

Grizzly *Industrial, Inc.*®

BANJO KIT MODEL H3124 INSTRUCTION MANUAL



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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.

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SECTION 1: SAFETY

WARNING

Always wear safety glasses or goggles when operating equipment. Everyday glasses or reading glasses are not safety glasses. Be certain the safety glasses you wear meet the appropriate standards of the American National Standards Institute (ANSI).

Because there are various ways to cut and join wood, you can make substitutions for the methods stated in this plan. We try to suggest the easiest methods possible. However, only you know your skills with each piece of machinery. Never compromise your safety by using a cutting method with which you are not comfortable. Instead, find an alternative approach that will yield the same result.

WARNING

These instructions assume that you are intimately familiar with the safe operation and use of woodworking machinery and woodworking tools, and understand the techniques used to reproduce this project. If you do not qualify for both of these criteria, **STOP building this project for your own safety.** Read and understand the owners manual for the machinery you intend to use, take a woodworking class or visit your local library for more information. Woodworking machinery and tools are inherently dangerous because they use sharp edges that can and will cause serious personal injury including amputation and death. Do not underestimate the ability of these tools and machinery to cause injury. Never operate any tool without all guards in place and always wear approved safety glasses. For your own safety, please heed this warning.

SECTION 2: INTRODUCTION

We are proud to offer the Model H3124 Banjo Kit. This kit is part of a growing Grizzly family of fine woodworking products. When assembled according to the guidelines set forth in this manual, you can expect years of enjoyment from this banjo.

We are pleased to provide this manual with the Model H3124. It was written to guide you through assembly, review safety considerations, and cover general information. It represents our effort to produce the best documentation possible.

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

Grizzly Industrial, Inc.
c/o Technical Documentation
P.O. Box 2069
Bellingham, WA 98227-2069

Most importantly, we stand behind our products. If you have any questions or parts requests, please call or write us at the location listed below.

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

The specifications, drawings, and photographs illustrated in this manual represent the Model H3124 as supplied when the manual was prepared. However, owing to Grizzly's policy of continuous improvement, changes may be made at any time with no obligation on the part of Grizzly. For your convenience, we always keep current Grizzly manuals available on our website at www.grizzly.com. Any updates to products will be reflected in these manuals as soon as they are complete. Visit our site often to check for the latest updates to this manual!



SECTION 3: PARTS INVENTORY

REF	PART #	DESCRIPTION
1	PH3124001	Wooden Rim
2	PH3124002	Brass Tone Ring
3	PH3124003	Banjo Head
4	PH3124004	Tension Hoop
5	PH3124005	Bracket Hook Assembly
5-1	PH3124005-1	Bracket Hook Lugs
5-2	PS56M	Phlp Hd Scr M4-.7 X 16
5-3	PLW02M	Lock Washer 4mm
6	PH3124006	Bracket Hooks
6-1	PH3124006-1	Bracket Hook Nuts
7	PH3124007	Coordinator Rod
7-1	PW01M	Flat Washer 8mm
7-2	PW04M	Flat Washer 10mm
8	PH3124008	Neck with Top and 5th String Nuts
8-1	PHTEK15	Tap Screw #10 X 2
9	PH3124009	Pegs with Nuts and Washers
10	PH3124010	Truss Rod Cover with Screws
11	PH3124011	5th String Peg
12	PH3124012	Tailpiece
13	PH3124013	Bridge
14	PH3124014	Strap Hook
15	PH3124015	Strings
16	PH3124016	T-wrench
17	PH3124017	Truss Rod Wrench
18	PH3124018	Adjustable Wrench
19	PH3124019	Tailpiece Lug

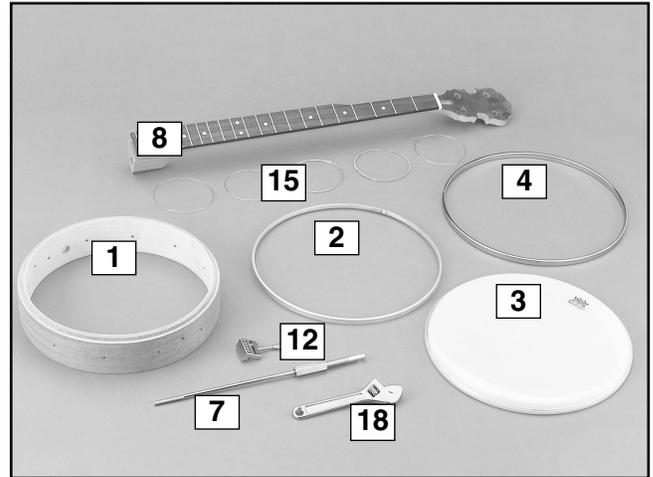


Figure 1. Boxed components.

