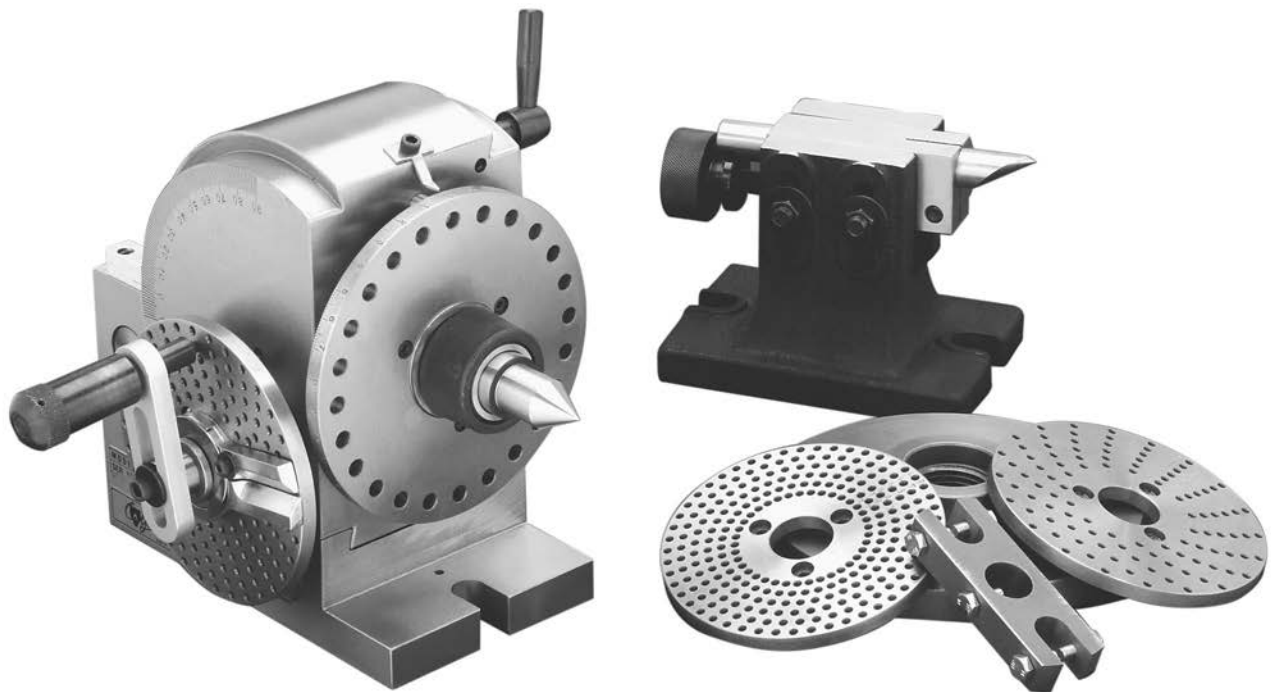




MODEL G1053/G1054

DIVIDING HEAD

OWNER'S MANUAL



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**WARNING: NO PORTION OF THIS MANUAL MAY BE REPRODUCED IN ANY SHAPE
OR FORM WITHOUT THE WRITTEN APPROVAL OF GRIZZLY INDUSTRIAL, INC.**
(FOR MODELS MANUFACTURED SINCE 1/09) #DDTS11699 PRINTED IN TAIWAN



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
Manual Accuracy.....	2
Contact Info.....	2
Functional Description.....	2
Identification.....	3
Specifications.....	4
SECTION 1: SAFETY.....	5
Safety Instructions for Machinery.....	5
SECTION 2: SETUP.....	7
Needed for Setup.....	7
Unpacking.....	7
Inventory.....	8
Clean Up.....	8
Installation.....	9
Centering Spindle.....	10
Tailstock Center Height.....	11
SECTION 3: OPERATIONS.....	12
Basic Controls.....	12
Changing Dividing Plates.....	13
Tilting Spindle.....	14
Spindle Center.....	14
Center Dog.....	15
Chuck Backing Plate.....	15
Setting Index Pin.....	16
Using Dividing Plates.....	16
Disengaging Worm.....	20
Cutting Angles.....	21
SECTION 4: ACCESSORIES.....	22
SECTION 5: MAINTENANCE.....	23
Schedule.....	23
Cleaning.....	23
Lubrication.....	23
Surface Care.....	24
Bearing Preload.....	25
SECTION 6: PARTS.....	26
G1053/G1054 Main.....	26
G1053 Parts List.....	27
G1054 Parts List.....	28
WARRANTY AND RETURNS.....	33

INTRODUCTION

Manual Accuracy

We are proud to offer this manual with your new dividing head! We've made every effort to be exact with the instructions, specifications, drawings, and photographs of the dividing head we used when writing this manual. However, sometimes errors do happen and we apologize for them.

Also, owing to our policy of continuous improvement, **your dividing head may not exactly match the manual**. If you find this to be the case, and the difference between the manual and dividing head leaves you in doubt, check our website for the latest manual update or call technical support for help.

For your convenience, we post all available manuals and manual updates for free on our website at **www.grizzly.com**. Any updates to your model of dividing head will be reflected in these documents as soon as they are complete.

Contact Info

We stand behind our machines. If you have any service questions, parts requests or general questions about the dividing head, please call or write us at the location listed below.

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

If you have any comments regarding this manual, please write to us at the address below:

Grizzly Industrial, Inc.
c/o Technical Documentation Manager
P.O. Box 2069
Bellingham, WA 98227-2069
Email: manuals@grizzly.com

Functional Description

The Model G1053/G1054 Dividing Head offers precision rotary positioning of the workpiece for machining various spacing patterns.

A pattern of drilled holes radially or on the face of the workpiece may be produced with exact spacing. Other typical operations include milling of spur gears, sprockets, cogs, and circular slots, as well as, grinding punches or other hardened materials. These tasks would be difficult to perform without the use of a dividing head.

This dividing head is supplied with a 24-hole direct indexing plate and index system that allows divisions of 2, 3, 4, 6, 8, 12, and 24.



Identification

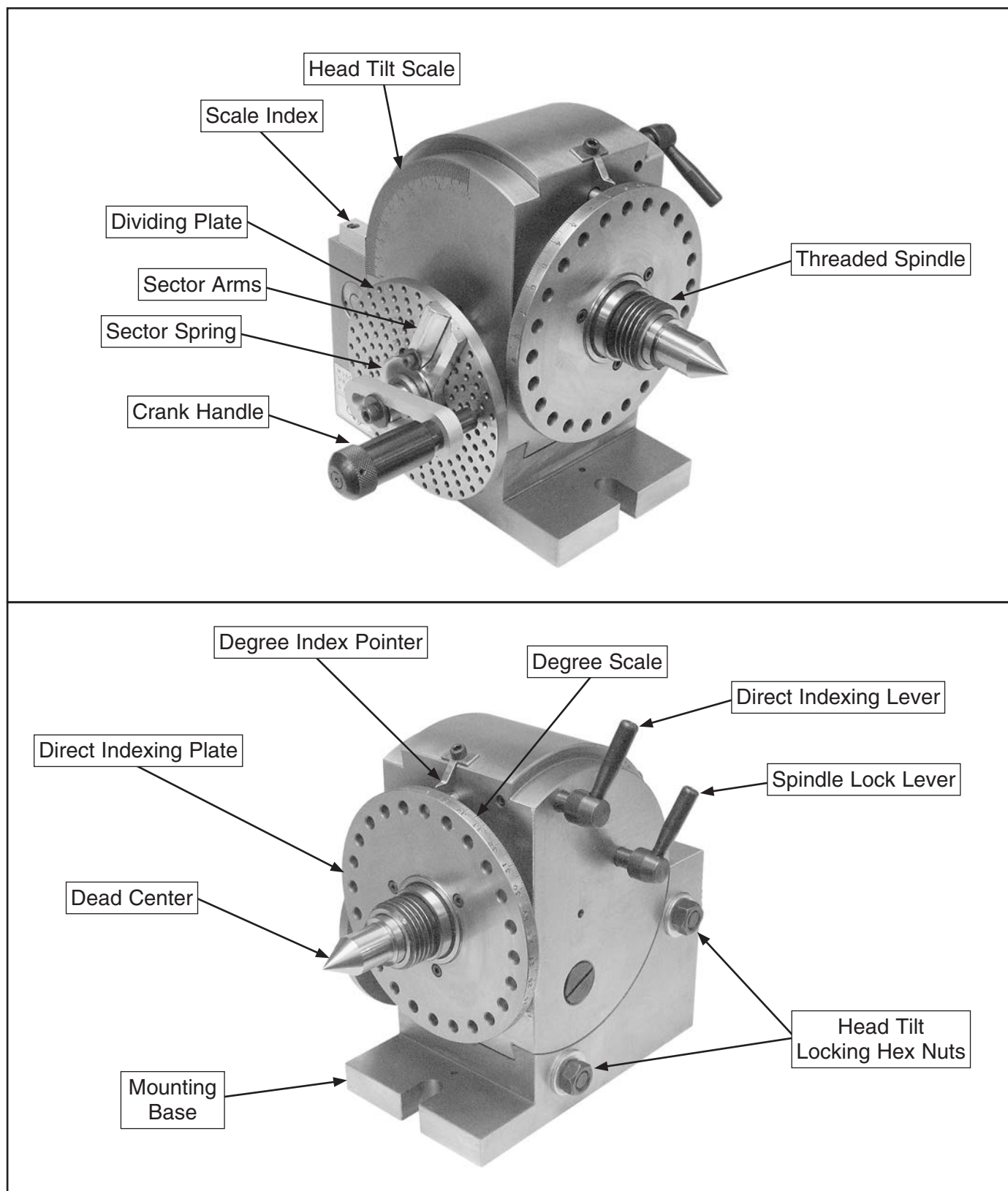


Figure 1. Model G1053/G1054 identification.



Specifications

Description	G1053	G1054
Overall Length	7.72"	9.96"
Overall Width	7.25"	8.5"
Overall Height	6.61"	8.66"
Center Height	3.94"	5.04"
Spindle Taper	Brown & Sharpe #7	Brown & Sharpe #9
Spindle Bore	0.63"	.078"
Tailstock Length	7.17"	7.17"
Tailstock Width	3.23"	3.23"
Tailstock Height	4.84"	5.24"
Spindle Thread	1 1/2"-8	1 1/2"-8
Shipping Weight	41 lbs.	69 lbs.
No. of Dividing Plates	3	3
Country of Origin	Taiwan	Taiwan



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.



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



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



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



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!

