# －我育发汖 <br> Jefferson Lab Alignment Group Data Transmittal 

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The large beam pipe after the pivot towards the dump in Hall A was surveyed in September，2018．The results below show the center of the four main flanges and also the bolt circles in the front flange．The coordinate system is based on the upstream flange and the mid upstream flange（ $\mathrm{y} / \mathrm{z}$ axis）and the center of the upstream flange．The bottom access flanges／plane were used to control roll．

The plane of the bottom access flange is given for information．Units are millimeters．

| Main Flanges |  |  |  |  |
| :---: | :---: | :---: | :---: | :---: |
| Circle | x | $y$ | z | radius |
| Upstream Flange | 0.000 | 0.000 | 0.000 | 583.943 |
| Mid－US Flange | 0.000 | 0.000 | 2552.169 | 392.824 |
| Mid－DS Flange | 0.235 | 0.042 | 2618.074 | 374.919 |
| Downstream Flange | 5.050 | －0．247 | 4971.817 | 203.109 |
| top bolts circles on upstream face |  |  |  |  |
| BR＿bolt | －74．248 | 562.533 | 0.798 | 5.414 |
| BL＿bolt | 74.233 | 562.891 | 0.660 | 5.537 |
| Center＿bolt | －0．057 | 567.861 | 0.736 | 5.482 |
| bottom bolt circles on upstream face |  |  |  |  |
| BR＿bolt | －73．039 | －563．562 | －0．662 | 5.373 |
| BL＿bolt | 75.225 | －563．593 | －0．801 | 5.474 |
| Center＿bolt | 0.967 | －568．509 | －0．738 | 5.424 |
| Access Flanges for instrumentation |  |  |  |  |
| US | －1．936 | －353．126 | 1502.388 | 101.576 |
| DS | －0．728 | －351．573 | 2390.768 | 101.558 |


| Access Instrumentation Plane data（unit vector） |  |  |  |  |  |
| :--- | :--- | :--- | :--- | :--- | :--- |
|  | A | B | C | D | angle |
| Plane | 0.00000 | -1.00000 | 0.00166 | -355.5810 | 179.9050 |