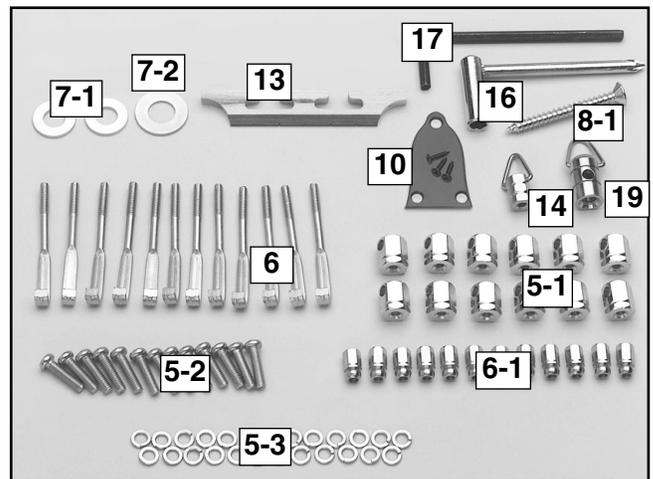


Figure 2. Hardware Bag.

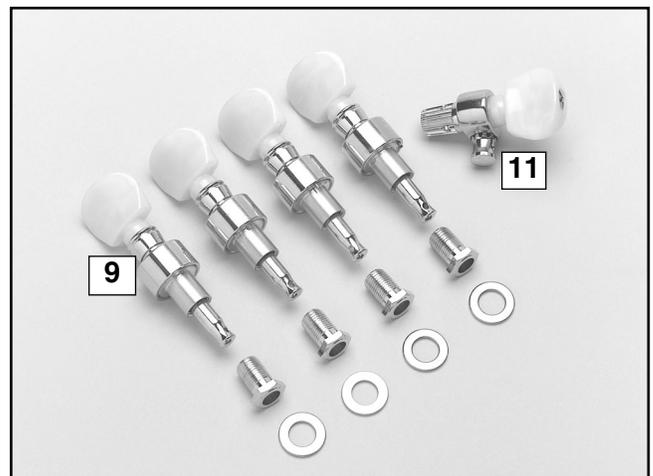


Figure 3. Peg Bag.

SECTION 4: SANDING

Supplies/Tools

The majority of the wooden components in this kit are fully machined from the factory and are ready for assembly. A small amount of sanding and finishing will need to be performed to complete the banjo.

Recommended Tools & Supplies:

- Finishing Supplies
- #180, #240, and #320 Aluminum-Oxide Sanding Paper
- Sanding Block
- Paste Filler
- "000" Grade Steel Wool
- Masking Tape
- Razor Blade
- Razor Saw
- Long Shank Eye Screws
- Tack Cloth
- Coping, Jig, or Scroll Saw (Optional)
- Drill
- 4mm or $\frac{5}{32}$ " drill bit
- Hammer



Wooden Rim

The banjo wooden rim has been rough sanded at the factory; however, no finish has been applied.

To sand the wooden rim:

1. **Wear an ANSI-approved respirator and safety glasses when sanding wood!**
2. Using either an electric palm sander or a sanding block, sand the wooden rim with #180 grit aluminum-oxide sanding paper until there is a consistent scratch pattern on the entire surface. *Note—When hand sanding, always sand in the same direction as the wood grain.*
3. Sand the wooden rim with a #240 grit sanding paper until there is a consistent scratch pattern on the entire surface.
4. Sand the wooden rim with a #320 grit sanding paper until there is a consistent scratch pattern on the entire surface.
5. Wipe the wooden rim with a damp cloth. Wiping the workpiece with a damp cloth before the final sanding helps to “raise” the wood grain; thus, allowing the “raised” grain to be sanded smooth.
6. Once the wooden rim is dry, repeat **step 4**.
7. Fill the wood pores with a paste filler according to the manufacturer’s instructions.
8. When the paste filler is dry, use “000” grade steel wool to remove the residue and polish the wood surface.
9. Wipe the wooden rim with a tack cloth to remove all remaining sanding dust.



