

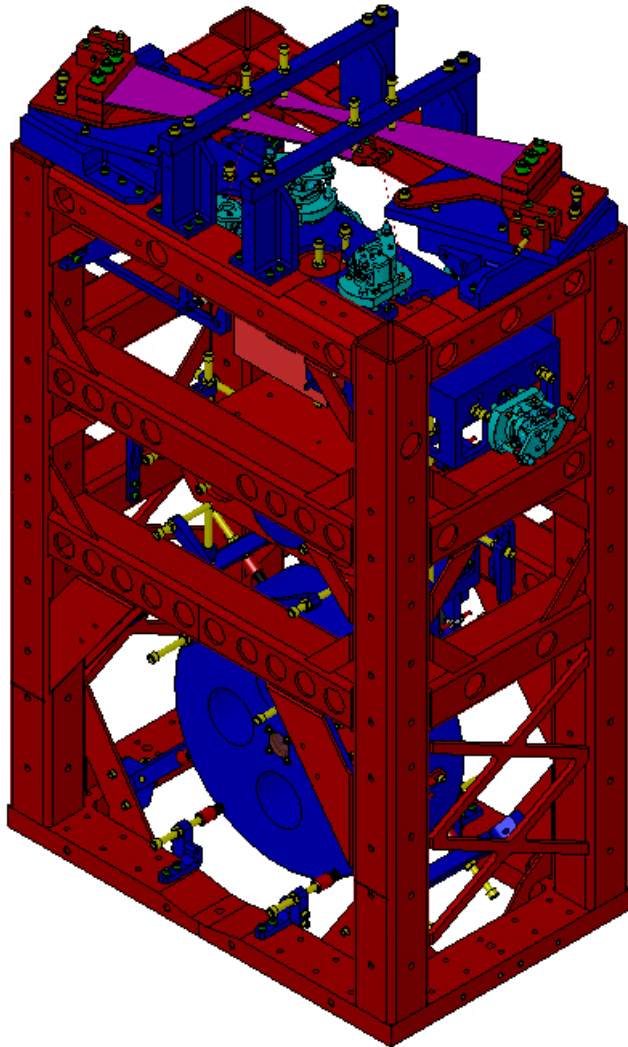


HLTS Kickoff Presentation

Derek Bridges
Bobby Moore

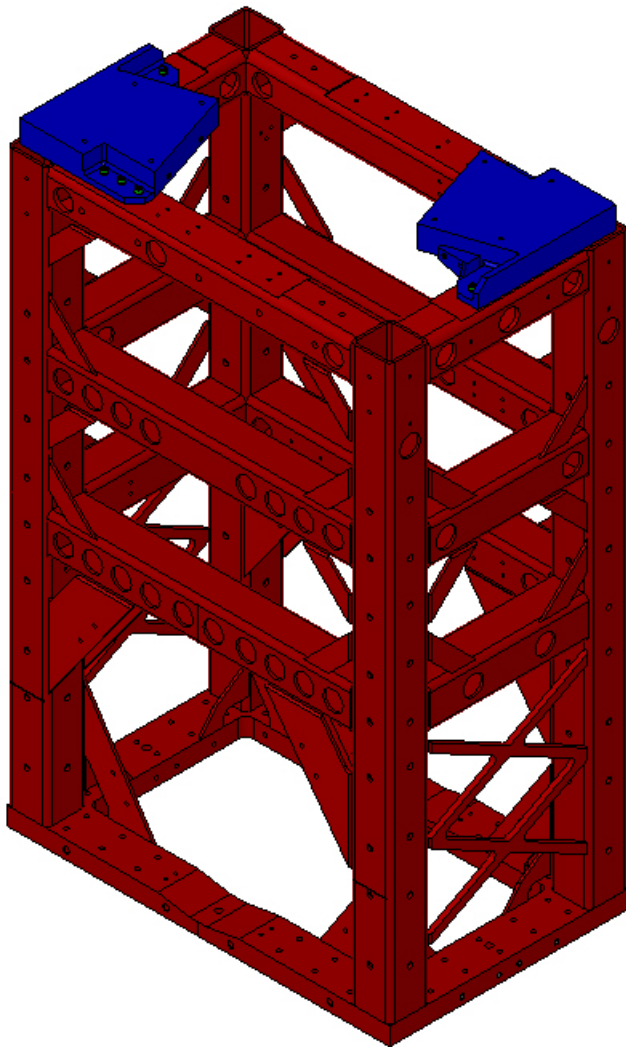
July 7, 2011

HLTS Description



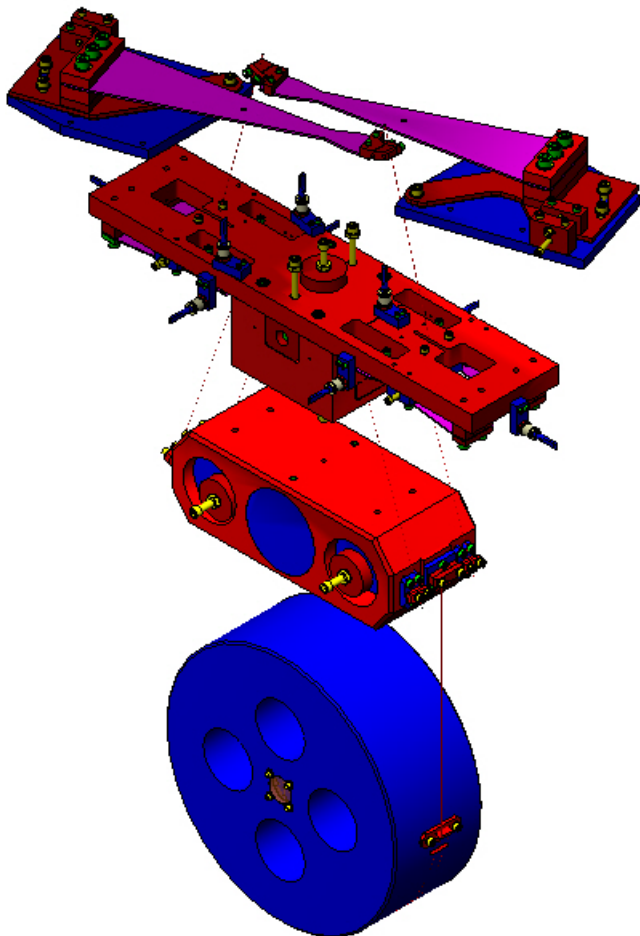
- HLTS vs. HSTS – optic diameter
 - 265 mm vs. 150 mm
- Suspends recycling mirror optics (PR3, SR3)
- Total mass: 93.64 kg (~206 lb)
 - Suspended mass: 36.50 kg (~80 lb)
 - Nonsuspended mass: 11.58 kg (~26 lb)
 - Structure mass: 45.56 kg (~100 lb)
- Total quantity: 8
 - LLO: 3 (1 PR3, 1 SR3, 1 spare)
 - LHO: 5 (1 PR3, 1 F-PR3, 2 SR3, 1 spare)

D070537 – HLTS Structure



- Vendor: Industrial Manufacturing Products
- Structural Weldment
 - SSTL tubes and plates
 - 3 – welded correctly
 - 4 – 1 piece too thick (2 long, 2 short)
 - 1 – 4 pieces too thick (2 long + 2 short)
- Mounting Pads
 - Aluminum
 - Fly cut to achieve correct height
 - Matched to front/back of each weldment

HLTS Suspension

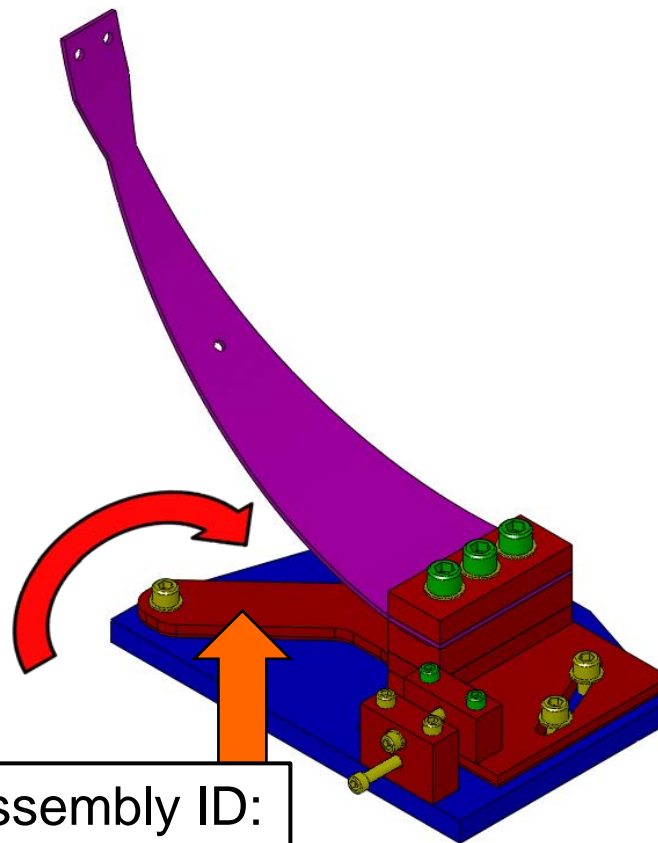


- Triple pendulum suspension
- All masses suspended using music wire
- Two stages of isolation from maraging steel blades
 - 2 Upper Blades (on Rotational Adj.)
 - 4 Lower Blades (on Upper Mass)
- Sensing and control
 - Upper Mass – 6 BOSEMs
 - Intermediate Mass – 4 AOSEMs
 - Bottom Mass – 4 AOSEMs

D070326 – Rotational Adjuster

Adjustments:

- Angled blade clamps
 - 0° to 3.5° by 0.5°
- Blade shims
 - 0.0 mm to 2.0 mm by 0.5 mm
- Push/pull screws (yaw)

