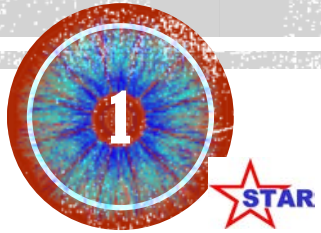
FST INSTALLATION

November 19 2020 by Felix Archampong



CONTENT

SS RING ASSEMBLY

Fig. 1

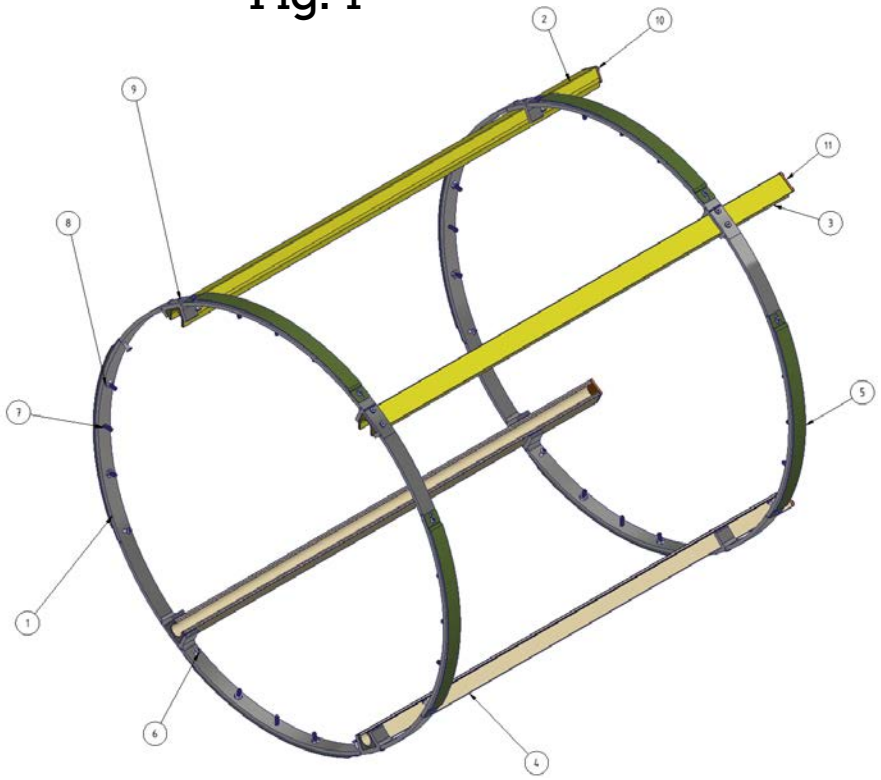


Fig. 2

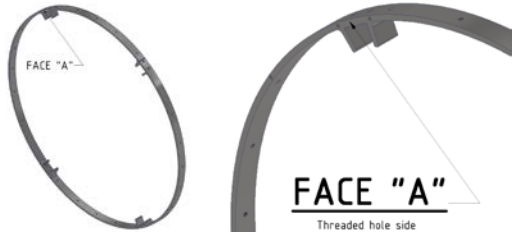
QTY	ITEM	PART NUMBER	DESCRIPTION
4	11	END CAPS	HALLOW RAIL STOP CAPS
8	10	93615A380_McMASTER	SOCKET CAP SCREW_TYPE 18-8 SS LOW PROFILE_10-32 X 1/2L
16	9	93615A410_McMASTER	SOCKET CAP SCREW_TYPE 18-8 SS LOW PROFILE
32	8	94805A029_McMASTER	HEX NUT_TYPE 316 STAINLESS STEEL THIN
24	7	62126362 OAL VLIER_MSC	SWIVEL PAD _STAINLESS STEEL_1/4-20
16	6	99637A430_McMASTER	BINDING BARREL AND SCREW_18-8 STAINLESS STEEL
8	5	Support Collar	ADJUSTABLE COLLAR_ CONE_INST.
2	4	Slotted Rail	HALLOW RAIL
1	3	Slotted Rail-2BR	RIGHT HALLOW RAIL MODIFIED
1	2	Slotted Rail-2B	LEFT HALLOW RAIL MODIFIED
2	1	SS Ring-WH	SUPPORT RING ASSY

BILL OF MATERIALS

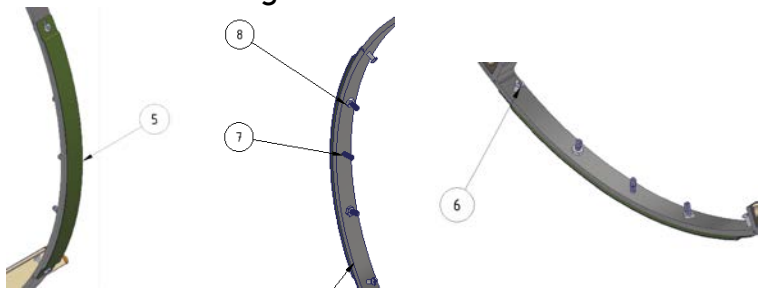
Steps

1. Identify all the items needed for installation. See fig 1 & 2.

2. Place item 1 on a flat surface by keeping the threaded holes side face down (Face "A").



3. Install the four Adjustable Collar (item 5) as shown. See fig.3



4. Align items 2, 3 and 4 to the matching holes on item 1and fasten the parts together. Use items 9 screws. See fig. 2

5. Install all Hallow Rail Stop Caps to items 2, 3 and 4 as noted on fig 1. Use item 10 screws.

6. Repeat steps 3 and 4 to install the second Supporting Ring Assembly (item1) as shown in fig 4.

Fig. 3

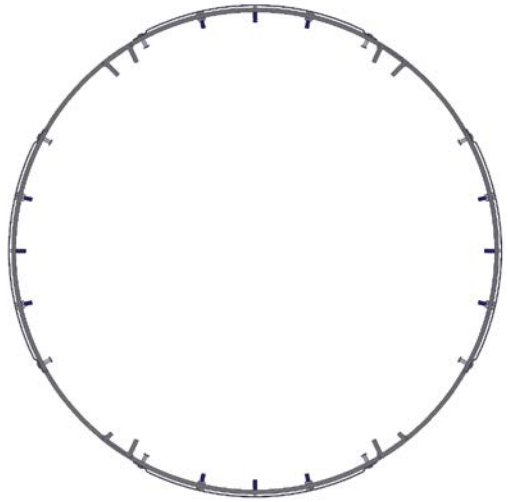
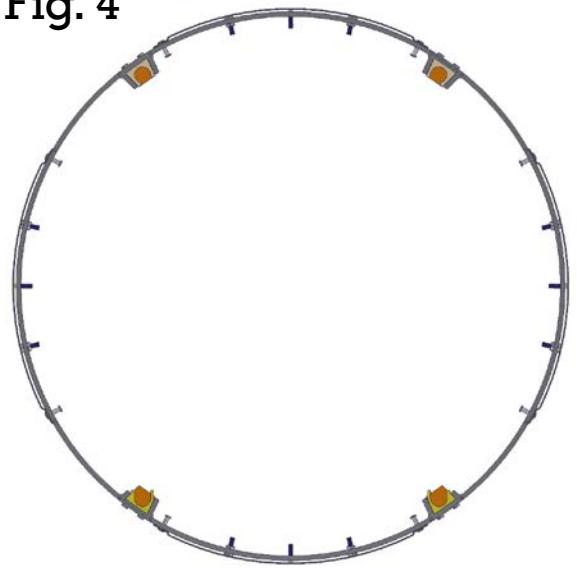


Fig. 4



HALF PI DISK ASSEMBLY

Fig. 1

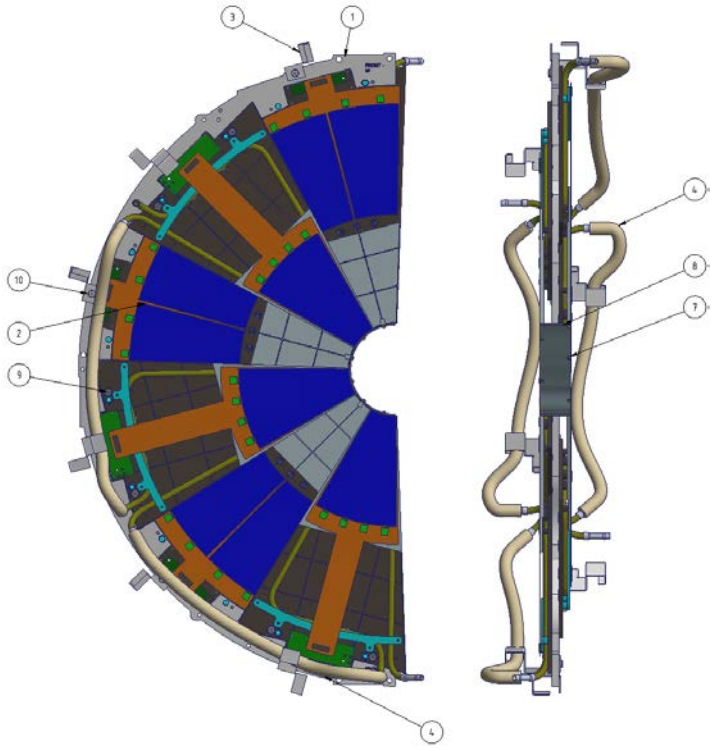


Fig. 2

QTY	ITEM	PART NUMBER	DESCRIPTION
6	10	93615A113_McMASTER	SOCKET HEAD SCREWS_18-8 SS LOW-PROFILE
12	9	90278A319_McMASTER	PRECISION SHOULDER SCREW_18-8 STAINLESS STEEL
1	8	Center Brace 2020.08.20	CONNECTING DISK BRACE
6	7	CB	CENTER BRACE SCREW
1	4	Tubing Run 01	COOLING TUBE (CONNECTING DISK)
6	3	Piping & Cable Channel Bracket	BRACKET
6	2	FST_module_0330	Pi Disk
1	1	Aluminum_FST_Ring	FST- 0323_NCKU-2a

BILL OF MATERIALS

Steps

1. Identify all the items needed for installation. See fig 1 & 2.
2. Place item 1 on a flat surface with the side labeled Front- Up facing upwards. See fig 4.
3. Rotate PI Disk and align with the Pin & Slot feature on the Aluminum structure. **Note**: Skip the first Pin & Slot located close to the marking (Front- UP). See fig. 1, 3 & 5.
4. Orient the Pi Disk in such a way that the Slot feature on the aluminum structure and the cooling inlet and outlet (Barbed Hose fittings) are on the same side. See fig 1 & 3.
5. Fasten with screws using (item10). See fig 2.
6. Repeat steps 3 thru 5 for the two remaining Pi Disk. **Note:** Pi Disk installation alternates by skipping each Pin & Slot feature on the installation side. See fig. 1
7. Flip the Aluminum Structure to complete the installation of the three additional Pi Disk on the opposite side of the aluminum structure labeled "Back –DN".
8. Repeat steps step 3 thru 6
9. Connect the cooling tubes (item 4) as shown in Fig. 1

