

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 manual. 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 wood-working machinery and woodworking tools, and understand the techniques used to assemble 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 wood-working 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

Foreword

We are proud to offer the Model H6084 Heirloom Electric Guitar Kit. This kit is a 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 your guitar.

We are pleased to provide this manual for the Model H6084 Heirloom Electric Guitar Kit. 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.



Contact Info

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.

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The specifications, drawings, and photographs illustrated in this manual represent the Model H6084 Heirloom Electric Guitar Kit 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	QTY
1	PH6084001	Neck	1
2	PH6084002	Guitar Body	1
3	PH6084003	Pickups	2
4	PH6084004	Tuners with Screws	6
5	PH6084005	Tuner Bushings with Washers	6
6	PH6084006	Truss Rod Cover w/Screws	1
7	PH6084007	Nut	1
8	PH6084008	Tailstop	1
9	PH6084009	Bridge	1
10	PH6084010	Tailstop Adjusting Assembly	2
11	PH6084011	Bridge Adjusting Assembly	2
12	PH6084012	Wiring Harness	1
13	PH6084013	Audio Jack Nuts w/Washers	2
14	PH6084014	Control Knob Nuts w/Washers	8
15	PH6084015	Control Knobs	4
16	PH6084016	Strap Buttons w/Screws	2
17	PH6084017	Audio Jack Plate w/Screws	1
18	PH6084018	3-Way Switch Cover w/Screws	1
19	PH6084019	3-Way Switch Plate	1
20	PH6084020	M3 X 12 Tap Screws	12
21	PH6084021	Strings	6
22	PH6084022	Control Cavity Cover Plate	1
23	PH6084023	M2 X 12" Tap Screws	10
24	PH6084024	M2.6 X 16 Tap Screws	6
25	PAW04M	Hex Wrench 4mm	1
26	PH6084026	Pickguard Assembly	1

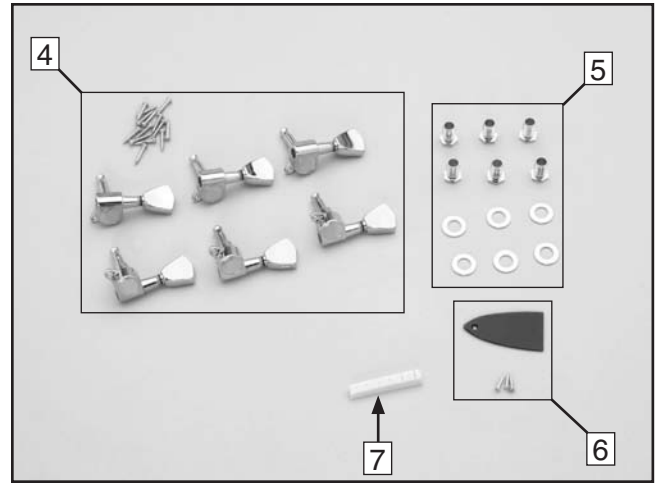


Figure 2. Peghead components.

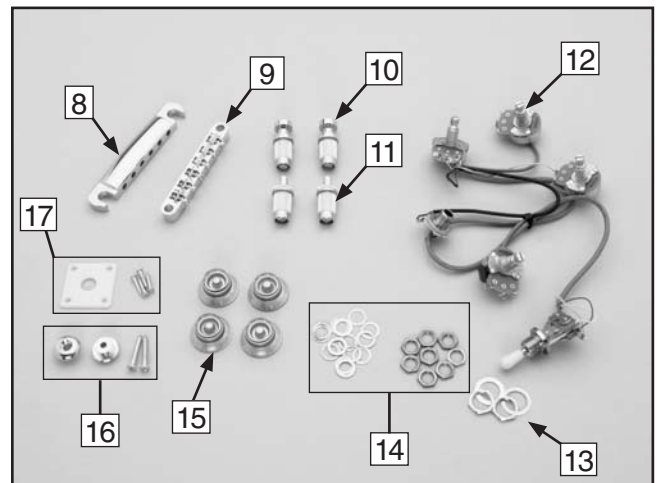


Figure 3. Guitar parts.

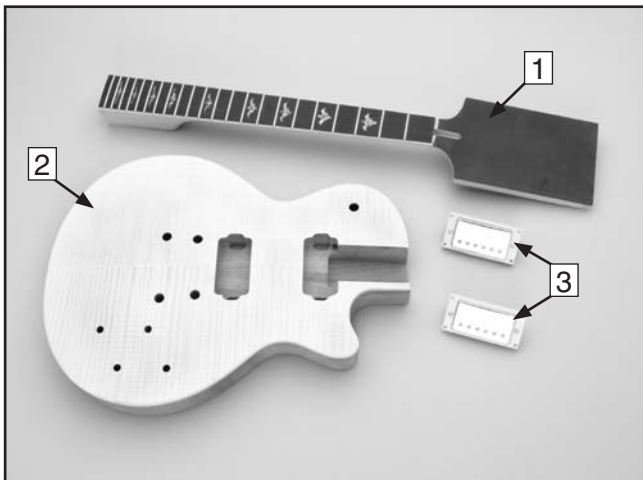


Figure 1. Boxed components.

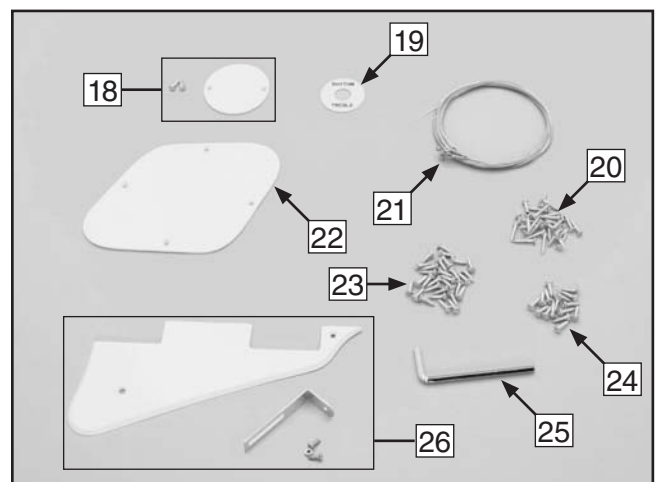


Figure 4. More guitar parts.