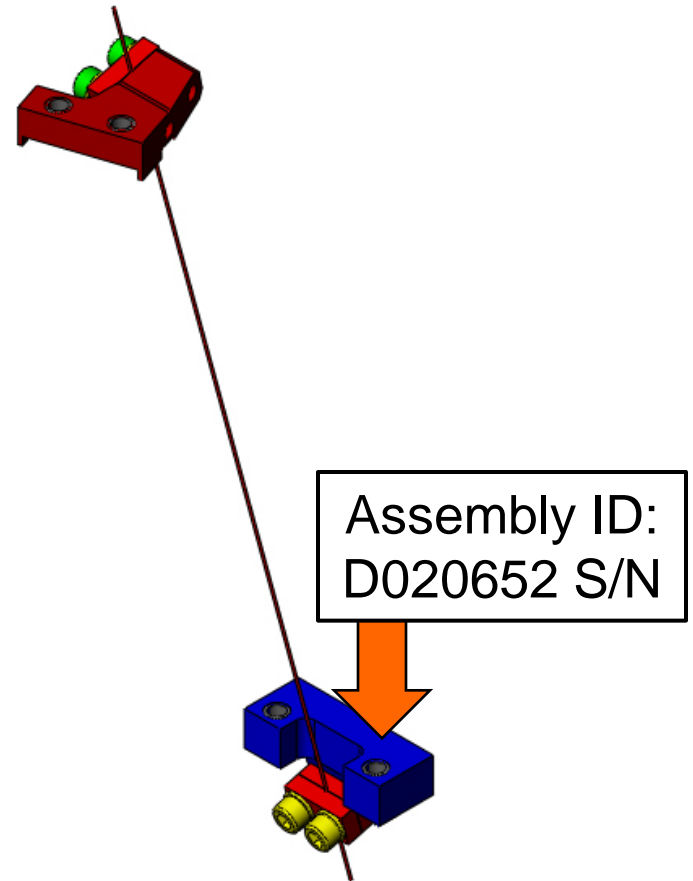


Assembly ID:
D070328 S/N

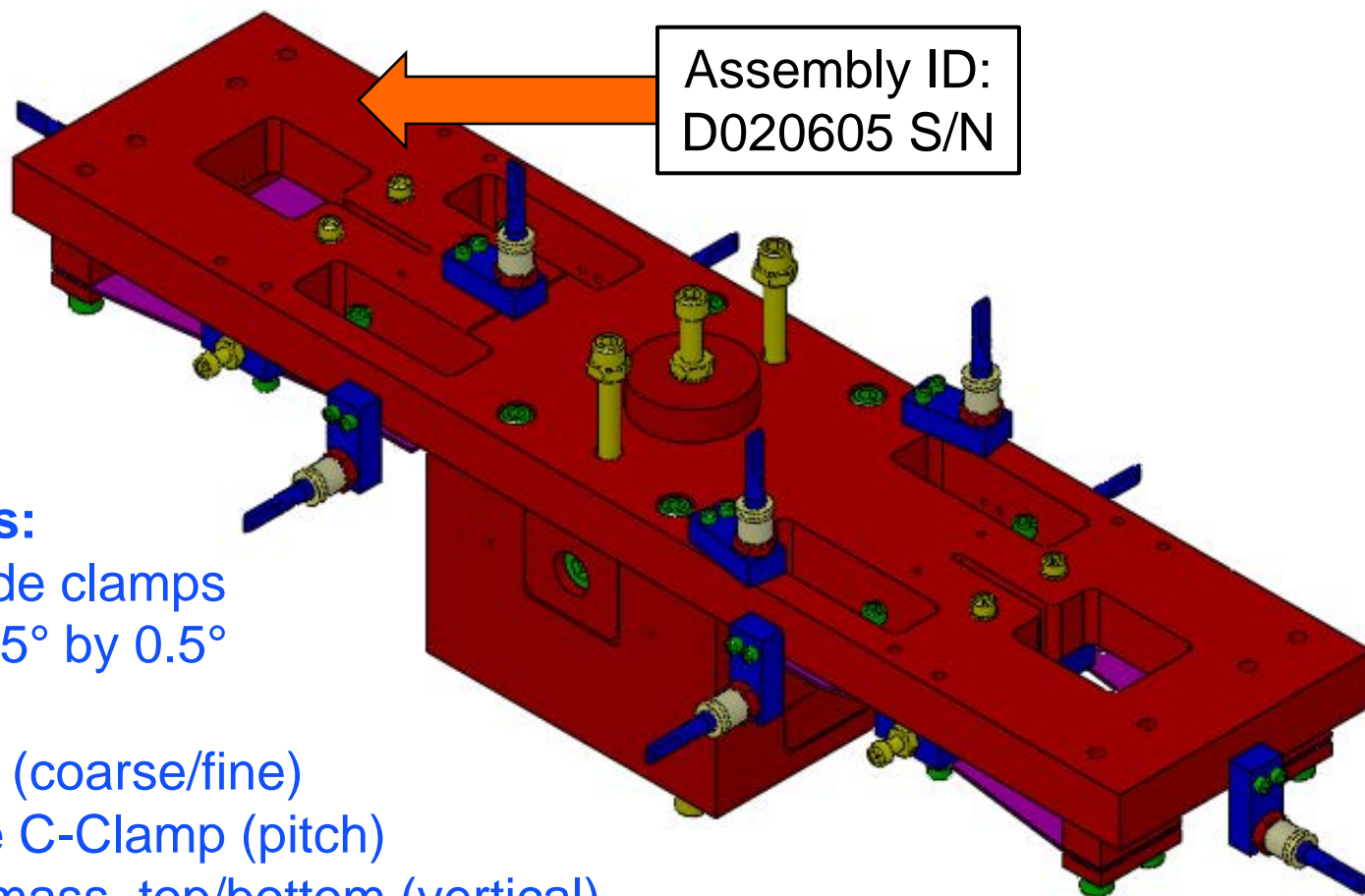
D070340 – Upper Wire Assy.

Properties:

- 2 wires per HLTS
- Wire diameter – 0.024 in (\approx 0.61 mm)
- Wire length – 202.5 mm (\approx 7.972 in)
 - Distance between clamps



D070335 – Upper Mass Assy.



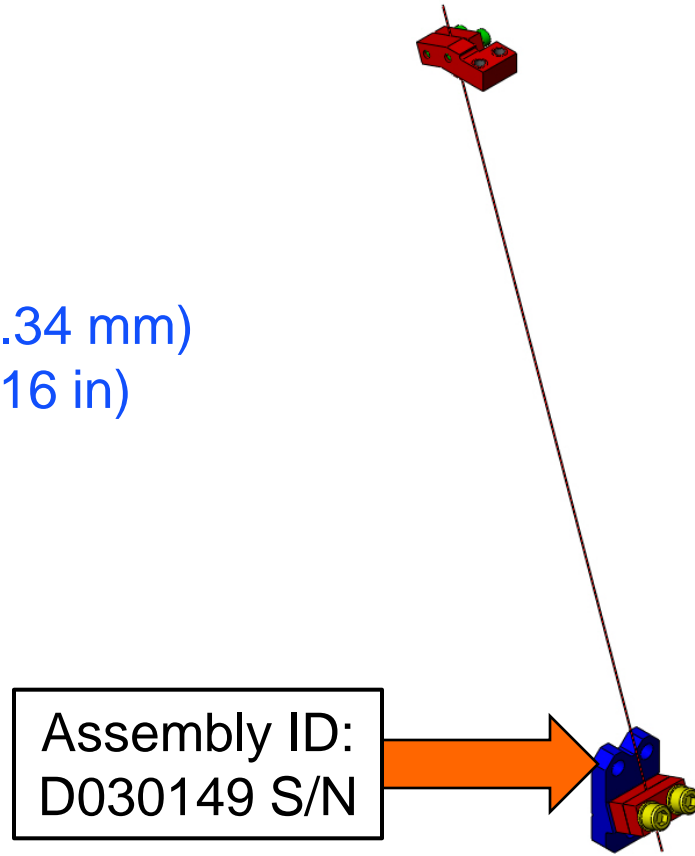
Adjustments:

- Angled blade clamps
 - 0° to 3.5° by 0.5°
- Roll offset
- Pitch offset (coarse/fine)
- Upper Wire C-Clamp (pitch)
- Additional mass, top/bottom (vertical)

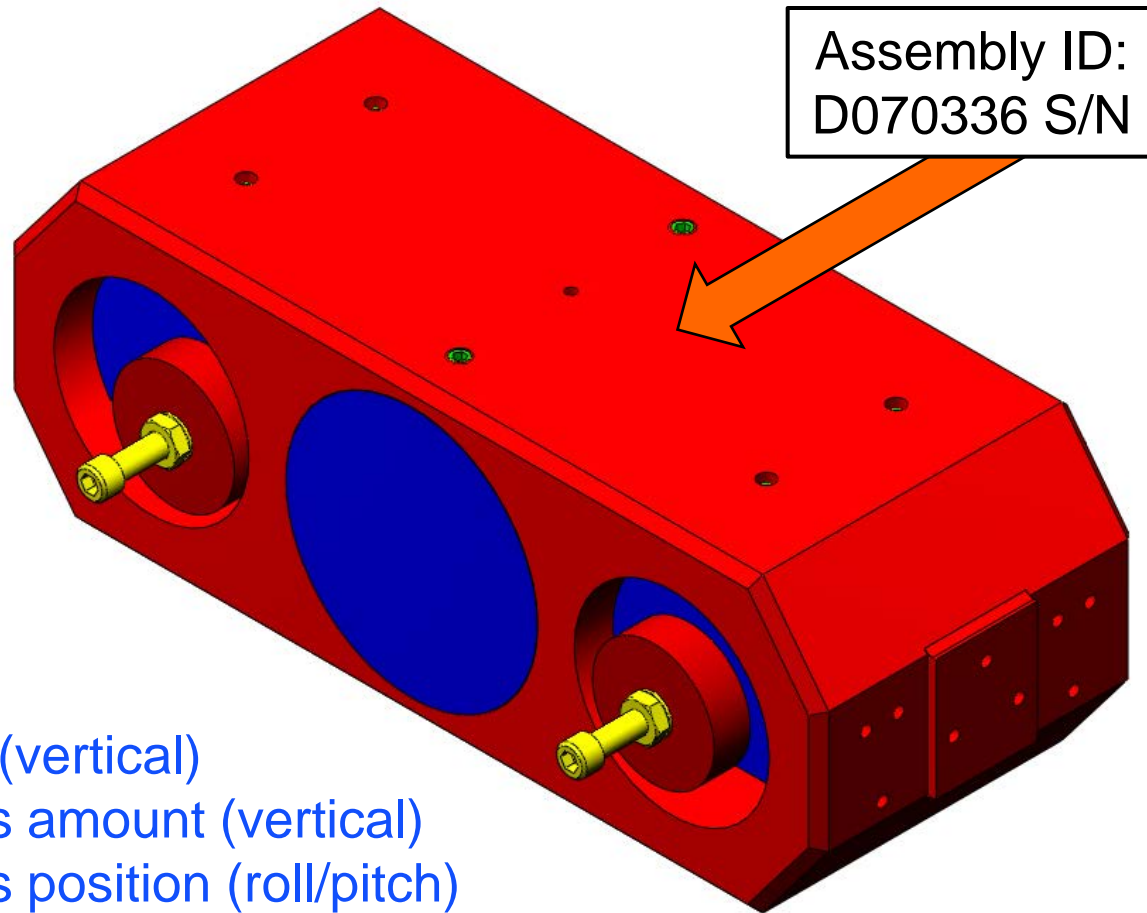
D070393 – Int. Wire Assy.

Properties:

- 4 wires per HLTS
- Wire diameter – 0.0134 in (\approx 0.34 mm)
- Wire length – 203.6 mm (\approx 8.016 in)
 - Distance between clamps



D070334 – Int. Mass Assy.



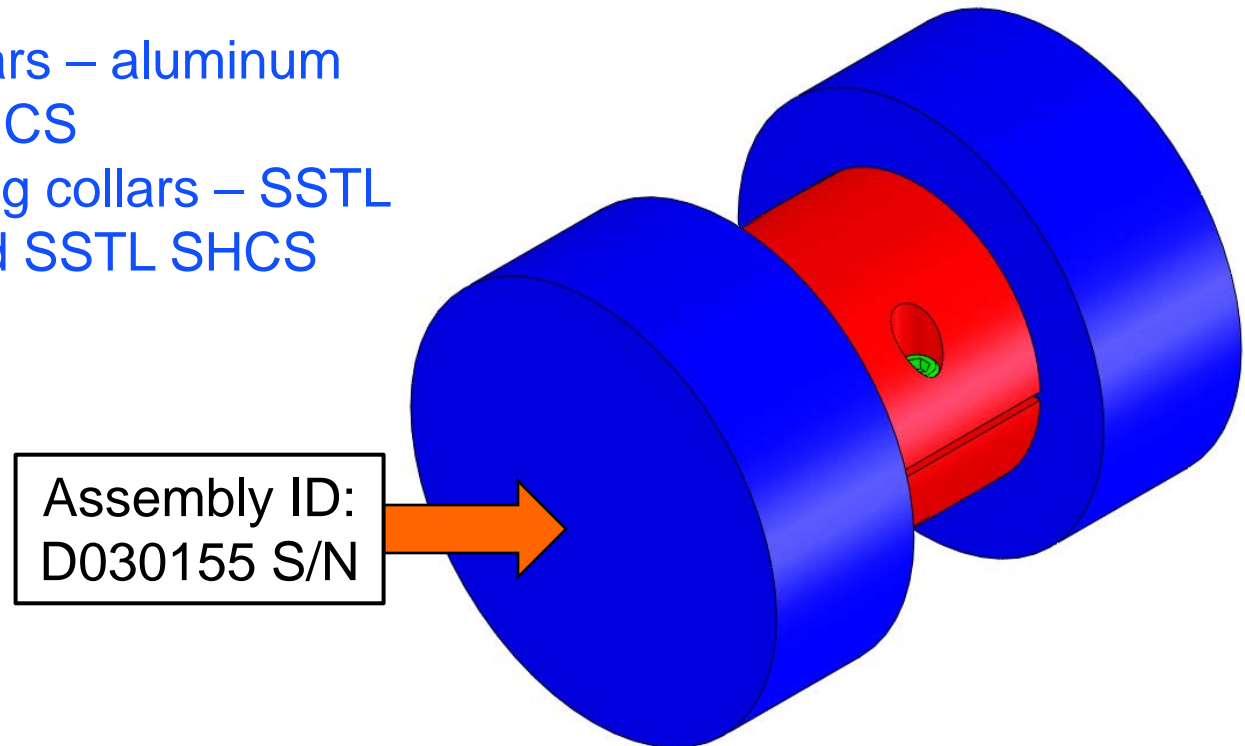
Adjustments:

- Mass Changer (vertical)
- Additional mass amount (vertical)
- Additional mass position (roll/pitch)

D080181 – Int. Mass Changer

Features:

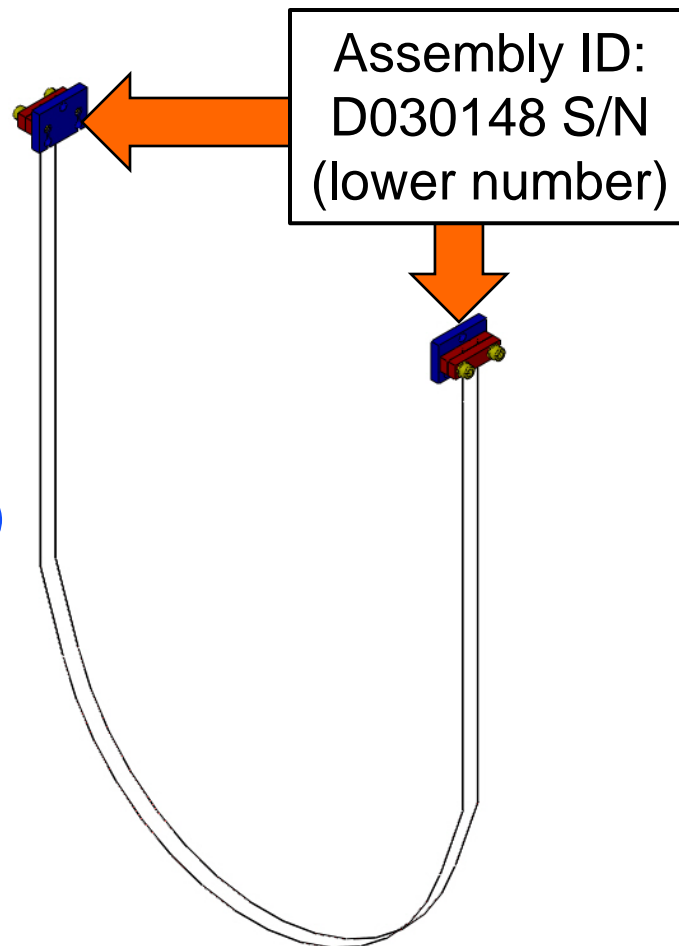
- 100g, 300g collars – aluminum
 - Use SSTL SHCS
- 500g, 700g, 900g collars – SSTL
 - Use Ag-plated SSTL SHCS



D070436 – Lower Loop Wire Assy.

