LPJ Guitar Kit Assembly Manual

This guide provides step-by-step instructions to build a solid-body junior LP-style DIY guitar using a kit.

There’s nothing more satisfying than playing a guitar you have put together yourself!

Project Tools and Consumables

Before we get started check the list below and ensure you have the necessary tools and consumables required to complete the project.

Tools

- 2 X Timber clamps (*set neck guitar only)
- Electric jigsaw or coping saw (*If shaping the headstock)
- Steel ruler (at least 40cm)
- Hard sanding block
- Center punch (or similar tool for marking hole locations)
- Electric drill and assorted drill bits
- Large and small screwdrivers (phillips head and flat head)
- Pliers (needle nose preferably)
- Soldering iron

Consumables

- Disposable gloves
- Titebond, PVA, or similar wood glue (*set neck guitar)
- Small paintbrush
- Wood grain filler (If open grain timber such as Mahogany or Oak)
- Sandpaper. Various grades, from 120 up to 1500 (*depends on finish)
- Finishing supplies. (This depends on your choice of finish)
- Painters masking tape
- Assortment of clean rags and paper towel
- Denatured alcohol (or cleaning product with degreasing ability)
- 0000 fine grade steel wool
- Solder (and sponge for cleaning tip of iron)
- Container for storing finishing supplies.

Next, check that all parts have been included.

Parts List

Below are the parts you will find included in your packaging to complete an LPJ guitar kit.

- LPJ body and neck
- Neck plate, neck plate cushion and screws
- Pickguard
- 2 x Strap buttons
- 3 + 3 tuners
- 1x P90
- 1 x volume and 2 x tone controls, 1 x 3 way pickup selector
- Input jack
- Cable and hex wrench (for adjusting truss rod)
- Tone and volume knobs
- Assorted screws and washers

Safety Precautions

To complete your guitar kit safely, also ensure you have the following on hand, and a well ventilated work space to work in.

Protective eyewear

Use protective safety glasses or a genuine face shield, not regular prescription, reading, or sunglasses.

Disposable gloves

Use disposable gloves if applying stains or oil finishes directly to the guitar.

Masks

Use an N95 rated dust mask for sanding and an R95 rated particle mask for finishing. If using water based finishing products an N95 dust mask may suffice for both sanding and finishing, but be sure to check the finishing suppliers recommendations first. Paint fumes are dangerous.

A well ventilated work area

Ensure your work space is well ventilated, especially when finishing to prevent a build up of potentially toxic fumes.

Making your Guitar Kit play and Sound Great

There are four stages to building a great kit guitar, these are:

1. Preparation and Finishing

The finished surface appearance of your guitar e.g. staining, painting, or applying a hand rubbed oil finish.

2. Hardware Installation

Fitting the tuners, strap buttons, bridge, and pickups.

3. Connecting the electronics

Connecting the pickups to the input jack, and incorporating a pickup selector and volume and tone potentiometers.

4. Final Setup

Adjusting the neck relief, action, intonation and pickup height.

We'll cover each of these below, starting with preparation and finishing.

1. Preparation and Finishing

Inspecting and prepping the body

Once unboxed, remove the pickguard by removing the two screws holding it in place on either side of the bridge cutout. Next, carefully inspect the guitar body and neck under good light.

Identify problem areas, as these should be addressed early on before commencing the project. This includes large dents that require filling, deep scratches that require sanding

and glue residue on the surface of the guitar that will prevent your finish from being absorbed evenly. Glue stains only apply for guitars with binding, and/or a veneer top.Once you have identified problem areas you can begin prep sanding the guitar.Start by sanding the entire body using 180 grit sandpaper.

Follow that up with 240 grit paper. If you are applying a stain directly to the raw wood sand up to 400 grit, but sanding any smoother than this may begin to affect how well the stain is absorbed.

Once you have completed sanding up to 240 grit, wipe a small amount of moisture on the surface of the guitar. Using denatured alcohol is a good option here as it evaporates before it is absorbed into the timber, but water will also raise the grain of the timber which can then be sanded flat. Generally grain will only raise once, so you can be confident by taking care of it now, you won't have any problems during the finishing process.

