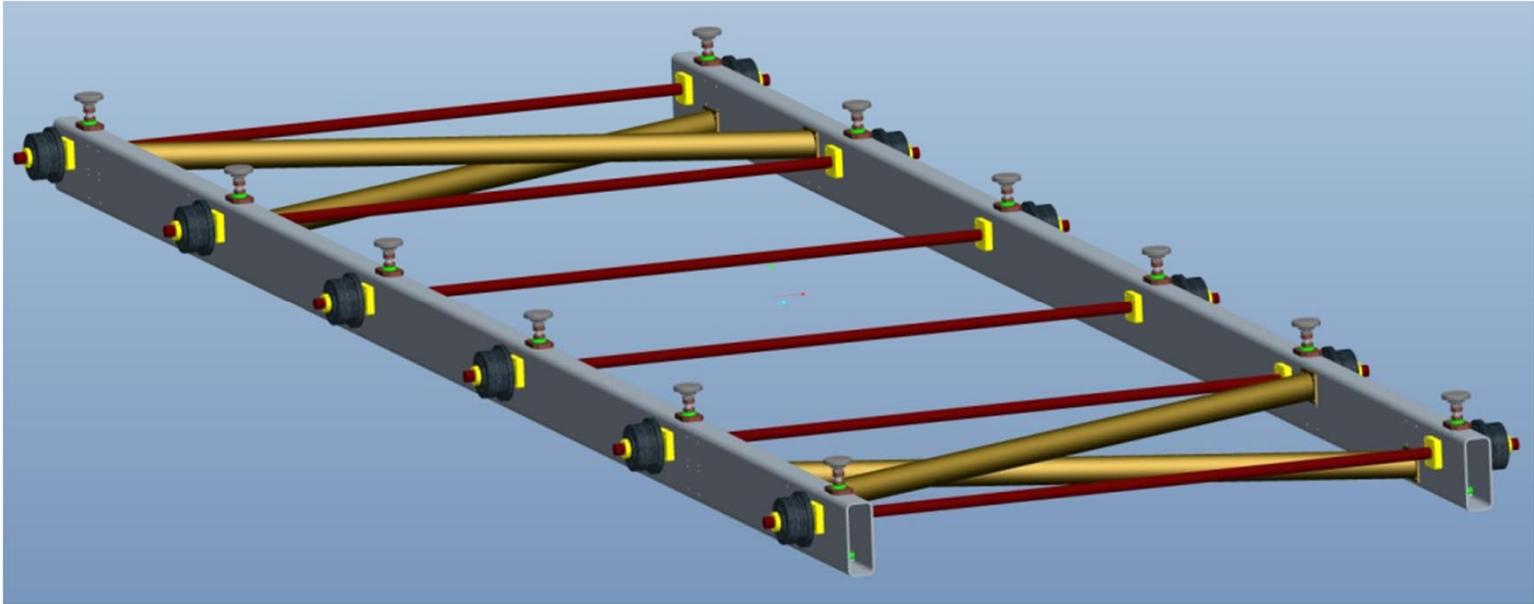


TPC Cart

Dec. 15, 2011

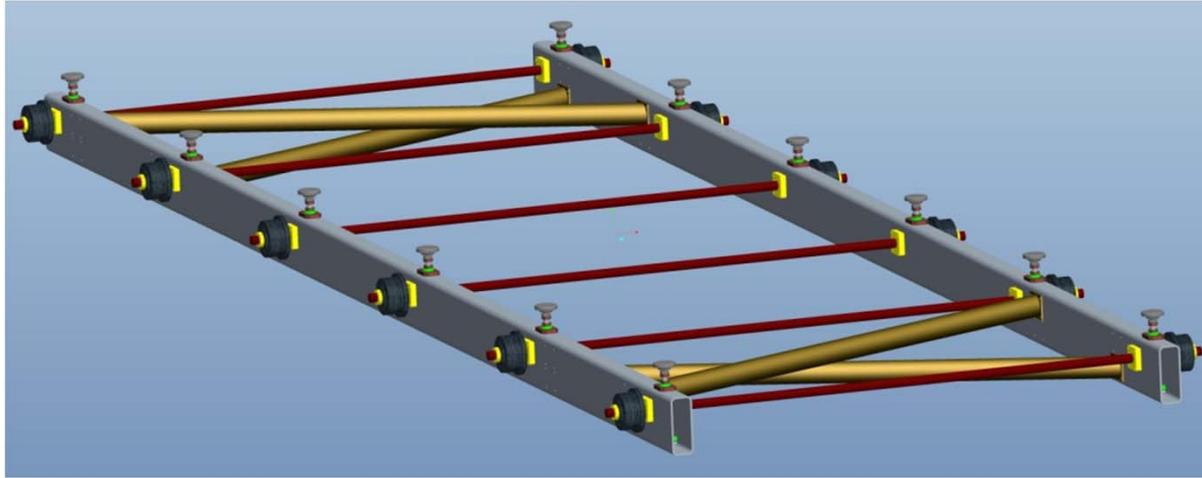
G. Mahler, K. C. Wu, B. Yu
and C. Thorn

TPC Cart – General Description, page 1



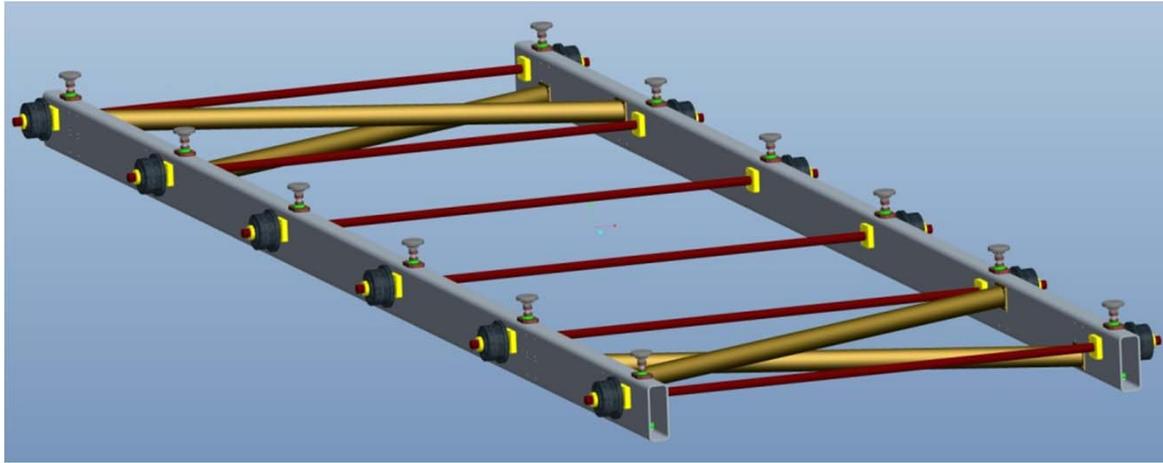
- Consists of 12 hydraulic jacks (5 ton capacity each) on two box beams (CS, 8" x 3" x 1/4") with 6 axles (CS, 1 1/4" dia.), 12 wheels (CS, 5" dia.) and 4 strengthening bars (CS, 3" dia.) for cross bracing
- Note: hydraulic jack and wheel are not on the same longitudinal location and not interfere with each other