INTENDED USAGE. Only use machine for its intended purpose and never make modifications not approved by Grizzly. Modifying machine or using it differently than intended may result in malfunction or mechanical failure that can lead to serious 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.

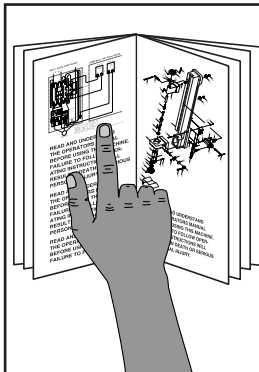
CHECK DAMAGED PARTS. Regularly inspect machine for any condition that may affect safe operation. Immediately repair or replace damaged or mis-adjusted parts before operating machine.

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.

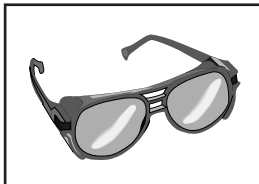


SECTION 2: SETUP



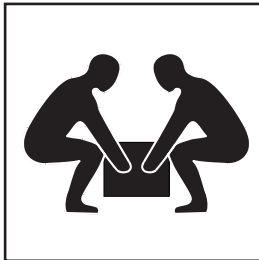
!WARNING

This tool presents serious injury hazards to untrained users. Read through this entire manual to become familiar with the controls and operations before starting the operation!



!WARNING

Wear safety glasses during the entire setup process!



!WARNING

The dividing head is very heavy. Get lifting help and use proper lifting methods to avoid serious personal injury.

Needed for Setup

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

Description	Qty
• Safety Glasses	1
• Cleaner/Degreaser (Page 8)	As Needed
• Shop Rags.....	As Needed
• Another Person	1
• Precision Square	1
• Test Indicator*	1
• Edge Finder*	1
• Clamping Hardware*	As Needed

*Refer to the **Accessories** section on **Page 22** for options from Grizzly.

Unpacking

Your dividing head was carefully packaged for safe transportation. Remove the packaging materials from around your dividing head and inspect it. If you discover the dividing head is damaged, *please immediately call Customer Service 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.



Inventory

The following is a description of the main components shipped with your dividing head. Lay the components out to inventory them.

Note: *If you can't find an item on this list, check the mounting location on the dividing head or examine the packaging materials carefully. Occasionally we pre-install certain components for shipping purposes.*

Inventory: (Figure 2)	Qty
A. Dividing Plates.....	3
B. Dividing Head	1
C. Tailstock.....	1
D. Dead Center	1
E. Center Dog	1
F. Crank Handle	1
G. Chuck Backing Plate	1
H. Hardware Bag (not shown)	
—Cap Screw M6-1 x 12 (Crank)	1
—Flat Washer 6mm (Crank).....	1

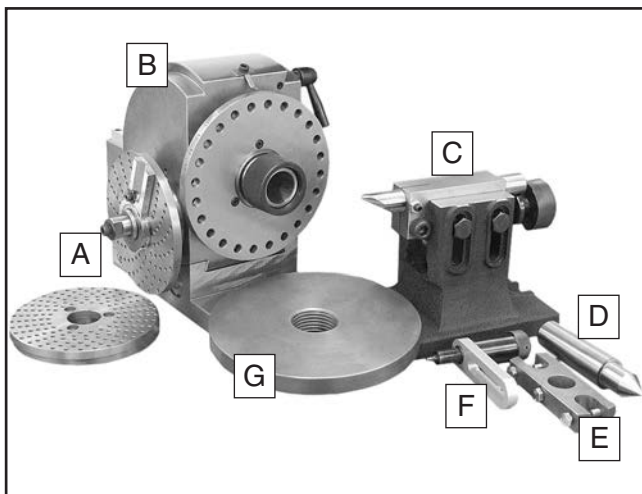
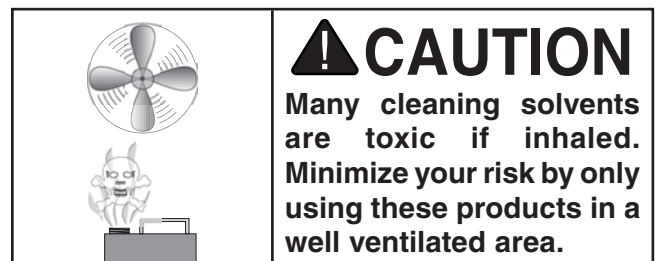
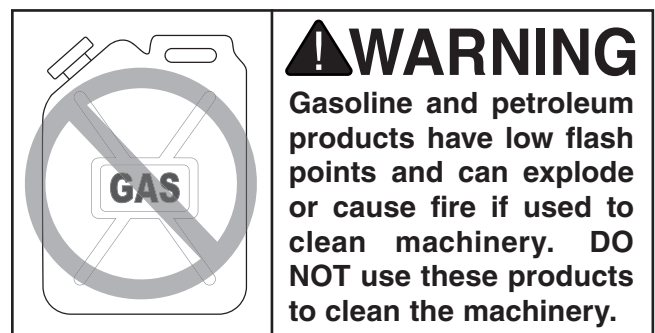


Figure 2. Model G1053/G1054 inventory.

If any nonproprietary 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.

Clean Up

The unpainted surfaces are coated with a waxy oil to prevent corrosion during shipment. Remove this protective coating with a solvent cleaner or degreaser, such as shown in **Figure 3**. For thorough cleaning, some parts must be removed. **For optimum performance, clean all moving parts or sliding contact surfaces.** Avoid chlorine-based solvents, such as acetone or brake parts cleaner that may damage painted surfaces. Always follow the manufacturer's instructions when using any type of cleaning product.



G2544—Solvent Cleaner & Degreaser

H9692—Orange Power Degreaser

Great products for removing shipping grease.



Figure 3. Cleaner/degreasers available from Grizzly.



Installation

Before installing the dividing head or tailstock, make sure that your mill table and spindle are properly aligned as instructed in the owner's manual for your mill. Remove any surface burrs or scratches from the mating surfaces of the mill table, the dividing head, and the tailstock by "stoning" them, then thoroughly wipe them clean and dry (refer to the **Surface Care** section on **Page 24** for detailed instructions).

The dividing head and tailstock have keyways machined into the bottom of their mounting bases, which measure 16mm or approximately 0.6299". Making alignment keys that fit these keyways and the T-slot of the mill table provides a convenient and efficient way to ensure alignment of the dividing head and tailstock with the mill table X-axis.

Note: *The dividing head and tailstock install in the same manner.*

Installing with Alignment Keys

1. DISCONNECT MILL FROM POWER!
2. Install the alignment keys into the base of the dividing head, as shown in **Figure 4**.

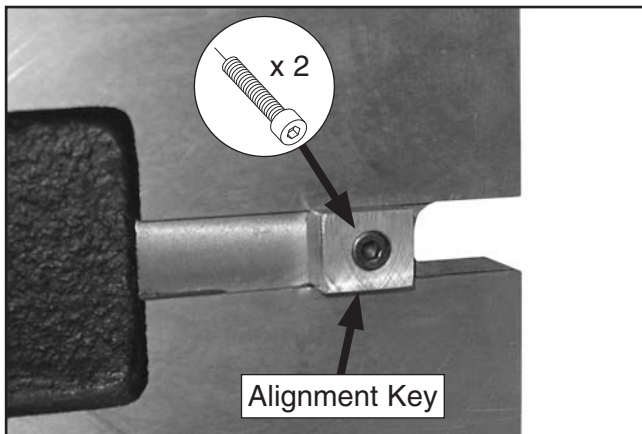


Figure 4. Alignment key installed.

3. While aligning the keys with the center T-slot of the table, place the dividing head on the table with the spindle facing to the right, then secure it with the appropriate clamping hardware (see **Figure 5**).

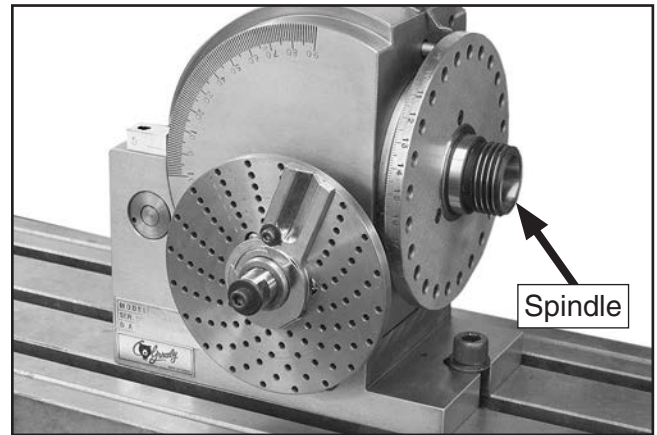


Figure 5. Tool installed on the mill table.

Installing Without Alignment Keys

1. DISCONNECT MILL FROM POWER!
2. Place the dividing head in the center of the mill table with the spindle facing to the right.
3. Mount a test indicator into the mill spindle with the indicator tip touching the front face of the dividing head, as shown in **Figure 6**.

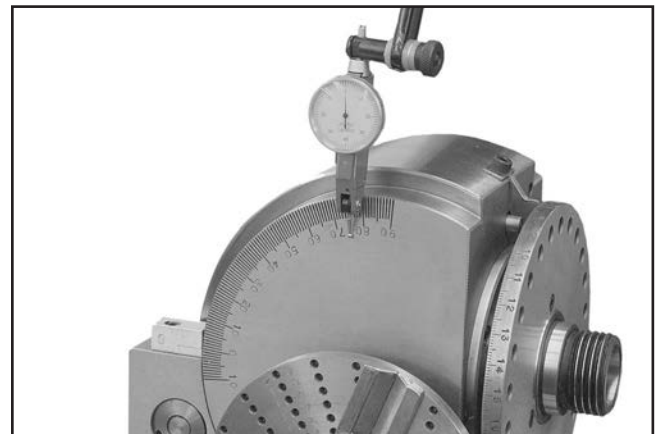


Figure 6. Indicating the front face of the tool.

4. Adjust the position of the dividing head while moving the mill table back-and-forth along the X-axis until the indicator reads zero deviation across the face, then clamp the head in place.



Centering Spindle

Whether the spindle of the dividing head is mounted horizontally or vertically, you must center the dividing head spindle with the mill spindle to achieve the most precise results.

We have included two methods to center the spindles below, one for each orientation. However, there are many ways to center the spindles, and it is up to the machinist to know their capabilities and to decide which approach is best.