Dry Fitting the Neck

You should also check the neck fit. While the LPJ is a bolt-on neck guitar, it's still important to dry fit the neck and check how well it fits the neck pocket, along with neck alignment, neck angle and scale length.

Insert the Neck

First push the heel gently into the back of the neck pocket, then push the neck down flat. This reduces the risk of chipping the thin edges of the neck pocket before the neck has been installed.

Check the scale length

You can check the location of your bridge with regard to scale length by loosely installing the bridge and measuring the distance from the edge of the nut closest to the fretboard and the middle of the 12th fret and then doubling that number. An LPJ guitar kit should have a scale length of 24.75” or 628mm.

If your scale length appears out by a few mm, keep in mind the bridge can be adjusted forward or back to compensate.

Check the neck fit

The neck, once inserted into the neck pocket, should have very little sideways movement. If there is a gap on either side of the neck, you may need to shim the neck by cutting small sections of scrap wood with a craft knife and gluing these to the sides of the neck pocket. Otherwise smaller gaps can be filled prior to finishing using a filler.

Check the neck angle

Run a steel ruler along the fretboard and over the bridge. The steel ruler should sit just above the saddles on the bridge when the bridge is sitting flat against the body.

Cutting the Headstock

If shaping your headstock, start out by sketching out some rough concepts before transferring the chosen design to paper at the correct size.

When designing your headstock be sure to leave a margin of at least 15mm from the last tuning hole and the edge of the headstock (the equivalent distance between the tuning peg holes).

1. Once you have a completed design at the correct size cut the shape out and glue it to a thin scrap piece of timber to be used as a template. (You can also use cardboard which in many cases will be easier to work with).
2. Using a coping saw, jigsaw, or ideally a bandsaw cut out the headstock shape and sand the edges of your template smooth.
3. Taking a small clamp, clamp the template to the headstock and carefully trace the outline.

From there you can either cut the new headstock shape using the template as a guide, or remove the clamps and cut following the outlines you just made.

When cutting out your headstock shape protect the neck of the guitar when cutting, cut well outside the lines to allow room for sanding and keep your saw as vertical as possible to ensure straight lines on your headstock.

If unsure keep the design simple. A well executed simple design is better than a poorly executed complex one. Once complete, sand the edges until as smooth as the rest of the body and neck.

Masking

Before we start grain filling and finishing we should mask the neck pocket, and body cavities of the guitar.

Mask the tuning peg holes on the headstock to keep the holes clean, along with the holes for the bridge and tailpiece and pay special attention to the truss rod. You should also mask the fretboard when spraying the back of the neck.

If your guitar has binding you can either attempt to mask off the binding, which in most cases will mean some finish still permeates the masking tape and will need to be removed,

or not masking, and scraping the binding clean with a razor blade before spraying your clear coats.