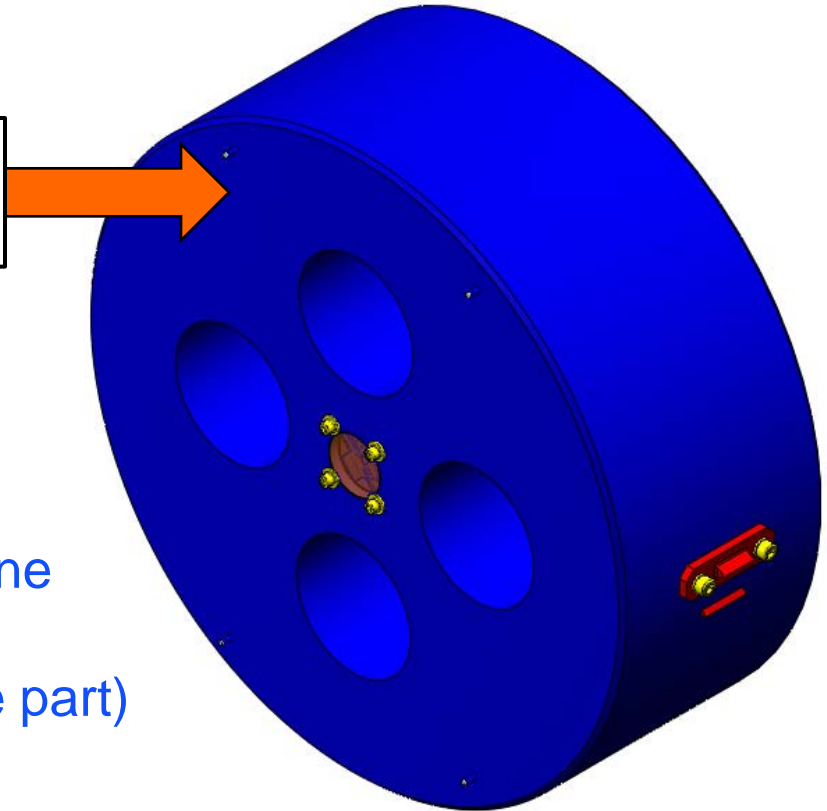
Properties:

- 1 assembly per HLTS
- 2 wires per assembly
- Wire diameter – 0.0106 in (≈ 0.27 mm)
- Wire length – 36.694 in (≈ 932 mm)
 - Distance between clamps



D070337 – Bottom Mass Assy.

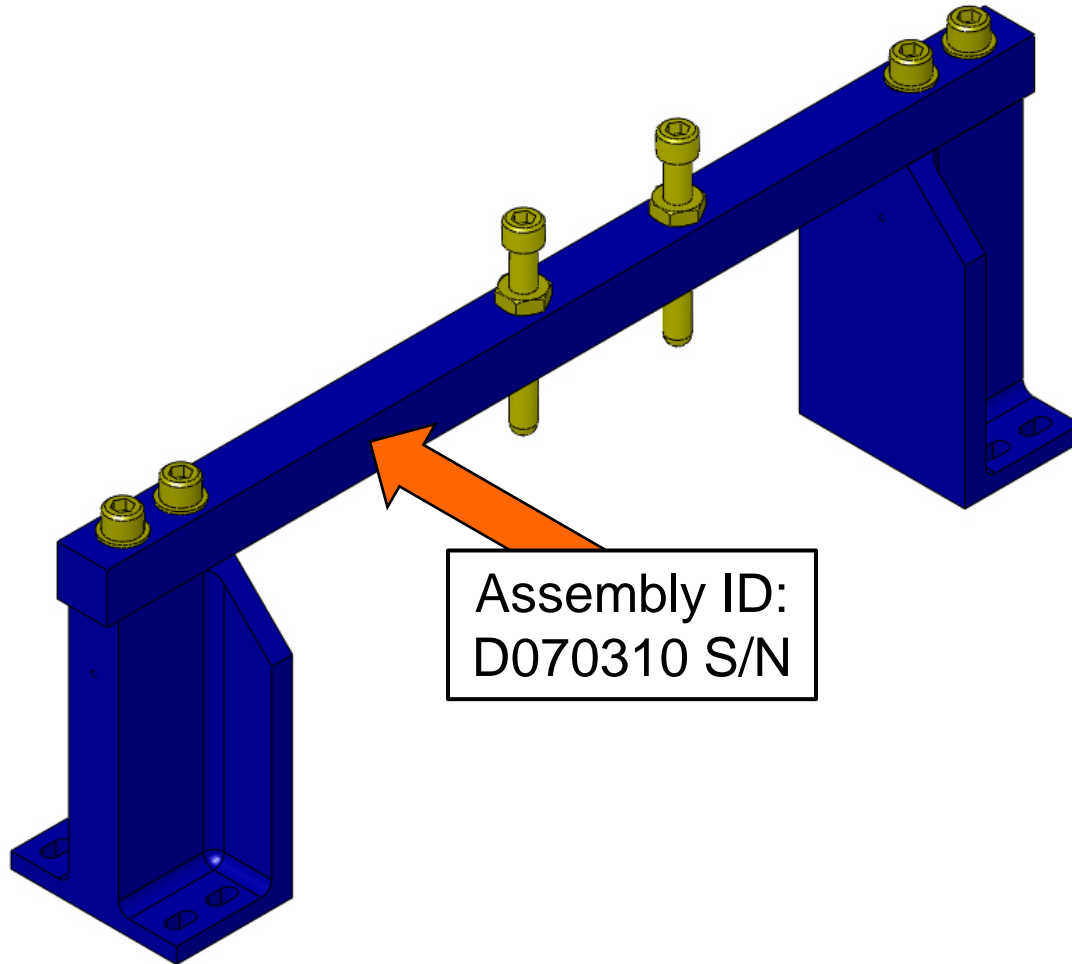
Assembly ID:
D070338 S/N



Features:

- Primary prism – SSTL
 - Glass optics use sapphire
 - Positioning – 1 mm above centerline
- Secondary prism – SSTL
 - Glass optics also use SSTL (same part)
 - Positioning to be determined

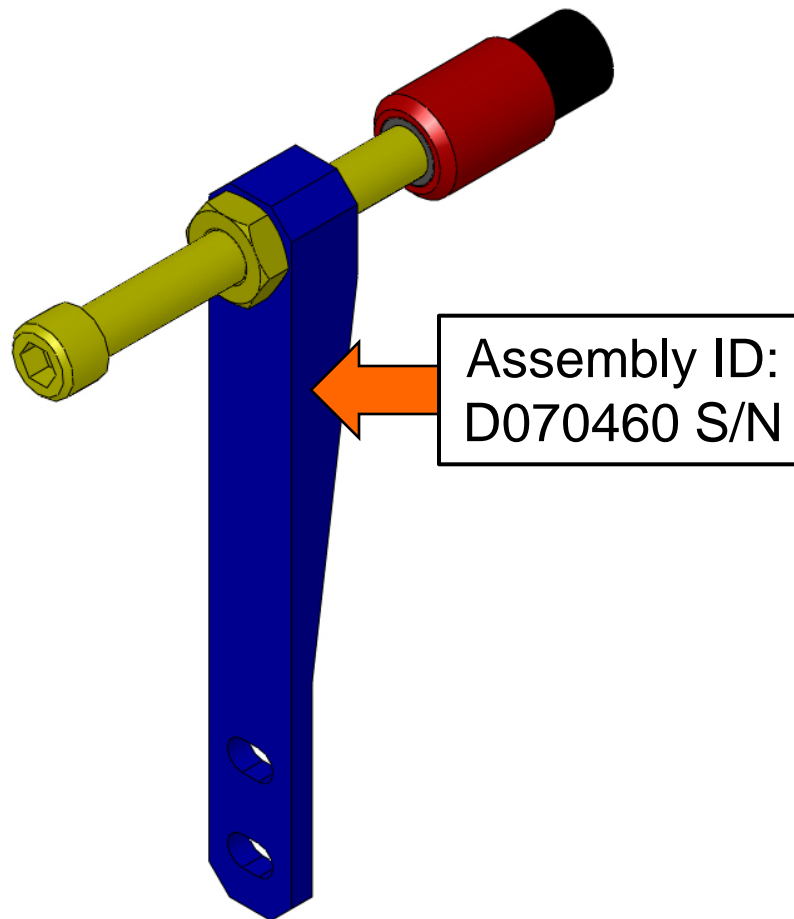
D070308 – Top Blade Guard



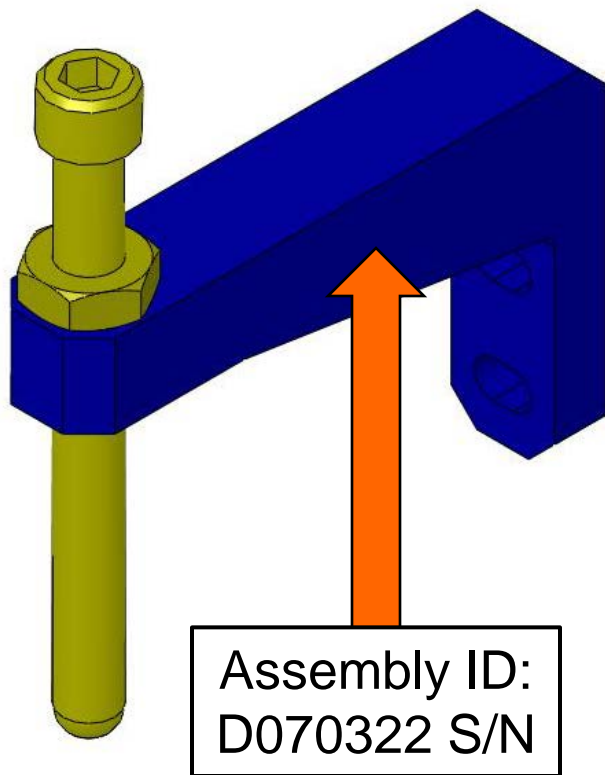
D080726 – EQ Stop, Long Mount

Features:

- Metal configuration
 - Rounded-end SHCS
- Glass configuration
 - Rounded-end SHCS with a glass-tipped cap



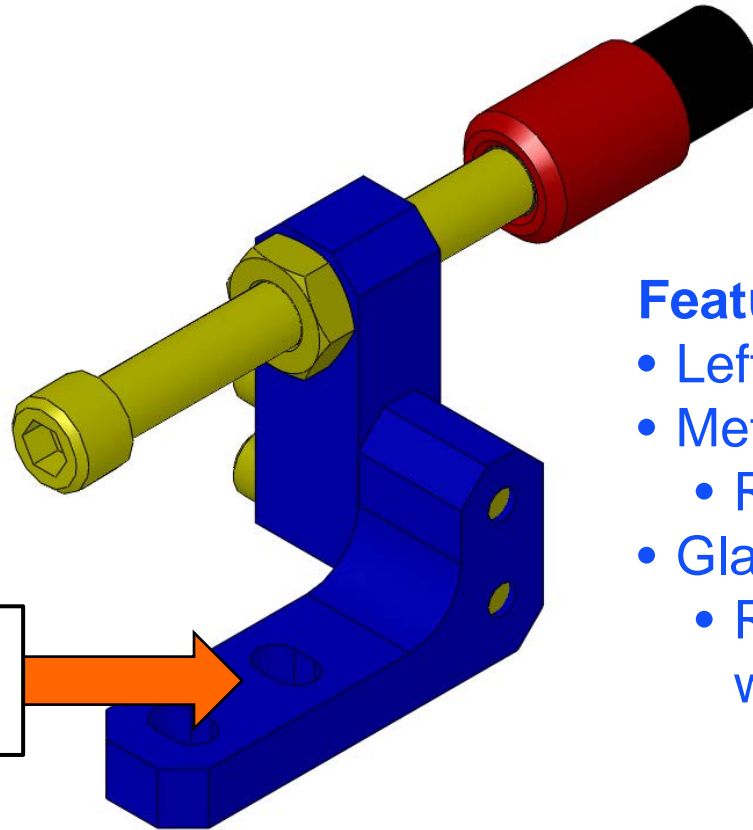
D080727 – EQ Stop, Long Mount



Features:

- Metal configuration only
 - Rounded-end SHCS
- Top and bottom sides of Intermediate Mass Assy.

