DISCONNECT MACHINE FROM POWER!
2. Center master spindle on copy centers, or attach template to support brackets.
3. Loosen M5-.8 x 10 set screw, then adjust stylus height until the follower edge is centered on template or profile (see **Figure 15**).

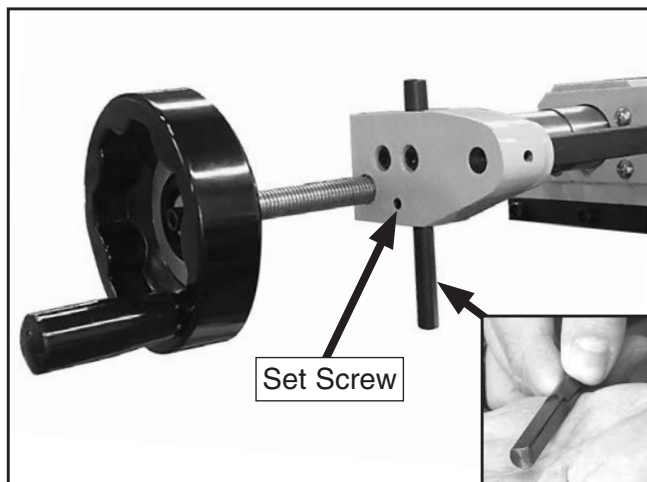


Figure 15. Stylus follower edge.

4. Tighten M5-.8 x 10 set screw to secure stylus.
5. Run stylus along length of master spindle or template.
 - If stylus does not contact master spindle or template details, move cutting tool accordingly, and repeat **Steps 3–4**.

Cutting Tool

The cutting tool can be positioned closer to or farther from the workpiece by loosening the set screw at the top of the cutting tool collar.

To install or replace cutting tool:

1. Loosen M8-1.25 x 16 set screw on cutting tool collar shown in **Figure 16**.
2. Insert cutting tool with triangular cutting edge facing up (see **Figure 16**), then tighten set screw.

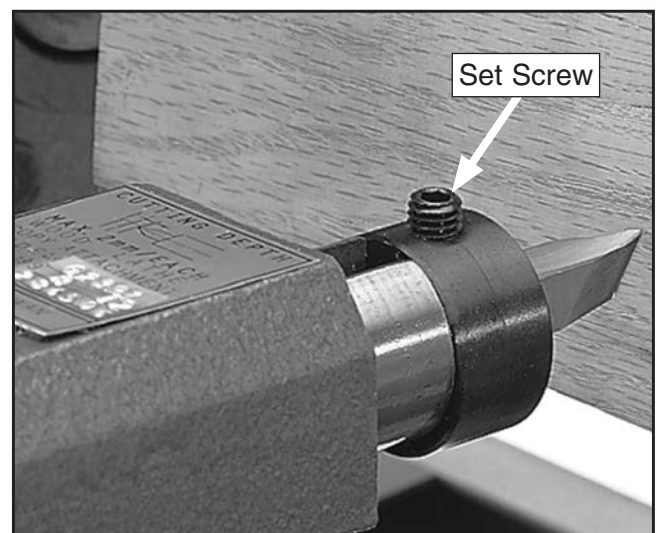


Figure 16. Example of proper position for cutting tool.



Basic Operation

⚠ WARNING

Make sure headstock and tailstock centers are properly aligned before beginning any turning operation. See your lathe owner's manual for additional instructions on this procedure. Failure to observe this warning could result in workpiece being thrown from lathe, resulting in serious personal injury.

To make copies from existing spindle or template:

1. DISCONNECT MACHINE FROM POWER!
2. Mount workpiece on lathe.
3. Move carriage with longitudinal handwheel until tip of cutter is precisely located at point on workpiece where you want turning action to begin.

Note: Always move stylus so it follows the template "downhill". Trying to move "uphill" along the template will cause the stylus and cutting tool to dig into the template and workpiece (see **Figure 17**).

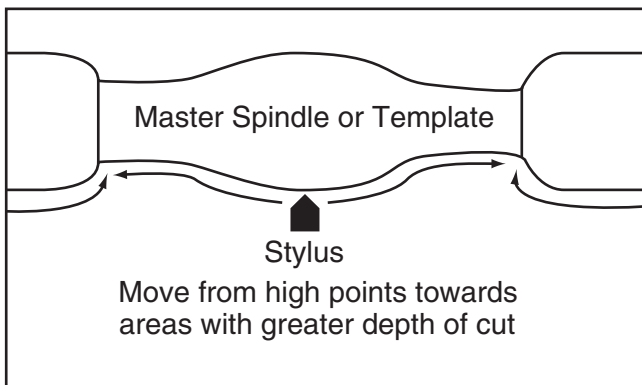


Figure 17. Recommended direction of stylus travel.

4. Mount template or master spindle onto copy attachment.

—If you are using a template, spread template mounting brackets (see **Figure 18**) apart to accommodate template. Drill holes in your template and secure it to mounting brackets. Position template on copy attachment main body so profile will line up with desired location of profile on workpiece.