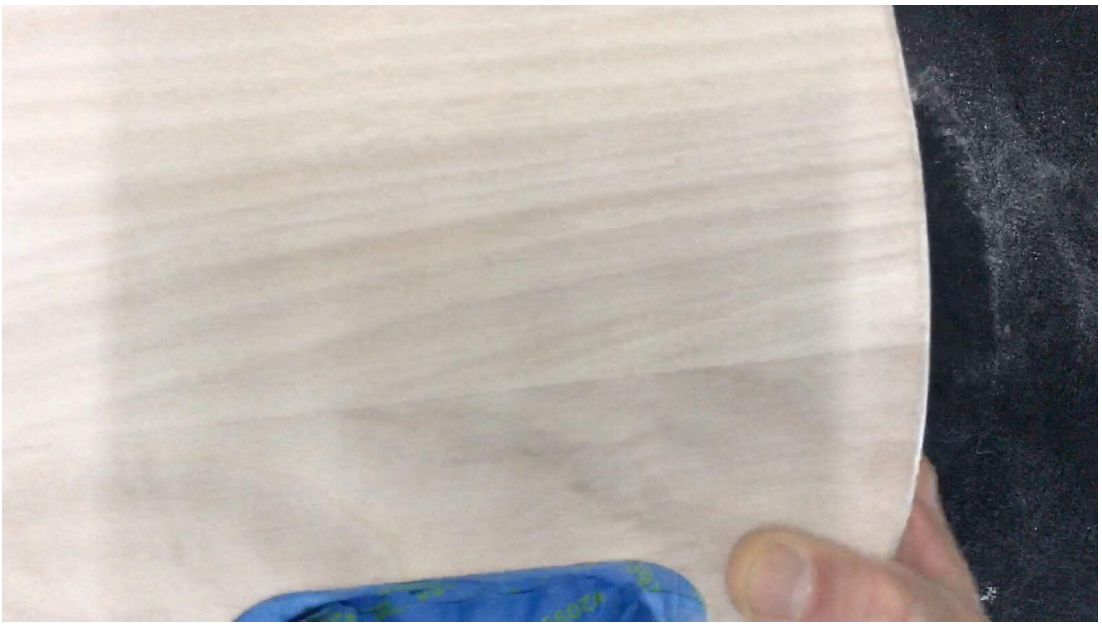
I'd normally scrape the binding as this is a more effective use of time, rather than attempting to mask. But it's best to mask the binding if you notice any cracks as the finish you apply will permeate the binding staining it permanently.

Grain Filling

Grain filling is optional, and mostly depends on the wood your guitar is made from and whether you are aiming for a flat finish.

If your guitar is made from an open grain timber such as Oak or Mahogany, the open pores of the timber will prevent a flat finish unless filled.

Basswood for the most part is optional. In most cases it's advisable to grain fill but if painting a solid color you can get by using a primer which will level and seal the surface.



If you are staining, depending on the product you are using, you can grain fill either before or after. In most cases I've found grain filling first results in a more even application, and a better result.

There are a number of different grain fillers available, including solvent, water and oil based options, along with pre-tinted options. Oil based grain fillers penetrate deeper into the wood, but water is obviously easier to work with with regard to drying times and clean up.

Using a tinted grain filler is a great option if you want to accentuate the grain pattern of the guitar, as the excess will be removed when sanding but the filler used to pack the pores of the wood will remain in place, emphasizing the grain pattern of the wood under a transparent finish.

Below are the steps required for applying grain filler:

1. Mix up enough product to grain fill the entire guitar. Follow the recommendations for the product you are using in terms of application, cleanup and safety, then mix your grain fill into a workable paste in a spare container.
2. Apply to the guitar using a clean rag, working in line with the grains pattern of the wood. Next, work across the grain really pushing the grain fill into the wood, making several passes.
3. Once finished applying, leave the guitar for ten minutes and then wipe away any excess using a clean damp rag.
4. Once dry, sand back to the surface level of the guitar, working through the grades of sandpaper from 120 grit to 240. Sand sufficiently to remove the excess grain fill but not enough to dig into the wood and create more open pores.
5. Inspect the surface of the guitar and repeat the process if required.

Finishing

It’s beyond the scope of this guide to cover every available way to finish an electric guitar but below are a few rules that apply to almost all finishing options:

- Carefully consider your finishing options with regard to how protective they are and how they might affect tone along with aesthetics.
- Choose your type of finish based on the wood itself. For example, it would be a shame to cover up a beautiful grain pattern with a solid color finish. Alternatively, staining a less figured piece of basswood for example may not provide a great aesthetic either.
- Wear gloves and a mask and work in a well ventilated area as required. Fumes from some finishing products can be toxic.
- Clean the body of the guitar using a product that includes a degreasing agent.
- Wear disposable gloves when handling the guitar after cleaning.
- Make sure you are working in a relatively dust free environment and make sure to clean the cavities of the guitar body thoroughly after sanding. Dust accumulates in the cavities of the guitar, and when turning the guitar over that dust will become airborne.
- If staining, make sure to wipe away any excess that hasn't been absorbed after approximately ten minutes.