D1002821 – EQ Stop, Bottom Mass, Lower



Assembly ID:
D1002823 S/N

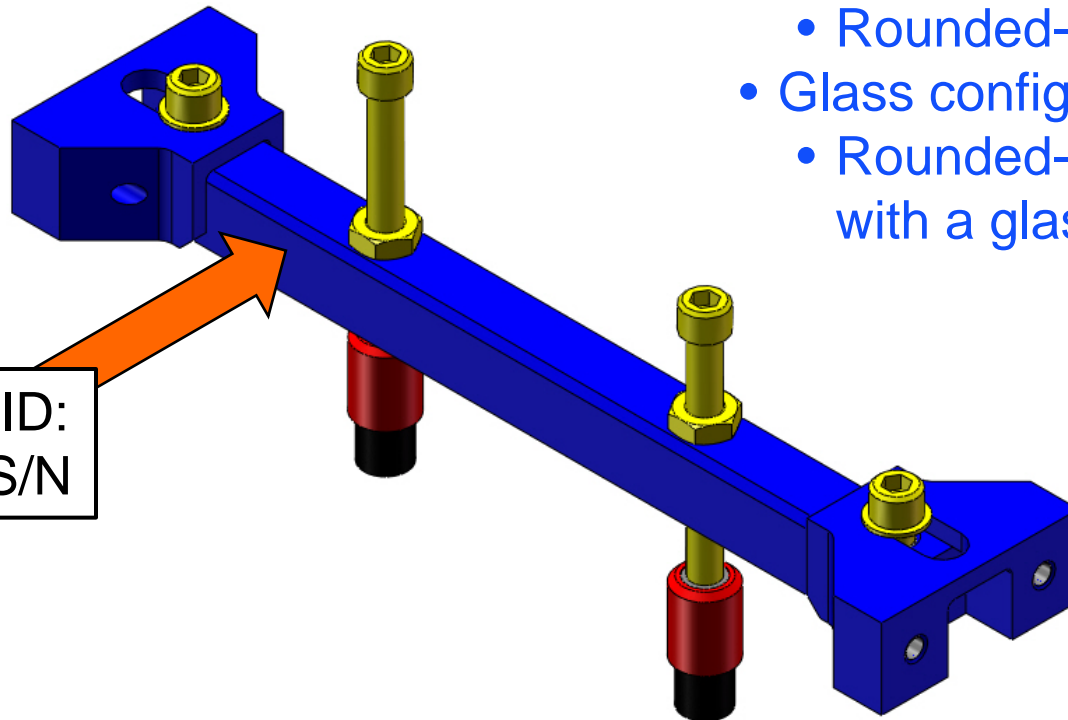
Features:

- Left and right sides
- Metal configuration
 - Rounded-end SHCS
- Glass configuration
 - Rounded-end SHCS with a glass-tipped cap

D070319 – EQ Stop, Bridge

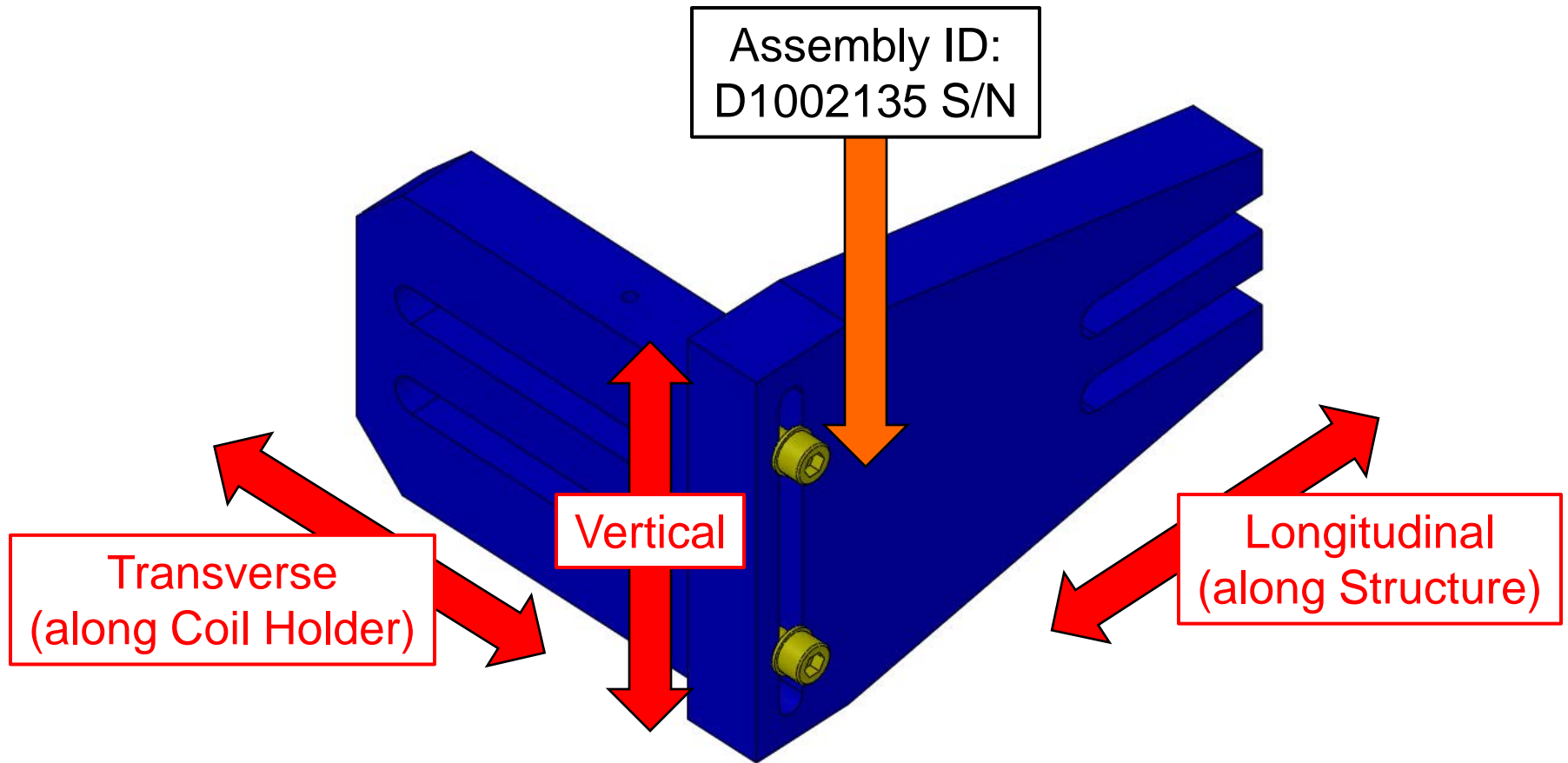
Features:

- Metal configuration
 - Rounded-end SHCS
- Glass configuration
 - Rounded-end SHCS with a glass-tipped cap

