**Ludlow Mouthpiece removal and cleaning**

 **So, you think you want to remove your Ludlow Mouthpiece and clean out the throat? Here are the tools you may need:**

1. **Safety Glasses**
2. **A pair of work gloves, not the rubber ones**
3. **A long-sleeved shirt and some cotton rags**
4. **Electric Drill**
5. **Pair of good pliers**
6. **Round steel wire brush to fit the drill**
7. **Several #20 good quality drill bits**
8. **Package of 12 NEW #248 Mouthpiece Screws**
9. **A Ludlow mouthpiece jig**
10. **A 10-30 tap for cleaning out the screw holes**
11. **A few Linotype spacebands**
12. **Ludlow Jarring tool with a good bit**
13. **Largish hammer, I use a small 3# hammer**
14. **Impact Driver with several good bits**
15. **Good flat bladed screwdriver that will fit the head of the #248 screws**
16. **Ludlow slot cleaning handle and blade**
17. **Ludlow handle and sharp throat cleaning blade**
18. **6” knife sharpening stone – PRETREAT NEW STONE BY SOAKING IN A CAN OF WARM 30 WEIGHT MOTOR OIL This will help keep the stones pores from clogging when using it**
19. **Small tube of High Temperature Anti-seize**
20. **A can of A945A Ludlow Lubriclean**
21. **A .029” and/or .021” blade style feeler gauge**
22. **Maybe a new or good used mouthpiece depending on the condition of the one that you are removing**

**My procedure is as follows:**

1. **Heat the machine to operating temperature**
2. **Using the electric drill and the round steel wire brush clean the top of the mouthpiece until there is no brown left on it as well as the holes surrounding the screw heads**
3. **Take the Ludlow Lubriclean and coat the top of the mouthpiece and all screw heads, let sit for about 5 minutes**
4. **Take the Ludlow jarring tool and insert the bit into the screw head, then take the hammer and strike each screw sharply three to four times**
5. **Take the good fitting flat bladed screwdriver and try to back out each screw. Some may come out easily some may be harder and some may not come out at all in this manner.**
6. **After removing the screws that you can, strike each screw head that did not come out three more times with the jarring tool and hammer.**
7. **Repeat step E.**
8. **For the ones that have not come out to this point, you will need to get a little more serious. Using the IMPACT DRIVER with a good fitting bit, strike each screw that has not moved yet a few times to see if they will come out in this way. Using the impact driver could break of mangle the head of the screw.**
9. **If there are screws that still did not come out you will need to use the electric drill and the #20 drill bits and very carefully drill out each screw, ONLY AS DEEP AS THE HEAD OF THE SCREW,**
10. **Once the screw heads are drilled take a couple of the Linotype spacebands and putting one on each side of the mouthpiece between the mouthpiece and the crucible tap the spaceband and try to drive it between the mouthpiece and the crucible to separate the two pieces.**
11. **Once the pieces are separated and the mouthpiece is loose, take a picture of how the mouthpiece is in the slot, there is only one proper way for it to be put back in, then using a pair of pliers, remove the mouthpiece from the crucible, being very careful as they will be VERY HOT.**
12. **Set the mouthpiece aside to cool**
13. **The next thing will be to remove any screws that you were not able to get out previously, this may include using pliers, regular or locking, to grasp the threads if any are still sticking out of the crucible and try to unscrew them. If this does not work then you may have to mount the Ludlow Mouthpiece Jig onto the crucible and drill out the screws that are being stubborn.**
14. **After ALL of the screws have been removed, you will need to clean up the face of the crucible where the mouthpiece mounts, by scraping off any accumulated metal, then using the 6” sharpening stone and some regular 30 weight oil to stone the crucible where the mouthpiece mounts to get a good clean flat surface to re-mount the mouthpiece.**
15. **Once this surface is clean then you need to take a 10-30 tap and clean out the screw holes in preparation for installing the new screws.**
16. **Once the screw holes are cleaned out then you want to put a new screw in each hole and screw them in flush with the top of the crucible.**
17. **After this then you take the handle with the throat cleaning tool and dig out any dirt and dross that has accumulated in the mouthpiece slot. The you need to take a small screwdriver and skim out all of the trash and discard.**
18. **Once the mounting surface and the slot on the crucible are clean, you need to turn your attention to the mouthpiece itself.**
19. **First thing is you check the slot where the metal exits, for a 12-point mold this slot should be .029”, if you are working with a 6-point mold and mouthpiece the slot should be .021”. Make sure the slot if clean and the correct width. Also check the vents on top of the mouthpiece for depth and cleanliness. These vents should be well pronounced and clean so that the air can escape as the plunger descends. If any of these measurements are excessively off then you may want to consider replacing your mouthpiece.**
20. **If all measurements are within range, then you need to clean the holes on the top of the mouthpiece where the heads of the screws will be, so that there is clearance for the heads to settle all the way into them. Then you need to take the 6” knife sharpening stone and clean the bottom surface of the mouthpiece where it will mount with the crucible so they will fit tightly and flat together to prevent any leakage at this point.**
21. **When all is clean then you are ready to re-assemble the parts. Start by placing the mouthpiece in the slot in the correct orientation. YES, there is a proper direction for the mouthpiece to go into the slot, refer to the picture you took previously.**
22. **When the mouthpiece is sitting in the slot correctly, place four screws in, one screw goes in each end on opposite corners and two in the middle holes catty corner from each other. Tighten these screws Robin tight, not Superman tight.**
23. **Let sit for about ten minutes so that all can heat up and settle in. Next starting in the center, put a little of the anti-seize on one of the remaining screws and put it in one of the holes and tighten it. Then do the same for the next screw working out from the center until all holes have screws in them and they are tight. Next remove the four screws that you initially installed and put a little anti-seize on them and tighten them. Next working from the center out, re-tighten all screws, Batman tight.**
24. **Once ALL screws are tight then take your 6” knife sharpening stone and holding it flat and level drag it across the top of the mouthpiece a couple of times. What you are looking for is a shiny surface about ½” in the center where the slot is. This will show that the mouthpiece is flat and no low spots and it will also show that all screws are tight and not sticking up to be hit by the stone and reveal a shiny spot on the screw head. It should not be shiny all the way across just in the center.**
25. **Next remove your mold from the machine and make sure that the bottom surface and the top is clean and void of any build-up. Also making certain that the mounting points are totally clean and there is no dirt or metal present before you re-install it.**
26. **Cast a few blank slugs and see how they look.**

**NOTES:**

**The #248 mouthpiece screws are ½” long with a 10-30 thread. They do make 10-30 screws with ¾” long threads for machines that the hole is stripped out and you need a little more depth.**

**THERE ARE OTHER TRICK THAT I HAVE LEARNED OVER THE YEARS. IF AFTER READING THIS YOU DO NOT UNDERSTAND SOMETHING OR ARE JUST NOT COMFORTABLE DOING THIS, THEN MAYBE YOU NEED SOMEONE TO DO IT FOR YOU!**