MODEL T24831 LEFT-HANDED CLASSIC-STYLE KIT

INSTRUCTION MANUAL

(For models manufactured since 9/12)

#MM15364 PRINTED IN JAPAN
V1.10.13

⚠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 reduces your exposure to these chemicals: Work in well ventilated area, and work with approved safety equipment, such as those dust masks that are specifically designed to filter out microscopic particles.

⚠WARNING

For Your Own Safety, Read Instruction Manual

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.

⚠DANGER	**Indicates an imminently hazardous situation which, if not avoided, WILL result in death or serious injury.**
⚠WARNING	**Indicates a potentially hazardous situation which, if not avoided, COULD result in death or serious injury.**
⚠CAUTION	**Indicates a potentially hazardous situation which, if not avoided, MAY result in minor or moderate injury. It may also be used to alert against unsafe practices.**
NOTICE	**This symbol is used to alert the user to useful information about proper operation of the machine.**

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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 that you understand the techniques used to build 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 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 T24831 Left-Handed Classic-Style 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 T24831 Left-Handed Classic-Style 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:

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

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SECTION 3: PARTS INVENTORY

Inventory

REF	PART#	DESCRIPTION	QTY
1	PH8068001	Guitar Body	1
2	PH8068002	Neck	1
3	PH8068003	Pickguard	1
4	PH8068004	Silver Neckplate	1
5	PH8068005	Black Neckplate Setter	1
6	PH8068006	Tuning Machines	6
7	PH8068007	Audio Patch Cable	1
8	PH8068008	Control Plate	1
9	PH8068009	Bridge	1
10	PH8068010	Plastic Bushings	6
11	PH8068011	Output Jack Cover	1
12	PH8068012	Strings	6
13	PH8068013	Strap Buttons	2
14	PH8068014	#7 x 1-3/8" SS Screws	4
15	PH8068015	#5 x 5/8" SS Screws	4
16	PH8068016	#3 x 3/8" SS Screws	12
17	PH8068017	#2 x 3/8" SS Screws	13
18	PH8068018	#4 x 15/16 SS Screws	2
19	PH8068019	Bushing 3/32" x 3/16" x 3/32"	1
20	PH8068020	String Retainer	1
21	PH8068021	String Nut	1
22	PH8068022	Ferrules	6
23	PAW04M	Hex Wrench 4mm	1
24	PAW01.5M	Hex Wrench 1.5mm	1

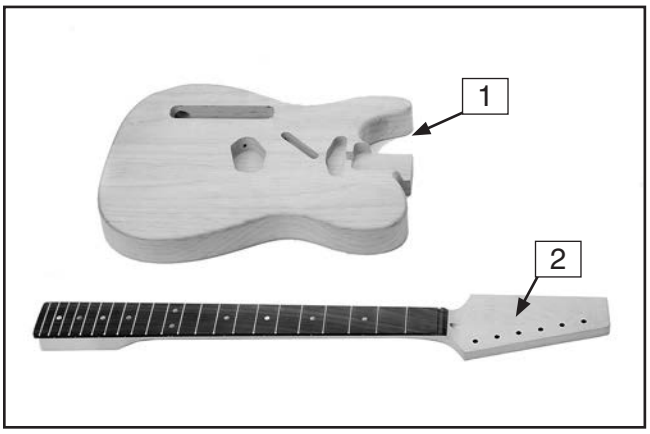


Figure 1. Boxed components.

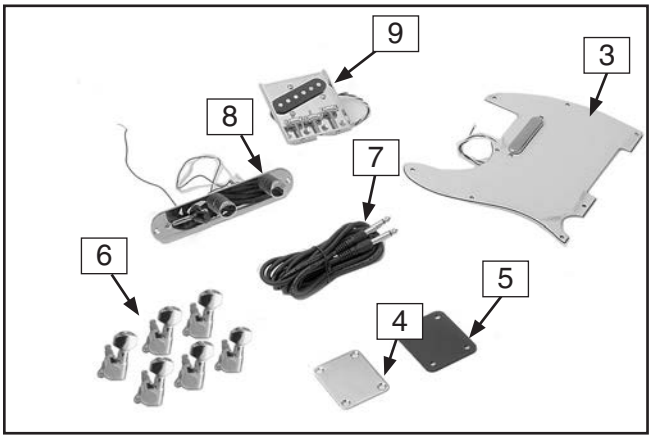


Figure 2. Guitar parts.

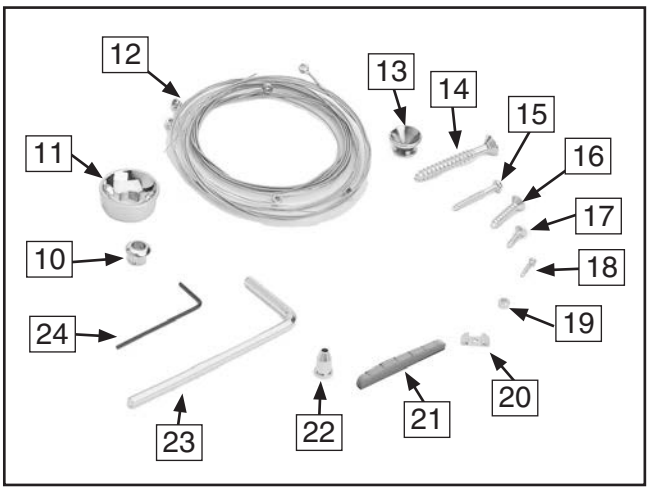


Figure 3. More guitar parts.

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 sanding and finishing is required to complete your guitar.

Recommended Tools & Supplies:

- Sharp Pencil
- Drill Press
- Drill Bits: 1/16", 7/64", 1/8", 5/16", 1/4"
- Electric/Cordless Drill
- Depth Stop
- NIOSH-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 Head Screwdriver #1, #2
- 1/4" Steel Rod or a Coat Hanger
- Masking Tape
- Tack Cloth or Clean Soft Rag
- Sanding Sealer
- Assorted Wood Files
- Buffing Compounds
- Oil Wood Finish
- Soldering Iron and Solder
- Peghead Reamer or a Round File
- Rubber Dead Blow Hammer
- Tweezers, Pliers, Wire Cutters
- C-Clamps
- Temporary Wood Handle: Approximately 1" x 2" x 16"
- Guitar Capo
- Feeler Gauge Set
- Spray Primer and Finish (see Note below)
- Spray Gun and Compressor
- 18" Metal Straightedge (1/32" Resolution)
- 36" Metal Straightedge
- Steel Ruler (1/64" Resolution)
- Wood Dowel
- Wooden Blocks: Approximately 4" x 4" x 12" (2)
- Wood Shim 7/16" Thick

Note: *Use the same type of paint for primer and finish—either enamel or lacquer base. Do not use different base paints for priming or finishing or your results may not be desirable.*

Identification

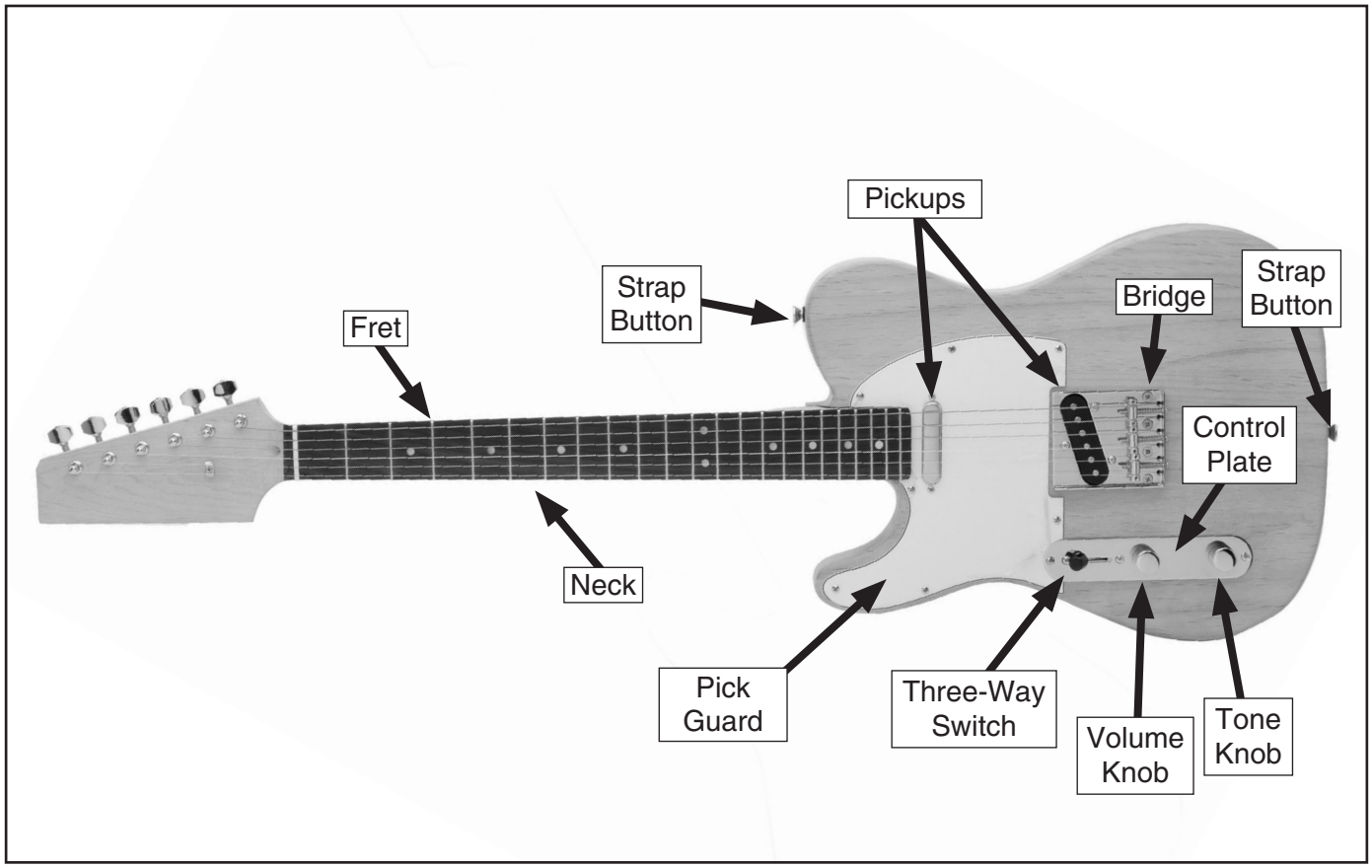


Figure 4. Model T24831 controls.