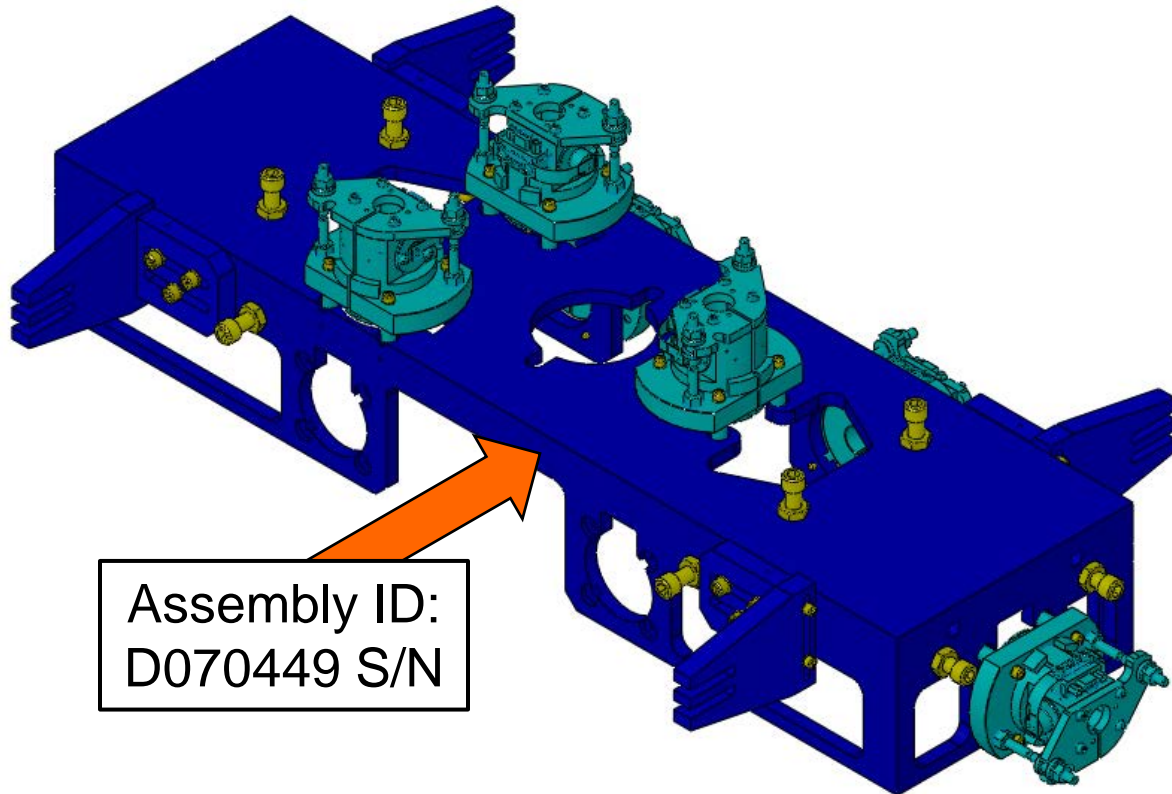


Assembly ID:
D070321 S/N

D1002133 – Mounting Bracket, Coil Holder

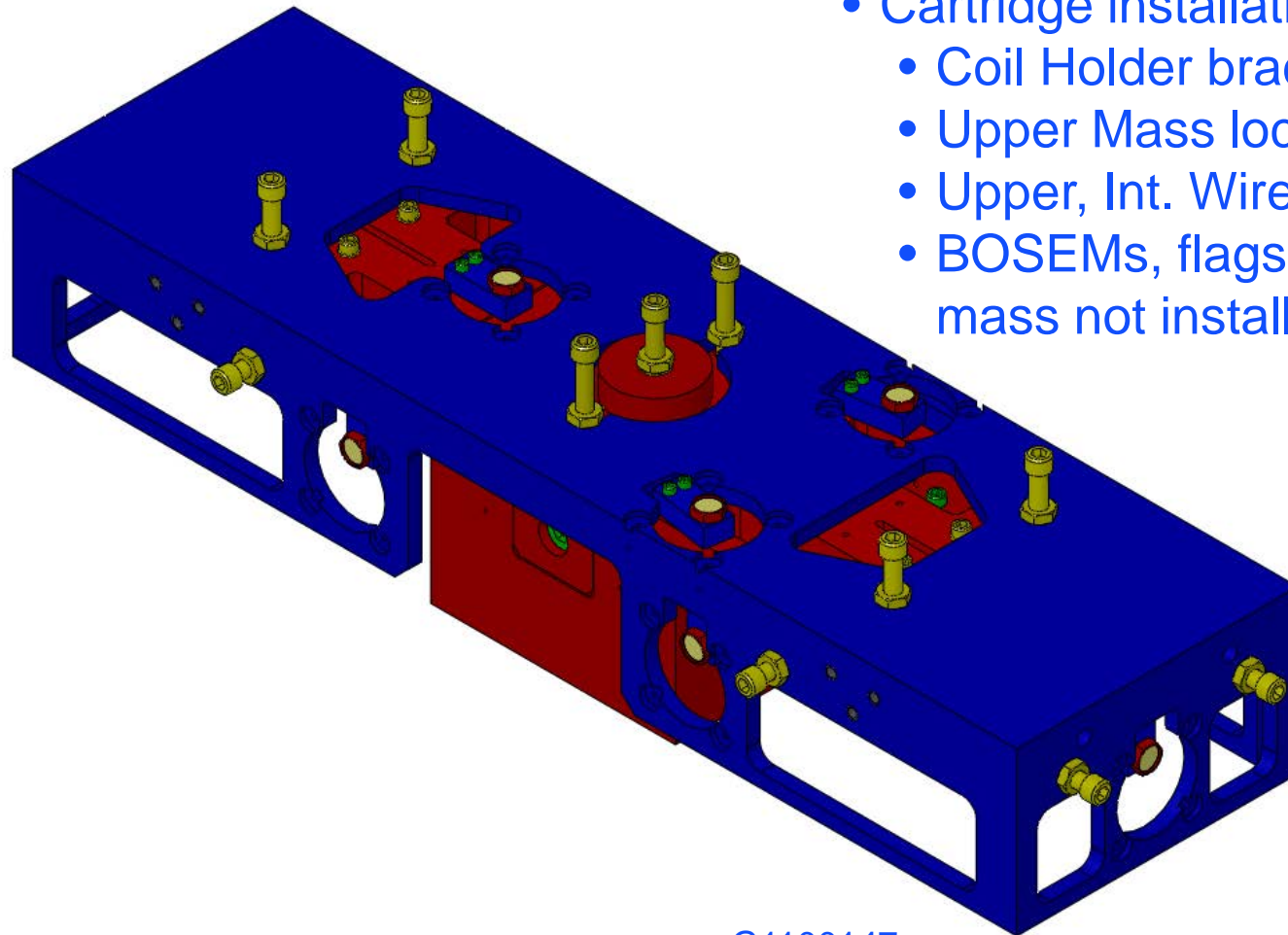


D080677 – Coil Holder



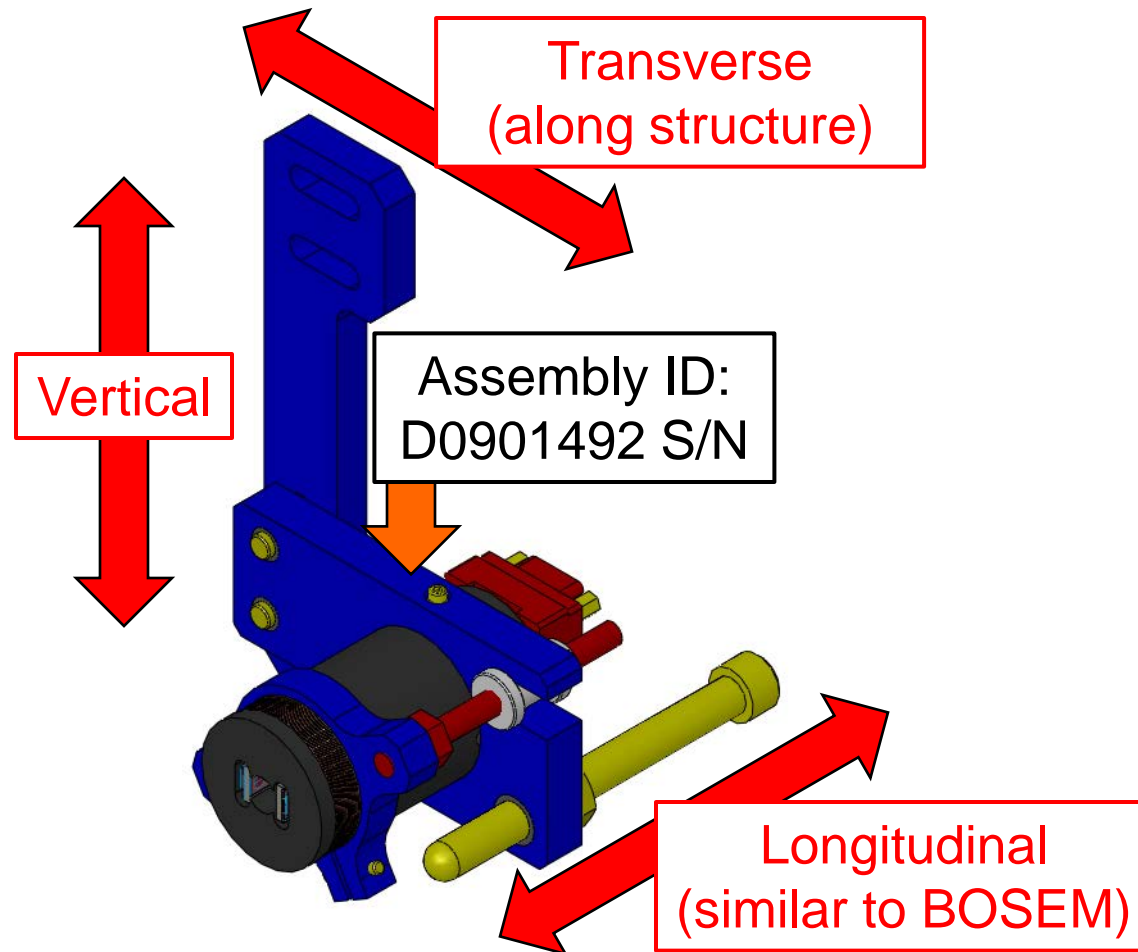
Assembly ID:
D070449 S/N

Coil Holder/Upper Mass Assy.

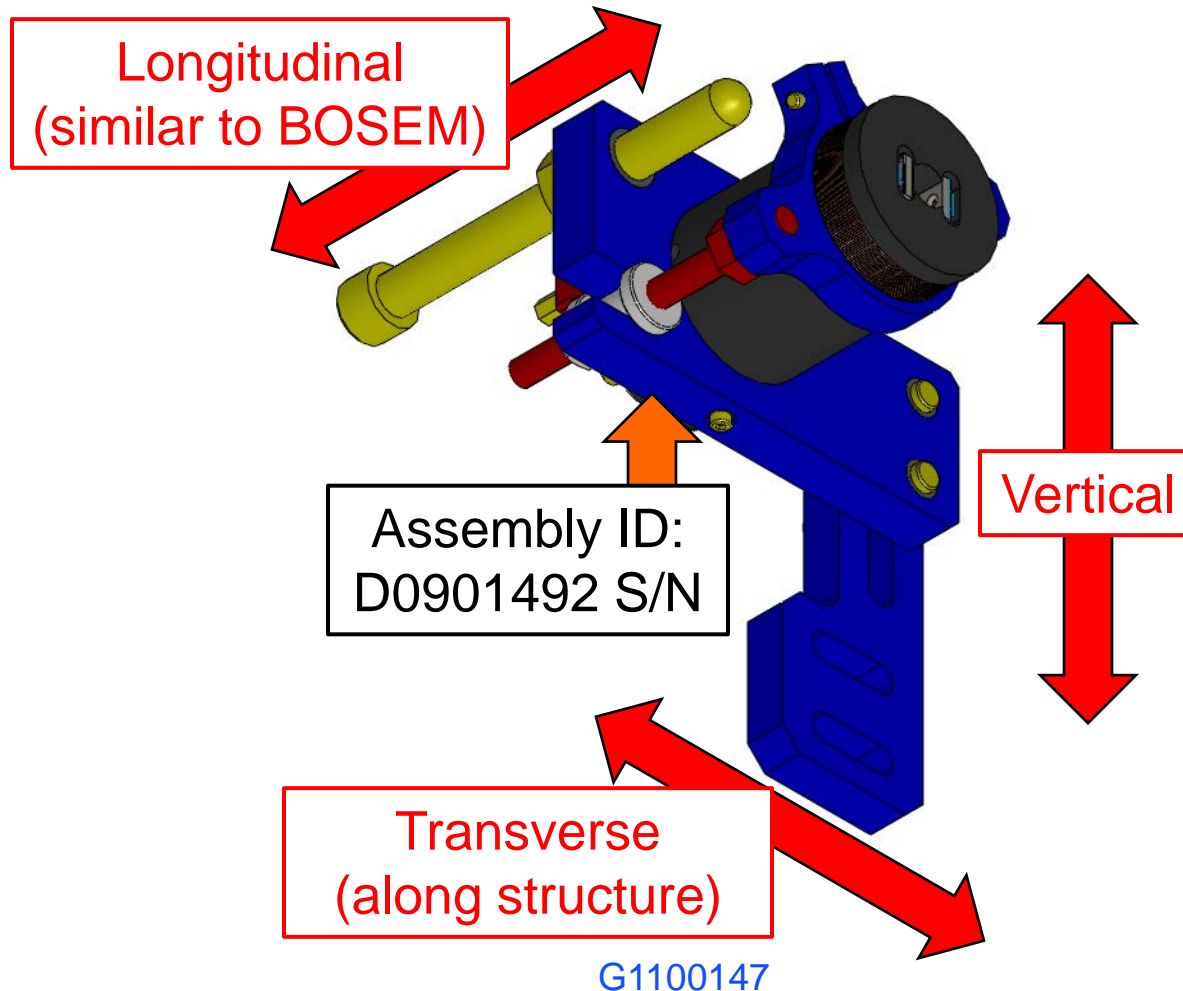


- Cartridge installation
 - Coil Holder brackets on structure
 - Upper Mass locked to Coil Holder
 - Upper, Int. Wires attached
 - BOSEMs, flags, lower additional mass not installed

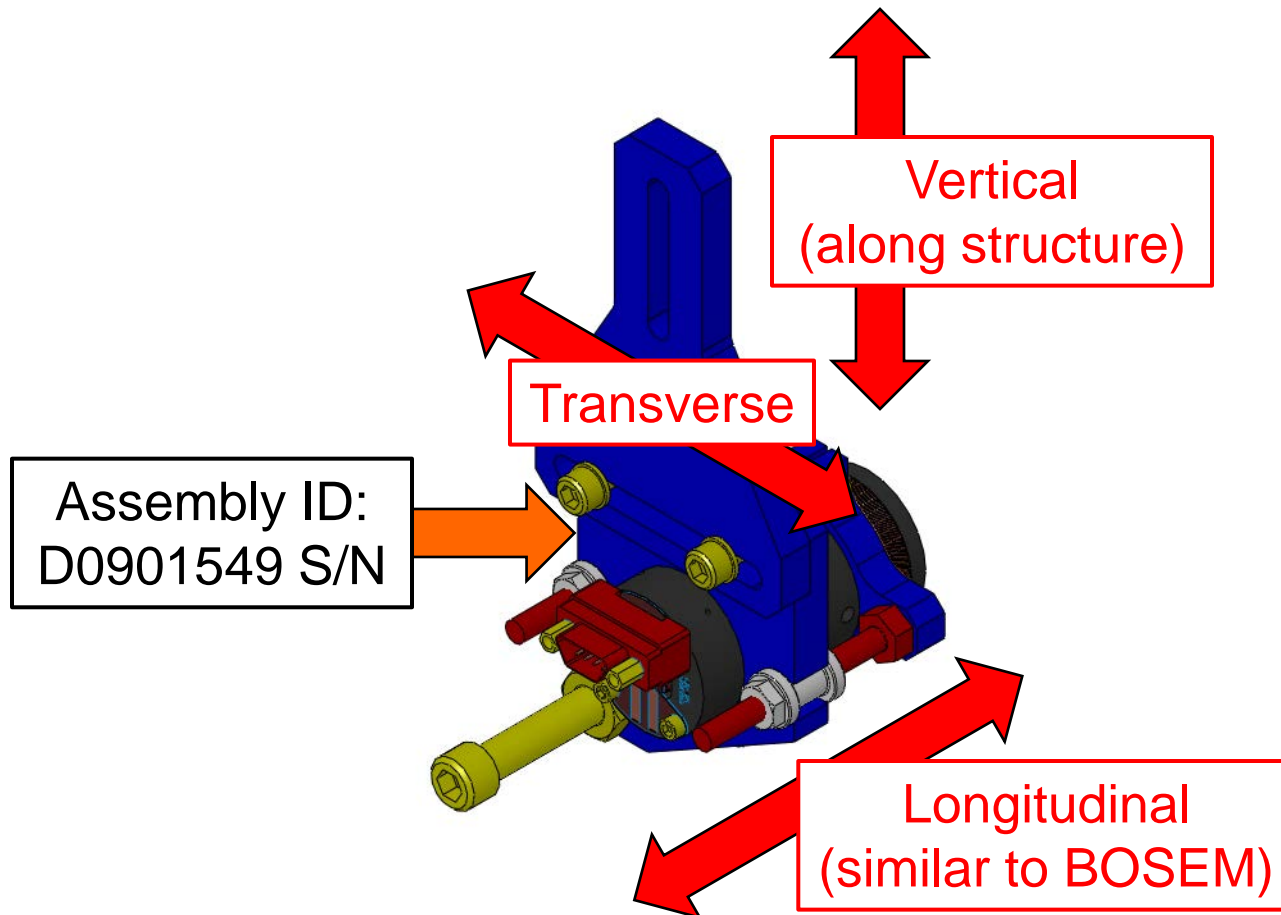
D0902024 – Upper AOSEM Alignment Assy, Int. Mass



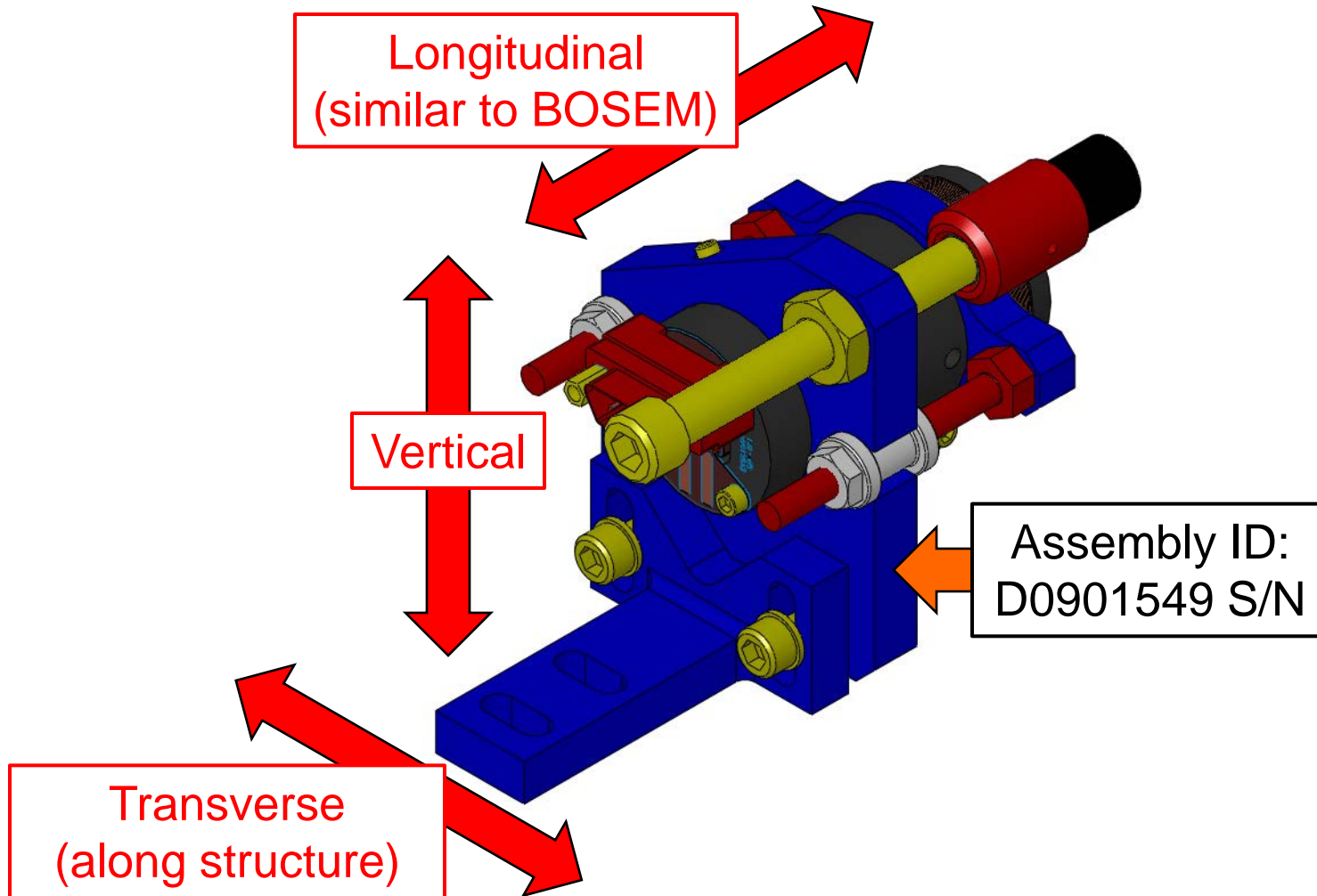
D0901551 – Lower AOSEM Alignment Assy., Int. Mass



