

P R E L I M I N A R Y

NECK ANGLE JIG

This tool is designed to set up the appropriate neck angle on the jig and then cut the joint on both the neck and the body of the guitar. Two adjustment knobs allow precise adjustment for both side to side and neck angle positioning. All the joint templates are made in a match set for both the neck and body and indexed to the center of the Jig.

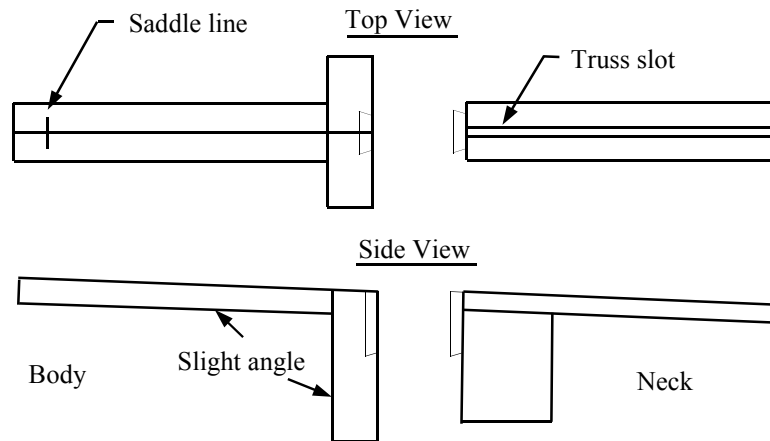
S A F E T Y

W A R N I N G

- | | |
|----------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------|-----------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------|
| <ol style="list-style-type: none"> 1. ALWAYS wear safety glasses or a face shield. 2. DO NOT wear loose clothing, gloves, neckties, or jewelry. Wear protective cover on hair and prevent contact with moving tool. These items can get caught in tool during operation and pull operator into moving part. 3. KEEP children away. 4. KEEP visitors at a safe distance. 5. WEAR a dust mask all times. 6. ALWAYS turn off motor before making any adjustments. | <ol style="list-style-type: none"> 7. NEVER leave running tool unattended. 8. ALWAYS make sure all screws are tight and any hardware is removed from or near tool before starting. 9. SECURE all work pieces before starting. 10. ALWAYS keep knife edges sharp. 11. ALWAYS keep work area clean. 12. DO NOT operate tool if under the influence of drugs or alcohol. |
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R E C O M E N D A T I O N

We highly recommend to put a few practice necks and bodies together out of scrap wood. This is very beneficial in getting used to the tool. The practice pieces do not have to be the actual body or neck they just need to be a representation.



R E F E R E N C E P O I N T S

There are a few reference points that are important to the jig. The first point is the hinge area this will determine how flat and well the finger board will fit. It is also important to complete all the necessary steps to insure a level area for the finger board on the body, such as proper bracing and leveling the dome (figure 1).

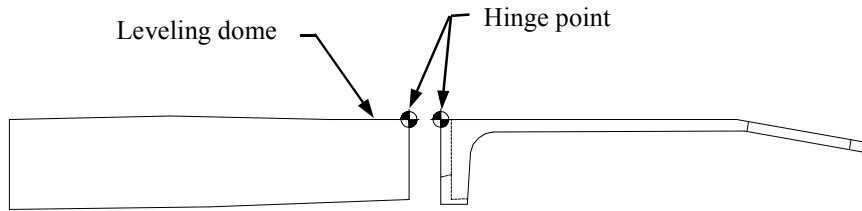


Figure 1

The other reference point or surface is where the neck will be attached to the body (figure 2). This is the area where the small edge vise will be clamped.

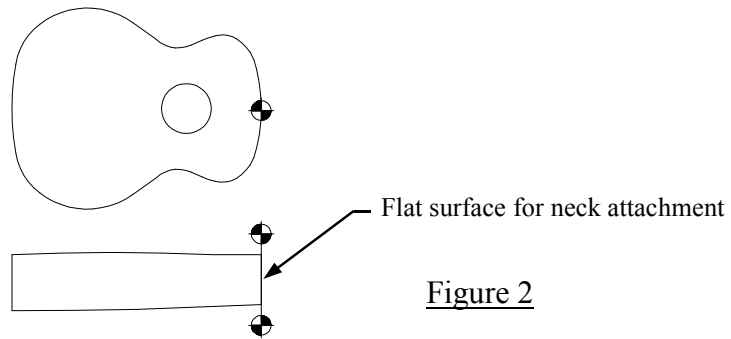
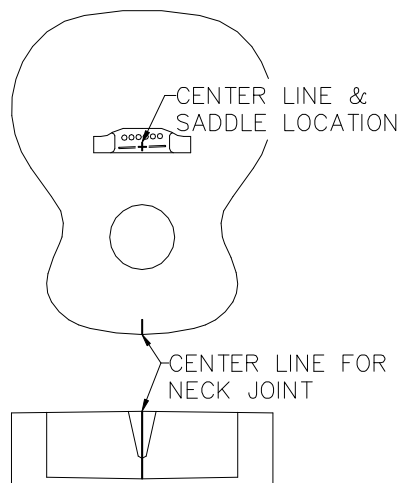


Figure 2

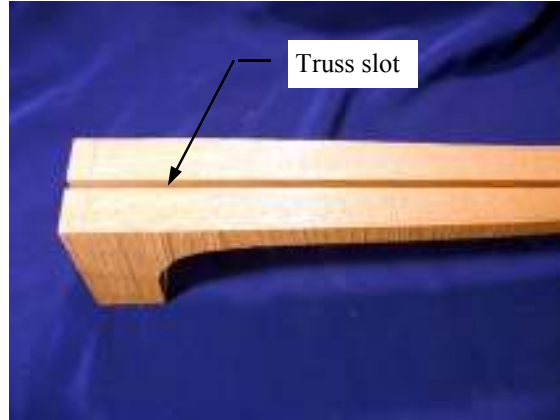
The next reference points or marks are the center line of the saddle and where the neck will be attached (figure 3). It is important to align the small edge vise and the jig in respect to the center line/saddle location.

Figure 3



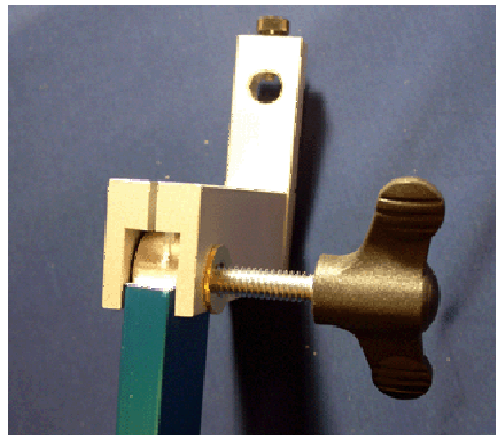
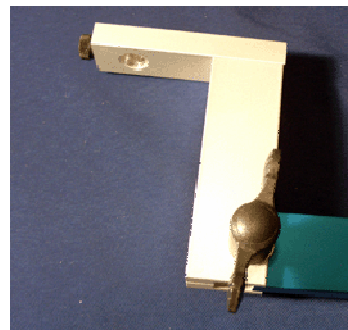
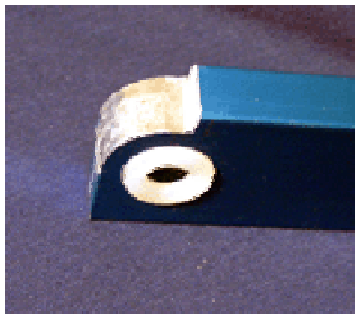
REFERENCE POINTS (CONTINUED)

The last reference is the Truss slot on the neck.