Supplies/Tools

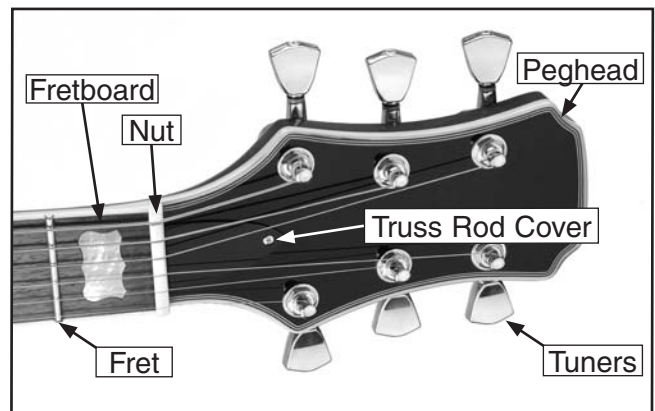
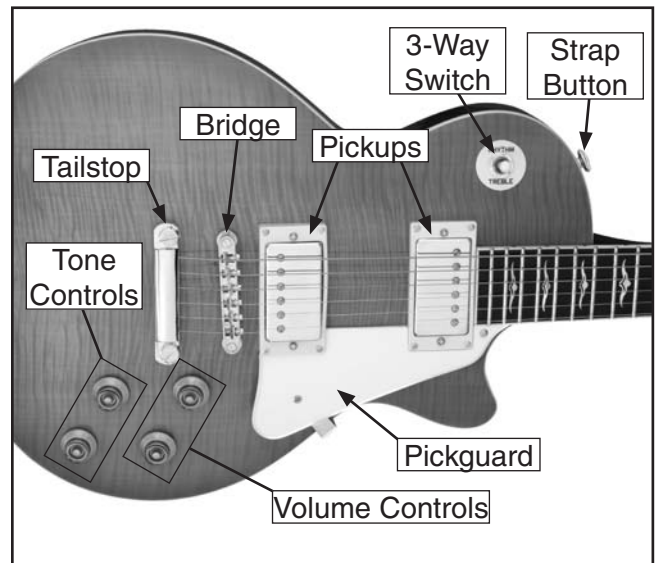
The majority of the wooden components in this kit are fully machined from the factory and are ready for assembly. A small amount of shaping, drilling, sanding and finishing will need to be performed to complete your guitar.

Recommended Tools & Supplies:

- Sharp Pencil
- 18" Metal Straightedge with a $\frac{1}{32}$ " Resolution
- Drill Press
- Hand Drill
- Drill Bits: $\frac{1}{16}$ ", $\frac{3}{32}$ ", $\frac{1}{8}$ ", $\frac{5}{32}$ ", $\frac{3}{16}$ ", $\frac{5}{16}$ "
- Depth Stop
- Bandsaw or Coping Saw with $\frac{1}{4}$ " Blade
- ANSI Approved Respirator
- ANSI Approved Safety Glasses
- Aluminum-Oxide Sanding Paper #150, #220, and #320 Grit
- Wet and Dry Sanding Paper #400, #600, and #1000 Grit
- Flexible Sanding Block
- Wood Glue
- Chisel or Razor Blade
- Phillips Screwdriver
- $\frac{1}{4}$ " Steel Rod, or a Coat Hanger
- Masking Tape
- Tack Cloth or Clean Soft Rag
- Sanding Sealer
- Assorted Wood Files
- Finishing Materials
- Buffing Compounds
- Oil Wood Finish
- Soldering Iron and Solder
- Peghead Reamer or a Round File
- Ratchet with 11MM and 14MM Sockets
- Hammer
- Small Wooden Block
- C-Clamps
- Wire Cutters



Identification



SECTION 4: ASSEMBLY

Shaping the Headstock

The peghead comes as a large square so it can be cut to any shape. The only limitation is the strength of the wood. If the headstock is cut too close to the pegholes or in between the pegholes and the nut, the wood may crack under the pressure of the strings. These instructions will guide you through designing the shape of the headstock and the placement of the pegholes.

Components Needed	Qty
Guitar Neck	1

Tools Needed

Sharp Pencil	1
Paper	Varies
Bandsaw with a 1/4" Blade or a Coping Saw	1
Woodworking Files	Assorted
Drill Press with a 3/8" Drill Bit.....	1

To shape the headstock:

1. Trace the headstock onto a piece of paper. Test various ideas for headstock shapes on paper before cutting into the headstock. To design a symmetrical headstock, fold the paper in half and cut out trial shapes.
2. Layout pegholes for the tuners that are a minimum of 1/2" from the edge of the headstock. Space the centers of the pegholes at least 15/16" apart.
3. Draw the path of the strings onto the test paper to ensure that the strings do not interfere with each other. Note—If the strings cross the nut at a sharp angle, this increases friction and makes tuning difficult. It also increases the likelihood of the strings pulling out of the nut slots.

4. Layout the tuners on the test piece to ensure you have enough room between the tuners and for the tuner buttons to turn.
5. Redraw your final headstock shape onto the headstock with a pencil.
6. Cut the headstock out with a bandsaw or coping saw. Be sure to cut to the outside edge of your pencil line. Note—To cut sharp corners, cut several slots perpendicular to the corner, then cut out the small pieces. This will reduce blade binding.
7. Carefully hand file the headstock to finalize the shape.
8. Drill the pegholes with a 3/8" drill bit in a drill press as shown in **Figure 5**. The pegholes are drilled slightly undersized so that the tuners will fit tight.



Figure 5. Drilling the pegholes.



Installing the Neck

Consider applying inlays or additional design work on the fretboard and headstock before final sanding. Note—Take your time and test your designs in scrap wood before performing the work on the instrument.

Components Needed	Qty
Guitar Neck	1
Guitar Body	1

Tools Needed	
Sandpaper #150 Grit	Varies
C-Clamp	1
Wood Glue	Varies

To attach the neck to the guitar body:

1. Place the neck into the neck pocket (**Figure 6**). If the neck will not fit into the neck pocket, lightly sand the highpoints on the neck until it fits in the pocket.



Figure 6. Neck installation.

2. Remove the neck and spread a thin layer of wood glue onto the areas of the neck that fit into the neck pocket, and spread glue in the neck pocket.
3. Place the neck into the neck pocket. Make sure that it fits correctly in the pocket.
4. Clamp the neck to the body as shown in **Figure 7**. Note—To protect the neck and body, place wood blocks and pads between the clamp and the guitar.



Figure 7. Clamping the neck to the body.



Sanding the Guitar

The guitar neck and body have been rough sanded at the factory, but it is up to you to do the final sanding before the finish is applied. To get a good finish the guitar should be sanded with a series of sandpaper grits up to #320 grit.

Components Needed	Qty
Guitar Body	1

Tools Needed	
Wood Files	Assorted
Flexible Sanding Block	1
Aluminum-Oxide Sanding Paper #150, #220, and #320 Grit	Varies
Sanding Sealer	Varies

NOTICE

The curly maple surface of this guitar is a very thin veneer. Sanding through this veneer will cause irreparable damage to the guitar.

NOTICE

The fretboard requires no sanding. Sanding the fretboard can affect the playability of the guitar and could lead to unreparable damage.

To sand the guitar body:

- 1. Wear an ANSI-approved respirator and safety glasses when sanding wood!**
2. Use wood files and #150 grit sandpaper to shape the body and neck until the side of the neck joint is smooth. It is normal for the back of the guitar and the base of the neck block to be unequal.
3. Use a flexible sanding block with #150 grit aluminum-oxide sanding paper to sand the guitar 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.
4. Resand the entire guitar with #220 grit sanding paper and lightly round over the outside edges of the body. **DO NOT** round over the neck pocket or the body cavities.
5. Wipe the guitar with a damp cloth to “raise” the wood grain, allowing the “raised” grain to be sanded smooth.
6. Wait until the wood is dry and resand the entire guitar with #220 grit sandpaper. Dampen again and resand. **Note**—If you want to add color to a natural wood finish, the stain should be applied before continuing with the next step. Stains cannot be applied to the guitar after the sanding sealer.
7. Apply a coat of sanding sealer according to the manufacturer's instructions. **Note**—Make sure the sealer you are using is compatible with the finish that you are planning on using.
8. When the sanding sealer or primer is dry, use #320 grit sandpaper for final sanding. **DO NOT** sand through the sealer to bare wood.



