

# *BONGO Bass Guitar Kit Assembly Instructions*



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### **WARNING**

*Some dust created by power sanding, sawing, grinding, drilling, and other construction activities contains chemicals known to the State of California to cause cancer, birth defects or other reproductive harm.*

*Some examples of these chemicals are:*

- *Lead from lead-based paints.*
- *Crystalline silica from bricks, cement, and other masonry products.*
- *Arsenic and chromium from chemically treated lumber.*

*Your risk from these exposures varies, depending on how often you do this type of work. To reduce your exposure to these chemicals: work in a well ventilated area, and work with approved safety equipment, such as those dust masks that are specially designed to filter out microscopic particles.*

### **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 familiar with the safe operation and use of woodworking 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 owner's manual for the machinery you intend to use, take a woodworking class or visit your local library for more information. Woodworking machinery and tools are inherently dangerous because they use sharp edges that can and will cause serious personal injury including amputation and death. Do not underestimate the ability of these tools and machinery to cause injury. Never operate any tool without all guards in place and always wear approved safety glasses. For your own safety, please heed this warning.*

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### 1 Introduction

Thank you for purchasing a BYOGuitar.com guitar kit. This kit includes everything you need to build a complete custom guitar. In addition to the construction of your guitar, you will need to consider the finish – natural, solid color and possibly a design that will make your guitar unique. We suggest you do some research to determine your finish preferences. Procuring the required finishing materials,



**TIP:** Get some finishing ideas by visiting [BYOGuitar.com](http://www.byoguitar.com) and [BYO Guitar on Facebook](#)

(<http://www.byoguitar.com/gallery/index.html>)

especially if they have to be ordered, will allow expedite your guitar project.

We carry a full line of finishing products that give you the beautiful finish you are looking for, whether a clear natural finish or a bold, colorful finish. We also carry an instructional DVD made by Behlen that will give you step by step instructions to help you achieve the look you want for your custom guitar.

These instructions assume you are familiar with the anatomy of a guitar. Refer to Figure 1 for many of the terms used in the assembly of your guitar.

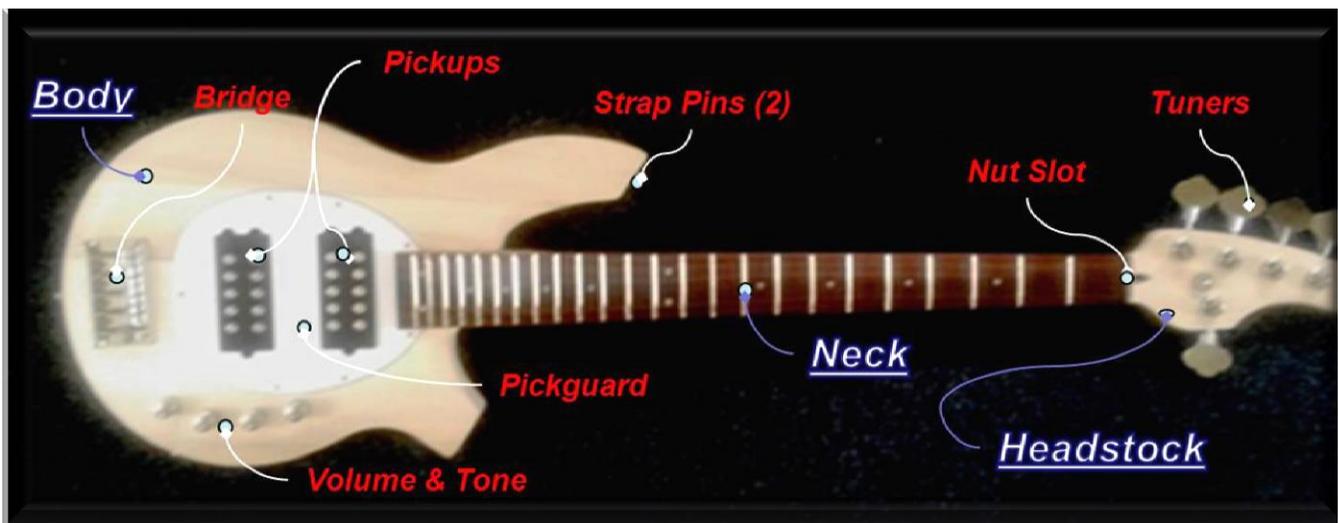


Fig 1 Major Components in Your BONGO bass Guitar Kit

## 1.2 Material Check List

In preparation for the building of your guitar, all required material should be checked both for type and quantity. Use the following check list to ensure all piece parts are included. If you customized your order (ex. different tuners), ensure that these parts are accounted for. Please contact BYOGuitar if there are any discrepancies.

<b>BONGO bass Material List</b>			
<b>Item</b>	<b>Component</b>	<b>Quantity</b>	<b>Description</b>
1		<ul style="list-style-type: none"> <li><input type="checkbox"/> 1 BONGO bass Body</li> <li><input type="checkbox"/> 1 BONGO bass Neck</li> <li><input type="checkbox"/> Miscellaneous materials (see below)</li> </ul>	BYO BONGO bass Guitar Kit
2		<ul style="list-style-type: none"> <li><input type="checkbox"/> 1, white</li> </ul>	BONGO bass Pickguard
3		<ul style="list-style-type: none"> <li><input type="checkbox"/> 2 black pickups</li> <li><input type="checkbox"/> 6 mounting screws, 1 1/4"</li> <li><input type="checkbox"/> 6 springs</li> </ul>	Pickups

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**TIP:** use small interior packing box to inventory and organize piece parts

4		<ul style="list-style-type: none"> <li>☐ 17 screws <sup>1/2"</sup> + spare</li> </ul>	Mounting screws for Pickguard, Bridge & Back Plate
5		<ul style="list-style-type: none"> <li>☐ 1 harness w/ 4 potentiometers</li> <li>☐ 4 knobs</li> </ul>	BONGO bass Wiring harness
6		<ul style="list-style-type: none"> <li>☐ 1 Bridge</li> </ul>	Bridge assembly
7		<ul style="list-style-type: none"> <li>☐ 4 top mount</li> <li>☐ 1 bottom mount</li> <li>☐ 5 tuner inserts</li> </ul>	Tuning Pegs
8		<ul style="list-style-type: none"> <li>☐ 20 screws, <sup>3/8"</sup></li> </ul>	Tuning Peg screws

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9		□ 1 plate	Electronics cover
10		□ Jack w/washer	Output Jack
11		□ 2 Holders □ 2 plastic washers □ 2 screws, 1"	Strap Holder materials
12		□ 4 screws, 1 1/2" □ 4 washers	Neck Mounting hardware
13		□ 1 string T □ 1 screw, 3/4"	String T
14		□ 5 strings	Strings

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15		<input type="checkbox"/> Output Cable <input type="checkbox"/> 2 Allen wrenches	Other
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### 1.3 Additional tools/materials required:

Drill & drill bits	#1 & #2 Phillips screwdriver	Soldering iron/solder
Masking/painters tape	Finishing/painting material	Sand paper 220 & 320 grit
Guitar strap	Soap or candle	Feeler gauge
ruler	Wood glue	Clamps
Wrap (8") or straw	String or fishing line (36")	

## Introduction



The remainder of the assembly instruction is divided into four sections:

**Section 2 – Mockup & Fit check:** in this section, all components will be checked for proper alignment and ensure that all holes have been drilled.