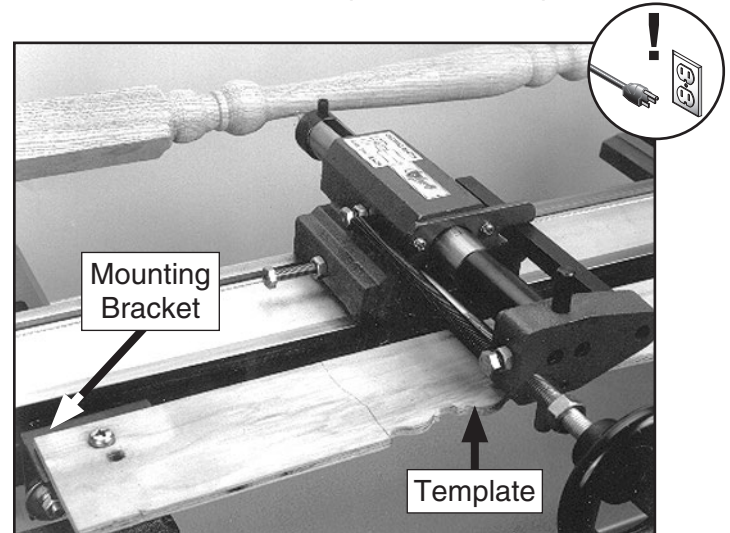


Figure 18. Template mounted to mounting brackets.

—If you are using a master spindle, mount spindle between copy attachment centers. Position and secure head center so existing spindle profile will line up with intended profile area on copy. Slide tail center so it just touches master spindle and secure it. Then hold master spindle and tighten hand knob located on tail center.

5. Adjust crossfeed handwheel until stylus comes in contact with template in its desired position.



6. Move carriage stylus to left hand limit of profiled area and adjust left hand carriage stop until it contacts carriage, then tighten stop (see **Figure 19**).

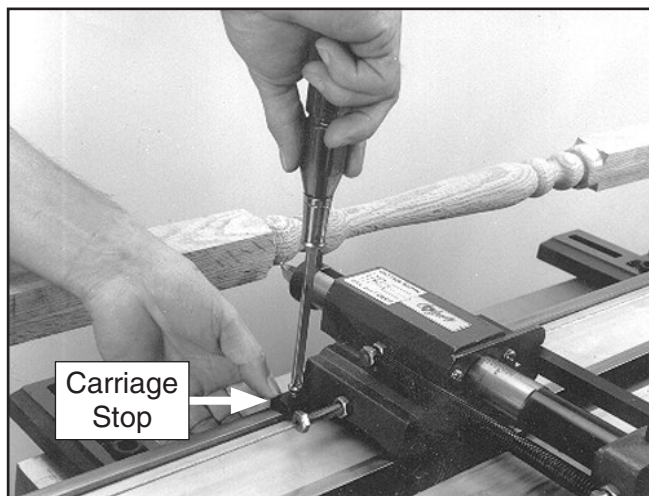


Figure 19. Adjusting carriage stops.

7. Repeat procedure for right hand stop.
8. Adjust cutting tool so both it and stylus are just touching workpiece and template.

—It is essential for accurate copying that cutting tool tip and stylus always remain at same positions in relation to workpiece and template.

9. Slide carriage away from workpiece, so stylus and cutter are clear of workpiece and template.
10. Turn lathe **ON** at its slowest speed, then slowly advance cutting tool toward left edge of workpiece. Once contact is made, advance cutting tool into copy spindle approximately $\frac{1}{16}$ ". Turn longitudinal handwheel so the carriage travels from left to right.
11. After each pass, extend cutting tool another $\frac{1}{16}$ " (maximum), and repeat with another pass. Repeat this process until stylus comes in contact with template.

—If cutting tool tends to bite or gouge workpiece, back off cutting tool slightly and try again. Be conservative when removing stock.

12. Turn lathe **OFF** and inspect results.

—If workpiece is tapered, copy attachment is not properly aligned to wood lathe (refer to **Performing Final Alignment** on **Page 13**).

13. If you are satisfied, continue to remove material from workpiece, using "downhill" cutting method illustrated in **Figure 17** on **Page 17**.

Tip: Avoid cutting "uphill". It will likely result in chipping and gouging.

14. Continue removing stock until workpiece is complete (see **Figure 20**).

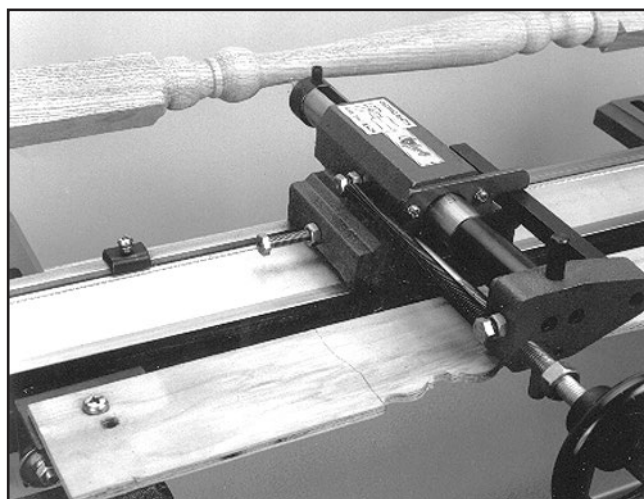


Figure 20. Shaping the copy spindle.

