



duncan|turner acoustic research

TIMBER-LINE™

Under Saddle Transducer Pickup

Installation instructions

"WITH RESPECT TO ACOUSTIC TONE"

5427 hollister ave santa barbara ca 93111-2345
tel 805-964-9610 fax 805.964.9749 www.dtar.com

Thank you for choosing a D-TAR Timberline pickup. We are a company started by and for musicians, and we have worked closely with a number of the world's top luthiers in developing Timberline. We believe this is the best sounding under saddle pickup available, and we are confident that you will get top performance from it.

There are several things that set Timberline apart from other under-saddle transducers and help give it a sonic edge:

- 1) The 18 volt power supply ensures the high headroom needed to prevent transient overload and distortion, the primary cause of the dreaded "piezo quack" sound.
- 2) Coaxial construction picks up a more complex vibration pattern and gets more of the sound of the guitar's top.
- 3) The jacket around the pickup itself acts as a shock absorber, smoothing out the high frequency response especially to sharp attack.

Furthermore, we have provided for several future add-on options in the design of the current Timberline endpin preamp.

1) There is a set of solder pads on the circuit card, which provide a "feed through" for adding a 2nd pickup or mic sound source. This 2nd source will appear on the "ring" terminal of the stereo jack. Power switching is independent of the ring terminal.

2) You can access 18 volts of DC voltage to power an internal electret microphone.

3) Both volume and passive treble roll-off controls can be added at any time.

We strongly suggest professional installation as there are steps that involve drilling, routing, and soldering that are not for unsupervised, first time guitar hobbyists. If you are not perfectly confident in your use of power tools around guitars, please call us for a reference to an authorized installer. Please read these instructions in their entirety before beginning an installation.

TOOLS REQUIRED FOR AFTERMARKET INSTALLATION

- 1) Small router, laminate trimmer, or Dremel Mototool.
- 2) 7/64" round ended milling cutter, we suggest a Robb-Jack solid carbide three flute ball end mill available from your D-TAR dealer. This bit is smaller by 1/64" than the standard 1/8" bridge saddle slot, and thus should allow you to deepen the slot without touching the sides and widening it. It is almost impossible to exactly align a router jig and use a 1/8" bit in a 1/8" channel without hitting the sides of the slot and widening it. This will allow you to reuse the original bridge saddle.
- 3) OR 1/8" version of the above bit if you are routing a fresh slot in a bridge. The part number for the 1/8" ball end bit is 1100 5114.
- 4) Collet adaptor to make 1/8" diameter bit fit your router collet if necessary. If you are using a Dremel, you probably already have a 1/8" collet for it.
- 5) Router jig for slotting bridges. You can either make your own or buy one from Luthiers' Mercantile International, phone #: 707-800-477-4437, part number: SPPMR, or from Stewart MacDonald Guitar Shop Supply (telephone 800-848-2273, part #: 4043).
- 6) 1/2" chuck electric drill for drilling out or reaming the end pin hole.
- 7) Calipers or depth gauge for measuring the bridge slot depth.
- 8) 1/8" drill bit for drilling the hole for the pickup cable.

9) 15/32" drill bit with flutes ground for zero rake. This keeps the drill bit under control and prevents the bit from grabbing as you drill through the end block of the guitar. An alternative to this is a 2-step Endpin Jack Reamer from Stewart MacDonald, (part #: 4323).

10) Sharp end nippers.

11) Soldering iron and fine rosin core solder. Use a eutectic SN 63 electronic grade solder.

12) Small Crescent wrench for tightening the nut on the output jack.

13) Small Phillips head screw driver, Allen wrench, or finish nail to prevent jack from turning as you tighten the nut.

14) A modified 1/4" plug with either a length of solid core 16 ga copper electrical wire soldered to it or a length of thin dowel glued to it. This will help guide the end pin jack through the hole in the end block from the outside and make it unnecessary for you to reach all the way through the sound hole to install the end pin preamp.

INSTALLATION STEPS

1) Set up a clean and well-lit work area padded to avoid scratching the guitar.

2) Remove strings from bridge. (Luthier's tip: coil the strings in pairs to get them out of the way a make it easy to put them back on. This avoids tangling and subsequent frustration).

3) Remove end pin or current end pin jack, and drill or ream the hole out to 15/16" to accommodate the Timberline end pin preamp. Test fit and adjust the 15/16" nut with lock washer so the larger diameter of the jack body is completely within the hole.