- Be aware of the compatibility of the products you use. If painting using spray cans I'd recommend using the same brand and type of paint for your seal coat, color coat and clear coats.
- If you have to spray outside avoid spraying on windy days.
- Spray the sides of the body first. That way when spraying the front and back you will be spraying over any overspray from the sides of the guitar.
- Don't spray heavy coats. In many cases, several lighter coats are a better option than 1-2 heavy coats due to the potential for runs.
- Check your binding for cracks. If cracks are present, mask the binding prior to applying a colored finish or the finish will penetrate the binding and become impossible to restore to its original state.
- Don't apply too many coats within recommended drying times. If you spray more than 3 coats in a day for example, your first coat may have trouble curing.
- If you are using steel wool on the body of the guitar prior to finishing ensure you remove all fibers from the steel wool.
- Always hang your guitar in a cool dry environment. Do not leave your guitar outside to dry, it will attract dust.
- In most cases, you can respray within an hour. If you leave it longer than this, you may need to leave the guitar for 24 hours and then lightly scuff up the paint with 600 - 800 grit sandpaper to ensure the ensuing coats will adhere to the previous coats. (This depends on the product you are using, so check the label).

If you're looking for a resource that covers guitar finishing in great detail, check out Guitar Finishing Step-by-Step by Dan Erlewine and Don MacRostie.

2. Hardware Installation

Next we'll install our hardware. This includes our tuners, strap buttons and pickup. There are some best practices to follow including drilling pilot holes and aligning your hardware correctly which we'll cover in more detail below.

Pilot Holes

Drill pilot holes for all screws used on the body and neck of the guitar.

The small screws used for securing your tuners for example are small, fragile and easily stripped.

Whenever installing hardware:

1. Use masking tape on the guitar to mark the location of the hole using a pen (pencils usually don't result in sharp lines on masking tape).
2. Mark the location of the hole making an indentation in the wood through the masking tape using a hole punch or similar tool.
3. Decide on the correct size drill bit (⅔ thickness of the screw) and mark the drill bit depth using a small piece of masking tape at approximately 2/3 the depth of the screw to be installed.
4. Always aim to drill your holes straight. If you have a drill press this is preferred.
5. Use a countersink drill bit (or similar) to chamfer the edges of any holes in the body of the guitar, especially if painted using a solid color finish, to prevent chipping.You may want to drill less than ⅓ depth on less dense timbers such as Mahogany and Basswood.

Installing the neck

Within your packaging there will be a neck plate, neck plate cushion and four long screws. Place the neck into the neck pocket and ensure it is pushed right up into the back of the cavity.

Place the back neck plate cushion followed by the chrome neck plate and then loosely place the 4 screws, but don’t begin tightening these yet.

Next, double check your alignment and begin installing the screws. Install the top left screw first, followed by the bottom right screw, working diagonally. Once all screws are in place, tighten and double check the neck alignment.

Installing strap buttons

Strap buttons not only support your guitar when playing standing up, the placement of the strap buttons also affects the balance of the guitar. On an LPJ guitar, the rear strap button is located in the center of the lower bout.

The front strap button is inserted into the top horn. The strap button can be aligned perfectly to the top of the P90 pickup, if placed in the pickup cavity.

Installing the truss rod cover

While not strictly hardware, it's important to center the truss rod cover on the headstock.

The simplest way to do this is by using masking tape on the headstock, measuring half way across the headstock (the guitar has a nut width of 42mm, so the number should be 21mm) and drawing a line extending out from the nut to the end of the headstock.

You can then align the truss rod cover with the nut and center by lining up the hole at the tip for the truss cover with the centerline.

Installing the Tuners

LPJ guitar kits utilize 3 per side tuners, so you will need to first separate your tuners into left and right.