Horizontal Spindle

1. Make sure the dividing head is properly aligned with the mill table and firmly secured in position.
2. Mount the included dead center into the dividing head spindle and an edge finder into the mill spindle, then move the mill table to position the edge finder in front of the center, as shown in **Figure 7**.

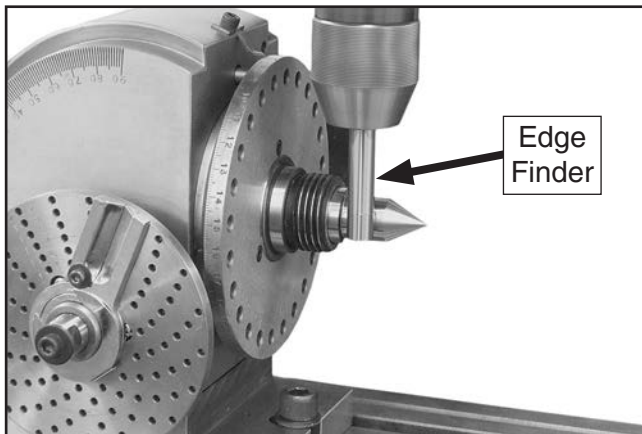


Figure 7. Aligning the spindles using an edge finder.

3. Set the mill for the slowest spindle speed, then turn the mill **ON**.
4. Carefully and slowly move the table in-and-out along the Y-axis until you find the edge of the dividing head center.
5. Note the Y-axis position of the mill table.

Note: When recording the mill table position, take into account the backlash that is usually present in the leadscrew.

6. Use a caliper to measure the diameter of the dividing head center where the edge finder made correct contact.
7. Add half the diameter of the center and half the diameter of the edge finder together, then move the mill table in toward the mill an additional distance equal to the calculated number above.

Vertical Spindle

1. **DISCONNECT MILL FROM POWER!**
2. Make sure the dividing head is properly aligned with the mill table and firmly secured in position.
3. Mount a test indicator in the mill spindle and position the indicator tip against the inside wall of the dividing head spindle bore, as shown in **Figure 8**.

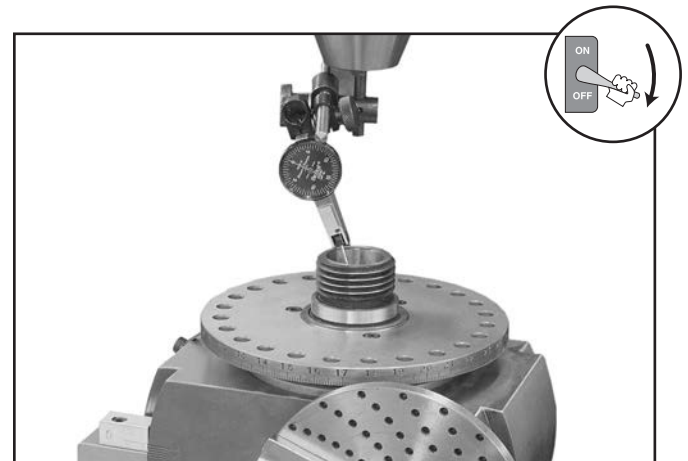


Figure 8. Indicating the spindle bore.

4. Slowly rotate the mill spindle by hand and watch the test indicator dial.

Note: For best results, turn the spindle in only one direction.

Tip: Use a mirror to view the indicator dial as it turns away from you.

5. Slowly adjust the mill table to adjust for the runout as shown on the indicator.
6. The spindles of the dividing head and mill are centered with one another when the test indicator shows zero runout when rotated a full 360°.



Tailstock Center Height

When supporting a workpiece between centers, it is necessary to set the height of the tailstock center so that it is even and parallel with the center line of the dividing head spindle. One method for accomplishing this is listed below.

Tools Needed	Qty
Wrench or Socket 14mm	1

To properly adjust the tailstock center height:

1. DISCONNECT MILL FROM POWER!
2. Place the dividing head on the table and position it so that the spindle faces toward the operator.
3. Install the tailstock so that its center is aligned with the center hole in the side of the dividing head, as shown in **Figure 9**.

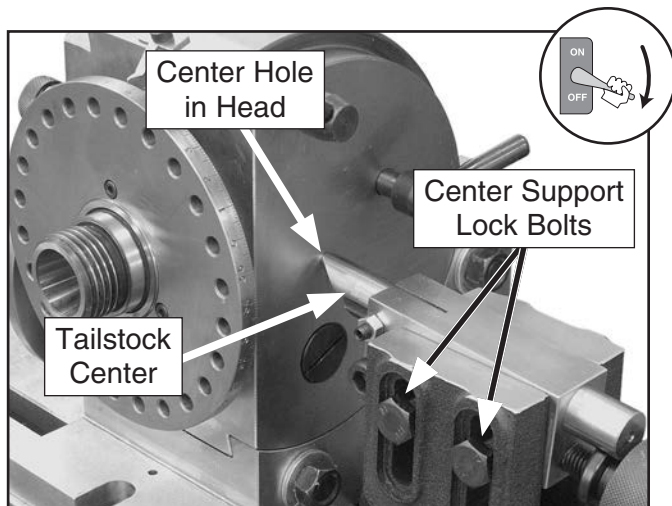


Figure 9. Tailstock center contacting the center hole of the dividing head.

4. Loosen the hex nuts on the tailstock center support lock bolts (see **Figure 10**), adjust the tailstock center so that the tip is in the center hole of the head and is approximately level, then snug one of the hex nuts to hold it in place.

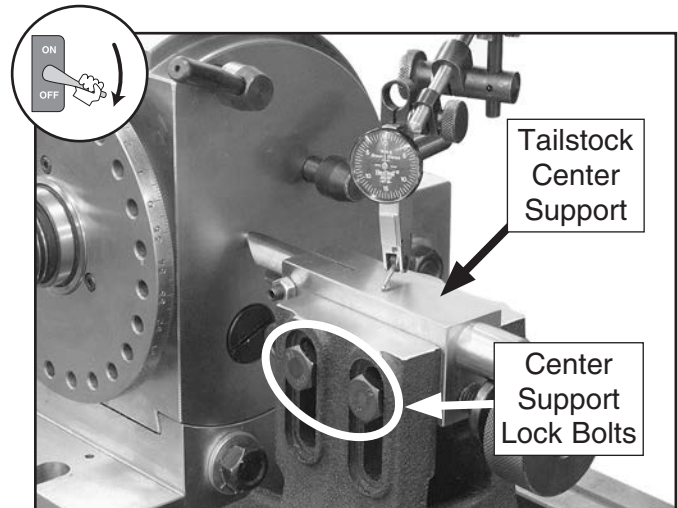
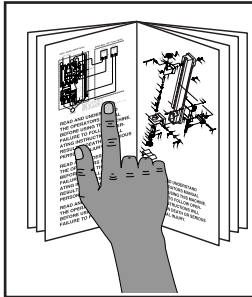


Figure 10. Indicating the tailstock center support.

5. Mount a test indicator into the mill spindle with the tip resting on the top of the tailstock center support, as shown in **Figure 10**.
6. Move the mill table back-and-forth along its X-axis so that the full length of the center support is indicated.
7. Make adjustments to the height of the center support until there is zero deviation indicated along the full length of the center support, then completely tighten the lock bolt hex nuts.
8. Indicate the full length of the center support again and make any necessary corrections.



SECTION 3: OPERATIONS

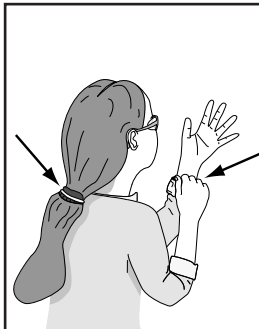


!WARNING

To reduce the risk of serious injury when using this tool, read and understand this entire manual before beginning any operations.

!WARNING

Damage to your eyes and lungs could result from using this tool without proper protective gear. Always wear safety glasses and a respirator when operating this tool.



!WARNING

Loose hair, clothing, or jewelry could get caught in machinery and cause serious personal injury. Keep these items away from moving parts at all times to reduce this risk.

NOTICE

If you have never used this type of equipment before, WE STRONGLY RECOMMEND that you read books, review industry trade 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.

Basic Controls

Use **Figures 11–12** and the following descriptions to become familiar with the basic controls of your dividing head.

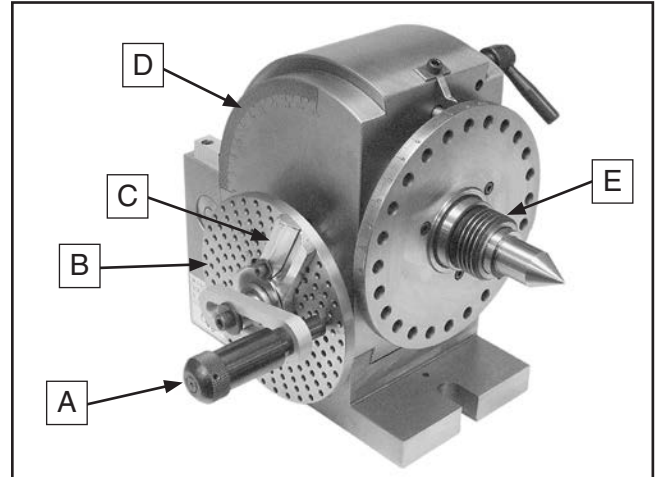


Figure 11. Basic controls, left side.

- A. Hand Crank:** Rotates the spindle when turned. Pulling the knob out causes the index pin to disengage from the dividing plate.
- B. Dividing Plate:** Provides 6 circles of holes for indexing (1 of 3 plates).
- C. Sector Arms:** Sections the dividing plate into a segment that allows you to keep track of the fraction of rotation.
- D. Head Tilt Scale:** Shows the amount of spindle tilt and is calibrated from -10° to $+90^{\circ}$ in one degree increments.
- E. Threaded Spindle:** Provides threaded mounting for the chuck backing plate or other precision accessories. The threads are $1\frac{1}{2}$ "-8.



Changing Dividing Plates

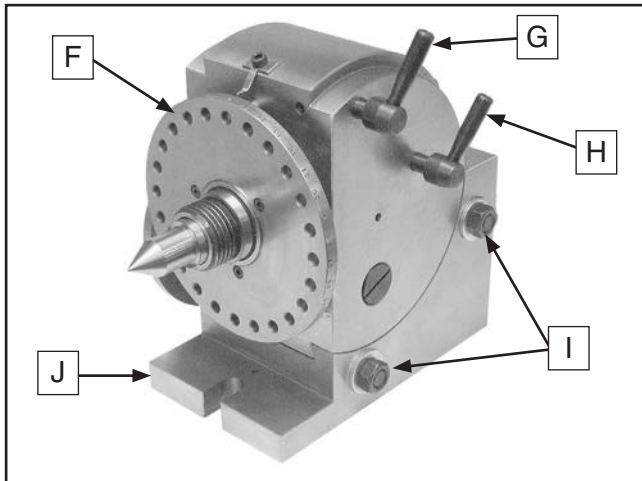


Figure 12. Basic controls, right side.