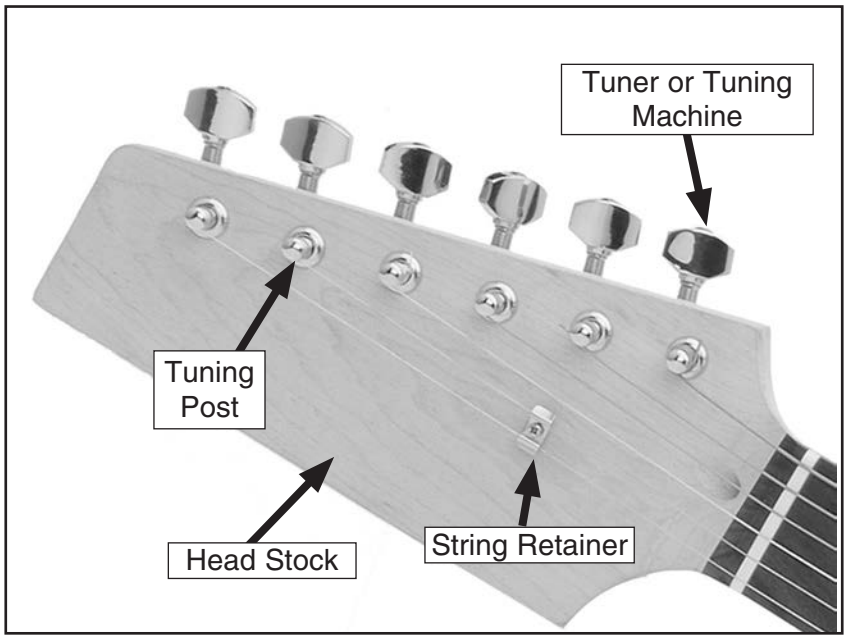


Figure 5. Model T24831 headstock features.

SECTION 4: ASSEMBLY

Sanding Body

The guitar body has been 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 body should be sanded with a series of sandpaper grits up to #320 grit.

To sand the guitar body:

1. **Wear a NIOSH-approved respirator and ANSI-approved safety glasses when sanding wood!**

2. Use a flexible sanding block with #150 grit aluminum-oxide sanding paper to sand the guitar body until there is a consistent scratch pattern on the entire surface.

   Note: *DO NOT round over the neck pocket or the body cavities.*

   When hand sanding, always sand in the same direction as the wood grain.

3. Resand the entire guitar body with #220 grit sanding paper and lightly round over the outside edges of the body.

4. Wipe the guitar body with a damp cloth to “raise” the wood grain.

5. Wait until the wood is dry and resand the entire body with #220 grit sandpaper to sand the “raised” grain smooth.

6. Repeat **Step 4 & 5.**

   Note: *If you want to stain your guitar, the stain should be applied now before continuing with the next step. Stains cannot be applied to the guitar body after the sanding sealer is applied.*

7. Apply a primer if you plan to paint the guitar a solid color. Apply a coat of sanding sealer if you stained the guitar. Use the sealer or primer according to the manufacturer's instructions.

   Note: *Make sure the primer or sealer you use is compatible with your finish.*

8. When the sanding sealer or primer is dry, use #320 grit sandpaper for final sanding. DO NOT sand through to bare wood.

Sanding Neck

Like the guitar body, the guitar neck has been rough sanded at the factory, and should fit into the body. However, due to changes or differences in humidity between the factory and your location, the wood may swell, requiring minor sanding to fit the neck into the body.

Final sanding should be done as described in the previous sub-section **Sanding the Body**. Consider applying inlays or additional design work on the fretboard and headstock before final sanding.

Note: *If you are considering inlays or other design work, take your time and test your designs in scrap wood before performing the work on the instrument.*

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

Finishing Neck

Some of the finishing options include stains, lacquers, varnishes and oil finishes. Traditionally this style of guitar has a clear finish on the neck. Depending on the type, finishes can be applied with a spray gun, brush, rag, or a spray can. Finish materials and books on finishing instruments can be ordered through Grizzly Industrial or numerous luthier supply catalogs.

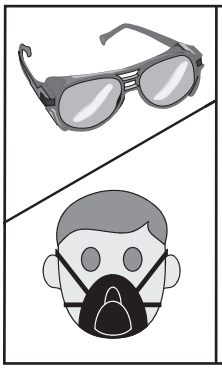
To finish the guitar neck:

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.

2. Make an "S" shaped hook out of 1/4" steel rod, or a coat hanger that has been folded in half.

3. Wipe the entire neck with a tack cloth or a soft clean rag to remove any dust.

4. Thread the hook through the upper peghole and hang the neck in the finishing room.



⚠WARNING

Most finishes are 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 finishing.

5. Apply the finish according to **Finishing Body**, **Steps 5–11,** on **Page 9**.

6. Before wet sanding, remove the masking tape from the fretboard and carefully scrape any excess finish off the fretboard with a razor blade or chisel, as shown in **Figure 6**.

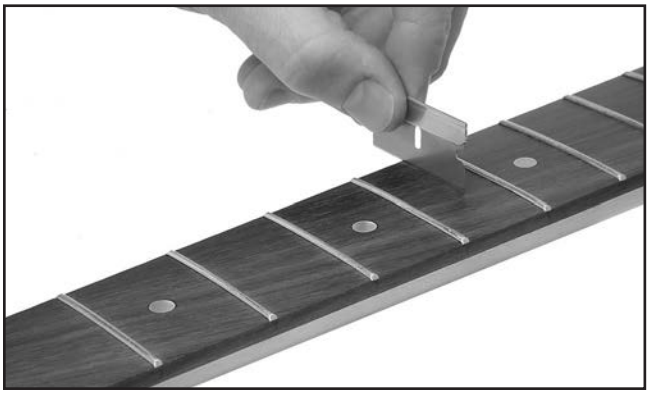


Figure 6. Scraping the fretboard.

7. Use a clean rag to wipe wood finishing oil on the surface of the fretboard.

Finishing Body

This guitar looks incredible with a clear finish to highlight the wood grain patterns. The surface can be stained prior to finishing or a transparent pigment can be added to the finish. These instructions guide you through a very basic finishing process. Books describing different guitar finishing techniques are available through luthier supply catalogs, or through your local library. Clear finish materials and books on finishing 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.

To finish the guitar body:

1. Mask off the neck pocket. Press the masking tape tight against the edges of the pocket so the finish does not seep under the tape.

2. Screw through the neck pocket screw holes into a long piece of wood to use for a handle during spraying. Drill a hole in the end of the handle for hanging from a hook.

3. Wipe the entire guitar body with a tack cloth or a soft clean rag to remove any dust.

4. Thread the hook through the temporary handle and hang the body in the finish room.

5. Apply several thin coats of the finish, following the manufacturer's instructions. Multiple thin coats usually produce a better quality finish than one heavy coat.

6. 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.

7. Apply more finish, sanding between coats, until the finish is the desired thickness.

   Note: *If finishing with a solid color, you may wish to apply several coats of a clear finish over the top, sanding between coats, to add depth to the finish.*

8. When the final coat has dried at least a week, preferably a month, remove the temporary handle and masking.

9. Wet sand the finish using #600 grit wet and dry sandpaper on a sanding block, followed with #1000 grit wet and dry sandpaper.

10. Buff the finish by hand or with a buffer, starting with a medium polish and work 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.*

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.**

Mounting Neck

Components and Hardware Needed:	Qty
Guitar Body	1
Neck	1
Silver Neckplate	1
Black Neckplate Setter	1
#7 x 1⅜" Stainless Steel Screws	4

Note: *Unless otherwise indicated, we strongly recommend using a drill press for the majority of drilling in this manual to obtain the most precise results. However, an electric/cordless drill fitted with a depth stop or a drill stand can be used if you do not have a drill press.*

To mount the neck to the guitar body:

1. Insert the neck into the neck pocket, and check to make sure the neck and body are flush, as shown in **Figure 7**.

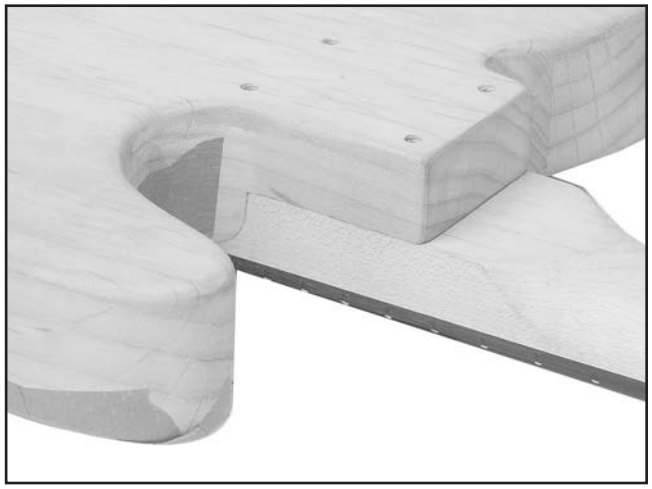


Figure 7. Making neck and body flush.

2. Clamp the neck and body together.

3. Set the guitar facedown on top of two 4x4's (cut to 12") for support.

4. Insert a ⅛" drill bit into a neck hole (see **Figure 8**). While pressing down slightly, twist the drill bit by hand to make a pilot hole.

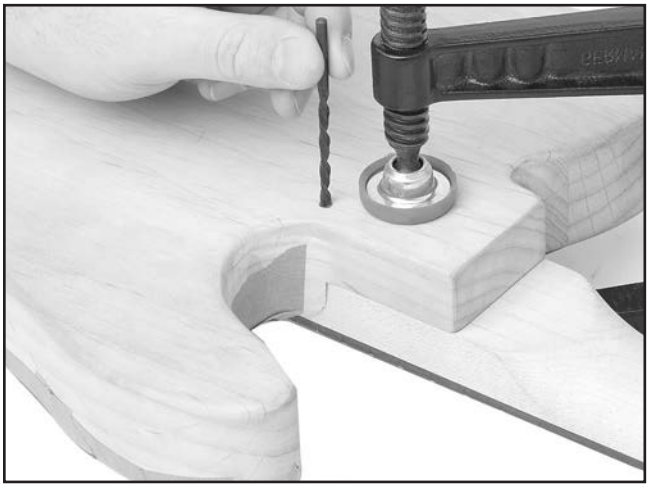


Figure 8. Making a pilot hole in the neck.