SET UP

The first step is to assemble the Dial indicator arm. Place the two nylon washers in the relieved pocket on the adjustment arm, then place the dial indicator holder over the nylon washers and screw in the wing nut. Once the assembly is complete insert the adjustment arm in block on back of Jig.



S E T U P (C O N T I N U E D)

The Neck Angle Jig consists of two sine plates, one is for side to side adjustment A+, A- (figure 4) and the other for actual neck angle adjustment B+, B-. These surfaces are referenced to the **Reference plane** which is the same plane the body is indexed to. Both of these plate will need to be set up so that they are precisely aligned with the Dial Indicator.

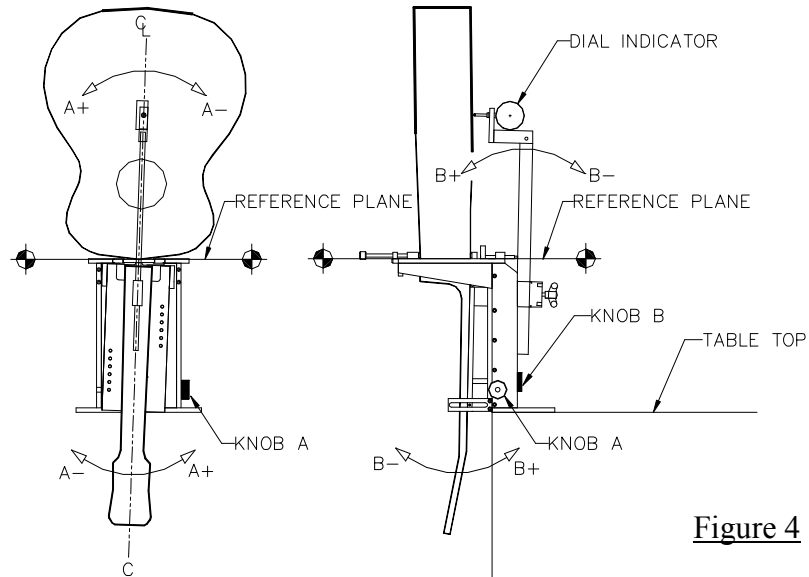
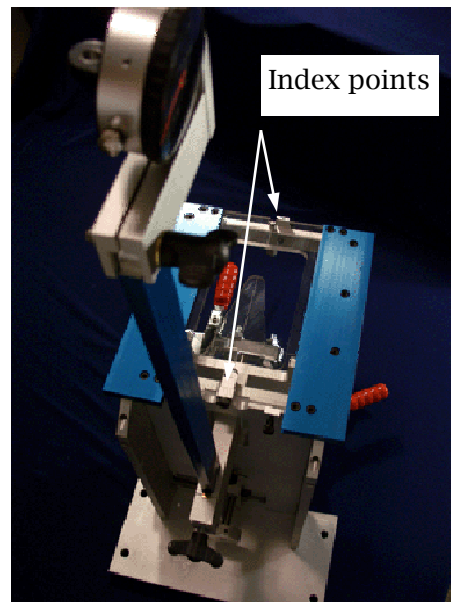


Figure 4

The dial indicator arm is an extension of the inner sine plate (the plate that the neck is clamped to). Because the arm can be adjusted for different saddle heights it is necessary to calibrate the arm with the dial indicator after re-positioning.

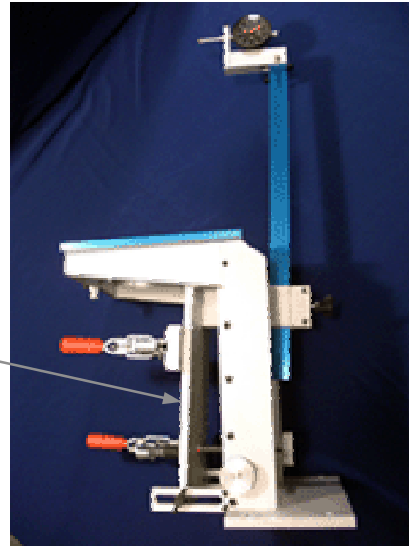
All the templates are indexed to the center of the Jig even the edge vise template this way we can place the body in the Jig for proper neck angle setting.

There are four 3/8" mounting holes on the base to properly attach the Jig to a solid surface. If you do not want to use bolts two heavy duty C clamps will do.

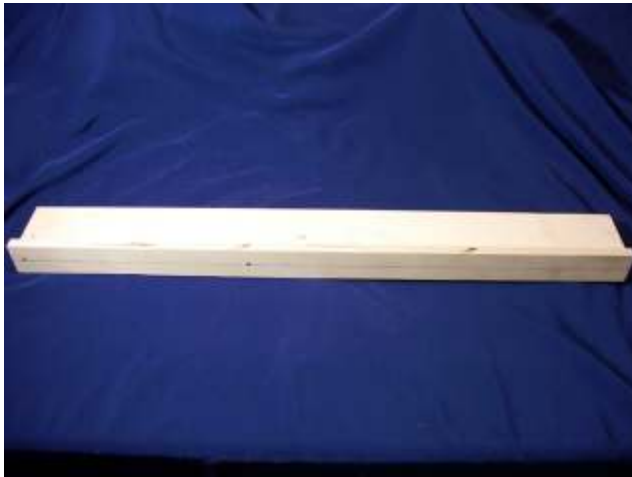


S E T U P (C O N T I N U E D)

The Dial Indicator mounted arm is attached to the inner sine plate . This plate also has the clamps attached to keep the neck secured during the routing process.



