

Burner Head Upgrade

Tools you will need:

- Phillips Screw Driver
- Tape Measure or Caliper
- 5/16" Wrench
- 5/8" Wrench
- Needle Nose Pliers
- Cut Wheel
- Paper Towels
- Two Quarters

In order to upgrade your 1st or 2nd Gen Burner you must detach your burner from your boiler or furnace. The 2nd Gen Burner has a silver cylinder heat exchanger underneath the air tube. When you have the burner on a clean work bench the first step will be to take off the Air Turbine and Air Diffuser. With the 1st Gen Burner you need to use the Phillips screw driver to remove two screws, then the Needle Nose Pliers to remove the two standoffs. With the standoffs removed you can take out the bracket holding the Air Diffuser in place. The 2nd Gen Burner only has one screw and the brackets are welded to the Air Turbine. With the Air Turbine removed you can easily remove the Air Diffuser. (Note: Depending on the type of oil used and the amount of time since the boiler was cleaned you may need to take a knife or a scraper to clean up the end of the Air Tube before the Air Turbine and Air Diffuser can be removed without the threat of bending.)

When the Air Turbine and Air Diffuser are removed the next step is to remove the Nozzle and the Igniter. Remove the Igniter first, take your 5/16th Wrench and loosen the screw on top of the igniter so that you can remove the screw by hand. Once you have removed the screw you will need to pull the Igniter out. With the Igniter removed it is easier to loosen and remove the Nozzle. You will need use your 5/8th Wrench, you can use a socket as well. (**Note:** there will possibly be some oil pressure behind the nozzle, especially if you are working with the 2nd Gen Burner; make sure you have plenty of towels and a bucket handy.) Once you have the Nozzle out you will want to plug the Nozzle body with a piece of paper towel to keep the Nozzle Body clear of metal shavings.

With the Igniter and the Nozzle removed it is now time to measure and mark the depth of the area to be cut off. To get an accurate measurement you will need to use the Phillips Screw Driver to remove one of the screws on the side of the Air Tube. (Note: There are three Air Tube screws total, one on each side and one on the bottom. These three screws may be hard to loosen due to buildup on the Air Tube due to standard use, use some caution to prevent stripping of the screws.) Once you have taken one of the screws out you must measure from the center of the Air Tube screw toward the front of the Air Tube. With the 1st Gen Burner you need to measure 1.275" or 1^{9/32}". The 2nd Gen Burner's measurement is 1.15" or 1-5/32". When you have marked the right depth with a sharp point reinstall the Air Tube screw and move onto the next one. Do this for all three Air Tube screws.

Using the three marks you will turn the Burner Head Sleeve so that the Hose Clamp is away from the burner and slide it on until all three marks line up with the Burner Head Sleeve. Be sure that the Burner Head Sleeve is not on crooked. Put a piece of paper towel in the nozzle port to keep out metal shavings. When you have used a sharp point to mark a line around the end of the air tube you will cut the Air Tube using a cut wheel. Once the end has been cut off you will want to smooth and de-bur the end of the Air Tube using a Cut-off Wheel or a Die Grinder. When finished with the cutting, smoothing, and de-burring, you need to use compressed air to blow out the Air Tube.

With the Air Tube cut, smoothed, and de-burred it is time to re-assemble the burner. The first step is to take out the piece of paper towel used to keep the metal shavings from getting inside the Nozzle Body. Then re-install the Nozzle, dip the o-ring and threads of the nozzle in oil before re-installing it. With the Nozzle installed it is now time to install the Igniter. Before you put the Igniter in the Air Tube it is very important to loosen and lift the Ignition Transformer so that the Igniter doesn't catch on the Transformer springs. With the Igniter in place you will want to hand tighten the screw so that the igniter can freely move horizontally but doesn't move vertically. With the one of the two quarters you need to measure the depth of the Igniter. Place the quarter flush with the front of the Nozzle, move the Igniter so that the tips are flush with the front of the quarter. When this has been accomplished, tighten down the Igniter till snug. **(Important! Do not over tighten the Igniter! If over tightened you may crack the ceramic body, which would then render the Igniter worthless)** The next step in setting the correct depths of the Igniter would be to slip the two quarters in between the top of the Nozzle and the bottom of the Igniter, distance should fit the two quarters snugly. The final measurement is