5. Unclamp the neck from the body.

To determine neck mounting hole depth:

1. Secure the ⅛" drill bit in the drill press chuck, raise the table, and set the neck fretboard-down on the table.

2. Set the drill press depth stop so the tip of the bit will ONLY drive half way through the eck.

   Note: *Correctly set the depth stop or the bit may drill through the fretboard!*

Another way to determine neck mounting hole depth (Optional):

1. Insert the neck into the neck pocket.

2. Place the neckplate and neckplate setter on top of the body so a mounting hole protrudes beyond the body and neck.

3. Insert a #7 x 1⅜" screw through the plates so it hangs down to the side of the neck and body.

4. Gently mark the screw tip depth with a pencil (see **Figure 9**).

   Note: *You may want to cover the screw tip marking location with masking tape to avoid scratching the finish.*

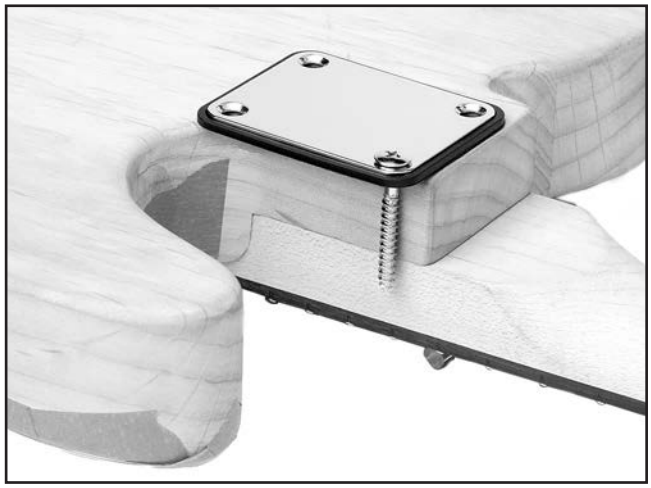


Figure 9. Using screw tip depth to set depth stop.

5. Set the neck fretboard face down on the drill press table, and set the depth stop to the mark from **Step 4**.

To drill mounting holes in the neck:

1. Lower the ⅛" drill bit over the center of a pilot hole and drill the hole.

2. Repeat **Step 1** for each of the three remaining pilot holes.

To mount the neck to the body:

1. Insert the neck into the neck pocket, and place the neckplate and neckplate setter on the body.

   Note: *Do not glue the neck to the body.*

2. Align the mounting holes in the neck and body.

3. Fasten the four #7 x 1⅜" screws, but do not final tighten them (see **Figure 10**).

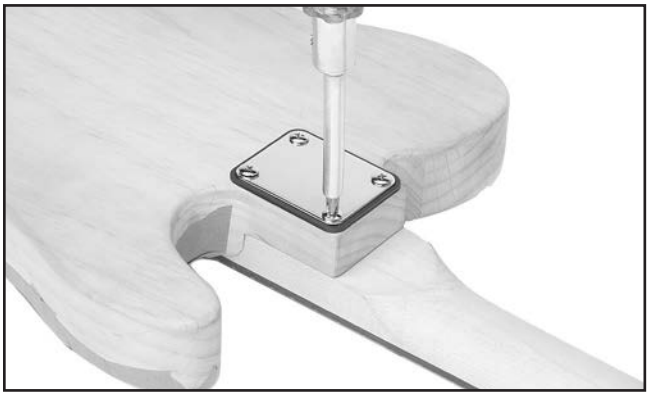


Figure 10. Fastening neck to body.

Positioning Pick Guard, Control Plate & Bridge

The following steps require you to mark the guitar body. To avoid damaging the finish, place masking tape on the guitar body and gently mark the tape.

In the following steps the bridge, control plate, and pick guard will be installed temporarily to correctly orient them.

Components and Hardware Needed:	**Qty**
Guitar Body and Neck	1
Pick Guard	1
Control Plate	1
Stainless Steel Screws #3 x 3/8"	10
Bridge	1
Stainless Steel Screws #5 x 5/8"	4

To position the pick guard, control plate and bridge:

1. Remove the neck from the guitar body.

2. Thread the pick guard pickup wires through the center cavity into the control plate cavity, then place the pick guard on the body.

3. Secure the neck to the body.

4. Tuck the control plate wires into the control plate cavity.

5. Place the control plate on the body so it fits snugly into the curve on the pick guard, as shown in **Figure 11**.

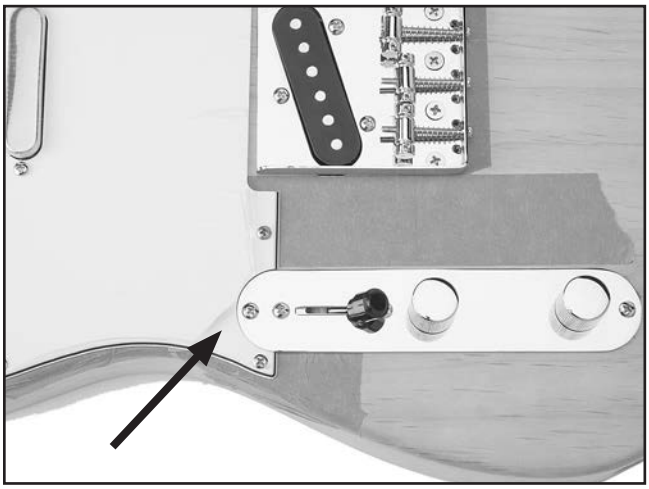


Figure 11. Control plate fits into pick guard.

6. Place a long straightedge over the center of the fretboard inlays and over the bridge cavity, and mark the center line on the guitar body (see **Figure 12**).

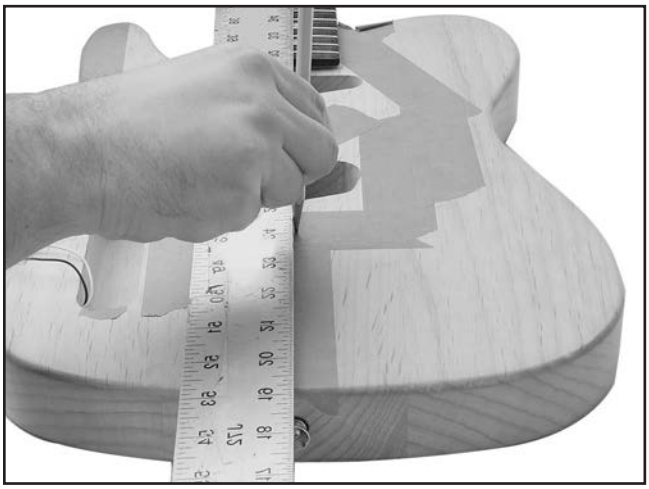


Figure 12. Marking center line.

7. Place a ruler across the body at several locations and mark the half way point to double check the center line location against the mark in **Step 6**.

8. Insert the bridge into the bridge cavity and align the bridge with the guitar center line.

9. Using the long straightedge, measure 25½" from the fretboard side of the nut slot (see **Figure 13**) along the center line to the bridge point (see **Figure 14**), and mark this location on the guitar.

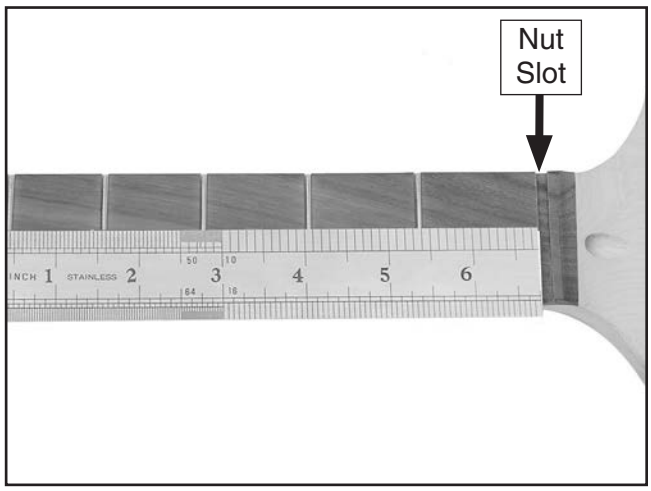


Figure 13. Measuring 25½" from nut along center line.

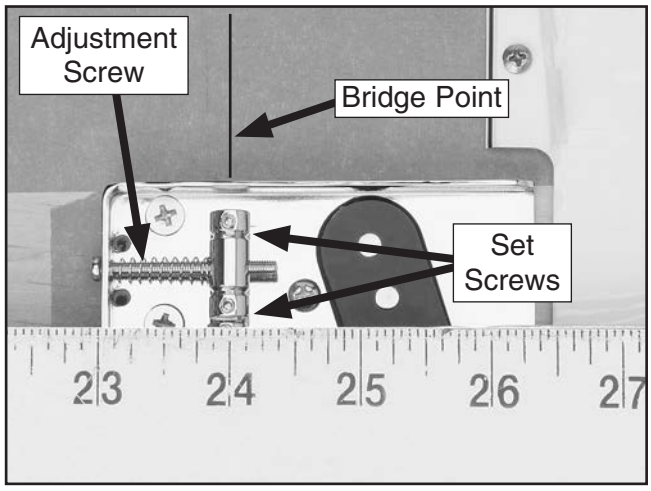


Figure 14. Bridge point and high E saddle adjustment screw.

10. Using a Phillips head screwdriver, turn the lower saddle adjustment screw so the set screws shown in **Figure 14** are centered over the bridge point.

11. Align the control plate, pick guard, and bridge so the bridge is parallel to the control plate (leave an even distance between the pickguard and bridge).

12. Mark the mounting holes for the control plate (see **Figure 15**), pick guard, and bridge, then remove these components and the neck.