Finishing the Guitar

This guitar looks incredible with a clear finish to highlight the curly pattern of the maple top. The surface can be also be stained for color prior to finishing or a transparent pigment can be added to the finish. These instructions will guide you through a very basic finishing process. Books describing different guitar finishing techniques are available through luthier supply catalogs, or may be available through your local library. Clear finish materials and books on finishing instruments can be ordered through Grizzly Industrial. Finishing a guitar is a difficult task. If you are unsure of your skills; do your research, practice on scrap wood, or take it to a professional.

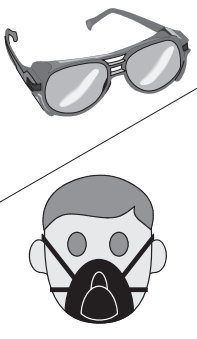
Components Needed	Qty
Guitar.....	1

Tools Needed

¼" Steel Rod, or a Coat Hanger	1
Masking Tape.....	Varies
Tack Cloth or a Clean Rag.....	Varies
Finish and Tools for Application.....	Varies
Wet/Dry Sandpaper #600, #1000 grit.....	Varies
Buffing Supplies	Varies

To finish the guitar body:

1. Mask off the surface of the fretboard. Carefully press all the masking tape edges securely to the fretboard. The finish coat can seep under these edges, especially near corners, uneven edges, and places where the frets meet the fingerboard. **DO NOT** mask the binding.
2. Wipe the entire guitar body with a tack cloth or a soft clean rag to remove any dust.
3. Using a ¼" steel rod or a coat hanger that has been folded in half to make a hook, thread the hook through the audio jack hole and hang the guitar in the finish room.

	<p style="text-align: center;">!WARNING</p> <p>Most finishes can be hazardous to your health. Wear a NIOSH/OSHA approved respirator with particulate and gas/vapor filters, safety glasses, rubber gloves, and work in a well ventilated area when using finishing materials!</p>
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4. Apply several thin coats of the finish according to the manufacturer's instructions. Multiple thin coats will produce a better quality finish than one heavy coat.
5. Sand the entire body with #400 grit wet and dry sandpaper after at least three coats of finish have been applied. **DO NOT** sand through the finish—be especially careful on the edges.
6. Apply more finish, sanding between coats, until the finish is the desired thickness.
7. Allow the finish to dry at least a week, but preferably a month.

NOTICE

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 guitar parts and immediately leave the finish room.**
- **DO NOT return to the room until the specified drying time has elapsed.**

- Remove the masking tape from the fretboard and carefully scrape any excess finish off the surface of the fretboard with a razor blade or chisel as shown in **Figure 8**.

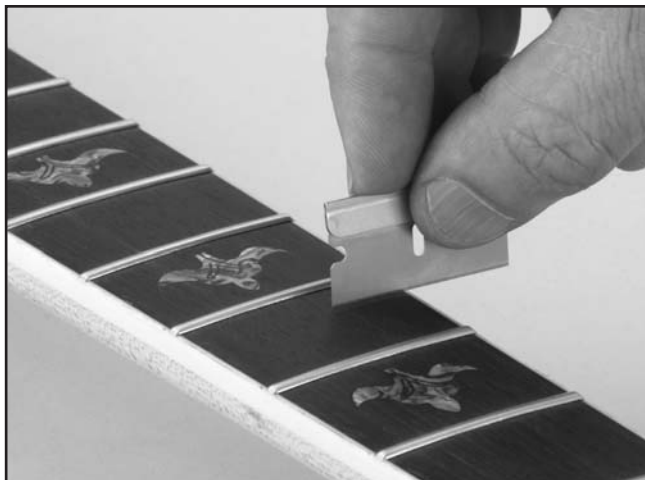


Figure 8. Scraping the fretboard.

- Wet sand the finish using #600 grit wet and dry sandpaper on a sanding block, followed with #1000 grit wet and dry sandpaper.
- Buff the finish by hand or with a buffer, starting with a medium polish and working up to a high gloss polish. Note—If using a buffing machine, be extremely careful to avoid going through the finish, especially on the edges.
- Use a clean rag to wipe wood finishing oil on the surface of the fretboard according to the manufacturer's instructions.



Installing the Tuners

Each tuner consists of the tuner, washer, and a barrel nut. The tuners are attached to the headstock with a small wood screw that attaches between the tuners.

Components Needed	Qty
Guitar.....	1
Tuner.....	6
Washer.....	6
Barrel Nut.....	6
Tap Screw M2 X 12.....	6

Tools Needed

Peghead Reamer or Round File.....	1
Phillips Head Screwdriver.....	1
Drill Press with a 1/16" Drill Bit.....	1

To install the tuners:

- Place the six tuners into the holes on the back of the headstock. The holes may need to be widened with a peghead reamer or a round file. DO NOT widen the holes too much—the tuners should fit snug.
- Slide a washer over the tuner shaft and screw the barrel nut onto the tuner.
- Align the tuners perpendicular to the edge of the headstock and parallel to each other. Use a strip of masking tape to secure their position on the headstock.
- Using a 1/16" drill bit in a drill press, drill 3/8" deep holes into the headstock. Note—Drilling the holes deeper than 3/8" could result in drilling out through the front face of the headstock. Use a depth stop or tape wrapped around the drill bit at the correct depth as an indicator.
- Secure the machine heads to the guitar headstock with the tap screws.



Installing the Pickups

The pickups convert the motion of the strings into an electrical pulse. This electrical pulse is amplified and used to power the speaker. The speaker moves the air in the same motion as the guitar strings, making the sound audible.

Components Needed	Qty
Guitar.....	1
Pickup.....	2

Tools Needed

Drill with a $\frac{3}{16}$ " Drill Bit.....	1
Masking Tape	Varies
Soldering Iron	1
Solder	Varies

To attach the pick guard to the guitar body:

1. Push the black wire on the neck pickup (the thinner pickup) through the hole shown in **Figure 9**, and place the pickup in the cavity with the thin edge towards the neck.



Figure 9. Neck pickup wire.

2. Push the gray wire on the bridge pickup (the thicker pickup) through the hole shown in **Figure 10** and place the pickup in the cavity with the thin edge towards the neck.



Figure 10. Bridge pickup wire.

3. Secure the wires with masking tape so they do not fall back out through the holes.
4. Secure the position of the pickups to the body with masking tape.
5. **DO NOT** drill the screws at this time! Final adjustments need to be made after installing and winding the strings.



Wiring the Pickups

This guitar comes with a wiring harness that has most of the components soldered in place. You will need to solder in the pickup wires and the three way switch. Soldering the wires may cause damage to the components if done incorrectly. If you are unsure of your skills; do your research, practice on scrap wires, or take it to a professional.