Inner sine plate



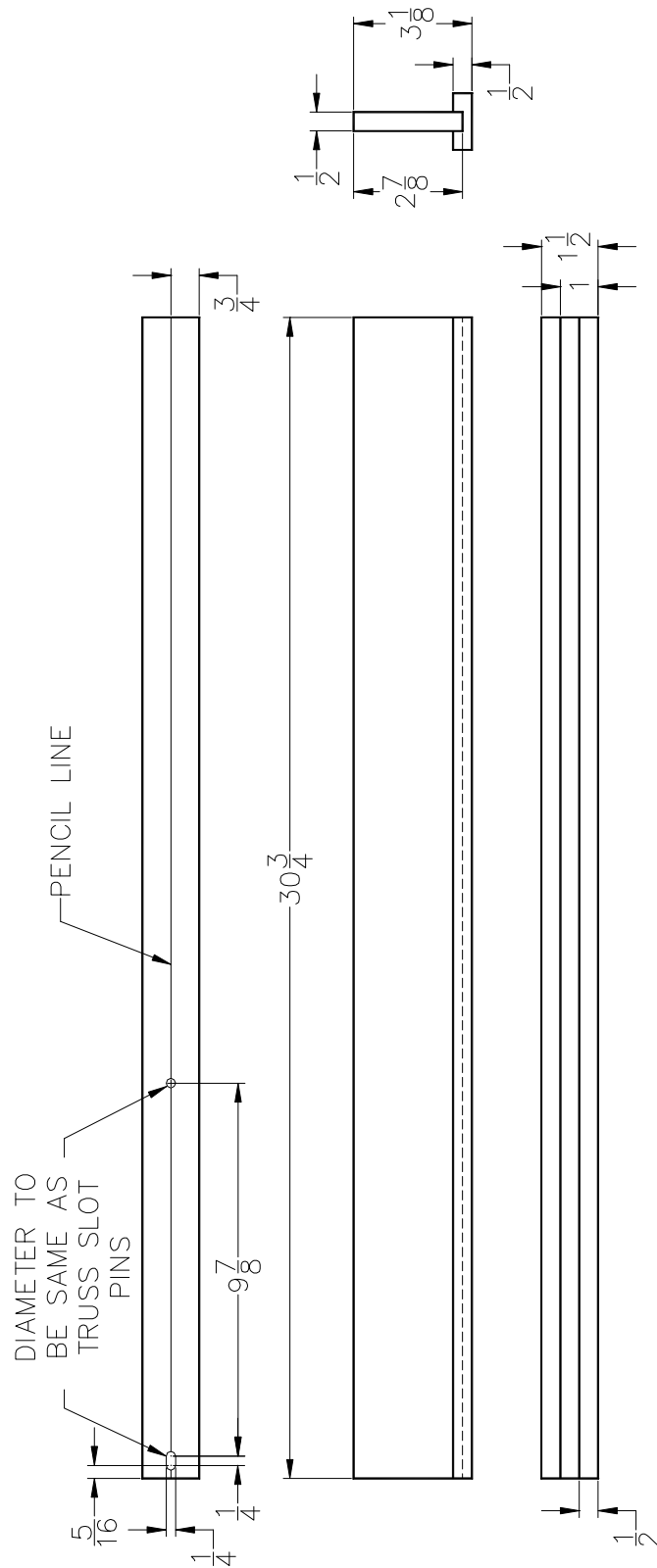
We have to make sure that this plate is calibrated with the Dial Indicator so that the appropriate neck angle and saddle center can be measured. We recommend making a straight edge board using good birch 1/2 inch plywood, making sure that it is absolutely straight.

This board will need to have a straight pencil line down the middle of one surface with two holes, the same diameter as the truss slot guide pins. See next page for dimensional drawing.



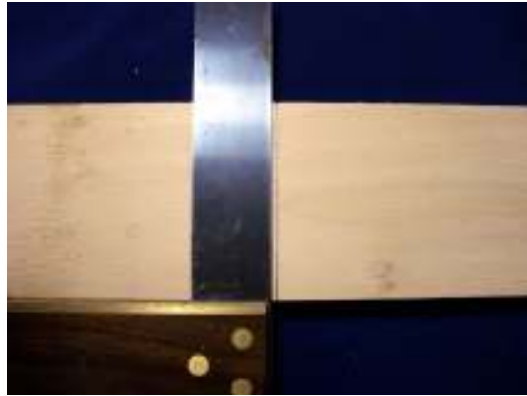
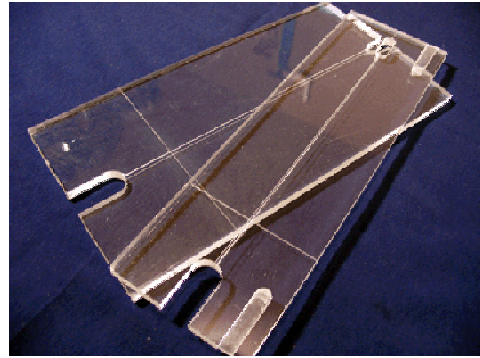
I N S T R U C T I O N S

S E T U P (C O N T I N U E D)

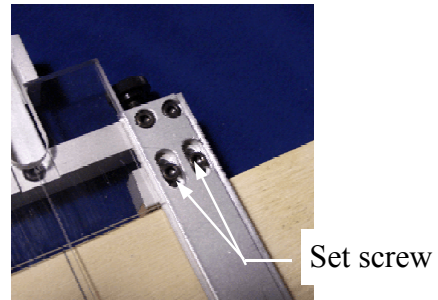
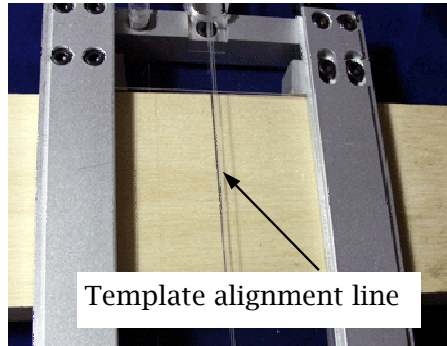


S E T U P (C O N T I N U E D)

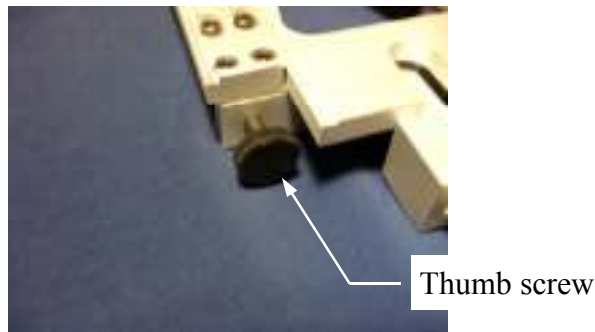
The alignment templates are designed for ease in lining up the Edge vise and Jig with respect to the center of the inner sine plate.



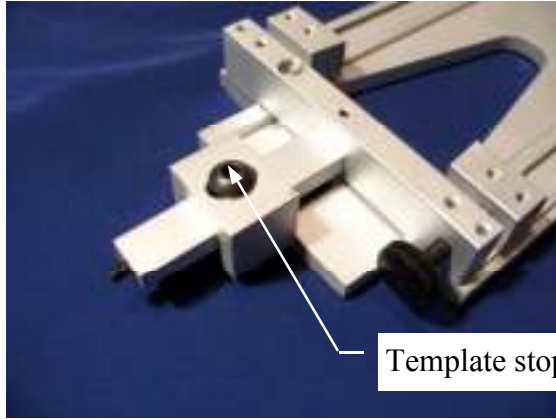
The first step is to make sure that the Small Edge Vise is perpendicular to the hinge point of the body. The best way to adjust for perpendicularity is to have a scrap piece of wood about 4" wide and using an accurate square, draw a pencil line on the wood.



Place the Edge vise on the piece of wood and align the template line with the pencil line. If not the same loosen the two set screws and with the thumb move the edge vise so that both lines line up. Make sure to hold the Edge vise jaws firmly against the wood.