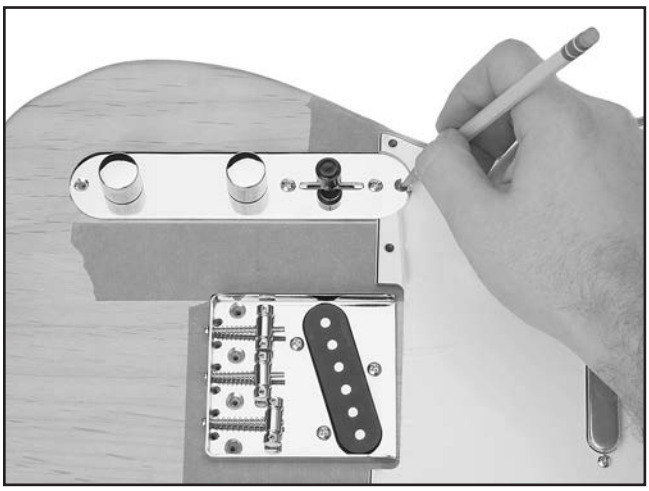


Figure 15. Marking control plate holes.

Note: *Take care to correctly position the control plate mounting holes so you do not drill into the control plate cavity.*

13. Using a 1/16" drill bit, drill 3/8" deep holes in the body for the pick guard and control plate.

14. Set the depth stop on the drill press to 7/8" and drill the four bridge mounting holes with a 7/64" drill bit.

15. Mount the pick guard and control plate to the body with the #3 x 3/8" screws, secure the neck to the body, and fasten the bridge with the four #5 x 5/8" screws.

16. Determine whether you want to mount the strings through the bridge or whether you want to mount them to the body using the ferrules.

—If you decide to mount the strings through the bridge, skip to **Mounting Tuners**, on **Page 15**.

—If you decide to mount the strings through the body, go to **Installing Ferrules**, on **Page 14**.

Installing Ferrules

The strings can be installed optionally through the body using the ferrules. One advantage of using the ferrules is that the strings will sustain notes longer. Ferrules can be mounted flush (see **Figure 16**) or above the surface of the guitar (see **Figure 17**).

Components and Hardware Needed:	**Qty**
Guitar Body	1
Ferrules	6

To install the ferrules:

1. Mark the six string holes on the bridge. (The holes are parallel with the guitar body.)

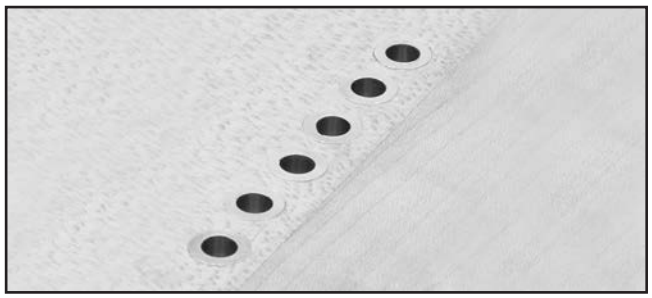


Figure 16. Flush mounted ferrules.

Tip: You can mark the holes using a drill bit mounted in a drill press. Position the drill bit in a ferrule hole and, with the drill ***OFF,*** turn the chuck by hand until the bit breaks the wood surface.

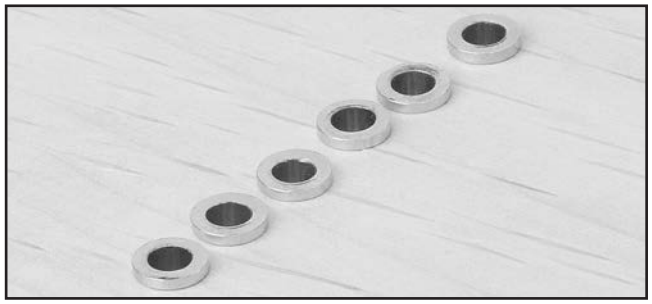


Figure 17. Above surface mounted ferrules.

2. Remove the neck, pick guard, control plate and bridge.

3. Secure a 7⁄64" drill bit in the drill press.

4. To minimize tear out, tape the back of the guitar where the pilot bit will emerge from the ferrule holes, and place a board under the guitar.

5. Drill the pilot holes through the body.

6. Determine whether you want to flush mount the ferrules or let them sit above the body. For flush mounting instructions, go to **Flush Mounting**. To mount ferrules above the guitar body, go to **Above Surface Mounting**.

Flush Mounting

1. Place the body topside down on a drill press and drill 15⁄32" down into the pilot hole using a a 1⁄4" bit.

2. Using a 5⁄16" drill bit, drill 1⁄16" deep into the pilot holes.

   Note: *We recommend setting the depth stop and using a 5⁄16" end mill for greater precision*.

3. Repeat **Steps 1–2** for each of the other ferrule holes.

4. Set the ferrules into the holes so they are flush with the surface of the guitar (see **Figure 16**).

Above Surface Mounting

1. Place the top of the guitar face down on a drill press table, then drill 13⁄32" down into the pilot hole using a 1⁄4" bit.

2. **Note:** *We recommend setting the depth stop for greater precision.*

3. Repeat **Steps 1–2** for the five other ferrules.

4. Set the ferrules into the holes (see **Figure 17**).

5. Go to **Mounting Tuners** on **Page 15.**

Mounting Tuners

Components and Hardware Needed:	Qty
Neck	1
Tuners	1
Stainless Steel Screws #2 x 3/8	2
Bushings	6

To install the tuners:

1. Slide each of the six bushings into the pre-drilled holes through the front face of the headstock.

Note: *If you have trouble inserting the bushings, turn a drill bit by hand in the top of the hole to widen it just enough to insert the bushings. You can also use a deadblow hammer or a dowel in a drill press to press the bushings into the tuner mounting holes.*

2. Slide each of the tuning machines through the bushings from the back face of the headstock.

3. Align the tuning machines, secure their position on the headstock with masking tape, and mark the mounting holes.

4. Remove the tuners.

5. If the neck is attached to the body, remove it now.

6. Fasten a 7/16" thick wood shim with tape on the top side of the peghead near the tip (see **Figure 18**). This will help stabilize the neck during the next step.

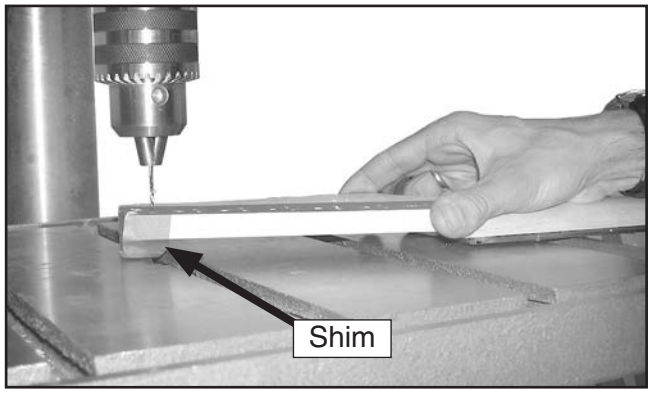


Figure 18. Peghead supported with shim.

7. Using a 1/16" drill bit, drill 3/8" deep holes into the back of the peghead (see **Figure 18**).

Note: *Drilling the holes deeper than 3/8" could result in drilling out through the front face of the headstock.*

8. Insert the tuners into the bushings and mount them with the #2 x 3/8" screws, as shown in **Figure 19**.

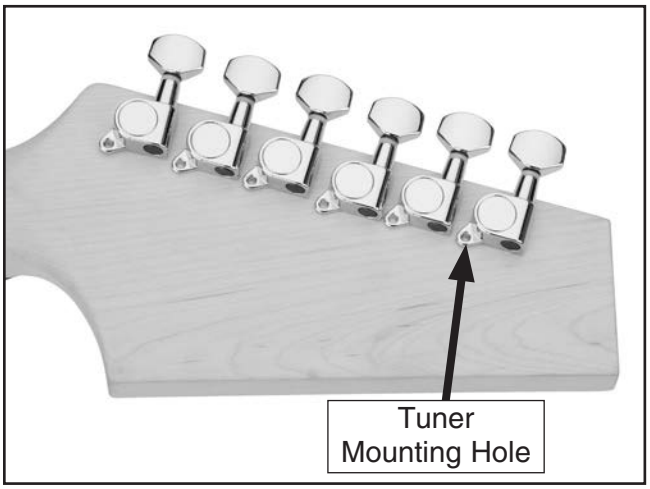


Figure 19. Tuners aligned to edge of headstock.

Wiring Pickups

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

Components and Hardware Needed:	**Qty**
Guitar Body	1
Control Plate	1
Pick Guard	1
Bridge	1

To wire the pickups:

1. Remove the bridge and control plate.

2. Thread the pick guard pickup and bridge pickup wires through the channels and holes into the control plate cavity, as shown in **Figure 20**.

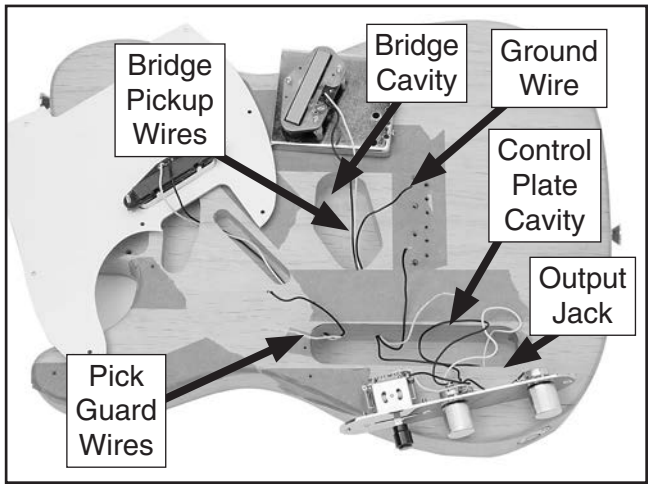


Figure 20. Wires threaded through body.

3. Thread the ground wire through the hole in the control plate cavity into the bridge cavity (see **Figure 20**).

4. Push the output jack out through the hole in the end of the body.

5. Solder the pickup wires onto the volume and three way switch, as shown in the **Wiring Diagram** on **Page 27,** and in the **Electrical Components** on **Pages 25– 26**.