TPC Cart – General Description, page 2



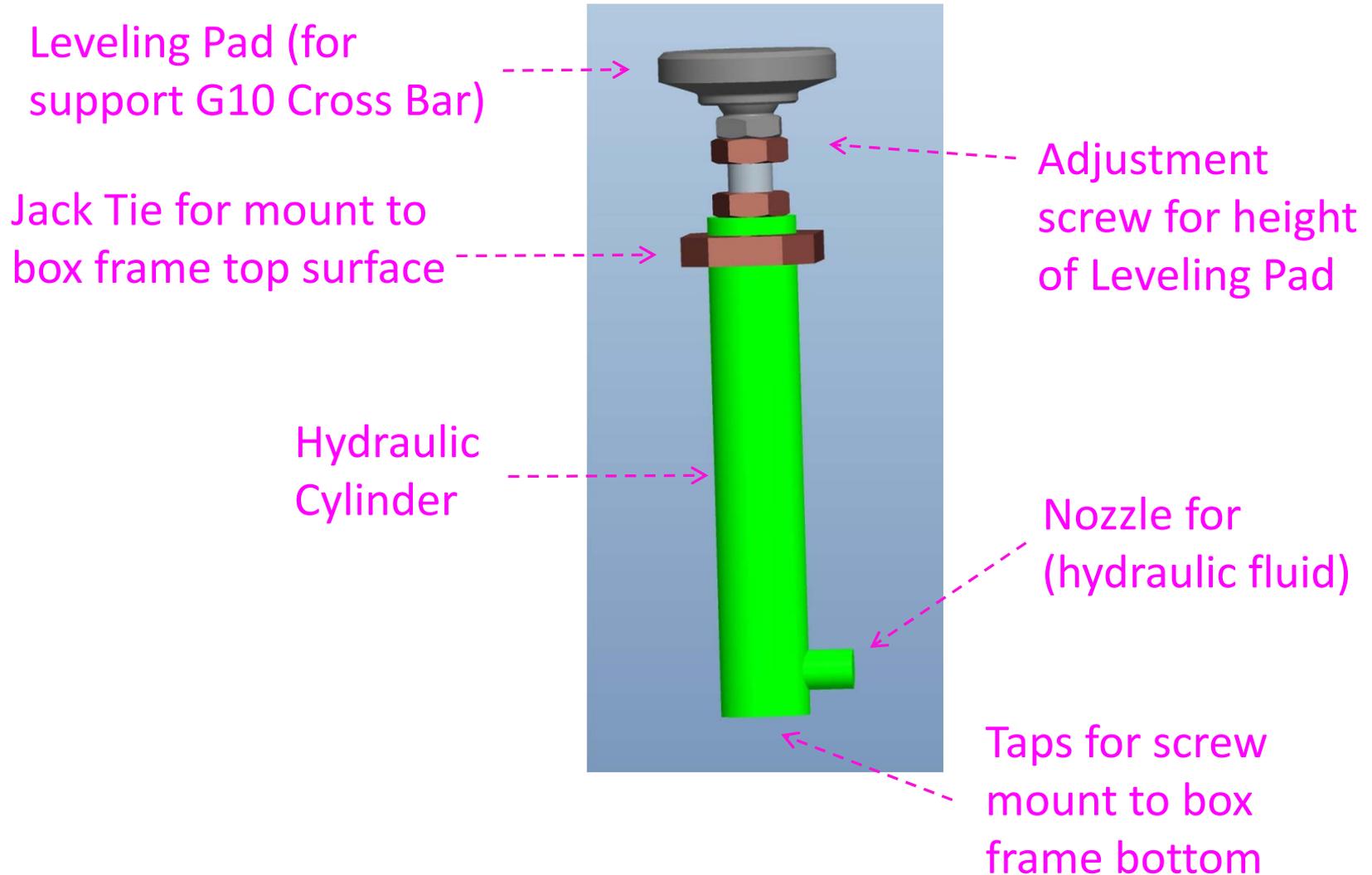
- Shafts are fixed on the frame using bearing hangers (collar with flange), flange mount is used for the wheel.
- Hydraulic jack with elbow connected to 3/8" hoses, Piped in parallel with isolation valves to a manifold, fluid to be pumped using 1 SIMPLEX hydraulic pump (manual operation)
- Isolation valves will be installed on hose / manifold to ease operation

TPC Cart – General Description, page 3



- Adjustment screw is used to bring leveling pad on the top of jack in contact with a small cradle under G10 cross bar on TPC
- Jack cylinders are attached to the box beam using 5/16" screw
- Wheel positions will be shimmed to match rail if necessary
- Wheel and shaft form journal bearing with grease on the inner surface of wheel
- During insertion of TPC to cryostat, isolation valves will be closed and hydraulic pump will move together with TPC,
- 12 video cameras installed near hydraulic jack will be used to guide the movement

Major Part - Hydraulic Jack (Cylinder)