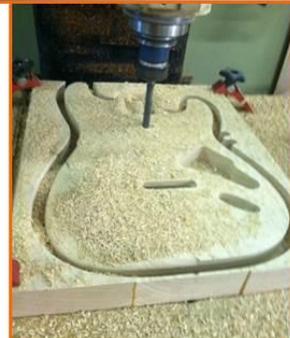
**Section 3 – Finishing the Body and Neck:** after fit check, the components are removed from the neck & body to allow the selected finish to be applied. This will allow you to customize your guitars' color(s). As the finishing will likely require several coats with sanding between each coat, ensure that the finish is completely dry.

**Section 4 – Assembly:** the final assembly is the next step - once the finish has been applied and completely dried. In this section, all of the components are installed, internal wiring connected and strings attached – your guitar will ready to go!

**Section 5 – Setup:** in this section, initial adjustments are made to your guitar, such as the height of the pickups.

Again, we thank you for your purchase of a BYO Guitar and we look forward to seeing pictures of your unique guitar! We also look forward to providing you with the guitar for your next project from our Custom Shop where you can select the wood for the body and neck as well as customizing all of the other components.

Let us know if your music, school, church or scouting organization would like to undertake a group project – BYO Guitar can supply multiple kits or custom guitars.



*Some Ideas for Finishing Your Guitar and Examples of Our Custom Shop Products*

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**2 Mockup and Fit Check**

The following steps will ensure that the base, neck, tuners, pickups, etc. are properly aligned and that all screw holes have been drilled.



***TIP...use the large cover of the shipping box as a work area that can be easily stored when you're done working***

**2.1 Wiring Harness**

The wiring harness for the BONGO guitar is pre-wired and ready for installation. Check the harness for loose or broken wires. Section 4 has a detailed wiring diagram if needed.

## 2.2 Check Guitar Body & Neck mounting holes

1. Check Neck cavity on the Body for pre-drilled (4) mounting holes (Figure 2.2);
2. Skip to 2.3 if the holes are pre-drilled.

### 2.2.1 Drilling the Mounting Holes in the Guitar Body

1. The back of the body should have four pre-marked and counter sunk hole locations – if there are no hole markings, contact BYO Guitar.
2. Center punch the four marks.
3. Drill the holes using a 3/16" drill bit.

 **TIP...if possible, use a drill press to achieve the best results building your guitar**

## 2.3 Checking the Mounting Holes in the Neck

1. Check the neck for pre-drilled (4) mounting holes.
2. Skip to 2.4 if the holes are pre-drilled.

### 2.3.1 Drilling Mounting Holes in the Neck

1. Place the neck in the pocket (...you should be able to fit the neck in the neck pocket by hand).
  - a. Carefully clamp the neck in place – frets damage easily.
  - b. Using the same drill bit you drilled the holes in the body, place the bit in the hole through the body and tap it a few times to make a mark on the neck.
2. Remove the neck from the body.
3. Determine the neck mounting hole depth.
  - a. Place a neck mounting screw & washer (Item # 12 on the material list) through body into the neck pocket.
  - b. Measure the amount of the mounting screw that extends up into the neck pocket, and mark your drill bit.

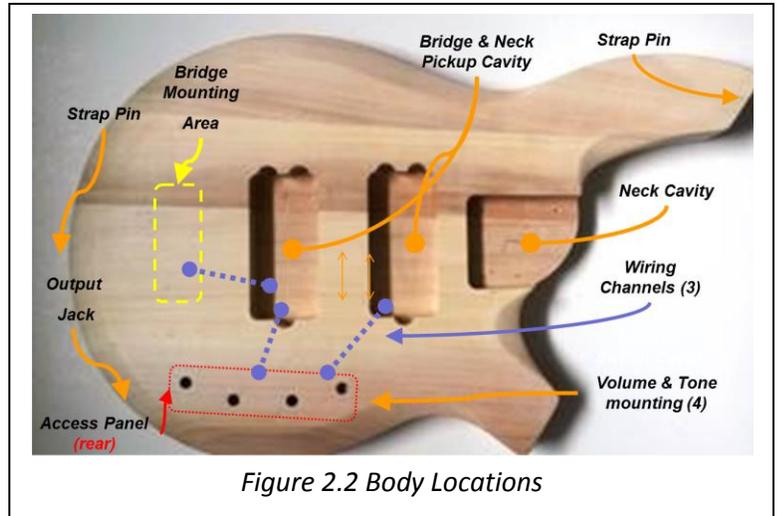


Figure 2.2 Body Locations



**TIP...a piece of masking tape around the drill bit works great as a depth indicator.**

- c. **Double check the depth** by holding the marked drill bit to the side of the neck and be certain the drill won't go through the fingerboard.
4. Drill the holes in the neck with a 1/8" drill bit. **Make sure you don't drill through the fingerboard!**

## 2.4 Attach the Neck to the Body



**TIP...rubbing the threads of the screw on a bar of soap or candle will help prevent the wood from splitting**

1. Insert the neck into the neck, aligning the mounting holes in the neck and body.
2. Attach the neck to the body using the supplied screws (4), item #12 on the material list – do not over tighten!

## 2.5 Fit Check & Alignment of the Pickguard (#2 on materials list)

1. Temporarily place the pickguard into position around the neck.
2. Carefully slide the Pickguard under the neck and adjust the Pickguard so that it is snug against the neck while centered/aligned with the pickup cavities (Figure 2.2).
3. Mark and pre-drill one mounting hole for the Pickguard – temporarily attach the pickguard using 3/8" screws (#4 on material list).
4. With the pickguard in place, recheck the pickguard and pickup cavity alignment to ensure proper positioning. If incorrect, repeat step #2 & #3 using another pickguard hole.
5. Once confirmed, mark and pre-drill the remaining holes for the pickguard. Ensure all holes are pre-drilled.

## 2.6 Fit Check the Bridge

1. Check the Bridge mounting area (yellow area in Figure 2.2) for six Bridge mounting holes.
2. Skip to 2.6.2 if holes are pre-drilled.

