H-04: Replace Power Cable (Water-Cooled)

SAFETY FIRST

- ☐ Follow all Caterpillar facility safety standards when performing this task.
- ☐ There is a heat hazard if the water temperature isn't adjusted at the heat exchanger.
- ☐ The area is low lit, observe caution.
- ☐ Ensure that the preparation for entry procedures has been completed.

EQUIPMENT

- ☐ Maintenance Mechanic hand tools
- ☐ flashlight

RESOURCES

- ☐ Furnace Cooling Water Connections Schematic

Replace Power Cable (Water-Cooled)

Warning: The water supply side must be turned on every 15 minutes even if the replacement cable is not available. Let the water run onto the floor. Allow the water to run through the copper coils until the water is cool. The temperature inside the furnace is 2700 degrees Fahrenheit.

Note: For this job aid the yellow side of the Furnace Cooling Water Connections Schematic has the defective cable.

Preparation

1. Upon notification from the Melt Controller in the control tower that the furnace went to ground, prepare to replace the power cable, if a water leak is detected around the furnace.

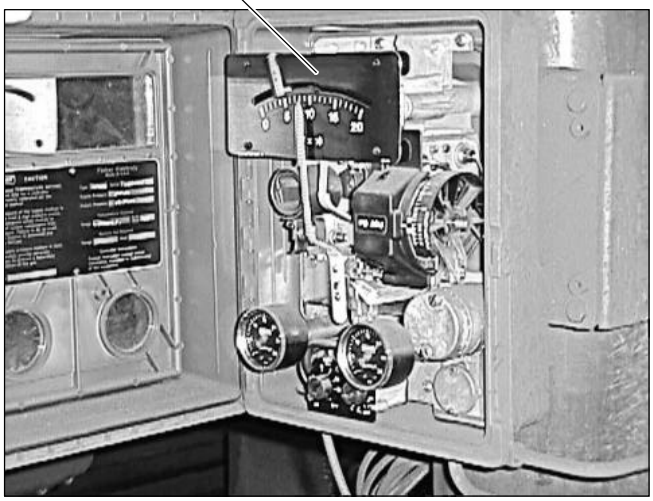
2. Notify the power crew or an Electrician to prepare the furnace for entry.

3. Remove one of the three keys from the key block and put it in your pocket.

   ☐ Removing the key ensures that the electrical power will not accidently be restored to the furnace area.

4. Determine what is causing the leak.

5. Move the lever to zero to reduce the water temperature at the heat exchanger. See the figure below.

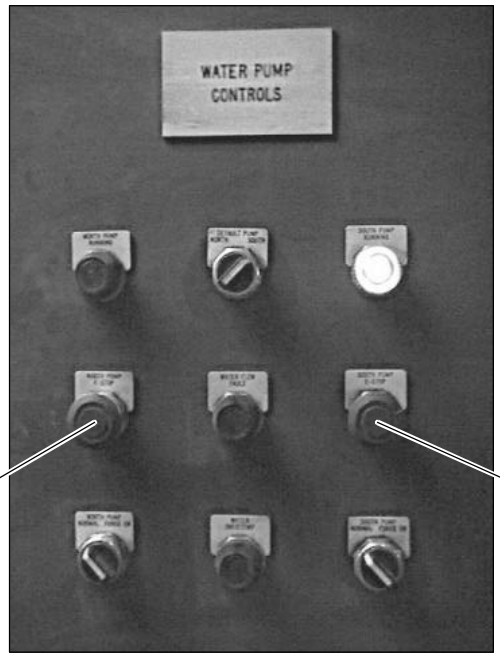


Heat Exchanger Water Temperature Control

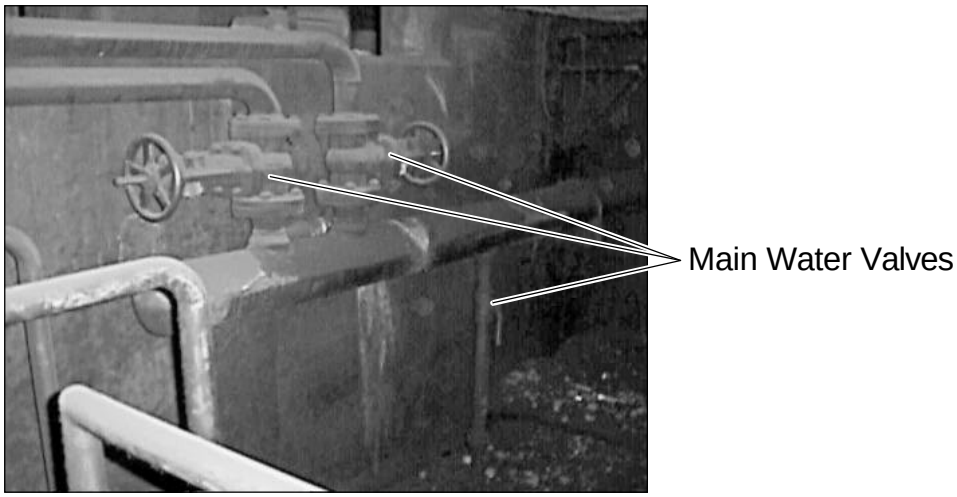
Note: The water is approximately 100 degrees Fahrenheit and must be reduced to approximately 80 degrees Fahrenheit. It will take about two minutes for the water to cool down.

