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| Traveler Title | P1 Supply and return beam pipe assemblies |
| Traveler Abstract | Traveler for the assembly of the supply pump-drop and return beam tube sub-assemblies for the P1 cryomodule.  |
| Traveler ID | P1-CMAWS4-CM-BPIP |
| Traveler Revision  | R1 |
| Traveler Author | J. Fischer |
| Traveler Date | 3-Sep-20 |
| NCR Informative Emails | areilly,drury |
| NCR Dispositioners | fischer,worland |
| D3 Emails | areilly,drury,fischer,worland |
| Approval Names | J. Fischer | K. Worland | A. Reilly |  |
| Approval Signatures |  |  |  |  |
| Approval Dates |  |  |  |  |
| Approval Title | Author | Reviewer | Project Manager |  |

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| References | List and Hyperlink all documents related to this traveler. This includes, but is not limited to: safety (THAs, SOPs, etc), drawings, procedures, and facility related documents. |
| [CRM-120-7061-3000](https://jlabdoc.jlab.org/docushare/dsweb/Get/Document-42407/CRM1207061-3000%5B1%5D.pdf)Supply | [CRM-120-7060-3000](https://jlabdoc.jlab.org/docushare/dsweb/Get/Document-41004/CRM1207060-3000.pdf)Return | [Ionized nitrogen cleaning procedure](https://jlabdoc.jlab.org/docushare/dsweb/Get/Document-42408/Ionized%20nitrogen%20cleaning%5B1%5D%5B1%5D%5B1%5D.pdf) | [JL0101527\_-\_P1 Ion Pump Support Assy](https://jlabdoc.jlab.org/docushare/dsweb/Get/Document-224004/JL0101527_-_P1%20ION%20PUMP%20SUPPORTS%20ASSY.pdf) | [JL0101525\_-\_P1 Warm Beam Pipe Assy](https://jlabdoc.jlab.org/docushare/dsweb/Get/Document-224003/JL0101525_-_P1%20WARM%20BEAMTUBE%20ASSY%20MOD.pdf) |
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| Revision Note |  |
| R1 | Initial release of this Traveler. |

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| Step No. | Instructions | Data Input |
| 1 | **Record the supply and return beam tube weldment serial #:** | [[SUBPSN]] <<SUBPSN>>[[RTBPSN]] <<RTBPSN>>[[SupplyBeamTubeComment]] <<COMMENT>>[[ReturnBeamTubeComment]] <<COMMENT>>[[Technician1]] <<SRFCVP>> |
| 2 | **Gather the required hardware from inventory:**Gather parts needed according to the supply and return beam tube assembly drawings. [CRM-120-7061-3000](https://jlabdoc.jlab.org/docushare/dsweb/Get/Document-42407/CRM1207061-3000%5B1%5D.pdf) , [CRM-120-7060-3000](https://jlabdoc.jlab.org/docushare/dsweb/Get/Document-42406/CRM1207060-3000%5B1%5D.pdf), [JL0101525- P1 Warm Beam Pipe Assy](https://jlabdoc.jlab.org/docushare/dsweb/Get/Document-224003/JL0101525_-_P1%20WARM%20BEAMTUBE%20ASSY%20MOD.pdf)Standard 11 liter ion pump manifold will be required. Disassemble components and send them in for cleaning. 11 liter ion pump, 2 ¾" CF tee, 2 ¾" CF metal seal valve, gaskets and bolt hardware.Two 6" blank CF flanges with bolt hardware will also be required to cover the end flanges for leak testing. These will be used where the 6" gate valves are pictured on the drawingsTwo sets of three bellows support rods.Inspect all knife edge seal paths to ensure no nicks or damage. Contact the supervisor if there are any discrepancies. Send all parts in for standard UHV cleaning. |  |

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| Step No. | Instructions | Data Input |
| 3 | **Receiving Components:**In the class 10 room: Clean the handles and upper shelf of a cleanroom cart with an isopropyl soaked wiper. Clean the cart with ionized nitrogen. Individually remove each vacuum component from its container and clean with ionized nitrogen as per the [Ionized nitrogen cleaning procedure](https://jlabdoc.jlab.org/docushare/dsweb/Get/Document-40587/Ionized%20nitrogen%20cleaning%5B1%5D%5B1%5D.pdf).Visually inspect each metal seal path. It should be smooth and free of scratches, dings and stains. Contact the supervisor if there are any discrepancies. Carefully place each dried component onto the clean room cart.**Note: When blowing valves, (including the 01 VAT valve) cycle them as you are blowing the internals to eliminate the possibility of trapped particles.**  | [[Technician2]] <<SRFCVP>>[[AssyDate]] <<TIMESTAMP>> |
| 4 | **Preparation of Hardware:**Clean two perforated stainless trays with an isopropyl soaked wiper. Organize hardware in the trays by placing the #8 hardware in one tray and the ¼" and 5/16" hardware in the other.Place the trays of hardware on the top shelf of the cleanroom cart, next to the other components. |  |
| 5 | **Record the individual component serial numbers into the traveler:**SE Valve RE Valve Ion Pump | [[MUGVSN\_SEValve]] <<MUGVSN>>[[MUGVSN\_REValve]] <<MUGVSN>>[[IP45S4DSN]] <<IP45S4DSN>>[[VAT01RSN]] <<SN>>[[VAT01SSN]] <<SN>>[[SerialNoComments]] <<COMMENT>>[[Technician5]] <<SRFCVP>> |