Components Needed	Qty
Guitar.....	1
Wiring Harness.....	1
Washer 8MM.....	4
Nut 8MM.....	4
Washer 12MM Gold.....	1
Nut 12MM Gold.....	1
3-Way Switch Plate.....	1
3-Way Switch Back Cover.....	1

Tools Needed	
Socket 11MM.....	1
Soldering Iron.....	1
Solder.....	Varies

To wire the pickups:

1. Place the pots into the electronics cavity as shown in **Figure 11**.

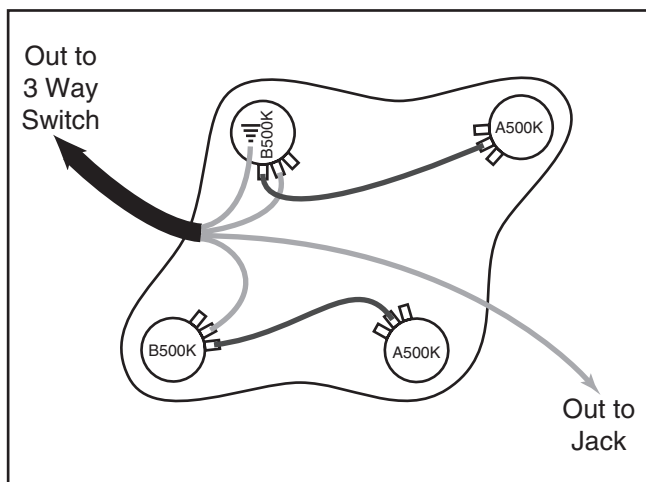


Figure 11. Wiring diagram 1.

2. Flip the guitar over and secure the pots with the 8MM nuts and washers.
3. Rotate the control pot shafts counterclockwise until they stop. Place the control knobs over the control pot shafts with the 0 at the 12 o'clock position.
4. Push the audio jack out through the hole in the end of the body.
5. Solder the pickups onto the pots as shown in **Figure 12**. Note—The ground wires are soldered directly to the surface of the pots.

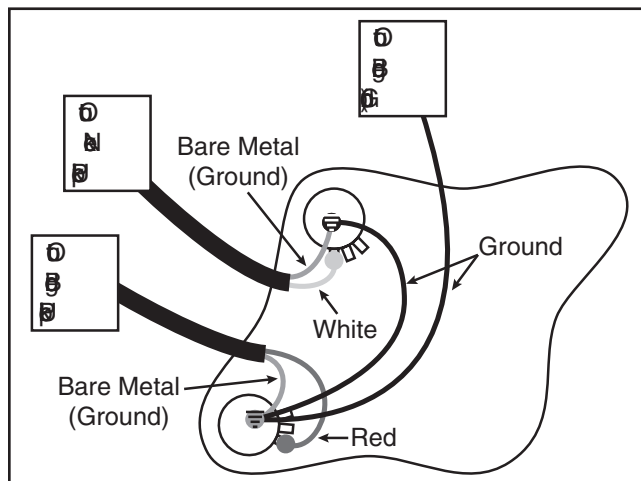


Figure 12. Wiring diagram 2. (The wires from Wiring Diagram 1 are removed for clarity.)

6. Cut the ground wires to length and solder them to the surface of the pots as shown in **Figure 12**.
7. Unsolder the three way switch from the wiring harness.

8. Feed the switch wire through the body and out of the hole shown in **Figure 13**.



Figure 13. 3-way switch.

9. Re-solder the three way switch onto its wire as shown in **Figure 14**.

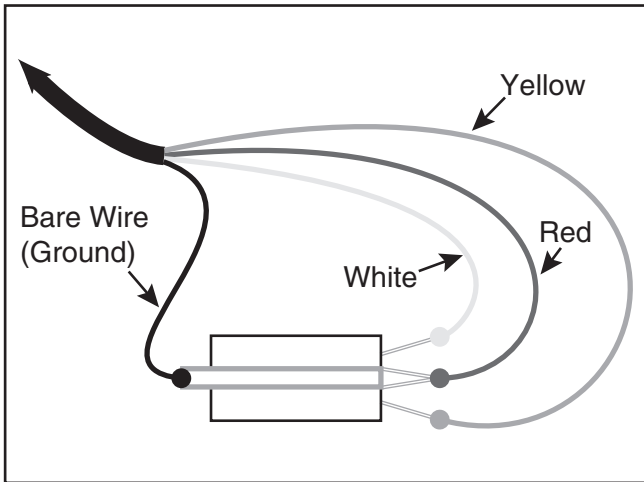


Figure 14. 3-way switch wiring.

10. Push the 3-way switch through the hole in the guitar top. Rotate the switch until the white wire is at the 12 o'clock position.
11. Remove the sticky back from the switch plate and place it onto the guitar top around the 3-way switch with the word "Treble" at the 12 o'clock position.
12. Secure the position of the 3-way switch with the 9MM nuts and washers.



Audio Jack

Components Needed	Qty
Guitar.....	1
Jack Plate.....	1
Washer 9MM Gold.....	1
Nut 9MM Gold.....	1
Tap Screw M2.6 X 16.....	4

Tools Needed	Qty
Socket 14MM.....	1
Drill with a 1/16" Drill Bit.....	1
Depth stop.....	1
Phillips Head Screwdriver.....	1

To attach the audio jack to the guitar body:

1. Insert the audio jack into the hole in the jack plate, place the washer over the threads, and secure with the nut (see **Figure 15**).

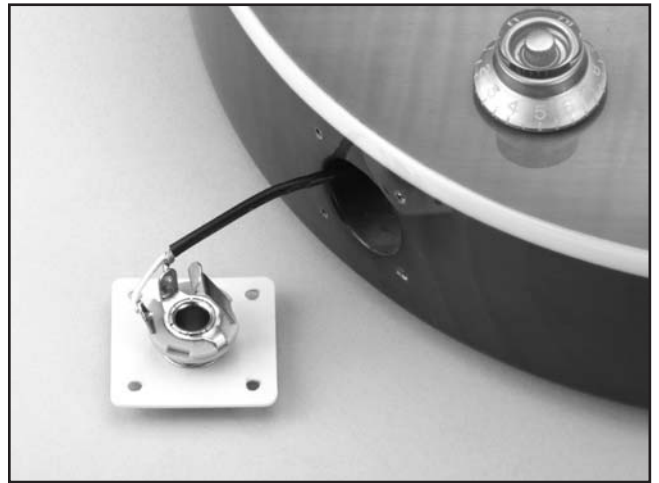


Figure 15. Jack plate.

2. Place the jack plate in the hole in the guitar.
3. Secure the position of the jack plate to the guitar body with masking tape.
4. Use 1/16" drill bit to drill 1/2" holes through the holes in the jack plate and into the body.
5. Secure the jack plate to the guitar body with four tap screws.



Strap Button

The strap buttons are positioned on the guitar as shown in **Figure 16**.



Figure 16. Strap buttons.

Components Needed	Qty
Guitar.....	1
Tap Screws	2
Strap Buttons.....	2

Tools Needed

Drill with a 1/8" Drill Bit.....	1
Phillips Head Screwdriver.....	1

To attach the strap buttons to the guitar:

1. Using an 1/8" drill bit, drill 3/4" deep holes at each of the mounting locations.
2. Secure each of the strap buttons to the guitar body with a tap screw.



