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Bryan "Flexible Water Tube"

Tube Replacement Instructions: CL/CLM & HECL/HECLM Models

Bryan Steam, the originator and leader in the production of flexible tube water and steam boilers for over 90 years, is pleased to provide you with the technical and service information you need to keep your Bryan Boiler running. These instructions will give you the information you need to remove and replace tubes on a CL/CLM or HECL/HECLM Model Bryan Boiler.

Here are a few points to consider when inspecting your boiler.

1. Inspect your boiler annually to find and replace bad tubes.
2. These are the two warning signs that a tube is bad:
   - A knocking sound in the tube bank of the boiler indicates a possibly clogged tube.
   - A white ash visible along the bottom of a tube or tubes indicates that the tube is getting too hot from reduced water flow.

Required Tools for Tube Replacement:

- 1" tube puller
- 1" tube driver
- 50/50 mixture pipe dope and cutting oil
- 1" paint brush
- 3 lb. hammer
- 9/16" socket wrench
- half round file
- full round file
- piece of emery cloth
- a tool to bend the tube studs (or small socket/ratchet set)

BRYAN® BOILERS

Originators of the "Flexible Water Tube" design

How to change a CL/CLM or HECL/HECLM model tube:

1. Remove the tube access panel by removing the nuts and clips from around the panel with a 9/16″ socket wrench. For older boiler units you may need to use penetrating oil on the nuts to loosen them and remove the clips. (Additional manpower may be needed to lift off the panel.)

2. Remove the nuts and the tube clamps between each tube. Again, for older units, penetrating oil may be used on the nuts. The CL/CLM or HECL/HECLM models do not have an inside or outside tube, it has one tube that is inverted from end to end. For example, on the first tube on the right, the bottom fitting is in the outside tube hole on the bottom rail of the boiler, but when you follow that tube to the top rail it is in the inside tube hole. On the CL/CLM or HECL/HECLM Boiler, if you want to replace a tube, you will need to remove the two adjacent tubes.

3. Using a 3 lb. hammer strike the sides of the tube to break the seal. Don't use a lot of force and don't strike in the same place consistently or you will flat side the tube. Once the tube is loose, place the tube puller, wedge side to the boiler head, against the tube fitting. The tips may have to be ground slightly after you size it up on the tube fitting. Strike the end of the tube puller until it is tight against the tube fitting, being careful not to drive the tips into the studs. Then, strike the top of the tube puller handle until the tube comes out.

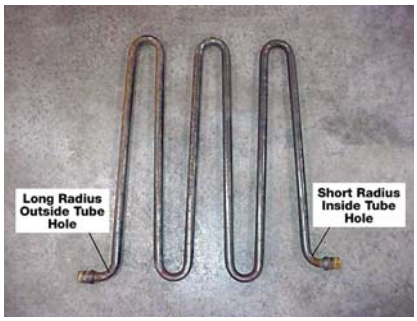
Repeat this procedure with all the tubes you are removing. When removing the back tube, the tube driver can be used as a chisel to loosen the tube. Place the tube driver against the back tube and strike it with the hammer to break the seal on the fitting, again do not hit in the same spot consistently. Fit the tube puller around the tube, there is a slot or a groove on the tube puller that fits right around the stud. Pay attention to how deep you are getting in comparison to the stud because you can bend the stud. Again, drive the tube puller in with the 3 lb hammer until it is tight, and then strike down on the puller handle forcing the tube out of the hole. (At this point it may be beneficial to have some sort of makeshift tool with a hooked end that can reach in and wrap around the tube to pull it out. Once your tube ends are out of their holes, simply pull out the tube.)

4. Check the tube hole for any burrs or marks. It is important to create a clean surface. To clean the tube hole, you can use a piece of emery cloth (60 count works well) or a piece of coarse sandpaper. For bigger burrs, you can use a half round or full round file. You will also need to clean the holes of the tubes that were removed to get to the back tube. After carefully cleaning the hole, take a rag and wipe out the hole and get a fairly dry surface.

5. Apply a lubricant around the hole. A 50/50 mixture of common pipe dope and cutting oil is suggested. The lubricant can be applied with a brush to the inside of the hole, covering it completely. Repeat this process with all of the holes where a tube end has been removed.

6. Inspect the new tube and its fittings before installing. Use the emery cloth to get rid of any burrs there may be and use a rag to wipe the ends clean.

7. Before installing the tube, notice that one end of the tube has a short radius and the other a long radius. The short radius will go in the inside hole and the long radius will go in the outside hole.



8. When inserting a tube, place the tube in the outside hole first. Hold the adjacent tube out of the way and push the tube into the inside hole. It may take two people, one to hold the front tubes out of the way while the other pushes the tube in back holes. A makeshift hook tool is also good for pulling the other tubes out of the way. Repeat the process and push all other tubes into place.

9. Drive the tubes back into place with a one inch tube driver. The tube driver is concave on one end. Fit the concave part against the tube, it does not matter which tube is driven first, and hit the end of the tube driver with the hammer. Continue to hit the tube driver until you hear a solid sound. When you hear a solid sound it means that the tube fitting has been seated in place. Driving the top tube is a little more difficult because the hammer is striking up. Repeat the process to drive the other tubes.

10. When driving the back tube, a stud is in the way and the driver can not fit between the stud and tube to drive the fitting into place. Bend the stud out of the way using a socket wrench or makeshift tool. (A makeshift stud bender can be made from a ¼ inch piece of pipe that has been drilled out to fit over the stud.) When driving the back tube, be careful not to rest the driver on the stud. After the back tube is driven, carefully bend the stud back into place.

NOTE: *Avoid overdriving tubes. Listen for the solid sound when driving the tube and watch fitting heights. The fitting does not have to go all the way down to the boiler head.*

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11. Replace the tube clamps. The clamps are slightly concave on three sides and the concave sides go against the tube. Before replacing the nuts, check the threads on each tube stud because you may have caused minor damage and you might have to recondition the threads. A socket wrench can be used to tighten the nuts until they are snug, you don't need a lot of force.

12. Replace the access panel. When the panel is centered into place, lock it down with the clips and nuts. Notice that the clips in the top and bottom corners are slightly angled out. Use a hammer and hit the clips to angle them in towards the panel. Again, not a lot of force is needed. (By angling the clips inward you create a better seal.)

Specifications subject to change without notice.
Consult factory to consult on other boiler options.

BRYAN® BOILERS

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