SET UP (CONTINUED)

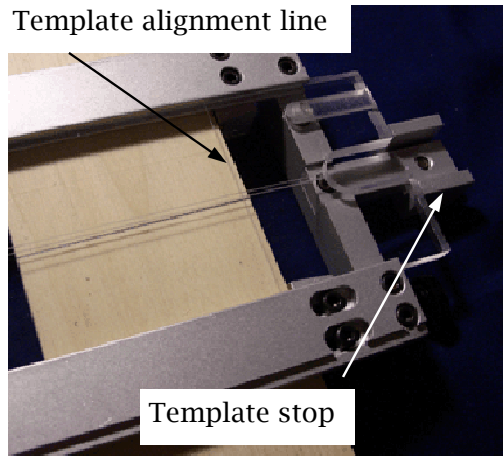


Loosen the button head screw on the template stop.

Template stop screw

Move the template and the template stop so that the horizontal line on the template lines up with edge of the piece of wood.

Re-tighten the button screw and this part of the set up is complete. Double check to make sure that the set screws and thumb screw are tight.



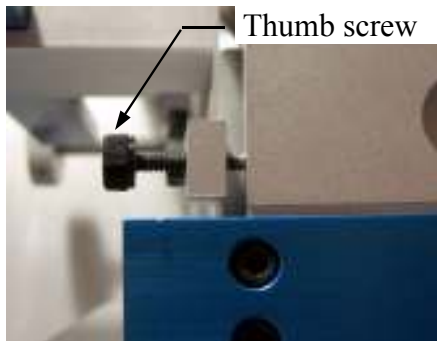
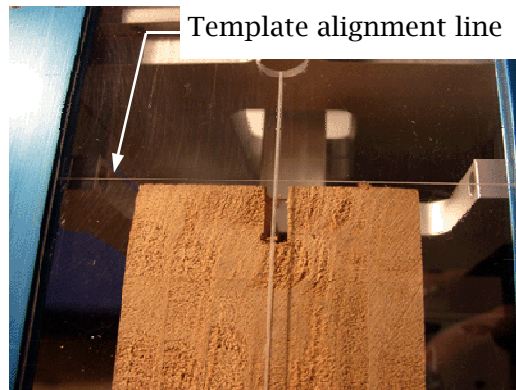
Template alignment line

Template stop

SET UP (CONTINUED)

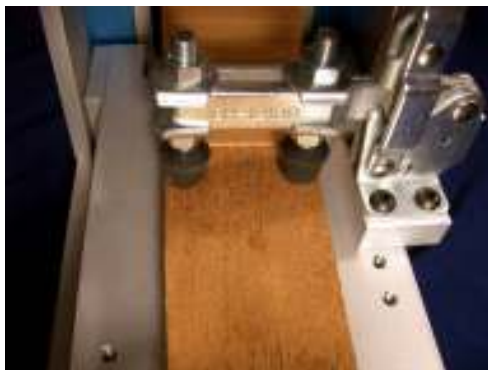
Place a blank neck in the Jig and using the thumb screw, align the template horizontal line with the top surface of the neck.

For Arch tops move the template up to allow for the finger board extension.



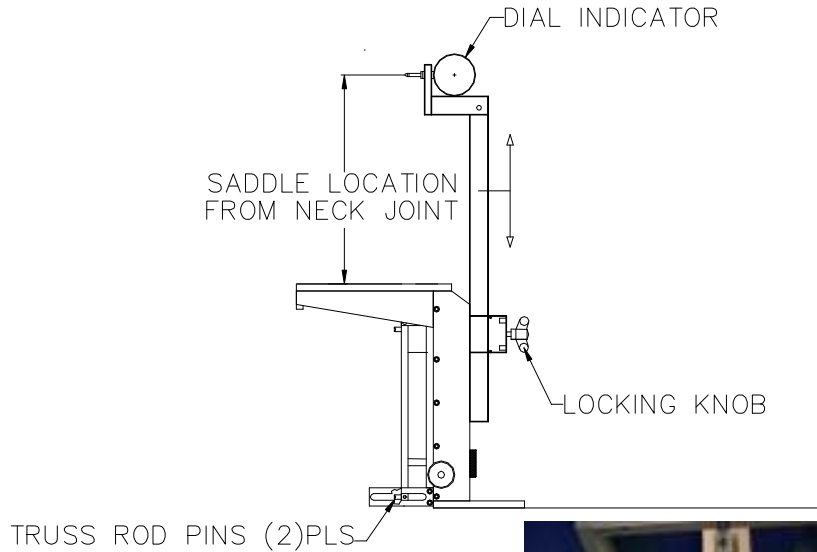
In some cases you may want to leave the neck tenon a bit proud above the body surface to sand the last bit of the neck joint by hand, this can be done by adjusting the thumb screw appropriately.

The last step is to make sure that the clamping spindles are set up. The lower clamp has one spindle where as the top has two. The two top spindles are to insure that the top part of the neck is a absolutely tight against the inner sine plate to prevent any chattering during the routing process. Be sure to keep the top spindles as far apart as practical.

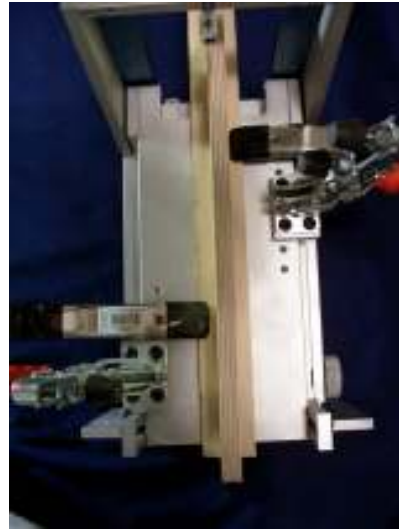


O P E R A T I O N

You can move the height bar up or down to the appropriate saddle location. This location can also be transferred to the straight edge board with a pencil mark for future application.



Place the straight edge board on the inner sine plate truss rod pins of the jig and clamp with two large spring clamps.



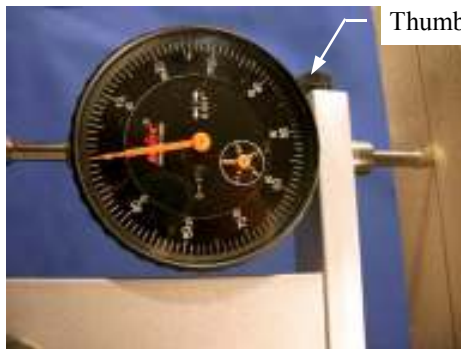
Be careful to pull back the dial indicator plunger before mounting the edge board. At this point we want to align the Inner sine plate center line and angle with the dial indicator.

O P E R A T I O N (C O N T I N U E D)

Loosen the wing nut and move the adjustable arm from side to side so that the dial indicator plunger center is precisely centered on the pencil line of the straight edge board.



The Dial indicator has two pointers. The small pointer will move in 0.100 of an inch and the larger pointer will move in 0.001 of an inch. The goal is to have large pointers point to zero and the small pointer fairly close to a major mark.



Loosen the thumb screw near the Dial Indicator and move it so that the small pointer is on or near a numbered mark, then tighten the thumb screw.