15. After completing initial copy, continue following **Steps 1–14** until all spindles are completed.
16. When all spindles are complete, remove copy attachment and replace it with the lathe tool post.
17. Use appropriate lathe chisels to sharpen details and smooth turned surfaces of each copy, then sand smooth.

!WARNING

Refer to your owner's manual for complete setup, operating, and safety instructions. Serious injury could occur if you do not follow these instructions.



SECTION 4: ACCESSORIES

⚠ WARNING

Installing unapproved accessories may cause machine to malfunction, resulting in serious personal injury or machine damage. To reduce this risk, only install accessories recommended for this machine by Grizzly.

NOTICE

Refer to our website or latest catalog for additional recommended accessories.

Basic Eye Protection

- T20501—Face Shield Crown Protector 4"
- T20502—Face Shield Crown Protector 7"
- T20503—Face Shield Window
- T20451—"Kirova" Clear Safety Glasses
- T20452—"Kirova" Anti-Reflective S. Glasses
- H7194—Bifocal Safety Glasses 1.5
- H7195—Bifocal Safety Glasses 2.0
- H7196—Bifocal Safety Glasses 2.5



Figure 21. Assortment of basic eye protection.

Recommended Metal Protectants

- G5562—SLIPIT® 1 Qt. Gel
- G5563—SLIPIT® 12 oz. Spray
- G2871—Boeshield® T-9 12 oz. Spray
- G2870—Boeshield® T-9 4 oz. Spray
- H3788—G96® Gun Treatment 12 oz. Spray
- H3789—G96® Gun Treatment 4.5 oz. Spray



Figure 22. Recommended products for protecting unpainted cast iron/steel part on machinery.

D3098—Center Finder

Find the center of round or square stock for lathe turning with this handy Center Finder. One side locates a diagonal line on square stock up to 8" x 8" and the other side locates a diagonal line on round stock up to 4½" in diameter.

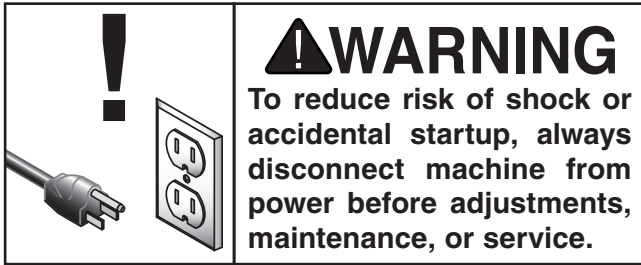


Figure 23. D3098 Center Finder.

order online at www.grizzly.com or call 1-800-523-4777



SECTION 5: MAINTENANCE



Schedule

For optimum performance from your machine, follow this maintenance schedule and refer to any specific instructions given in this section.

Daily Check

- Loose mounting bolts.
- Worn or damaged wires.
- Any other unsafe condition.

Monthly Check

- feed cable tension, damage, or wear.
- Clean/vacuum dust buildup.

Cleaning & Protecting

Cleaning the Model T27313 is relatively easy. Vacuum excess wood chips and sawdust, and wipe off the remaining dust with a dry cloth. If any resin has built up, use a resin dissolving cleaner to remove it.

Protect any unpainted cast iron surfaces by wiping it clean after every use—this ensures moisture from wood dust does not remain on bare metal surfaces. Keep cast iron surfaces rust-free with regular applications of products like G96® Gun Treatment, SLIPIT®, or Boeshield® T-9 (see **Page 19** for more details).

Lubrication

Leadscrews and Slides

Lubrication Type ...T23964 or NLGI#2 Equivalent
Amount 1–2 Pumps
Lubrication Frequency6–12 Months

Add lubrication to the leadscrews and slides shown in **Figure 24**.

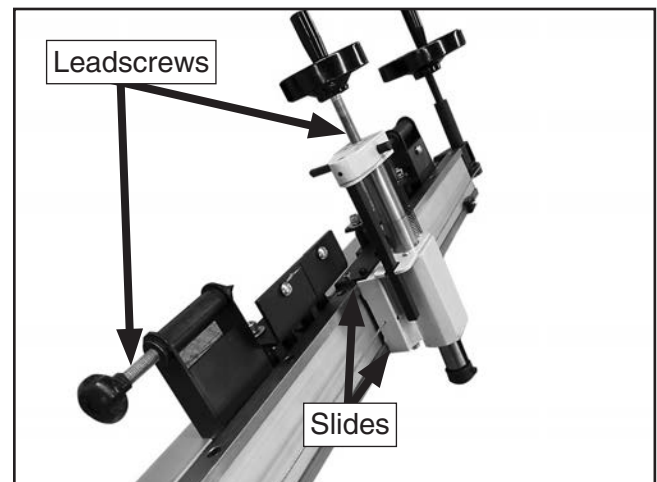


Figure 24. Location of leadscrews and slides.