Fig. 3

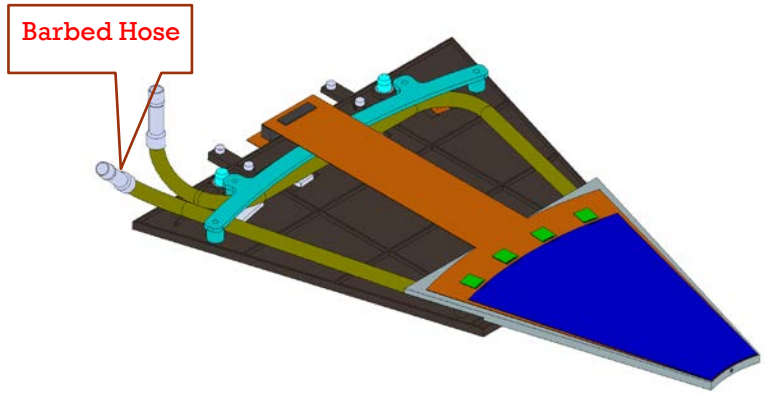


Fig. 4

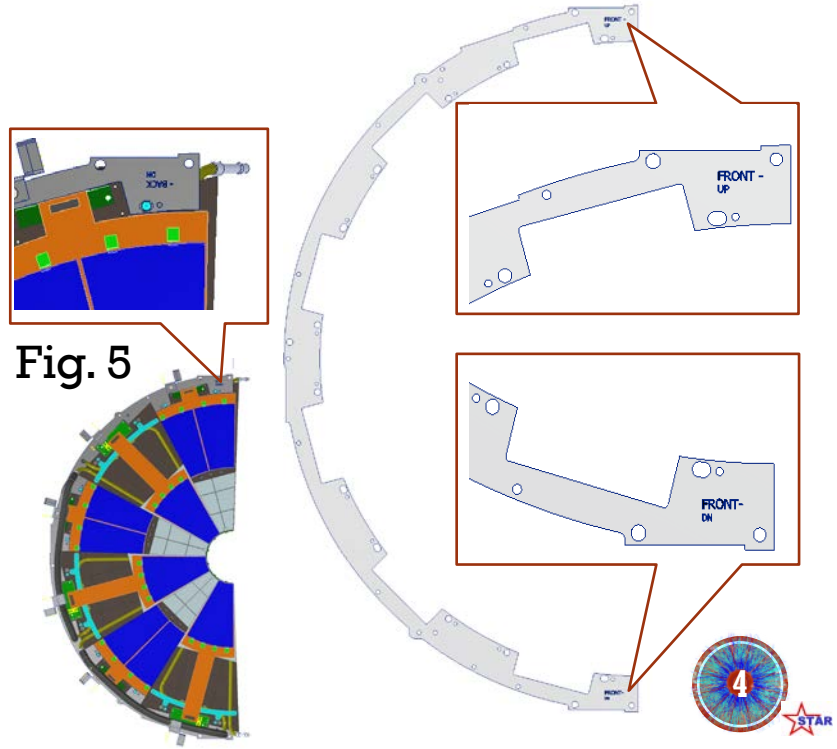


Fig. 5

HALF PI DISK ASSEMBLY

Fig. 1

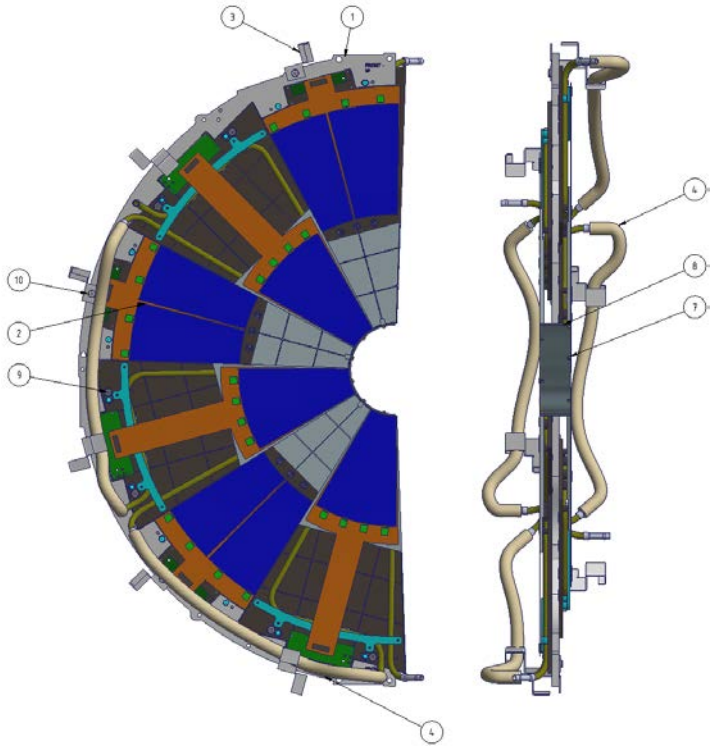


Fig. 2

QTY	ITEM	PART NUMBER	DESCRIPTION
6	10	93615A113_McMASTER	SOCKET HEAD SCREWS_18-8 SS LOW-PROFILE
12	9	90278A319_McMASTER	PRECISION SHOULDER SCREW_18-8 STAINLESS STEEL
1	8	Center Brace 2020.08.20	CONNECTING DISK BRACE
6	7	CB	CENTER BRACE SCREW
1	4	Tubing Run 01	COOLING TUBE (CONNECTING DISK)
6	3	Piping & Cable Channel Bracket	BRACKET
6	2	FST_module_0330	Pi Disk
1	1	Aluminum_FST_Ring	FST- 0323_NCKU-2a

BILL OF MATERIALS

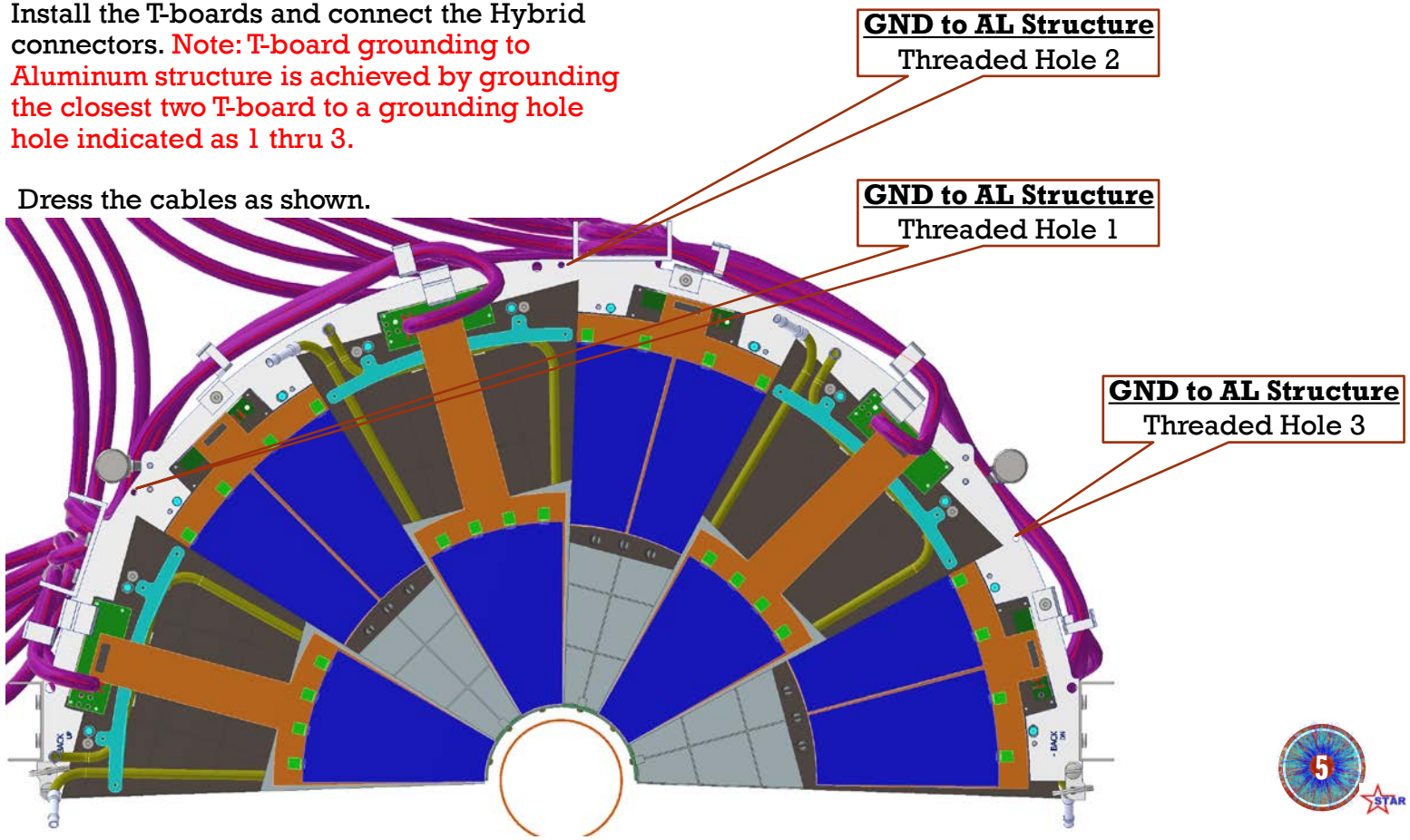
Steps

10. Install the Connecting Disk Brace (item 8) using the screws provided (item 7 by NCKU). See fig 1.

11. Install the Brackets (item 3) as shown. Note: The screw side is opposite the Pi Disk. See fig 1.

12. Install the T-boards and connect the Hybrid connectors. Note: T-board grounding to Aluminum structure is achieved by grounding the closest two T-board to a grounding hole hole indicated as 1 thru 3.

13. Dress the cables as shown.



3 HALF PI DISK ASSEMBLY

Fig. 1

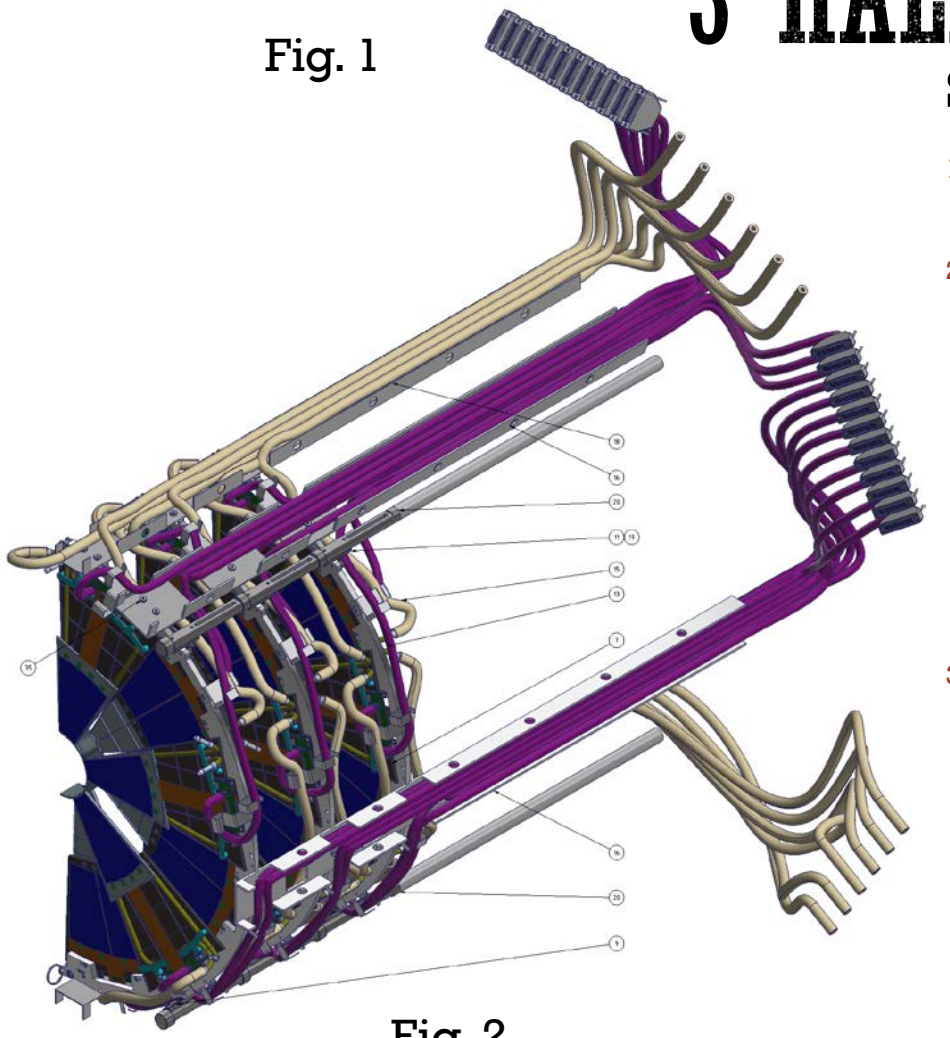


Fig. 2

QTY	ITEM	PART NUMBER	DESCRIPTION
48	35	90666A016_McMASTER	SOCKET HEAD CAP SCREW_TYPE 316 SS LOW PROFILE
4	20	Solid Rail-3	SOLID RAIL ASSY
60	19	93615A380_McMASTER	SOCKET CAP SCREW_TYPE 18-8 SS LOW PROFILE_10-32 X 1/2L
4	18	9001k923_McMASTER	ARCHIT. 6061 ALUMINUM U-CHANNEL
2	16	9001K784_McMaster	ARCHIT. 6063 AL. U-CHANNEL
1	15	Run 02	COOLING LINES
1	13	FST Assembly-2.Harness4	CABLE SYSTEM
3	11	FST Plane Holding Bracket-3	TOP - SOLID RAIL HOLDING BRACKET - RIGHT
3	9	FST Plane Holding Bracket-2	BOTTOM - SOLID RAIL HOLDING BRACKET - RIGHT
3	7	FST_Disk_0415	Full Disk Assy
1	1	CONE ASSEMBLY	FST CONE

BILL OF MATERIALS

Steps

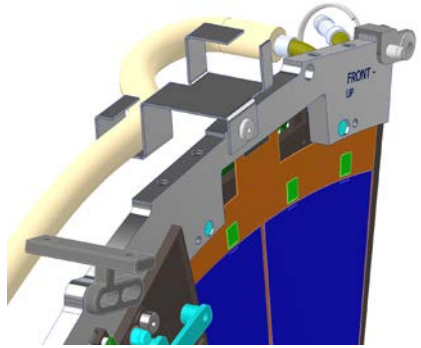
1. Identify all the items needed for installation. See fig 1 & 2.

