

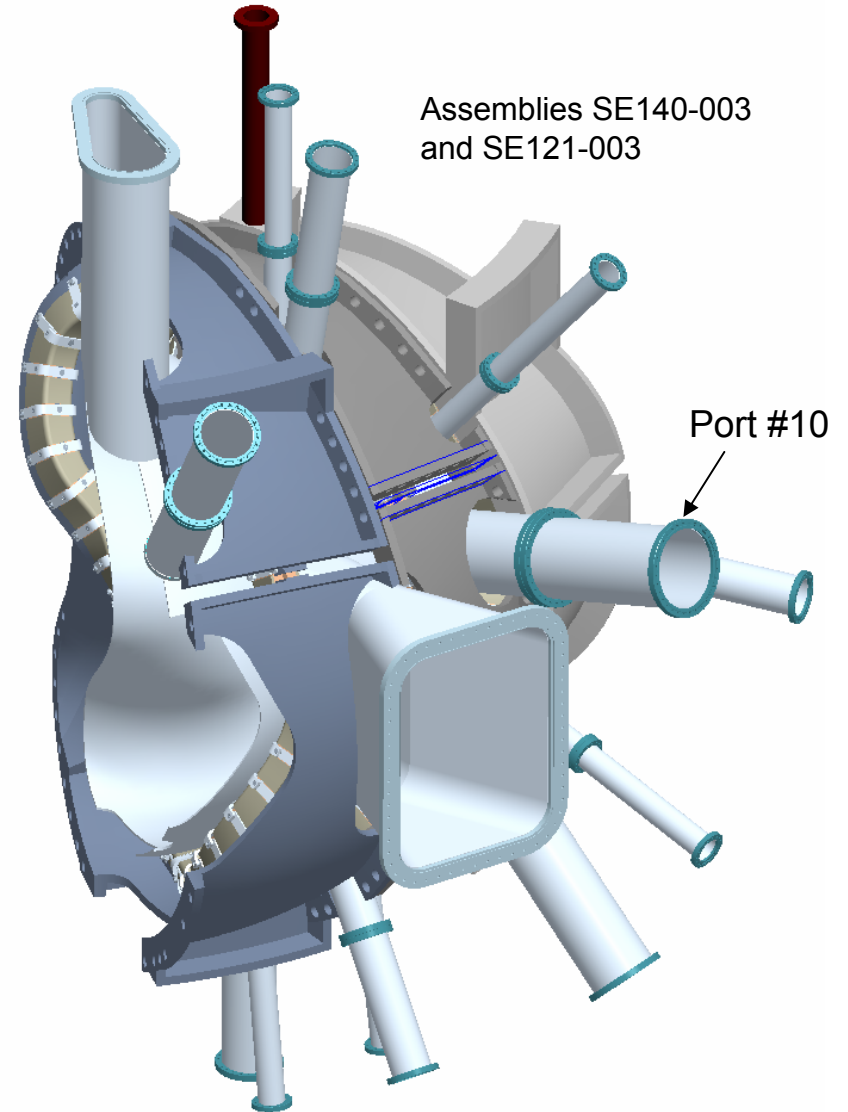
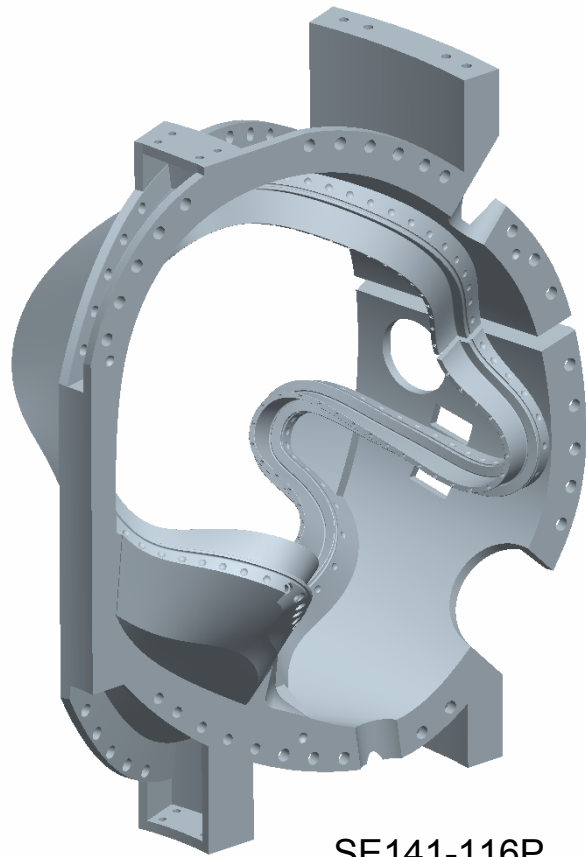
Prototype Modular Coil Design Status