- F. Direct Indexing Plate:** Provides 24 evenly spaced holes for indexing 2, 3, 4, 6, 8, 12, or 24 locations.
- G. Direct Indexing Lever:** Engages the indexing pin with the direct indexing plate holes.
- H. Spindle Lock:** Locks the spindle in place to ensure rigidity and accuracy.
- I. Head Tilting Hex Nuts:** When loosened, allows the head to be tilted.
- J. Mounting Base:** Precision ground base with slots for mounting to the mill table.

The dividing plates can be changed when a specific hole count is required for indirect indexing.

Tools Needed

	Qty
Phillips Screwdriver #2	1
Hex Wrenches 3, 5mm.....	1 Each

To change the dividing plate:

1. Remove the cap screw and flat washer that secure the hand crank, then remove the crank (see **Figure 13**).

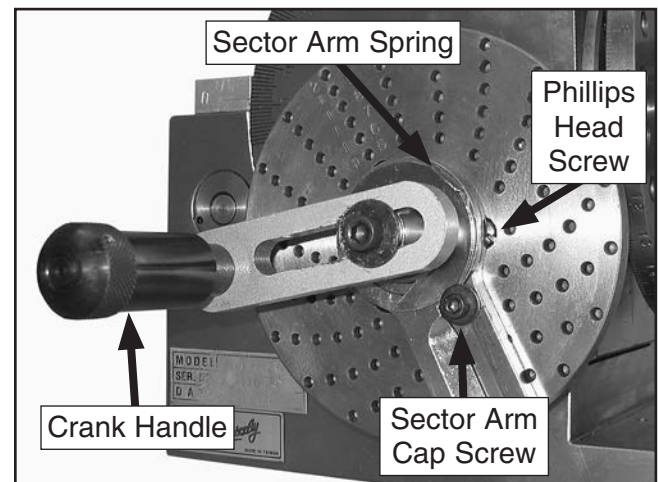


Figure 13. Dividing plate components.

2. Loosen the sector arm cap screw, then remove the sector arm spring and the sector arms.
3. Replace the dividing plate, then re-install the parts in the reverse order that you removed them.

Note: Before storing or installing a dividing plate, thoroughly clean it with mineral spirits, then apply a thin coat of light machine oil to the surfaces to prevent corrosion.



Tilting Spindle

The spindle of your dividing head tilts from -10° to $+90^{\circ}$ out of parallel from the bottom of the mounting base.

Tools Needed	Qty
Wrench or Socket 19mm.....	1

To tilt the spindle:

1. Loosen the two tilt locking hex nuts on the rear of the dividing head (see **Figure 14**).

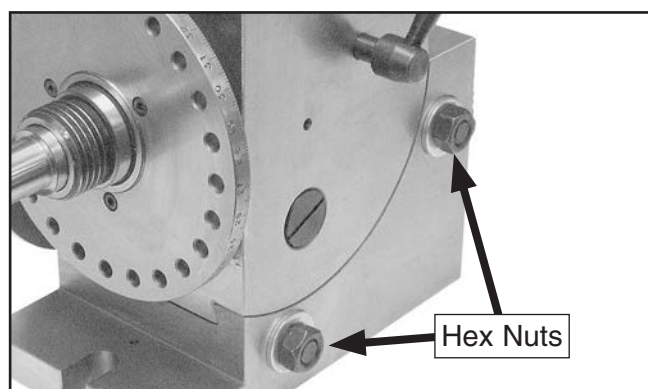


Figure 14. Tilt locking hex nuts.

2. Tilt the spindle to the desired angle as displayed on the tilt scale, then re-tighten the hex nuts (see **Figure 15**).

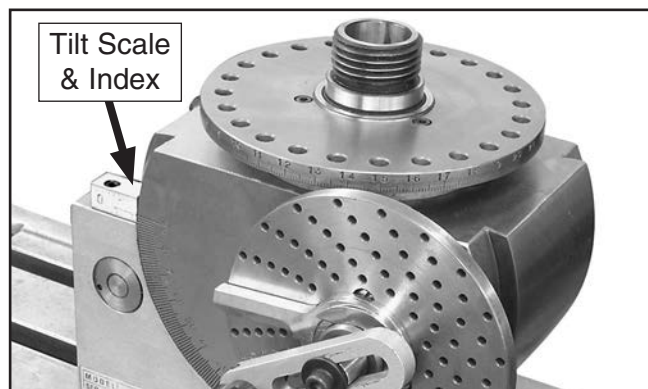


Figure 15. Spindle tilted vertical.

Note: It may be necessary to tap on the hex nuts with a dead blow hammer to break the locking bolts loose before the head will move.

Spindle Center

Your dividing head includes a dead center for use in the spindle. The spindle bore and the shank of the center are a Brown & Sharpe taper #7 for the Model G1053 and a #9 for the Model G1054.

To install the dead center:

1. Thoroughly clean the spindle bore and the center shank. Inspect these surfaces for scratches or nicks. If necessary, dress or "stone" them (refer to **Surface Care** on **Page 24** for detailed instructions).
2. Insert the center into the spindle bore to within $\frac{1}{2}$ " of being fully seated, then thrust the center rapidly into the bore the rest of the way to ensure the tapers lock (see **Figure 16**).

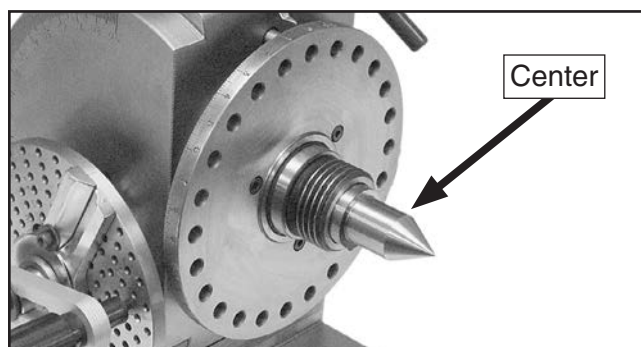


Figure 16. Dead center installed.

3. Test the taper lock by grasping the protruding portion of the center and attempt to twist it out of the bore.

—If the center comes out of the spindle bore, repeat **Steps 1–2** until it does not.

Removing Spindle Center

Tools Needed	Qty
Brass or Aluminum Rod	
Approx. $\frac{5}{8}$ " Diameter x 12"–16" Long.....	1

To remove the dead center:

1. Use a gloved hand or shop rags to hold the center.
2. Insert the rod into the rear of the spindle bore and tap the center until it releases.



Center Dog

When supporting the workpiece between centers, it is necessary to use the center dog (sometimes referred to as a drive bracket). The center dog that is supplied with your dividing head is designed to mount onto the included dead center and will require the use of a bent-tail lathe dog (not provided) installed onto the workpiece.

To mount a workpiece between centers:

1. DISCONNECT MILL FROM POWER!
2. Loosen the middle hex nut on the center dog until it clears the bore, slide it onto the dead center, then re-tighten the hex bolt to secure it in place, as shown in **Figure 17**.

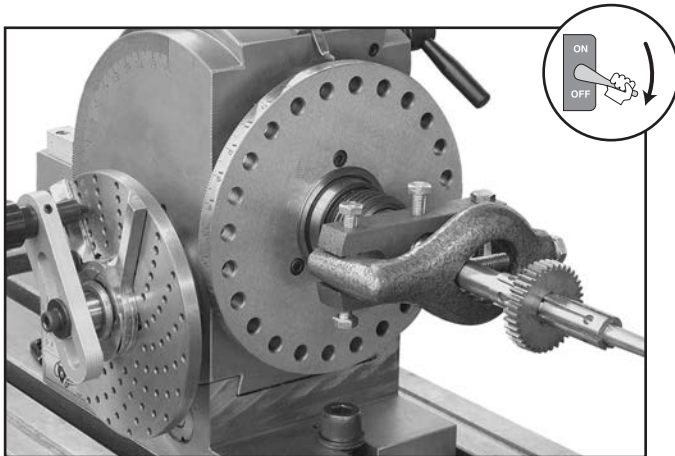


Figure 17. Workpiece installed between centers.

3. Install the lathe dog onto the workpiece with the tail extending beyond the end of it.
4. Align the lathe dog tail with a side slot of the center dog, then properly mount the workpiece between the centers.
5. Tighten the two hex bolts on the center dog so that they firmly hold the lathe dog tail.

Note: It may be necessary to alter the lathe dog tail so that the hex bolts make contact with two flat surfaces.

6. Make adjustments as necessary to ensure that the workpiece does not rotate independently of the dead center.

Chuck Backing Plate

A chuck backing plate is included with your dividing head for mounting a lathe chuck, as shown in **Figure 18**.



Figure 18. Model G9856 6-jaw run true chuck installed (Model G1054 only).

Follow these rules when mounting a chuck onto your dividing head:

- The backing plate must be mounted on a lathe with a threaded mandrel, then faced and shouldered.
- Make the new shoulder a "press fit" with the chuck to maximize accuracy.
- Correctly drill holes into the backing plate to accept the mounting of the chuck.
- For maximum accuracy when using the Model G1054, a run true chuck should be used, such as the Grizzly G9856 shown in **Figure 18**. This chuck has four set screws that allow the center line of the chuck to be correctly aligned with the center line of the dividing head spindle.

Note: If you are using a run true chuck, a press fit is not necessary.



Setting Index Pin

The index pin on the end of the hand crank can be repositioned to any of the six hole circles on the dividing plate (see **Figure 19**). The index pin is spring loaded so that it will stay engaged with the current hole.

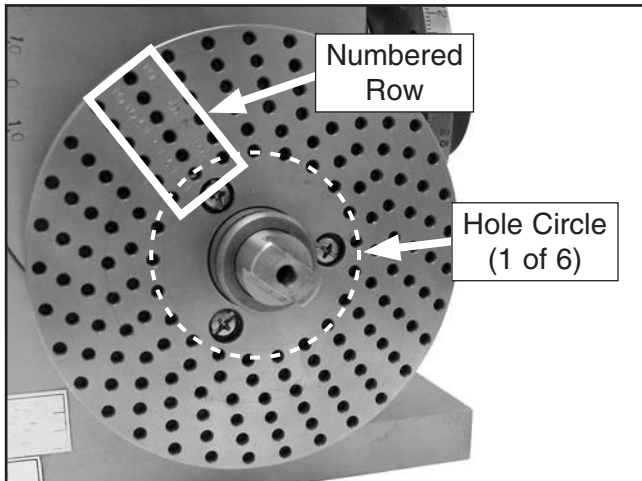


Figure 19. Dividing plate.