2. Rotate the Pi Disk Assembly to have the side marked "Front - UP" facing you and install items 9 and 11. **Note:** Each bracket consist of a left and right part. Select the "Right Brackets" for the first half installation.

Top-Solid Rail Holding Bracket

Bottom-Solid Rail Holding Bracket

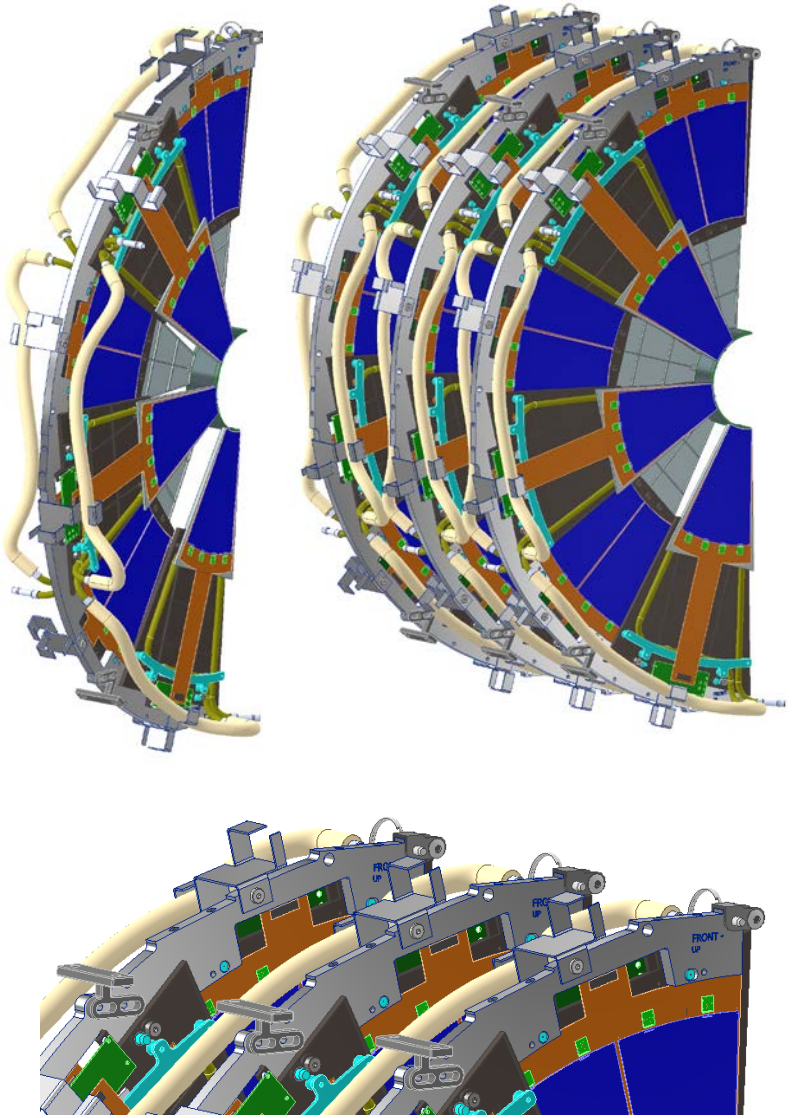
3. Align the holes of the Pi Disk to the slot of the Right bracket as shown and fasten with screws (Item 19).



4. Repeat the same process for the bottom part and install using item 9 and 19.

5. Repeat steps 2 thru 4 for the remaining two Pi Disk as shown. See Fig. 3

Fig. 3



3 HALF PI DISK ASSEMBLY

Fig. 1

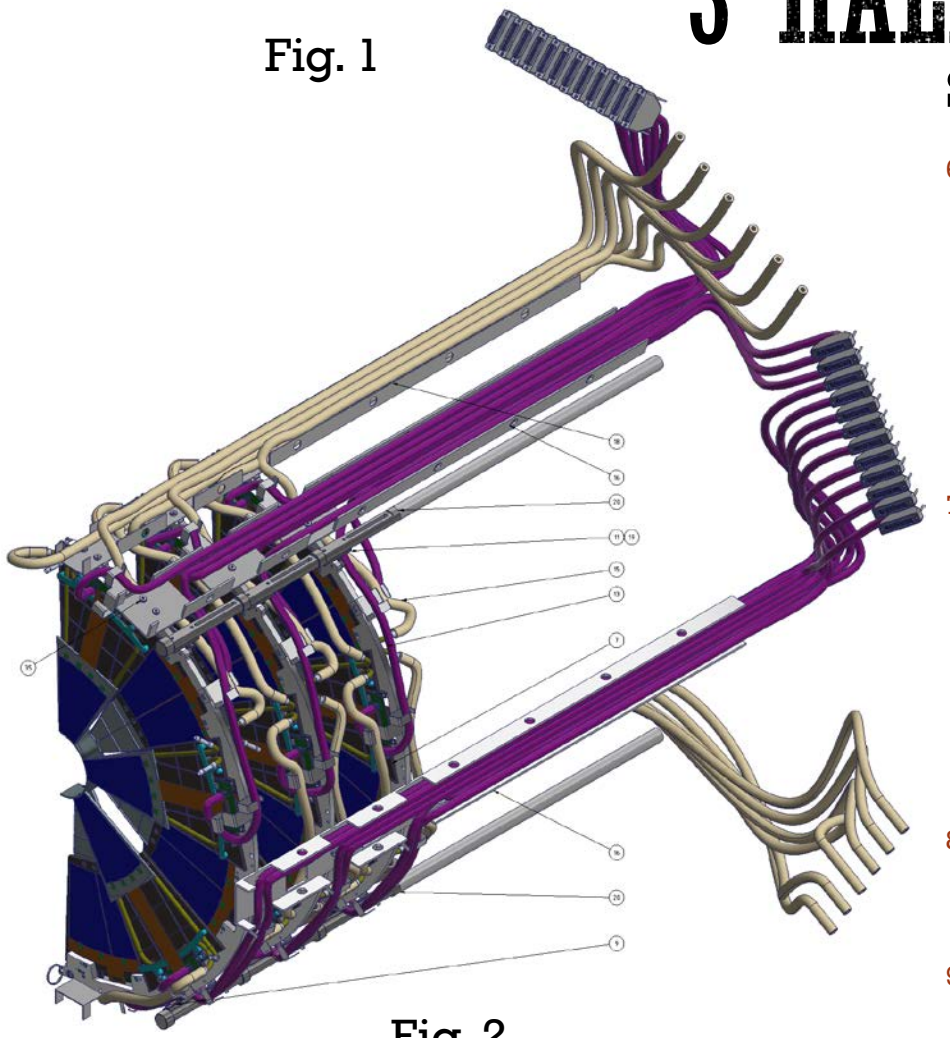


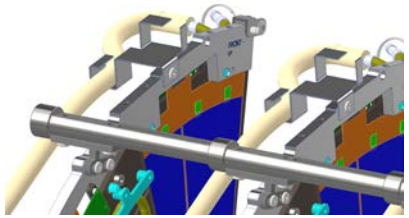
Fig. 2

QTY	ITEM	PART NUMBER	DESCRIPTION
48	35	90666A016_McMASTER	SOCKET HEAD CAP SCREW_TYPE 316 SS LOW PROFILE
4	20	Solid Rail-3	SOLID RAIL ASSY
60	19	93615A380_McMASTER	SOCKET CAP SCREW_TYPE 18-8 SS LOW PROFILE_10-32 X 1/2L
4	18	9001k923_McMASTER	ARCHIT. 6061 ALUMINUM U-CHANNEL
2	16	9001K784_McMaster	ARCHIT. 6063 AL. U-CHANNEL
1	15	Run 02	COOLING LINES
1	13	FST Assembly-2.Harness4	CABLE SYSTEM
3	11	FST Plane Holding Bracket-3	TOP - SOLID RAIL HOLDING BRACKET - RIGHT
3	9	FST Plane Holding Bracket-2	BOTTOM - SOLID RAIL HOLDING BRACKET - RIGHT
3	7	FST_Disk_0415	Full Disk Assy
1	1	CONE ASSEMBLY	FST CONE

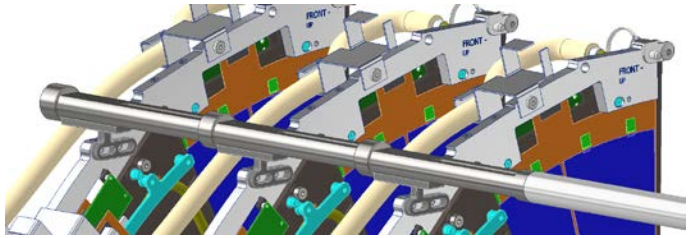
BILL OF MATERIALS

Steps

6. Align the holes of the Brackets (items 9 & 11) to the Solid Rail Assembly (item 20) and fasten with item 19 screws as shown.



7. Repeat the same process for the Top and bottom parts as shown to complete the whole installation of the 3 Pi Disk.



8. Install all the U Channels as shown and fasten with item 35 screws. Route the cooling lines and cables as shown. See Fig 1, 2 & 3.

9. Repeat steps 2 thru 9 to complete the installation for the left side. Note: The left side installation, the Pi Disk should be oriented as shown in the picture below.

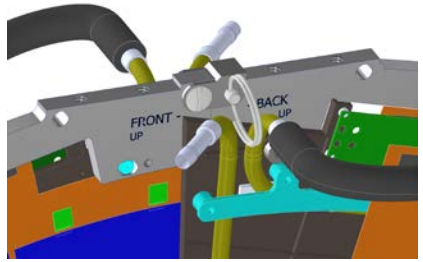
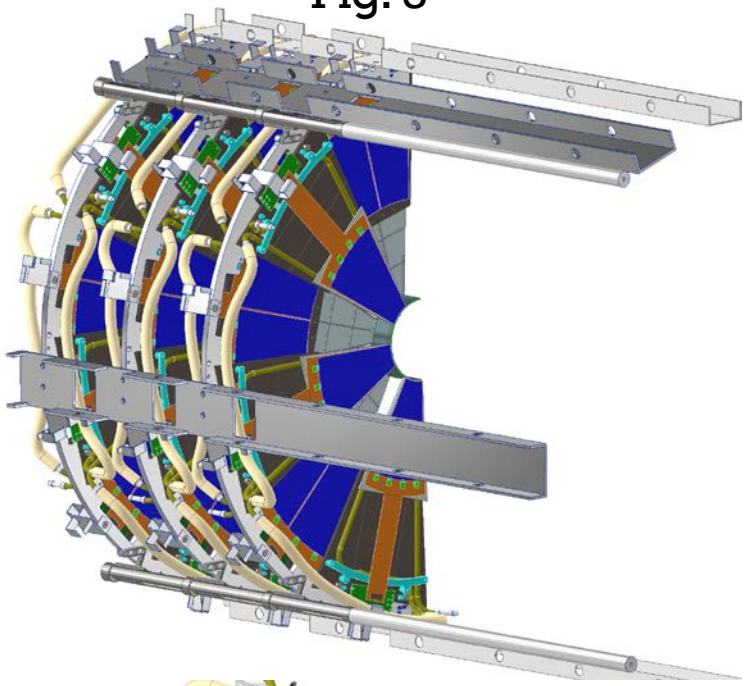
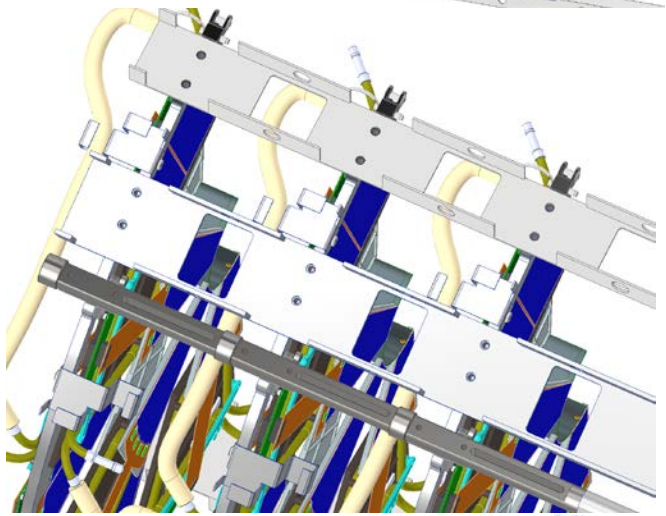