4) Measure the height of the top of the bridge saddle relative to the top of the bridge at the 1st and 6th string and write down the measurements here for future reference:

6th string saddle height _____
1st string saddle height _____

Unless you plan to change the action of the guitar, these are the measurements you want to end up with when the job is complete.

You can also make a pencil line on the saddle right where it emerges from the slot in the bridge for future reference.

5) Remove the bridge saddle.

6) Set up your router or laminate trimmer with the 7/64" round bottomed bit.

7) Set up your router jig for deepening and round-bottoming the bridge saddle slot taking extra care to align the router guides so that when you do the cut, you are only deepening the slot, not making it wider. The 7/64" bit give you about .015" clearance on either side if you have the jig perfectly on the center line, thus you have a little bit of room for error. Set traverse limits with small clamps or on the router jig so you don't rout the slot too far.

8) Measure the distance from the face of the router jig on which the router will slide to the bottom of the saddle slot. You can do this by holding a straight edge to the router jig over the opening through which the bit reaches to cut the bridge. Once again, measure at the 1st and 6th string positions and write measurements here:

6th string router jig to slot bottom _____
1st string router jig to slot bottom _____

If you are planning to use the original saddle without sanding it down very much, you will need to then set the ultimate router bit depth to .105" deeper than the shallower of the two measurements you just made. You should plan on leaving at least half of the ultimate saddle height below to line of the top of the bridge, and 5/8 to 3/4 of the height is preferable. This may mean that you have to rout close to the bottom of the bridge. In our experience this should not pose any problem nor compromise the acoustic performance of the guitar.

9) We do not recommend trying to rout the entire depth in one pass; it is better to take off no more than about 1/16" at a pass to reach your final depth. Measure your slot depth at the center of the slot after each pass. You are generally going for deepening the slot by about .005" less than the diameter of the pickup cable to allow for some deformation of the pickup when it's under pressure.

10) When you've reached your target depth, remove the router jig, and drill a 1/8" hole through the bottom of the saddle slot for the pickup. Drill at one end at a 30 to 45 degree angle. Try to avoid drilling through any guitar braces, but if it can't be avoided, you are better off with the hole going through close to the guitar top, not at the top of the brace. Also drill a shallow hole at a flatter angle at the other end of the saddle slot, but only into the bridge, not through into the guitar body. This is where you will tuck the end of the pickup to prevent it from popping up when you put the saddle in.

11) Slightly bevel the bottom edges of the saddle so they won't hang up on the saddle slot, and test fit the saddle. The saddle should be a slip fit: not as tight as you might want it on a strictly acoustic instrument, but not a sloppy fit either. It should drop out of the slot if you turn the guitar up side down. You might wax the sides of the saddle so it slides in the slot with minimal friction.

12) When you are satisfied that the saddle fit and height

are correct, install the end pin jack. We use a tool made from the 1/4" diameter section of a guitar cord phone plug with the body of the plug removed. It is soldered to a 18" section of solid core 12 gauge electrical wire. You can insert the plug end through the end pin jack hole, reach it up to the sound hole of the guitar, slip on the end pin jack/preamp, and then guide the endpin jack through the hole in the end block without having to reach inside the guitar. We advise setting the bass trim pot on the preamp to about 1/4 turn up as a starting point for tonal balance.

13) Adjust the 15/16" internal nut so the larger portion of the jack bushing is completely within the hole. Slip on the 3/8" washer and tighten up the 3/8" nut using a small screwdriver, Allen wrench, or nail to prevent the jack bushing from turning while you tighten the nut.

14) Determine where you will want the twin battery holders inside the guitar. Cut the battery leads to an appropriate length, and resolder the leads taking care that the red wire goes to the "+" terminal of the battery pack, and the black wire goes to the "-" terminal. Clean the area where you will stick the batteries with a rag and a little denatured alcohol. Peel off the backing on the Velcro on the bottom of the battery clips, and firmly press in place. Insert batteries. These battery holders only allow you to put the batteries in the correct way. We find the easiest way to put in the batteries is to first put the bottom of the battery into the clip and then press down. You should not have to force the battery if it is in the right way.

15) Thread the pickup up through the 1/8" hole in the saddle slot and pull it up snug, but not too tight. Now tuck the pickup end into the recessed hole you made for it and put in the saddle.

16) You are now ready for a test run on the action. Put on the 1st and 6th strings, and tune up to pitch. Now is the time to double check action measurements and make any adjustments necessary. When you're satisfied with the action, finish stringing up the guitar and bring it up to pitch.