6. Remove the plastic wrapping on the pick guard, if you have not already done so.

7. Fasten the pick guard to the body with the #3 x $^3/_8$" screws. Do not fasten the control plate or bridge yet.

Installing Output Jack

Components and Hardware Needed: **Qty**
Output Jack 1
Output Jack Cover..... 1
Stainless Steel Screws #3 x 3/8"..... 2

To install the output jack:

1. Thread the output jack onto the jack cover.

2. Place the output jack cover in the jack cavity, and mark the mounting holes.

3. Using a 1/16" drill bit, drill 3/8" holes at a 45° angle into the body, as shown in **Figure 21**.

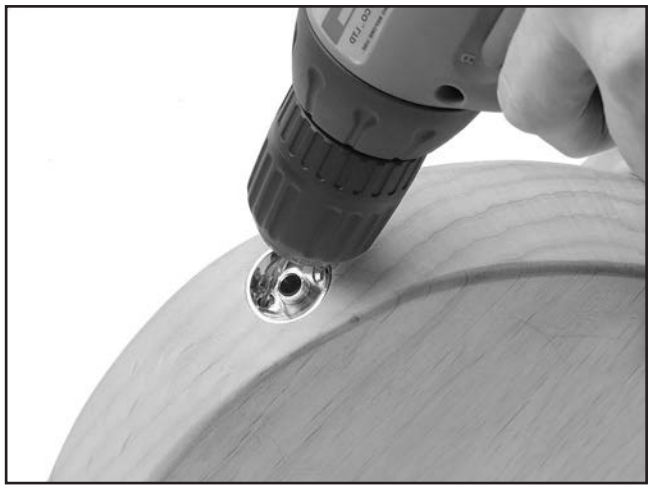


Figure 21. Drilling output jack mounting holes.

4. Mount the output jack cover with two #3 x 3/8" screws.

Installing Bridge & Control Plate

To reduce humming, the ground wire must contact the bridge plate.

Components and Hardware Needed: **Qty**
Guitar Body 1
Bridge 1
Control Plate..... 1
Stainless Steel Screws #5 x 5/8" 4
Stainless Steel Screws #4 x 15/16" 2

To position the ground wire under the bridge:

1. Place the exposed end of the ground wire above the bridge cavity (see **Figure 22**), and place the bridge over it so the bridge and wire make contact.

2. Tape the ground wire in the bridge cavity to keep the exposed portion from moving.

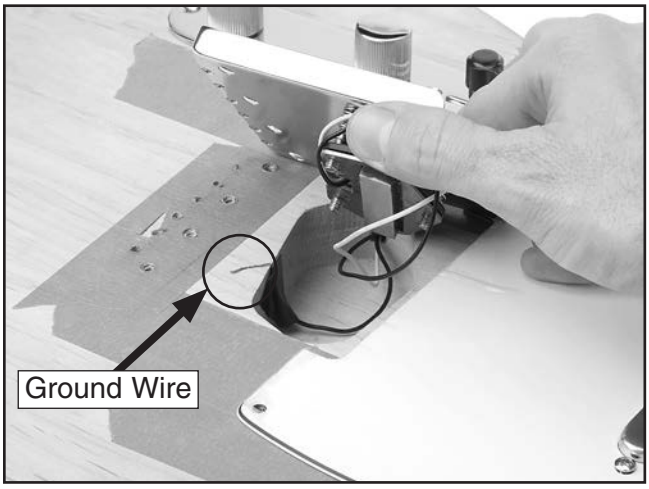


Figure 22. Ground wire above bridge cavity.

3. Secure the bridge with the #5 x 5/8" screws and the control plate with the #4 x 15/16" screws.

Strap Buttons

The strap buttons are positioned on the guitar, as shown in **Figure 23**.

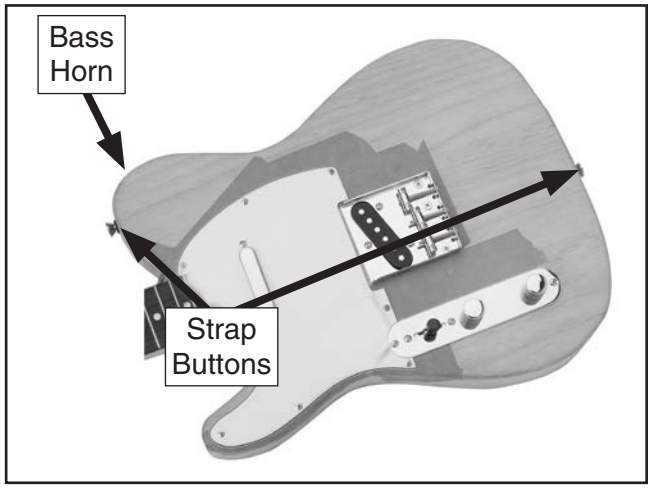


Figure 23. Strap buttons.

Components and Hardware Needed	Qty
Guitar	1
Stainless Steel Screws #4 x 15/16"	2
Strap Buttons	2

To attach the strap buttons to the guitar:

1. Using a 1/16" drill bit, drill 3/4" deep holes at the end of the guitar—on the center line— and on the bass horn (see **Figure 23**).

2. Secure each of the strap buttons to the guitar body with a #4 screw.

Installing Nut

Components and Hardware Needed:	Qty
Guitar Body	1
Nut	4
Neck	1
Black Neckplate Setter	1
Silver Neckplate	1
Stainless Steel Screws #7 x 1 3/8"	4

To install the nut:

1. Install the neck onto the body.

2. Use a chisel or razor blade to scrape any finish out of the nut slot. DO NOT remove any wood from the nut slot.

3. Sand one side of the nut on a piece of sandpaper by hand until it fits snugly into the nut slot, as shown in **Figure 24**. Make sure the large slots on the nut face the top of the neck and the small slots face the bottom of the neck.

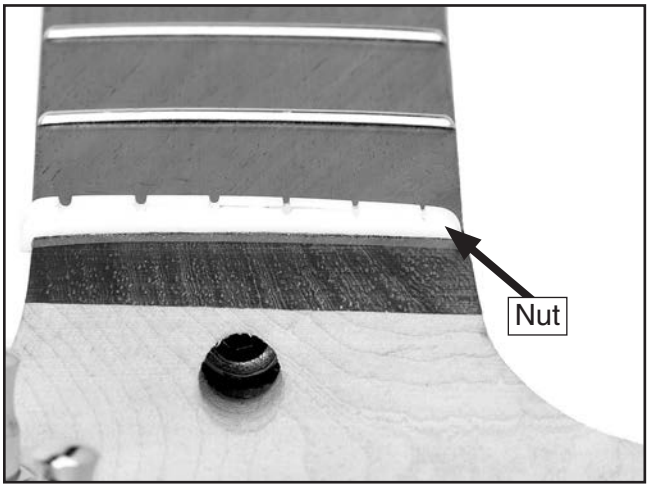


Figure 24. Nut installed.

4. Remove the nut, spread a thin layer of glue in the nut slot, and center the nut in the nut slot.

5. Install the strings, as described on **Page 19**, to hold the nut in place until the glue dries.

6. Wipe away the excess glue before it sets up, then allow the glue to dry for 24 hours.

Winding Strings

Strings can be installed through the body using the ferrules or they can be installed through the bridge.

Components and Hardware Needed: **Qty**
Guitar 1
Strings 6

The correct position of the guitar strings is shown in **Figure 25**. The thin High E string is the "1st" string and the thick Low E string is the "6th."

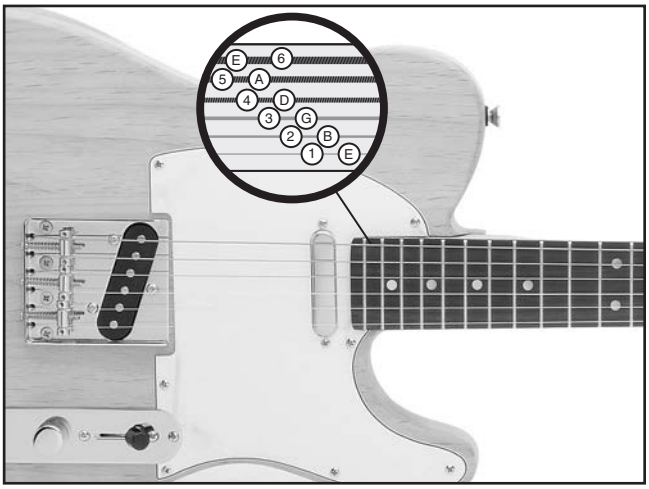


Figure 25. Correct string locations.

To install strings through the body:

1. If you installed ferrules, thread the 1st string through the ferrule, as shown in **Figure 26**.

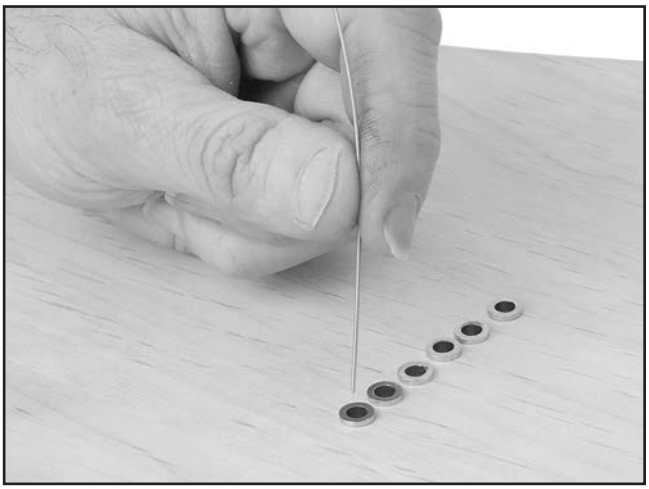


Figure 26. Threading string through ferrule.

2. Thread the string through the hole in the top of the guitar and through the bridge.

3. Guide the string across the saddle, over the nut, and through the hole in the corresponding tuner.

4. 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 tuning post after many successive rotations. If not enough slack is allowed, then the string may not hold the winding tension.*

5. Bend the string at a right angle across the edge of the tuner head.

6. Rotate the tuners until the string just begins to hold the winding tension (see **Figure 27**).

   Note: *DO NOT tighten the strings beyond the initial tensioning at this time. Final tensioning should be completed during the string tuning process.*

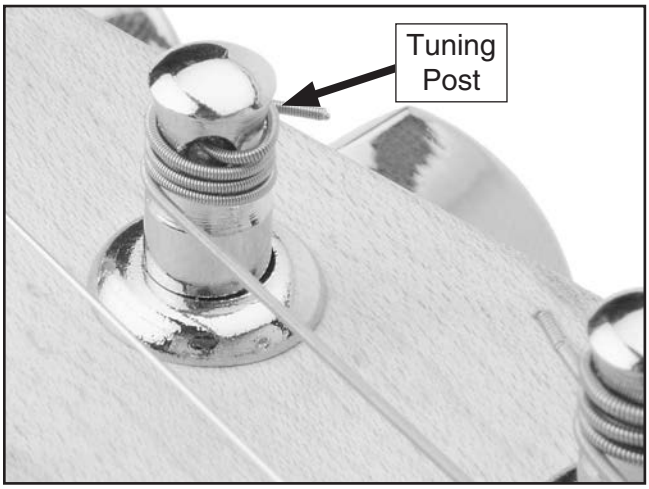


Figure 27. String wrapped around tuning post.

