

# ASSEMBLY AND DISASSEMBLY INSTRUCTIONS FOR

# CLASSIC RADIATOR

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The following instructions are necessary only when non-standard sized Classic Radiators are required. U.S. Boiler Company ships packaged Classic Radiators in 3, 5, 7 & 9 section assemblies.



## I. Reverse Threaded Nipple

- A. The individual sections of the classic radiator are fastened with a reverse threaded steel nipple. This unique nipple has right-hand threads cut on one half and left-hand threads cut on the other half. See Figure 1.



**Figure 1: Reverse Threaded Nipples and Gaskets**

- B. The nipples feature two (2) crimped knobs on the interior surface. These knobs provide a means by which to turn the nipples when inside the radiator.
- C. The threaded nipples are straight (not tapered) BSP threads.
- D. All Classic radiator sections have right-hand BSP threads on one side and left-hand BSP threads on the other.
- E. All nipple connections must be accompanied by a gasket. The gasket provides the seal as it is compressed between two (2) radiator sections.

## II. Assembly Tool Kit

- A. In order to assemble/disassemble Classic Radiators, an assembly tool kit is required. The U.S. Boiler Company part number for the assembly tool kit is 6054001.
- B. The tool kit contains the following parts:
1. (1) 33" shafts with keyed end (see Figure 2)
  2. (2) 21" shafts with keyed end (see Figure 2)
  3. (1) Lever arm (see Figure 3)



**Figure 2: Keyed End Shaft**



**Figure 3: Lever Arm**

### III. Preliminary Preparation

- A. Prepare a workstation by placing two (2) 2 x 4's of lumber on a level surface in a "rail arrangement" as shown below. Place the 3 1/2" dimension of the lumber down.
- B. Space the 2 x 4's apart so that the center to center dimension is approximately 15".



Figure 4

### IV. Disassembling

- A. Place the Classic Radiator that needs disassembling on the prepared wooden rails so that the tappings of the radiator point toward the ends of the wooden rails as shown in Figure 4.
- B. Using the wrench from the tool kit remove the two (2) bushings from both of the end sections to provide access to the threaded nipples between the various intermediate sections. Note that one end section will have bushings marked with an "R" designating right-hand threads, and one end section will have bushings marked with an "L" designating left-hand threads - remove bushings with an R by turning counterclockwise and those marked with an L by turning clockwise. Also remove the gaskets between the bushings and the face of the section tappings. See Figure 5.



Figure 5: End Bushing and Gasket

- C. Determine which sections of the radiator require disassembly and select an appropriate nipple location to begin the disassembling process.
- D. Using a keyed shaft from the tool kit, place the shaft on the exterior of the radiator precisely where it must be located in order for the key to align with the crimped knobs of the threaded nipple inside the radiator. Assume that the exact center of the crimped knobs are located at the point where the two (2) radiator sections are joined.
- E. Mark the shaft at the point where it meets the tapping face of the end section (this is where the shaft will visibly exit the radiator when placed inside the radiator) with chalk or a pencil as a point of reference. See Figure 6.



Figure 6

- F. Place the shaft into the radiator by entering the tapping of the end section. Using the mark, identify the correct placement of the key.
- G. Turn the shaft until the key has made solid contact with the crimped knobs.
- H. Into the socket head of the shaft insert attach the lever arm.
- I. Proceed to loosen the nipple only after verifying the correct placement of the shaft with the marking made. Loosening the nipple may require clockwise or counterclockwise motion and is dependent upon which end the radiator is approached from. When entering the radiator where the end section is marked with "NF", turn counterclockwise to separate the sections. When entering the radiator where the end section does not contain the "NF" designation, turn clockwise to separate the sections.

- J. After loosening the first threaded nipple do NOT completely remove the nipple. Loosen the corresponding nipple at the opposite end of the radiator by repeating steps F through I. When this nipple is loose turn several revolutions. Alternate between the two (2) nipples, giving several revolutions to each one in order to uniformly remove the sections from one another.

### NOTICE

**Failure to alternate loosening revolutions from one nipple to another may cause damage to the threaded nipples and/or the sections.**

- K. Repeat steps D through J to disassemble other sections of the radiator as necessary.

### NOTICE

**Cast iron sections can be damaged if dropped. Handle sections with care when disassembling them.**

## V. Assembling

- A. Place the Classic Radiator sections to be assembled on the workstation in the order that they are to be assembled. It is critical to verify that the sections are all facing the appropriate direction so that all joints contain a left and a right thread. To do this, check each section for the "NF" designation, making sure that this marking is facing the same direction on all the sections.
- B. Inspect all tappings ensuring their cleanliness and the absence of any debris. Clean any threads thoroughly that contain debris.
- C. Clean the tapping faces of the sections to be assembled to provide a smooth surface for the gaskets to seal against.
- D. Select two (2) sections or section assemblies with which to begin the assembly process.
- E. Begin threading a threaded nipple into either of the two sections being assembled. Remember that one section will have right-hand threads at the joint and the other section will have left-hand threads at the joint. The section with the "NF" marking facing the joint will contain the left-hand threads. See Figure 7.