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| Step No. | Instructions | Data Input |
| 6 | **Prepare the ion pump for assembly:**Bleed-up the ion pump with filtered nitrogen using the piercing valve (Refrigerator valve) bleedup hose. Remove all bolts from the pinch-off cover flange except two 180 degrees apart. Clean the flange area with Isopropyl alcohol and a cleanroom wiper. Clean with ionized nitrogen as per the [Ionized nitrogen cleaning procedure](https://jlabdoc.jlab.org/docushare/dsweb/Get/Document-40587/Ionized%20nitrogen%20cleaning%5B1%5D%5B1%5D.pdf). Remove the last two bolts and remove the pinch-off flange. Remove the 2 ¾" blank CF flange. Clean the ion pump with ionized nitrogen as per the [Ionized nitrogen cleaning procedure](https://jlabdoc.jlab.org/docushare/dsweb/Get/Document-42408/Ionized%20nitrogen%20cleaning%5B1%5D%5B1%5D%5B1%5D.pdf).  |  |
| 7 | **Assemble the pump-drop assembly:****The bellows can be easily damaged, protect it during the assembly process, movement, and storage.** Clean each component with ionized nitrogen as per the [Ionized nitrogen cleaning procedure](https://jlabdoc.jlab.org/docushare/dsweb/Get/Document-42408/Ionized%20nitrogen%20cleaning%5B1%5D%5B1%5D%5B1%5D.pdf). Cycle the pneumatic valve while cleaning with ionized nitrogen. Assemble the pump-drop assembly as per the supply beam tube assembly drawing [CRM-120-7061-3000](https://jlabdoc.jlab.org/docushare/dsweb/Get/Document-42407/CRM1207061-3000%5B1%5D.pdf). Clean sub-assembly with ionized nitrogen at each component added to the assembly.Tighten each conflate flange appropriately.Install a blank 6" conflate flange onto the open port, bolt and tighten. Ensure the bolts are installed so the nuts are on the bellows side of the flange.Install three bellows support rods 120 degrees apart onto the 6" CF bolt threads so the bellows will be supported while pumping. | [[AssyComments1]] <<COMMENT>>[[Technician7]] <<SRFCVP>> |

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| Step No. | Instructions | Data Input |
| 8 | **Assemble the return beam-line assembly:****The bellows can be easily damaged, protect it during the assembly process, movement, and storage.** Clean each component with ionized nitrogen as per the [Ionized nitrogen cleaning procedure](https://jlabdoc.jlab.org/docushare/dsweb/Get/Document-42408/Ionized%20nitrogen%20cleaning%5B1%5D%5B1%5D%5B1%5D.pdf). Cycle the pneumatic valve while cleaning with ionized nitrogen. Assemble the return beam-line assembly as per the return beam tube assembly drawing [CRM-120-7060-3000](https://jlabdoc.jlab.org/docushare/dsweb/Get/Document-42406/CRM1207060-3000%5B1%5D.pdf). Clean the sub-assembly with ionized nitrogen at each component assembly.Assemble the standard 11 liter ion pump manifold cleaning each component with ionized nitrogen during assembly. Assemble the ion pump manifold to the beam-line assembly. Ensure orientation is proper for vacuum connection in cryomodule assembly. Tighten each conflat flange appropriately.Install a blank 6" conflate flange onto the open port, bolt and tighten. Ensure the bolts are installed so the nuts are on the bellows side of the flange.Install three bellows support rods 120 degrees apart onto the 6" CF bolt threads so the bellows will be supported while pumping. | [[AssyComments2]] <<COMMENT>>[[Technician8]] <<SRFCVP>> |

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| Step No. | Instructions | Data Input |
| 9 | **Transport:**Assemblies are complete and are to be turned over to the cryomodule assembly group for assembly into a cryomodule. Place the completed assemblies in the clean room pass thru. Call the chem room Supervisor and have the assemblies **double bagged in N2.** Exit the clean room as per protocol immediately to receive parts. | [[ReadyForFurtherAssy]] <<YESNO>>[[TechnicianComplete]] <<SRFCVP>> |