Installing the Bridge

Components Needed	Qty
Guitar.....	1
Bridge	1
Stopbar Tailpiece	1
Threaded Inserts	4
Tailpiece Adjustment Screws	2
Bridge Adjustment Screws	2

Tools Needed

Hammer.....	1
Small Wooden Block	1

To attach the bridge to the guitar body:

1. Place two inserts into the forward holes as shown in **Figure 17**.

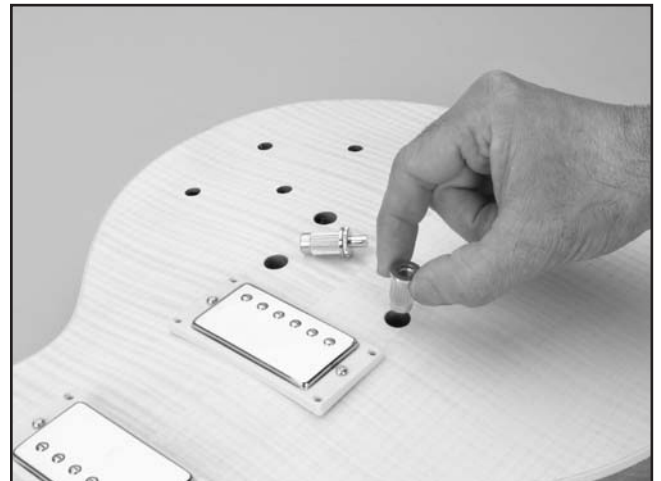


Figure 17. Threaded insert placement.

2. Place the wooden block on an insert and lightly tap the insert down until it touches the top of the guitar body. Repeat for the other insert.
3. Thread the bridge adjustment screws into the inserts, as shown in **Figure 18**, and place the bridge over the inserts.
4. Feed the grounding wire from the electronics cavity into the back hole. Hook the end of the wire down so it catches the edge of the hole.

Gluing the Nut

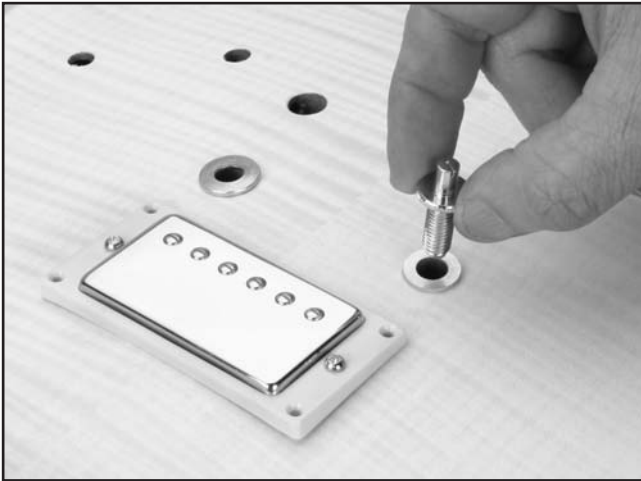


Figure 18. Bridge adjustment screw.

5. Place the remaining inserts into the back holes.
6. Place the wooden block on an insert and lightly tap the insert down until it touches the top of the guitar body. Repeat for the other insert.
7. Thread the bridge adjustment screws into the inserts as shown in **Figure 19**.



Figure 19. Tailpiece adjustment screw.

8. Slide the tailpiece onto the adjustment screws.



The nut holds the peghead end of the strings the correct distance above the frets. It is not necessary to cut the string notches in the nut that comes with this kit.

Components Needed	Qty
Guitar.....	1

Tools Needed	
Narrow Chisel or Razor Blade.....	1
Glue	Varies

To install the nut:

1. Use a chisel or razor blade to carefully scrape any finish overspray out of the nut slot (**Figure 20**). DO NOT remove any wood from the nut slot.

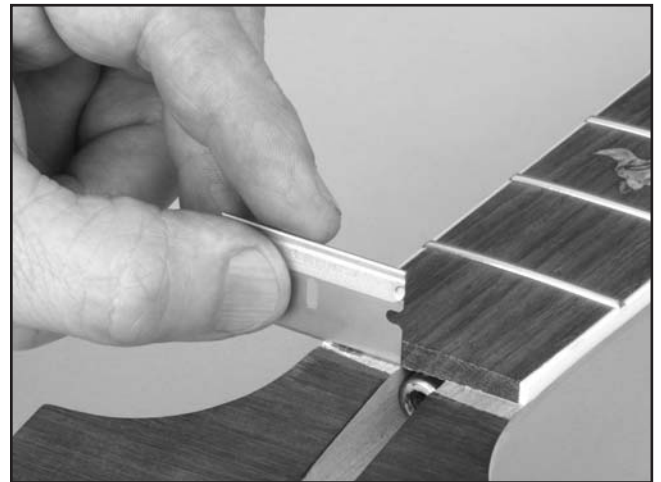


Figure 20. Cleaning out the nut slot.

2. Spread a thin layer of glue in the nut slot.
3. Center the nut in the nut slot.
4. Install the strings as described in the next section. The strings will hold the nut in place until the glue dries.
5. Wipe away the excess glue before it sets up, then allow the glue to dry for 24 hours.



Winding Strings

The correct position of the guitar strings is shown in **Figure 21**. The thin High E string is called the "1st" string and the thick Low E string is called the "6th" string.

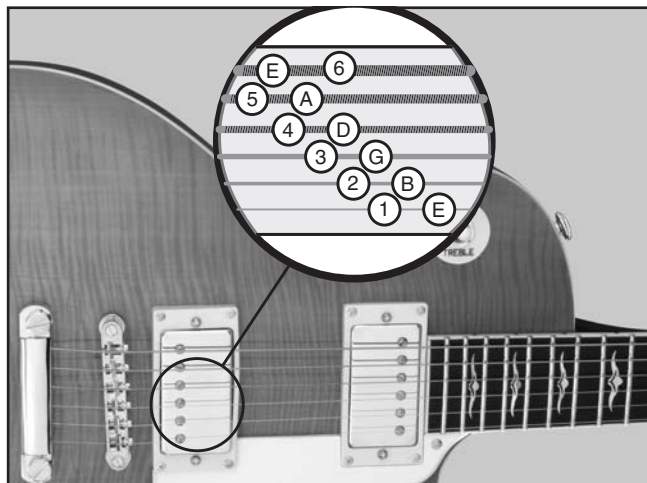


Figure 21. Correct string locations.

Components Needed	Qty
Guitar	1
Strings	6

Tools Needed	
Wire Cutters	1

To install the guitar strings:

1. Slide the 1st string through the corresponding hole in the bridge (**Figure 22**).

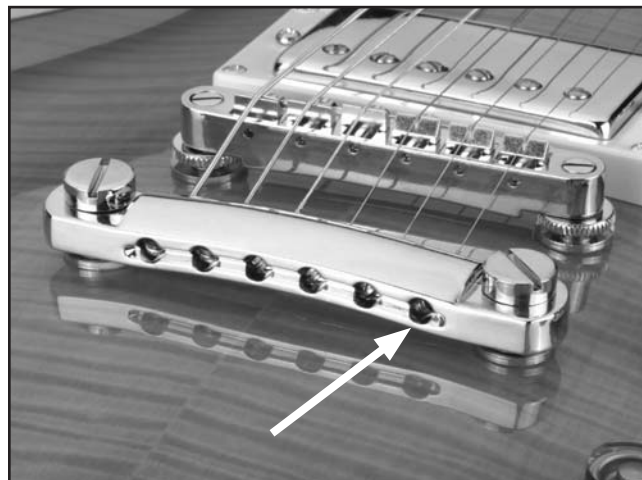


Figure 22. 1st string installation hole.