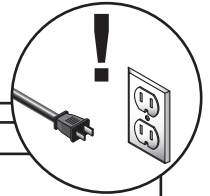


SECTION 6: SERVICE

Review the troubleshooting and procedures in this section if a problem develops with your machine. If you need replacement parts or additional help with a procedure, call our Technical Support at (570) 546-9663.

Note: Please gather the serial number and manufacture date of your machine before calling.

Troubleshooting



Symptom	Possible Cause	Possible Solution
Bad surface finish.	<ol style="list-style-type: none"> 1. Spindle speed or feed rate is wrong. 2. Dull cutting tool. 3. Too much play in gibs. 	<ol style="list-style-type: none"> 1. Adjust for appropriate spindle speed and feed rate. 2. Sharpen cutting tool. 3. Tighten gibs (Page 1).
Cutting tool vibrates excessively during cutting.	<ol style="list-style-type: none"> 1. Cutting tool is not tight enough. 2. Cutting tool sticks too far out of tool arbor; lack of support. 3. Gibs are out of adjustment. 4. Cutting tool is dull. 5. Spindle speed is wrong. 	<ol style="list-style-type: none"> 1. Tighten cutting tool. 2. Adjust cutting tool. 3. Adjust gibs (Page 1). 4. Replace or resharpen cutting tool. 5. Use recommended spindle speed.
Workpiece is tapered.	<ol style="list-style-type: none"> 1. Lathe bed and copy attachment are not parallel with each other. 2. Lathe bed is twisted. 	<ol style="list-style-type: none"> 1. Re-align lathe bed and copy attachment (Page 13). 2. Level lathe.
Carriage will not feed or is hard to move.	<ol style="list-style-type: none"> 1. Longitudinal-feed handle screw is loose. 2. Chips have loaded up on rails. 3. Slides are dry and in need of lubrication. 4. Gibs are too tight. 	<ol style="list-style-type: none"> 1. Tighten screw. 2. Frequently clean away chips that load up during turning operations. 3. Lubricate slides. 4. Loosen gib screw(s) slightly (Page 1).



Cable Tension

The movement of the carriage assembly along the body of the copy attachment is controlled by the movement of the longitudinal-feed handwheel. This handwheel is connected to the carriage via a cable. This cable should be taut to ensure responsive movement from the carriage.

Tools Needed	Qty
Open-End Wrench 13mm.....	2

To adjust cable tension:

1. DISCONNECT MACHINE FROM POWER!
2. Loosen hex nut shown in **Figure 25**.
3. Adjust tension by loosening or tightening cable tension bolt (see **Figure 25**).

Note: Cable should be pulled snug, but not so tight that stress is placed on cable.

4. Tighten hex nut (see **Figure 25**).

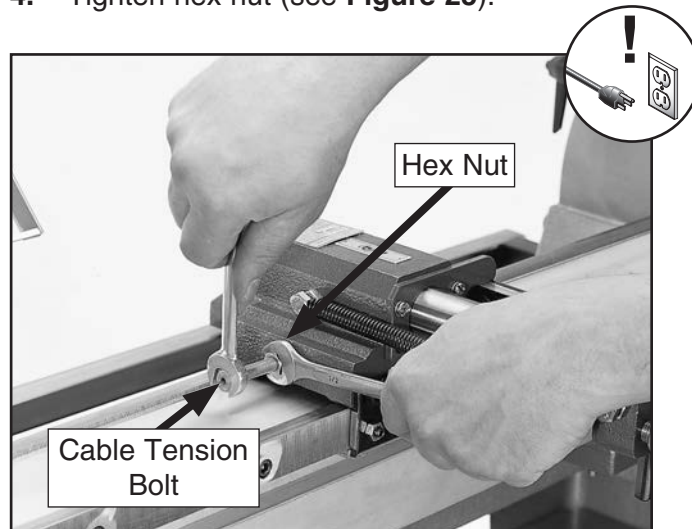


Figure 25. Adjusting carriage cable tension.

Gib Adjustment

The goal of gib adjustment is to remove sloppiness or "play" between the carriage and the bed while still allowing free movement of the carriage.

There are eight adjustment locations: two on the front of the carriage, two on the back and four underneath.

Tools Needed	Qty
Hex Wrench 2.5mm.....	1
Open-Ended Wrench 8mm	1

To adjust gibs:

1. DISCONNECT MACHINE FROM POWER!
2. Loosen hex nut shown in **Figure 26**.
3. Adjust set screws to increase or decrease friction (see **Figure 26**).