Neck

Like the wooden rim, the banjo neck has been rough sanded at the factory. Personalize the fretboard and neck headstock with additional cutting, inlay, or design work before final sanding. Note—*Take your time and consider testing your designs in scrap wood before performing the work on the actual fretboard and headstock.*

To sand the banjo neck:

1. **Wear an ANSI-approved respirator and safety glasses when sanding wood!**
2. Perform any custom cutting, inlay, or design work to the neck headstock.
3. Using the sanding technique described in the previous sub-section, sand the entire banjo neck, EXCEPT for the frets and fretboard. Note—*Sanding the fretboard and frets will affect the playability of the banjo, and could lead to unrepairable damage.*



Fingerboard

The fingerboard requires no sanding. Note—*Sanding the fingerboard will affect the playability of the banjo, and could lead to unrepairable damage.*



Bridge

The bridge has been rough sanded at the factory. Final sand the bridge as described in the **Wooden Rim** sub-section.



SECTION 5: FINISHING

Wooden Rim

Finishing supplies are not included with the banjo kit. Note—*The wooden rim and neck are made of mahogany wood. Clear finishes such as lacquer look exceptionally stunning and glossy on this wood.*

To finish the wooden rim:

1. **Wear a NOISH/OSHA approved respirator with particulate and gas/vapor filters, safety glasses, and rubber gloves, when using finishing materials!**
2. **Always work in a well ventilated area when using finishing materials.**
3. Thread a long shank screw eye into one of the holes in the wooden rim.
4. Hold the screw eye and apply several thin coats of the finish. Multiple thin coats usually produce a nicer finish than one heavy coat. Note—*Always follow the finish manufacturer's instructions.*
5. Hang the wooden rim to dry.

Painting/Finishing Tips:

Dust particles suspended in the air will settle on wet finishes, causing less than satisfactory results. To avoid this problem:

- Leave the finishing room undisturbed for 24 hours prior to applying the finish.
- Avoid making unnecessary movements upon entering the finish room.
- Apply the finish to the desired banjo parts and immediately leave the finish room.
- DO NOT return to the room until the specified drying time has elapsed.



Neck

To finish the neck:

1. **Wear an NOISH/OSHA approved respirator with particulate and gas/vapor filters, safety glasses, and rubber gloves, when using finishing materials!**
2. **Always work in a well ventilated area when using finishing materials.**
3. Mask off the fretboard. Use a small stick of wood to carefully press all the masking tape edges securely to the banjo fretboard. The finish coat can seep under these edges, especially near corners, uneven edges, and places where the frets meet the fingerboard.
4. Form a piece of wire into a U shaped hanger with hooks on both ends.
5. Thread the hooks through the upper peg-holes and hang the neck in the finish room.
6. Apply several thin coats of the finish. Multiple thin coats usually produce a nicer finish than one heavy coat. Note—*Always follow the finish manufacturer's instructions.*
7. Hang the neck in a dust free room to dry.
8. When finishing is complete, remove the masking tape from the fretboard.
9. Carefully scrape any excess finish off the fretboard with a razor blade.



SECTION 6: ASSEMBLY

Bracket Hook Lugs

The bracket hook lugs provide a secure anchor for the bracket hooks.

To install the bracket hook lugs:

1. Slide the M4-.7 X 16 Phillip head screws with 4mm lock washers through the holes on the centerline of the wooden rim and thread the bracket hook lugs onto the screws as shown in **Figure 4**.



Figure 4. Installing the bracket hook lugs.

2. Rotate the bracket hook lugs until the holes face up and tighten the screws.
3. Attach the strap hook with the remaining screw and lock washer into the hole that is off center.



Tone Ring

The tone ring transmits vibration from the banjo head into the rim. It is essential to shaping the sound of the instrument.

To install the tone ring:

1. Use a razor blade to scrape excess finish out of the groove in the wooden rim.
2. Test the fit of the ring. It should fit snug onto the wooden rim.
3. Install the tone ring with the flat side down as shown in **Figure 5**.



Figure 5. Installing the tone ring.



Banjo Head

To install the banjo head:

1. Press the banjo head onto the tone ring.
2. Place the tension ring over the banjo head. See **Figure 6**.



Figure 6. Installing the tension hoop.

3. Drop the bracket hooks over the tension ring and through the bracket hook lugs.
4. Thread the bracket hook nuts and 4mm lock washers onto the bracket hooks and finger tighten as shown in **Figure 7**. Note—*The bracket hook nuts install with the flat side toward the bracket hook lugs.*

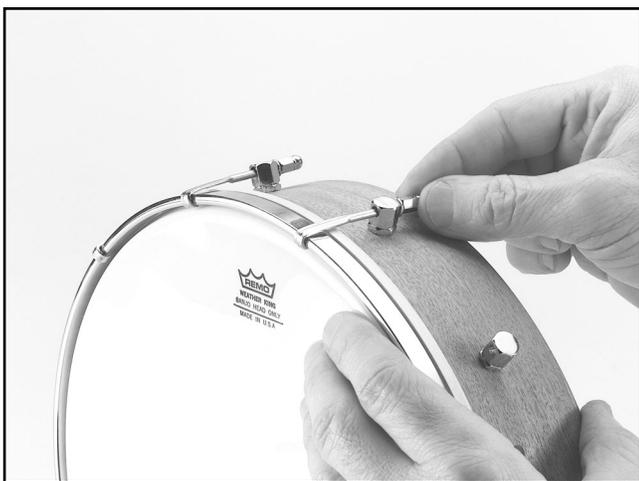


Figure 7. Finger tightening the bracket hook nuts.