2. Guide the string over the bridge saddle, over the nut, and through the hole in the corresponding tuner.
3. Allow only enough slack in the string for 2-3 rotations around the tuner. Note—If too much slack is allowed, then the string could wind off the machine head after many successive rotations. If not enough slack is allowed, then the string may not hold the winding tension.

4. Bend the string at a right angle across the edge of the machine head.
5. Rotate the tuners until the string just begins to hold the winding tension. Note—DO NOT tighten the strings beyond the initial tensioning at this time. Final tensioning should be completed during the string tuning process.



Figure 23. String wrapped around tuner.

6. Use wire cutters to cut off the excess string.
7. Repeat the above process for the remaining strings.



Truss Rod Cover

Components Needed	Qty
Guitar.....	1
Truss Rod Cover.....	1
Tap Screw M2 X 12.....	1

Tools Needed	
Drill with a 1/16" Drill Bit.....	1
Depth stop.....	1
Phillips Head Screwdriver.....	1

To install the nut:

1. Center the truss rod cover over the hole for the truss rod and press it up against the nut.
2. Use 1/16" drill bit to drill 3/8" holes through the hole in the truss rod cover and into the peghead.
3. Secure the truss rod cover to the peghead with the tap screw.



SECTION 5: SET UP

General

Guitar set up is an art that requires skill, patience and experience. If you have the patience, you can acquire the skill and experience. If you don't have the patience, you may want to have your guitar set up by a qualified guitar technician.

This section on set up is a general overview of set up practices. We highly recommended that you research more in-depth methods. Books on setting up electric guitars can be ordered through Grizzly Industrial, luthier supply catalogs, or may be available through your local library.



Neck Adjustment

The guitar neck was adjusted perfectly straight before it was packaged; however, the moisture content of wood acclimates to the humidity of the surrounding environment. This characteristic results in movement of the wood components with regards to alignment. It is not uncommon for the neck to require adjustment several times each year, especially in regions where the seasonal climate changes are more drastic.

Components Needed	Qty
Guitar with Strings Installed	1

Tools Needed	
Metal Straightedge 18"	1
Hex Head Wrench 4MM	1
Feeler Guage Set	1
Phillips Head Screwdriver.....	1

To adjust the bow of the guitar neck:

1. Tighten the strings to playing tension.

2. Place a straightedge from the 1st fret to the 17th. Measure any gaps between the straightedge and the frets with the feeler guage.
—If the neck is flat, or bowed up .012" or less, the neck is set up correctly.
—If the gap is greater than .012", or if the neck bows away from the straightedge, continue to **step 3**.
3. Loosen the strings and turn the truss rod nut in the base of the neck (**Figure 24**) counterclockwise to release tension on the neck. Retighten until the nut begins to grab.

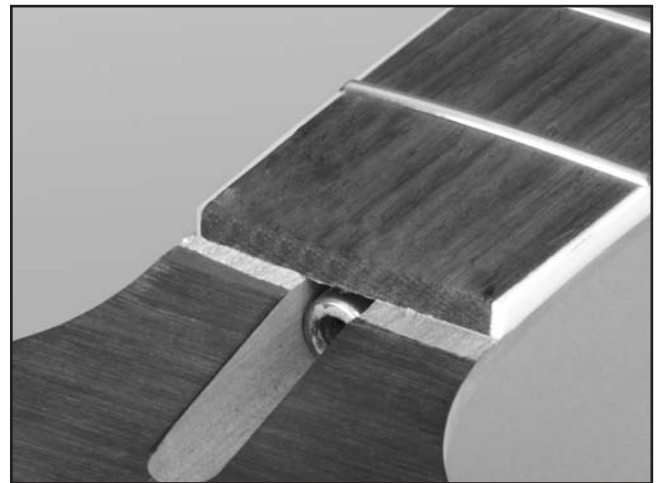


Figure 24. Truss rod nut.

5. To flatten a back bow, turn the truss rod nut a 1/4 turn clockwise. To correct an up bow, turn the nut a 1/4 turn counterclockwise.
6. Restring the guitar and recheck the neck with the straightedge.
—If the neck is correctly adjusted, go to the next section.
—If the neck is still out of adjustment return to **step 3**.



String Height

Correct string height is crucial for maximizing the playability of your electric guitar. The string height is the distance between the top face of the fret and the bottom face of the string (**Figure 25**).

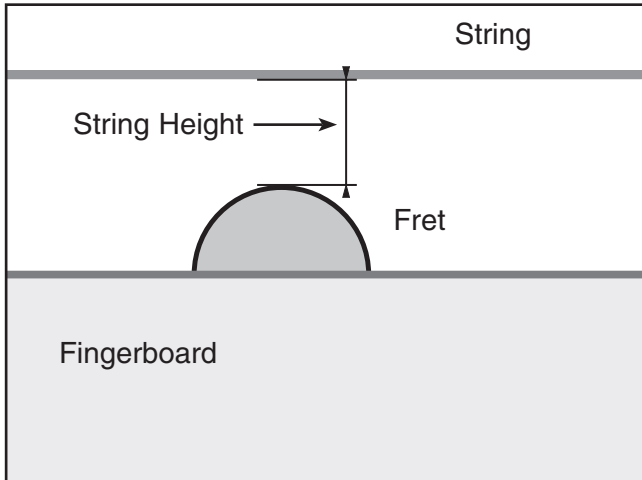


Figure 25. String height measurement.

Components Needed	Qty
Guitar with Strings Installed	1

Tools Needed	
Metal Straightedge or Feeler Gauges	1
Flat Head Screwdriver	1

To adjust the string height:

1. Tune the guitar, then measure the string height at the twelfth fret. The 1st string measurement should be $\frac{3}{64}$ " the 6th string measurement should be $\frac{5}{64}$ ".

2. De-tension the strings and adjust the bridge height as shown in **Figure 26**.



Figure 26. Adjusting the bridge height.

3. Re-tune the guitar and check the string height.
 - If the strings are at the correct height, go to the next step.
 - If the strings are at the wrong height return to **step 2**.
4. Check the angle of the strings between the bridge and the tailstop shown in **Figure 27**.
 - If the strings touch the back edge of the bridge, raise the tailstop.
 - If there is a large gap between the back edge of the bridge and the strings, lower the tailstop until there is only a small gap.