Tools Needed	Qty
Hex Wrench 5mm.....	1

To set the index pin:

1. Pull the crank handle out to disengage the index pin, then rotate the crank until it is aligned with the numbered row on the dividing plate (see **Figure 20**).



Figure 20. Adjusting the position of the crank index pin.

2. Slightly loosen the crank cap screw, adjust the crank arm on the shaft until the index pin is aligned with the required hole circle on the dividing plate, then re-tighten the cap screw.

Note: *Because the index pin is spring loaded, it will tend to push the crank arm out when the cap screw is not tightened. As you re-tighten the cap screw, push in on the crank arm so that it stays flat against the shaft shoulder.*

Using Dividing Plates

Your dividing head includes three dividing plates, each having six hole circles in the following patterns:

Plate	Number of Holes Per Circle
Plate A.....	15, 16, 17, 18, 19, 20
Plate B.....	21, 23, 27, 29, 31, 33
Plate C.....	37, 39, 41, 43, 47, 49

All divisions from 1 to 50 can be made with one of the three plates provided. However, not all of the divisions from 51 to 100 are capable with your dividing head, as noted with a "—" in the charts on the next page.

The dividing charts on **Page 17** are set up with three rows and one column for each division. Refer to the charts and the following descriptions to understand the numbers in the rows.

D – Division: The number of stops required for the machining operation.

H – Hole Circle: The number of the hole circle on the dividing plate required for the division.

R – Rotations of the Crank Handle: The number of crank handle rotations required for the division.



Dividing Charts

D	1	2	3	4	5	6	7	8	9	10
H		Any	33	Any	Any	33	49	Any	18	Any
R		20	$13^{11}/_{33}$	10	8	$6^{22}/_{33}$	$5^{35}/_{49}$	5	$4^8/_{18}$	4

D	11	12	13	14	15	16	17	18	19	20
H	33	33	39	49	33	20	17	18	19	Any
R	$3^{21}/_{33}$	$3^{11}/_{33}$	$3^3/_{39}$	$2^{42}/_{49}$	$2^{22}/_{33}$	$2^{10}/_{20}$	$2^6/_{17}$	$2^4/_{18}$	$2^2/_{19}$	2

D	21	22	23	24	25	26	27	28	29	30
H	21	33	23	33	20	39	27	49	29	33
R	$1^{19}/_{21}$	$1^{27}/_{33}$	$1^{17}/_{23}$	$1^{22}/_{33}$	$1^{12}/_{20}$	$1^{21}/_{39}$	$1^{13}/_{27}$	$1^{21}/_{49}$	$1^{11}/_{29}$	$1^{11}/_{33}$

D	31	32	33	34	35	36	37	38	39	40
H	31	20	33	17	49	18	37	19	39	Any
R	$1^9/_{31}$	$1^5/_{20}$	$1^7/_{33}$	$1^3/_{17}$	$1^7/_{49}$	$1^2/_{18}$	$1^3/_{37}$	$1^1/_{19}$	$1^1/_{39}$	1

D	41	42	43	44	45	46	47	48	49	50
H	41	21	43	33	18	23	47	18	49	20
T	$40/_{41}$	$20/_{21}$	$40/_{43}$	$30/_{33}$	$16/_{18}$	$20/_{23}$	$40/_{47}$	$15/_{18}$	$40/_{49}$	$16/_{20}$

D	51	52	53	54	55	56	57	58	59	60
H	—	39	—	27	33	49	—	29	—	33
R		$30/_{39}$		$20/_{27}$	$24/_{33}$	$35/_{49}$		$20/_{29}$		$22/_{33}$

D	61	62	63	64	65	66	67	68	69	70
H	—	31	—	16	39	33	—	17	—	49
R		$20/_{31}$		$10/_{16}$	$24/_{39}$	$20/_{33}$		$10/_{17}$		$28/_{49}$

D	71	72	73	74	75	76	77	78	79	80
H	—	18	—	37	15	19	—	39	—	20
R		$10/_{18}$		$20/_{37}$	$8/_{15}$	$10/_{19}$		$20/_{39}$		$10/_{20}$

D	81	82	83	84	85	86	87	88	89	90
H	—	41	—	21	17	43	—	33	—	18
R		$20/_{41}$		$10/_{21}$	$8/_{17}$	$20/_{43}$		$15/_{33}$		$8/_{18}$

D	91	92	93	94	95	96	97	98	99	100
H	—	23	—	47	19	—	—	49	—	20
R		$10/_{23}$		$20/_{47}$	$8/_{19}$			$20/_{49}$		$8/_{20}$

Legend:

D – Divisions

H – Hole Circle

R – Rotations of the Crank Handle



Example

To better understand how to properly use the dividing plates, perform the instructions in the example below.

In this example, you will set up the dividing head for 18 divisions:

1. Locate division 18 in the charts on the previous page, then note the number directly below it, which is the required hole circle. In this case, the hole circle is 18.
2. Install the dividing plate with the 18 hole circle on the dividing plate, as instructed in the **Changing Dividing Plates** section on **Page 13**.
3. Loosen the sector arm cap screw, spread the sector arms apart so that you can position the index pin of the crank handle between the sector arms and in a hole of the 18 hole circle, as shown in **Figure 21**.

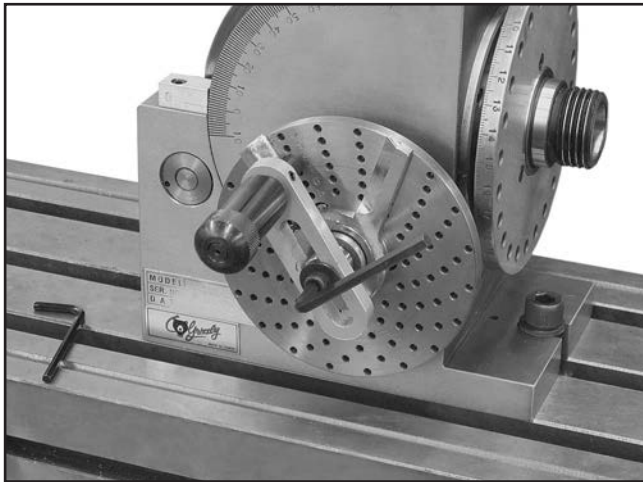


Figure 21. Index pin between the sector arms and seated in the 18 hole circle.

4. Make sure the crank cap screw is fully tightened to firmly secure the crank on the shaft.
5. Look at the division 18 column of the chart again and note the number in the third row below it. In this case the number is $2\frac{4}{18}$, which means the crank handle will be rotated two full turns and $\frac{4}{18}$, or 4 holes, of the third rotation for each machining cycle after the first one.

6. Position the left sector arm up against the index pin.
7. Move the right sector arm clockwise so that there are four holes showing in the 18 hole circle between the arms, as shown in **Figure 22**.

Note: Do not count the hole that the index pin is in.

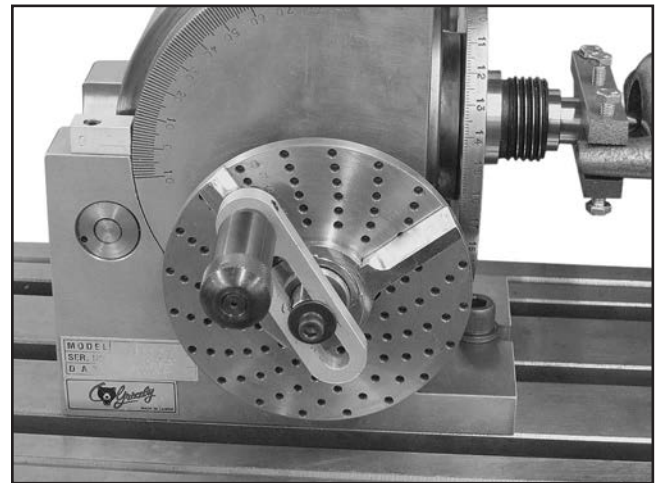


Figure 22. Sector arms correctly spread apart four holes on the 18 hole circle.

8. Tighten the sector arm cap screw to secure the arms in place and to preserve the correct 4-hole spacing.
9. Eliminate the backlash in the crank by pulling the crank handle out to disengage the index pin, rotating the crank $\frac{1}{2}$ counterclockwise turn, then turning it clockwise and engaging the index pin with the hole it was in before.

Note: To ensure accurate indexing, it is imperative that the crank index pin does not make contact with the sector arms as you rotate the crank so that the sector arms do not move from their correct locations.



10. Lock the spindle in place and perform the machining operation.
11. Without moving the sector arms, pull the crank handle out to disengage the index pin and carefully rotate the crank two full turns clockwise back to the position it started in.
12. Continue to rotate the crank clockwise until you can engage the index pin into the hole that is next to the right sector arm. You have now rotated the crank handle the required $2\frac{4}{18}$ turns, as shown in **Figure 23**.

Note: If you move the crank index pin beyond the final hole, it is crucial to the operation that you eliminate the crank backlash again, as explained in **Step 9**.

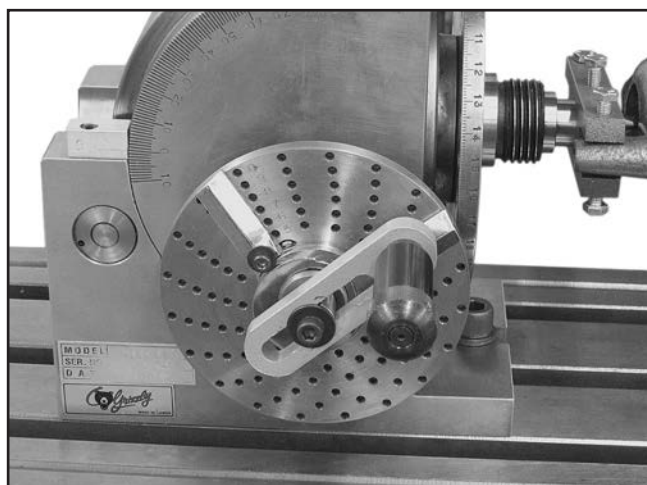


Figure 23. Crank position after $2\frac{4}{18}$ rotations.