Fig. 3





3 HALF PI DISK ASSEMBLY

Fig. 1

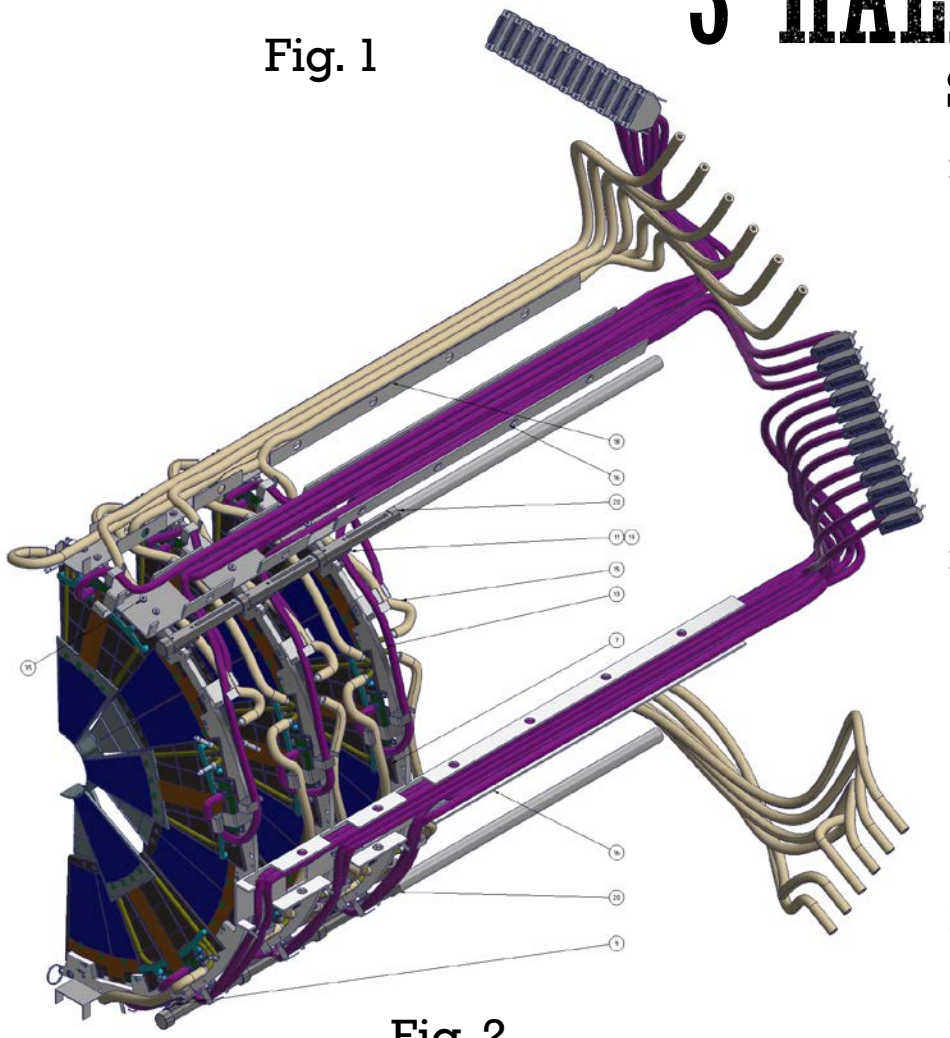


Fig. 2

QTY	ITEM	PART NUMBER	DESCRIPTION
48	35	90666A016_McMASTER	SOCKET HEAD CAP SCREW_TYPE 316 SS LOW PROFILE
4	20	Solid Rail-3	SOLID RAIL ASSY
60	19	93615A380_McMASTER	SOCKET CAP SCREW_TYPE 18-8 SS LOW PROFILE_10-32 X 1/2L
4	18	9001k923_McMASTER	ARCHIT. 6061 ALUMINUM U-CHANNEL
2	16	9001K784_McMaster	ARCHIT. 6063 AL. U-CHANNEL
1	15	Run 02	COOLING LINES
1	13	FST Assembly-2.Harness4	CABLE SYSTEM
3	11	FST Plane Holding Bracket-3	TOP - SOLID RAIL HOLDING BRACKET - RIGHT
3	9	FST Plane Holding Bracket-2	BOTTOM - SOLID RAIL HOLDING BRACKET - RIGHT
3	7	FST_Disk_0415	Full Disk Assy
1	1	CONE ASSEMBLY	FST CONE

BILL OF MATERIALS

Steps

10. Place the cooling lines in the small U channels as shown. See Fig 3.

Note:

- Top cooling lines are outlet lines and the bottom are inlet lines for the Right side installation.
- The left side installation is opposite of the right side installation(Top cooling lines are inlet lines and bottom are outlet lines).

11. Place the cables in the large U channels as shown. See Fig. 3.

Note:

- The top 3 Pi Disk cables runs are to be placed on the top U Channel. A total of 9 cables are placed in the top U Channel.
- The remaining 9 on the bottom are routed to the side (3 O'clock).

12. Dress all cables and cooling lines as shown in Fig 3.

13. Repeat steps 10 thru 12 for the other half of the Pi Disk Assembly.

14. Clip in Pi Disk lock and the quick release pin as shown.

Quick release pin & Disk lock

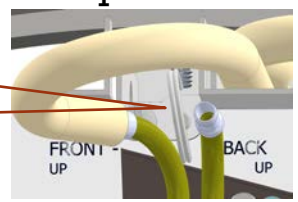
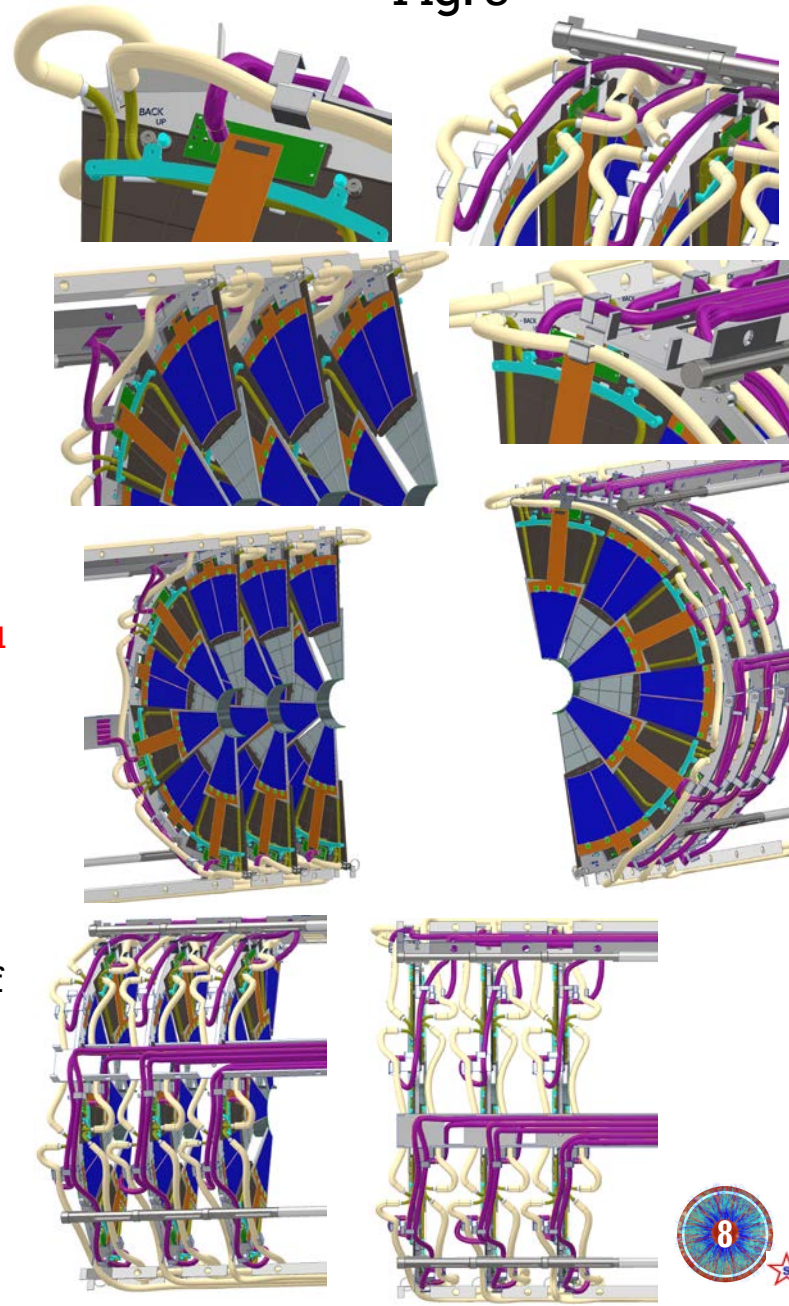


Fig. 3



INSTALLATION TOOLS & SETUP

Fig. 1

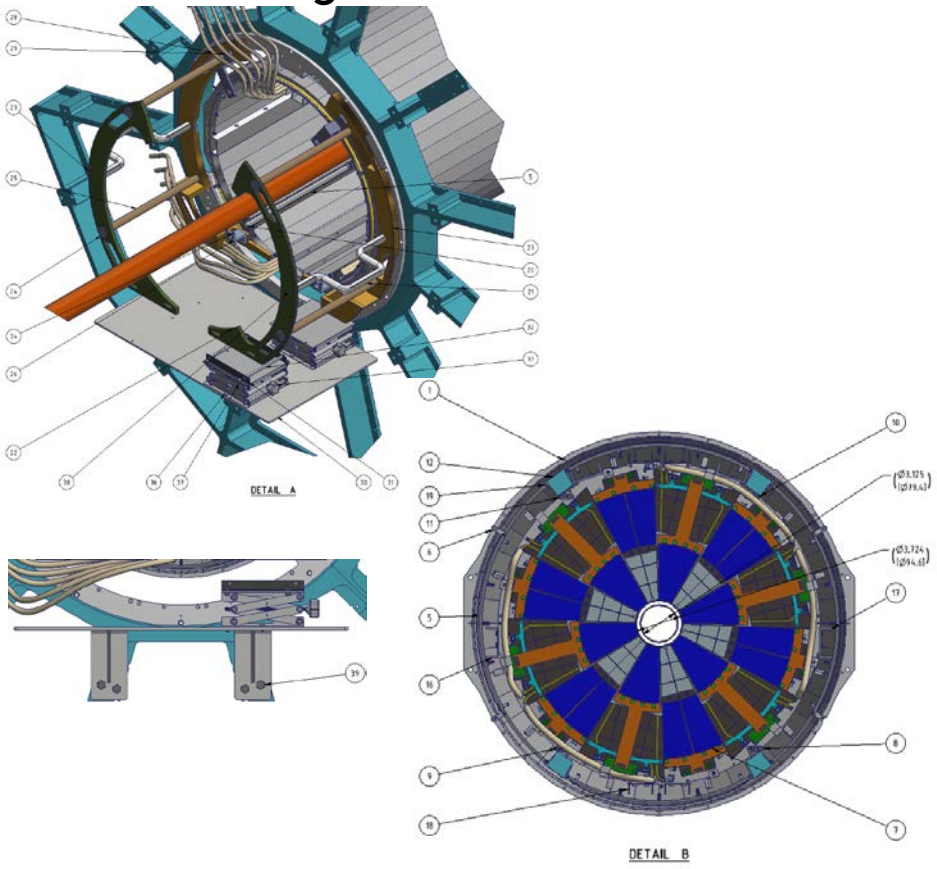


Fig. 2

QTY	ITEM	PART NUMBER	DESCRIPTION
60	19	93615A380_McMASTER	SOCKET CAP SCREW_TYPE 18-8 SS LOW PROFILE_10-32 X 1/2L
4	18	9001K923_McMASTER	ARCHIT. 6061 ALUMINUM U-CHANNEL
2	17	9001K784_L_McMASTER	ARCHITECTURAL 6063 AL. U-CHANNEL_LEFT
2	16	9001K784_McMaster	ARCHIT. 6063 AL. U-CHANNEL
1	15	Run 02	COOLING LINES
1	14	IST Services External-Simple	COOLING LINES SYSTEM
1	13	FST Assembly-2:Harness4	CABLE SYSTEM
4	12	SlideLock	STATIONARY LOCK SYSTEM (FST)
3	11	FST Plane Holding Bracket-3	TOP - SOLID RAIL HOLDING BRACKET - RIGHT
3	10	FST Plane Holding Bracket-3L	TOP - SOLID RAIL HOLDING BRACKET - LEFT
3	9	FST Plane Holding Bracket-2	BOTTOM - SOLID RAIL HOLDING BRACKET - RIGHT
3	8	FST Plane Holding Bracket-2L	BOTTOM - SOLID RAIL HOLDING BRACKET - LEFT
3	7	FST_Disk_0415	Full Disk Assy
4	6	ROTATION STOPPER	ROTATIONAL PREVENTION (SS RING)
1	5	Inner Rail Structure Assembly	DISK STRUCTURAL SUPPORTS ASSY.
1	4	Beam Pipe	BEAM PIPE ASSY
1	3	TPC IFC	STAR IFC End Ring (WEST)
1	2	TPC Wheel	TPC WHEEL ASSY
1	1	CONE ASSEMBLY	FST CONE