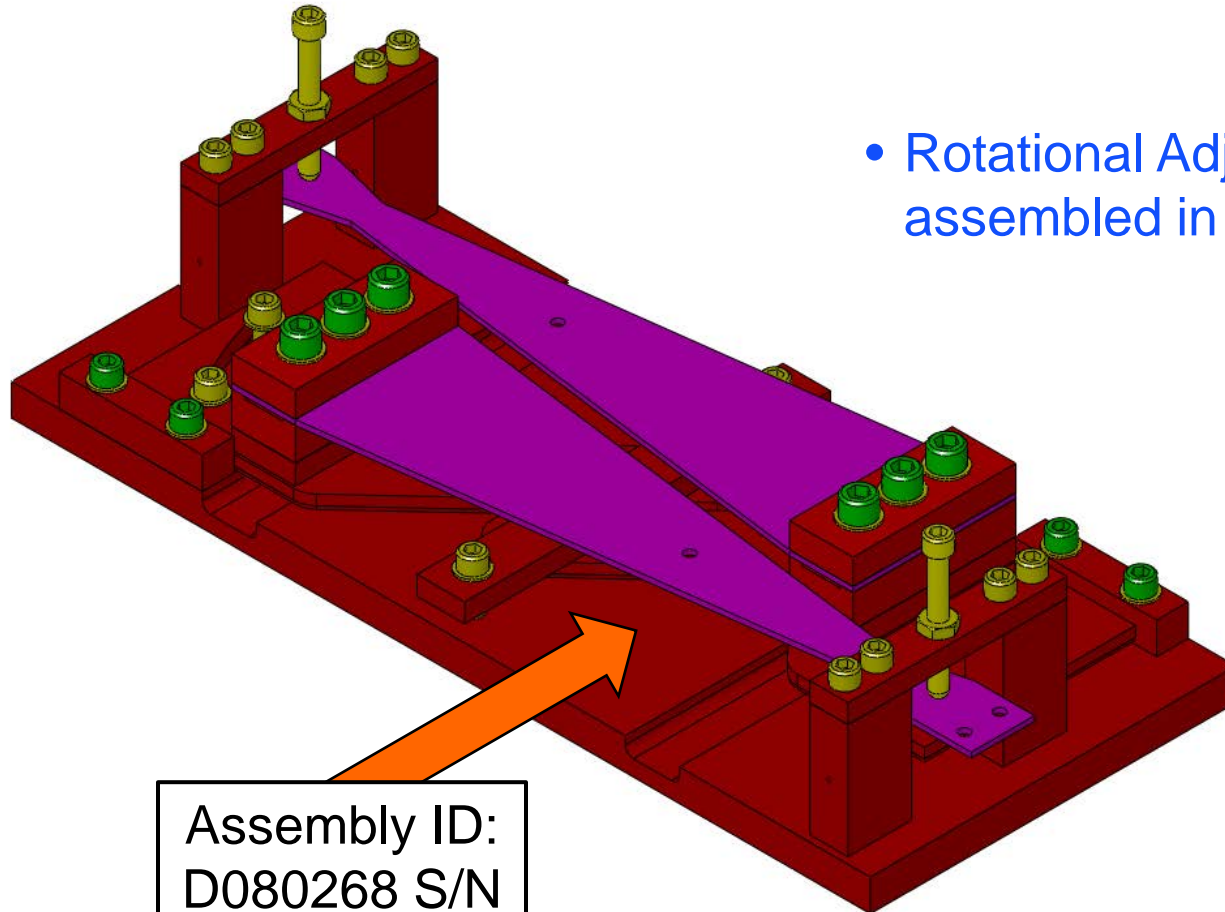
D0901552 – Upper AOSEM Alignment Assy., Bottom Mass



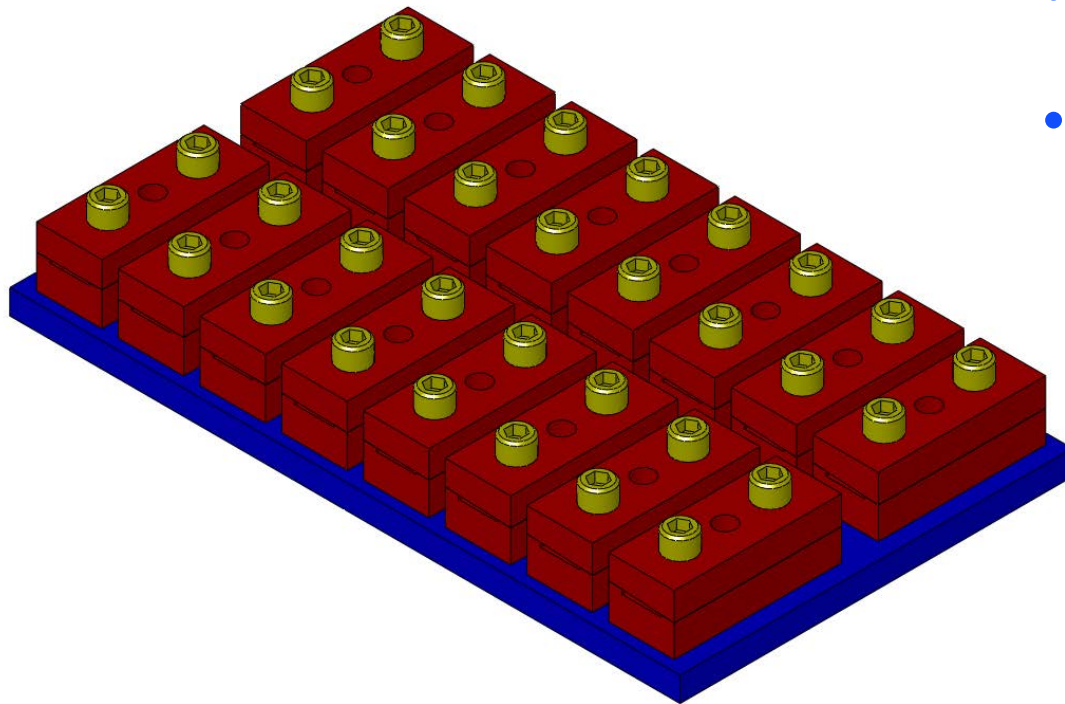
D0901553 – Lower AOSEM Alignment Assy., Bottom Mass



D080265 – Upper Blade Bake Fixture

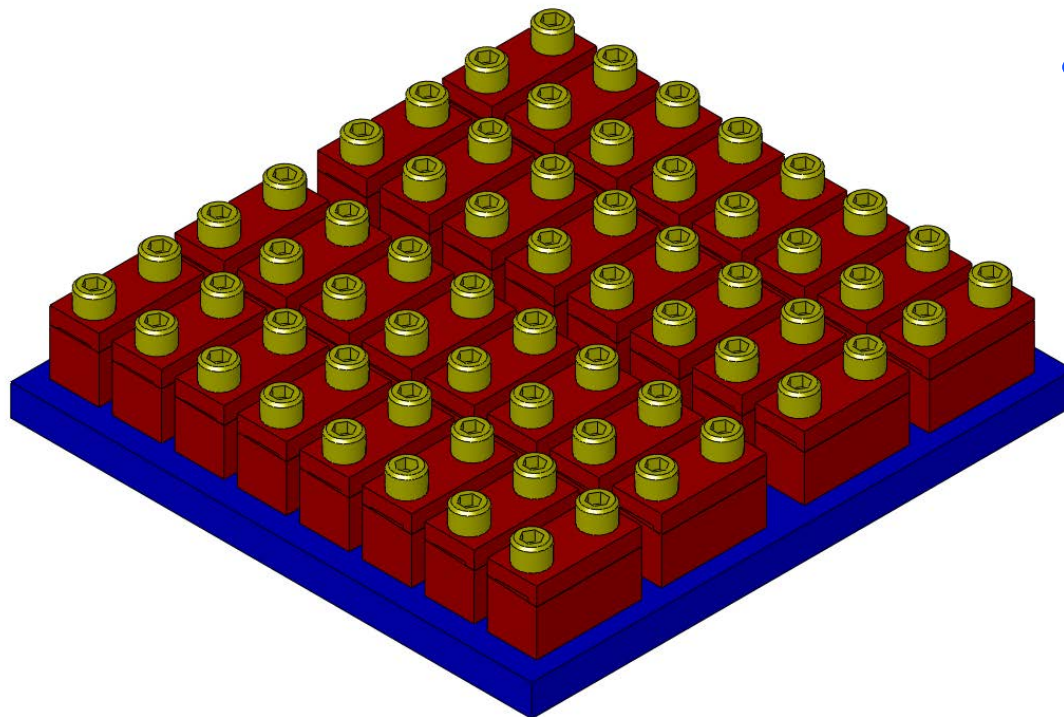


D0900665 – Library of Clamps, Upper Blade



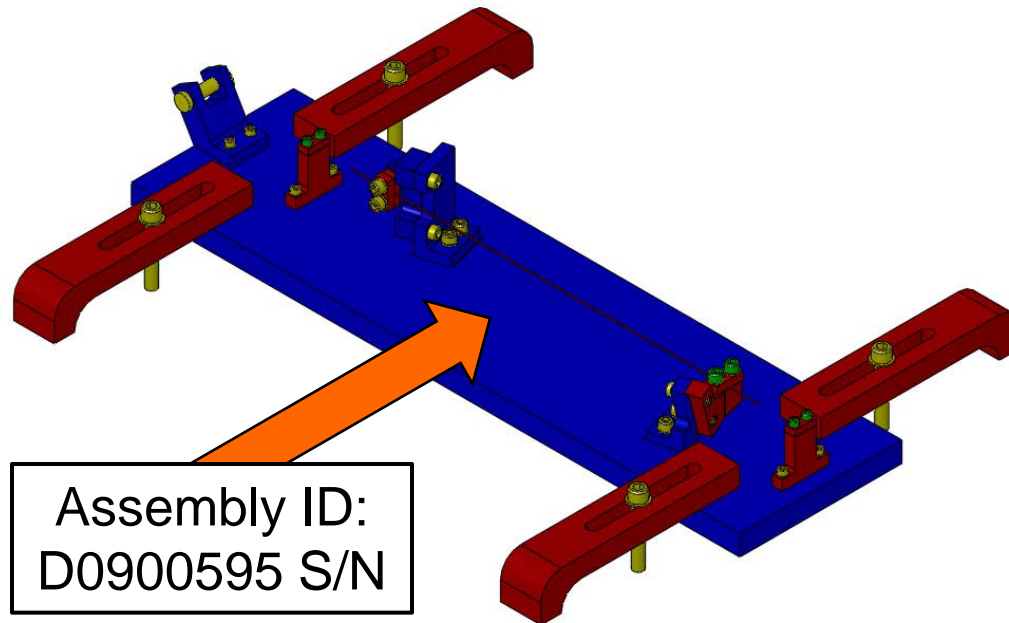
- 2 Upper Blades per HLTS
- Angled blade clamps
 - 0° to 3.5° by 0.5°
- Library should be entered into ICS as a storage load, not an assembly load

D0900681 – Library of Clamps, Lower Blade

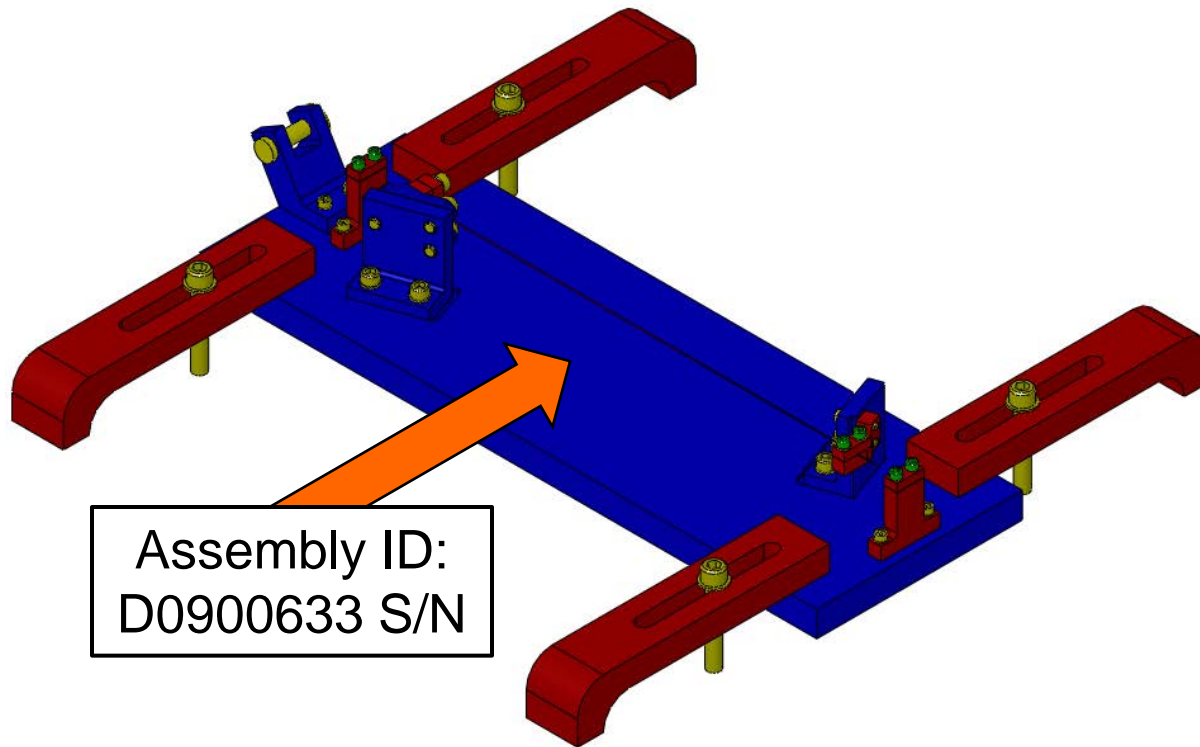


- 4 Lower Blades per HLTS
- Angled blade clamps
 - 0° to 3.5° by 0.5°
- Library should be entered into ICS as a storage load, not an assembly load

