15. REMOVING AIR FROM ACTUATOR

Initial Conditions

1. Ensure that the entire piping system has been commissioned (leak checked, removed of air and filtered).
2. Ensure that the 4-way valves are set in bypass configuration.
3. Ensure that the actuators have been leak checked (bubble check etc.) with the control valves installed.
4. Ensure that the limit stops are adjusted to restrict motion of the adapter plate without causing offset.

NOTE: Valves should be slowly re-positioned!

Preliminary Steps

1. Verify that all hoses are connected with the feed line going to the manifold adjacent to the control valve and the return line out the opposite side of the manifold.
2. Remove all caps covering the valves on the actuator plate and manifold.
3. Turn off the pump (end stations) or close supply and return isolation valves for the chamber (corner station).
HEPI Assembly and Installation Procedures

Vertical Actuator – Valve Positioning – Bleed Mode

1. Open the left and right valves located on the actuator plate 2 turns. Ensure that the center valve is closed. This step removes trapped air from the lower bellows and the resistor.

2. Open the upper valve located on the side of the manifold plate. This purges air from the upper bellows.

3. Close the lower valve located on the side of the manifold and the large valve located in the center of the manifold. By closing the large valve, you are diverting the fluid through the built in bleed passages.

HEPI Assembly and Installation Procedures

**Horizontal Actuator – Valve Positioning – Bleed Mode**

1. Open the three valves located on the actuator plate by 2 turns. This step removes trapped air from the lower bellows and the resistor.

2. Open the upper valve located on the side of the manifold plate. This purges air from the upper bellows.

3. Open the lower valve located on the side of the manifold. Ensure that the large valve located on the side of the manifold is closed. By closing the large valve, you are diverting the fluid through the built in bleed passages.

4. Check valve positions against the Valve Position Chart on page 24 for Horizontal, Bleed.
HEPI Assembly and Installation Procedures

Bleeding the Actuators

1. Gently turn the 4-way valve to allow supply to the system while checking for leaks around the valve caps.

2. Turn on the pump (end stations) or open supply and return isolation valves for the chamber (corner station).

3. Check actuators, etc. for leaks.

4. Allow the actuator to remain in the bleed state for at least 24 hours (48 hours recommended) with the pump running and with ~ 70 psi pressure across the actuator.

Vertical and Horizontal Actuators – Valve Positioning – Operational Mode

1. Turn off the pump (end stations) or close supply and return isolation valves for the chamber (corner station).

2. To place the actuator into run mode, close all small valves on the actuator plate and the side of the manifold plate. Replace the large valve cap (D020367-B-E) with the modified cap (D020367-B-E Part 2) which has a bushing for adjusting the large pin valve on the manifold while the cap is in place.

3. Open the large valve on the side of the manifold 2 turns through the bushing.

4. Check valve positions against the Valve Position Chart on page 24 for Vertical, Operate and Horizontal, Operate.

Close valve
Close all three valves on actuator plate
Open valve 2 turns
Close valve
5. Remove cap with bushing for the large valve, replace with standard cap and replace all small valve caps.

6. Turn on the pump (end stations) or open supply and return isolation valves for the chamber (corner station).

7. Ensure that limit stops on the actuators have been removed.

Valve Position Chart

<table>
<thead>
<tr>
<th>Vertical Actuator</th>
<th>Horizontal Actuator</th>
</tr>
</thead>
<tbody>
<tr>
<td><strong>Bleed</strong></td>
<td><strong>Operate</strong></td>
</tr>
<tr>
<td><strong>A</strong></td>
<td>O</td>
</tr>
<tr>
<td><strong>B</strong></td>
<td>C</td>
</tr>
<tr>
<td><strong>C</strong></td>
<td>O</td>
</tr>
<tr>
<td><strong>D</strong></td>
<td>O</td>
</tr>
<tr>
<td><strong>E</strong></td>
<td>C</td>
</tr>
<tr>
<td><strong>F</strong></td>
<td>C</td>
</tr>
</tbody>
</table>

O = open
C = closed