BILL OF MATERIALS

QTY	ITEM	PART NUMBER	DESCRIPTION
4	39	AS 2465 - 1/2 x 1 UNC	Unified hexagon bolts, screws and nuts (UNC and UNF threads)
4	38	ANSI B18.6.3 - 1/4-20 UNC x 1, PHWHMSI	Hexagon Head Screw
2	37	ANSI B18.2.2 - 1/4 - 20, HNI	Hex Nuts (Inch Series) Hex Nut
10	36	ANSI/ASME B18.2.1 - 1/4-20 UNC - 0.5, HBI	Hex Bolt - UNC (Regular Thread - Inch)
48	35	90666A016_McMASTER	SOCKET HEAD CAP SCREW_TYPE 316 SS LOW PROFILE
8	34	93615A390_ McMASTER	SOCKET CAP SCREW_TYPE 18-8 SS LOW PROFILE
2	33	9967T448_McMASTER	BENCH-TOP ADJ. POS. STAND
2	32	1658T82_McMASTER	ARCHIT. 6063 ALUM ROUND TUBE
2	31	Bench -Slide Stopper	INST. SAFETY HOLDER (FST)
1	30	Installation Table-2	TABLE FOR FST INST.
2	29	Back Plate-Top	INST. SAFETY BRACKET (SOLID RAIL)
1	28	OuterPartial Ring-2L	INST. SUPPORT RING (LEFT)
1	27	OuterPartial Ring-2	INST. SUPPORT RING (RIGHT)
2	26	Back Plate	INST. SAFETY BRACKET (SOLID RAIL)
4	25	Outer Rail	INST. OUTER RAIL
4	24	Stopper	INST. OUTER RAIL STOPPER
1	23	Solid Rail Support Ring-2L	INST. SUPPORT RING - LEFT
1	22	Solid Rail Support Ring-2	INSTALLATION SUPPORT RING
2	21	Carry Handle	CARRY HANDLE
4	20	Solid Rail-3	SOLID RAIL ASSY

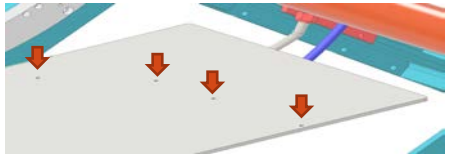
BILL OF MATERIALS

Steps

1. Install the SS Ring Assembly into the Cone and install all four Rotational Prevention part (items 6) as shown in fig 1, 2 & 3.

2. Installation of the Table (item 30) is done by aligning the table with the hole on the TPC face and fasten with screws (item 39). See Fig. 3.

3. Installation of Adjustable Bench (item 33) is done by matching the screw hole on the Table (item 30) with that of the adjustable bench. Fasten with screws (item 36). See below and Fig 1, 2 & 3.



4. Install the Inst. Safety Holder (item 31) as shown with screws (item 37). The Rod (Item 32) will be will be installed later.

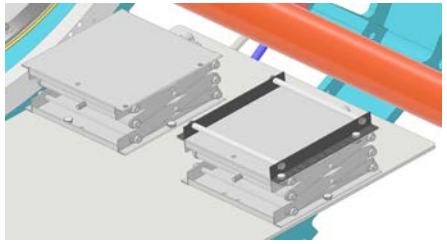
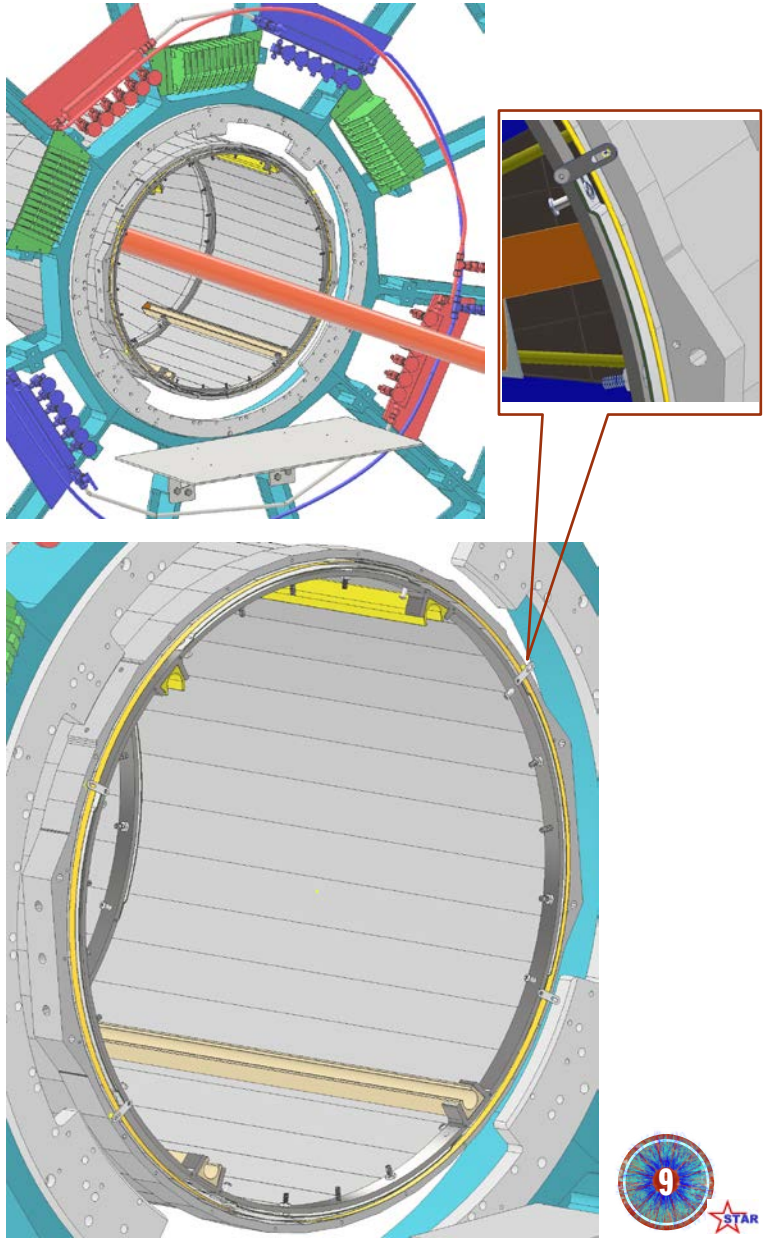


Fig. 3



INSTALLATION TOOLS & SETUP

Fig. 1

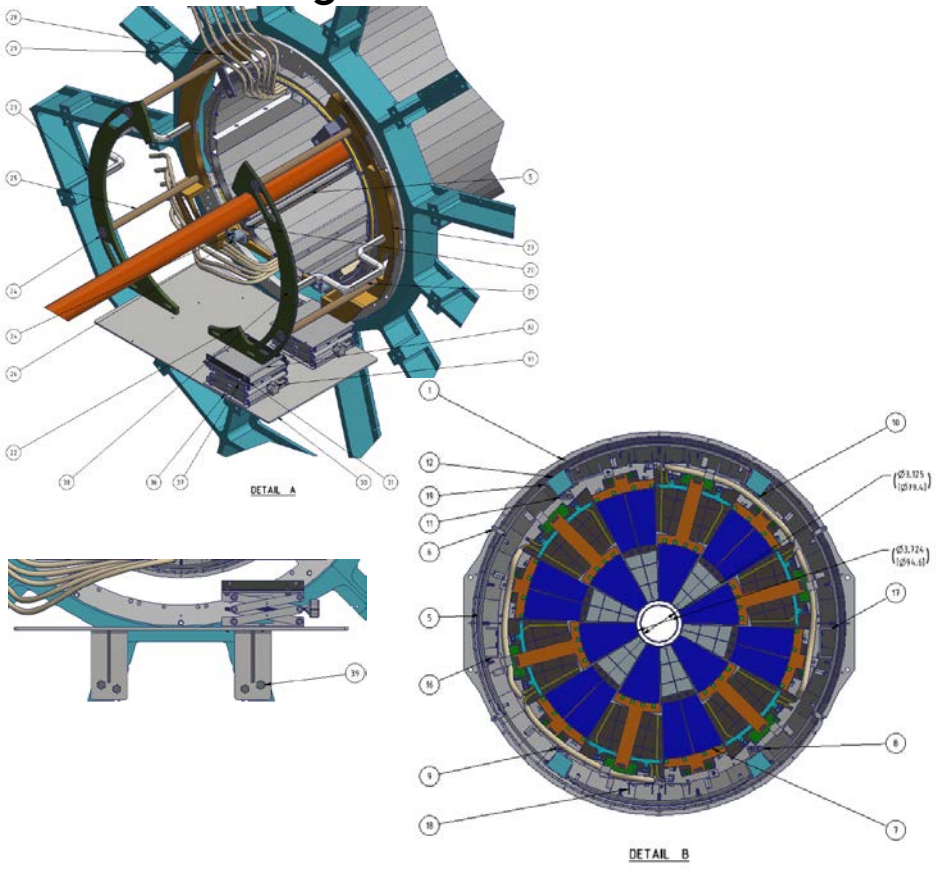


Fig. 2

QTY	ITEM	PART NUMBER	DESCRIPTION
60	19	93615A380_McMASTER	SOCKET CAP SCREW_TYPE 18-8 SS LOW PROFILE_10-32 X 1/2L
4	18	9001K923_McMASTER	ARCHIT. 6061 ALUMINUM U-CHANNEL
2	17	9001K784_L_McMASTER	ARCHITECTURAL 6063 AL. U-CHANNEL_LEFT
2	16	9001K784_McMaster	ARCHIT. 6063 AL. U-CHANNEL
1	15	Run 02	COOLING LINES
1	14	IST Services External-Simple	COOLING LINES SYSTEM
1	13	FST Assembly-2:Harness4	CABLE SYSTEM
4	12	SlideLock	STATIONARY LOCK SYSTEM (FST)
3	11	FST Plane Holding Bracket-3	TOP - SOLID RAIL HOLDING BRACKET - RIGHT
3	10	FST Plane Holding Bracket-3L	TOP - SOLID RAIL HOLDING BRACKET - LEFT
3	9	FST Plane Holding Bracket-2	BOTTOM - SOLID RAIL HOLDING BRACKET - RIGHT
3	8	FST Plane Holding Bracket-2L	BOTTOM - SOLID RAIL HOLDING BRACKET - LEFT
3	7	FST_Disk_0415	Full Disk Assy
4	6	ROTATION STOPPER	ROTATIONAL PREVENTION (SS RING)
1	5	Inner Rail Structure Assembly	DISK STRUCTURAL SUPPORTS ASSY.
1	4	Beam Pipe	BEAM PIPE ASSY
1	3	TPC IFC	STAR IFC End Ring (WEST)
1	2	TPC Wheel	TPC WHEEL ASSY
1	1	CONE ASSEMBLY	FST CONE

BILL OF MATERIALS

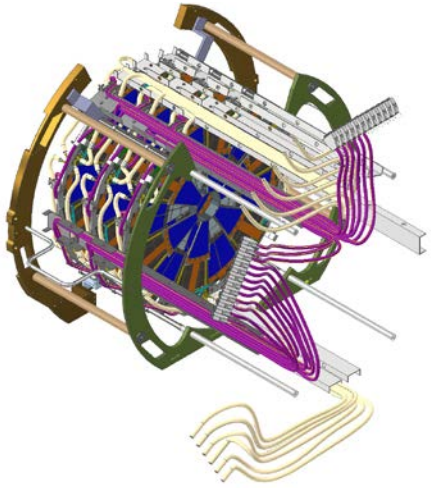
QTY	ITEM	PART NUMBER	DESCRIPTION
4	39	AS 2465 - 1/2 x 1 UNC	Unified hexagon bolts, screws and nuts (UNC and UNF threads)
4	38	ANSI B18.6.3 - 1/4-20 UNC x 1, PHWHMSI	Hexagon Head Screw
2	37	ANSI B18.2.2 - 1/4 - 20, HNI	Hex Nuts (Inch Series) Hex Nut
10	36	ANSI/ASME B18.2.1 - 1/4-20 UNC - 0.5, HBI	Hex Bolt - UNC (Regular Thread - Inch)
48	35	90666A016_McMASTER	SOCKET HEAD CAP SCREW_TYPE 316 SS LOW PROFILE
8	34	93615A390_ McMASTER	SOCKET CAP SCREW_TYPE 18-8 SS LOW PROFILE
2	33	9967T448_McMASTER	BENCH-TOP ADJ. POS. STAND
2	32	1658T82_McMASTER	ARCHIT. 6063 ALUM ROUND TUBE
2	31	Bench -Slide Stopper	INST. SAFETY HOLDER (FST)
1	30	Installation Table-2	TABLE FOR FST INST.
2	29	Back Plate-Top	INST. SAFETY BRACKET (SOLID RAIL)
1	28	OuterPartial Ring-2L	INST. SUPPORT RING (LEFT)
1	27	OuterPartial Ring-2	INST. SUPPORT RING (RIGHT)
2	26	Back Plate	INST. SAFETY BRACKET (SOLID RAIL)
4	25	Outer Rail	INST. OUTER RAIL
4	24	Stopper	INST. OUTER RAIL STOPPER
1	23	Solid Rail Support Ring-2L	INST. SUPPORT RING - LEFT
1	22	Solid Rail Support Ring-2	INSTALLATION SUPPORT RING
2	21	Carry Handle	CARRY HANDLE
4	20	Solid Rail-3	SOLID RAIL ASSY

BILL OF MATERIALS

Steps

5. Installation of the mounting tools (items 21,22,23,24,25,27,29 & 34) should be done as shown. See Fig. 3.

6. Install the FST Disk Assembly to the mounting tools as shown. Use items 26 & 29 and fasten with screws (item 34) and carry to the TPC face.



