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| **Gate Valve Alignment and Installation** | | | |
| **Document Number:** | L2HE-PR-CST-VLV-ASSY | **Approval Date:** | DD Mmm YYYY |
| **Revision Number:** | 1 | **Periodic Review Date:** | DD Mmm YYYY |
| **Document Owner:** | T. Ganey | **Department Owner:** | SRF Operations |

# Purpose

The purpose of this document is to provide instructions for installing the beamline upstream gate valve and short spool piece onto the L2HE lollipop tooling.

# Scope

This procedure applies to <enter text>.

This procedure does not apply to <enter text>.

# Terms and Definitions

The following terms have specific meanings within this procedure.

|  |  |
| --- | --- |
| **Term** | **Definition** |
| <Term 1> | <Definition> |
| <Term 2> | <Definition> |
|  |  |

A list of general terms and definitions can be found in the Quality Manual QML-001.

# Roles and Responsibilities

The following roles have responsibilities described in this document.

|  |  |
| --- | --- |
| **Role** | **Responsibility** |
| <Job Title> | <Very short summary of activities this job title performs in this procedure.> |
|  |  |
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# Procedure

## Prep

### As per the top string assembly drawing, have all the required hardware cleaned and inside the clean room ready for assembly. Such components include:

* beam line VAT gate valve
* short beam line extension
* zero length reducer
* 2 ¾” blank flange
* NW-78 gaskets
* CF gasket
* Fasteners.

### The 2 ¾” blank flange is to cover the zero length reducer to keep the valve clean. This is only needed until the Ion pump assembly is ready and installed.

### The lollipop tooling should already be cleaned, assembled inside the clean room ready for the string assembly.

### The first cavity is already on the rail and aligned.

## Sub-assemble the gate valve and short beamline extension on a clean room bench.

### Clean the AT valve with ionized nitrogen while cycling the valve open and closed. Take particle counts to verify the valve is clean.

### Clean the short beamline section with ionized nitrogen. Take particle counts to verify the short beamline section is clean.

### At the bench, assemble the VAT valve to the short beamline section using the proper hardware and gasket. Torque properly using the standard star pattern.

* **NOTE**: Attach short beamline section's fixed flange to the VTA valve. The short beamline section's rotatable flange will bolt to the cavity.

## Assemble the zero length reducer to the gate valve sub-assembly.

### Clean the gate valve sub-assembly with ionized nitrogen while cycling the valve open and closed. Take particle counts to verify the sub-assembly is clean.

### Clean the zero length reducer with ionized nitrogen. Take particle counts to verify the zero length reducer is clean.

### At the bench assemble the zero length reducer to the gate valve sub-assembly using the proper hardware and gasket. Torque properly using the standard star pattern.

### Clean the new sub-assembly with ionized nitrogen while cycling the valve open and closed. Take particle counts to verify the sub-assembly is clean.

### Install a clean blank 2 ¾” CF flange onto the zero length reducer and secure using a clean gasket and two bolts.

### Clamp a clean HDPF cover flange onto the short beam line extension open flange. This will seal the inside of the sub-assembly keeping it clean for further assembly.

## Install the gate valve sub-assembly onto the lollipop support and align.

### Install the gate valve sub-assembly onto the lollipop support stand.

### Using the transfer alignment plate and a level, adjust the valve support screws so the top side of the valve is level and the rotatable flange on the beamline is at string beam center.

* **NOTE**: If desired, instead of using the transfer alignment plate, the alignment cover can be used to align the beamline flange to the already aligned cavity flange. Both methods are acceptable.

**Assemble the valve sub-assembly to the cavity:**

 Stage the NW-78 seal and proper bolt hardware to connect the valve sub- assembly to the cavity.

 Set-up the particle counter under the cavity flange that will be connected to the valve sub-assembly.

 After alignment is verified, start the particle counter and verify there is a clean work environment.

 Slowly remove the cover flange from the valve sub-assembly.

 Install the cleaned gasket into the rotatable flange and secure the gasket with the delrin gasket holder.

 Slowly remove the cover flange from cavity, bring the two flanges together and secure with two bolt, nut, washer sets. Snug to seal the two assemblies.

**Note:** A clean assembly needs to be verified by monitoring the particle counter full time during this activity. Slow movements must be made to reduce particulate generation. A D-3 and supervisor notification must be made if unusual particulate generation is observed.

 Install the remaining hardware and torque properly using the standard star pattern.

# Process Workflow

<Related Process Outside this Procedure>

<Starting Condition>

<Step 2>

<Related Step 1>

<Step 4>

<Decision>

<Related Step 2>

<Related Step 4>

<Ending Condition>

<Step 1>

YES

NO

<Related Decision>

<Related Step 3>

YES

NO

<Step 3>

# References

|  |  |
| --- | --- |
| **Document No.** | **Title** |
| F1000009887, Rev - | String top assembly [UPDATE this reference] |
| JL00199999 | LCLS-II Clean room assembly tooling [UPDATE] |
| L2HE-PR-CLNRM-CST-IONCLN | Ionized Nitrogen Cleaning Procedure |

# Release and Revision History

|  |  |  |
| --- | --- | --- |
| **Rev #** | **Major Changes** | **Approval Date:** |
| 1 | Initial version, based on CP-L2PRD-CST-ASSY-VLV-R1 | DD Mmm YYY |

# Approvals

|  |  |  |  |
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