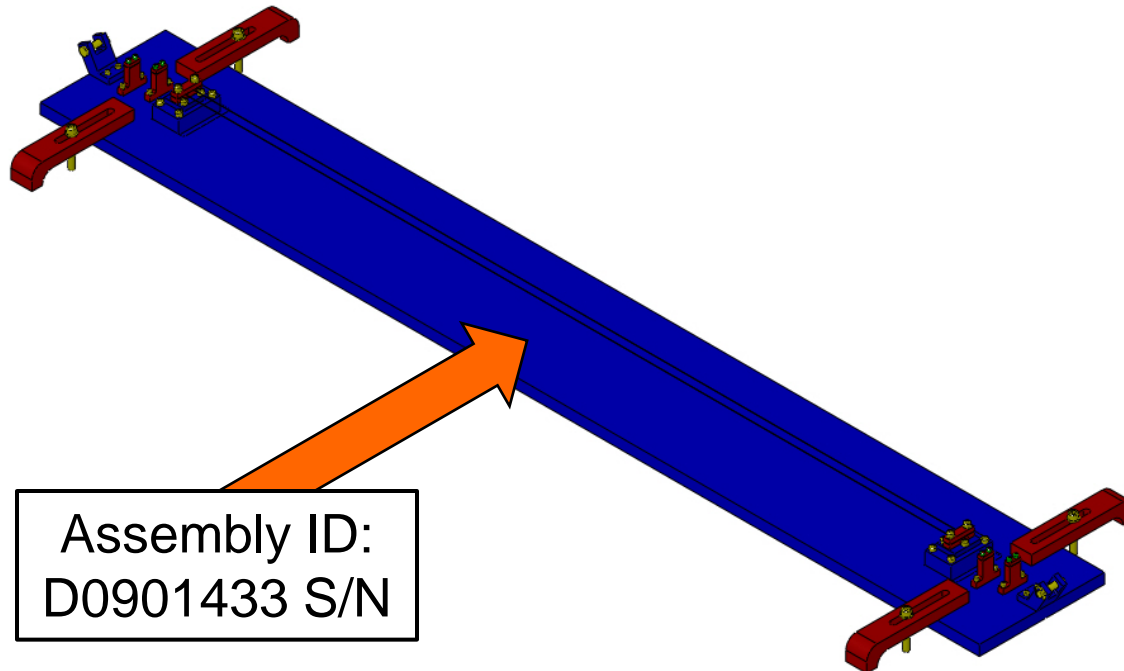
D0900594 – Upper Wire Jig



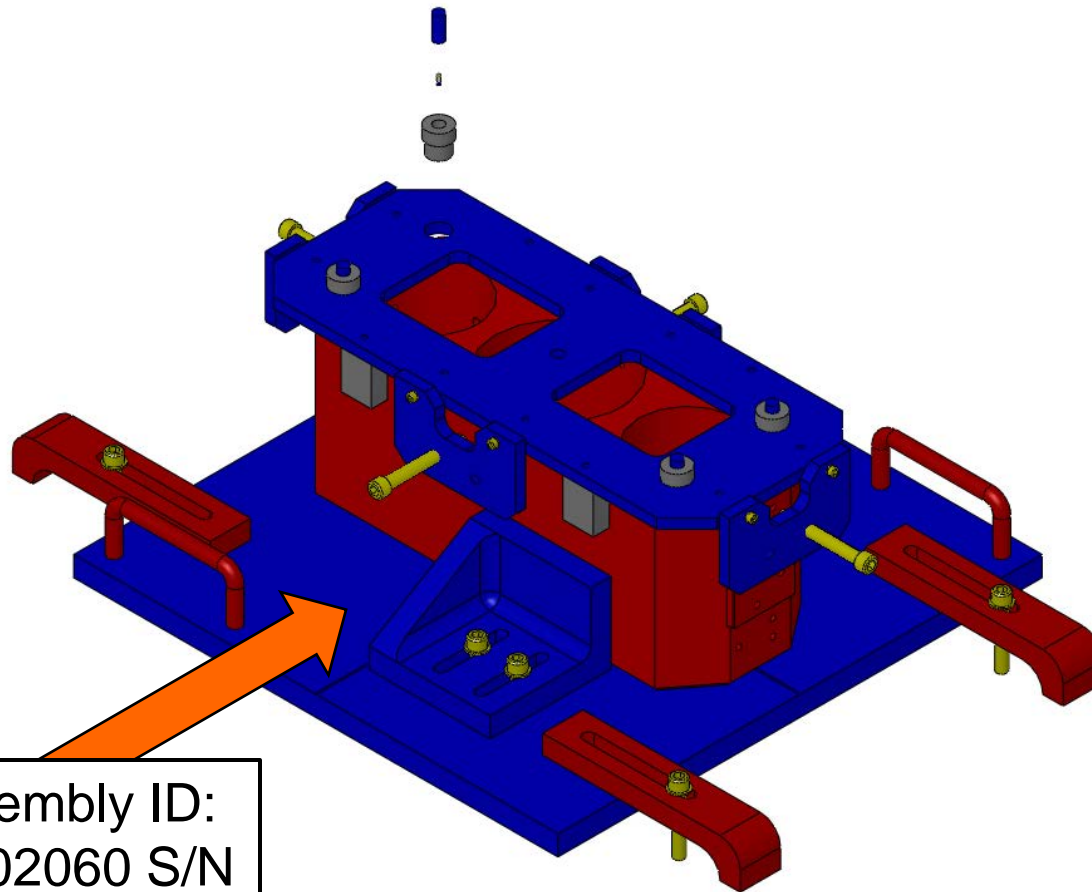
D0900630 – Intermediate Wire Jig



D0901419 – Lower Loop Wire Jig

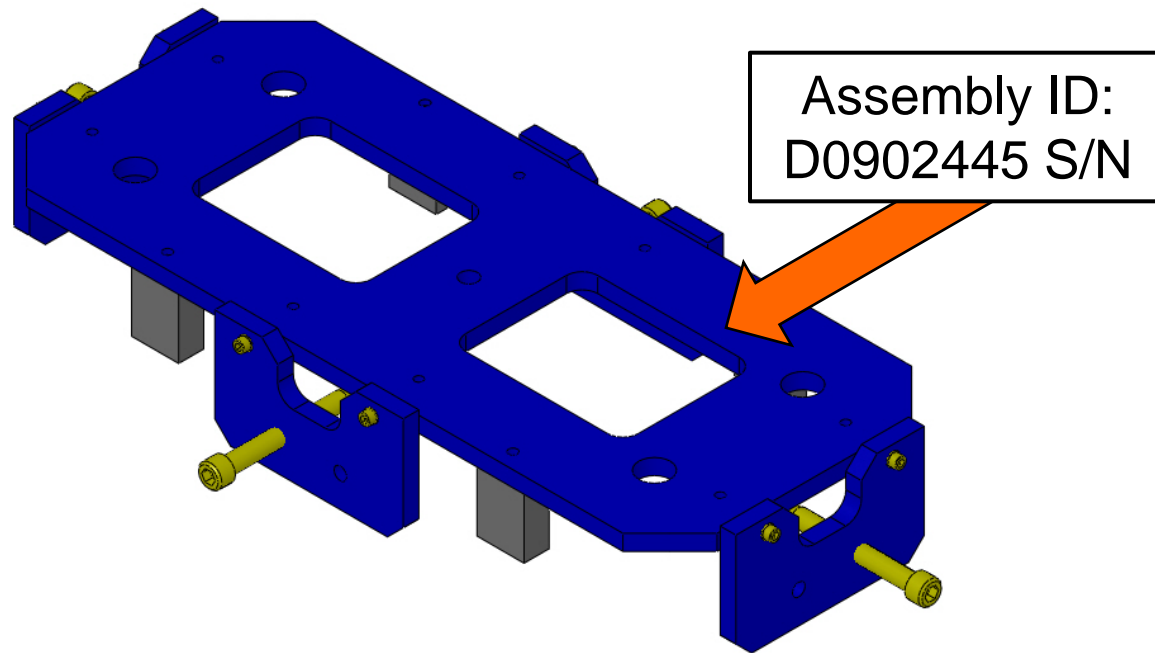


D0901461 – Magnet Placement Fixture, Intermediate Mass

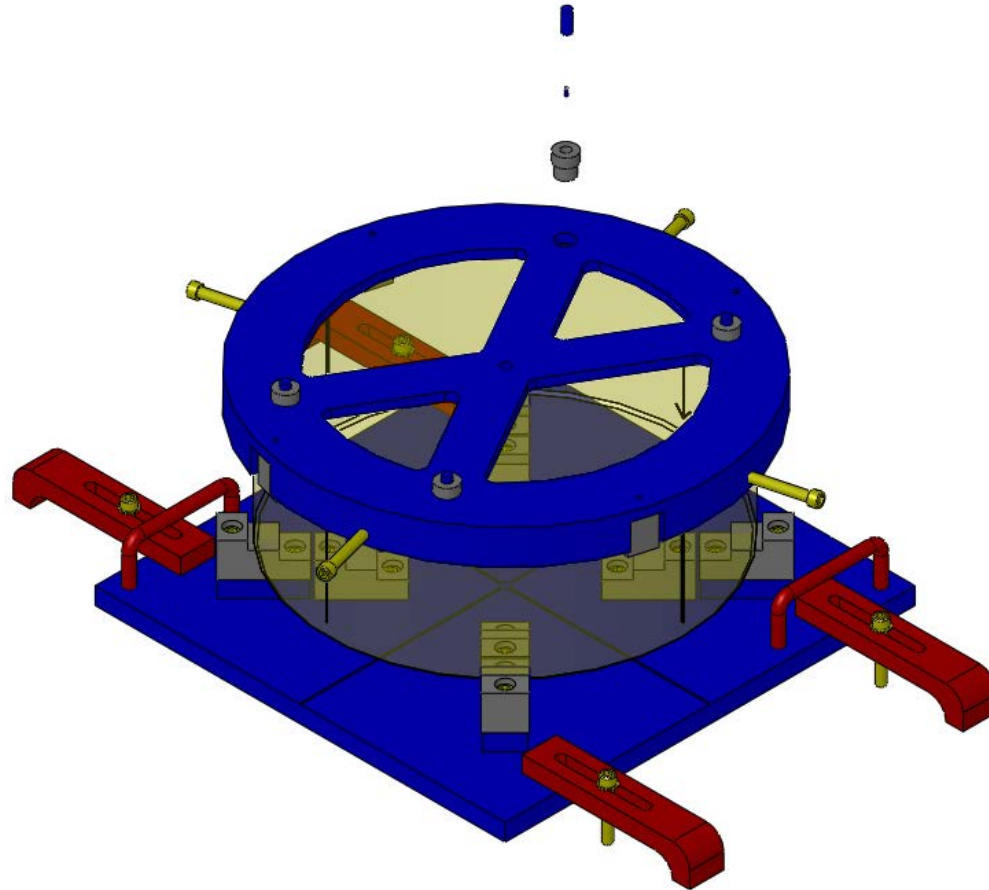


Assembly ID:
D0902060 S/N

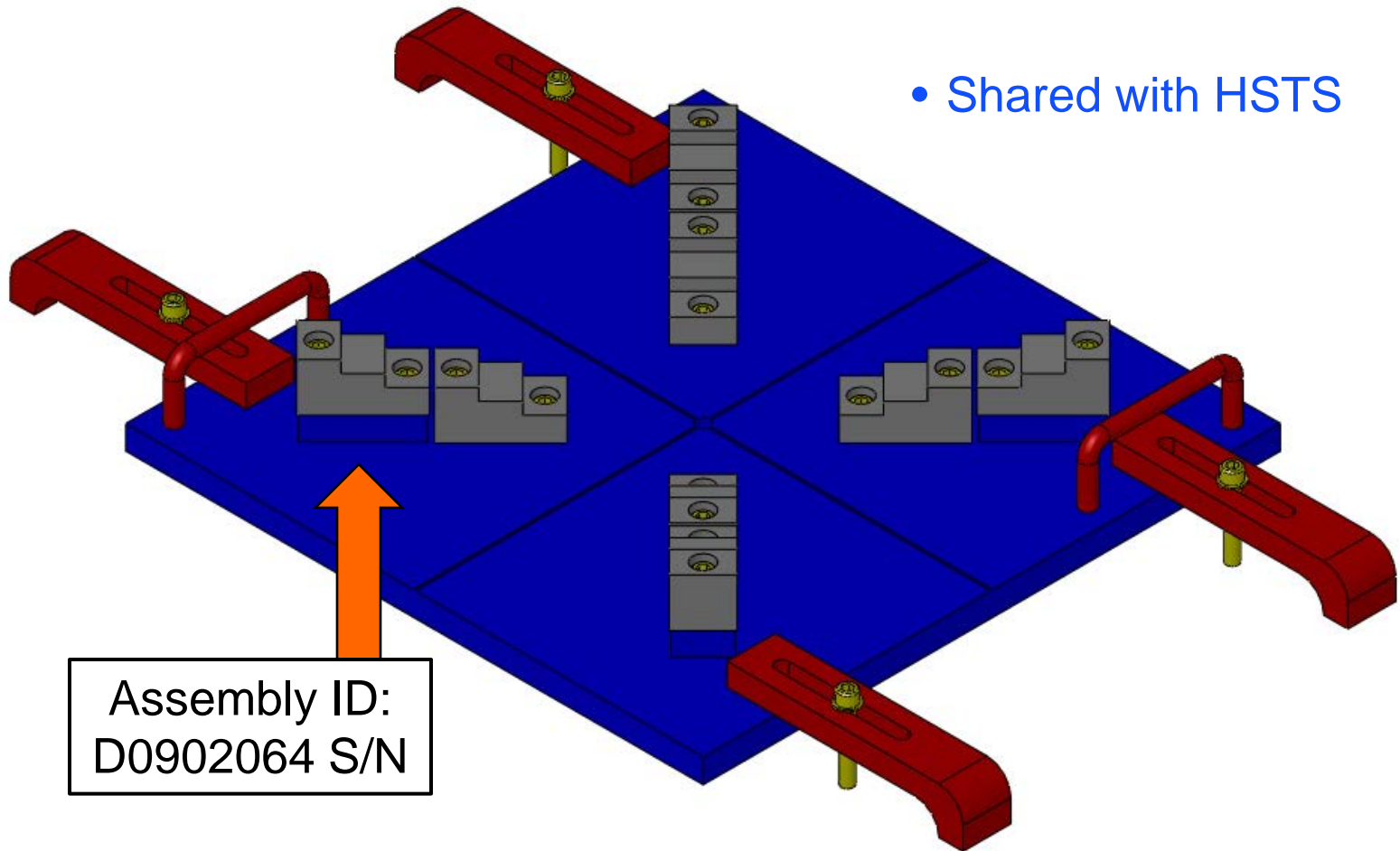
D0902444 – Positioning Standoff



D0901460 – Magnet Placement Fixture, Bottom Mass

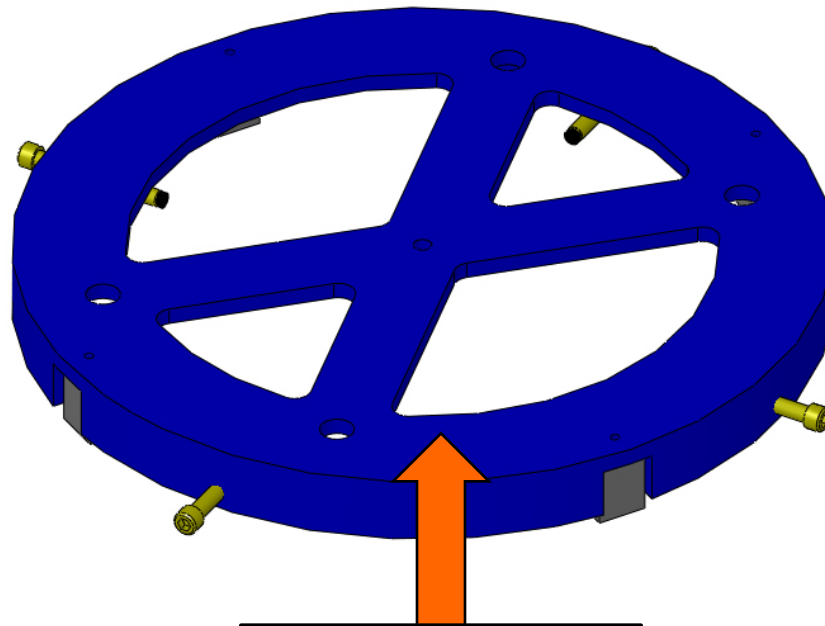


D1100356 – Optic Base Assy.



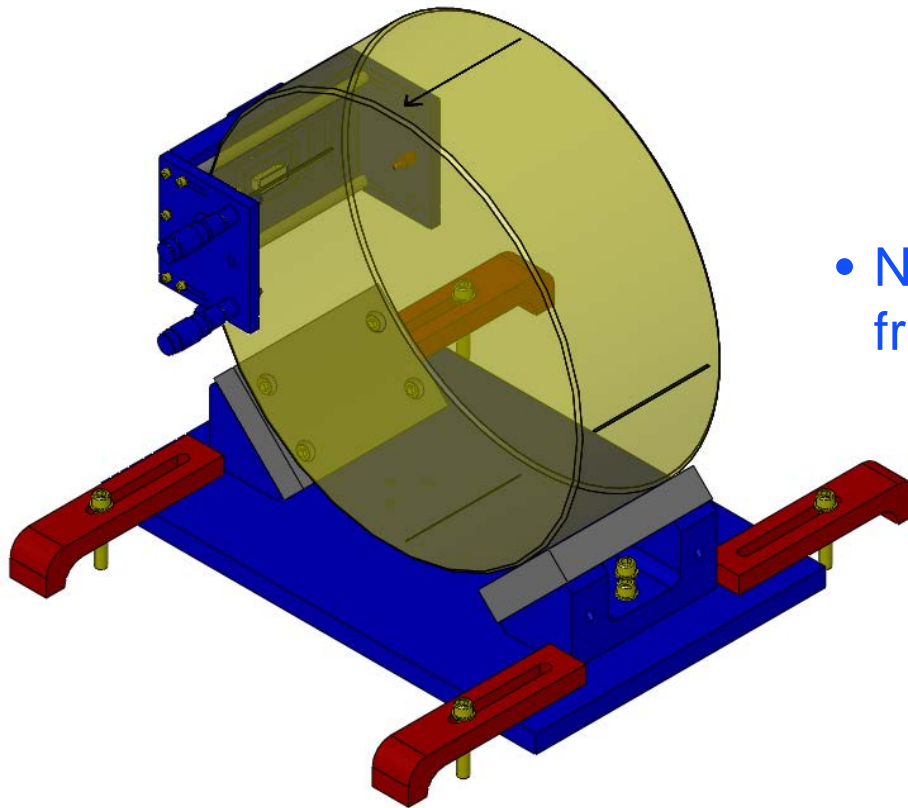
G1100147

D0902087 – Positioning Standoff



Assembly ID:
D0902068 S/N

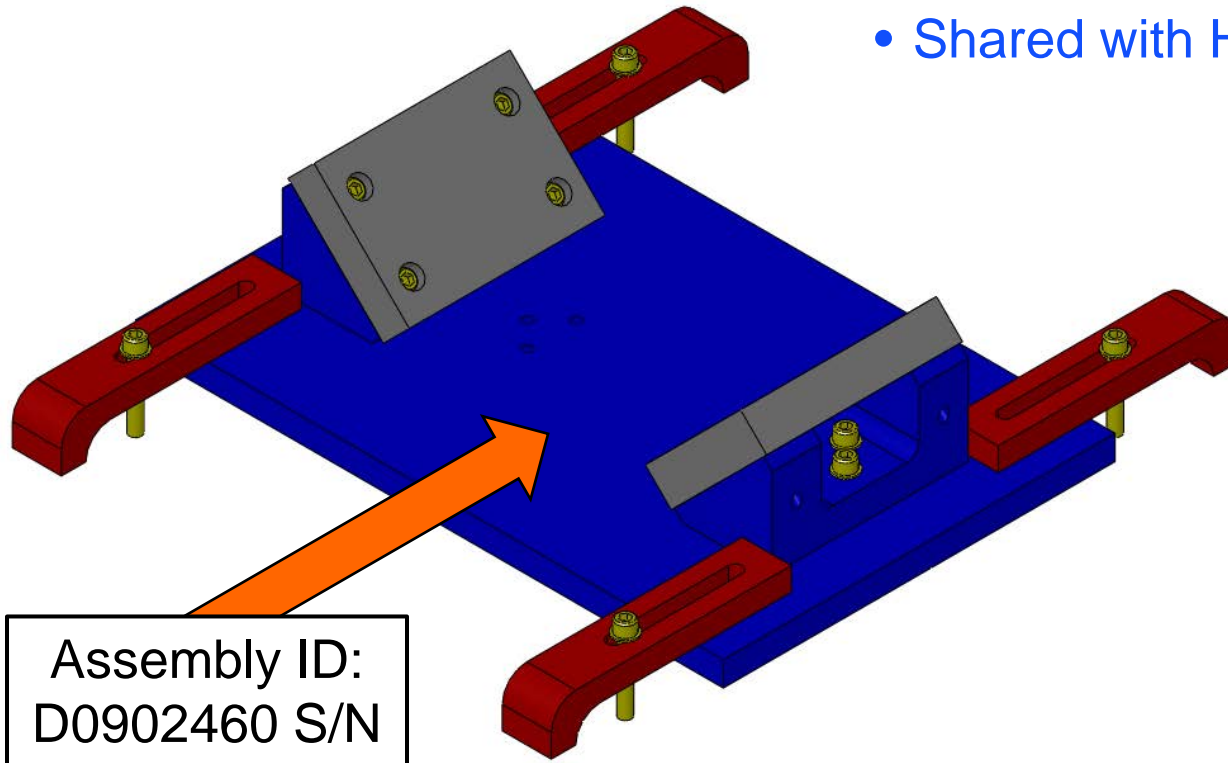
D0902459 – Sapphire Prism Placement Fixture