1. Start by inserting the tuner in the back of the headstock with the mounting hole facing back toward the body.
2. Place the washers over the tuning posts, then place the bushings and install the tuners by hand tightening.
3. Align the tuners using a steel ruler.
4. Mark the location of the mounting screws, drill your pilot holes and install the small screws.
5. Remove the protective covering by firmly pressing masking tape onto the back of each tuner and removing both the covering and masking tape in one action.

Align tuners using a steel ruler. You can also install the first and last tuner, and using a steel ruler mark a straight line between them on masking tape to mark out the location of the pilot holes.

Installing the Controls

Next, we'll install our tone and volume pot.

The tone pot goes to the front of the cavity. It's the pot with the capacitor attached (the green filter). It can help to position these facing one another to make the lugs on the pots more accessible. Secure both pots in place using the washers and nuts provided.

Once the controls are securely in place take the loose black wire and thread it through the hole in the control cavity to the pickup cavity and flip the guitar over.

Installing the Bridge and Ground Wire

1. Remove a few mm of the PVC coating and expose the bare wires.
2. Thread the wire, ensuring the bare wires are exposed and will sit flush against the side of the bridge or tailpiece post bushing once installed through the hole at the back of the pickup cavity, to the bridge bushing hole.
3. Make a small 'hook' in the top of the wire so the ground wire sits at the top of the bridge post hole before installing the bushing.
4. Remove the post from the bushing.
5. Insert the bushing into the predrilled hole, ensuring the ground wire ends up sitting flush against the bushing. In many cases you may require a rubber mallet to force the bushing into place.
6. Screw the bridge posts to the bridge bushings.
7. You can then fit the bridge over the bridge posts.

Installing the Pickup

We'll be installing our single dog ear style P90 pickup. To align this correctly we'll also install the low and high E strings as a guide.

1. Thread the pickup wire through the hole to the side of the pickup to the control cavity.
2. Install the low E and high E strings.
3. Position the pickups at the very front of the pickup cavity and then align the outside E strings to the individual pole pieces corresponding to the low E and high E.
4. Mark your pilot holes as done previously.
5. Remove the pickups from the cavity, drill the pilot holes and install the screws.