D. Williamson

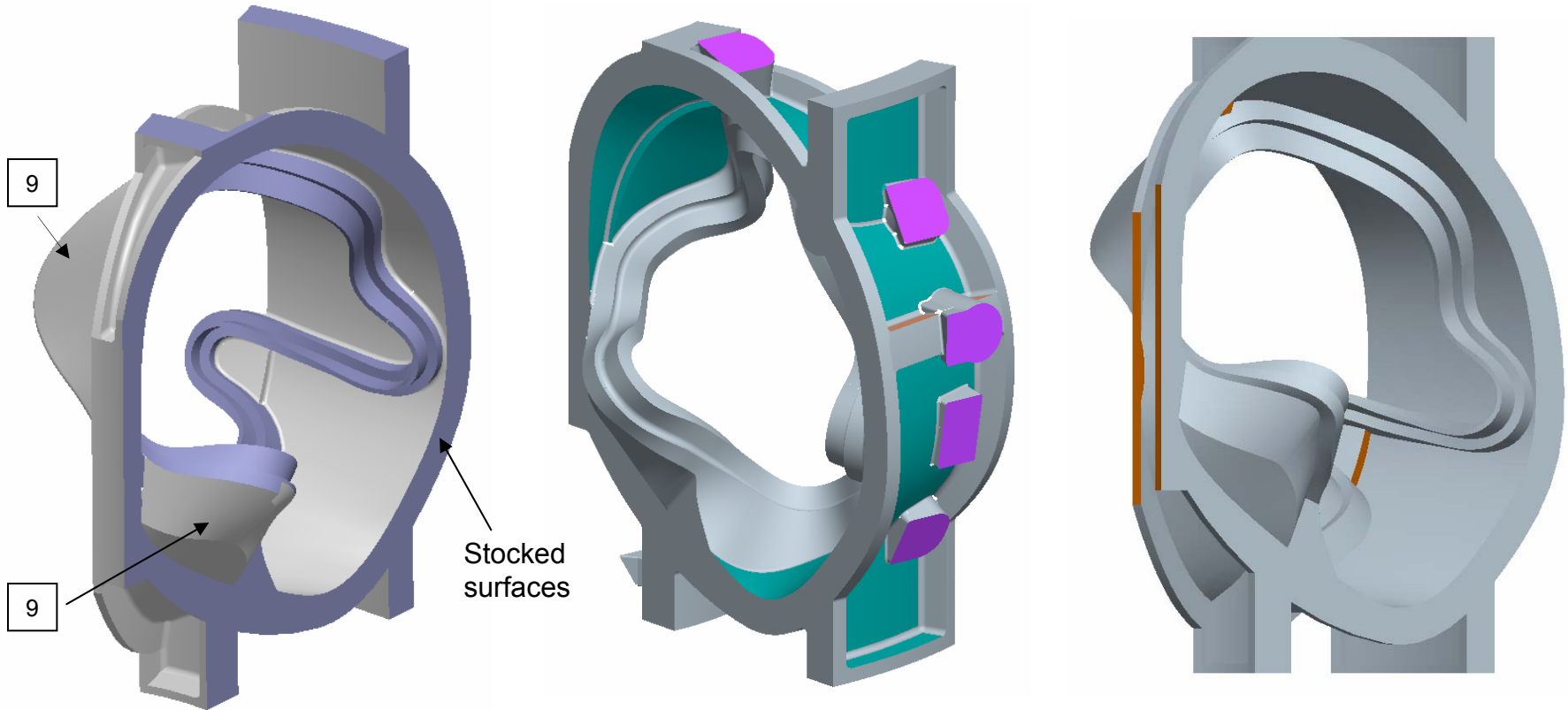
2/4/04

Prototype models / drawings are nearly done

- Model SE141-116P is a major revision of SE141-113P, which had interference and complexity issues
- New model is same as production part, SE141-116, except 1) thinner flanges, and 2) port #10 cut excluded