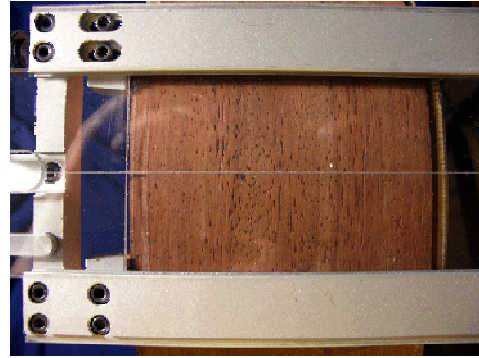
Small pointer

Then with the outside ring rotate the dial until the large pointer is on the zero mark.

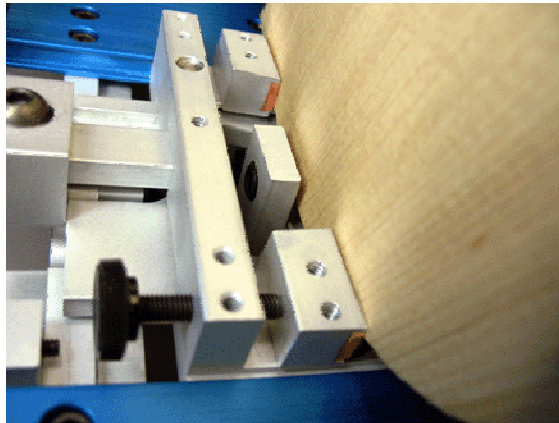
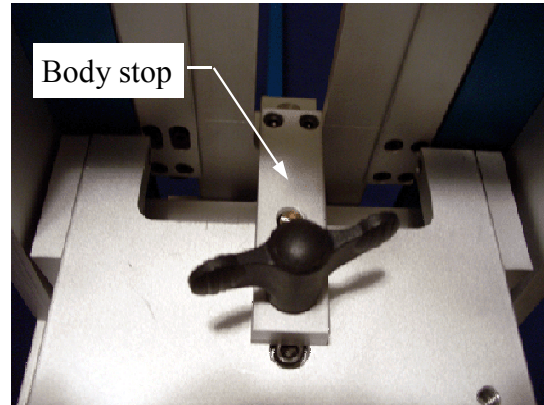
At this point the dial indicator is calibrated to the inner sine plate. It may be necessary to re-zero the outer ring when you re-position the adjustment bar.

O P E R A T I O N (C O N T I N U E D)

Place the Edge Vise on the guitar body and align the body pencil mark with the line on the template and firmly tighten the Vise. Make sure that the vise is seated properly on the body .

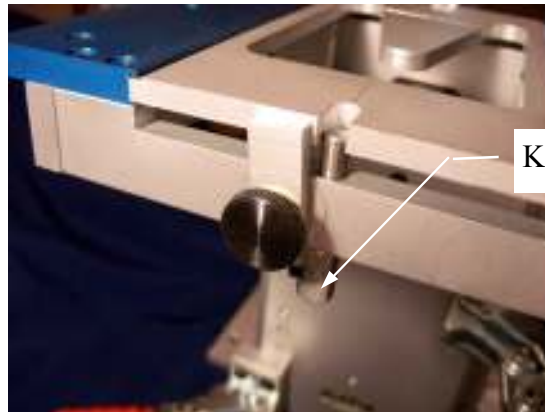


Now slide the guitar body and edge vise into the Jig . Mount the body stop (as shown) and move the guitar body forward until it touches the stop. During the neck angle adjustment process keep the body touching the stop at all times.



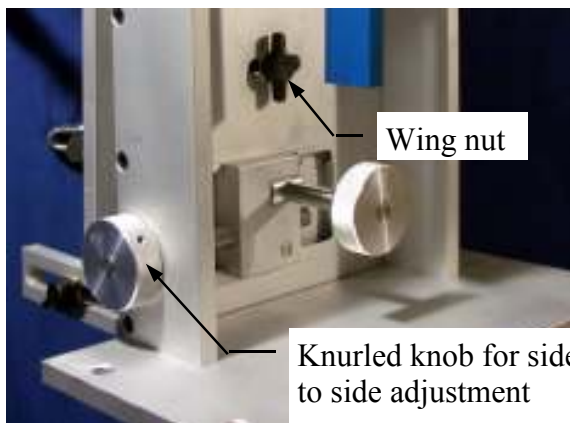
O P E R A T I O N (C O N T I N U E D)

Turn the knurled index knob at the front of the Jig so that the 1/4" shaft slides into the slot on the template . These templates are indexed in two places, both in the front and back, center of the Jig.



Knurled index knob

Side to Side Adjustment



Wing nut

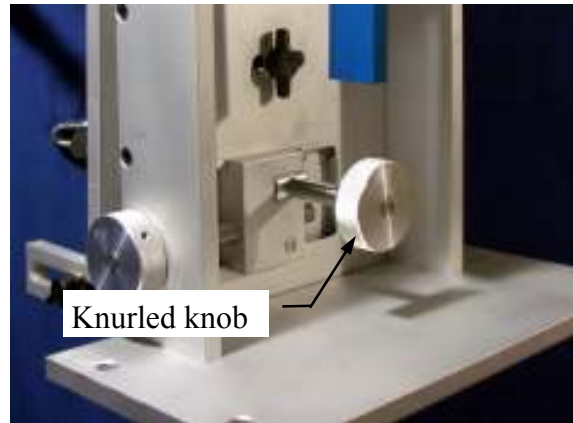
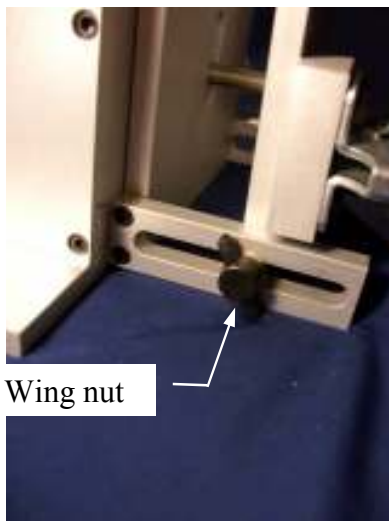
Knurled knob for side to side adjustment

Loosen the center wing nut and with the knurled knob on the side of the Jig, adjust so that the tip of the Dial Indicator is precisely over the saddle center pencil line. Tighten wing nut.

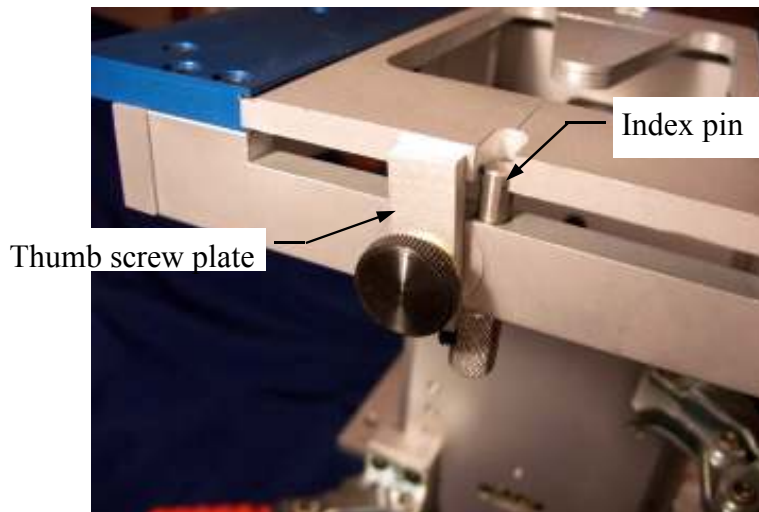
O P E R A T I O N (C O N T I N U E D)

Neck Angle Adjustment

Loosen the wing nuts on both sides of the Jig and with the knurled knob adjust the neck angle until the small pointer of the dial indicator is close to the set mark and the large pointer is on zero. Now you can add *saddle height compensation*. Then tighten the two wing nuts.