13. While keeping the sector arm cap screw tight, rotate the sector arms clockwise so that the left sector arm is up against the crank index pin and the right arm has moved an additional 4 holes.

Note: If the sector arm cap screw is loosened, the arms will move independently from one another and the 4-hole spacing will be changed.

14. Repeat **Steps 9–13** until the dividing spindle and workpiece have made one full revolution.

Divisions Beyond 100

In the event that divisions beyond 100 are required, you can usually find the correct hole circle number to use by dividing the number of divisions by the number of the hole circles available on the dividing plates until the answer is a whole number (without a fraction or decimal).

For example, for a division of 115, dividing the number 23 into 115 gives the answer of 5, a whole number. This means that the dividing plate with the 23 hole circle can be used.

The rotation of the crank for each division will always be less than one full turn for divisions beyond 40. The amount of holes on the required hole circle that the crank must be moved can be found with the following formula:

$$R = (H \times 40) / D$$

where **R** is the number of holes between the sector arms, **H** is the number of the required hole circle, **40** is a constant that represents the number of full crank rotations necessary to complete one revolution of the spindle, and **D** is the number of divisions required for the operation.

To continue the example given above, if the number of divisions needed is 115 and the number of the dividing plate hole circle is 23, then the number of holes that the sector arms must be separated per division is 8, as calculated below:

$$\begin{aligned} R &= (23 \times 40) / 115 \\ R &= 920 / 115 \\ R &= 8 \end{aligned}$$

Note: As in the divisions between 50 and 100, not all divisions beyond 100 are possible with your dividing head.

Continued on next page →



Use the following tips to help ensure a trouble-free dividing head operation:

- Because the scale on the direct indexing plate mounted on the dividing head spindle is oriented clockwise, always rotate the crank clockwise to make it easier to keep track of the spindle orientation during the operation.
- Take the time to create a quick-reference chart when divisions are complex. Using this chart to compare with the degree scale and check off as you change locations will reduce unnecessary mistakes.
- As in most operations, it is a good idea to perform a test-run before actually making the cuts, especially before machining an expensive part. Test your dividing setup by running the complete progression of settings and turns without actually machining the part.

For example, when performing a test-run for the previous example, the spindle should return to its original position after running the 18 positions. This can be verified by noting the location of the spindle on the degree scale before and after the test-run. Also, you can score the part at each division stop to make sure the cuts will be in the required locations, as shown in **Figure 24**.

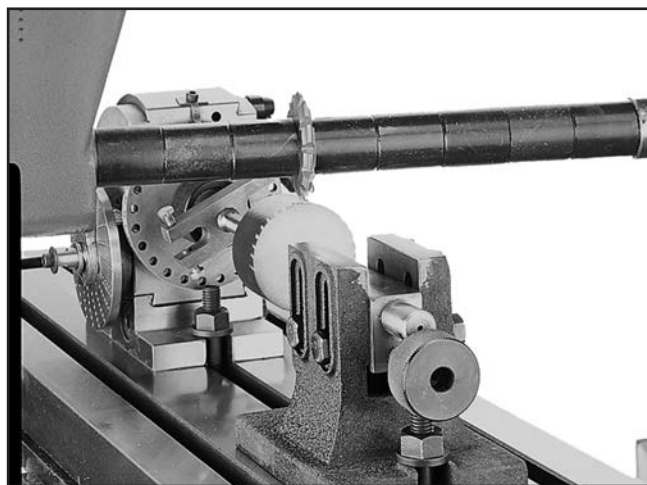


Figure 24. Scoring the part during a test run.

Disengaging Worm

The worm gear and wheel drive the spindle when the crank is rotated and these gears are engaged. They can be disengaged to rotate the spindle by hand for quick direct indexing.

Tools Needed

	Qty
Hex Wrenches 3, 4, 5mm.....	1 Each
Phillips Screwdriver #2	1

To disengage the worm gear and wheel:

1. Remove the crank handle, sector spring, sector arms, and dividing plate.
2. Loosen the two cap screws that secure the worm gear hub, rotate it counterclockwise until you can turn the spindle by hand, then re-tighten the cap screws (see **Figure 25**).

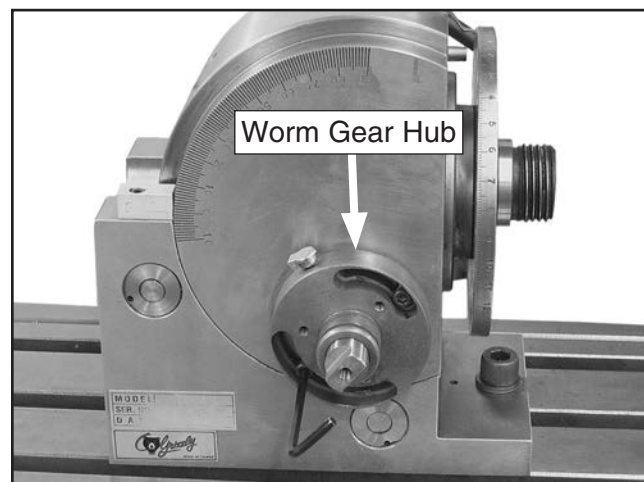


Figure 25. Disengaging worm gear and wheel.

To re-engage the worm gear and wheel:

1. Rotate the worm gear hub clockwise until you feel resistance, then tighten the cap screws.
2. Check the rotation of the spindle with the crank before reassembling the rest of the parts. If necessary, re-adjust the rotation of the worm gear hub so that the crank rotates freely without excess backlash.



Cutting Angles

The dividing head can be used for cutting a specific angle or producing a series of angles, such as in faceting. Perform the example below to learn how to use your dividing head for angled cuts.

To produce a hex shape (6-sided) with the dividing head:

1. Disengage the worm gear and wheel so that the spindle can be rotated by hand.
2. Rotate the spindle by hand until the zero point of the degree scale is aligned with the pointer, as shown in **Figure 26**.

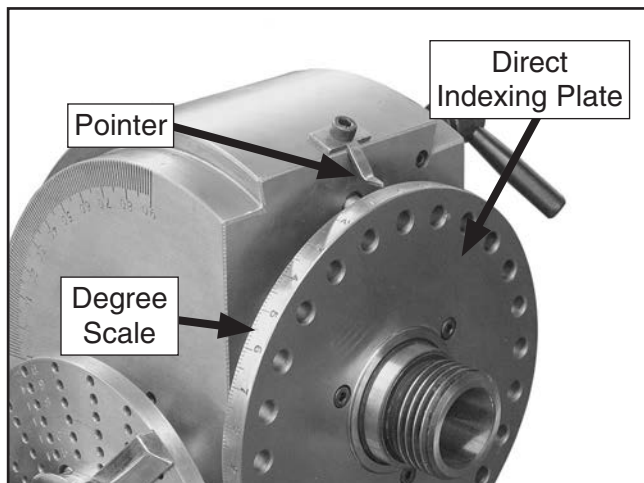


Figure 26. Direct indexing plate.

Note: In the next step, keep in mind that the direct indexing plate mounted on the spindle has 24 holes, which is evenly divisible by 6. Each index stop will require that 4 holes pass by the index pin—i.e., the index pin will engage the 5th hole from where it originally was.

3. Use the direct indexing lever to engage the pin into the plate hole.

Note: If necessary, rock the plate by hand until the pin engages the hole, then loosen the pointer cap screw, adjust it to the zero mark on the degree scale, and re-tighten the cap screw to secure it in place.

4. Properly mount the workpiece onto the dividing head.
5. Lock the spindle and machine the part.
6. Unlock the spindle, use the lever to disengage the pin, rotate the plate clockwise by hand until the pin is aligned with the 5th hole from where it originally was, then re-engage the pin with the plate.

Note: The pointer will be aligned at the 60° mark on the degree scale.

7. Repeat **Steps 5–6** until the spindle and workpiece have completed one full revolution.



SECTION 4: ACCESSORIES

G9610—Test Indicator

0.03" Range/0.001" Resolution

G9611—Test Indicator

0.008" Range/0.0001" Resolution

G9612—Test Indicator

0.030" Range/0.0005" Resolution

These test indicators have an easy to read dial and a pivoting stylus that moves at right angles to the dial face.



Figure 27. Test Indicator.

H2939—4 Piece Edge Finder Set

Four different styles to cover any setup problem! Set includes one each: a $\frac{3}{8}$ " diameter with a point, a combination $\frac{3}{8}$ " diameter with a point and a 0.200" shoulder, a $\frac{1}{2}$ " diameter with a 0.200" shoulder, and a combination $\frac{1}{2}$ " diameter with a 0.200" shoulder and a 0.500" shoulder.

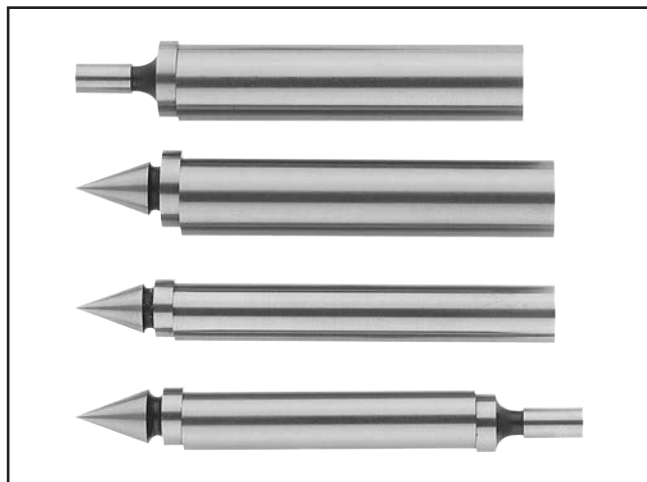


Figure 28. H2939 4-Pc. Edge Finder Set.

G1075—52-PC. Clamping Kit $\frac{1}{2}$ " T-Nut

G1076—52-PC. Clamping Kit $\frac{5}{8}$ " T-Nut

This clamping kit includes 24 studs, 6 step block pairs, 6 T-nuts, 6 flange nuts, 4 coupling nuts, and 6 end hold-downs. The rack is slotted so it can be mounted close to the machine for easy access.