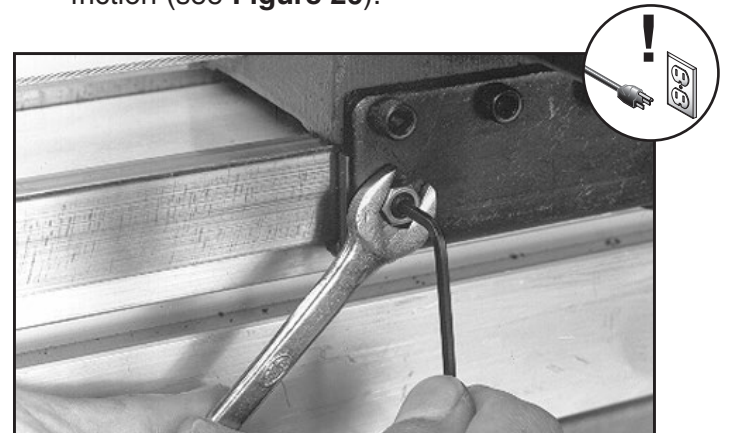


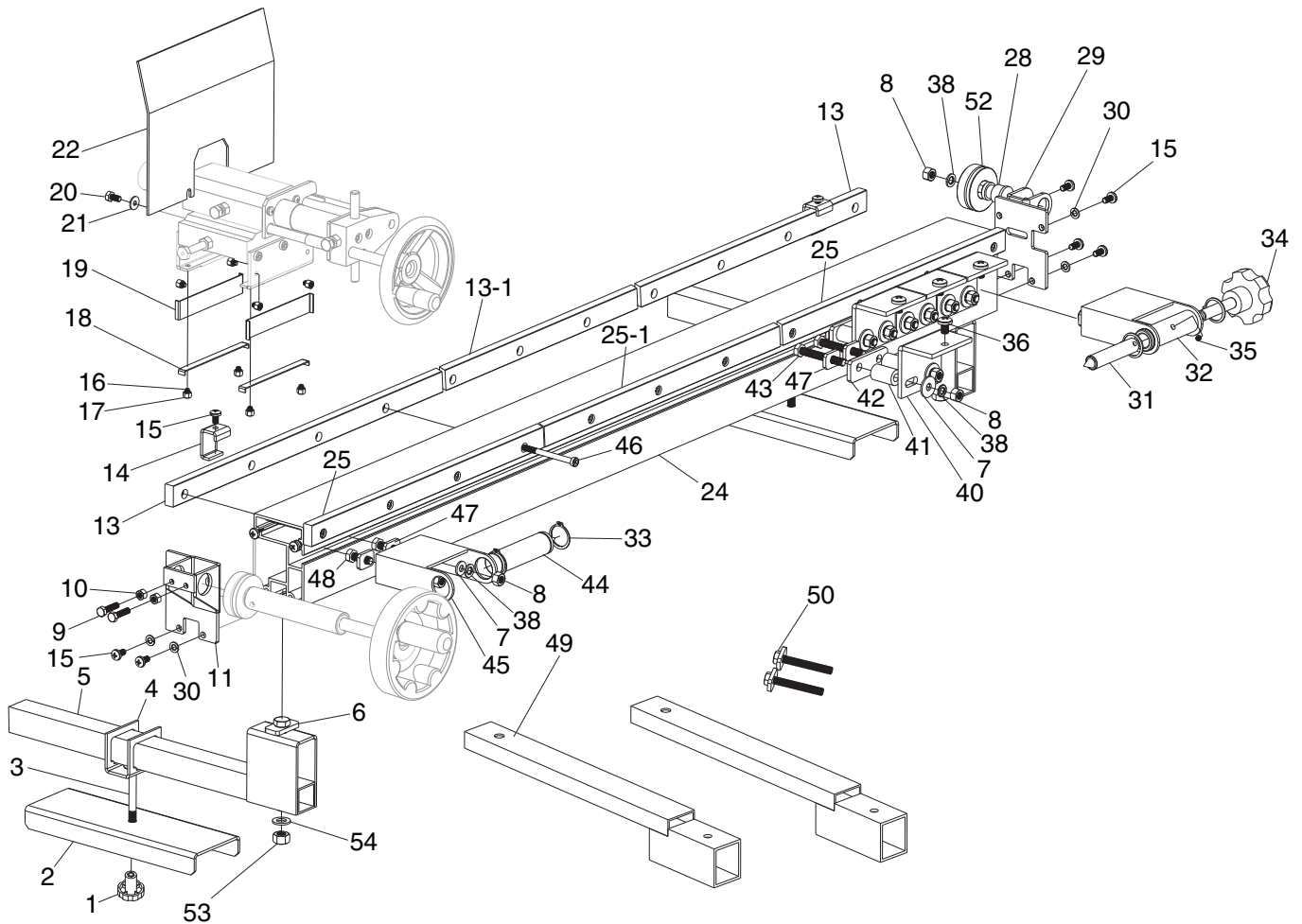
Figure 26. Adjusting carriage gib (1 of 8).

4. Slide carriage back and forth to test for binding or wobble.
—If carriage binds or wobbles, repeat **Step 3**.
5. When adjustments are complete, tighten the hex nuts while maintaining the set screw position.



SECTION 7: PARTS

Main Breakdown



Please Note: We do our best to stock replacement parts whenever possible, but we cannot guarantee that all parts shown here are available for purchase. Call (800) 523-4777 or visit our online parts store at www.grizzly.com to check for availability.