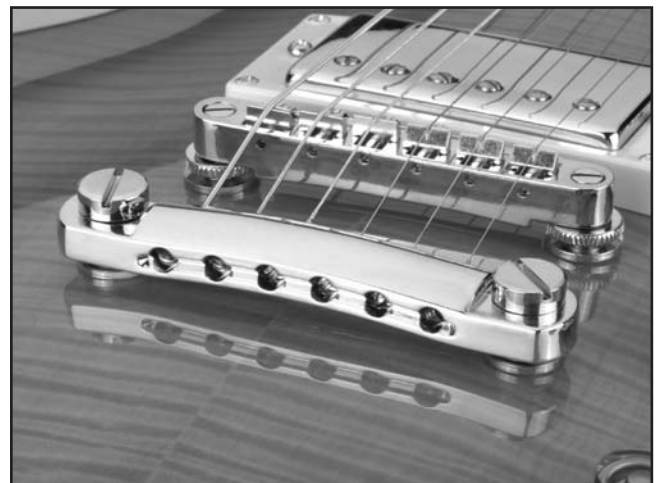


Figure 27. Adjusting the tailstop.



Pickup Adjustments

Pickup height can have a dramatic effect on the audio output signal. The closer the strings are to the pickups, the stronger the audio output signal will be. If the strings are too close, distortion is caused by magnetic interference from the electronic components.

Components Needed	Qty
Guitar with Strings Installed	1
Tap Screw M2.6 x 16	1

Tools Needed	
Drill with a $\frac{3}{32}$ " Drill Bit.....	1
Depth stop	1
Masking Tape.....	1
Metal Straightedge	1
Phillips Head Screwdriver.....	1

To adjust the pickups:

1. Align the pickups so the outside pickup screws are directly under the 1st and 6th strings, as shown in **Figure 28**, and tape the pickups in place.

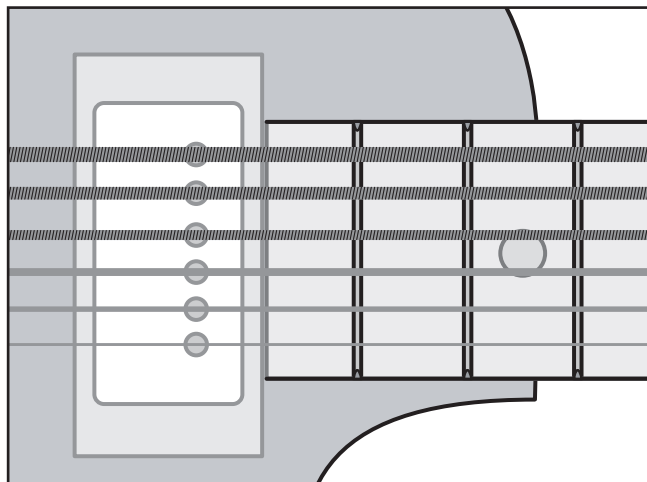


Figure 28. Pickup placement.

2. Drill $\frac{1}{2}$ " deep holes through the holes in the pickups and into the guitar body.
3. Fasten the pickups to the body with the M2.6 X 16 tap screws.

4. Measure the distance from the top of the outside screw heads on the neck pickup to the bottom of the strings as shown in **Figure 29**.

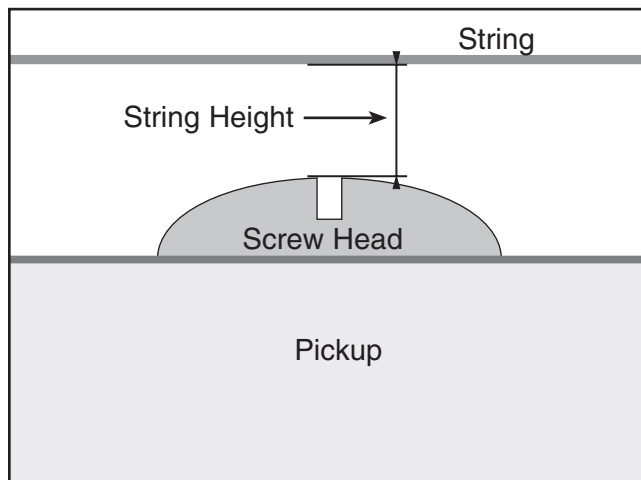


Figure 29. String heights over the pickup.

4. Adjust the screws shown in **Figure 30** until the gap between the strings and the pickup is $\frac{3}{32}$ ".

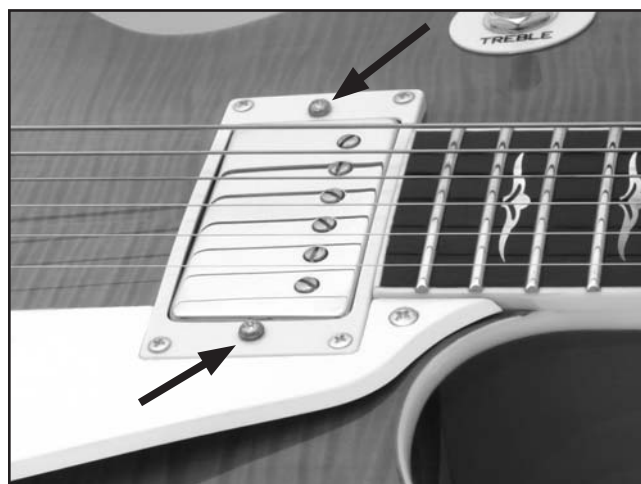


Figure 30. Pickup height adjustment.

5. Measure the bridge pickup and adjust the screws shown in **Figure 30** until the gap between the strings and the pickup is $\frac{1}{16}$ ".



Pickguard

The pickguard must be installed after the pickups are adjusted because the pickguard indexes off of the edge of the pickups.

Components Needed	Qty
Guitar.....	1
Pickguard.....	1
Pickguard Bracket	1
Machine Screw.....	1
Nut	1
Tap Screw M2.6 X 12.....	2

Tools Needed	
Drill with a $\frac{3}{32}$ " Drill Bit.....	1
Depth Stop	1
Phillips Head Screwdriver.....	1

To install the pickguard:

1. Loosely attach the metal bracket to the pickguard with the machine screw and nut.
2. Place the pickguard against the pickups as shown in **Figure 31**.



Figure 31. Pickguard placement.

3. Adjust the metal bracket so the pickguard is tight against the pickups and the bracket is tight against the side of the mandolin body, and tighten the screw holding the bracket and pickguard together.
4. Drill $\frac{1}{2}$ " deep holes through the holes in the pickguard and bracket and into the guitar body. The hole for the bracket should be about where the binding joins the guitar body as shown in **Figure 32**.

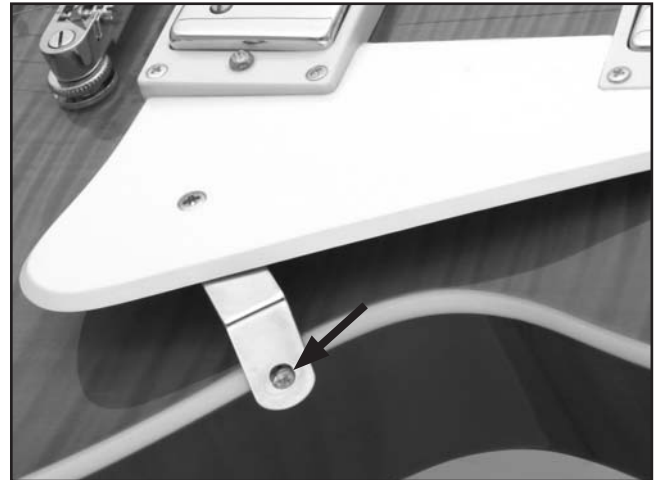


Figure 32. Bracket screw placement.