5. Ensure that the head is seated squarely on the rim, and the bracket hooks are perpendicular to the tension hoop.
6. Use the included wrench to tighten the bracket hook nuts. Proceed clockwise, tightening each nut $\frac{1}{2}$ turn as shown in **Figure 8**.

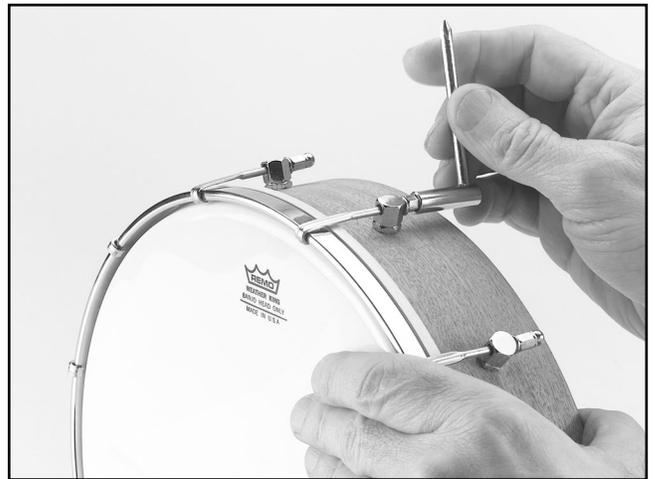


Figure 8. Tightening the bracket hook nuts.

7. If the surface of the tension hoop is higher than the fingerboard surface, tighten the bracket hooks until the surfaces are equal.



Neck

To attach the neck to the banjo rim:

1. Place the neck fretboard-side-down on a non marring surface and insert the coordinator bolt into the heel of the neck.
2. Thread the #10 X 2 tap screw into the neck and through the coordinator bolt as shown in **Figure 9**.



Figure 9. Installing the coordinator bolt.

3. Attach the neck to the rim by feeding the coordinator bolt through the large hole in the banjo rim, and threading the large bolt and washer tightly against the rim. Tighten with the included adjustable wrench.



Coordinator Rod

To install the coordinator rod:

1. Thread the remaining nut and a washer into the center of the coordinator rod.
2. Thread the coordinator rod through the hole in the rim from the inside. Note—*The washer needs to be between the nut and the banjo rim.*
3. Thread the tailpiece lug and a washer onto the coordinator rod. Make sure the coordinator rod does not block the hole in the tailpiece lug.
4. Thread the coupler onto the coordinator rod and the coordinator bolt, as shown in **Figure 10**, and finger tighten only.

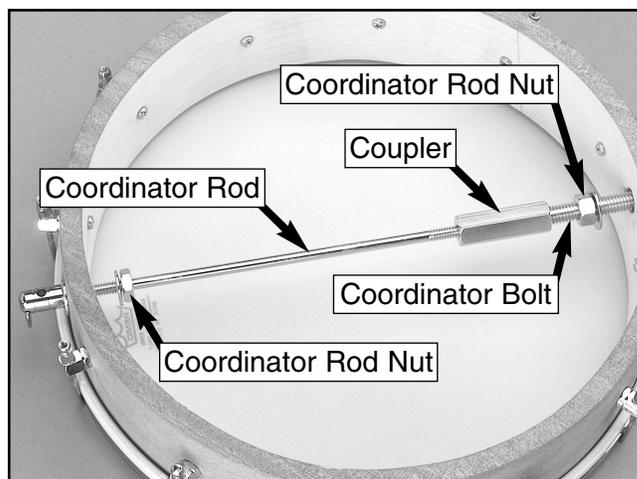


Figure 10. Installing the coordinator rod.

5. Tighten the coordinator rod nuts and washer against the banjo rim.



5th String Nut

the 5th string nut is installed in the banjo neck just above the 5th fret. It is necessary to cut a very shallow slot in this nut to guide the 5th string. The slot should be deep enough so the 5th string does not slide out, but a buzz will occur when the instrument is played if it is cut deeper than the height of the 5th fret.