6. Shut off the water pump on the water pump control panel in the pump room.

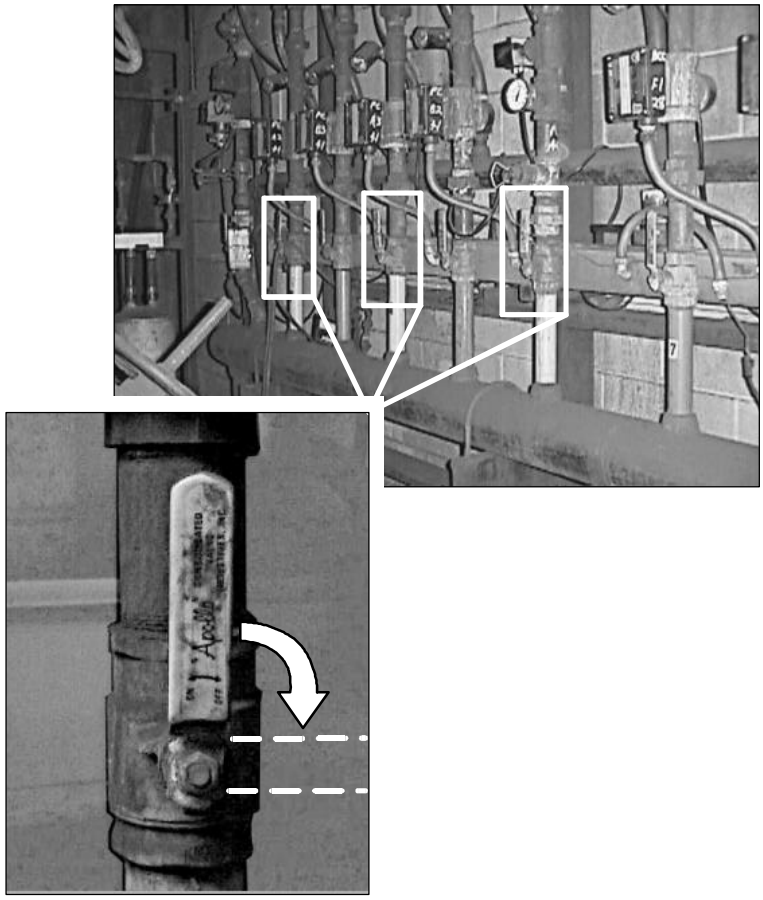
- ☐ Ensure that the non-powered water pump is shut off first.
- ☐ If the powered water pump is shut off first, the backup pump will come on. For example, if the south pump is on, shut off the north pump first. See the figure below.



7. Close the main supply valves located on the supply manifold in the same room as the power cables and the furnace body. See the figure below.

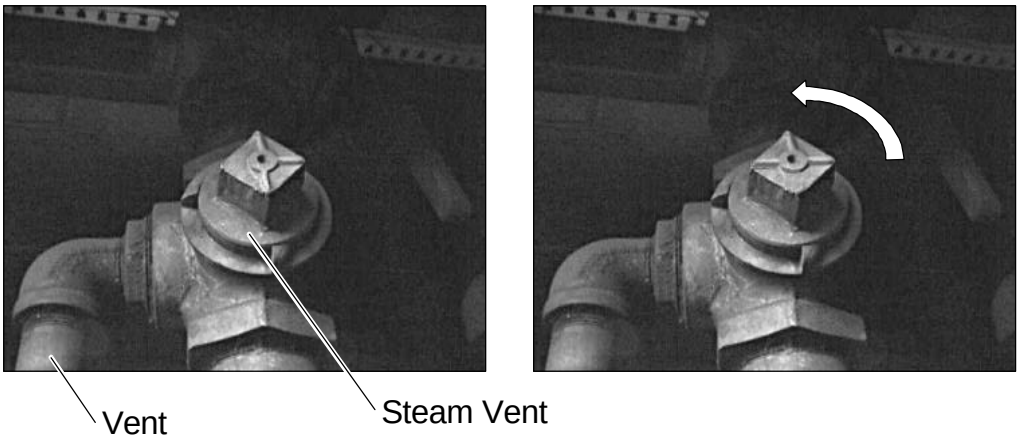


8. Close all the yellow colored valves illustrated on the Furnace Cooling Water Connections Schematic. See the figure below.