- Final changes in progress to make all machined features like production part



There are two casting patterns based on SE141-116P



SE141-116P

EIO ref stocked model
ProE based model

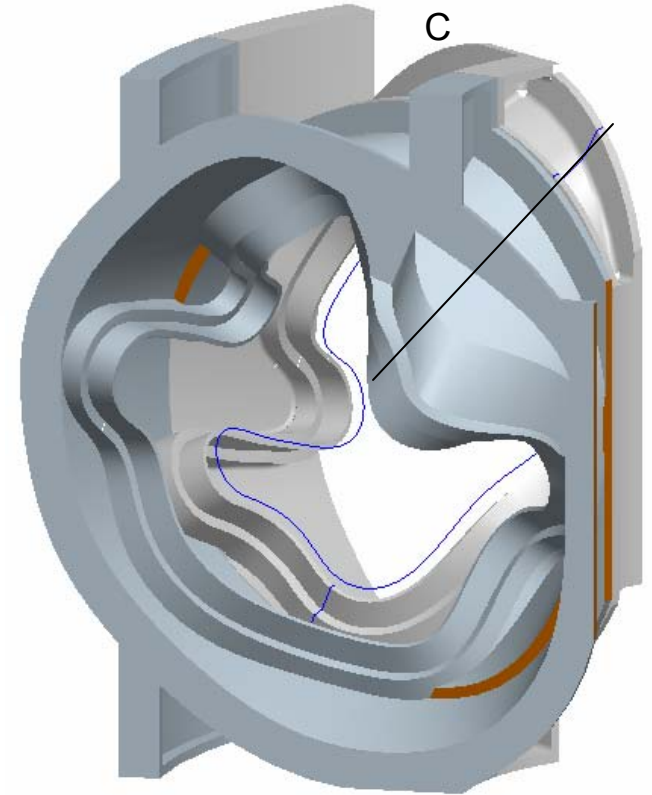
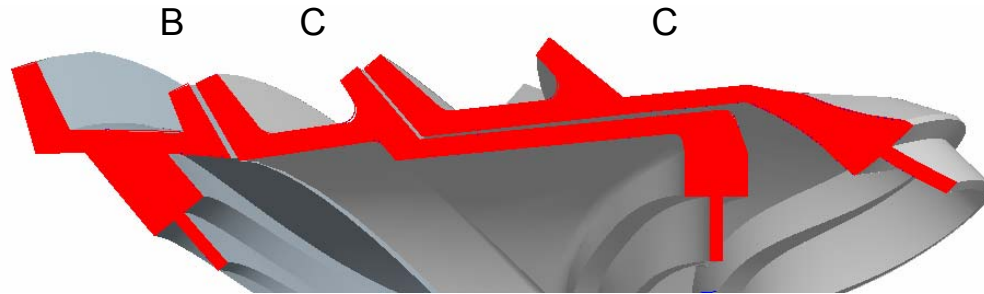
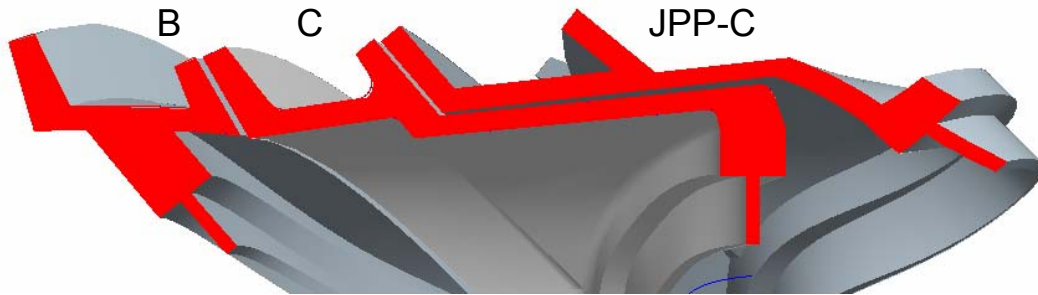
JPP model, no stock added
Model is UG-based variation
of -116P, other models

