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| Traveler Title | FPC Port Tube Traveler | | | |
| Traveler Abstract | Outlines the inspection and fabrication steps for the FPC port flange for the EIC 197Mhz Crab Cavity | | | |
| Traveler ID | EIC197-FAB-FPCT-ASSY | | | |
| Traveler Revision | R1 | | | |
| Traveler Author | J. Cox | | | |
| Traveler Date | 6-Sep-24 | | | |
| NCR Informative Emails | AREILLY,GEORGED,GROSE,KDAVIS | | | |
| NCR Dispositioners | BLUMER,BUTTLES,HUQUE | | | |
| D3 Emails | AREILLY,GEORGED,BUTTLES,GROSE,KDAVIS,BLUMER,HUQUE | | | |
| Approval Names | J. COX | G. GROSE | BUTTLES | N. HUQUE |
| Approval Signatures |  |  |  |  |
| Approval Dates |  |  |  |  |
| Approval Title | Author | Reviewer | Group Leader | 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. | | | |
| [JL0130461](https://misportal.jlab.org/jlabDocs/documents/179220/download) | [JL0149924](https://misportal.jlab.org/jlabDocs/documents/185354/download) | [JL0134072](https://misportal.jlab.org/jlabDocs/documents/179219/download) | [JL0141299](https://misportal.jlab.org/jlabDocs/documents/179222/download) | [JL0141297](https://misportal.jlab.org/jlabDocs/documents/179221/download) |
| [JL0141300](https://misportal.jlab.org/jlabDocs/documents/179223/download) | [JL0136178](https://misportal.jlab.org/jlabDocs/documents/180704/download) | [11141-S-0033](https://misportal.jlab.org/jlabDocs/documents/70285/download) | [FPCPortTubeFabricationPlan](https://jeffersonlab.sharepoint.com/:p:/r/sites/EICPartnerProject-TJNAF/Accelerator/RF%20Systems/Cryomodules/197%20MHz%20DVC/Cavity%20Fabrication%20Files/Fabrication%20Plans/FPC%20Port%20Tube%20Fabrication%20Plan.pptx?d=wa2642731cc734de7b6af2fdc9a2195a6&csf=1&web=1&e=AcduDD) | [CP-AUP-CAV-CHEM-ACID](https://jlabdoc.jlab.org/docushare/dsweb/Get/Document-260914/CP-AUP-CAV-CHEM-ACID-R2(2).pdf) |
| [EIC-BPS-JL0141297](https://misportal.jlab.org/jlabDocs/documents/205059/download) |  |  |  |  |

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| Revision Note |  |
| R1 | Initial release of this Traveler. |

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| Step No. | Instructions | Data Input |
| WORK CENTER | | |
| 0 | Enter Serial Number of Finished Part   |  |  |  | | --- | --- | --- | | **Steps** | **Work Center Areas** | **Actions** | | 1 | INSP | Initial Dimensional Inspection | | 2 | CHEM | BCP and DEGR | | 3-4 | FURN | Heat treat and Braze | | 5 | INSP | Verify perpendicularity | | 6 | MACHSHOP | Slug Removal | | 7 | CMA | Leak Check | | 8 | TR | Shipping and PR | | 9 | UT | Ultrasonic Inspection | | 10 | CHEM | BCP and DEGR Weld Prep | | 11 | EBW | Weld transition | | 12 | CMA | Leak Check | | 13 | MACHSHOP | Machine transition and knife edge | | 14 | CMA | Leak Check | | 15 | INSP | Final Dimensional Inspection | | 16 | INV | Return to INV | | [[FPCTSN1]] <<FPCTSN>>  [[New part SN dropdown]] <<NOTE>> |