3. Connecting the Electronics

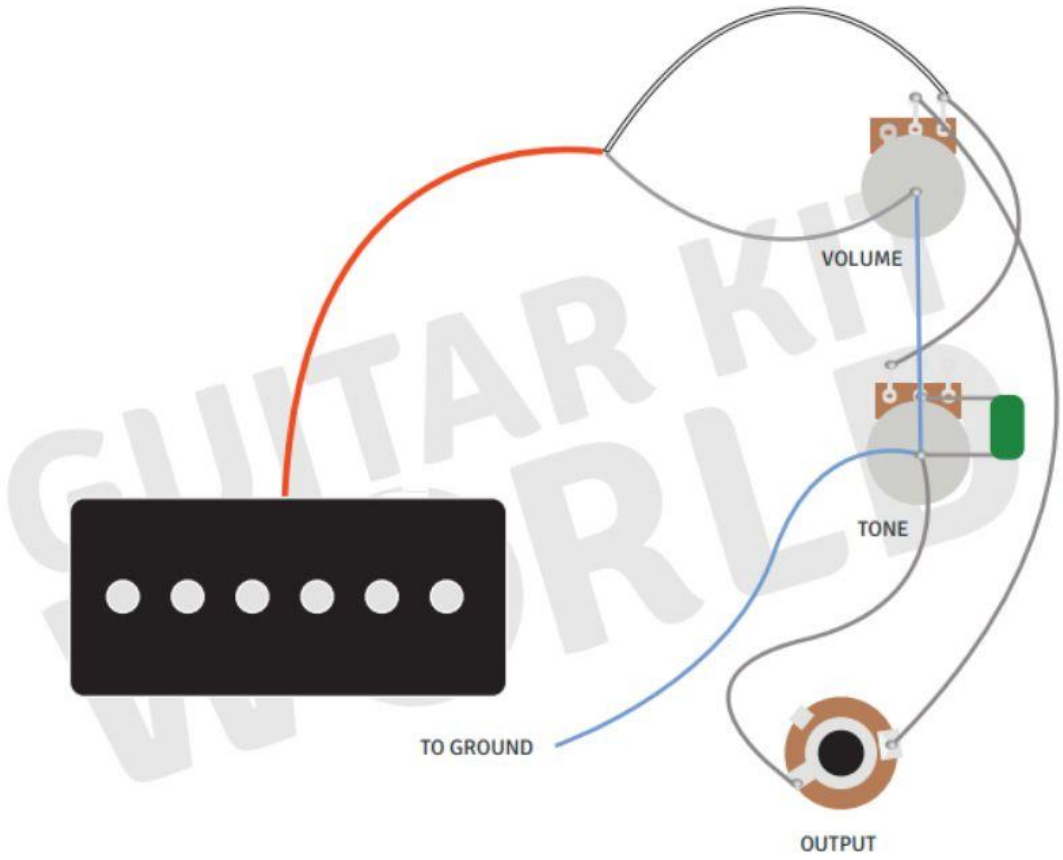
Soldering

If you haven't soldered before you're going to need a soldering iron, solder, and a damp sponge to clean the tip of your iron. I'd also recommend practicing before committing solder to your electrical components.

Most entry level soldering irons will do the job, and your kit will come with more than enough solder.Be careful when soldering. Solder won't melt until it reaches 185°C (365°F) and soldering irons get very hot, up to 392°-896° F in some cases.

WIRING DIAGRAM:

P90, 1 X Volume, 1 X Tone



SOLDER POINT

HOT WIRE (WHITE COATED)

* Wire colors may vary depending on manufacturer

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When soldering there are two key areas to keep in mind.

1. Tinning

Tin your soldering iron and the components you are connecting to. Tinning refers to maintaining a light coating of solder over the tip of your soldering iron and prevents the iron tip from oxidizing.

2. Preheating

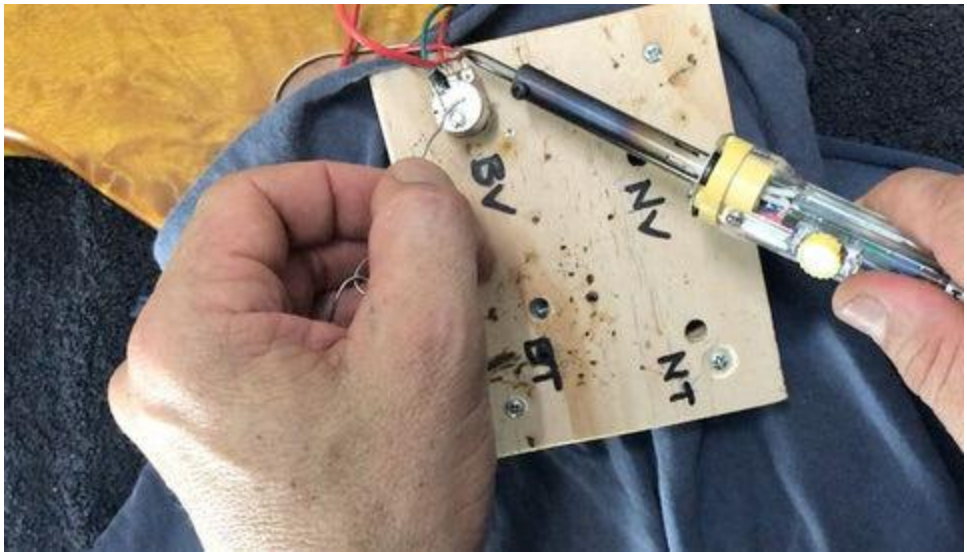
Soldering is really about transferring heat. The lug or component you are connecting to should be preheated so the solder is drawn to it rather than staying on the already hot iron.

Connecting the Controls

There are only four connections to make when wiring an LPJ guitar kit. Connecting the ground and hot wires to the pickup to the volume pot, and connecting the ground and hot wires to the input jack.