### 2.6.1 Positioning and Alignment of the Bridge (Figure 2.6.1)

1. Take the Bridge assembly (#6 on material list) and adjust the low saddle position to  
a



**INFO...**the “scale” of your BONGO bass guitar is 34”. This is not a musical scale; rather it is the length of the guitar strings as measured from the nut to the low E saddle on the Bridge. This section ensures that the Bridge is positioned correctly.

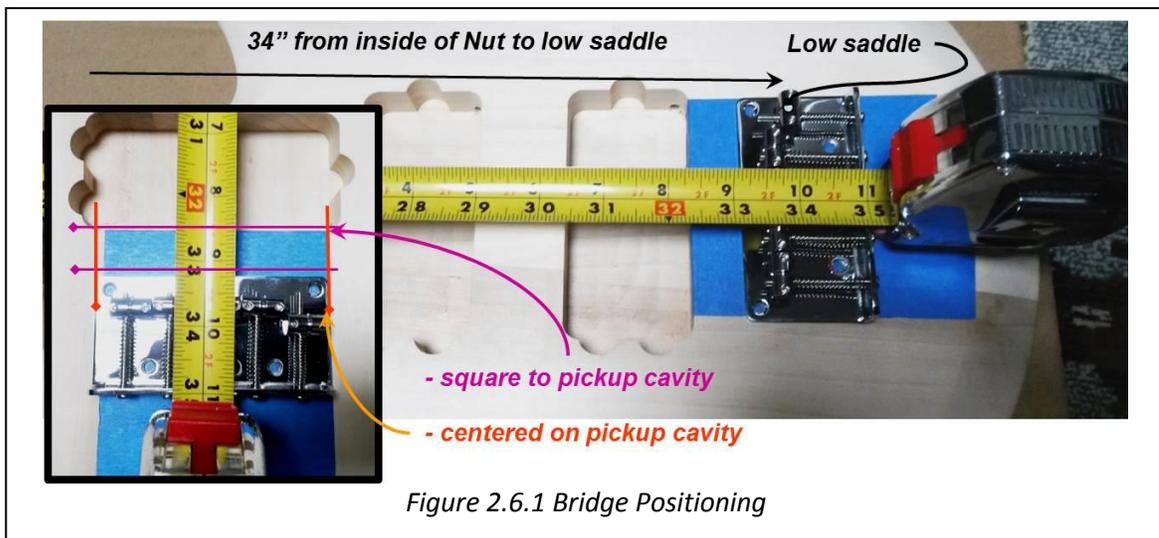


Figure 2.6.1 Bridge Positioning

## Section 2 – Mockup and Fit Check



- ½ of the threads of the adjustment screw – this is the reference point for the Bridge position.
- Using painters or masking tape, tape off a 3" X 4" directly behind the Bridge cavity, then position the bridge so that the low saddle is 34" from the inside of the Nut (Figure 2.6.1).
  - Square and center the Bridge on the pickup cavity/pickguard while ensuring that the Bridge remains 34" from the Nut.
  - Mark and pre-drill one of the forward Bridge holes. Attach the bridge with supplied screw (#4 on material list).
  - Recheck Bridge position, square & center – mark and pre-drill the remaining 5 Bridge mounting holes.
  - Remove the Bridge.

### 2.6.2 Check for Bridge Ground Wire Channel

- Check the bridge mounting area (Figure 2.2) for the Bridge ground wire channel to the Bridge pickup cavity.
- Skip to 2.7 if there is a wire channel.

### 2.6.3 Drill Bridge Ground Wire Channel

- Place a piece of painters tape between the two forward mounting holes. Mark a spot between the forward mounting holes, 1/4" inside and 1/8" back from the mounting screw hole nearest the volume controls (Figure 2.6.3).
- Keeping in mind that the objective is to create a channel between the Bridge and Bridge pickup cavity, ***use extreme caution*** and drill a 3/16" hole from the marker spot in the Bridge mounting area to the Bridge pickup cavity, at an angle of approximately 30 degrees, as shown in Figure 2.6.3.
- Using a piece of wire, ensure that the channel is clear.

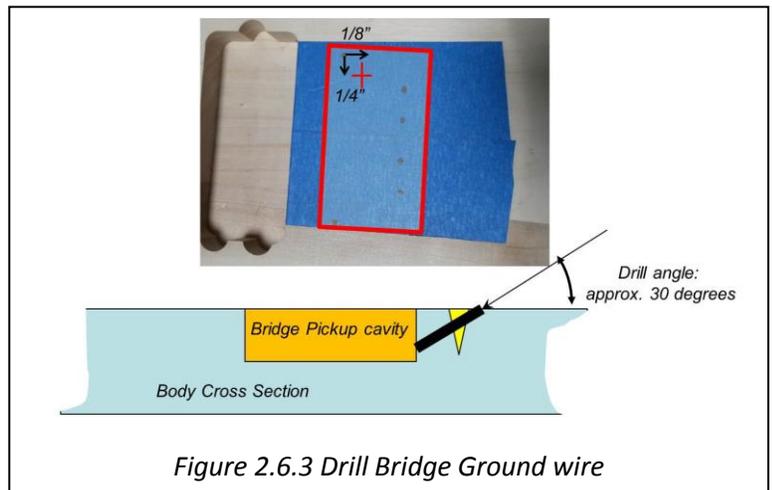


Figure 2.6.3 Drill Bridge Ground wire

### 2.7 Check Rear Access Panel (#9 on material list)

- Check the fit of the rear access panel.
- Skip to 2.8 if the holes are pre-drilled.
- Mark and pre-drill the four access cover holes (Figure 2.7).

### 2.8 Check Strap Pins

- Check for pre-drilled holes for the Strap Pins (item 11 on the material list), reference Figure 2.2.
- If the holes are pre-drilled, skip to 2.9.

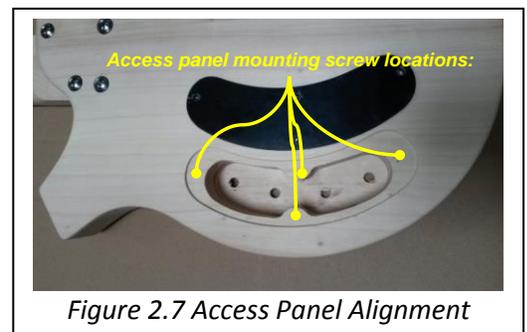


Figure 2.7 Access Panel Alignment

## Section 2 – Mockup and Fit Check



- a. Mark the rear Strap Pin hole so that it is centered on the Neck/Bridge and the forward Pin on the most forward point on the top of the Body.
- b. Drill starter holes with a 1/16 drill bit.