17) You can now plug in the guitar and start testing for string balance and bass trim level. Push back and down on the saddle with a dowel or flat blade screwdriver to allow it to completely seat on the pickup and carefully pick each string. If there is a weak string, push back and down right on either side of that string. This should even out the voicing balance of the strings.

18) You can now make final adjustments to the bass boost trim pot by using the end pin jack insertion tool to move the preamp up to the soundhole to tweak the trim pot, then slide it back into the end block and retighten it in place. When you are satisfied with the overall response of the pickup, put the strap holder nut on, and the job is done.

HOT-RODDING TIMBER-LINE INSTALLATION

There are a couple of "hot rodding" tips we can suggest to squeeze that last few percentage points of high performance out of your Timber-line installation.

1) Cove the bottom of the saddle to match the round coved bottom of the saddle slot. This way the pickup is nearly surrounded by 360 degrees of vibration input. This is best done on a miniature router table made so just the tip of the 7/64" ball end milling cutter can cove the bottom of the saddle using a fence to guide the cut. You will have to make the necessary adjustments in saddle slot depth to account for the saddle slipping slightly over the pickup; or perhaps you will have to make a new saddle.

2) This is primarily for OEM's and builders: Make your bridge with the saddle slot at a back tilt angle of about 7 degrees, compensating the bridge location appropriately to take the new intonation point into account. This will give you much better down pressure on the pickup, and has structural and acoustic tonal advantages as well. This trick takes much of the forward leaning pressure off the saddle, which pushes at the weakest point of the bridge. It also makes the bridge saddle somewhat self correcting for intonation if the action is raised (in which case you'd want the witness point to move flatter), or if the action is lowered (in which case you'd want the intonation point moved sharper).

TROUBLE SHOOTING

In the rare event of trouble, check the following symptoms:

No sound at all when plugged in:

- 1) Did you put in the batteries?
- 2) Check the pickup input on the PC card for a short circuit, and recut the end of the pickup very cleanly with a sharp chisel

String Balance Uneven:

- 1) Push back and down firmly on the saddle on either side of a weak string. This may take some force. You might also try waxing the saddle sides to make it slip easier in the slot.
- 2) Make sure the saddle fit is not too tight and that the saddle bottom is firmly seating on the pickup and not on any obstructions in the saddle slot.
- 3) Try making vertical slots in the saddle from the bottom of the saddle upward to approximately 1/8" from the top of the saddle to make it a bit more flexible. Sometimes the top and bridge pulls up under string tension, causing the slot bottom to no longer be dead straight, and the saddle must bend to conform with the hump in the guitar top.

4) Put thin pieces of copper foil tape available at electronics stores on the bottom of the saddle right under the weak string.

5) Try twisting the pickup around 90 degrees.

CAUTIONS

This pickup is designed for professional installation, not "do-it-yourself" hobbyists. Please do not attempt to put this pickup in a guitar unless you are well qualified to work around fine guitars with power tools. We can bear no responsibility for damage to your guitar due to incorrect installation.

If you or your customer has any doubts about installing this or any other pickup in a guitar, just don't do it. A proper pickup installation is somewhat invasive, and it does involve permanent modifications to the instrument. We do not recommend installing pickups in vintage instruments or in instruments that have high collectible value unless you are very sure that what you want is the best electro-acoustic you can get. Some of the finest luthiers in America have installed our pickups in extremely valuable instruments, and they report little if any alterations in acoustic tone, but if a guitar owner is expecting the worst, they will get it. Go back to the first sentence in this paragraph!

LIMITED WARRANTY

D-TAR offers the original purchaser a one-year limited warranty on both labor and materials starting from the day this product is purchased from an Authorized D-TAR Dealer or as original equipment in an instrument, provided that a qualified, professional repairperson or luthier performed the installation. D-TAR will repair or replace this product, at its option, if it fails due to faulty workmanship or materials during this period. Defective products should be returned to your USA dealer, international distributor, or sent direct to our factory postage prepaid along with dated proof of purchase (e.g., original store receipt) and a RMA number clearly written on the outside of the box. Please call our factory for issuance of an RMA number.

This warranty does not apply to damage to this product or an instrument caused by misuse, mishandling, accident, abuse, alteration, faulty installation or installation by a non-qualified repairperson. Product appearance and normal wear and tear (worn pain, scratches, etc.) are not covered by this warranty. D-TAR reserves the right to be the sole arbiter as to the misuse or abuse of this product. D-TAR assumes no liability for any incidental or consequential damages, which may result from the failure of this product. Any warranties implied in fact or by law are limited to the duration of this express limited warranty.