To cut the 5th string slot in the nut:

1. Use a razor saw or a small jewelers file to carefully cut a slot that is .01" (.25mm) deep or less .
2. Slide the 5th string in the slot. The 5th string should be flush with the top of the nut.
3. Carefully cut the slot deeper if the string is not flush with the top of the nut.

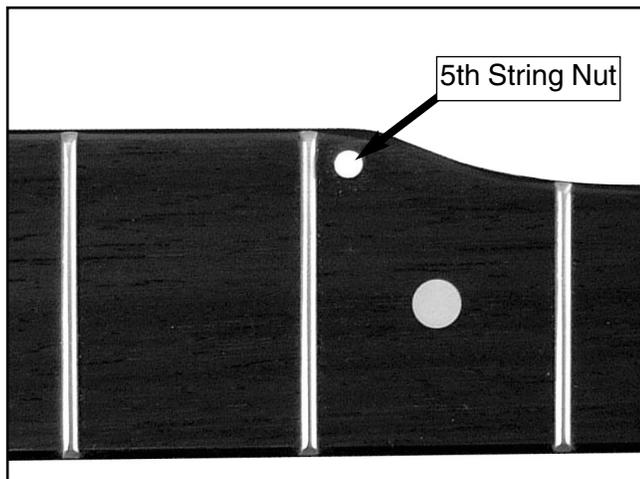


Figure 11. 5th string nut.



5th String Peg

The 5th string peg is the smallest of the tuners and is made to be force fitted into the peg hole.

To install the 5th string peg:

1. Clean any excess finish out of the peg hole.
2. Remove the knob and plastic washer from the 5th string peg.
3. Put a few drops of wood glue on the 5th string peg and insert it into the peghole with the tuning post towards the fretboard.
4. Place the T-wrench over the 5th string peg, shown in **Figure 12**, and carefully drive the 5th string peg into the peghole with a hammer. *Note—Place a non-marring support under the banjo neck before tapping.*

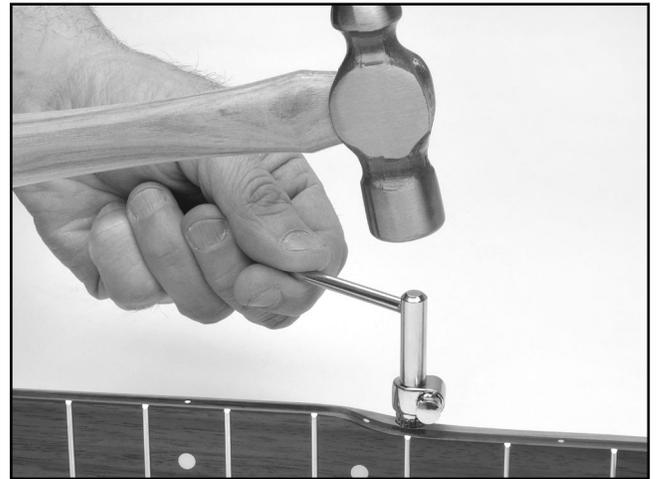


Figure 12. Inserting the 5th string peg.

5. Replace the plastic washer and knob on the 5th string peg.



Tuning Machines

To install the tuning machines:

1. Slide the tuning machines through the back of the headstock.
2. Place the washer and barrel nut over the tuning post and tighten with a 10mm socket.

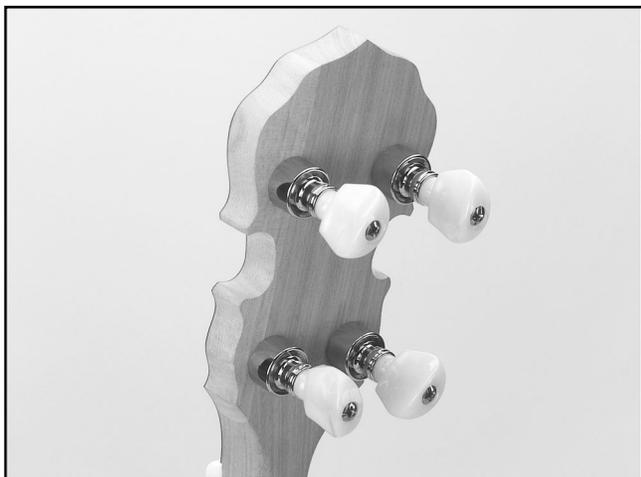


Figure 13. Tuning machines installed in the back of the headstock



Tailpiece

To install the tailpiece:

1. Insert the tailpiece screw through the tailpiece lug.
2. Set the tailpiece on the tensioning hoop, as shown in **Figure 14**, and tighten the nut against the tailpiece lug.