Drawing Notes:

8. AS-CAST SURFACES SHOWN IN NOMINAL MATERIAL CONDITION, THICKNESS TOLERANCE +/- 0.25. SURFACE PROFILE MUST BE WITHIN 0.5 INCHES OF CAD DATA, EXCEPT IN REGIONS OF INTERSECTING SURFACES WHERE FILLETS ARE EXPECTED.
9. DESIGNATED SURFACE PROFILES MUST BE WITHIN .125 OF CAD DATA.

Winding law x-sec shows minor differences between JPP and SE141-116P

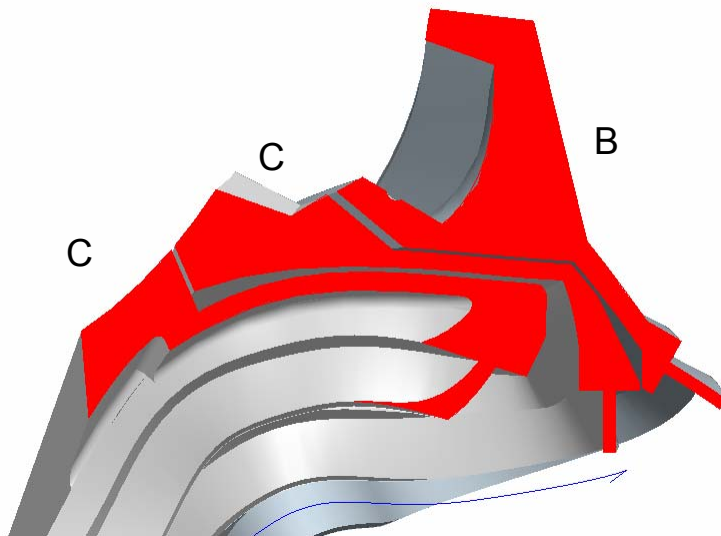
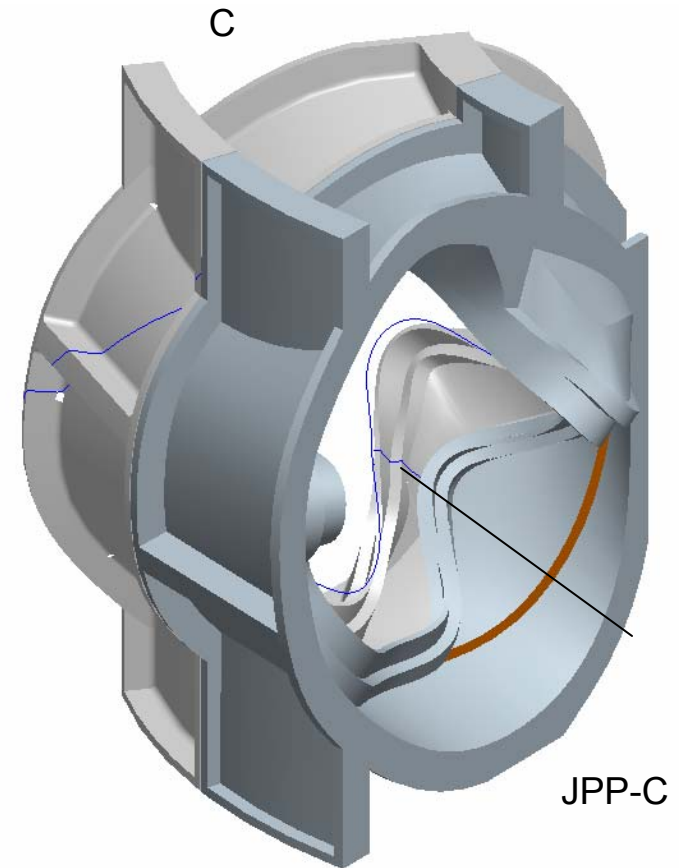
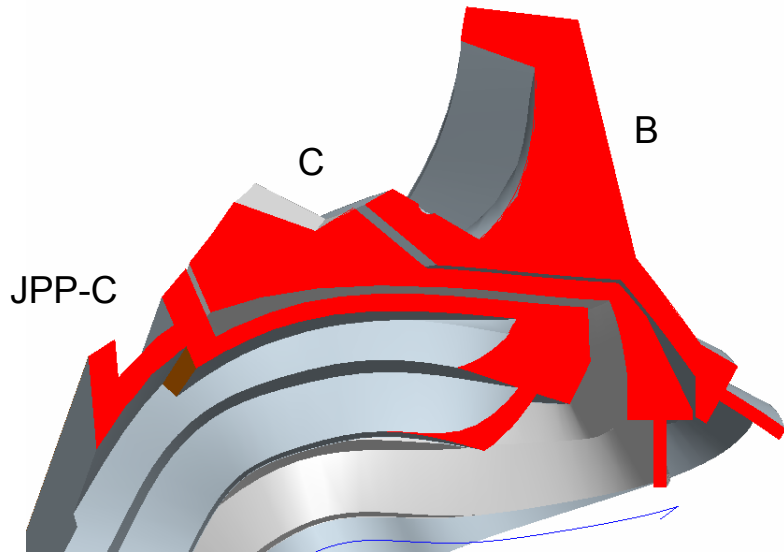
Minimum gap = ~ 0.25 -in
Length parameter $S = 0.32$