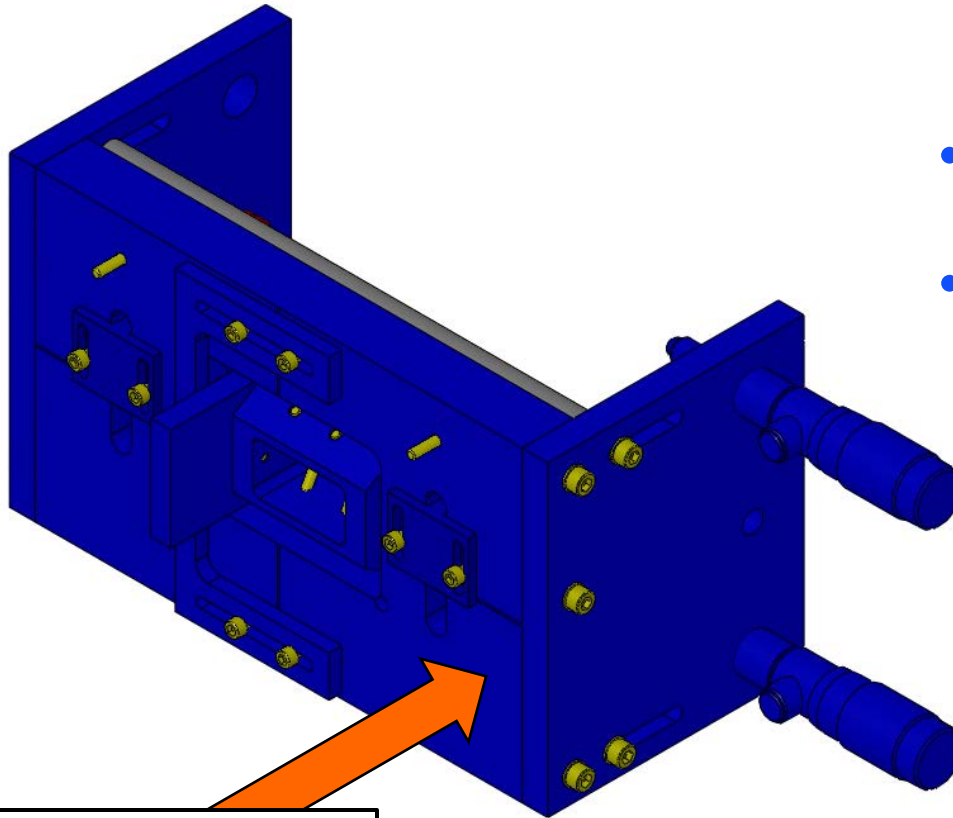
- New EP30 glue – prism glued from top down, not from side

D0902658 – Optic Holder

- Shared with HSTS



D0902661 – Sapphire Prism Bonding Jig



Assembly ID:
D0902665 S/N

- Test of prototype jig (shown) revealed problems
- Redesign features
 - Replace micrometers and spring plunger (metal tips) with PFA-tipped SHCS
 - Modify location markings on bonding template to reference flat face of optic

HLTS Assembly Sequence

1. Structural Weldment
2. Mounting Pads
3. Rotational Adjusters
4. Top Blade Guards
5. Int. Mass & Barrel EQ Stops
6. Upper Mass/Coil Holder
7. Intermediate Mass
8. Int. Mass AOSEMs
9. Lower Loop Wire
10. Bottom Mass
11. Bottom Mass EQ Stops & AOSEMs, BOSEMs and Flags