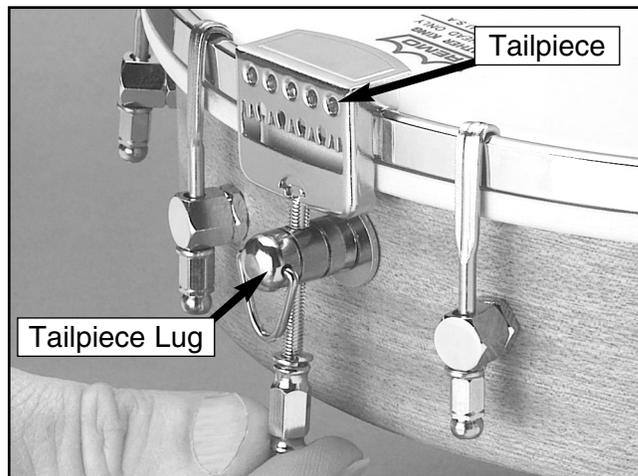


Figure 14. Tightening tailpiece screw into lug.



Winding Strings

Install the banjo strings loosely. The bridge must be installed and adjusted before the strings can be tightened and tuned.

To install the banjo strings:

1. Place the end of the string with the loop over the hooks on the tailpiece. The 1st string is farthest to the right, then 2nd, 3rd, 4th, and 5th farthest to the left as shown in **Figure 15**.

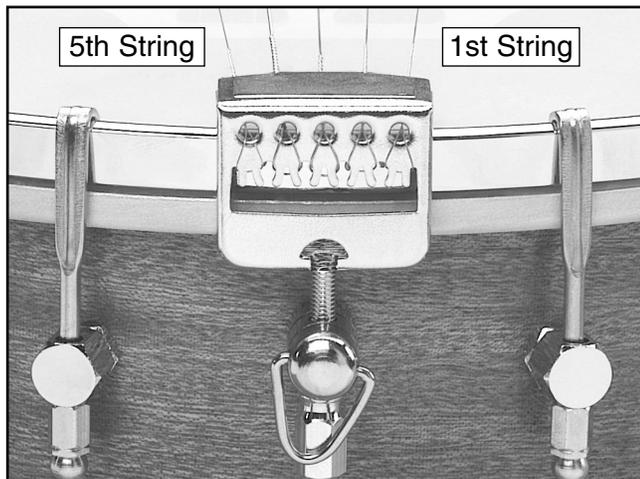


Figure 15. String placement.

2. Pull the strings through the tailpiece holes and up to the tuners. Do not overlap the strings.
3. Route the 5th string to the inside of the 5th string nut and down to the 5th string peg.
4. Route the strings to the inside of the tuning posts and through the peg holes. Note—*Allow enough string slack to allow 2-3 complete winds around the tuning peg.*
5. Turn the tuning knobs to tighten the strings. Note—*DO NOT completely tighten the strings at this time.*



Bridge Placement

To place the bridge:

1. Lay the bridge flat on the banjo head and slide it under the strings.
2. Slowly tilt the bridge up under the strings. Loosen the strings if it is difficult to raise the bridge.
3. Slide the strings into their slots and tighten.
4. The bridge location is 696mm (27.4") if measured from the nut and 348mm (13.7") if measured from the 12th fret. See **Figure 16**.



Figure 16. Bridge placement.

5. Finalize the position of the bridge by lightly touching the 1st string directly above the twelfth fret and plucking the string to play a harmonic note.
6. Now pluck the string while holding it against the twelfth fret. If this note is sharper than the note played in **step 5**, move the 1st string side of the bridge toward the tailpiece. If this note is flat in comparison, move the bridge toward the neck.
7. This can also be done with an electronic tuner by tuning the harmonic note to be exactly in tune and then adjusting the bridge until the note played in **step 6** is also in tune.



String Height

Correct string height is crucial to prevent fret buzz and maximize playability. The string height is measured from the top face of the fret and the bottom face of the string.

