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|  Traveler Title | Warm Girder Rework |
| Traveler Abstract | Outlines the removal, disassembly, and reinstallation of the warm Girder |
| Traveler ID | WMGRDR-GRDR-RMV |
| Traveler Revision  | R2 |
| Traveler Author | Tiffany Ganey |
| Traveler Date | 11-Feb-22 |
| NCR Informative Emails | weaksmc,overtonr |
| NCR Dispositioners | drury,dipette,forehand,ganey |
| D3 Emails | drury,dipette,weaksmc,forehand,ganey |
| Approval Names | Tiffany Ganey | Anthony DiPette | Matthew Weaks | Mike Drury |
| Approval Signatures |  |  |  |  |
| Approval Dates |  |  |  |  |
| Approval Title | Author | Reviewer | 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. |
| [22634-S-001](https://jlabdoc.jlab.org/docushare/dsweb/Get/Document-236328/22634-S-001%5B1%5D.pdf) – Helium Leak Test Procedure for Ultra High Vacuum Components |

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| [Ionized Nitrogen Cleaning Procedure](https://jlabdoc.jlab.org/docushare/dsweb/Get/Document-251185/SRF-MSPR-CLNRM-CST-ION-R1.pdf) |

 | [Girder Clean Assembly and Leak Check Procedure](https://jlabdoc.jlab.org/docushare/dsweb/Get/Document-252209/WMGRDR-PR-CLNRM-GRDR-ASSY-R1.pdf) | [Standard Cavity, Components, or Parts Degreasing Procedure](https://jlabdoc.jlab.org/docushare/dsweb/Get/Document-132364/CP-STP-CAV-CHEM-DEGR-R3.pdf) |  |
| [Girder Drawings Folder](https://jlabdoc.jlab.org/docushare/dsweb/View/Collection-49642) | WMGRDR-CHEM-COMP-DEGR - See latest revision in Pansophy | [Reduced particle generation Ion Pump turn-on](https://jlabdoc.jlab.org/docushare/dsweb/Get/Document-242956/CP-WMGRDR-VAC-IPON-R1.pdf) |  |  |

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| Revision Note |  |
| R1 | Initial release of this Traveler. |
| R2 | Updated references throughout traveler |

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| Step No. | Instructions | Data Input |
| \*Note | 1. During the girder re-work process, there will be some items labeled as "Radioactive Material". **Radioactive Material (RAM)** is defined in the RadCon manual as any activated material, equipment or system component with radiation levels distinguishable from background. The following guidelines are to be adhered to when handling RAM in order to follow Radcon requirements:* There are no requirements for dosimetry for Radioactive Material Areas unless otherwise notified by a member of the RCD.
* Persons must be Radiation Worker I qualified to handle RAM.
* The RAM tag must accompany the item at all times with the following exceptions. Cleaning, heating or any process in which the tag will impede that process or the tag could be potentially damaged or destroyed.
* When performing processes listed above, the tag is to be removed by personnel performing the task and placed on the RAM tag board located in the area.
* Each component removed from the Girder needs to be tagged with a RadCon coupon, recorded on the dedicated list.
* All hardware (bolts, nuts, gaskets…) needs to be gathered in a Rad waste bag.
* Once task is complete, the tag is to be placed back on the material/equipment.
* Eating, drinking or smoking is not permitted in Radioactive Material Areas.
* Remove all tags prior to installation of Girder in the Accelerator.

**Tasks associated with this traveler will be performed in the designated area of the clean room.****2 .The Girder needs to be maintained upright in the same orientation it had on the beamline. Do not flip over, topple, ...** |
| 1 | Serial Number of Girder | [[GRDRSN]] <<SN>> |
| All work to be done in a clean room or flow hood area.If particulate sampling is indicated, prepare all sample tubes inside clean room/flow hood area, and collect samples as directed by SRF Staff. | [[GirderStyle]]<<TEXT>>[[CleanConditions]]<<YESNO>>[[Sampling]]<<YESNO>>[[SRFtech1]]<<SRF>>[[InitialTimestamp]]<<TIMESTAMP>> |
| 2 | Note time and disconnect verification.  | [[Disconnected]]<<YESNO>>[[DisconnectSRFtech]]<<SRF>>[[BleedTime]]<<TIMESTAMP>> |