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| Step No. | Instructions | Data Input |
| DIMENSIONAL INSPECTION | | |
| 1 | Verify dimensions in red on [JL0130461](https://misportal.jlab.org/jlabDocs/documents/179220/download) (FPC PORT FLANGE)  Diagram, schematic  Description automatically generated | [[FPCPFSN1]] <<FPCPFSN>>  [[New part SN dropdown]] <<NOTE>>  [[InsTech]] <<SRF>>  [[InsTime]] <<TIMESTAMP>>  [[InsComm]] <<COMMENT>>  [[InsFile]] <<FILEUPLOAD>> |
| Verify dimensions in red on [JL0149924](https://misportal.jlab.org/jlabDocs/documents/185354/download) (6" FLANGE SLUG)  Shape, circle  Description automatically generated | [[InsTech2]] <<SRF>>  [[InsTime2]] <<TIMESTAMP>>  [[InsComm2]] <<COMMENT>>  [[InsFile2]] <<FILEUPLOAD>> |
| Verify dimensions in red on [JL0134072](https://misportal.jlab.org/jlabDocs/documents/179219/download) (FPC PORT TUBE)  Diagram  Description automatically generated | [[FPCPSN1]] <<FPCPSN>>  [[New part SN dropdown]] <<NOTE>>  [[InsTech3]] <<SRF>>  [[InsTime3]] <<TIMESTAMP>>  [[InsComm3]] <<COMMENT>>  [[InsFile3]] <<FILEUPLOAD>> |
| Verify dimensions in red on [JL0141299](https://misportal.jlab.org/jlabDocs/documents/179222/download) (FPC PORT TRANSITION ROUGH MACHINING)  Diagram, engineering drawing  Description automatically generated | [[FPCPTRSN]] <<FPCPTRSN>>  [[New part SN dropdown]] <<NOTE>>  [[InsTech4]] <<SRF>>  [[InsTime4]] <<TIMESTAMP>>  [[InsComm4]] <<COMMENT>>  [[InsFile4]] <<FILEUPLOAD>> |

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| Step No. | Instructions | Data Input |
| CHEMISTRY | | |
| 2a | Degrease [JL0130461](https://misportal.jlab.org/jlabDocs/documents/179220/download), [JL0149924](https://misportal.jlab.org/jlabDocs/documents/185354/download), [JL0134072](https://misportal.jlab.org/jlabDocs/documents/179219/download) and [JL0141299](https://misportal.jlab.org/jlabDocs/documents/179222/download)  According to [CP-AUP-CAV-CHEM-ACID](https://jlabdoc.jlab.org/docushare/dsweb/Get/Document-260914/CP-AUP-CAV-CHEM-ACID-R2(2).pdf) Acid Etching Proceedure  Upload any relevant photos and/or comments. | [[ChemTech]] <<SRFCVP>>  [[ChemTime]] <<TIMESTAMP>>  [[ChemComm]] <<COMMENT>>  [[ChemFile]] <<FILEUPLOAD>> |
| 2b | SS Etch [JL0130461](https://misportal.jlab.org/jlabDocs/documents/179220/download) and [JL0149924](https://misportal.jlab.org/jlabDocs/documents/185354/download) and  BCP to a depth of 15 microns [JL0134072](https://misportal.jlab.org/jlabDocs/documents/179219/download) and [JL0141299](https://misportal.jlab.org/jlabDocs/documents/179222/download)  According to [CP-AUP-CAV-CHEM-ACID](https://jlabdoc.jlab.org/docushare/dsweb/Get/Document-260914/CP-AUP-CAV-CHEM-ACID-R2(2).pdf) Acid Etching Proceedure  Upload any relevant photos and/or comments. | [[ChemTech2]] <<SRFCVP>>  [[ChemTime2]] <<TIMESTAMP>>  [[ChemComm2]] <<COMMENT>>  [[ChemFile2]] <<FILEUPLOAD>> |

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| Step No. | Instructions | Data Input |
| FURNACE | | |
| 3 | Heat Treat [JL0130461](https://misportal.jlab.org/jlabDocs/documents/179220/download) 2 hours at 950C  Heat Treat [JL0149924](https://misportal.jlab.org/jlabDocs/documents/185354/download) 2 hours at 950C  Upload relevant photos and/or comments | [[HeatTreatTech]] <<SRF>>  [[HeatTreatTime]] <<TIMESTAMP>>  [[HeatTreatComm]] <<COMMENT>>  [[HeatTreatFile]] <<FILEUPLOAD>> |
| 4 | Braze as per JLab [EIC-BPS-JL0141297](https://misportal.jlab.org/jlabDocs/documents/205059/download)  Enter serial number of brazement  Upload relevant photos and/or comments | [[BrazeTech]] <<SRF>>  [[BrazeTime]] <<TIMESTAMP>>  [[BrazeComm]] <<COMMENT>>  [[BrazeFile]] <<FILEUPLOAD>> |