7. Use wire cutters (optional) to cut off the excess string.

8. Repeat the above process for the remaining strings.

To install the strings using only the bridge:

1. Slide the 1st string through the corresponding hole in the bridge (see **Figure 28**).

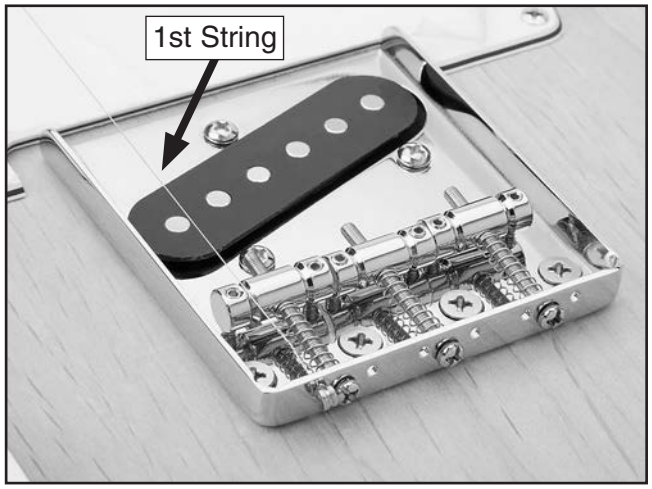


Figure 28. 1st string installed.

2. Repeat **Steps 3–8** in the previous subsection.

String Retainers

Components and Hardware Needed:	**Qty**
Guitar	1
Retainer	1
Stainless Steel Screw #2 x ⅜"	1
Bushing	1

The string retainer mounts between the 1st and 2nd strings, as shown in **Figure 29**. String retainers are designed to hold the strings down against the nut to achieve correct tuning.

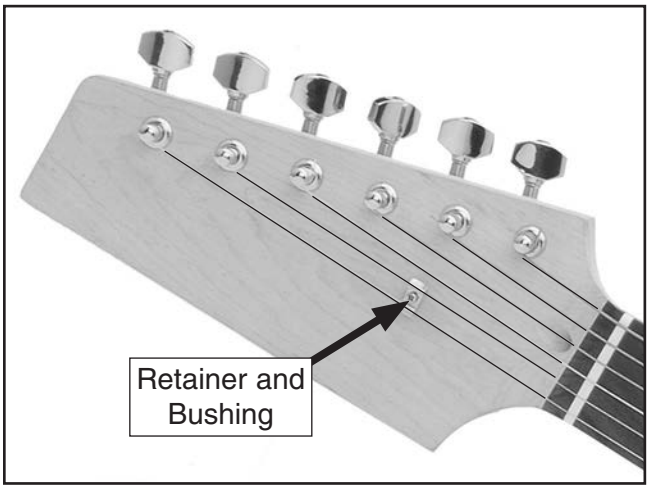


Figure 29. String retainer locations.

To install the string retainer:

1. Place the string retainer on top of the 1st and 2nd string near the second tuner.

2. Using a 1⁄16" drill bit, drill ¼" deep holes straight through the holes in the string retainers.

   Note: *Drilling the holes deeper than ½" could result in drilling out the bottom of the peghead.*

3. Slide a #2 x ⅜" screw through a retainer and small bushing, and fasten it to the back hole on the headstock (see **Figure 29**).

SECTION 5: SETUP

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 and Hardware Needed: Qty
Guitar with Strings Installed 1

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

To adjust the bow of the guitar neck:

1. Tighten the strings to playing tension. (Refer to **Tuning** on **Page 23**).

2. Place a straightedge from the 1st fret to the 17th. Measure any gaps between the straightedge and the frets with the feeler gauge.

   —If the neck is flat, or bowed up 0.012" or less, the neck is set up correctly. Continue to the next subsection.

   —If the gap is greater than 0.012", 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 (see **Figure 30**) counterclockwise with a 4mm wrench to release tension on the neck. Retighten until the nut begins to grab.

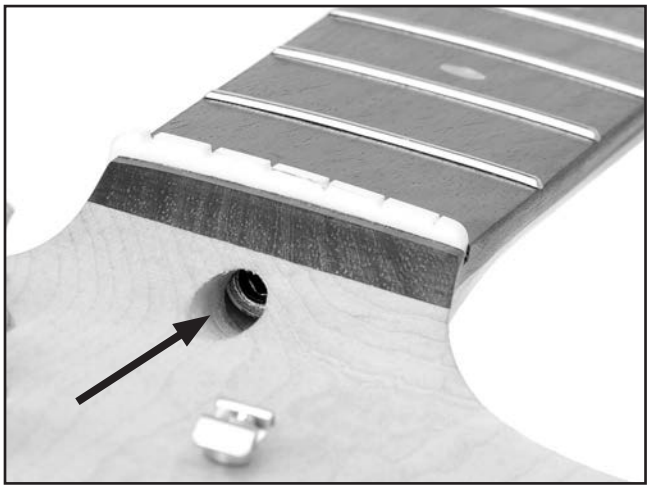


Figure 30. Truss rod nut.

4. To flatten a down bow, turn the truss rod nut a 1/4 turn clockwise. To correct an up bow, turn the nut a 1/4 turn counterclockwise.

5. Tighten the strings 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

Tools Needed	Qty
Hex Wrench 1.5mm	1
Guitar Capo	1
Metal Straightedge	1
Steel Ruler (1/64" Resolution)	1

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 (see **Figure 31**).

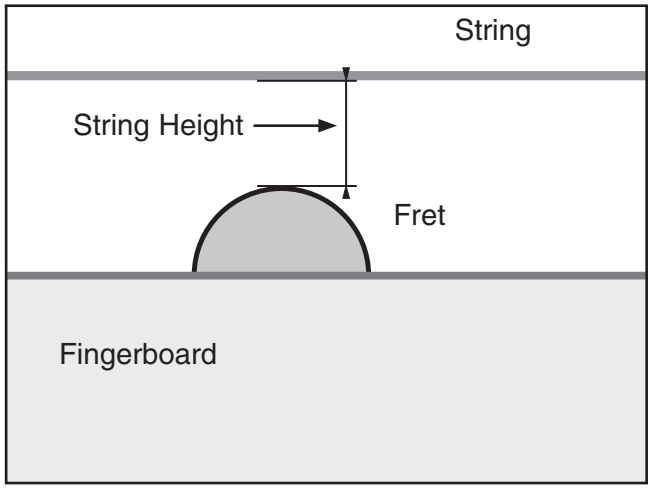


Figure 31. String height measurement.

To adjust the string height:

1. Place a capo on the 1st fret.

2. Measure the string height at the twelfth fret, as shown in **Figure 32**.

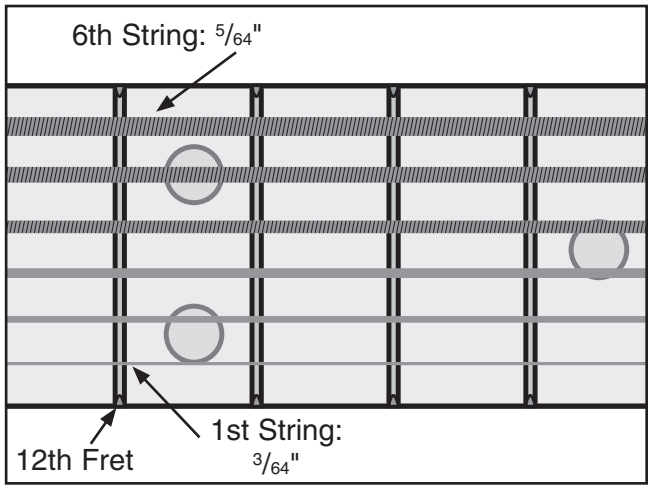


Figure 32. Correct 12th fret string heights.

The 1st string measurement should be 3/64", the 6th string measurement should be 5/64".

—If the string heights are correct, then continue to the next sub-section.

—If the string heights are incorrect at the 12th fret, then continue to the next step.

3. Use the included 1.5mm hex wrench to adjust the saddle height set screws (see **Figure 33**) until the string heights are correct.

—Turn the screws clockwise to raise the height of the string saddle; therefore, increasing the string height.

—Turn the screws counterclockwise to lower the height of the string saddle, therefore, decreasing the string height.

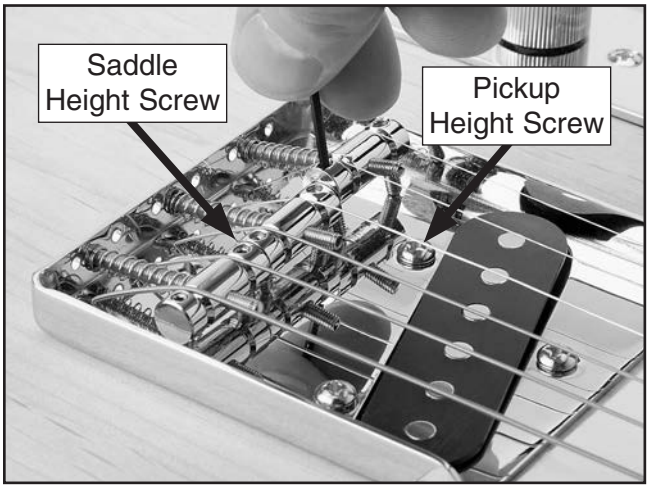


Figure 33. Adjusting string height.

4. Adjust the middle strings so they gradually increase in height from the 1st string height through the 6th string height.

5. Remove the capo.

Pickup Height

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

Tools Needed	**Qty**
Metal Straightedge	1
Phillips Head Screwdriver	1

To measure the string height at the pickup:

1. Measure the height of the 1st and 6th strings at the pickup while the strings are "fretted" at the 22nd fret (see **Figure 34**).

