

BYTES & BITES

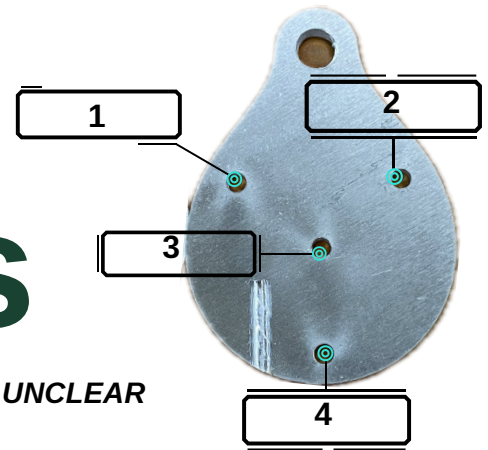
RIVETING WORKSHOP GUIDE



For a Step-by-Step Video Tutorial Please Scan or Go To:
<https://go.hawaii.edu/FPP>



Instructions



PLEASE REFER TO THE VIDEO, IF ANY OF THE STEPS ARE UNCLEAR

1. Place the metal plate (rectangle cavity side up) into the vice and secure it.
 - If using the cam vice, pull the lever down to secure
 - If using other, twist handle clockwise to tighten it

2. Brush cutting oil onto the tap (threaded) drill bit.
Using your **right pointer finger**, push the arrow button to drill clockwise.
 - Ensure you click the side with **the arrow pointing forward**.

You will now thread **pilot holes labeled #1-3**.

- Make sure to drill **directly vertical** and slowly pull the trigger of your drill and let it pull it self down further into the aluminum, don't apply pressure.
- **Do not go all the way through**. Stop when most of the the bit has went through.

Once you've drilled through, use your thumb to **press the arrow button pointing in your direction** to drill counterclockwise and slowly raise the drill out of the hole.

Apply more oil and repeat for the labeled holes 1-3 ONLY.

3. Using the **standard drill**, make sure it is on a **low setting and driver mode**. Make sure your drill is **vertical** and line it up with **pilot hole labeled #4**. The metal plate is now complete, **remove it from the vice, and set it aside**.

4. Now install **the plastic piece** into the vice and secure it. Then using the **standard drill**, drill **all of the holes** using the same technique as Step 3.
 - Be sure to go slowly and don't apply too much pressure, the plastic piece is much more fragile than the aluminum.

YOU ARE NOW FINISHED IN THE FABLAB. PLEASE PROCEED TO THE LANAI TO COMPLETE THE REMAINING STEPS



5. **OPTIONAL** Using the sand paper, sand the edges of the plastic piece. Sand out any imperfections on the metal plate this includes the sides as well as the flat portions. For the flat surfaces we recommend to go with the direction of the water jet cut to smooth out your surface.

6. Once sanded, align the plastic piece of the keychain onto the aluminum backing.

Now grab the **two smaller screws** and align it onto holes #1 & 2.

- The screws will secure the plastic piece on top of the metal plate.
 - Guide the screw a little so that it grabs onto the threading within the aluminum.
 - Now grab a **phillips screwdriver** and begin tightening both screws.
 - **Do not tighten all the way yet.**
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7. **Grab the thinner and wider washer, gear, long screw, and lock nut.**

Take your screw and turn it point side up and layer on the gear on the screw and the washer.

- Make sure that the face of the gear (**engraved design**) is **facing down** with the head of the screw.
- For the washer, it is recommended to put the **shiny side up**.

Begin to thread it into the center hole. Once threading has started use the phillips screwdriver to tighten.

- Tighten your center gear to your liking.
- Test this by placing your index and thumb on the top and bottom of the center screw while it is threaded through and then blow through the channel at the bottom.

Now begin to secure the lock nut on the back side of the center bolt.

- Use the wrench to hold the nut and the phillip screwdriver to secure the nut and bolt to lock it in place.
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8.

Now take your pop rivet and stick the thicker side through the bottom hole.

- If the pop rivet doesn't go in that means your plastic and backing don't align. Go back into fab lab and carefully re-drill a hole that goes through both pieces this time.

Once the pop rivet goes through make sure it goes through on the acrylic first.

- The thinner part of the pop rivet will be sticking up.

Place the **thicker washer** on the back side and make sure it is flush with the keychain.

Now **put the rivet gun onto the thin rod** of the pop rivet.

While holding the washer in the back, use your other hand to **squeeze** the rivet gun, you will see it pull the metal through.

Now **squeeze it again** and you should hear a pop which means it locks.

Lastly, **squeeze the rivet gun a third time** to cut the thin rod off.

You have successfully riveted your rivet!

9.

OPTIONAL Place your keychain upside down on the vice and secure it in place. Now can use the engraver to write your name or anything else you would like on your keychain.

Your keychain is complete! Accessorize with other attachments and you're all done!