### 2.9 Check Tuner Alignment

Each tuner assembly consists of the tuner and hole collar. The tuners are attached to the headstock with small wood screws (#8 on list of materials).

1. Insert tuners (item #7 on Material List) into the Neck Headstock from the back. There are two types of tuners: four for top mount and one for bottom mount – they are not interchangeable.
2. Insert hole collar the over each tuner shaft from the front of the Headstock. The collars are used for alignment and need not be fully inserted in the Headstock – they will be glued in place during assembly.
3. As the Headstock is curved, ensure that the Tuner shaft alignment follows the curvature Headstock (Fig. 2.9).
4. Check alignment of set screw holes (4) and tuner base.
5. If alignment is incorrect or holes are not drilled, mark a single hole location, drill a starter hole with 1/16 drill bit: recheck the alignment then mark and drill the remaining holes.
6. Repeat step #3-5 for the remaining 4 tuners.

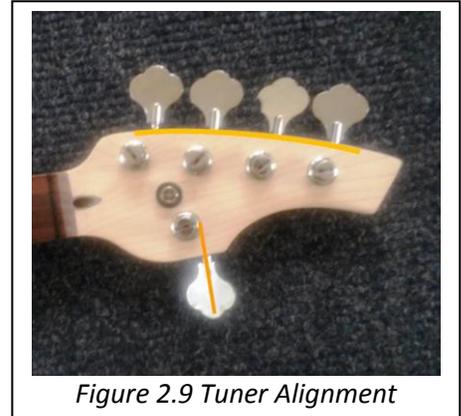


Figure 2.9 Tuner Alignment



**TIP... 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**

### 2.10 String Tee Position

The hole required for the installation of String Tee will be made during the guitar final assembly.

### 2.11 Nut Check

No, there is no error here! The Neck should have the Nut installed – check for the nut at the junction of the Headstock and the Neck – please contact BYO Guitar if you are short a Nut!

### 2.12 Mockup and Fit Check complete!

Carefully disassemble the Mockup and move on to the next step: applying the finish to your guitar!

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**3 Finish**

Before starting the finish make sure all holes are drilled for any remaining hardware (pickguard, jack plate, strap pins etc). This section will cover the application of several finish types, including;

1. Solid color
2. Pigmented translucent, gel stain or alcohol dye
3. Penetrating stain or water based dye

**Caution:** ... ensure that the Neck and Body mating surfaces are taped off to prevent the finish interfering with the final fit.

The guitar body was sanded at the factory and coated with one coat of sand and sealer. To get a good finish, the body should be sanded with a series of sandpaper grits up to #320 grit. Apply a solid color finish, a pigmented translucent finish (Bursts, toners, Blonde, Butterscotch Blonde etc), a gel based stain or an alcohol based dye finish over the sanding sealer. If you plan on using a penetrating stain or water based dye, the sanding sealer must be removed.

How you proceed will depend on the finish you would like on your guitar.

The following paragraphs outline several finishing processes, starting with the sequence for a finish type (paragraph 3.1) followed by detailed explanation of each sequence step (paragraph 3.2).

### 3.1 Finish Application Steps

#### 3.1.1 Solid Color finish:

1. Sand the body and neck
2. Apply grain filler if desired.
3. Apply 2 coats of sand and sealer
4. Sand to 320 grit
5. Apply primer
6. Sand the primer
7. Apply color coats
8. Apply clear top coats
9. Buff finish

#### 3.1.2 Pigmented Translucent, Gel stain or alcohol dye finish:

1. Sand the body and neck
2. Apply grain filler if desired.
3. Apply 2 coats of sand and sealer
4. Sand to 320 grit
5. Apply stain or dye
6. Apply clear top coats
7. Buff finish

#### 3.1.3 Penetrating Stain or water based dye finish:

1. Sand the body and neck to bare wood
2. Apply grain filler if desired.
3. Apply stain or dye
4. Apply 2 coats of sand and sealer
5. Sand to 320 grit
6. Apply clear top coats
7. Buff finish



**TIP...** re-open any of the screw holes in the body. Use a toothpick or small drill held between your fingers to clean out any filler in the holes.

### 3.2 Explanation of Sequence Steps:

#### 3.2.1 Sanding the Body and Neck

1. Wear a NIOSH-approved respirator and ANSI-approved safety glasses when sanding wood!
2. Before starting the finish on the neck mask off the surface of the fingerboard.

3. 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.
4. Re-sand the entire guitar body and neck with #220 grit sanding paper and lightly round over the outside edges of the body.
5. Wipe the guitar body and neck with a damp cloth to “raise” the wood grain.
6. Wait until the wood is dry and re-sand with #220 grit sandpaper to sand the “raised” grain smooth.

(Note: On a maple fingerboard you can apply a clear finish to the entire neck and fingerboard. Apply several coats and remove buildup on the frets between coats. An easy way to remove the finish buildup on the frets is to take a nail and file a half round slot in the head about the same size as the frets. You can then use this to easily scrape any finish build up.

If the neck has a Rosewood or Ebony fingerboard, be sure to tape off the fingerboard before applying the finish. Behlen’s Fingerboard Oil is a great product for your fingerboard.)

### 3.2.2 Applying Grain Filler

Grain filler will fill in the grain and create flat surface. This is essential if you are trying to get a high gloss finish. Oil based grain filler is recommended. We recommend using Behlen PORE-O-PAC grain filler. For most finishes use natural colored filler. The dyes used in darker fillers may over time find their way through the color coat.

Apply the filler by wiping across the grain. You can use a course cloth or your fingers to wipe the grain in. After it has dried about ten to twenty minutes the excess can be removed with a cloth dampened with mineral sprits. After about an hour repeat the process and let dry overnight. If you have removed most of the excess with mineral spirits the remaining filler on the field of the wood can be sanded off (use #220 again) in a few minutes. It is also a good idea at this time to reopen any of the screw holes in the body. Use a toothpick or small drill held between your fingers to clean out any filler in the holes. The body is now ready for a sand and sealer coating.

### 3.2.3 Applying Sanding Sealer

Sand and sealer is used to give the final coat a level base. It is also helpful in filling scratches which are too deep to sand out. We recommend using Behlen Vinyl Sealer. This comes in aerosol cans and can easily be sprayed on.

### 3.2.4 Solid Color Primer

The last step before applying the color coats is to apply a white primer coat. We recommend using Ohio Valley Nitro Primer. The white background will also let you apply an opaque color coat with less paint. Spray on two coats. When dry you may notice that the surface feels rough. Sand off the roughness with #320 dry and respray. Sand again. If the surface now appears smooth and all grain is opaqued you are ready for the color coat.