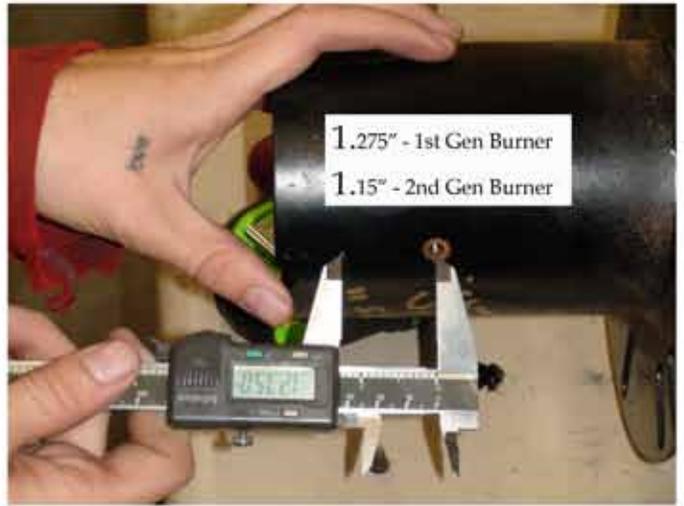
between the two Igniter prongs. This distance should be more than one quarter and less than two. With the Igniter installed you can close the Ignition transformer.

The next step is to install the Air Diffuser. Before you install the Air Turbine and the Burner Head Sleeve you will need to install the Burner to the Boiler. With the Boiler door open you can install the Air Turbine and necessary brackets. The Burner Head Sleeve will go on last with the Hose Clamp side closest to the Boiler door.

If you are installing this on a Buderus G115 you will need to cut a portion of the Boiler door insulation out so the new Burner Head Sleeve's clamp will fit and be accessible. Use a vacuum and brush to clean the front surface of the door pad. Cut out and place the circular template on the front surface of the door insulation so that the I.D. lines up with the burner hole. Use a marker to draw the O.D. of the template out of the door. Measure 1-1/2" from the front tip of a large drill bit and make a mark around the O.D. of the bit, use this mark as a depth gauge to carve out the door pad insulation.

Use your 5/16th Wrench to tighten down the Burner Head Sleeve. The Burner Head Sleeve has the exact number of holes as the Air Turbine has fins. The point of the Burner Head Sleeve is to allow for air to flow from the inside of the boiler over the fins of the Air Turbine in order to effectively clean the fins. The proper installation of the Burner Head Sleeve is imperative for this system to be effective. The Hose Clamp screw needs to be on top of the Air Tube with the back of the holes flush with the front of the Air Tube and the inside edge of the blades. The holes will also need to be positioned so that you cannot see the outer edge of the blades of the Air Turbine.

When you have successfully installed the Burner Head Upgrade you can close your Boiler door and turn on your system.