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| Step No. | Instructions | Data Input |
| 3 | Move the Girder to the holding area, and mark the Girder with a RAM Tag. \*\*Coordinate with RadCon to have the girder surveyed, and prepared for transport\*\* | [[RAMTagAttached]] <<CHECKBOX>>[[GirderRadTech]] <<RAD>>[[GirderRadComment]] <<COMMENT>>[[RadDate]] <<TIMESTAMP>>[[GirderRAMLevel1]] <<FLOAT>>[[GirderRemovalComments]]<<COMMENT>> |
| 4 | RAM Tag associated beamline, pumps, or other relevant components that will be removed with the Girder, and arrange to have them surveyed.Record Serial Numbers where available, and record RAM levels of anything identified as RAM. | [[RAMtaggedItemsComments]] <<COMMENT>> |
| **Description** | **SN** | **RAM Level** |
| [[Item1Description]] <<TEXT>> | [[Item1SN]] <<SN>> | [[Item1RAMLevel]] <<FLOAT>> |
| [[Item2Description]] <<TEXT>> | [[Item2SN]] <<SN>> | [[Item2RAMLevel]] <<FLOAT>> |
| [[Item3Description]] <<TEXT>> | [[Item3SN]] <<SN>> | [[Item3RAMLevel]] <<FLOAT>> |
| [[Item4Description]] <<TEXT>> | [[Item4SN]] <<SN>> | [[Item4RAMLevel]] <<FLOAT>> |
| [[Item5Description]] <<TEXT>> | [[Item5SN]] <<SN>> | [[Item5RAMLevel]] <<FLOAT>> |
| [[Item6Description]] <<TEXT>> | [[Item6SN]] <<SN>> | [[Item6RAMLevel]] <<FLOAT>> |
| 5 | \*\*Contact RadCon and coordinate transport of the Girder to the Test Lab, and have it placed in the RMA Storage\*\*RadCon will need to be contacted for movement from the RAM area to the Laydown area as well. | [[RadTransportTLTech]] <<RAD>>[[RadTransportTLComment]] <<COMMENT>>[[RadTransportTLDate]] <<TIMESTAMP>>[[DeliveryTLConfirmed]] <<CHECKBOX>>[[GRDRtempStorageTLapproved]] {{Hamlette}} <<HOLDPOINT>> |

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| **Step No** | **Instructions** | **Data Inputs** |
| 6 | **\*\*\*Get authorization from RADCON to move girder from RMA storage area to the Production chem room\*\*\*** | [[RadMoveChemTech]] <<RAD>>[[RadMoveChemComment]] <<COMMENT>>[[RadMoveChemDate]] <<TIMESTAMP>> |
| 7 | The Girder will be blown off prior entry in the Production chem room, wiped down with Isopropyl and blown off again prior entry in the cleanroom via the Production chem room path-thru. | [[ChemTech]] <<SRFCVP>> |
| 8 | Set the Girder in the cleanroom designated area.Ensure the area and Girder are adequately clean through N2 particle checks around the flange connections.Prepare disassembly tooling, sampling tooling, supplies & samples.Prepare recording lists for particulate samples generated, girder components and Radcon coupons.Let the cleanroom area recover. | [[SRFSetupScientist]] <<SRF>>[[DisaSetupTech]] <<SRFCVP>> |
| 9 | Set an environmental witness sample prior starting disassembly and sampling tasks. |  |
| 10 | Disassemble the Girder using the dedicated disassembly tools following the order set by the sampling protocol**.**Use caution when removing and handling delicate items such as BPM chamber and beam viewers. Cover/protect all flanges immediately after disassembly. Store all fasteners for later use or disposal. If the fasteners are deemed as RAM, place in appropriate disposal container for Radcon.  | [[RadDisaTech]] <<RAD>>[[RadDisaComment]] <<COMMENT>>[[RadDisaDate]] <<TIMESTAMP>>[[SRFDisaScientist]] <<SRF>>[[DisaTech]] <<SRFCVP>>[[FastenersRAM]] <<YESNO>> |