Model T27313 (Mfd. Since 01/15)



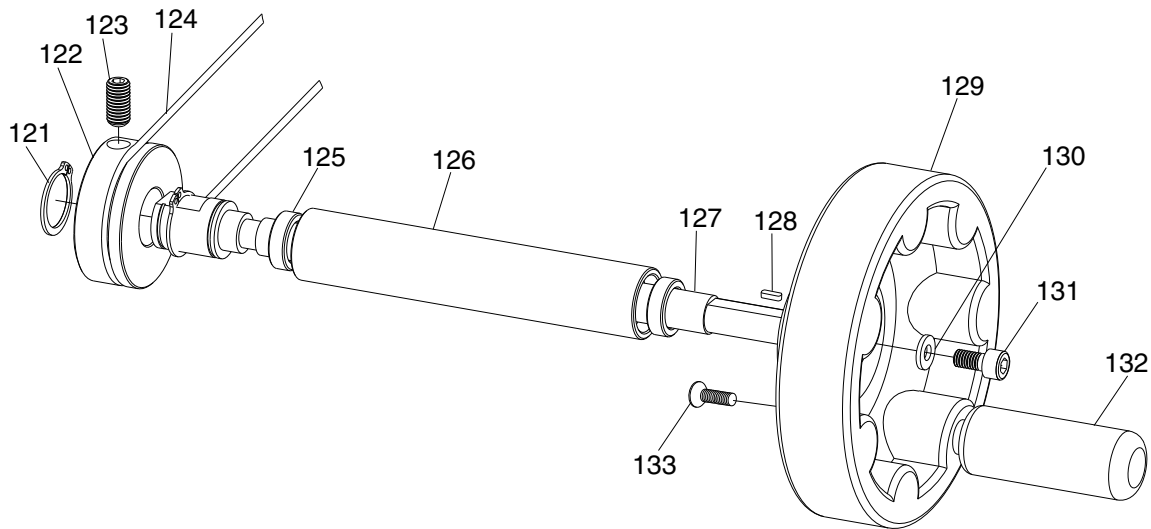
Main Parts List

REF PART #	DESCRIPTION
1	PT27313001 KNOB M8-1.25
2	PT27313002 SUPPORT ARM CLAMPING PLATE
3	PT27313003 CARRIAGE BOLT M8-1.25 X 150
4	PT27313004 SUPPORT ARM CLAMP
5	PT27313005 SUPPORT ARM (TALL)
6	PT27313006 T-BOLT M10-1.5 X 100
7	PT27313007 FENDER WASHER 8MM
8	PT27313008 HEX NUT M8-1.25
9	PT27313009 HEX BOLT M6-1 X 25
10	PT27313010 HEX NUT M6-1
11	PT27313011 LONGITUDINAL FEED BRACKET
13	PT27313013 REAR GUIDE RAIL
13-1	PT27313013-1 REAR GUIDE RAIL (SHORT)
14	PT27313014 CARRIAGE STOP
15	PT27313015 PHLP HD SCR M6-1 X 12
16	PT27313016 SET SCREW M5-.8 X 8
17	PT27313017 HEX NUT M5-.8
18	PT27313018 CARRIAGE GIB (SMALL)
19	PT27313019 CARRIAGE GIB (LARGE)
20	PT27313020 HEX BOLT M6-1 X 10
21	PT27313021 FLAT WASHER 6MM
22	PT27313022 CHIP GUARD
24	PT27313024 COPY ATTACHMENT BED
25	PT27313025 FRONT GUIDE RAIL
25-1	PT27313025-1 FRONT GUIDE RAIL (SHORT)

REF PART #	DESCRIPTION
28	PT27313028 PULLEY SHAFT
29	PT27313029 PULLEY BRACKET
30	PT27313030 LOCK WASHER 6MM
31	PT27313031 LIVE CENTER
32	PT27313032 LIVE CENTER SLEEVE
33	PT27313033 EXT RETAINING RING 24MM
34	PT27313034 KNOB BOLT M12-1.75 X 90
35	PT27313035 SET SCREW M5-.8 X 4
36	PT27313036 PHLP HD SCR M8-1.25 X 12
38	PT27313038 LOCK WASHER 8MM
40	PT27313040 TEMPLATE SUPPORT BRACKET
41	PT27313041 TEMPLATE SUPPORT OFFSET
42	PT27313042 TEMPLATE SUPPORT CLAMPING PLATE
43	PT27313043 HEX BOLT M8-1.25 X 60
44	PT27313044 DEAD CENTER
45	PT27313045 CENTER BRACKET
46	PT27313046 CAP SCREW M6-1 X 85
47	PT27313047 CENTER CLAMPING PLATE
48	PT27313048 HEX BOLT M8-1.25 X 25
49	PT27313049 SUPPORT ARM (SHORT)
50	PT27313050 T-BOLT M10-1.5 X 45
52	PT27313052 LONGITUDINAL FEED PULLEY
53	PT27313053 HEX NUT M10-1.5
54	PT27313054 FENDER WASHER 10MM