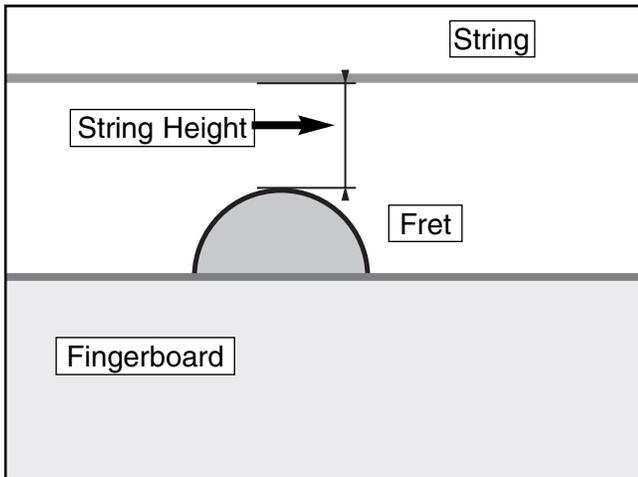


Figure 17. String height measurement.

To check the string height:

1. Measure the string heights at the 12th fret from the peghead (**Figure 18**). The string should be $\frac{1}{8}$ " above the fret. Note—Use a steel ruler with a resolution of $\frac{1}{64}$ ".

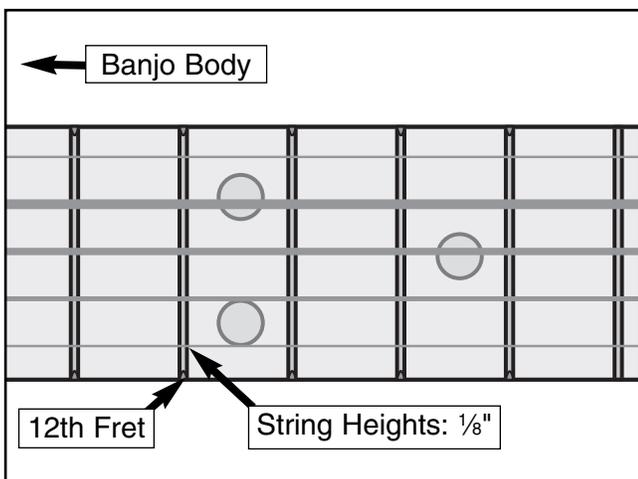


Figure 18. Correct 12th fret string heights.

2. Measure the string heights at the 22nd fret. The string should be $\frac{9}{64}$ " above the fret. Note—The 22nd fret is the closest to the banjo body.
3. Turn the coordinator rod to adjust the string height as shown in **Figure 19**. Note—DO NOT adjust string height more than $\frac{1}{16}$ ". This may cause damage to the banjo rim.

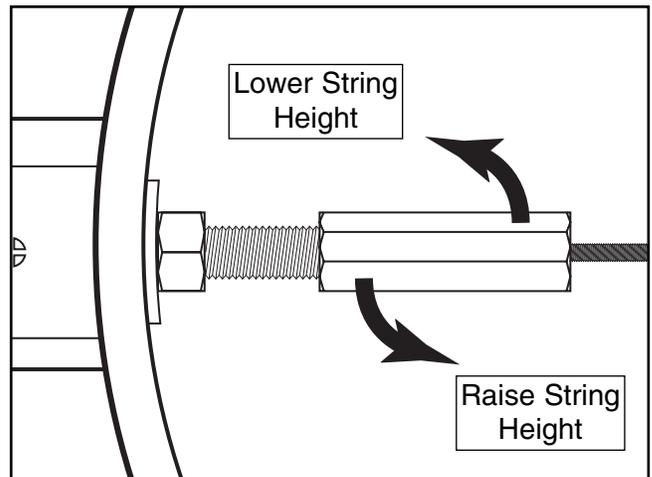


Figure 19. Adjusting string height.

4. If the strings need to be adjusted more than $\frac{1}{16}$ ", shim the bottom of the neck to increase string height, or shim the top to decrease the string height.

Tuning

Tuning is the most important concept of playing a banjo. If the banjo is not in tune with itself, or the other instruments in an ensemble, the resulting music will not sound pleasing to the ear. Banjo players use many different tunings, but the most common (“G”) is shown in **Figure 20**.

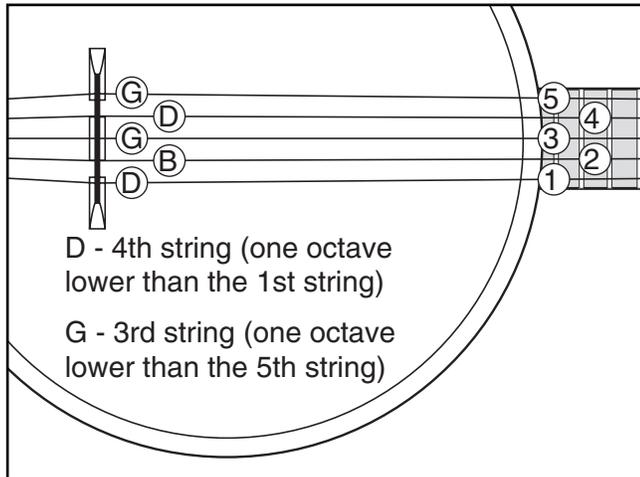


Figure 20. Standard tuning notes.