## Section 3 – Finishing Your Guitar



### 3.2.5 Burst and Translucent finishes

Bursts and Translucent finishes can be applied using aerosol cans of lacquer toner. Ohio Valley Nitro and Behlen have a full line of Nitrocellulose Lacquer Toners to achieve these finishes.

### 3.2.6 Clear Top coats

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. Dry sand the entire body with #400 grit wet dry sandpaper after at least three coats of finish have been applied. DO NOT sand through the finish, be careful on the edges. Use a tack cloth to remove sanding residue. Apply more finish, sanding between coats, until the finish is the desired thickness.

### 3.2.7 Buff finish

When the final coat has dried at least a week, preferably a month, remove the masking. Wet sand the finish using #600 grit wet/dry sandpaper with a sanding block, followed with #1000 grit wet/dry sandpaper. Use a clean, absorbent rag to remove excess water. Let the guitar dry completely, then use a tack cloth to remove all residue. Buff the finish by hand or with a buffer, starting with a medium polish and working up to a high gloss polish.

Note: If you use a buffing machine, be careful to avoid going through the finish, especially on the edges.

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4.8 Install the String Tee ..... - 6 -

## 4 Assembly

After your finish has been applied and thoroughly dried, we can now assemble your guitar. In this section we will permanently install all of the components and solder the wiring for the bridge and neck pickups. Remove all of the protective tape from neck and the neck cavity that you might have used during the Finishing process. Use patience and caution as you assemble your guitar as hardware and tools will likely not enhance the finish of your guitar!



**TIP...** use a blanket or large towel on your work area to protect your guitars' finish

### 4.1 Assembling the Neck and Body

1. Insert the Neck into the Body – the Neck should fit snugly but not forced. If you encounter difficulty, check for finish build-up on the Neck and/or the Neck cavity. Carefully sand the build up until the fit is proper.
2. Using the four mounting screws & washers (#12 on material list), attach the Neck to the Body. Use caution as to not over tighten the screws.

### 4.2 Installing the Tuners (Figure 4.2)

Each tuner consists of the tuner and collar. The tuners are attached to the headstock with  $\frac{3}{8}$ " wood screws (refer to Section 2.9).

1. Place a small amount of wood glue on the inside of the tuner hole then insert the hole collar – if the fit is snug, use two pieces of scrap wood (1 under the headstock, 1 on top of the collar) and gently tap with a hammer, or compress with a "C" clamp.
2. Repeat #1 on the remaining four tuner collars.
3. Promptly remove any excess glue with a damp rag.
4. Place a tuner into the hole from the back of the headstock and secure to the guitar headstock with the supplied screws (#8 on material list). (**Note:** one tuner is reverse from the other 4 – place it below the headstock)
5. Repeat #4 on the remaining four tuners.



**Figure 4.2 Tuners**

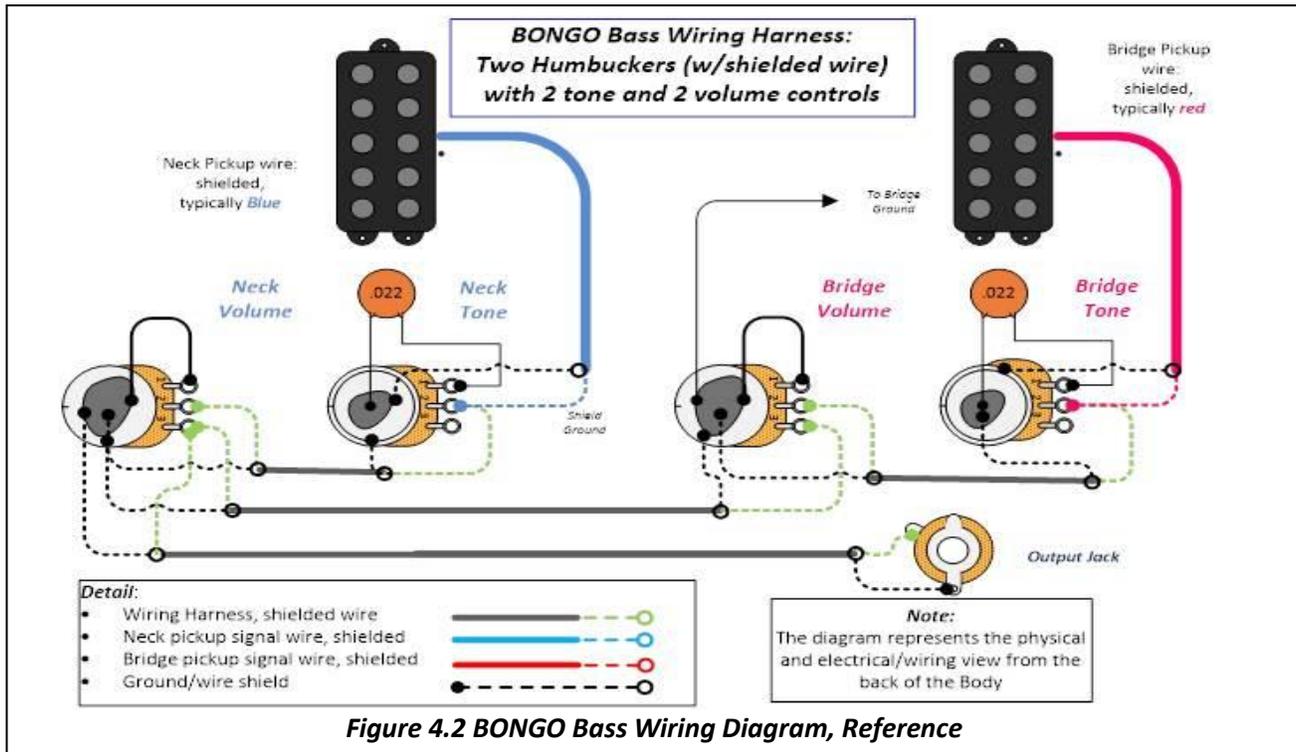
### 4.3 Install the Pickguard

After removing the clear protective sheet from the Pickguard, carefully slide it around the Neck and attach with the supplied screws (# 4 on the material list).