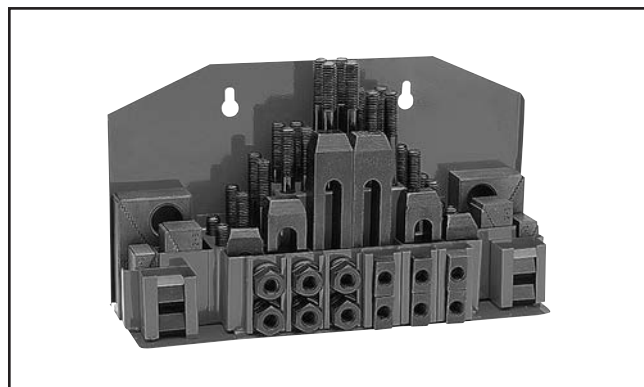


Figure 29. 52-PC. Clamping Kit.

G9856—6-Jaw Precision Run True Chuck

When used with your dividing head, this chuck offers maximum holding power on delicate parts and absolute positioning using the 4 adjustment screws.

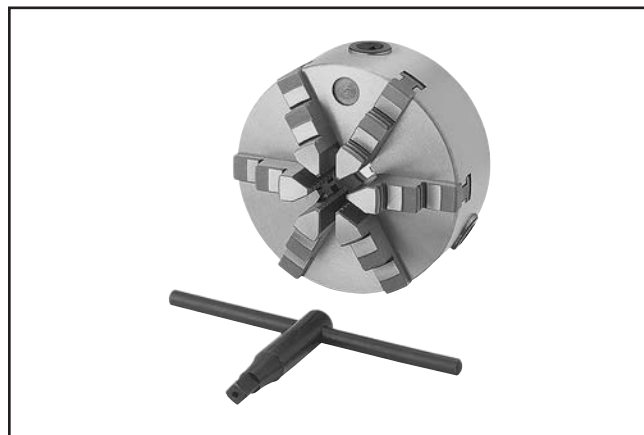


Figure 30. G9856 6-Jaw Chuck.

Call 1-800-523-4777 To Order



SECTION 5: MAINTENANCE

Schedule

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

Every 8 Hours of Use:

- Clean and lubricate the tool.
- Dress the surfaces of the tool (**Page 24**).
- Check/resolve any unsafe condition.

Every 160 Hours of Use:

- Disassemble, clean, and lubricate the worm gear and wheel (**Page 24**).

Cleaning

To ensure smooth operation and long life of your dividing head, it is essential that it is cleaned after every use and a thin coat of light machine oil is applied to the surfaces to prevent corrosion.

DO NOT use compressed air to clean your dividing head. This could force chips and swarf to become lodged between the moving parts and reduce the life and accuracy of the tool. Instead, use a stiff-bristled brush to remove the chips and swarf, then wipe down the surfaces with a clean shop rag.

Lubrication

Ball Oiler & Oil Port

Wipe off the ball oiler on the head shown in **Figure 31**, then use the tip of an oil can to add one squirt of 30W non-detergent oil to the oiler.

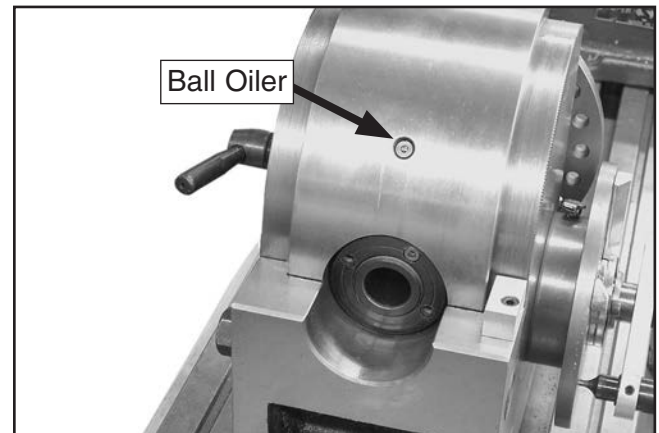


Figure 31. Ball oiler on the head.

Open the lid of the oil port on the worm gear hub shown in **Figure 32**, then add one squirt of 30W non-detergent oil to the port. Make sure to close the lid to keep debris out.

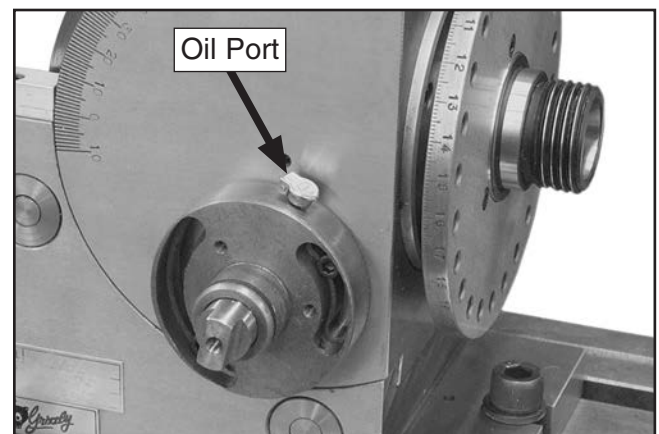


Figure 32. Worm gear oil port.



Worm Gear & Wheel

Tools Needed

	Qty
Hex Wrenches 3, 4, 5mm.....	1 Each
Phillips Screwdriver #2	1

To lubricate the worm gear and wheel:

1. Remove the crank handle, sector spring, sector arms, and dividing plate.
2. Remove the two cap screws that secure the worm gear hub, then remove the hub from the worm gear shaft, as shown in **Figure 33**.

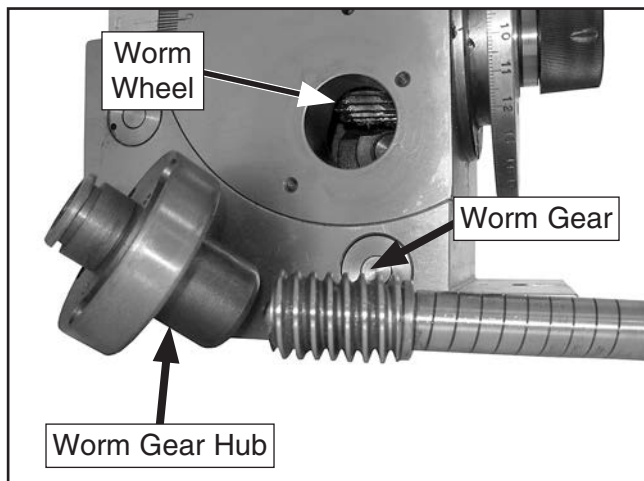


Figure 33. Worm gear removed to expose the worm wheel.

3. Use a stiff-bristled brush, shop rags, and mineral spirits to clean away the old grease and grime. When dry, apply a light coat of medium bearing grease, then re-install the parts.

Surface Care

Nicks, dings, and scratches on the surfaces of the dividing head and mill table can have an adverse effect on accuracy and may damage the workpiece or mill table.

Prior to use, dress or "stone" these surfaces with a fine sharpening stone until they are smooth. A few strokes of the stone on the mill table surface and the machined surfaces of the dividing head will help to ensure machining accuracy.

Make sure to thoroughly wipe these surfaces clean to remove any dust generated from the process, then re-apply a thin coat of light machine oil to prevent corrosion.



Bearing Preload

The spindle in the dividing head is mounted with tapered roller bearings. The preload on these bearings was set at the factory and should never need adjusting. However, if you experience excess play in the spindle, you can adjust the spindle bearing preload.

Testing Spindle Play

1. DISCONNECT MILL FROM POWER!
2. Firmly mount the dividing head to the mill table.
3. Mount a test indicator in the mill spindle and rest the indicator tip on the top of the spindle nose.
4. While watching the indicator dial, attempt to lift the spindle up.

—If the test indicator shows zero deviation as you attempt to lift the spindle up, there is no spindle play and the bearing preload is sufficient.

—If the indicator shows a deviation when you attempt to lift the spindle up, there is not enough bearing preload. Continue to the next subsection to adjust the preload.

Adjusting Bearing Preload

Tools Needed	Qty
Hex Wrench 3mm.....	1
Hammer & Punch.....	1 Each
Dead Blow Hammer	1

To adjust the bearing preload:

1. DISCONNECT MILL FROM POWER!
2. Firmly mount the dividing head to the mill table.
3. Use the spindle lock lever to hold the spindle in place.

4. Loosen the set screw on the spanner nut shown in **Figure 34**.

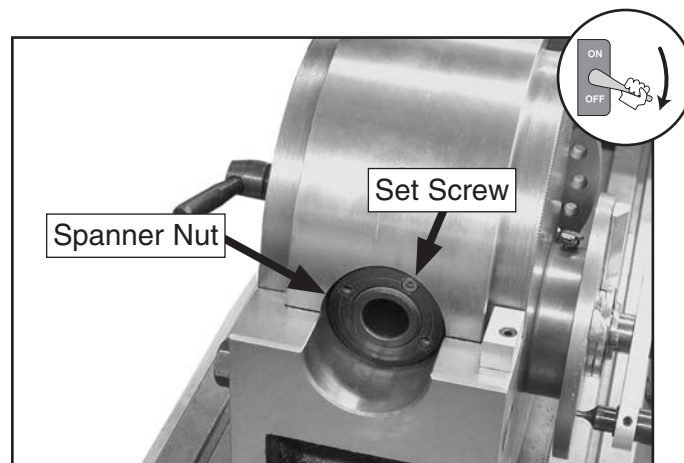


Figure 34. Spanner nut and set screw.

5. Rotate the spanner nut counterclockwise one full turn, then tap on it with the dead blow hammer to release the bearing preload.
6. Position a test indicator so that the indicator tip is touching the front end of the spindle.
7. While watching the test indicator, rotate the spanner nut clockwise until the indicator dial stops moving.

Note: By accurately performing this step, you have reached the zero preload point, which means that all of the slack has been taken up between the bearings, seats, and spindle.

8. Tighten the spanner nut clockwise an additional $\frac{1}{16}$ of its circumference to set the proper amount of bearing preload, then re-tighten the set screw.
9. Test the spindle play. If necessary, repeat this procedure until you have achieved the proper amount of bearing preload.