7. Insert the two Rods (Item 32) through the slotted hole provided to prevent FST Disk from tipping. Fasten with screws on front and back as shown using (item 37). See Fig 4.

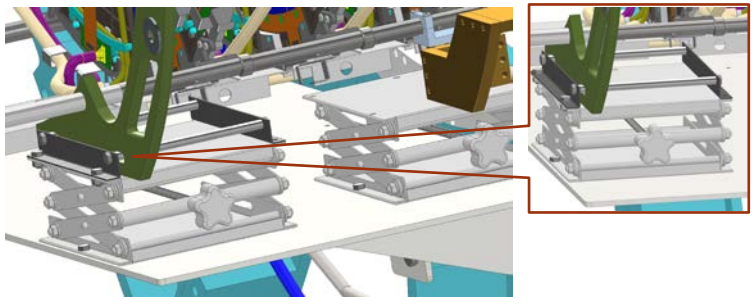


Fig. 3

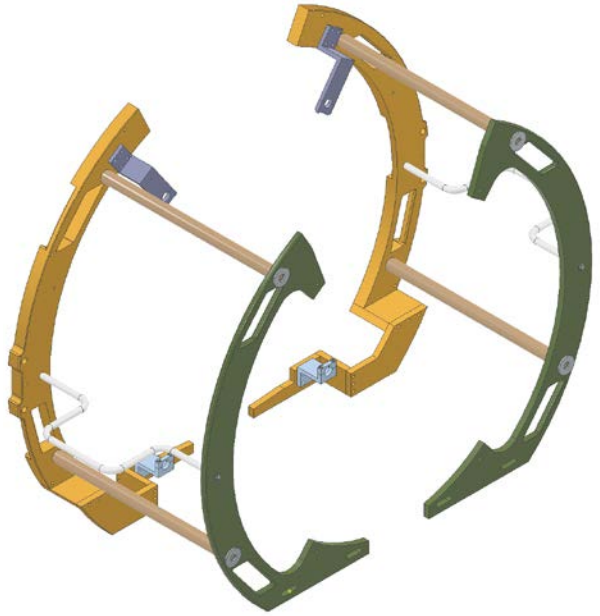
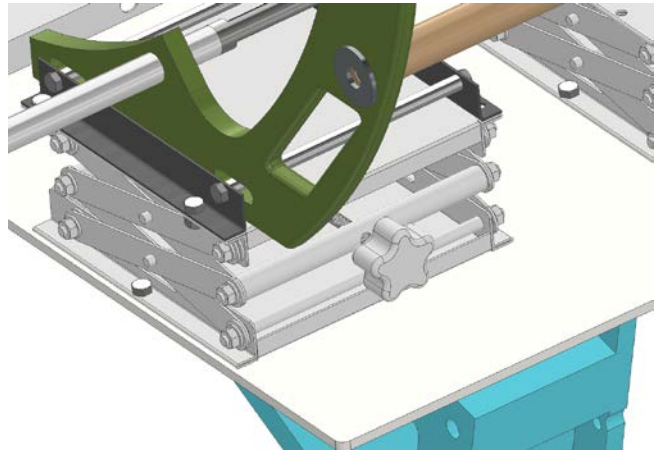


Fig. 4



INSTALLATION TOOLS & SETUP

Fig. 1

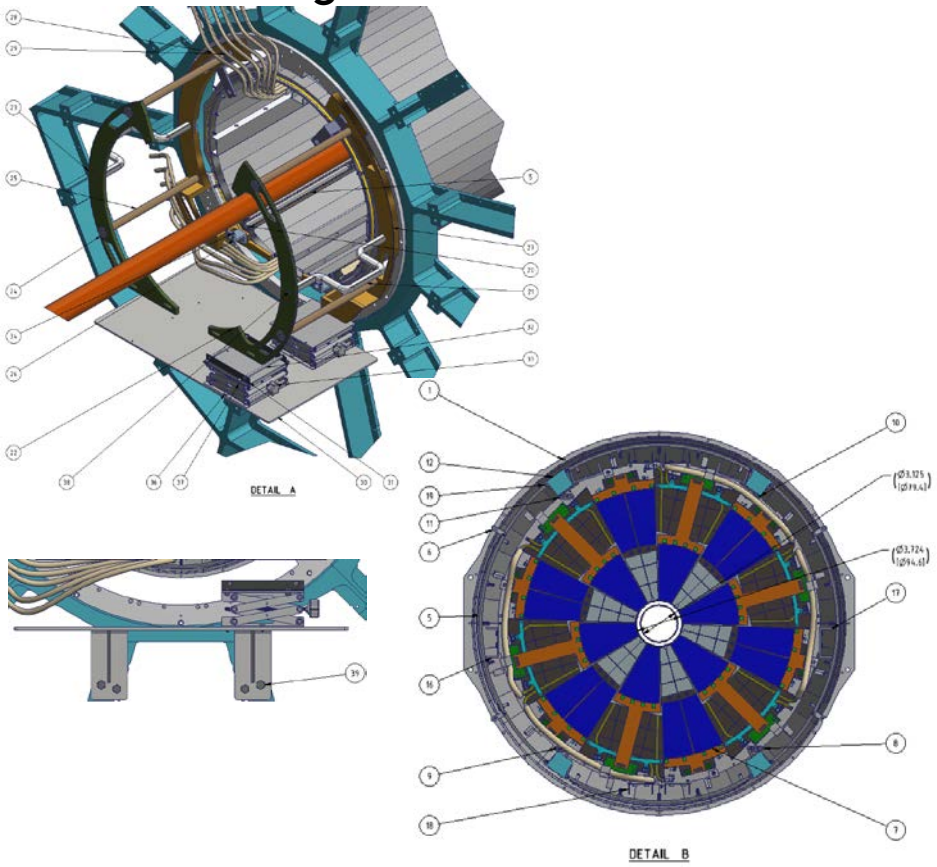


Fig. 2

QTY	ITEM	PART NUMBER	DESCRIPTION
60	19	93615A380_McMASTER	SOCKET CAP SCREW_TYPE 18-8 SS LOW PROFILE_10-32 X 1/2L
4	18	9001K923_McMASTER	ARCHIT. 6061 ALUMINUM U-CHANNEL
2	17	9001K784_L_McMASTER	ARCHITECTURAL 6063 AL. U-CHANNEL_LEFT
2	16	9001K784_McMaster	ARCHIT. 6063 AL. U-CHANNEL
1	15	Run 02	COOLING LINES
1	14	IST Services External-Simple	COOLING LINES SYSTEM
1	13	FST Assembly-2:Harness4	CABLE SYSTEM
4	12	SlideLock	STATIONARY LOCK SYSTEM (FST)
3	11	FST Plane Holding Bracket-3	TOP - SOLID RAIL HOLDING BRACKET - RIGHT
3	10	FST Plane Holding Bracket-3L	TOP - SOLID RAIL HOLDING BRACKET - LEFT
3	9	FST Plane Holding Bracket-2	BOTTOM - SOLID RAIL HOLDING BRACKET - RIGHT
3	8	FST Plane Holding Bracket-2L	BOTTOM - SOLID RAIL HOLDING BRACKET - LEFT
3	7	FST_Disk_0415	Full Disk Assy
4	6	ROTATION STOPPER	ROTATIONAL PREVENTION (SS RING)
1	5	Inner Rail Structure Assembly	DISK STRUCTURAL SUPPORTS ASSY.
1	4	Beam Pipe	BEAM PIPE ASSY
1	3	TPC IFC	STAR IFC End Ring (WEST)
1	2	TPC Wheel	TPC WHEEL ASSY
1	1	CONE ASSEMBLY	FST CONE

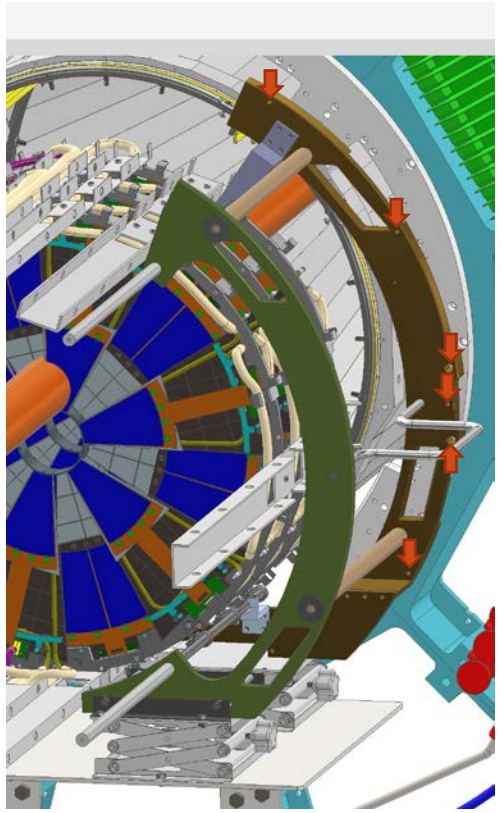
BILL OF MATERIALS

QTY	ITEM	PART NUMBER	DESCRIPTION
4	39	AS 2465 - 1/2 x 1 UNC	Unified hexagon bolts, screws and nuts (UNC and UNF threads)
4	38	ANSI B18.6.3 - 1/4-20 UNC x 1, PHWHMSI	Hexagon Head Screw
2	37	ANSI B18.2.2 - 1/4 - 20, HNI	Hex Nuts (Inch Series) Hex Nut
10	36	ANSI/ASME B18.2.1 - 1/4-20 UNC - 0.5, HBI	Hex Bolt - UNC (Regular Thread - Inch)
48	35	90666A016_McMASTER	SOCKET HEAD CAP SCREW_TYPE 316 SS LOW PROFILE
8	34	93615A390_ McMASTER	SOCKET CAP SCREW_TYPE 18-8 SS LOW PROFILE
2	33	9967T448_McMASTER	BENCH-TOP ADJ. POS. STAND
2	32	1658T82_McMASTER	ARCHIT. 6063 ALUM ROUND TUBE
2	31	Bench -Slide Stopper	INST. SAFETY HOLDER (FST)
1	30	Installation Table-2	TABLE FOR FST INST.
2	29	Back Plate-Top	INST. SAFETY BRACKET (SOLID RAIL)
1	28	OuterPartial Ring-2L	INST. SUPPORT RING (LEFT)
1	27	OuterPartial Ring-2	INST. SUPPORT RING (RIGHT)
2	26	Back Plate	INST. SAFETY BRACKET (SOLID RAIL)
4	25	Outer Rail	INST. OUTER RAIL
4	24	Stopper	INST. OUTER RAIL STOPPER
1	23	Solid Rail Support Ring-2L	INST. SUPPORT RING - LEFT
1	22	Solid Rail Support Ring-2	INSTALLATION SUPPORT RING
2	21	Carry Handle	CARRY HANDLE
4	20	Solid Rail-3	SOLID RAIL ASSY

BILL OF MATERIALS

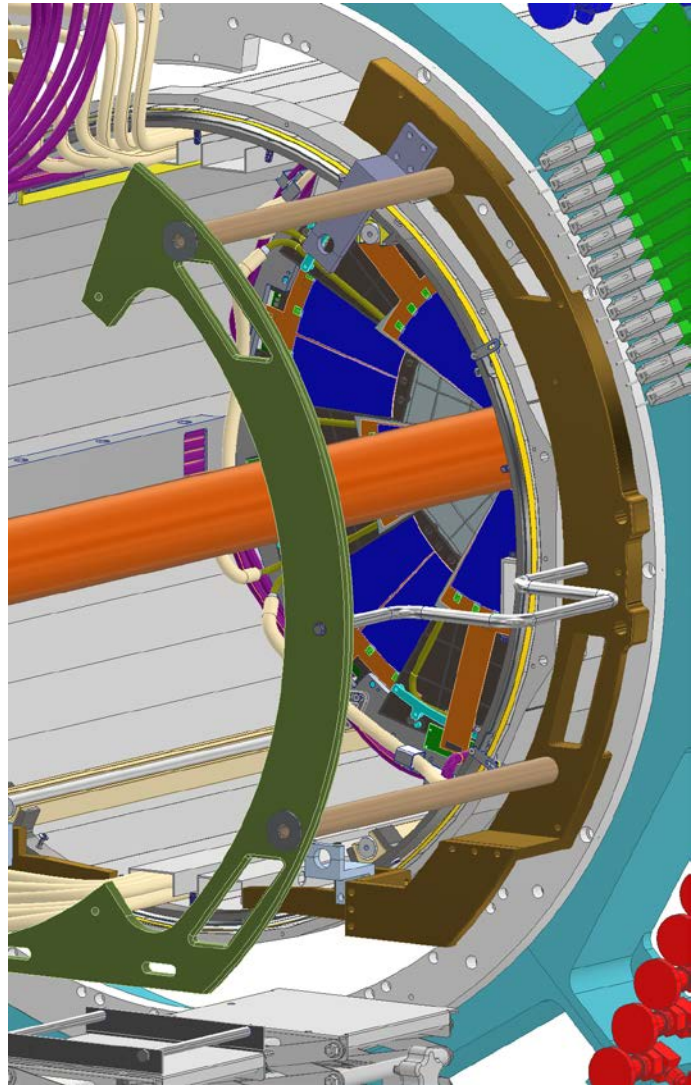
Steps

8. Remove the Carry Handle (item 21) and jack up the whole assembly to align with the holes on the TPC face. Fasten with screws. Note: Install one half before installing the other half.