### 4.4 Installation of the Electronic Components

## Section 4 – Assembly

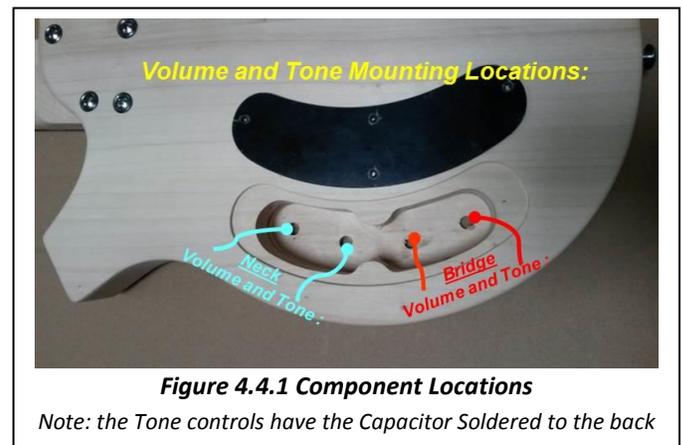
After ensuring that the gluing process in previous section is completely dry, you can install the wiring harness, volume & tone controls, pickups, and output jack. The wiring harness and controls come assembled reducing your task to making the final connections between the output jack & pickups. Wire strippers, solder, soldering iron and small needle nose pliers are required for this section. Figure 4.2 illustrates the harness and configuration of other components, and should be used for reference for this section.



### 4.4.1 Installing the Wiring Harness

As noted, the wiring harness comes assembled and only requires to be run through various tunnels prior to being connected to other components. Before starting the installation, check the harness connection & solder joints to ensure the integrity of the wiring.

1. Using Figure 4.2 as a reference, insert the Volume & Tone controls and wiring harness into the Body (as shown in Figure 4.4.1), hand tightening the shaft nuts.
2. Run the Bridge ground wire from the wiring harness to the Bridge pickup cavity via the channel (reference Figure 2.2).



### 4.4.2 Installing the Bridge and Neck Pickups

## Section 4 – Assembly



The Bridge and Neck pickups (#3 on material list) are mounted with three screws and adjustment springs. The springs maintain pressure on the pickups so the height can be adjusted for your playing style.

1. Check the fit of the mounting screws on each pickup – they should be snug but not threaded in the pickup. If the screws do not turn freely, open the holes with a 1/8" drill using caution not to oversize the hole.
2. Ensure that the Bridge ground wire is run through the Bridge Pickup cavity and the channel under the Bridge to the Bridge mounting area (Figure 2.2 and Section 2.6.3).
3. Insert each screw into the Bridge pickup (typically with the **red** shielded signal wire). Place a spring on the screw with the smaller side of the spring facing the pickup. Temporarily hold the spring in place with a small piece of tape (Figure 4.4.2).
4. Insert the Bridge Pickup signal wire through the channel into the electrical cavity while placing the pickup into the Bridge cavity (closest to the back of the Body). Start each adjustment screw for 2 or 3 turns. Remove the tape from each mounting screw.
5. Repeat steps 3 and 4 for the Neck pickup (typically with the **blue** shielded signal wire). Note the different channel for the signal wire is in the Neck cavity.

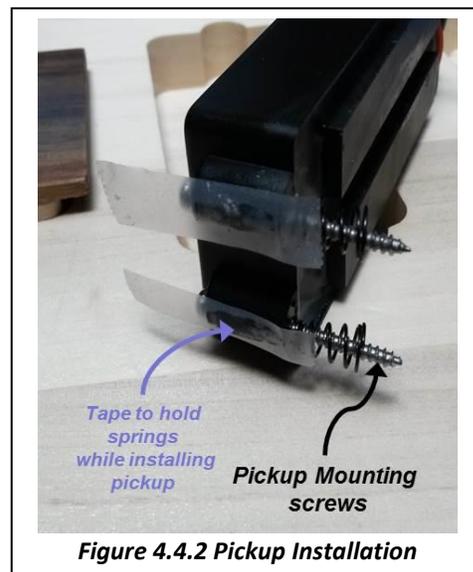


Figure 4.4.2 Pickup Installation

### 4.4.3 Install Output Jack

Install the Output Jack (#19 on material list) in the Body (Figure 2.2).

### 4.4.4 Connecting the dots – Soldering in the Components

Using Figures 4.2, 4.4.1 & 4.4.4-1 as a reference:

1. Strip and tin the **Neck signal wire**; solder the signal wire to the Neck Volume potentiometer pin2 and the shield to the case of the potentiometer. (**Note**: consider dismantling the Volume control for the soldering – access will be easier. Reinstall.).

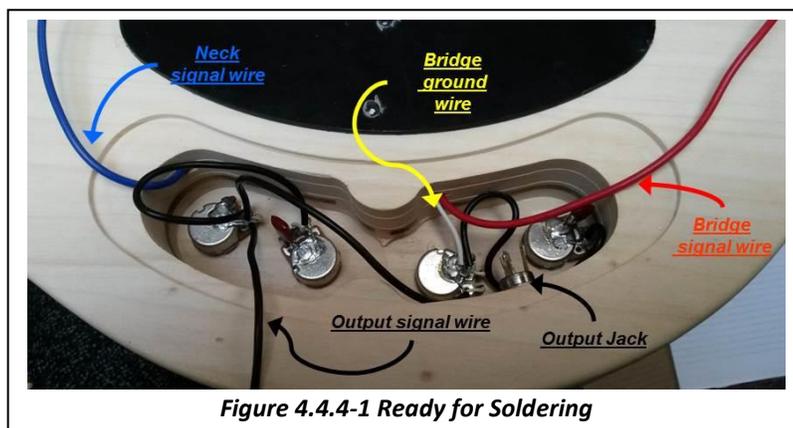


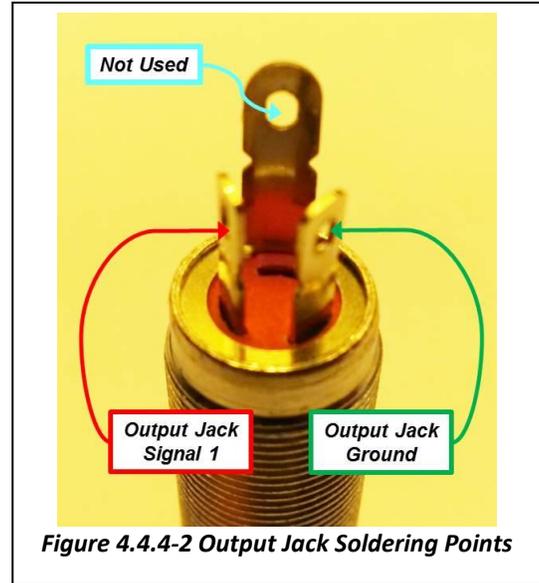
Figure 4.4.4-1 Ready for Soldering



**Tip...** “tinning” a wire: stripping off approximately 1/4” of insulation, then applying solder to the exposed wire to make soldering the final connection easier

## Section 4 – Assembly

2. Strip and tin the **Bridge signal wire**; solder the signal wire to the Bridge Volume potentiometer pin2 and the shield to the case of the potentiometer. (Again consider dismantling the Volume control for easier access).
3. Strip and tin the **Output signal wire**; solder the signal wire to the Output Jack **Signal 1** terminal and the shield to the Output jack **ground** (Figure 4.4.4-2).
4. Carefully tighten down the Volume and Tone controls using caution as not to stress any of the wiring.
5. Remove the protective covering on the access panel and install with supplied screws.
6. Place the Volume and Tone knobs over the potentiometer shafts, applying pressure until the knob is seated.