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| Step No. | Instructions | Data Input |
| DIMENSIONAL INSPECTION | | |
| 5 | Verify perpendicularity on [JL0141297](https://misportal.jlab.org/jlabDocs/documents/179221/download)  Upload Inspection report  Diagram, engineering drawing  Description automatically generated | [[BrazeInsTech]] <<SRF>>  [[BrazeInsTime]] <<TIMESTAMP>>  [[BrazeInsComm]] <<COMMENT>>  [[BrazeInsFile]] <<FILEUPLOAD>>  [[BrazeInsMail]] {{BLUMER}} <<EMAIL>>  [[BrazeInsMail]] {{Pansophy: FPC Port Assy has finished preliminary inspection.}} <<EMAILSUBJ>> |

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| Step No. | Instructions | Data Input |
| MACHINE SHOP | | |
| 6 | Remove slug and machine tube to final ID as per [JL0141297](https://misportal.jlab.org/jlabDocs/documents/179221/download)  Include job number | [[MachTech]] <<SRF>>  [[MachTime]] <<TIMESTAMP>>  [[MachJobNumber]] <<INTEGER>>  [[MachComm]] <<COMMENT>> |

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| Step No. | Instructions | Data Input |
| LEAK CHECK | | |
| 7 | Leak check the assembly in accordance with [11141-S-0033](https://misportal.jlab.org/jlabDocs/documents/70285/download) Vendor Standard Helium Leak Check Procedure  Upload any relevant images/comments | [[BrazeVacTech]] <<SRF>>  [[BrazeVacTime]] <<TIMESTAMP>>  [[BrazeVacPass]] <<YESNO>>  [[BrazeVacComm]] <<COMMENT>>  [[BrazeVacFile]] <<FILEUPLOAD>>  [[BrazeVacMail]] {{BLUMER}} <<EMAIL>>  [[BrazeVacMail]] {{Pansophy: Field Probe Port Assy has finished preliminary leak check.}} <<EMAILSUBJ>> |

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| Step No. | Instructions | Data Input |
| TECHNICAL REPRESENTATIVE | | |
| 8 | Enter SRF OPS Shipping form number and Purchase Requisition number for ultrasonic testing. | [[TechRep]] <<SRF>>  [[ShippingFormNumber]] <<INTEGER>>  [[PurchaseRequestNumber]] <<INTEGER>> |

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| Step No. | Instructions | Data Input |
| ULTRASONIC INSPECTION | | |
| 9 | Ultrasonic inspection of the braze as per EN ISO 18279 Level B,  and no discontinuities over a length ≥20% of the nominal length of the joint.  Upload inspection report | [[UtTech]] <<SRF>>  [[UtTime]] <<TIMESTAMP>>  [[UtPass]] <<YESNO>>  [[UtComm]] <<COMMENT>>  [[UtFile]] <<FILEUPLOAD>> |

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| Step No. | Instructions | Data Input |
| CHEMISTRY | | |
| 10a | Degrease [JL0141297](https://misportal.jlab.org/jlabDocs/documents/179221/download).  According to [CP-AUP-CAV-CHEM-ACID](https://jlabdoc.jlab.org/docushare/dsweb/Get/Document-260914/CP-AUP-CAV-CHEM-ACID-R2(2).pdf) Acid Etching Proceedure  Upload any relevant photos and/or comments. | [[WeldChemTech]] <<SRFCVP>>  [[WeldChemTime]] <<TIMESTAMP>>  [[WeldChemComm]] <<COMMENT>>  [[WeldChemFile]] <<FILEUPLOAD>> |
| 10b | BCP [JL0141297](https://misportal.jlab.org/jlabDocs/documents/179221/download) weld region to a depth of 15 microns.  Diagram  Description automatically generated  According to [CP-AUP-CAV-CHEM-ACID](https://jlabdoc.jlab.org/docushare/dsweb/Get/Document-260914/CP-AUP-CAV-CHEM-ACID-R2(2).pdf) Acid Etching Proceedure  Upload any relevant photos and/or comments. | [[WeldChemTech2]] <<SRFCVP>>  [[WeldChemTime2]] <<TIMESTAMP>>  [[WeldChemComm2]] <<COMMENT>>  [[WeldChemFile2]] <<FILEUPLOAD>> |
| 10c | USC [JL0141297](https://misportal.jlab.org/jlabDocs/documents/179221/download) and [JL0141299](https://misportal.jlab.org/jlabDocs/documents/179222/download) for EBW weld prep. | [[WeldChemTech3]] <<SRFCVP>>  [[WeldChemTime3]] <<TIMESTAMP>>  [[WeldChemComm3]] <<COMMENT>>  [[WeldChemFile3]] <<FILEUPLOAD>> |

