

Head Casting Instructions

General Instructions: Some like to paint the head first, some like to install mechanics first, some like to do a combination of both. If you paint first, you risk marring your paint job while working on mechanics installation, but is generally easiest overall if the head is painted first. It can be done, but a lot of care needs to be taken while installing mechanics. If you install mechanics first, you have to take good care not to get paint on the eyes or other parts of the mechanism (eyes can be covered with thin plastic wrap while painting). Although the jaw piece could be painted after installing it, it is definitely easier to paint beforehand. Do the fitting of the jaw (see Jaw installation below) before painting. Not gluing it in yet, but making sure all the fitting is done.

General Painting Instructions: Wash the castings completely with a strong dishwashing detergent (that cuts grease), inside and out. Rinse and dry thoroughly!

Sanding (etching) the castings with sandpaper (100 grit sandpaper is good) will help promote good adhesion of paint or patching/altering putty materials. Be careful not to sand away the details (teeth, eyebrows, etc). It is best to use edge of sandpaper lightly on eyebrow areas). **Note: This sanding (or etching) of the castings is the most important step for good paint adhesion! Be sure not to miss any areas that will receive paint.** Use fresh sandpaper, and replace if it is starting to clog or loose it's edge while sanding. Patching or altering some of the facial features some is best done with a material like Apoxie Sculpt, available here.....

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This material blends and feathers with a little water. If you wish to use other products (like wood dough or similar material), it would be best to do a small test to verify that it will bond adequately to the head casting material. Let patching material fully set up before continuing. As you inspect the casting you may find some areas that have some air bubbles just under the surface, from the casting process. These can sometimes be found on top of the head or top of the ears, but can be in other places as well. Open them up slightly with an Exacto Knife or other similar tool. Fill in with patching material as needed. May need to do some more sanding of patched areas possibly, and is also a good idea to sand or etch these areas (for good paint adhesion), same as you did with the casting itself. Note: **some people can develop an allergic reaction to epoxy putties (eyes or eyelids swell, red patches, blisters, etc. can develop). When in doubt, always wear rubber gloves (disposable latex, nitrile, or vinyl) when working with the uncured material. Most people never have a problem. Some develop a sensitivity over time. Some few have a reaction from the first use of the material and should discontinue use immediately.**

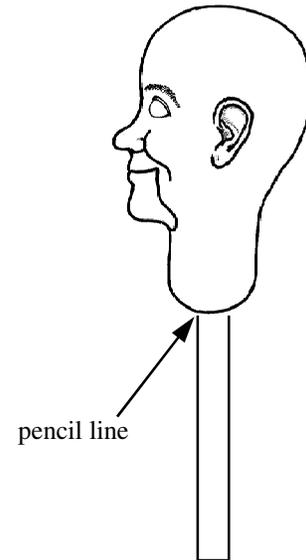
Rinse the castings to be sure all sanding dust is gone, and thoroughly dry before painting. Paint with acrylic or other suitable paint. Acrylic paint is the easiest to work with, and does not need a primer. Artist acrylics, or even bottle acrylics can work fine. If you need to thin the acrylic paint, use an acrylic thinner or extender. Do not thin with water (it will affect paint adhesion!). Make sure to do the above washing and sanding first. If using something other than acrylic, do a small test for paint adhesion and compatibility.

Jaw installation: *Very important to read all the way through the Jaw Installation description before attempting to install the jaw casting.* The installation of the jaw has been simplified with using metal collars. Insert the brass rod into the jaw pivot holes. Hold the rod tightly in your fingers and verify that the jaw rotates freely. Install a metal collar on each rod end, and slide them up next to the sides of the jaw. Tighten the allen screw in the collars very slightly for now, just enough to hold them in place. Set the jaw inside the head, with the brass rod placed in the jaw pivot flanges. ***Important!*** The rod needs to be centered inside the head. There should be a little space between the ends of the rod and the sides of the head, an even amount on each side is the goal. You will have to loosen the allen screws on the collars, move the collars slightly, and retighten (just very slightly tight at this point). After doing this, verify that the jaw still rotates freely. ***Important! If the collars are tightened too snugly against the side of the jaws, they will rub and the jaw will not swing freely.*** Do a dry fit of everything to make sure that the jaw and axle fit properly inside the head, and that the fit of the jaw is good inside the mouth opening. Do any minor sanding of jaw opening in the head (along the sides or bottom of opening), if necessary. If the bottom of the jaw is scraping on the bottom of the mouth opening, you can also temporarily put a very small amount of clay into the jaw flanges, to raise the jaw rod up slightly (more info on this in the next step). When you are sure that the jaw rod is centered, and the jaw can rotate freely, you can remove the jaw from the head and then tighten the allen screws. Put the small end of the allen wrench in the allen screw, and tighten with a reasonable amount of force. Now is a good time to paint the jaw and let it dry. If you are painting the head before mechanics installation (eyes, eyebrows, etc.), the rest of the head should also be painted and dry before doing the next step.