Longitudinal Drive Breakdown



REF PART #	DESCRIPTION
121	PT27313121 EXT RETAINING RING 19MM
122	PT27313122 LONGITUDINAL FEED PULLEY
123	PT27313123 SET SCREW M8-1.25 X 16
124	PT27313124 LONGITUDINAL FEED CABLE
125	PT27313125 BUSHING (COPPER)
126	PT27313126 LONGITUDINAL SPINDLE SLEEVE
127	PT27313127 LONGITUDINAL FEED SPINDLE

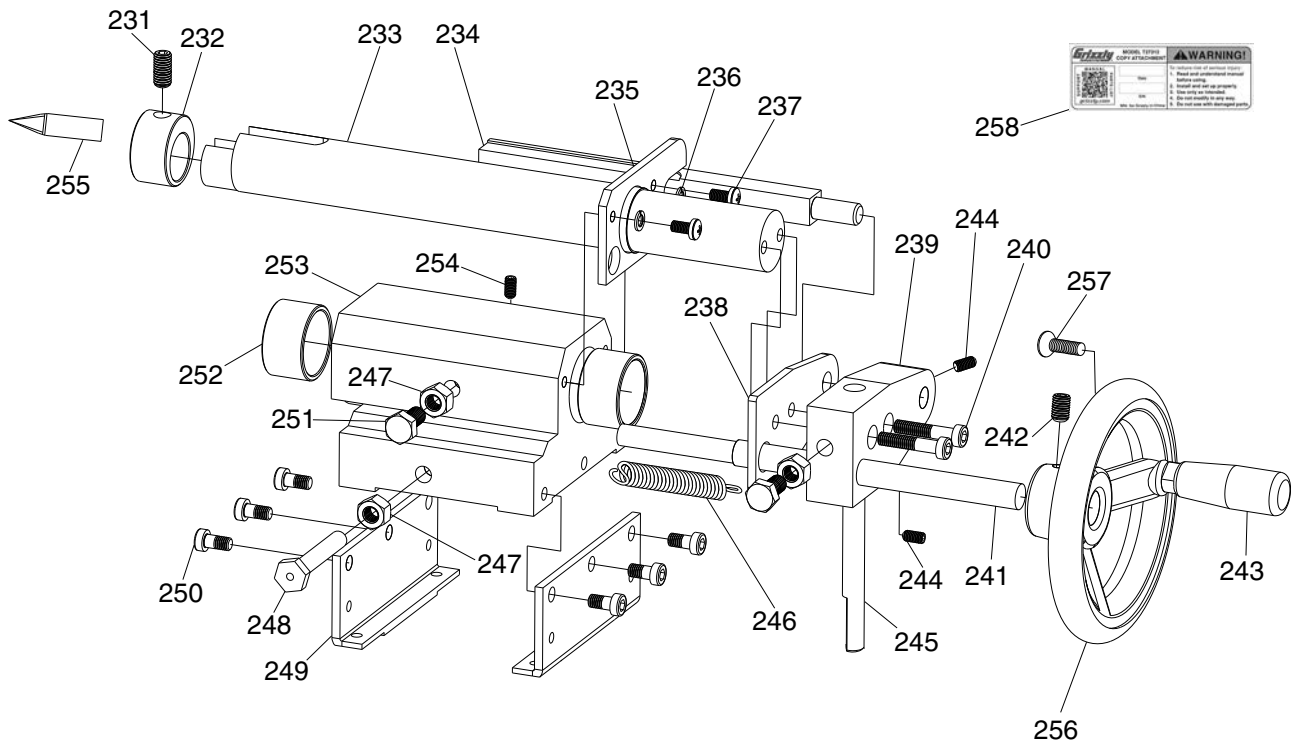
REF PART #	DESCRIPTION
128	PT27313128 KEY 4 X 4 X 10
129	PT27313129 HANDWHEEL 160MM DIA DISHED (PLASTIC)
130	PT27313130 FLAT WASHER 6MM
131	PT27313131 CAP SCREW M6-1 X 12
132	PT27313132 HANDWHEEL HANDLE
133	PT27313133 FLAT HD SCR M6-1 X 8

WARNING

Safety labels help reduce the risk of serious injury caused by machine hazards. If any label comes off or becomes unreadable, the owner of this machine **MUST** replace it in the original location before resuming operations. For replacements, contact (800) 523-4777 or www.grizzly.com.