**NOTE: When assembling radiator sections, always use new threaded nipples and gaskets - discard all previously used nipples and gaskets.**

- F. Begin threading a second nipple into the opposite end of the radiator.



Figure 7

- G. Back both threaded nipples out of the section tappings without removing them from the sections. This will ensure that the nipples get threaded into both sections as evenly as possible.
- H. Place a gasket over both of the threaded nipples.
- I. Carefully position the two (2) sections to be assembled so that the threaded nipple is in contact with the tappings from both sections.
- J. Using a keyed shaft from the tool kit, place the shaft on the exterior of the radiator precisely where it must be located in order for the key to align with the crimped knobs of the threaded nipple inside the radiator.
- K. Mark the shaft at the point where it meets the tapping face of the end section (this is where the shaft will visibly exit the radiator when placed inside the radiator) with chalk or a pencil as a point of reference. See Figure 8.
- L. Place the shaft into the radiator by entering the tapping of the end section. Using the mark, identify the correct placement of the key.



Figure 8

- M. Turn the shaft until the key has made solid contact with the crimped knobs.
- N. Carefully begin the threads by turning the shaft by hand in the appropriate direction. When entering the radiator where the end section is marked with "NF", turn clockwise to draw the sections together. When entering the radiator where the end section does not contain the "NF" designation, turn counterclockwise to draw the sections together. Continue drawing the sections together by hand until substantial resistance is encountered, alternating rotations between the two (2) nipples to draw the sections together evenly.

- O. Keeping the key in contact with the crimped knobs of the threaded nipple, insert the lever arm into the socket head of the shaft. Continue drawing the two (2) sections together evenly until the faces of the two (2) sections mate. Assure that the gasket matches up to both section faces properly.
- P. Tighten the threaded nipples to 145 ft. lb. - 180 ft. lb.

To achieve the proper torque ratings with the tool kit provided use the following formula:

$$\text{Torque} = \text{Distance (ft)} \times \text{Force (lb)}$$

Using the tool kit, if 85 lbs. of force is directly applied to the end of the 21 inch (1.75 feet) long lever arm the torque applied to the nipple would be:

$$\begin{aligned} \text{Torque} &= 85 \text{ lb.} \times 1.75 \text{ ft.} \\ &= 149 \text{ ft. lb.} \end{aligned}$$

In order to get the desired minimum torque rating of 145 ft. lb. on the push nipple using the tool kit, approximately 83 lb. must be applied to the end of the lever arm.

### NOTICE

Failure to alternate tightening revolutions from one nipple to another may cause damage to the threaded nipples and/or the sections.

### NOTICE

Two end sections with legs can support a maximum of 16 total sections (including the end sections). Radiators greater than 16 sections long must contain an intermediate section with legs for proper support. Multiple intermediate sections with legs are necessary for radiators greater than 31 sections long. See Figure 9.

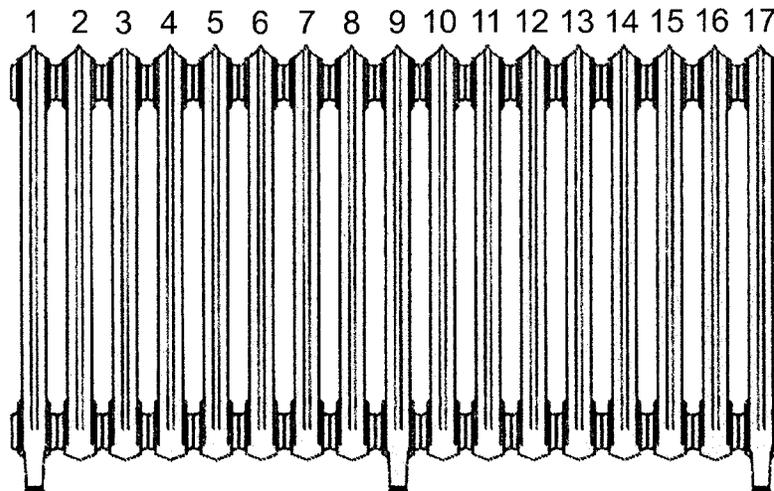


Figure 9

## VI. Repair Parts

Description	Part Number
Touch-up Paint, Dark Graphite Color, 2 oz. bottle with brush	8054016

All Classic Radiator Repair Parts may be obtained through your local U.S. Boiler Company distributor. Should you require assistance in locating a U.S. Boiler Company Distributor in your area, or have questions regarding the availability of U.S. Boiler Company products or repair parts, please contact U.S. Boiler Company Customer Service at (717) 481-8400 or Fax (717) 481-8408.

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