9. Remove the two Rods and jacks. Repeat steps 6 & 7 for the other side.

Fig. 3



INSTALLATION TOOLS & SETUP

Fig. 1

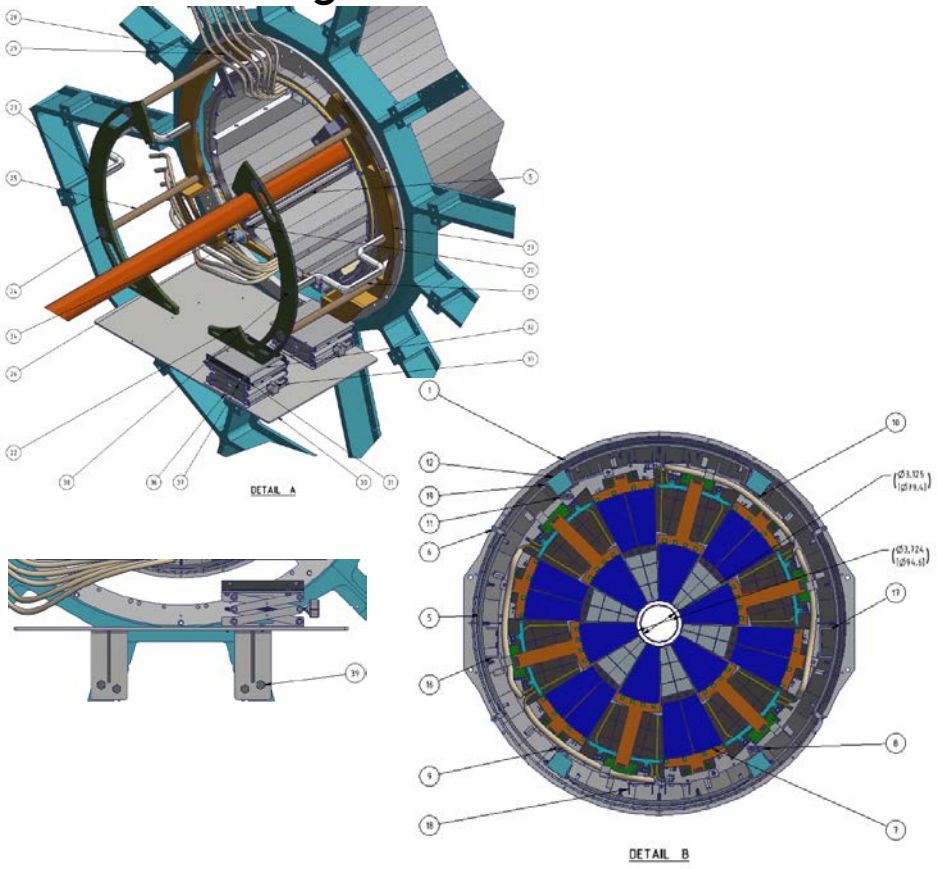


Fig. 2

QTY	ITEM	PART NUMBER	DESCRIPTION
60	19	93615A380_McMASTER	SOCKET CAP SCREW_TYPE 18-8 SS LOW PROFILE_10-32 X 1/2L
4	18	9001k923_McMASTER	ARCHIT. 6061 ALUMINUM U-CHANNEL
2	17	9001K784_L_McMASTER	ARCHITECTURAL 6063 AL. U-CHANNEL_LEFT
2	16	9001K784_McMaster	ARCHIT. 6063 AL. U-CHANNEL
1	15	Run 02	COOLING LINES
1	14	IST Services External-Simple	COOLING LINES SYSTEM
1	13	FST Assembly-2:Harness4	CABLE SYSTEM
4	12	SlideLock	STATIONARY LOCK SYSTEM (FST)
3	11	FST Plane Holding Bracket-3	TOP - SOLID RAIL HOLDING BRACKET - RIGHT
3	10	FST Plane Holding Bracket-3L	TOP - SOLID RAIL HOLDING BRACKET - LEFT
3	9	FST Plane Holding Bracket-2	BOTTOM - SOLID RAIL HOLDING BRACKET - RIGHT
3	8	FST Plane Holding Bracket-2L	BOTTOM - SOLID RAIL HOLDING BRACKET - LEFT
3	7	FST_Disk_0415	Full Disk Assy
4	6	ROTATION STOPPER	ROTATIONAL PREVENTION (SS RING)
1	5	Inner Rail Structure Assembly	DISK STRUCTURAL SUPPORTS ASSY.
1	4	Beam Pipe	BEAM PIPE ASSY
1	3	TPC IFC	STAR IFC End Ring (WEST)
1	2	TPC Wheel	TPC WHEEL ASSY
1	1	CONE ASSEMBLY	FST CONE

BILL OF MATERIALS

QTY	ITEM	PART NUMBER	DESCRIPTION
4	39	AS 2465 - 1/2 x 1 UNC	Unified hexagon bolts, screws and nuts (UNC and UNF threads)
4	38	ANSI B18.6.3 - 1/4-20 UNC x 1, PHWHMSI	Hexagon Head Screw
2	37	ANSI B18.2.2 - 1/4 - 20, HNI	Hex Nuts (Inch Series) Hex Nut
10	36	ANSI/ASME B18.2.1 - 1/4-20 UNC - 0.5, HBI	Hex Bolt - UNC (Regular Thread - Inch)
48	35	90666A016_McMASTER	SOCKET HEAD CAP SCREW_TYPE 316 SS LOW PROFILE
8	34	93615A390_ McMASTER	SOCKET CAP SCREW_TYPE 18-8 SS LOW PROFILE
2	33	9967T448_McMASTER	BENCH-TOP ADJ. POS. STAND
2	32	1658T82_McMASTER	ARCHIT. 6063 ALUM ROUND TUBE
2	31	Bench -Slide Stopper	INST. SAFETY HOLDER (FST)
1	30	Installation Table-2	TABLE FOR FST INST.
2	29	Back Plate-Top	INST. SAFETY BRACKET (SOLID RAIL)
1	28	OuterPartial Ring-2L	INST. SUPPORT RING (LEFT)
1	27	OuterPartial Ring-2	INST. SUPPORT RING (RIGHT)
2	26	Back Plate	INST. SAFETY BRACKET (SOLID RAIL)
4	25	Outer Rail	INST. OUTER RAIL
4	24	Stopper	INST. OUTER RAIL STOPPER
1	23	Solid Rail Support Ring-2L	INST. SUPPORT RING - LEFT
1	22	Solid Rail Support Ring-2	INSTALLATION SUPPORT RING
2	21	Carry Handle	CARRY HANDLE
4	20	Solid Rail-3	SOLID RAIL ASSY

BILL OF MATERIALS

Steps

10. Install all four Stationary Lock System (item 12) and fasten with screws (item19). See fig 1,2 & 3.

11. Remove all installation tools from the TPC face as shown. Connect the cables and the cooling lines as shown below for each Half Pi Disk Assembly.

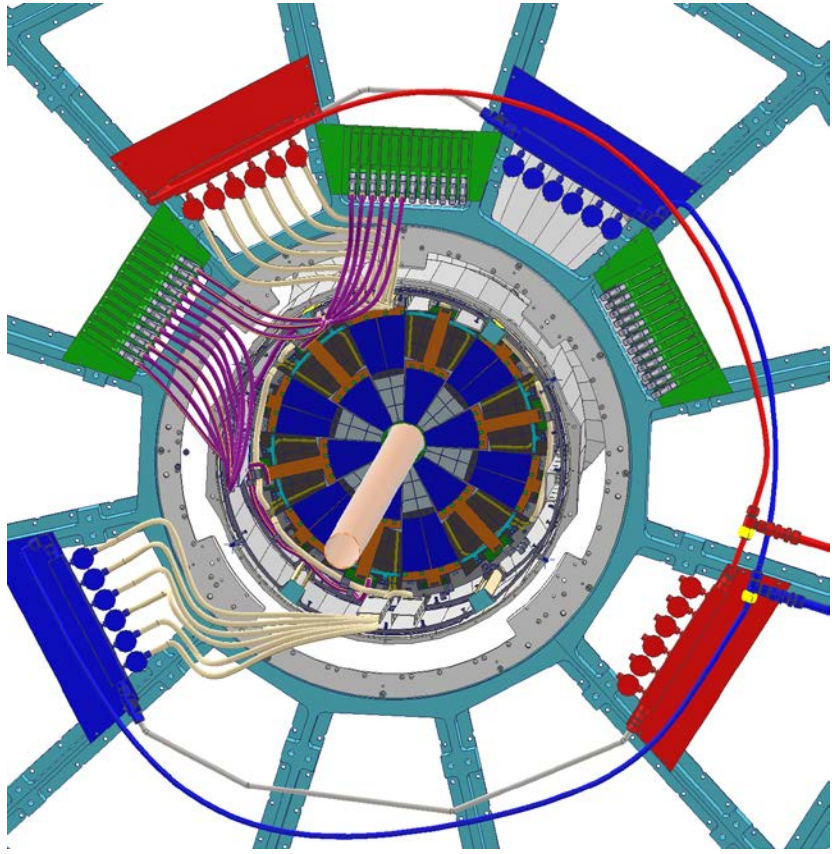
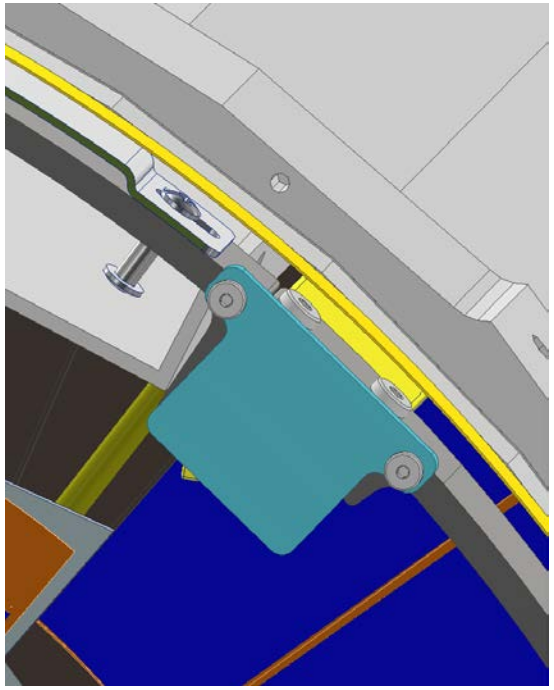