### 4.5 Installing the Bridge

The Bridge installation requires:

1. ...stripping the insulation from approximately 1" of the Bridge ground wire – gently push any extra wire back into the channel leaving the 1 inch of wire exposed. Bend the exposed wire as to lie flat under the Bridge when installed.
2. ...installation of the Bridge on the Body using the supplied screws.

### 4.6 Install the Strings

Like most projects, there often several tricks that will make the assembly easier and your guitar better. Properly stringing your guitar is just one of those tricks. Please review the following video:



<http://www.youtube.com/watch?v=tlfP3v-bxwE>

Although the video addresses restringing a guitar, the principles and techniques will help you string your guitar – as well as provide a visual for the stringing of your guitar.

1. Carefully uncoil each of the strings (5), ensuring that the strings do not have a kink.
2. Run the G string (largest diameter string) through the upper hole in the Bridge. Carefully seat the string ball in the Bridge.
3. Adjust the hole in the first tuner to be perpendicular to the neck.
4. Run the string upward over the Bridge saddle and through the hole in the tuner till snug on the neck; gently pull the string backward for a length of about 2 frets (check the video).
5. Run the string forward (toward the end of the headstock) wrapping the around the tuner and under the string; bend over the string (toward the end of the headstock).
6. Tighten the string down the tuner; when the string is snug against the 1<sup>st</sup> slot in the nut, trim the excess string.

## Section 4 – Assembly



7. Repeat steps 2-6 using the next smaller diameter string & the tuner.

### 4.7 Installing the Strap Pins

Secure each strap pins (2) in the pre-drilled holes with the supplied screws (2ea, 1”).

### 4.8 Install the String Tee

The String Retainer is used to ensure a steep angle of the E & A strings (relative to the nut) and is placed on the headstock between the E and A strings.

1. Snug up the E & A strings. To protect the guitar finish while installing the String Tee, place a piece of tape on the headstock approximately at the intersection of (Figure 4.8.1):

- a. Using a straight edge (ruler) establish the **“A” sting line** from the center notch in the nut to the lower side of the “A” tuner;

- b. Using a straight edge (ruler) establish the **“E” sting line** from the 2<sup>nd</sup> notch from the bottom in the nut to the lower side of the “E” tuner;

- c. Using a straight edge (ruler) establish a **line** from the lower edge of the “G” tuner to the lower edge of the “B” tuner.

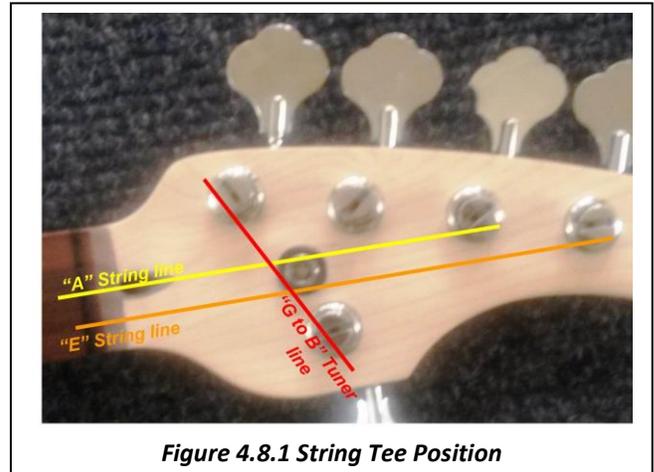


Figure 4.8.1 String Tee Position

2. Using a String Tee (item #13 on the material list), mark the headstock at the intersection of the three lines as shown in Figure 4.8.1.
3. Carefully drill 1/16” starter hole in the headstock.
4. Attach the String Tee to the headstock.



**Section 5 Contents:**

5 Initial setup ..... - 1 -

5.1 Adjust the Guitar Neck: Truss Rod ..... - 2 -

5.1.1 Check the Neck..... - 2 -

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**5 Initial setup**

In this section, we will address the initial setup for:

1. Adjusting the Neck (Truss Rod);
2. Adjusting the String Action (string height);
3. Adjusting the Pickup heights;
4. Adjusting the Intonation.

These adjustments will provide preliminary settings from which you can fine tune the sounds to your individual playing style. As with previous sections,  references are included for additional clarification of specific adjustments.



reference...check out the following



references that can be helpful in tuning your guitar:

- ✓ **tone generator for tuning:** [http://www.get-tuned.com/online\\_guitar\\_tuner.php](http://www.get-tuned.com/online_guitar_tuner.php) & <http://www.guitarforbeginners.com/onlinetuner.html>
- ✓ **downloadable “musical instrument tuner” from PerfectPitch (<http://www.nch.com.au/tuner/>) that will allow visualization of string adjustments**

String up the guitar with your desired gauge of strings – check the tuning.

### 5.1 Adjust the Guitar Neck: Truss Rod

The first major procedure in the setup is adjusting the neck relief. Neck relief simply refers to how much the neck bows. The degree of bowing in the neck is a matter of personal preference and is correlated to your playing style.

#### 5.1.1 Check the Neck

Get a ruler or straightedge that is at least as long as the neck, but not so long that it reaches all the way from the nut to the saddles. If you can't get one between these lengths, and are willing to sacrifice a ruler, get one that's too long and cut it to length.

Alternatively, you can just cut a little out of one edge so that you can still make full use of the other edge of the ruler. Now lay the edge of the ruler along the frets (don't rest it on top of the nut, saddles, pickups or pickup surrounds).

Using a feeler gauge or high resolution metal ruler, measure the string height (the gap between the ruler/string and the top of the fret) at about the 8th fret. The string height should be approximately 1/8" (0.012") - simply slide the feeler gauge into the gap to see if it is too big/small.

#### 5.1.2 Adjusting the Truss Rod

Tightening the truss rod adjustment bolt will cause the neck to warp backward (too much and the strings will buzz on the frets), and loosening it will cause it to bow forward (giving more relief.).

CAUTION: If you find that the truss rod is very difficult to turn, then stop. It may be that there is a problem with the neck or the truss rod and you may damage the guitar by forcing it.

Sight down the edge of the fingerboard from behind the headstock, looking toward the body of the guitar.

1. If the neck is too concave (action too high), turn the truss rod nut clockwise to remove excess relief (only adjust ¼ turn at a time).
2. If the neck is too convex (strings too close to the fingerboard), turn the truss rod nut counter-clockwise to allow the string tension to pull more relief into the neck.
3. Check the tuning, then re-check the gap with the feeler gauge and re-adjust as needed.