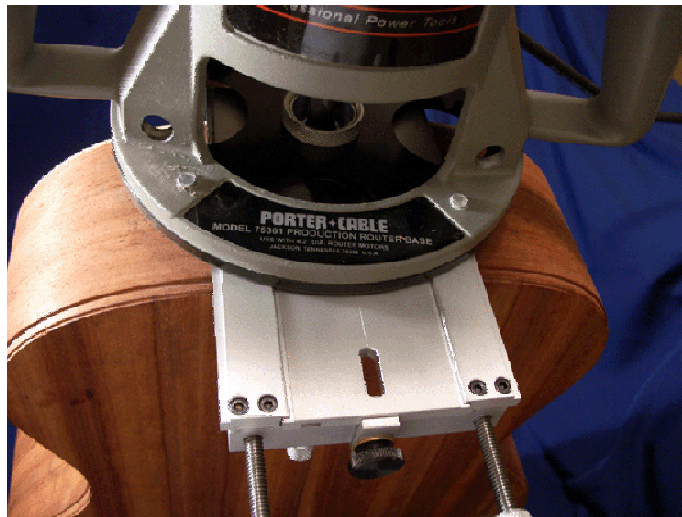
At this point the Jig has been set up for the neck angle. All we have to do now is route out the appropriate neck joints. Remove the guitar body from the jig and insert the appropriate template. Make sure to screw in the indexing pin and tighten the thumb screw plate.



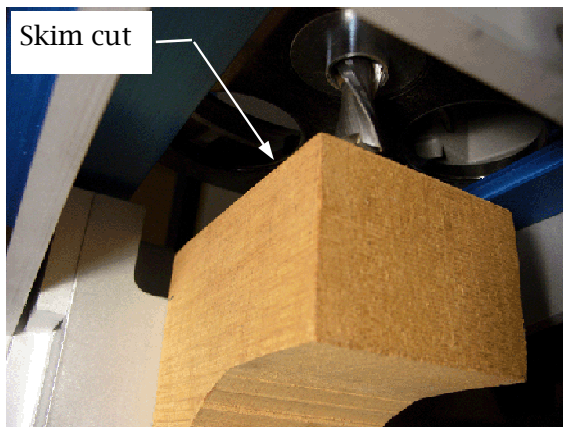
O P E R A T I O N (C O N T I N U E D)

CAUTION

It is very important to secure the body properly before routing out the neck tenon, any large vibration can cause the router bit to take out a large chunk of the wood. Always remove the majority of wood before making the final cut, but **DO NOT** be in a hurry and remove too much wood at one time. Specially with a 1/2" bit it is best to apply a slow feed rate. Practice on a scrap piece of wood to find the correct cutting speed. Also make sure that the Edge vise is secure to the guitar body.



Before routing the tenon you can check the angle by simply making a skim cut on the top of the neck tenon area. Place the neck on the guitar and using a straight edge to check the neck angle and side to side angle. Slight adjustments can be made before the tenon is cut.

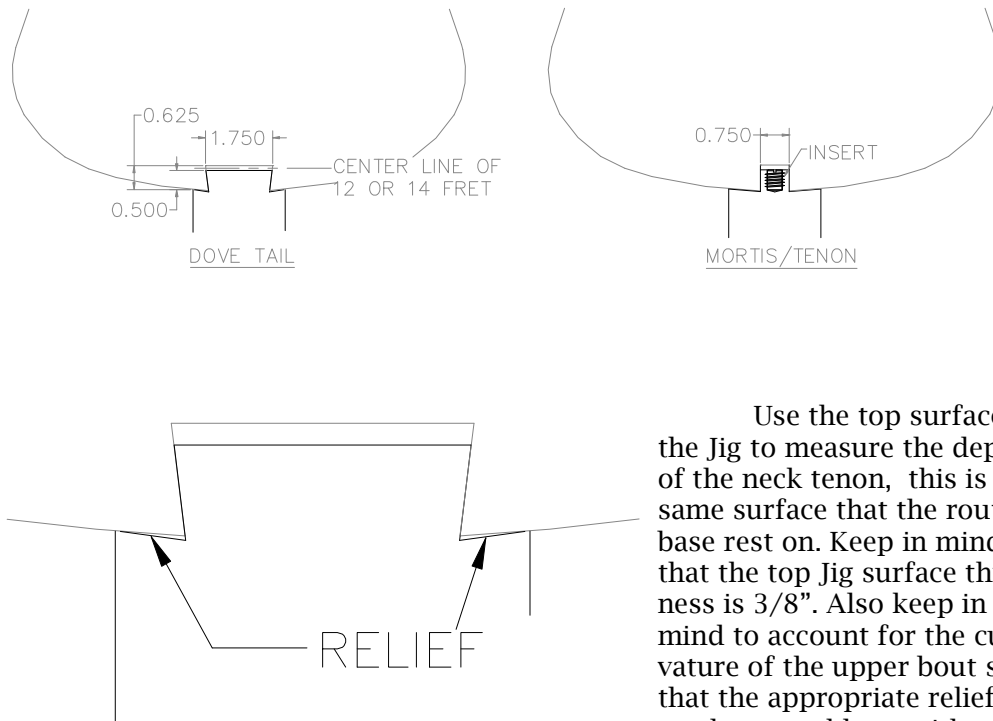


O P E R A T I O N (C O N T I N U E D)

The Dove tail and Arch top templates are designed for 1" router bit extension. The router bit can be set to any desired extension for the Mortise/tenon templates.



Now that Jig is set up you can set the tenon depth. The drawing below shows the typical neck joint for the Neck Angle Jig.