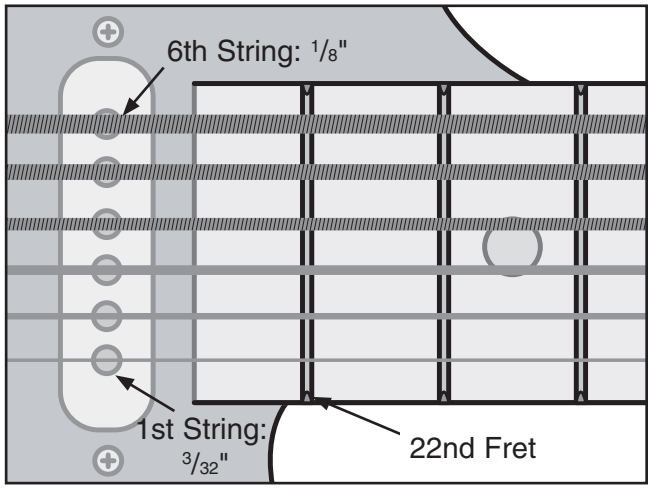


Figure 34. String heights over the pickup.

2. With a Phillips head screwdriver, adjust the screws on each side of the pickup until the 1st string is approximately 3/32" above the pickup and the 6th string is approximately 1/8" above the pickup.

   —Turn the screws clockwise to raise the height of the pick up, therefore, decreasing the string height.

   —Turn the screws counterclockwise to lower the height of the pick up, therefore, increasing the string height.

3. The string height may be adjusted for the bridge pickup by turning the three screws shown in **Figure 33**, on **Page 28**. Adjust the screws using the method described in **Steps 1–2**.

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 by using an electronic tuner, such as the Grizzly T23099 Digital Tuner, shown on **Page 28**.

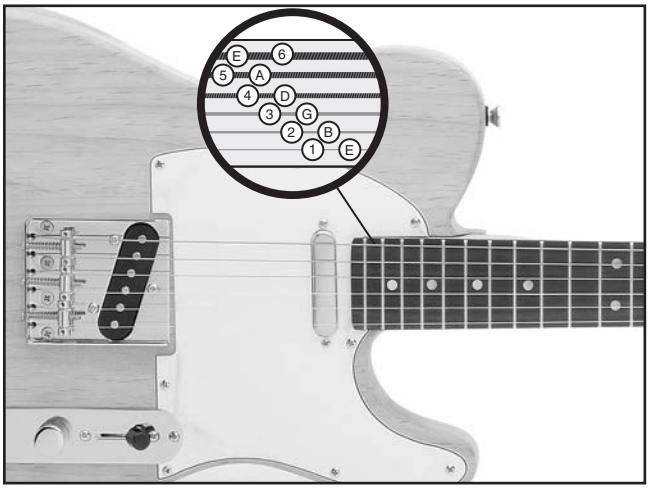


Figure 35. Example of standard tuning.

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. Tune the 4th string by playing the 5th string while it is being pressed (fretted) at the 4th fret, and then play the open 4th string. Adjust the 4th string tuner until the notes match.

5. Perform the same tuning step on the and 3rd string.

6. When tuning the 2nd string, fret the 3rd string at the 4th fret instead of the 5th fret.

7. Tune the 1st string in the same manner as the 6th, 5th, 4th, and 3rd strings.

Setting Intonation

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

Setting the intonation adjusts the length of the string to correct for flatness/sharpness on each string. This is a simple process that takes a lot of trial and error.

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 by turning the saddle adjustment screw (see **Figure 36**) clockwise. If this note is flat in comparison, move the saddle toward the neck.

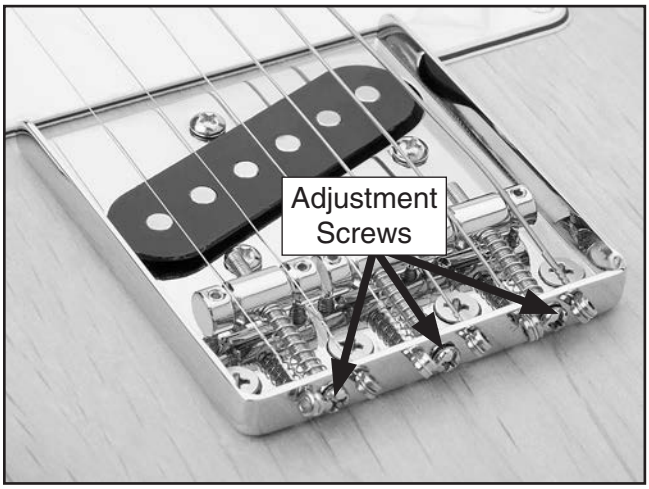


Figure 36. Saddle adjustment screws.

Note: *This 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.

Electrical Components

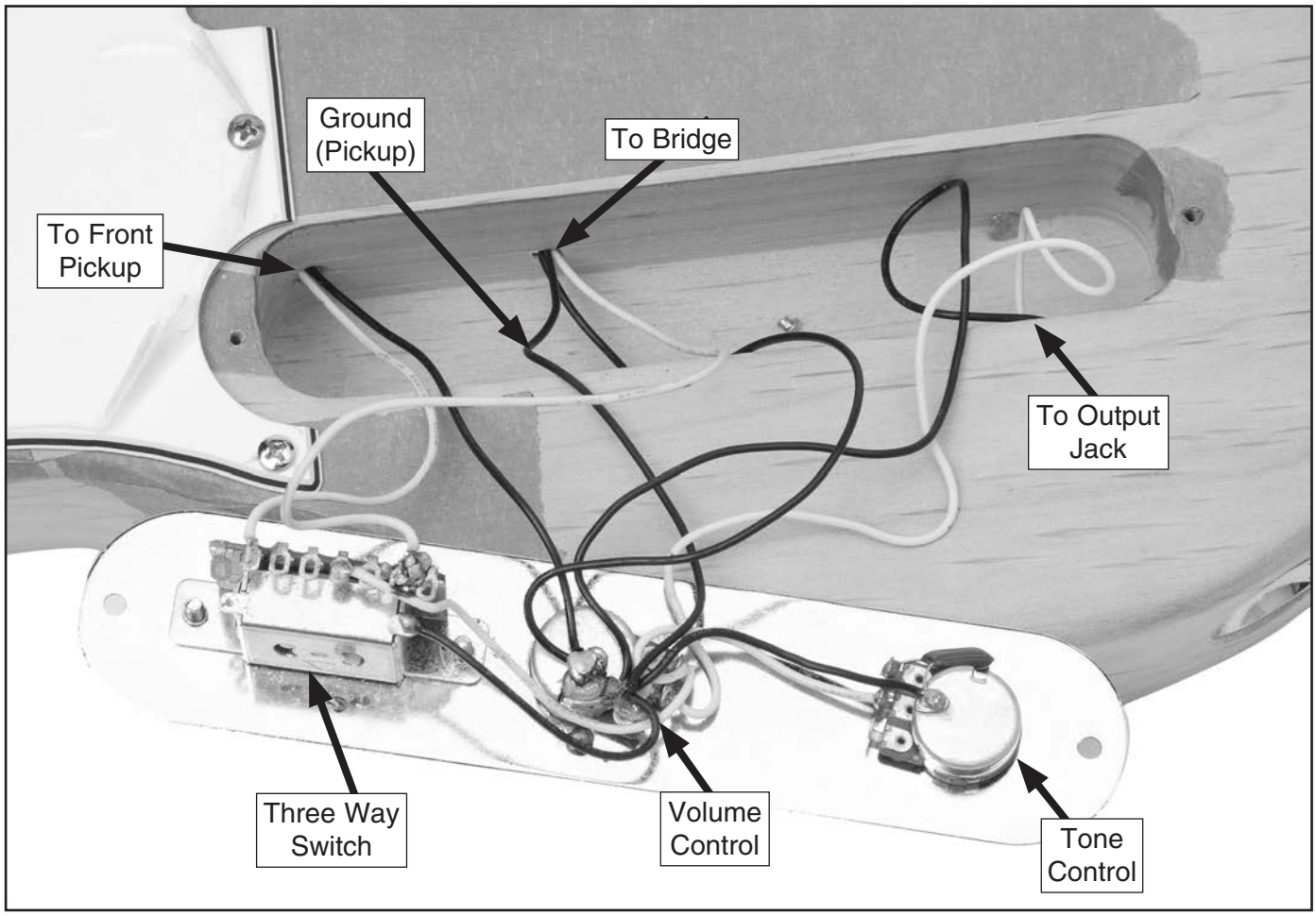


Figure 37. Control plate wiring.

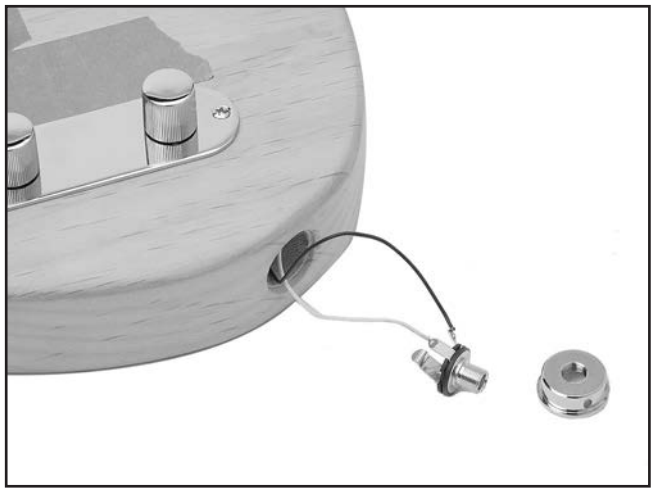


Figure 38. Output jack wiring.