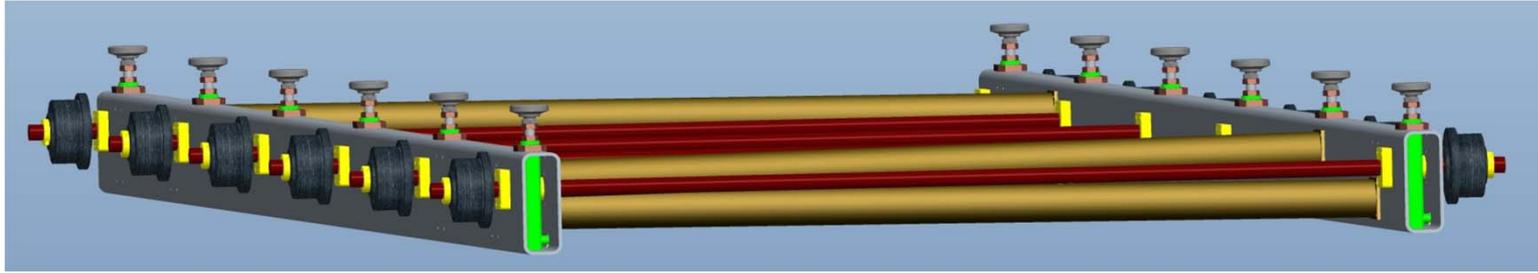


Major Part - Shaft Wheel Assembly



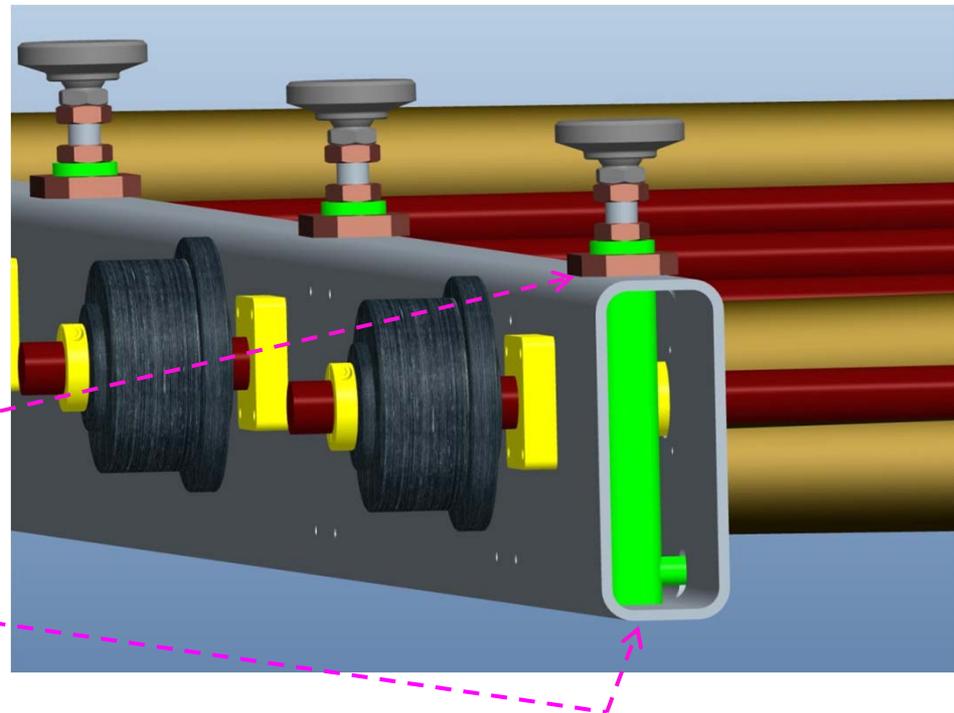
1 ¼" shaft with 5" diameter wheel (carbon steel)