Fig. 3



REPAIR/ACCESSIBILITY OF KEY COMPONENTS

Fig. 1

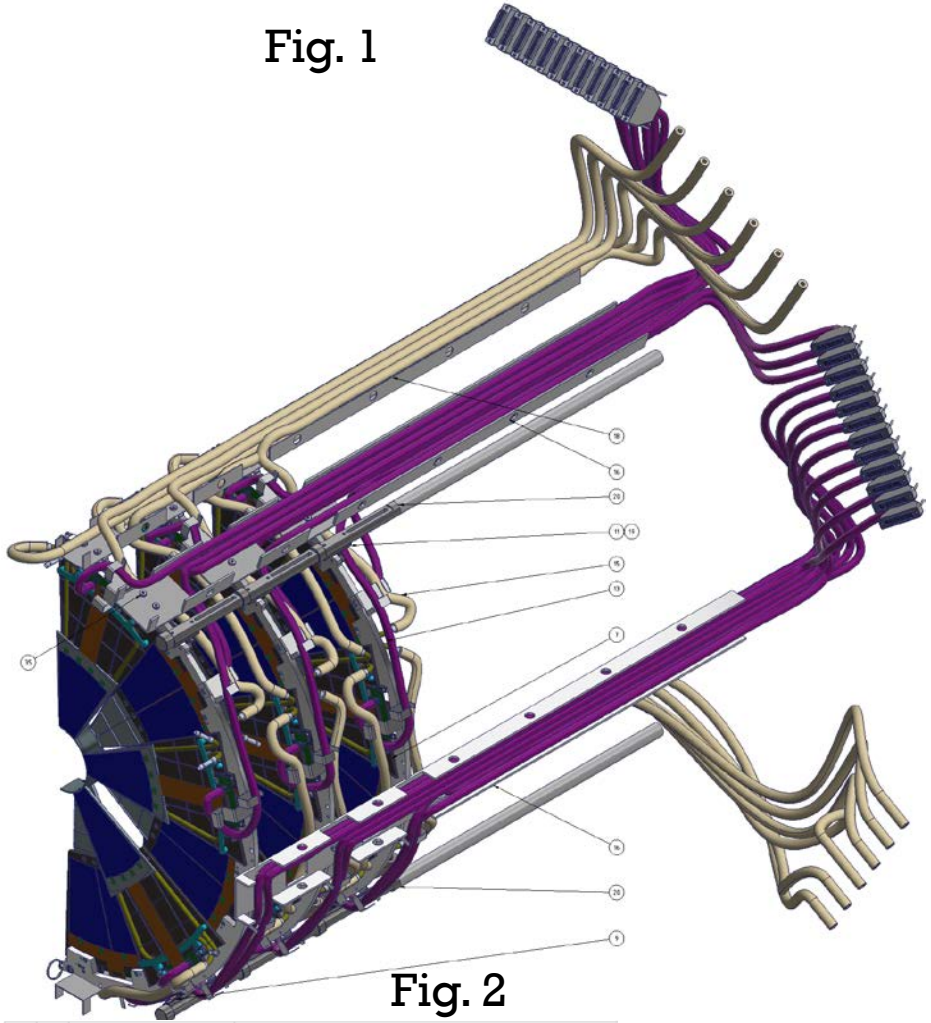


Fig. 2

QTY	ITEM	PART NUMBER	DESCRIPTION
48	35	90666A016_McMASTER	SOCKET HEAD CAP SCREW_TYPE 316 SS LOW PROFILE
4	20	Solid Rail-3	SOLID RAIL ASSY
60	19	93615A380_McMASTER	SOCKET CAP SCREW_TYPE 18-8 SS LOW PROFILE_10-32 X 1/2L
4	18	9001k923_McMASTER	ARCHIT. 6061 ALUMINUM U-CHANNEL
2	16	9001K784_McMaster	ARCHIT. 6063 AL. U-CHANNEL
1	15	Run 02	COOLING LINES
1	13	FST Assembly-2.Harness4	CABLE SYSTEM
3	11	FST Plane Holding Bracket-3	TOP - SOLID RAIL HOLDING BRACKET - RIGHT
3	9	FST Plane Holding Bracket-2	BOTTOM - SOLID RAIL HOLDING BRACKET - RIGHT
3	7	FST_Disk_0415	Full Disk Assy
1	1	CONE ASSEMBLY	FST CONE

BILL OF MATERIALS

Steps for Changing a Pi Disk Assembly

1. When the FST Disk is outside of the Cone, identify the disk assembly that is needed to be replaced.

2. Remove the screws that holds the U-Channels, Center Brace, Top and Bottom Solid Rails. Slide and rotate the assembly away from the beam pipe towards the mounting tools. If need be, remove the cable from the bracket.

Top-Solid Rail Holding Bracket

Bottom-Solid Rail Holding Bracket

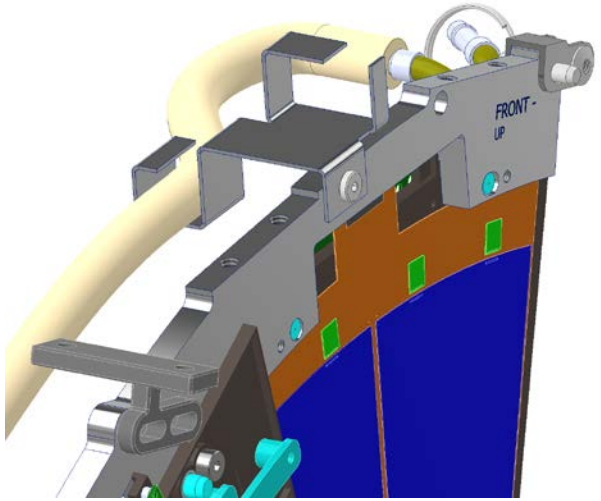
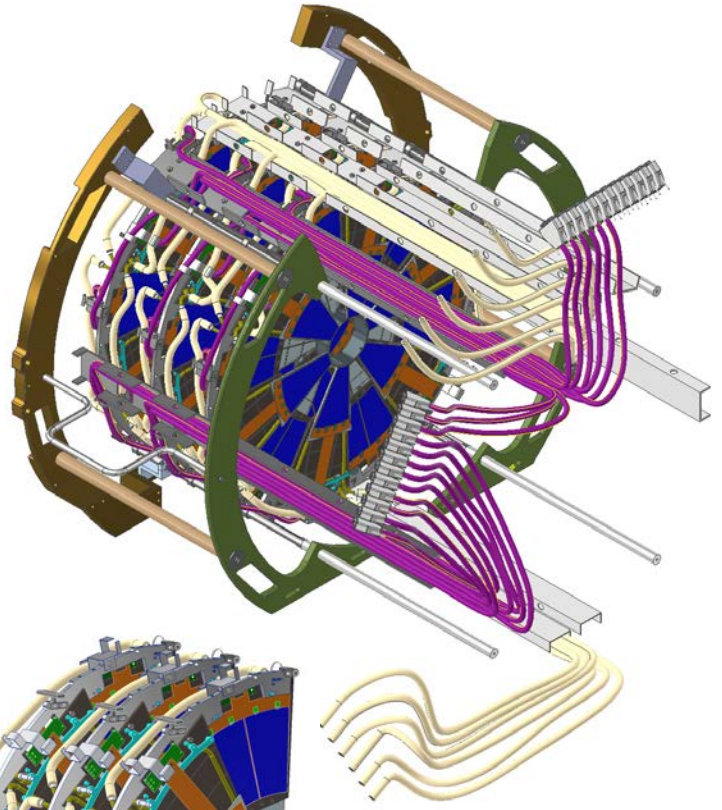
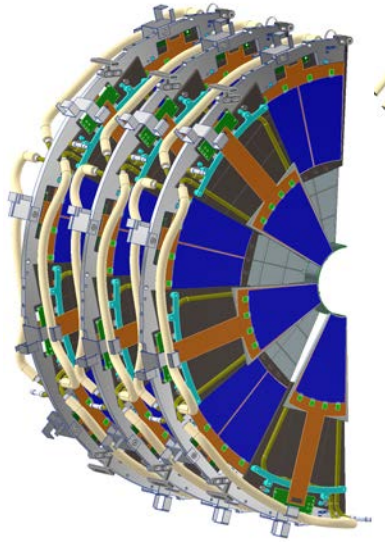


Fig. 3





REPAIR/ACCESSIBILITY OF KEY COMPONENTS

Fig. 1

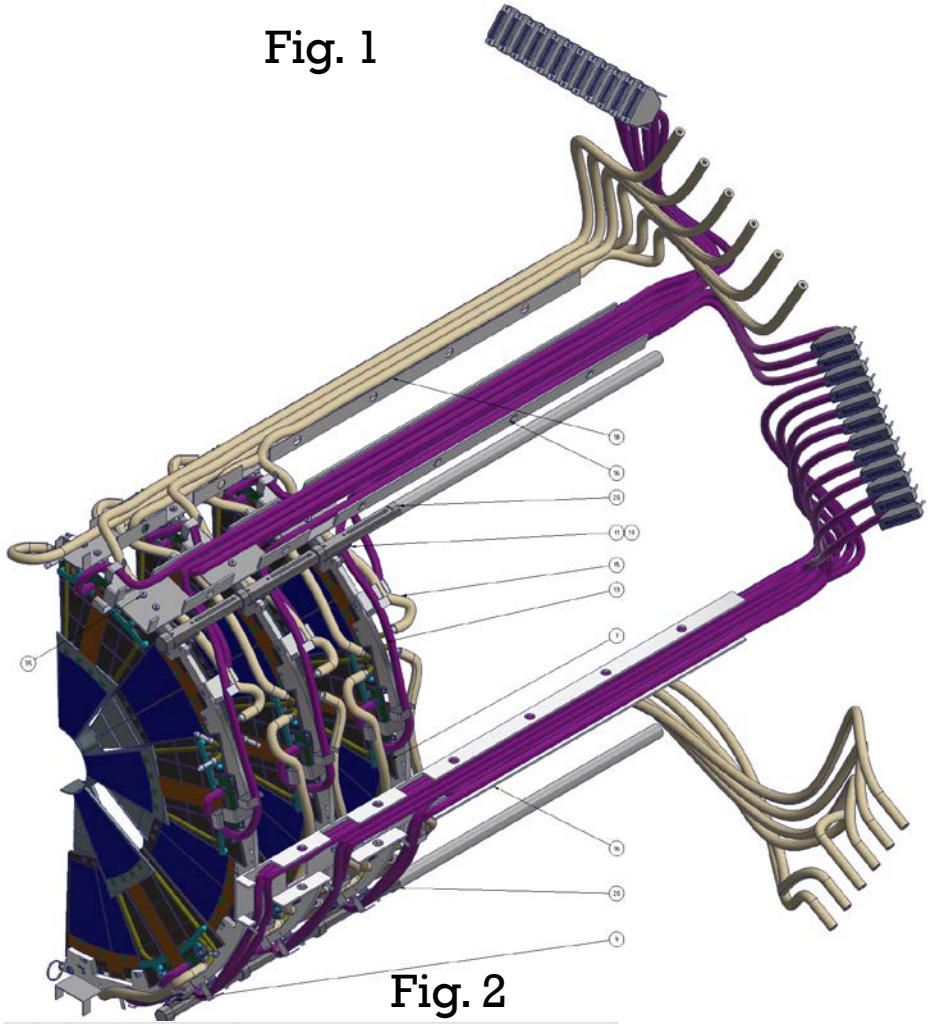


Fig. 2

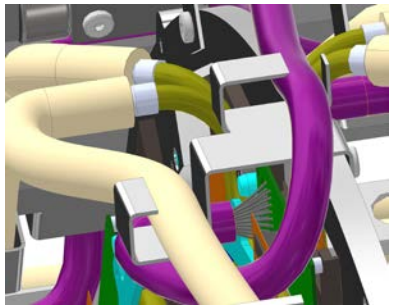
QTY	ITEM	PART NUMBER	DESCRIPTION
48	35	90666A016_McMASTER	SOCKET HEAD CAP SCREW_TYPE 316 SS LOW PROFILE
4	20	Solid Rail-3	SOLID RAIL ASSY
60	19	93615A380_McMASTER	SOCKET CAP SCREW_TYPE 18-8 SS LOW PROFILE_10-32 X 1/2L
4	18	9001k923_McMASTER	ARCHIT. 6061 ALUMINUM U-CHANNEL
2	16	9001K784_McMaster	ARCHIT. 6063 AL. U-CHANNEL
1	15	Run 02	COOLING LINES
1	13	FST Assembly-2.Harness4	CABLE SYSTEM
3	11	FST Plane Holding Bracket-3	TOP - SOLID RAIL HOLDING BRACKET - RIGHT
3	9	FST Plane Holding Bracket-2	BOTTOM - SOLID RAIL HOLDING BRACKET - RIGHT
3	7	FST_Disk_0415	Full Disk Assy
1	1	CONE ASSEMBLY	FST CONE

BILL OF MATERIALS

Steps for Changing T-board

1. When the FST Disk is outside of the Cone, identify the disk assembly that needs T-board replacement. See fig 3.

2. Remove the cable from the Bracket to give some slack if needed.



3. Disconnect the Hybrid cable from the T-board.

4. Remove the four screws that holds the T-board to the Aluminum Structure and replace with functional part. Note: However, if you cannot get to the defected part, repeat steps 1 & 2 from page 13 before steps for changing the T-board.

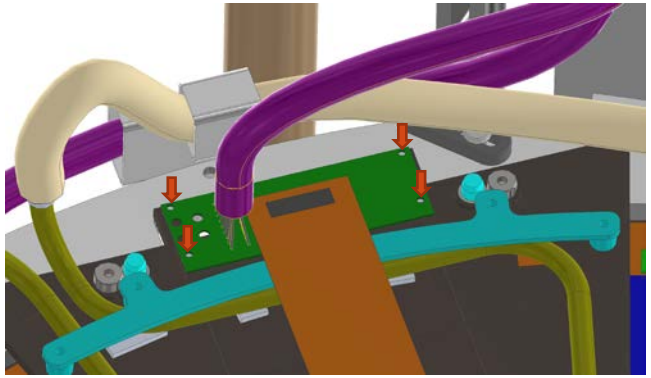


Fig. 3