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| 11 | Record the existing serial numbers of each component, and choose the new serial number from the drop-down list if indicated. If the old and new serial numbers are different, engrave the part with the new serial number that was chosen in the drop-down list (this happens after the parts are removed from the cleanroom). Print and record all existing component data on the [Girder assembly drawing](http://jlabdoc.jlab.org/docushare/dsweb/Get/File-9530/5cell_pair_with_text.jpg). Any component that has been tagged as RAM shall be noted in the last column. |
| **Part** | **Original Serial No** | **Standardized Serial No** | **Part RAM?** | **Part Present** |
| Pump drop |  | [[PMPDRPSN]] <<PMPDRPSN>> | [[PMPDRPSN\_RAM]] <<YESNO>> |  |
| BPM chamber |  | [[BPMSN]] <<BPMSN>> | [[BPMSN\_RAM]] <<YESNO>> |  |
| Ion Pump | [[BLIPSN\_Orig]] <<SN>> | [[BLIPSN]] <<BLIPSN>> | [[BLIPSN\_RAM]] <<YESNO>> |  |
| Gate valve | [[BLGVSN\_Orig]] <<SN>> | [[BLGVSN]] <<BLGVSN>> | [[BLGVSN\_RAM]] <<YESNO>> | [[BLGVSN\_Present]] <<YESNO>> |
| Gauge on 2.75" CF | [[GCF275SN\_Orig]] <<SN>> | [[GCF275SN]] <<GCF275SN>> | [[GCF275SN\_RAM]] <<YESNO>> | [[GCF275SN\_Present]] <<YESNO>> |
| 90 angle all-metal valve (AMUV) | [[AMGVSN\_Orig]] <<SN>> | [[AMGVSN]] <<AMGVLSN>> | [[AMGVSN\_RAM]] <<YESNO>> |  |
| Beamviewer assembly  | [[BVWRSN\_Orig]] <<SN>> | [[BVWRSN]] <<BMVWRSN>> | [[BVWRSN\_RAM]] <<YESNO>> | [[BVWRSN\_Present]] <<YESNO>> |
| QD beamtube assembly A | [[QDBTSNA\_Orig]] <<SN>> | [[QDBTSNA]] <<QDBTSN>> | [[QDBTSNA\_RAM]] <<YESNO>> | [[QDBTSNA\_Present]] <<YESNO>> |
| QD beamtube assembly B | [[QDBTSNB\_Orig]] <<SN>> | [[QDBTSNB]] <<QBDTSN>> | [[QDBTSNB\_RAM]] <<YESNO>> | [[QDBTSNB\_Present]] <<YESNO>> |
| 2.75" CF A |  |  | [[CFBLK275\_A\_RAM]] <<YESNO>> |  |
| 2.75" CF B |  |  | [[CFBLK275\_\_B\_RAM]] <<YESNO>> |  |
| Viewport /2.75" CF C |  |  | [[CFBLK275\_C\_RAM]] <<YESNO>> | [[CFBLK275\_C\_Present]] <<YESNO>> |
| Bellow A | [[BLBPSNA\_Orig]] <<SN>> | [[BLBPSNA]] <<BLBPSN>> | [[BLBPSNA\_RAM]] <<YESNO>> | [[BLBPSNA\_Present]] <<YESNO>> |
| Bellow B | [[BLBPSNB\_Orig]] <<SN>> | [[BLBPSNB]] <<BLBPSN>> | [[BLBPSNB\_RAM]] <<YESNO>> | [[BLBPSNB\_Present]] <<YESNO>> |