Shaft, Wheel and Hydraulic Cylinder on Box Beam Frame

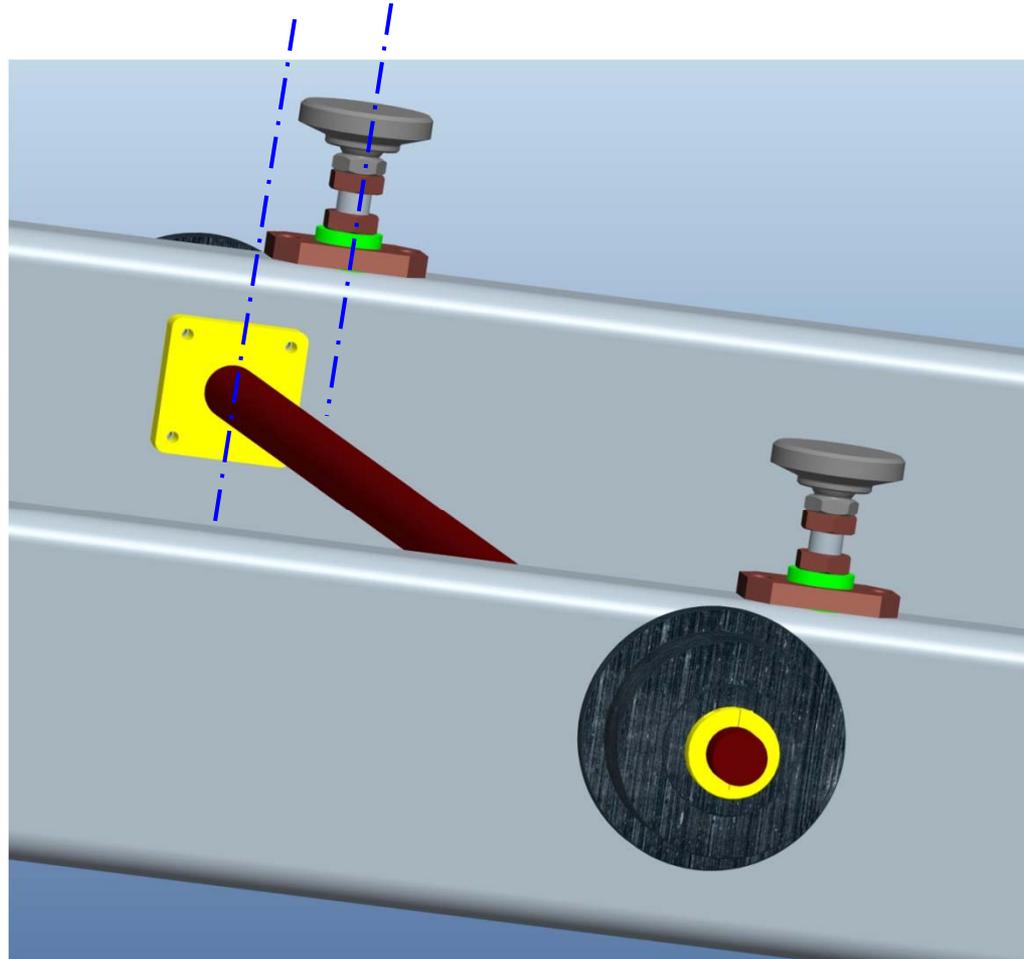


Shaft, wheel and
hydraulic cylinder
on Box Beam Frame

Hydraulic jack is
bolted on the upper
surface and on the
bottom surface of
Box Beam frame