Important issues to consider when tuning a banjo:

- Get into the habit of tuning the banjo every time it is picked up to be played.
- Always tune the strings “up.” The final tuned tension of each string should be reached while tightening the string, not loosening it. If the string is tensioned too far, loosen the tension and tune “up” again.
- The easiest way to tune a banjo is using an electronic tuner such as the Grizzly H3097 Chromatic Tuner shown on **page 16**.



SECTION 7: REFERENCE INFO

General

If you need parts or help in assembling your banjo, or if you need operational information, call the service department at (570) 546-9663. Trained service technicians will be glad to help you.

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

Grizzly Industrial, Inc.
c/o Technical Documentation
P.O. Box 2069
Bellingham, WA 98227-2069

We recommend you keep a copy of our current catalog for complete information regarding Grizzly's warranty and return policy. If you need additional technical information relating to this banjo, or if you need general assistance or replacement parts, please contact the Service Department 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
Web Site: <http://www.grizzly.com>.



Aftermarket Accessories



Figure 21. Model H3097 Chromatic Tuner.



Notes

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; assembly, finishing or modification of kits; 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.

Warranty Card

Name _____
Street _____
City _____ State _____ Zip _____
Phone Number _____ E-Mail _____ FAX _____
MODEL # _____ Order # _____

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
 World Wide Web

 Other _____
2. Which of the following magazines do you subscribe to.
 American Woodworker Practical Homeowner
 Cabinetmaker Shop Notes
 Family Handyman Today's Homeowner
 Fine Homebuilding WOOD
 Fine Woodworking Wooden Boat
 Home Handyman Woodshop News
 Journal of Light Construction Woodsmith
 Old House Journal Woodwork
 Popular Mechanics Woodworker
 Popular Science Woodworker's Journal
 Popular Woodworking Workbench

 Other _____
3. Which of the following woodworking/remodeling shows do you watch?
 Backyard America The New Yankee Workshop
 Home Time This Old House
 The American Woodworker Woodwright's Shop

 Other _____
4. What is your annual household income?
 \$20,000-\$29,999 \$60,000-\$69,999
 \$30,000-\$39,999 \$70,000-\$79,999
 \$40,000-\$49,999 \$80,000-\$89,999
 \$50,000-\$59,999 \$90,000 +
5. What is your age group?
 20-29 50-59
 30-39 60-69
 40-49 70 +
6. How long have you been a woodworker?
 0 - 2 Years 8 - 20 Years
 2 - 8 Years 20+ Years
7. How would you rank your woodworking skills?
 Simple Advanced
 Intermediate Master Craftsman
8. What stationary woodworking tools do you own? Check all that apply.
 Air Compressor Panel Saw
 Bandsaw Planer
 Drill Press Power Feeder
 Drum Sander Radial Arm Saw
 Dust Collector Shaper
 Horizontal Boring Machine Spindle Sander
 Jointer Table Saw
 Lathe Vacuum Veneer Press
 Mortiser Wide Belt Sander

 Other _____
9. How many of your woodworking machines are Grizzly? _____
10. Which benchtop tools do you own? Check all that apply.
 1" x 42" Belt Sander 6" - 8" Grinder
 5" - 8" Drill Press Mini Lathe
 8" Table Saw 10" - 12" Thickness Planer
 8" - 10" Bandsaw Scroll Saw
 Disc/Belt Sander Spindle/Belt Sander
 Mini Jointer

 Other _____
11. How many of the machines checked above are Grizzly? _____
12. Which portable/hand held power tools do you own? Check all that apply.
 Belt Sander Orbital Sander
 Biscuit Joiner Palm Sander
 Circular Saw Portable Planer
 Detail Sander Saber Saw
 Drill/Driver Reciprocating Saw
 Miter Saw Router

 Other _____
13. What machines/supplies would you like Grizzly Industrial to carry?

14. What new accessories would you like Grizzly Industrial to carry?

15. What other companies do you purchase your tools and supplies from?

16. Do you think your purchase represents good value?
 Yes No
17. Would you recommend Grizzly Industrial to a friend?
 Yes No
18. Would you allow us to use your name as a reference for Grizzly customers in your area? **Note: We never use names more than three times.**
 Yes No
19. 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 _____
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