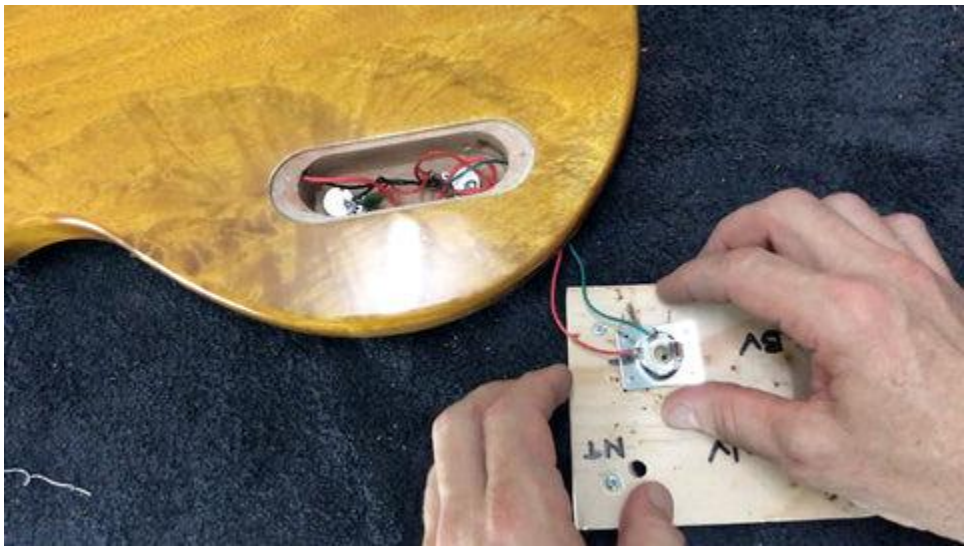
We'll connect the pickup to the volume pot first. But, first protect the finish of your guitar with a clean rag to prevent the possibility of solder getting on your finish. Then, loosen the nuts for the tone and volume pot so you can solder outside of the control cavity.

1. Taking the unshielded ground wire from the pickup, solder this to the back of the volume pot, as per the image above. (The volume pot is the pot without the green capacitor attached.).
2. Remember to preheat the back of the volume pot for a few seconds first then feed the wire and solder onto the lug.
3. Once the solder begins to melt remove the iron and allow the connection to cool.
4. Once cooled, test the connection by gently pulling on the wire.

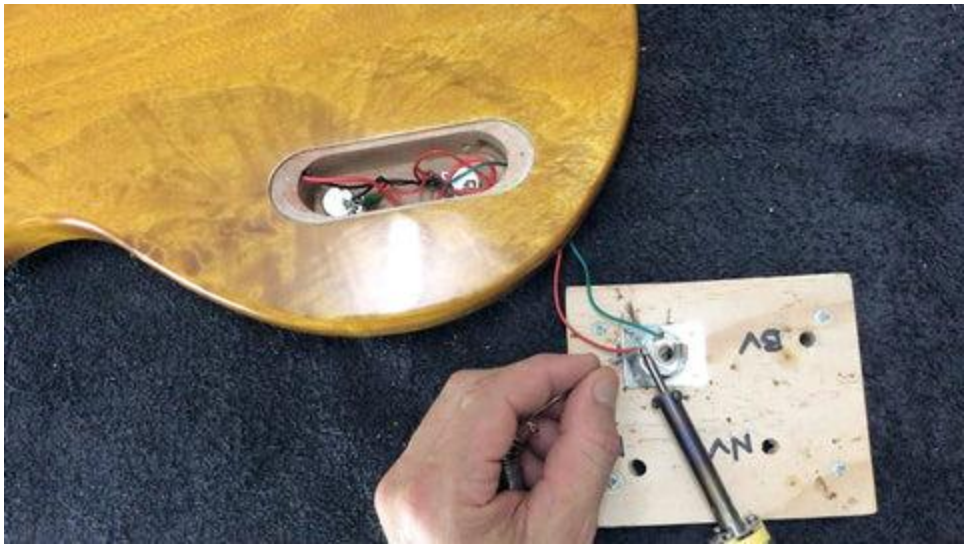


Next, take the shielded wire and connect this to the eyelet on the right side of the pot if facing away from you. Thread the wire through the eyelet and then solder in place.