5. Attach the pickguard to the body with tap screws in the hole at the head of the pickguard and in the bracket hole.



Setting Intonation

Setting the intonation adjusts the length of the string to correct for flatness/sharpness on each string. The adjustment is simple, but this procedure takes a lot of trial and error.

Components Needed	Qty
Guitar with Strings Installed	1

Tools Needed	Qty
Phillips Head Screwdriver.....	1

To set the intonation:

1. Lightly touch and then release the 1st string directly above the twelfth fret as you pluck the string to play a harmonic note.
2. Now pluck the string while holding it fretted at the twelfth fret. If this note is sharper than the note played in **step 1**, move the saddle away from the neck. If this note is flat in comparison, move the saddle toward the neck.

Note—This procedure can also be done with an electronic tuner by tuning the harmonic note to be exactly in tune and then adjusting the saddle until the note played in **step 2** is also in tune.

3. Repeat **steps 1–2** until the string is in tune. Repeat the process for the rest of the strings.



Figure 33. Saddle adjustments.



Tuning

Tuning is an important guitar concept. If the guitar is not in tune, the resulting sound is unpleasant. These instructions explain how to tune by ear. You can also tune using an electronic tuner such as the Grizzly H3097 Chromatic Tuner shown on **page 25**.

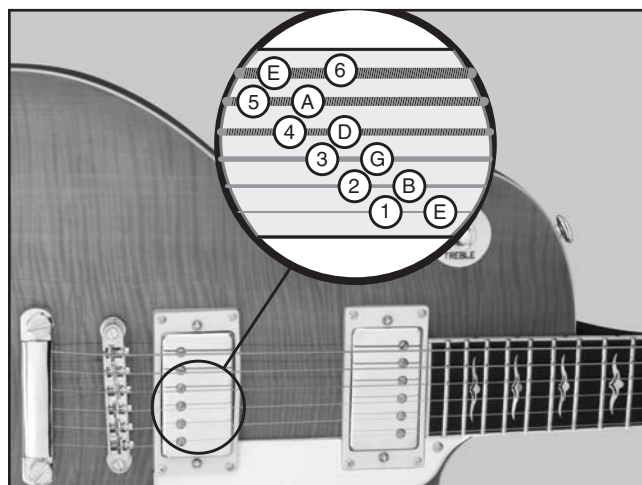


Figure 34. Standard tuning.

To tune the guitar:

1. Play a Low E pitch on a piano, a tuning fork, or an electronic computer file.
2. Play an open (non-fretted) 6th string and adjust the tuner to match the Low E. Note—Always tune up. If the string is tuned high, loosen the string to lower the pitch, then tune the string up to the correct note.
3. Tune the 5th string by playing the 6th string while it is being pressed (fretted) at the 5th fret, and then play the open 5th string. Adjust the 5th string tuner until the notes match.
4. Perform the same tuning steps on the 4th and 3rd strings.
5. When tuning the 2nd string, fret the 3rd string at the 4th fret instead of the 5th fret.
6. Tune the 1st string in the same manner as the 6th, 5th, 4th, and 3rd strings.



Notes

SECTION 6: REFERENCE INFO

Accessories

G7984—Face Shield

H1298—Dust Sealed Safety Glasses

H1300—UV Blocking, Clear Safety Glasses

H2347—Uvex® Spitfire Safety Glasses

H0736—Shop Fox® Safety Glasses

Safety Glasses are essential to every shop. If you already have a pair, buy extras for visitors or employees. You can't be too careful when it comes to shop safety!

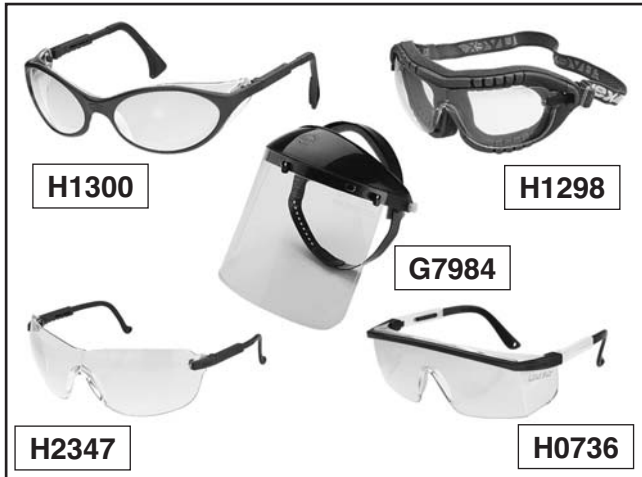


Figure 35. Our most popular safety glasses.

H1302—Standard Earmuffs

H4979—Deluxe Twin Cup Hearing Protector

H4977—Work-Tunes Radio Headset Earmuffs

Protect yourself comfortably with a pair of cushioned earmuffs. Especially important if you or employees operate for hours at a time.



Figure 36. Our most popular earmuffs.

- H2499—Small Half-Mask Respirator**
- H3631—Medium Half-Mask Respirator**
- H3632—Large Half-Mask Respirator**
- H3635—Disposable Cartridge Filter Pair P100**

Wood dust is now considered a known carcinogen and has been linked to nasal cancer and severe respiratory illnesses. If you work around dust everyday, a half-mask respirator can be a lifesaver. Also compatible with safety glasses!



Figure 37. Half-mask respirator and disposable cartridge filters.

H3097—Chromatic Tuner

An absolute must for any guitar player, this tuner allows you to tune your acoustic or electric guitar dead on. Includes 9V battery.



Figure 38. Model H3097 Chromatic Tuner.

- H5750—Vinyl Washcoat/Sealer, 1Qt**
- H5751—Nitrocellulose Lacquer, Gloss, 1 Qt**
- H5752—Nitrocellulose Lacquer, Gloss, 1 Gal**
- H5753—Nitrocellulose Lacquer, Satin, 1 Qt**
- H5754—Nitrocellulose Lacquer, Satin, 1 Gal**
- H5755—Retarder for Lacquer, 1 Qt**
- H5756—Natural Filler, 1 Pint**
- H5757—Mahogany Filler, 1 Pint**
- H5759—Filler Reducer, 1Qt**

McFadden's nitrocellulose lacquer is the leading lacquer used by custom guitar builders. It sprays and buffs really well and is capable of giving you a finish that looks "wet."



Figure 39. Model H5750-59 McFadden's Lacquers and Fillers.

- H0818—Fine Prepolishing Paste, 1.85 lb**
 - H4873—Medium Prepolish Liquid, 1 Qt**
 - H0821—High Gloss Polishing Liquid, 1 Qt**
- Menzerna professional polishing compounds will remove any fine scratches from the finish and give your instrument the incredibly high gloss finish that you are looking for.



Figure 40. Menzerna polishing compounds.

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 applies only to the hardware of this kit, all wood components of this kit are excluded from this warranty. This warranty does not apply to defects due directly or indirectly to assembly, finishing or modification of kits; 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, provide proof of purchase, and give us all the details. We will then determine if any components need to be replaced. Kits are non-returnable.

The manufacturer's 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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