Carriage Breakdown



REF	PART #	DESCRIPTION
231	PT27313231	SET SCREW M8-1.25 X 16
232	PT27313232	CUTTING TOOL ARBOR
233	PT27313233	QUILL
234	PT27313234	GAUGE ROD
235	PT27313235	INDICATOR PLATE
236	PT27313236	LOCK WASHER 5MM
237	PT27313237	PHLP HD SCR M5-.8 X 12
238	PT27313238	CARRIAGE SPACER
239	PT27313239	LEADSCREW SEAT
240	PT27313240	CAP SCREW M6-1 X 30
241	PT27313241	LEADSCREW
242	PT27313242	SET SCREW M8-1.25 X 12
243	PT27313243	HANDWHEEL HANDLE
244	PT27313244	SET SCREW M5-.8 X 10

REF	PART #	DESCRIPTION
245	PT27313245	STYLUS
246	PT27313246	EXTENSION SPRING
247	PT27313247	HEX NUT M8-1.25
248	PT27313248	VENTED BOLT M8-1.25 X 65
249	PT27313249	MOUNTING PLATE
250	PT27313250	CAP SCREW M6-1 X 12
251	PT27313251	HEX BOLT M8-1.25 X 16
252	PT27313252	BUSHING (COPPER)
253	PT27313253	CARRIAGE CASTING
254	PT27313254	SET SCREW M5-.8 X 12
255	PT27313255	CUTTING TOOL
256	PT27313256	HANDWHEEL 98MM DIA DISHED (PLASTIC)
257	PT27313257	FLAT HD SCR M6-1 X 8
258	PT27313258	MACHINE ID LABEL





WARRANTY CARD

Name _____
 Street _____
 City _____ State _____ Zip _____
 Phone # _____ Email _____
 Model # _____ Order # _____ Serial # _____

The following information is given on a voluntary basis. It will be used for marketing purposes to help us develop better products and services. **Of course, all information is strictly confidential.**

1. How did you learn about us?

Advertisement Friend Catalog
 Card Deck Website Other:

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

<input type="checkbox"/> Cabinetmaker & FDM	<input type="checkbox"/> Popular Science	<input type="checkbox"/> Wooden Boat
<input type="checkbox"/> Family Handyman	<input type="checkbox"/> Popular Woodworking	<input type="checkbox"/> Woodshop News
<input type="checkbox"/> Hand Loader	<input type="checkbox"/> Precision Shooter	<input type="checkbox"/> Woodsmith
<input type="checkbox"/> Handy	<input type="checkbox"/> Projects in Metal	<input type="checkbox"/> Woodwork
<input type="checkbox"/> Home Shop Machinist	<input type="checkbox"/> RC Modeler	<input type="checkbox"/> Woodworker West
<input type="checkbox"/> Journal of Light Cont.	<input type="checkbox"/> Rifle	<input type="checkbox"/> Woodworker's Journal
<input type="checkbox"/> Live Steam	<input type="checkbox"/> Shop Notes	<input type="checkbox"/> Other:
<input type="checkbox"/> Model Airplane News	<input type="checkbox"/> Shotgun News	
<input type="checkbox"/> Old House Journal	<input type="checkbox"/> Today's Homeowner	
<input type="checkbox"/> Popular Mechanics	<input type="checkbox"/> Wood	

3. What is your annual household income?

\$20,000-\$29,000 \$30,000-\$39,000 \$40,000-\$49,000
 \$50,000-\$59,000 \$60,000-\$69,000 \$70,000+

4. What is your age group?

20-29 30-39 40-49
 50-59 60-69 70+

5. How long have you been a woodworker/metalworker?

0-2 Years 2-8 Years 8-20 Years 20+ Years

6. How many of your machines or tools are Grizzly?

0-2 3-5 6-9 10+

7. Do you think your machine represents a good value? Yes No

8. Would you recommend Grizzly Industrial to a friend? Yes No

9. Would you allow us to use your name as a reference for Grizzly customers in your area?

Note: We never use names more than 3 times. Yes No

10. Comments: _____

CUT ALONG DOTTED LINE

FOLD ALONG DOTTED LINE



Place
Stamp
Here



GRIZZLY INDUSTRIAL, INC.
P.O. BOX 2069
BELLINGHAM, WA 98227-2069



FOLD ALONG DOTTED LINE

Send a Grizzly Catalog to a friend:

Name _____
Street _____
City _____ State _____ Zip _____

TAPE ALONG EDGES--PLEASE DO NOT STAPLE

WARRANTY & RETURNS

Grizzly Industrial, Inc. warrants every product it sells for a period of **1 year** 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 or 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, contact us by mail or phone and give us all the details. We will then issue you a "Return Number," which must be clearly posted on the outside as well as the inside of the carton. We will not accept any item back without this number. Proof of purchase must accompany the merchandise.

The manufacturers reserve the right to change specifications at any time because they constantly strive to achieve 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.

Please feel free to write or call us if you have any questions about the machine or the manual.

Thank you again for your business and continued support. We hope to serve you again soon.

grizzly.com[®]

TOOL WEBSITE

Buy Direct and Save with Grizzly[®] – Trusted, Proven and a Great Value!
~Since 1983~

*Visit Our Website Today For
Current Specials!*

**ORDER
24 HOURS A DAY!
1-800-523-4777**



Free Manuals Download Website

<http://myh66.com>

<http://usermanuals.us>

<http://www.somanuals.com>

<http://www.4manuals.cc>

<http://www.manual-lib.com>

<http://www.404manual.com>

<http://www.luxmanual.com>

<http://aubethermostatmanual.com>

Golf course search by state

<http://golfingnear.com>

Email search by domain

<http://emailbydomain.com>

Auto manuals search

<http://auto.somanuals.com>

TV manuals search

<http://tv.somanuals.com>