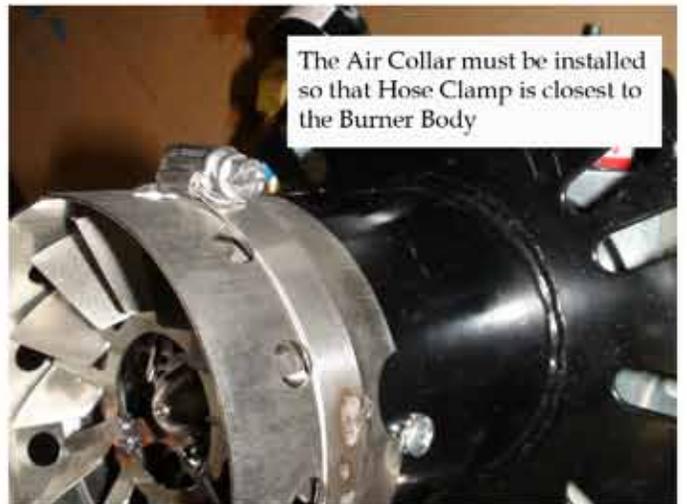




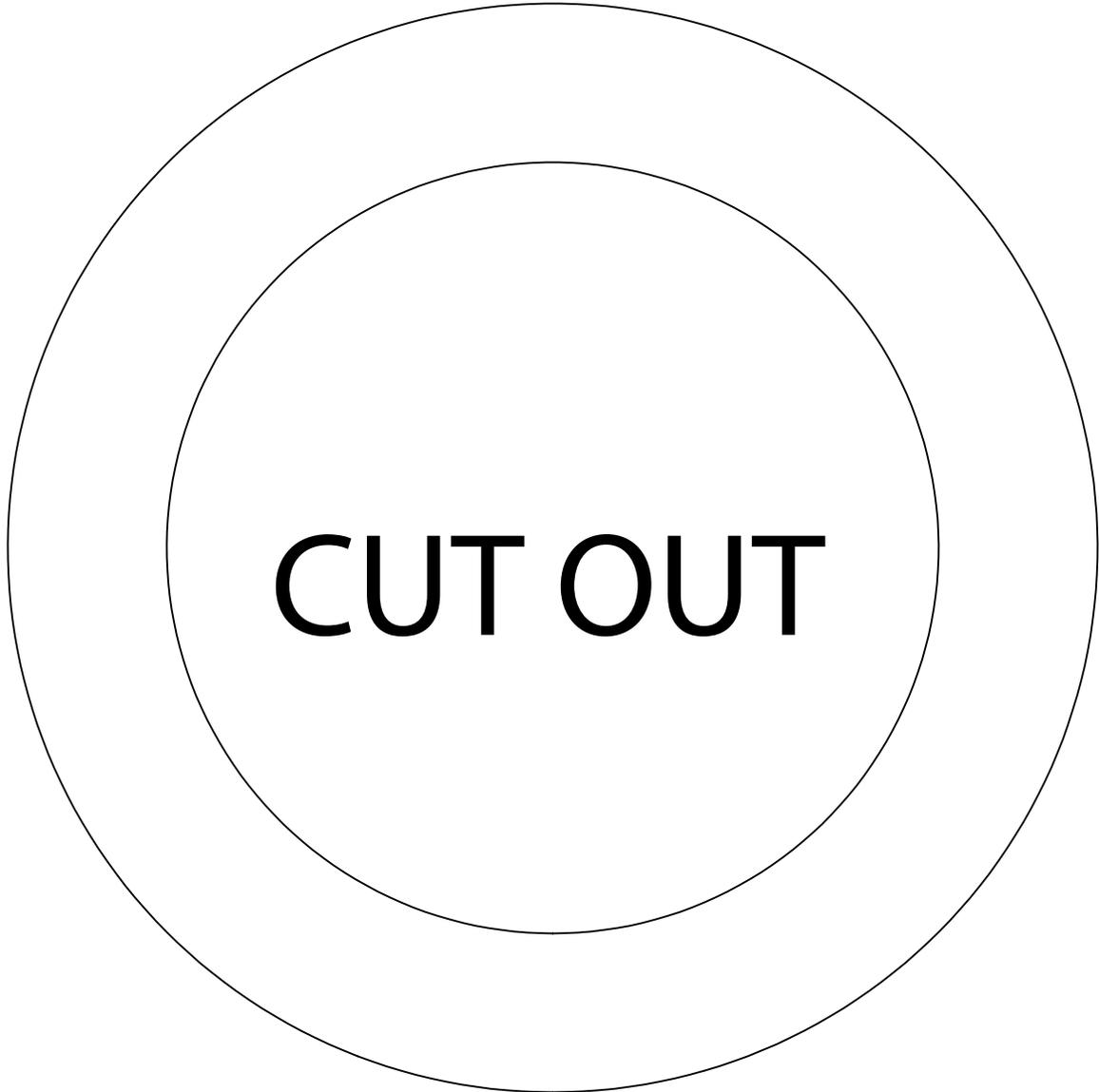
The hole's in the Air Collar are positioned between the fins to allow for air to move across the fins.



The Air Collar must be installed so that Hose Clamp is closest to the Burner Body



CUT OUT



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