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| Step No. | Instructions | Data Input |
| 12 | Retrieve and store environmental witness sample placed prior starting disassembly and sampling tasks. | [[NumGirderSamplesTaken]] <<INTEGER>> |
| 13 | \*\*\*Coordinate with RADCON for surveying and moving parts from Cleanroom to RMA area or to accomplish the next task\*\*\* | [[RadMoveRMATech]] <<RAD>>[[RadMoveRMAComment]] <<COMMENT>>[[RadMoveRMADate]] <<TIMESTAMP>> |
| 14 | Collect required new parts (Ion Pump, Right Angle Valve, SS Part Spools, Bellows) from stock, and place all new components in assembly bins.Record the Serial Numbers for all new parts.Serialize any old parts that do not yet have a SN.Note which components are being reused, and which are being swapped for new.\*\*Notify RadCon about all part movement for survey and tracking\*\* | [[BLIPSNnew]] <<BLIPSN>>[[BLIPSNnewCondition]] {{New, Reuse Old}} <<SELECT>>[[BLGVSNnew]] <<BLAVSN>>[[BLAVSNnewCondition]] {{New,Reuse,Old}} <<SELECT>>[[SPOOLSN]]<<SN>>[[SPOOLCondition]] {{New,Reuse,Old}} <<SELECT>>[[BLBSN1]] <<SN>>[[BLBSN1Condition]] {{New,Reuse,Old}} <<SELECT>>[[BLBSN2]] <<SN>>[[BLBSN2Condition]] {{New,Reuse,Old}} <<SELECT>>[[GirderPartsComments]] <<COMMENT>>[[GirderPartsDisposition]] {{Refurbish, Storage, Disposal}} <<SELECT>> |
| 15 | Route parts (Ion Pump & Right Angle Valve) for storage or refurb.Note which items are being sent for storage, refurb, or use as-is.\*\*Contact RadCon to coordinate movement and storage of RAM\*\* | [[BLIPSNDisposition]] {{Refurbish,Reuse,Storage,Disposal}} <<SELECT>>[[BLGVSNDisposition]] {{Refurbish,Reuse,Storage,Disposal}} <<SELECT>>[[GirderPartsDispositionComments]] <<COMMENT>> |
| 16 | Route unused (SS Parts & Damaged Parts) parts to storage or trash.Note which items are being send for storage, or disposal.\*\*Contact RadCon to coordinate movement, storage and disposal of RAM\*\* | [[SSPartsDisposition]] {{Storage,Disposal}} <<SELECT>>[[SSPartsComments]]<<COMMENT>> |

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| Step No. | Instructions | Data Input |
| 17 | \*\*Coordinate with RadCon to have parts moved to chemistry and cleanroom\*\* | [[RadConTech]] <<RAD>>[[RadConComment]] <<COMMENT>>[[RadConDate]] <<TIMESTAMP>> |
| 18 | Clean Girder Parts following the WMGRDR-CHEM-COMP-DEGR traveler in Pansophy. | [[OldPartsCleaningComments]] <<COMMENT>> |
| 19 | Contact Pete Francis (x7528) for RF measurement of BPM before entry to cleanroom.If any of the RF Measurements exceed 0.25dB, note them in the comments. | [[ContactedRFMeasTech]] <<YESNO>>[[XplusMeasurement]]<<Float>>[[XnegMeasurement]]<<Float>>[[YplusMeasurement]]<<Float>>[[YnegMeasurement]]<<Float>>[[MeasurementsExceedLimit]] <<CHECKBOX>>[[RFmeasurementsComments]] <<COMMENT>> |
| 20 | Contact Anthony Delacruz (x7029/ delacruz@jlab.org) , Christopher Norris (x6513/ norris@jlab.org) and Keith Cole (x5920/ colek@jlab.org) - EESICS. for beam viewer assembly | [[BeamViewerPresent]] <<YESNO>>[[BeamViewTechContacted]] <<YESNO>>[[BVWRCompletedDate]] <<TIMESTAMP>>[[BVWRComments]] <<COMMENT>> |