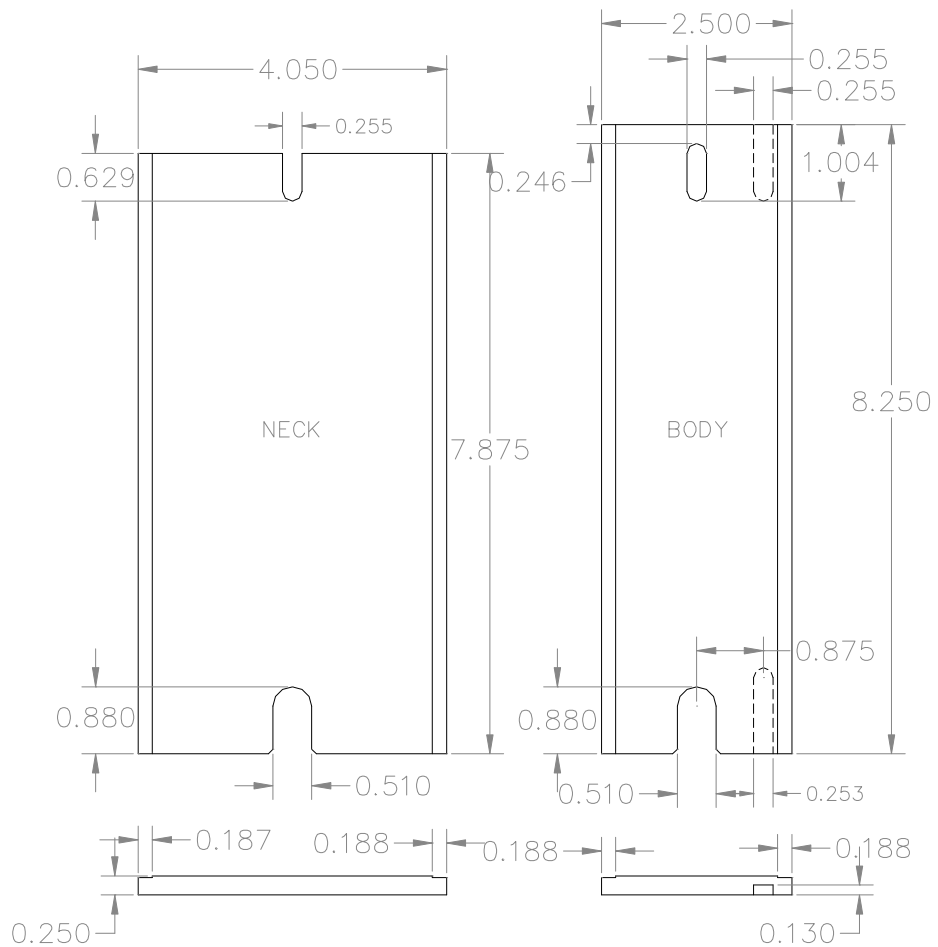
Use the top surface of the Jig to measure the depth of the neck tenon, this is the same surface that the router base rest on. Keep in mind that the top Jig surface thickness is 3/8". Also keep in mind to account for the curvature of the upper bout so that the appropriate relief can be carved later without jeopardizing the tenon depth.

T E M P L A T E S

There are three types of neck templates available.

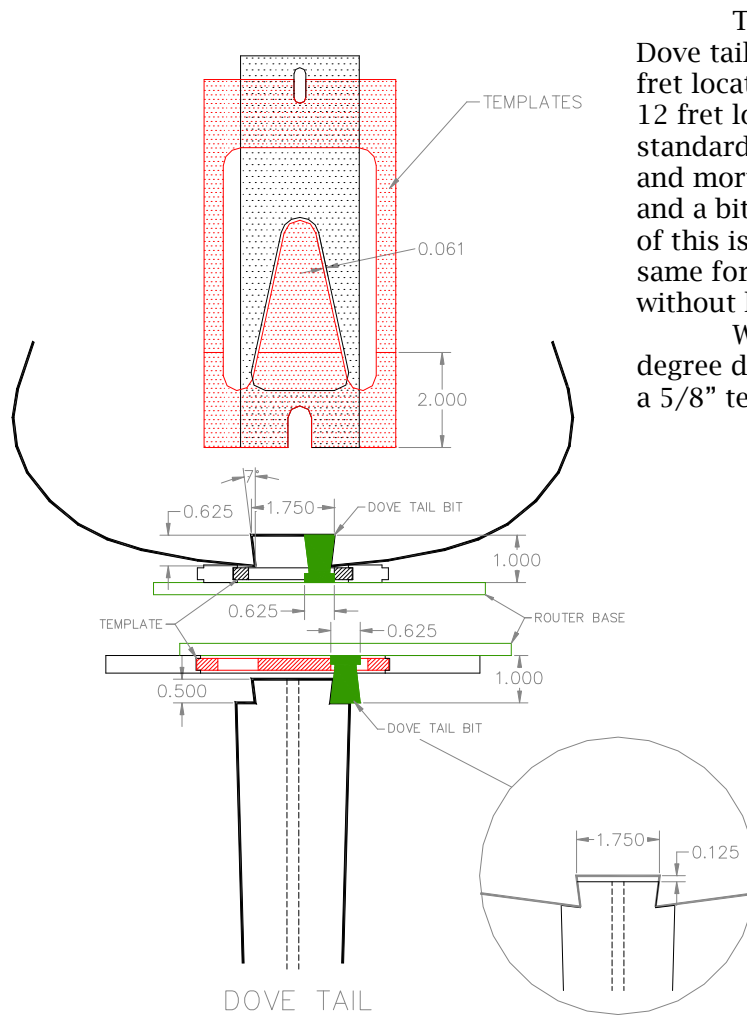
- A. Dove tail
- B. Mortis/tenon
- C. Arch top

The templates are made of 1/4" aluminum, this is to prevent the tong from moving during the routing process.



The above drawing shows the dimensions for both the neck and body templates. These templates can be made from either aluminum or acrylic.

DOVE TAIL

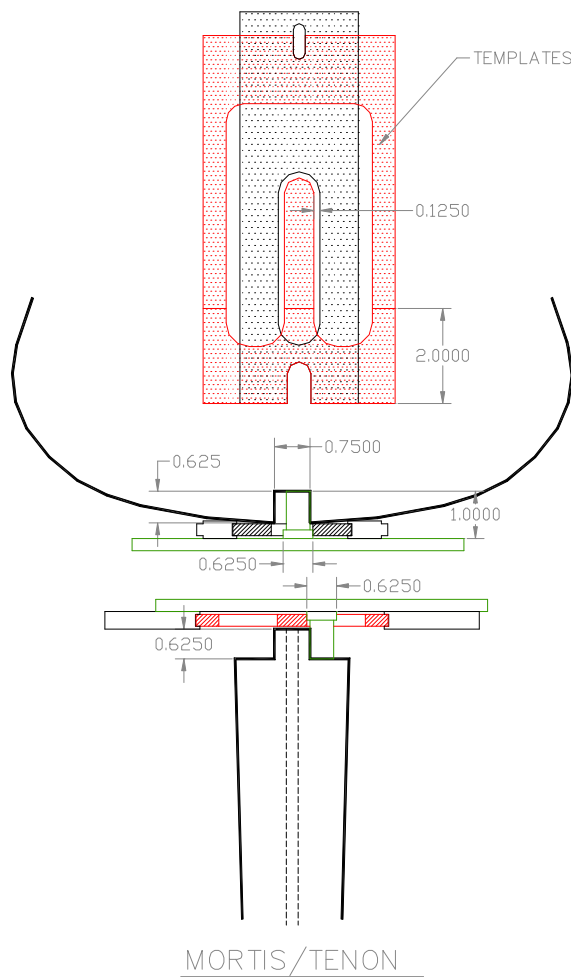


There are two styles of Dove tail templates, one for the 14 fret location and the other for the 12 fret location. We have elected to standardize the depth of the tenon and mortis. 5/8" for ,1/2" for tenon and a bit depth of 1". The purpose of this is to leave the bit depth the same for both the body and neck without having to adjust it.