Three of the Four Yellow Shut Off Valves

9. Turn one of the steam vents to vent on one of the yellow lines located in the line above the yellow colored valve. This drains the water system. See the figure below.



Note: Draining the water system not only drains the water but also relieves built up pressure in the system.

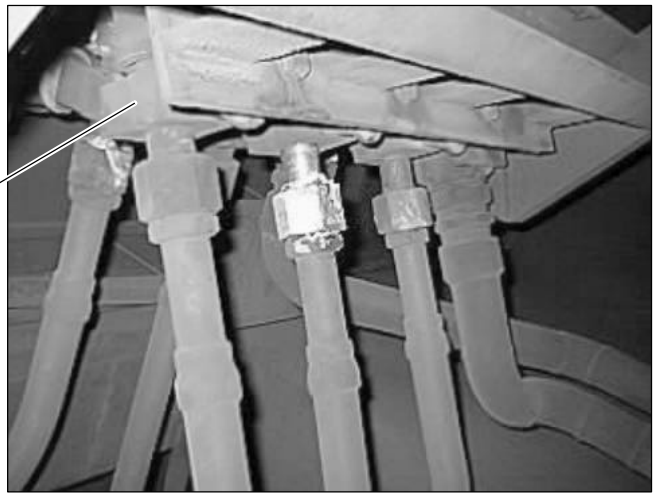
Warning: The water supply side must be turned on every 15 minutes even if the replacement cable is not available. Let the water run on to the floor. Allow the water to run through the copper coils until the water is cool. The temperature inside the furnace is 2700 degrees Fahrenheit.

Remove Cable

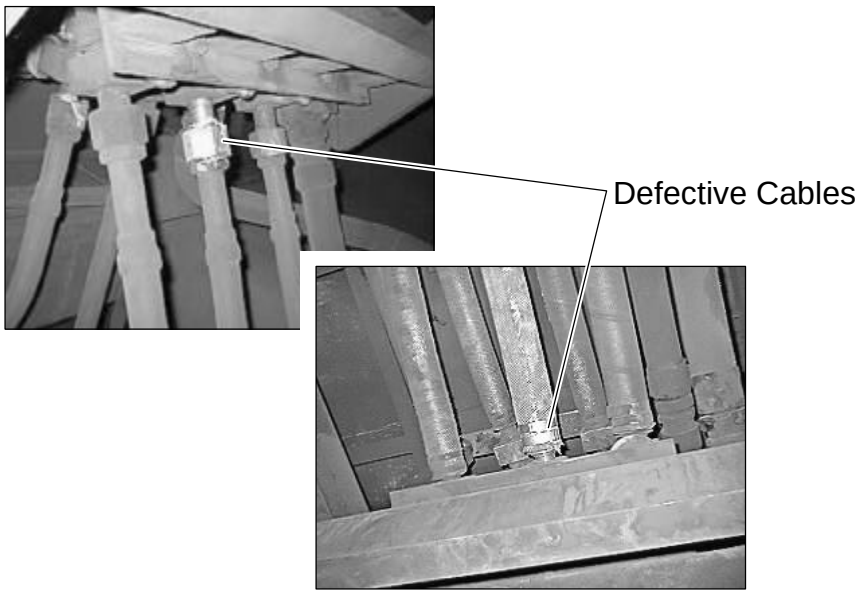
Note: Depending on the size and weight of the cable, it may take up to three people to remove and install the cable.

1. Locate the defective cable.

2. Unbolt the two 1/2-inch bolts to remove the insulated block from both ends of the cable. See the figure below.



3. Remove both ends of the defective cable. See the figure below.



Defective Cable Removal

Warning: The water supply side must be turned on every 15 minutes even if the replacement cable is not available. Let the water run on to the floor. Allow the water to run through the copper coils until the water is cool. The temperature inside the furnace is 2700 degrees Fahrenheit.

Install Cable

1. Ensure that the cable ends are clean.

   - ☐ The cable should be free from corrosion.
   - ☐ The cable should not have any lubrication.

2. Install the new cable.

3. Install the insulated blocks.

4. Turn the return side on first.

Note: The return side is low pressure.

- ☐ Turn the steam vent to close on the yellow line.

5. Turn on the supply located in the room with the power cables and the furnace body.

6. Start the water pump that was originally running first.

7. Check the cable for leaks.

8. Move the lever to its original setting at the heat exchanger, if there are no leaks.

9. Close and lock the door.

10. Return the key to the key block.

11. Notify the Melt Controller in the control tower that the furnace is operational.

12. Take the defective cable to the crib to be reconditioned.