Next, roughen the flange area inside head (where jaw axle and brass tube will be mounted) with coarse sandpaper, to promote good adhesion of bonding material. Place the jaw back inside the head, and rotate it. If the bottom of the jaw scrapes the bottom of the mouth opening, there are a couple of ways to handle this. You can put just a little epoxy putty in the jaw pivot flange. The smallest amount is best, toward the inside edge of the flanges. It is also best if the mixed epoxy putty has sat for a little while and is a bit firmer. Set the jaw in place. Test to see if the putty raises the bottom of the jaw enough. If it is too high, you can press the jaw rod down gently into the epoxy putty until there is a small space between the bottom of the jaw and the bottom of the mouth opening. When all looks good, remove the jaw. Remove the putty, roll it into a small ball, and put it back into the jaw flanges on each side. This will give you a fresh start when you actually glue the rod in place.

Use two part epoxy (the syringe type is nice to work with) from hardware store or home improvement store. The 5 minute version works fine, and in some ways is better (will set up quicker). Mix up enough to glue both sides of the jaw rod in place. Disposable latex (or vinyl) gloves (Wal-mart item) are good when working with the epoxy to protect your hands. Take a flat toothpick, and put some epoxy down into the jaw flanges on each side. Set the jaw into the head with the jaw rod down into the flanges. ***Note: Make sure the the allen screws are facing the back of the head. You want to have access to these when the glue dries!*** Check the space between the bottom of the jaw and the bottom of the mouth opening. If necessary, push down gently to decrease the space. Can use a small piece of a business card to help keep the right amount of space there. Add more of the mixed epoxy around the ends of the jaw rod. Don't add too much, but add enough. You don't want it running all over the place inside the head! While it is setting, you can look at the front of the face, and verify that the jaw is centered in the mouth opening. Not a huge worry, as you can always loosen the allen screws and center the jaw later after the glue had fully set. That's the advantage to this arrangement.

Head stick installation: Neck flange opening is made for a 1 1/4" diameter head stick (hardwood dowel from hardware or home improvement center). Roughen the inside of the neck opening (flange inside the neck) on the head casting with some coarse sandpaper. Do not sand too much. You do not want to make the inside of the neck flange bigger necessarily. It is best to have most of the head stick controls mounted (if possible) before gluing it to the head casting. Mark a line with a pencil as to how far inside the neck the headstick will go. Insert the head stick into the neck flange. Take note of where the pencil mark is. Push the control stick inside the head, *past* the pencil line temporarily. You can use the two part 5-minute epoxy (the syringe type). Wear disposable gloves as mentioned before. Mix up enough epoxy to glue the control stick in place. Take a small popsicle stick and apply glue to a small area near the top of the control stick, *from the inside of the head (down inside the neck area)*. Takes a little finesse, but this is the easiest way to get the glue where you want it. Rotate the head stick a little to get the glue applied mostly all the way around the stick. While keeping the head upright, slowly pull the stick back down to where the pencil line is.



Hold the head upright and verify that the head stick positioned correctly (i.e., that the controls on the head stick are facing the right way). Check that the head stick is straight. Check and recheck everything as the glue begins to set up. You can adjust things a little when the glue is partially set, but will not be able to adjust when it is starting to fully set. When you can not move the head stick any more (glue is pretty well set), let the glue further cure before doing more work on the head. An hour or two is usually sufficient with 5 minute epoxy. Set the head aside on some towels or other soft surface while the glue fully sets.

Trap door installation: There are two recessed areas on either side on the trap door casting. These are for access screws that hold the trap door in place. Size 10-24 machine screws can work well if you have access to a 10-24 size tap (and you will need a #25 drill bit). First drill a #25 drill bit hole in the trap door recess areas, drilling all the way through. Then hold the trap door firmly in place on the back of the head, and drill with the #25 drill bit part way into the receiving areas on the head. Then remove the trap door, and drill the rest of the way into the receiving areas on the head with the #25 drill bit. You can not tap the holes with the 10-24 tap. Finally, drill clearance holes in the trap door recessed areas. There's already a #25 size hole there, you just need open the holes enough to get your 10-24 screws through comfortably, without binding. If you do not have access to a tap, you can use some smaller wood screws. The same steps would be used, however, the hole size for the receiving areas (and the clearance holes in the trap) will depend on the size wood screw that you use. You want the wood screws to be tight enough, but not too tight going into the receiving areas. Drywall screws can also work similar to a wood screw.

Other mechanics installtion: For any type of bonding inside the head (e.g, a horizontal rod going across inside the neck for a pulley axle; See my web site or Chapter 7 of my book), you need

to clean it very well as per the instructions above and then, use some coarse sandpaper and roughen the area good. Clean off the sanding dust carefully, and wipe with a damp rag and dry thoroughly. Make sure to use one of the tackier 2 part epoxy putties as mentioned (or test the type of adhesive material you plan on using). In some cases, depending on how critical the item being bonded is (or how much strength is needed), you should also take the Dremel Moto Tool with one of the conical shaped bits and make small, angled, impressions on the inside of the casting (don't get carried away, however) where the epoxy putty will be applied. This helps make a good mechanical bond, using the principle of undercuts (see Chapter 3 of my book) to your advantage. It can also help to rough up the ends of the item being bonded in place (e.g. a horizontal rod going across inside the neck for a pulley axle).

Note: People have asked about the extra casting material found on the top of the head and the top of the trap door piece. This is extra material from the casting process and can first be sanded with rough sandpaper, and then medium grit sandpaper. That's usually sufficient. It is up to you how finely you sand this area. It doesn't matter that much, as this will usually be covered by a wig.

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