We recommend using a 7 degree dove tail bit 1/2" shank and a 5/8" template guide.

You may prefer to adjust for neck joint fit. This can be done by adding paper tape to the template edge that requires adjustment.

STRAIGHT MORTIS and TENON



There are two styles of Mortis/tenon templates, one for the 14 fret location and the other for the 12 fret location. The depth of the bit can be adjusted accordingly.

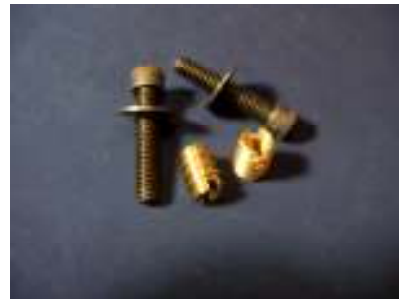
We recommend using a 1/2" diameter bit with 1/2" shank and a 5/8" template guide.

There are also templates available for the drilling and mounting the inserts.

We recommend to mount the inserts before routing out the tenon, that way the chances of splitting the wood will be kept to a minimum.

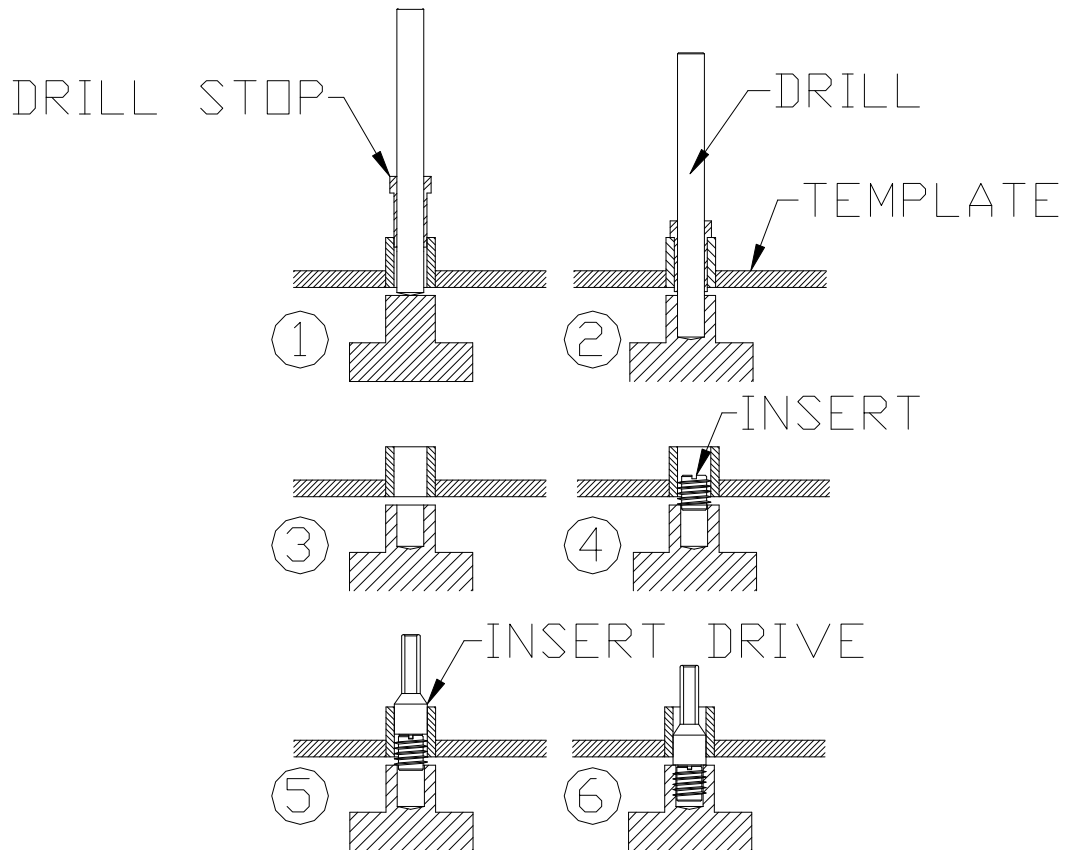
You may want to add some paper tape to the tenon template edge to adjust for fit.

There are two types of inserts available one that is for a 3/8" diameter hole and the other for a 5/16" diameter hole. The insert for the 3/8" hole is designed more for harder woods whereas for the 5/16" hole are more for softer wood.

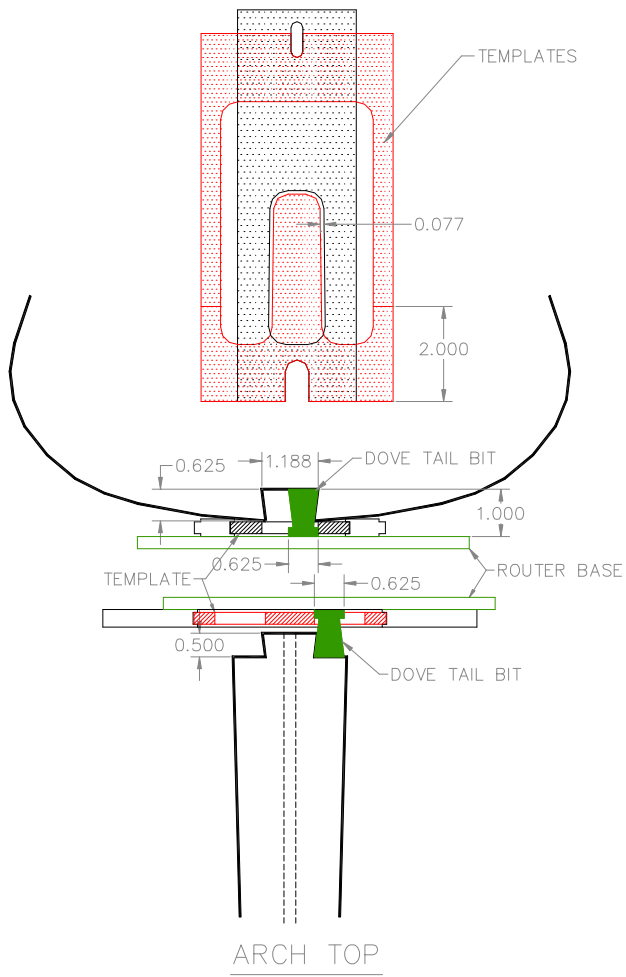


S T R A I G H T M O R T I S a n d T E N O N

Two drill stops are also available 3/8" and 5/16". These stops are designed to fit into the neck drill bushing templates. Drawing below shows a typical sequence for drill and applying the insert. One thing to remember is to turn the insert into the wood slowly and to stop before the insert is completely seated, otherwise it is possible to remove the slot tangs because they are made of brass. Then turn the inserts in the rest of the way by hand.



ARCH TOP



The arch top template is based on the Beneditto joint design, instead of square corners they will be rounded. The template also has a slight taper.