Electrical Components

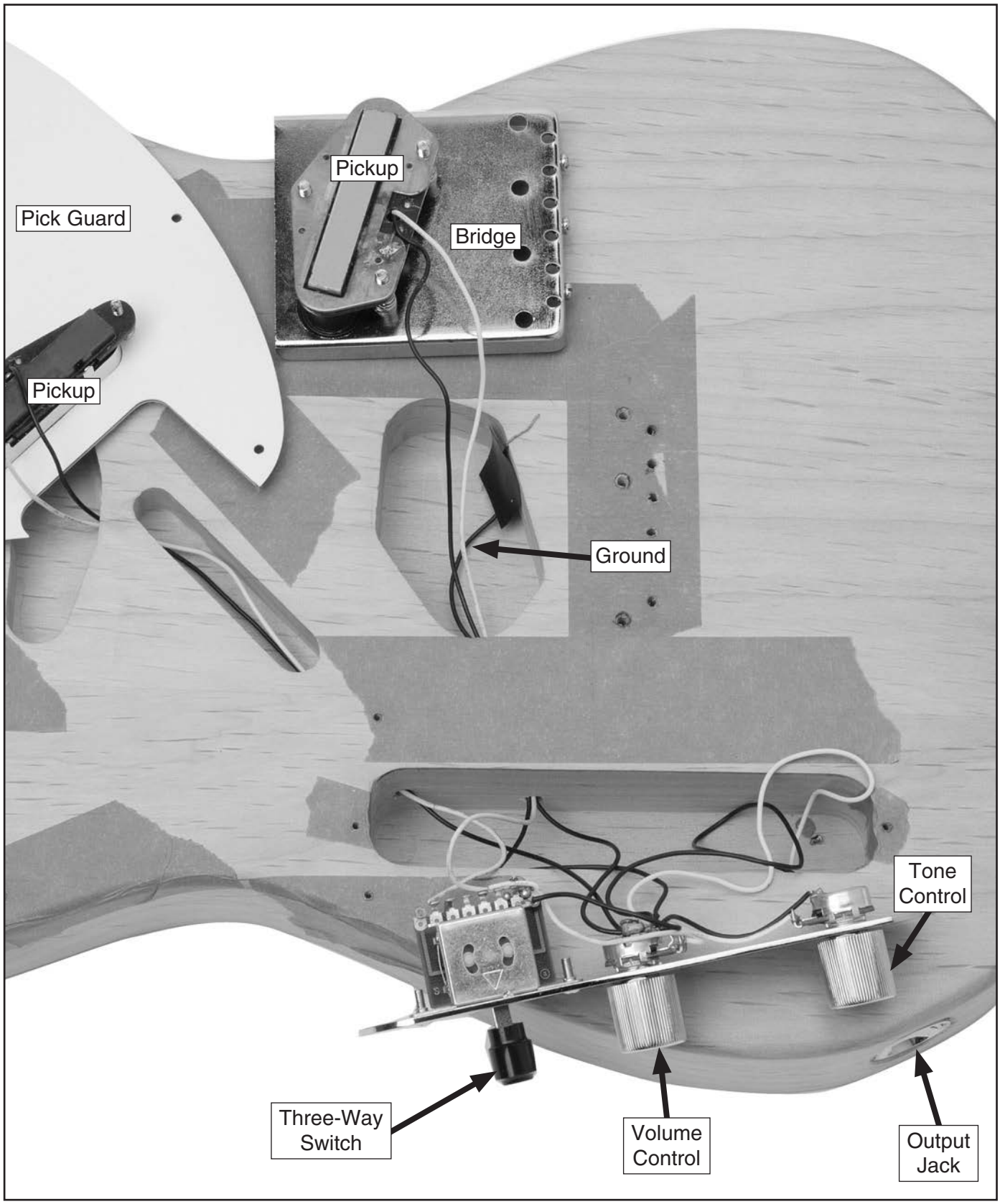


Figure 39. Model T24831 overall wiring.

Wiring Diagram

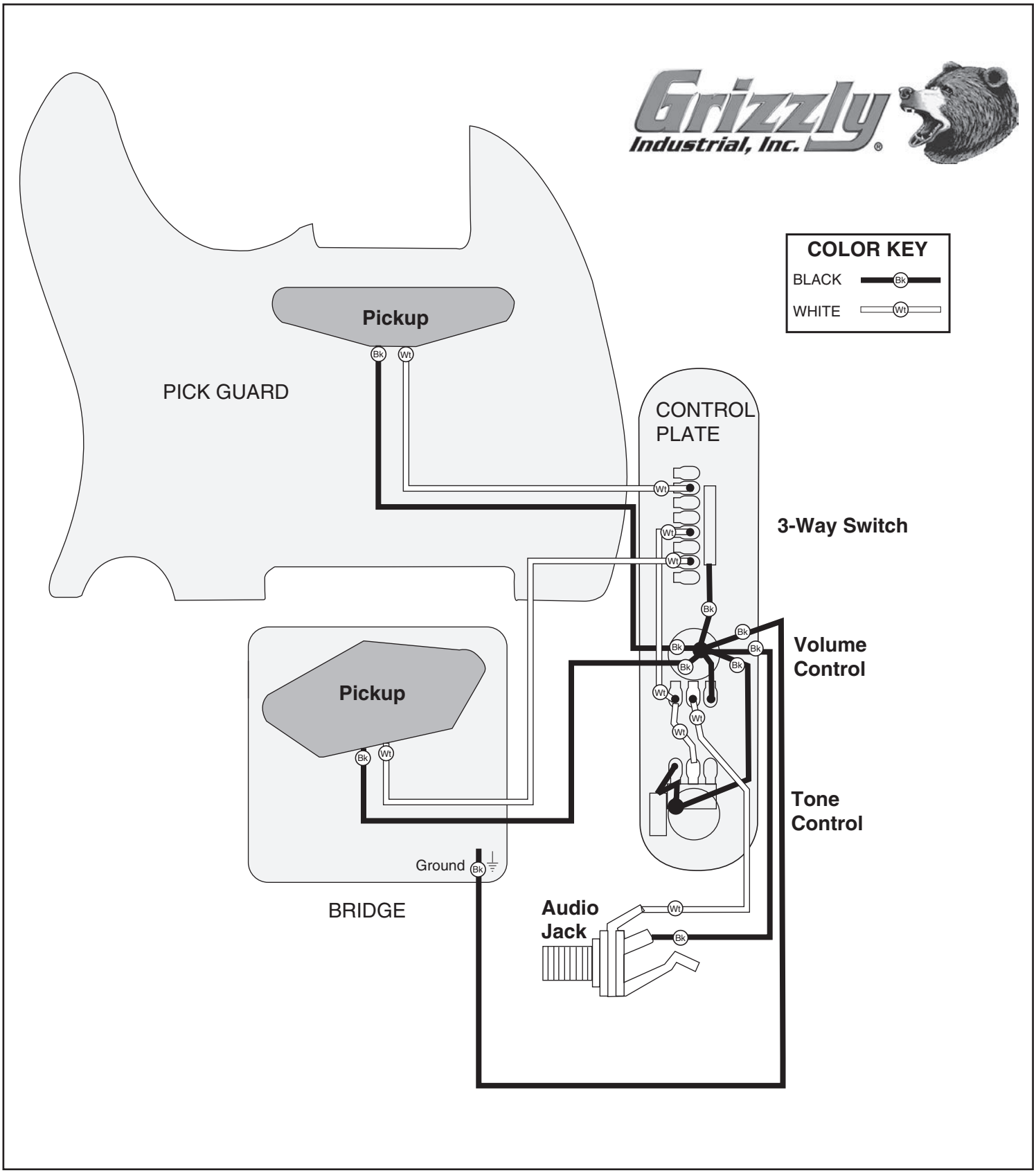


Figure 40. Model T24831 wiring diagram.

SECTION 6: ACCESSORIES

NOTICE

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

T20452—WolfPeak KIROVA Safety Glasses, Black/Anti-Reflective
T23554—WolfPeak Brazeau Safety Glasses, Black/Smoke
Safety glasses can be functional as well as fashionable with EDGE™ Eyewear from Wolfpeak. All of these models meet the requirements of ANSI Z87.1-2003 and provide 99.9% protection from harmful UVA/UVB/UVC rays.

Figure 41. Our most popular safety glasses.

T23099—Digital Metronome Tuner
Suitable for all types of electric and acoustic stringed instruments.

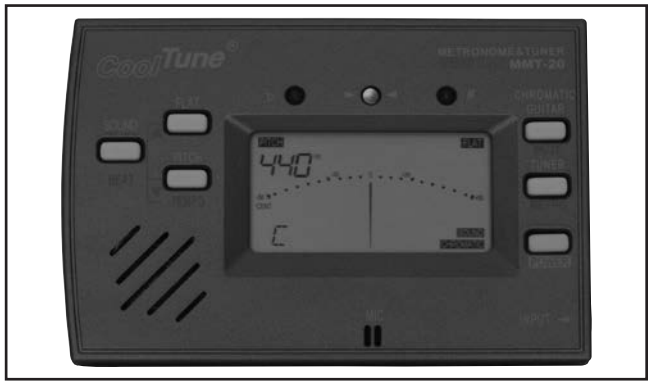


Figure 42. T23099 Digital Metronome Tuner.

H4978—Peltor H7A Deluxe Personal Hearing Protector
H4979—Deluxe Twin Cup Hearing Protector
T20447—WolfPeak Ear Plugs, Corded–100 Pair
Disposable foam earplugs insert in the ear and quickly conform to any size ear canal. The plugs provide 31 decibel noise reduction and meet ANSI S3.19-1974 standards.

Figure 43. Our most popular earmuffs.

H5095—A Guitar Maker's Manual®
This manual is a straight-forward, profusely illustrated guide to constructing nylon string classical and steel string guitars. Includes a section on creating the jigs necessary to make the job easier and more accurate, along with full size templates. 112 pages.

Figure 44. Model H5095—A Guitar Maker's Manual.

H2499—Small Half-Mask Respirator
H3631—Medium Half-Mask Respirator
H3632—Large Half-Mask Respirator
H3633—Disposable Cartridge Filter Pair
H3635—Disposable Cartridge Filter Pair
This lightweight elastomeric facepiece has cradle suspension, easy adjust headstraps and low profile for greater field of vision and compatibility with normal use of glasses or goggles. Purchase cartridges separately depending upon intended application.

Figure 45. Half-mask respirator and disposable cartridge filters.

H5962—Guitar Stand-Electric/Archtop
- Stable stand keeps electric and archtop quitars safe yet accessible on stage or on display
- Folds up for easy transporting
- Three adjustable locking positions
- Padded protection at all contact points
- Non-slip rubber feet

Figure 46. Model H5962 Guitar Stand.

H3901—Behlen Jet Spray™ Clear Lacquer–Flat
H3903—Behlen Jet Spray™ Clear Lacquer–Satin
H3937—Behlen Top Coat Lacquer - Satin
H3938—Behlen Sanding Sealer, 13 Oz.
Behlen Master Top Coat Lacquer Sealer is an alcohol and water resistant, high solid nitrocellulose lacquer sealer. Use to seal and protect Behlen solvent based stains and other Master Aerosols. Master Topcoat Lacquer Sealer performs like a spray gun applied finish. 13 fl. oz. Cannot ship air.

Figure 47. H3938—BEHLEN Sanding Sealer

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 48. Menzerna pre-polishing paste.