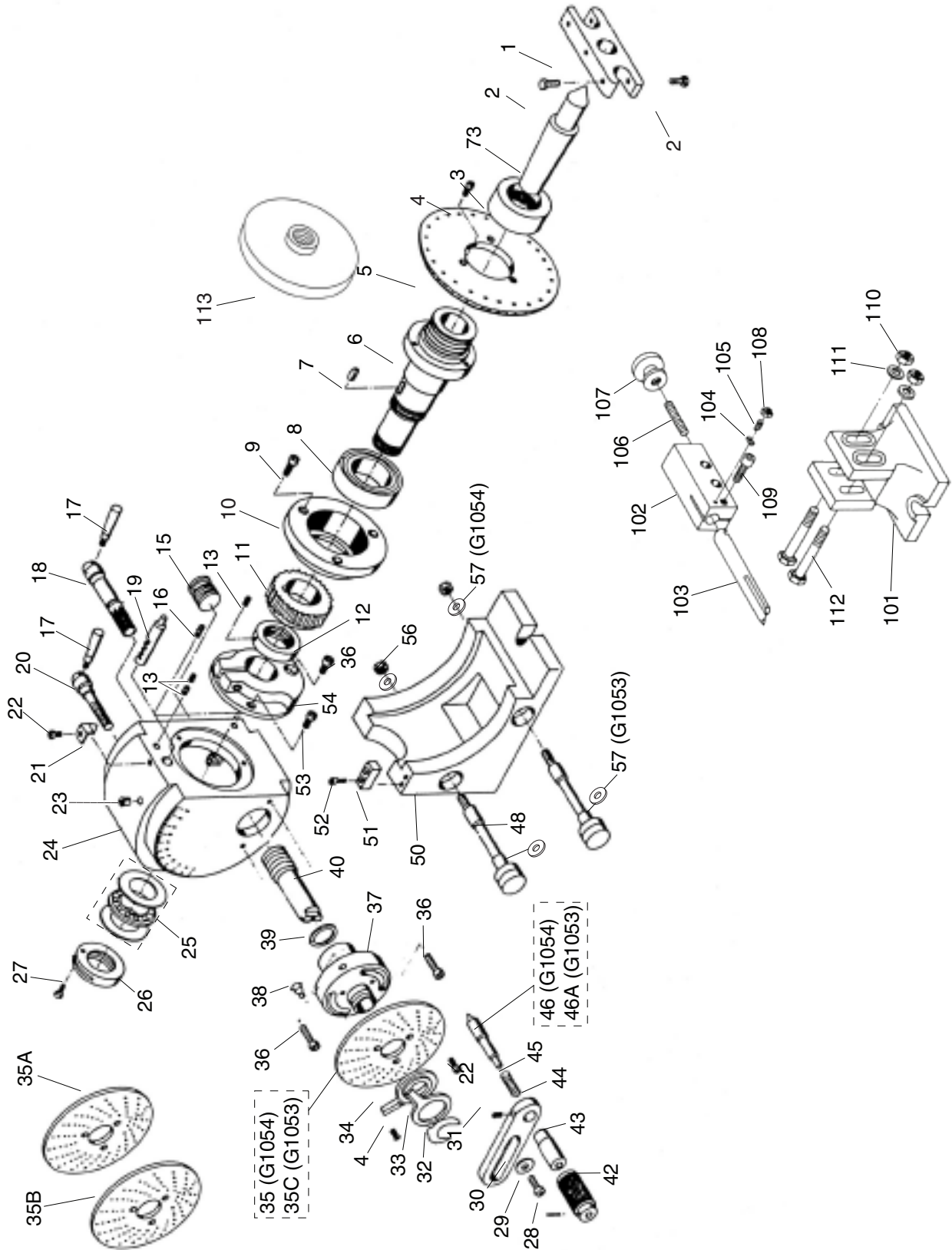
NOTICE

Spindle bearing life will be greatly reduced if the preload is either too loose or too tight. Disengage the worm gear and wheel and rotate the spindle by hand to make sure it turns easily without any play.



SECTION 6: PARTS

G1053/G1054 Main Breakdown



G1053 Parts List

REF	PART #	DESCRIPTION
1	P1053001	CENTER DOG
2	PB03M	HEX BOLT M8-1.25 X 16
3	P1053003	TAPERED BUSHING
4	PFH19M	FLAT HD SCR M4-.7 X 10
5	P1053005	DIRECT INDEXING PLATE
6	P1053006	SPINDLE
7	PK08M	KEY 5 X 5 X 16
8	P32007	TAPERED BEARING 32007
9	PCAP23M	CAP SCREW M4-.7 X 12
10	P1053010	FRONT BEARING SEAT
11	P1053011	WORM GEAR
12	P1053012	RETAINING NUT M30-1.5
13	PSS34M	SET SCREW M5-.8 X 16
15	P1053015	PLUG
16	PSS34M	SET SCREW M5-.8 X 16
17	P1053017	HANDLE
18	P1053018	GEARED HANDLE SHAFT
19	P1053019	GEARED INDEXING PIN
20	P1053020	LOCK SHAFT
21	P1053021	POINTER
22	PS09M	PHLP HD SCR M5-.8 X 10
23	P1053023	OIL FITTING 1/4"
24	P1053024	MAIN CASTING
25	P1053025	NEEDLE THRUST BEARING 25X42X4
26	P1053026	SPLIT RETAINING NUT M25-1.5
27	PCAP18M	CAP SCREW M4-.7 X 8
28	PRP02	ROLL PIN 1/8 X 3/4
29	PCAP26M	CAP SCREW M6-1 X 12
30	PW03M	FLAT WASHER 6MM
31	PSS07M	SET SCREW M5-.8 X 5
32	P1053032	RETAINING CLIP
33	P1053033	FRONT SECTOR ARM
34	P1053034	REAR SECTOR ARM
35A	P1053035A	DIVIDING PLATE 15-20 HOLE

REF	PART #	DESCRIPTION
35B	P1053035B	DIVIDING PLATE 21-33 HOLE
35C	P1053035C	DIVIDING PLATE 37-49 HOLE
36	PCAP24M	CAP SCREW M5-.8 X 16
37	P1053037	MOUNTING BRACKET
38	P1053038	OIL FITTING
39	P1053039	SPACER
40	P1053040	WORM SHAFT GEAR
42	P1053046	OUTER HANDLE
43	P1053046	INNER HANDLE
44	P1053044	HANDLE BRACKET
45	P1053046	COMPRESSION SPRING
46A	P1053046A	INDEX NEEDLE W/42, 43, 44, 45
48	P1053048	HEX BOLT M10-1.25 X 90
50	P1053050	BASE
51	P1053051	SCALE INDEX
52	PCAP16M	CAP SCREW M4-.7 X 16
53	PCAP33M	CAP SCREW M5-.8 X 12
54	P1053054	LASHING RING
56	P1053056	HEX NUT M10-1.5
57	PW04M	FLAT WASHER 10MM
73	P1053073	DEAD CENTER B&S#7
101	P1053101	TAILSTOCK BASE
102	P1053102	CENTER BASE
103	P1053103	TAILSTOCK CENTER
104	PK06M	KEY 5 X 5 X 10
105	PSS11M	ECCENTRIC SET SCREW M6-1 X 16
106	P1053106	THREADED SHAFT
107	P1053107	KNURLED KNOB
108	PN01M	HEX NUT M6-1
109	PCAP72M	CAP SCREW M10-1.5 X 30
110	PN02M	HEX NUT M10-1.5
111	PW04M	FLAT WASHER 10MM
112	PB13M	HEX BOLT M10-1.5 X 80
113	P1053113	CHUCK BACKING PLATE



G1054 Parts List

REF	PART #	DESCRIPTION
1	P1054001	CENTER DOG
2	PCAP24M	CAP SCREW M5-.8 X 16
3	P1054003	TAPERED BUSHING
4	PFH19M	FLAT HD SCR M4-.7 X 10
5	P1054005	DIRECT INDEXING PLATE
6	P1054006	SPINDLE
7	PK08M	KEY 5 X 5 X 16
8	P1054008	TAPERED BEARING 32009
9	PCAP33M	CAP SCREW M5-.8 X 12
10	P1054010	FRONT BEARING SEAT
11	P1054011	WORM GEAR
12	P1054012	RETAINING NUT M38-1.5
13	PSS34M	SET SCREW M5-.8 X 16
15	P1054015	PLUG
16	PSS34M	SET SCREW M5-.8 X 16
17	P1054017	HANDLE
18	P1054018	GEARED HANDLE SHAFT
19	P1054019	GEARED INDEXING PIN
20	P1054020	LOCK SHAFT
21	P1054021	POINTER
22	PS09M	PHLP HD SCR M5-.8 X 10
23	P1054023	OIL FITTING 1/4"
24	P1054024	MAIN CASTING
25	P1054025	NEEDLE THRUST BEARING 30X47X4
26	P1054026	SPLIT RETAINING NUT M30-1.5
27	PS07M	PHLP HD SCR M4-.7 X 8
28	PRP02	ROLL PIN 1/8 X 3/4
29	PCAP33M	CAP SCREW M5-.8 X 12
30	PW02M	FLAT WASHER 5MM
31	PSS07M	SET SCREW M5-.8 X 5
32	P1054032	RETAINING CLIP
33	P1054033	FRONT SECTOR ARM
34	P1053034	REAR SECTOR ARM
35	P1054035	DIVIDING PLATE 37-49

REF	PART #	DESCRIPTION
35A	P1054035A	DIVIDING PLATE 15-20
35B	P1054035B	DIVIDING PLATE 21-33
36	PCAP15M	CAP SCREW M5-.8 X 20
37	P1054037	MOUNTING BRACKET
38	P1054038	OIL FITTING
39	P1054039	SPACER
40	P1054040	WORM SHAFT GEAR
42	P1054042	OUTER HANDLE
43	P1054043	INNER HANDLE
44	P1054044	HANDLE BRACKET
45	P1054045	COMPRESSION SPRING 10X12X45
46	P1054046	INDEX NEEDLE
48	P1054048	THREADED CLAMP SHAFT
50	P1054050	BASE
51	P1054051	SCALE INDEX
52	PCAP16M	CAP SCREW M4-.7 X 16
53	PCAP33M	CAP SCREW M5-.8 X 12
54	P1054054	LASHING RING
56	PN09M	HEX NUT M12-1.75
57	PW06M	FLAT WASHER 12MM
73	P1054073	DEAD CENTER B&S#9
101	P1054101	TAILSTOCK BASE
102	P1054102	CENTER BASE
103	P1054103	TAILSTOCK CENTER
104	P1054104	SPECIAL KEY 3/16 X 3/16 X 3/8
105	P1054105	ECCENTRIC SET SCREW M6-1 X 16
106	P1054106	THREADED SHAFT
107	P1054107	KNURLED KNOB
108	PN01M	HEX NUT M6-1
109	PCAP72M	CAP SCREW M10-1.5 X 30
110	PN02M	HEX NUT M10-1.5
111	PW04M	FLAT WASHER 10MM
112	PB13M	HEX BOLT M10-1.5 X 80
113	P1054113	CHUCK BACKING PLATE



Notes



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?

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

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 AND 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.



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