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| Step No. | Instructions | Data Input |
| ELECTRON BEAM WELDING | | |
| 11 | Weld [JL0141299](https://misportal.jlab.org/jlabDocs/documents/179222/download) (FPC PORT TRANSITION ROUGH MACHINING) to [JL0141297](https://misportal.jlab.org/jlabDocs/documents/179221/download) FPC Brazement as per [JL0141300](https://misportal.jlab.org/jlabDocs/documents/179223/download).  Engrave SN onto OD of flange  Upload any relevant photos/comments | [[FPCTSN2]] <<FPCTSN>>  [[WeldTech]] <<SRF>>  [[WeldTime]] <<TIMESTAMP>>  [[WeldComm]] <<COMMENT>>  [[WeldFile]] <<FILEUPLOAD>> |

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| Step No. | Instructions | Data Input |
| LEAK CHECK | | |
| 12 | Leak check the assembly in accordance with [11141-S-0033](https://misportal.jlab.org/jlabDocs/documents/70285/download) Vendor Standard Helium Leak Check Procedure  Upload any relevant images/comments | [[WeldVacTech]] <<SRF>>  [[WeldVacTime]] <<TIMESTAMP>>  [[WeldVacPass]] <<YESNO>>  [[WeldVacComm]] <<COMMENT>>  [[WeldVacFile]] <<FILEUPLOAD>> |

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| Step No. | Instructions | Data Input |
| MACHINE SHOP | | |
| 13 | Machine Transition and Knife Edge as per [JL0136178](https://misportal.jlab.org/jlabDocs/documents/180704/download)  Include Job number | [[KnifeMachTech]] <<SRF>>  [[KnifeMachTime]] <<TIMESTAMP>>  [[KnifeMachJobNumber]] <<INTEGER>>  [[KnifeMachComm]] <<COMMENT>> |

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| Step No. | Instructions | Data Input |
| LEAK CHECK | | |
| 14 | Leak check the assembly in accordance with [11141-S-0033](https://misportal.jlab.org/jlabDocs/documents/70285/download) Vendor Standard Helium Leak Check Procedure  Use a copper seal to validate knife edge  Upload any relevant images/comments | [[KnifeVacTech]] <<SRF>>  [[KnifeVacTime]] <<TIMESTAMP>>  [[KnifeVacPass]] <<YESNO>>  [[KnifeVacComm]] <<COMMENT>>  [[KnifeVacFile]] <<FILEUPLOAD>> |

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| Step No. | Instructions | Data Input |
| DIMENSIONAL INSPECTION | | |
| 15 | **Verify all dimensions on** [JL0136178](https://misportal.jlab.org/jlabDocs/documents/180704/download)  **Take knife edge profile on FormTracer**  **Upload inspection report** | [[KnifeInsTech]] <<SRF>>  [[KnifeInsTime]] <<TIMESTAMP>>  [[KnifeInsPass]] <<YESNO>>  [[KnifeInsComm]] <<COMMENT>>  [[KnifeInsFile]] <<FILEUPLOAD>>  [[KnifeInsMail]] {{BLUMER}} <<EMAIL>>  [[KnifeInsMail]] {{Pansophy: FPC Port Assy has finished final inspection.}} <<EMAILSUBJ>> |

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| Step No. | Instructions | Data Input |
| LOGISTICS | | |
| 16a | Upload pictures of finished assembly | [[FPCTSN3]] <<FPCTSN>>  [[LogTime]] <<TIMESTAMP>>  [[LogFile]] <<FILEUPLOAD>> |
| 16b | Return to inventory | [[LogTech]] <<SRF>>  [[LogComm]] <<COMMENT>> |