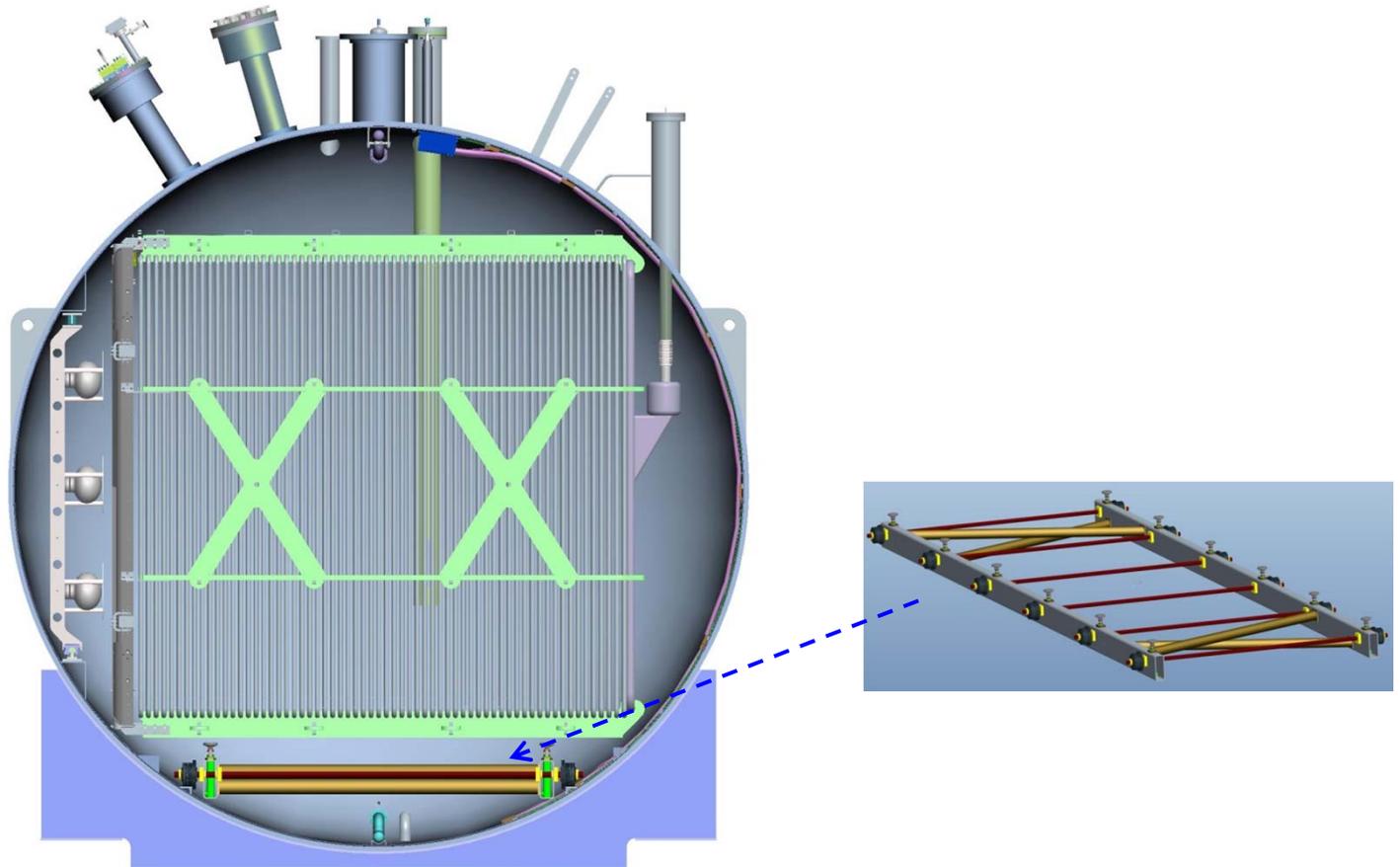


Hydraulic Cylinder and Wheel are **NOT** on the same longitudinal location

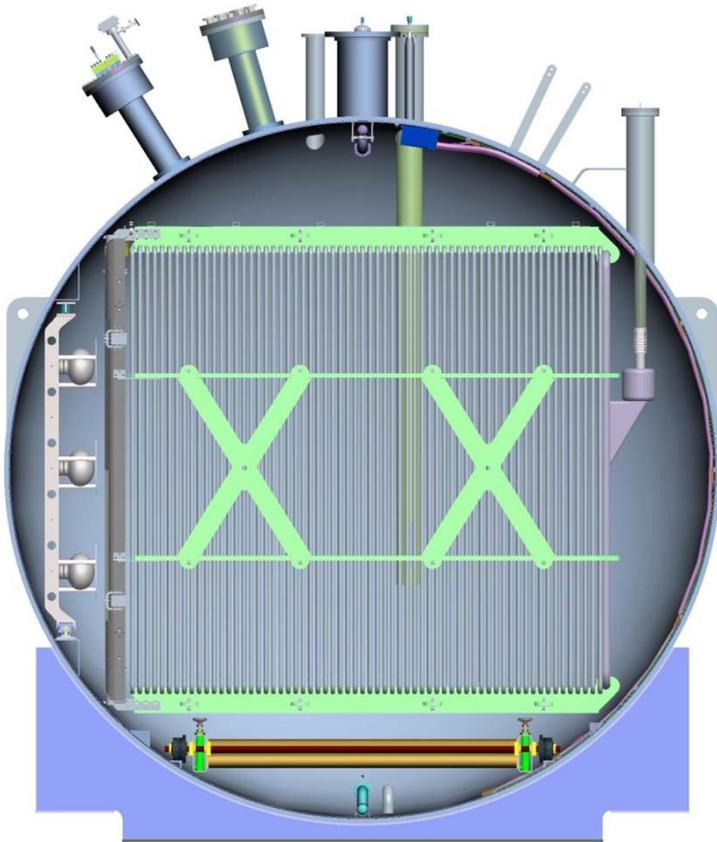


Moving TPC into Cryostat – p1

The fully assembled TPC, with its complete set of cold electronics, signal and bias cables connected and tested, is loaded onto a cart and wheeled into the cryostat. The TPC is then lowered onto its support platforms and the cart removed.



Moving TPC into Cryostat – p2



- Gap between upper corner of TPC and cryostat is $\sim 1 \frac{1}{2}$ "
- Let's assume to raise TPC by $\sim \frac{3}{4}$ " during insertion to Cryostat,
- One should be able to control the raise with good accuracy because capacity of the hand pump is relatively small,
- Components between support (on cryostat) and TPC will be designed to meet this space requirement

TPC Cart will be moved into /out of cryostat using a hydraulic jack or folk lift