### 5.2 String Lubrication

Lubricate the contact points of a string's travel to ensure tuning stability and reduce string breakage. Lubricate:

1. string/saddle contact points with a light machine oil (...such as 3-in-1 oil because it contains anti-rust and anti-corrosive properties) every time you change strings.



reference: ...check out the following



references for adjusting the Truss rod:

- ✓ <http://www.youtube.com/watch?v=PHHepmTX3So>
- ✓ <http://www.youtube.com/watch?v=4j3QryKIXrc>



**TIP... do the neck adjustment in a series of intermediate steps and re-tune your guitar before each step – different tension on the strings changes the adjustment of the neck**

2. string trees should also be lubricated; a small amount of lip balm applied with a toothpick works well.

### 5.3 Adjusting the Action

#### 5.3.1 The Nut

Setting the string action that is right for you starts at the nut. The slots should already be close, but you might want to make some adjustments.

1. Push the fifth string down between the second and third fret. The space between the first fret and the bottom of the string should be about .006 or just about the thickness of two sheets of paper. If the gap is wider than .006" you should deepen the slot with a small needle file. **DO NOT FILE TOO DEEP!** Make sure when you file, the file is angled down toward the headstock. This will ensure the string sits on the edge of the nut closest to the fretboard.
2. Repeat the procedure for the remaining 5 strings.

 **reference...check out the following references for adjusting the "Nut Action":**   
✓ <http://www.youtube.com/watch?v=zz9UKX2lcxw> **TIP...check out the following references for adjusting the "Bridge Action Height":**   
✓ <http://www.youtube.com/watch?v=oWpnW8ICn-U>

#### 5.3.2 Bridge Saddle Adjustment

This will adjust the height of the strings over the 12<sup>th</sup> fret. Minor adjustments are made by raising or lowering the individual Bridge saddles. There should be a gradual increase in height from the "G" string to the "B" string. The question here is how high to make the bridge. This is personal choice.

Using the small Allen wrench supplied (#15 on material list), we will make individual adjustments for each saddle:

1. Check and, if necessary, initially adjust the G string height by raising (or lowering) the saddle: using the Allen wrench, evenly adjust the saddle insert screws to the 3/32" at the 12<sup>th</sup> fret. Rotating the insert screw clock-wise raises the saddle while counter clock-wise lowers the saddle, keeping the top of the saddle parallel to the body.
2. Re-adjust the height until string doesn't buzz on any fret from being too low, but low enough that you can play up and down the neck easily. There's usually a sweet spot where you can just start to detect some buzzing and you can leave it just a tiny bit higher than that. Be careful if you use a tool as it is easy to slip and damage the finish on your guitar.
3. Repeat 1 & 2 for the "D", "A", "E" & "B" strings.

 **TIP... most factories set action at 3/32" to 7/64" on the G string at the 12th fret and 2/32" to 5/64" on the B string.**

4. Play the guitar a little bit to see if any of the strings are buzzing. Readjust as necessary.

### 5.4 Pickup Height (Figure 5.4)

Each pickup is adjustable on the bass and treble sides. Finding the best combination of tone and volume will require some experimentation.

- 1 Bridge pickup:
  - 1.1 Press the “G” string onto the last fret and hold;
  - 1.2 Using a machinist ruler, measure the distance from the top of the pickup pole to the bottom of the 1<sup>st</sup> string – note measurement;
  - 1.3 Repeat #1.1 & #1.2 on the “B” string – note the measurement;
- 2 Neck Pickup: repeat steps 1.1 through 1.3 (above) on the neck pickup, noting measured heights.

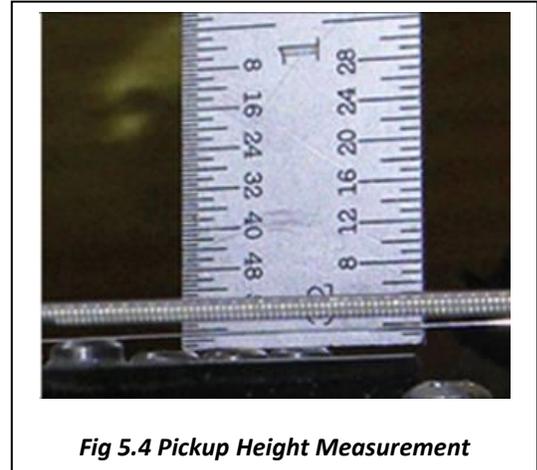


Fig 5.4 Pickup Height Measurement

Table 5.4 Pickup Height Guide		
Pickup	“G” String	“B” String
Bridge	2/64”	3/63”
Neck	3/64”	4/64”

Table 5.4 Bridge and Neck Pickup Heights

Using Table 5.4 as a reference, adjust the height of the pickups by turning the adjustment screws for the bridge, & neck pickups – recheck string heights after each adjustment.

### 5.5 Intonation (Figure 5.5)

Adjustments should be made after all of the above have been accomplished.

1. Turn the volume & tone controls to maximum.
2. Check tuning. Check each string at the 12th fret, harmonic to fretted note (make sure you are depressing the string evenly to the fret, not the fingerboard).
3. If sharp, lengthen the string by adjusting the saddle back. If flat, shorten the string by moving the saddle forward.

*reference...check out the following for adjusting Intonation:*

✓ <http://www.youtube.com/watch?v=CqN7xJD1rdE>

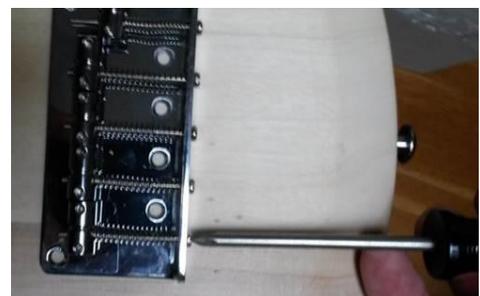


Fig 5.5 Intonation Adjustment

### 5.6 ...Other Hints

There are a few other things that you can do to optimize your tuning stability:

1. Each time you play your guitar, before you do your final tuning, play for a few minutes to allow the strings to warm up. Metal expands when warm and contracts when cool. After you've played a few riffs, you can then do your final tuning;
2. Wipe the strings, neck and bridge with a lint-free cloth after playing;
3. When transporting or storing your guitar, even for short periods, avoid leaving it anyplace you wouldn't feel comfortable yourself.

Remember, guitars are tempered instruments! Re-tune, play and make further adjustments as needed.

We hope you have enjoyed building your guitar! If you have any questions along the way please email us at [sales@BYOGuitar.com](mailto:sales@BYOGuitar.com).