Connecting the input jack



We'll need to connect the hot wire and ground wire to their respective lugs on the input jack to complete the wiring.



Take the ground wire from the guitar (the green wire in the image) and thread it through the eyelet of the lug attached to the inner sleeve of the input jack (the ground lug).

Connect this using your soldering iron, and repeat the same process for the hot wire, which is attached to the lug attached to the outer sleeve of the input jack.

The wiring is now complete. You can now install the control cover plate and pickguard using the same process we have used to install all previous screws on the body of the guitar and then test the pickup by plugging a cable from an amp into the guitar and tapping gently on the pickups.

4. Final Setup

The last stage of our project is setting up the guitar. This is an important step that makes all the difference with regard to playability and tone. Our final setup will consist of four key areas:

- Neck relief
- String action
- Intonation

I'll provide a basic overview of each below. Also, keep in mind the guitar should be tuned to concert pitch and checked regularly during the process to ensure the correct amount of tension is on the neck as adjustments are made.

You may also want to revisit aspects of your setup once you have had time to play the guitar and have identified problems e.g. fret buzz or intonation issues.

Adjusting neck relief

The ideal guitar neck is one that has a small amount of inward bow or relief to provide clearance for the strings when vibrating. A neck that is too straight will very likely run into problems with fret buzz.

You can measure the straightness of the neck using a steel ruler. I prefer to hold down the first and last fret and then tap the 12th fret lightly of the low E string. If the string is already sitting hard against the fret more relief is required. If sitting well above the fret, the amount of relief can be reduced.

To adjust the amount of relief, adjust the truss rod using the hey key included in your packaging. Turn counter clockwise to loosen the truss rod which will introduce more relief. Turn clockwise to flatten the neck further.

Remember to only make incremental changes of ⅛th to a ¼ turn each time and make sure the guitar is tuned to concert pitch so the correct amount of tension from the strings is placed on the neck. Be sure to continue to check your tuning through the entire setup process.

Adjusting the action

Action refers to the height of the strings from the fretboard of the guitar. This is usually measured from the top of the 12th fret to the underside of the low E string.

A good starting point if unsure is 2.4mm on the low E side and 1.6mm on the high E side, taking into account the different string gauges. Make sure the guitar is in tune before checking and making adjustments.
Action is adjusted at the bridge. Taking the small alum key in your packaging, turn the individual saddle posts counter clockwise to lower the individual saddle posts or clockwise to raise the action.

You'll need to match the height for both to keep the saddle balanced on the bridge.

Intonating the guitar

Intonation, in essence means, is the guitar in tune with itself. You can check this by tuning to standard tuning and then checking the strings at the 12th fret (an octave up from the open string). If the pitch is sharp you will need to lengthen the string length. If flat you will need to shorten it.

As mentioned earlier. Your scale length is not a precise measurement as there is some compensation required for the additional mass of the heavier bass strings. This is also why most bridges on electric guitar are angled away from the body of the guitar toward the bass strings.

To lengthen the string, turn the intonation adjustment screws at the back of the saddle counter clockwise. To shorten turn them clockwise. Make sure the guitar is in tune before checking and adjusting.

Summary

And that marks the end of our project.

Once you have completed the steps outlined above. You should have a complete guitar ready to play. Keep in mind, as you become more accustomed to the guitar you may want to revisit some aspects, especially the final setup of the guitar.

You should also test the guitar, by going through each pickup position and testing the volume and tone pot. Also test for interference by taking your hands off the guitar and listening for hum. If you hear any signs of electrical interference you may need to open the electronics cavity and check your ground circuit.

Lastly I'd recommend playing each fret up and down each string and listening for fret buzz or any sign of dead notes. If you notice a problem chances are it can be resolved by either adjusting your action or the amount of neck relief in the neck.

Thanks for following along!