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| Step No. | Instructions | Data Input |
| 21 | Clean and Degrease Girder Assembly cart. | [[GRDRAssyCartCleaningComments]] <<COMMENT>> |
| 22 | Assemble Girder on cart in cleanroom – [WMGRDR-PR-CLNRM-GIRDER-ASSY](https://jlabdoc.jlab.org/docushare/dsweb/Get/Document-252209/WMGRDR-PR-CLNRM-GRDR-ASSY-R1.pdf).Verify all bellows supports are installed prior to pumpdown.Upload relevant photos and files for the girder assembly. | [[GRDRAssyCompleted]] <<YESNO>>[[GRDRAssyComments]] <<COMMENT>>[[GRDRAssyDocuments]]<<FILEUPLOAD>> |

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| Step No. | Instructions | Data Input |
| 23 | Leak check fully assembled Girder in accordance with [WMGRDR-PR-CLNRM-ASSY](https://jlabdoc.jlab.org/docushare/dsweb/Get/Document-252209/WMGRDR-PR-CLNRM-GRDR-ASSY-R1.pdf) and [SRF-MSPR-CLNRM-LEAK](https://jlabdoc.jlab.org/docushare/dsweb/Get/Document-251183/SRF-MSPR-CLNRM-LEAK-R1.pdf).Upload Leak Check Chart, relevant photos/pictures, and Data Files. | [[GRDRLeakTight]] <<YESNO>>[[GRDRLeakRateStepSize1]] <<FLOAT>>[[CalibratedLeakRateNumber1]] <<FLOAT>>[[GRDRLeakTestDocuments]] <<FILEUPLOAD>> |
| 24 | Slow turn-on the Ion Pump using the Reduced particle generation Ion pump turn-on procedure. Note the current and voltage of the Ion Pump. And then turn off the pump.[CP-WMGRDR-VAC-IPON-R1](https://jlabdoc.jlab.org/docushare/dsweb/Get/Document-242956/CP-WMGRDR-VAC-IPON-R1.pdf) | [[FirstSlowTurnOnCurrent]] <<FLOAT>>[[FirstSlowTurnOnVoltage]] <<FLOAT>>[[IPSlowTurnOnComments]] <<COMMENT>> |
| 25 | Backfill cart with Nitrogen and normalize the cart pressure to ATM before the next step. | [[CartBackfillNitrogen]] <<CHECKBOX>> |
| 26 | Remove the end blanks and replace with soft seals.Bag the assembly in the Cleanroom. | [[BlanksReplaced]] <<CHECKBOX>> |
| 27 | If necessary, contact RadCon to remove the Girder from the cleanroom to the staging area. | [[RadConContacted]] <<YESNO>>[[RADRemvCLNRMTech]] <<RAD>>[[RADRemvCLNRMComments]] <<COMMENT>>[[RADRemvCLNRMDate]] <<TIMESTAMP>> |
| 28 | Collect final assembly bellows and spools. Note the Serial Numbers of the bellows and spools. | [[ComponentsCollected]] <<YESNO>>[[BLBPSNAnew]] <<BLBPSN>>[[BLBPSNBnew]] <<BLBPSN>>[[SPOOLSNAnew]] <<SN>>[[SPOOLSNBnew]] <<SN>> |
| 29 | Clean final assembly bellows and spools and have the parts pre-N2 cleaned and bagged in the main cleanroom. | [[BPBLandSPOOLComm]]<<COMMENT>> |

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| Step No. | Instructions | Data Input |
| 30 | Contact vacuum group to confirm parts and Girder ready for install. | [[VacuumGroupContacted]] <<YESNO>> |
| 31 | If necessary, contact RadCon to have the Girder moved to the tunnel, otherwise transport the Girder normally to the tunnel. | [[RadConRequired]] <<CHECKBOX>>[[GRDRRAMLevel2]] <<FLOAT>>[[GRDRtransportedToTunnel]] <<YESNO>>[[GirderComm]]<<COMMENT>> |
| 32 | Close traveler after the Girder is installed and operational. Use vacuum group installation procedures and daily checklist for installation. | [[GirderInstalled]] <<YESNO>> |