JPP-C

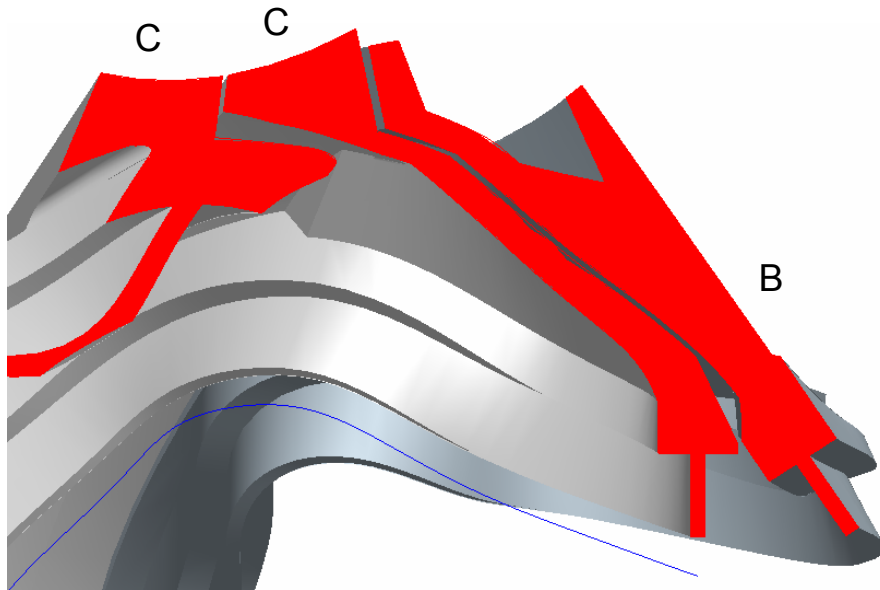
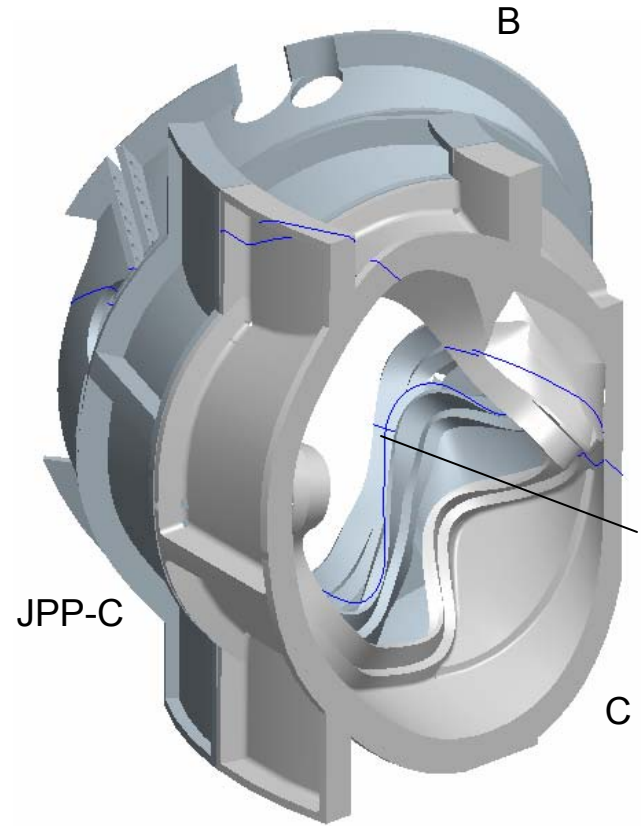
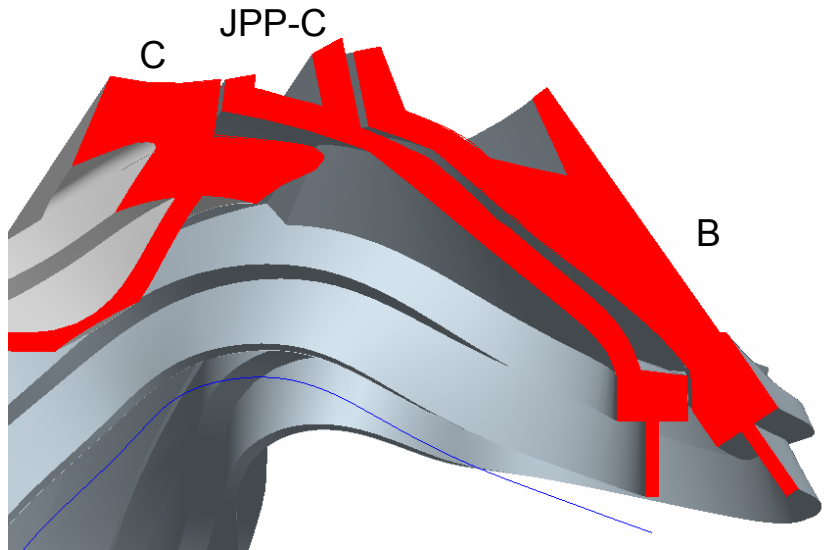
Winding law cross-sections (JPP and SE141-116P)

$S = 0.58$

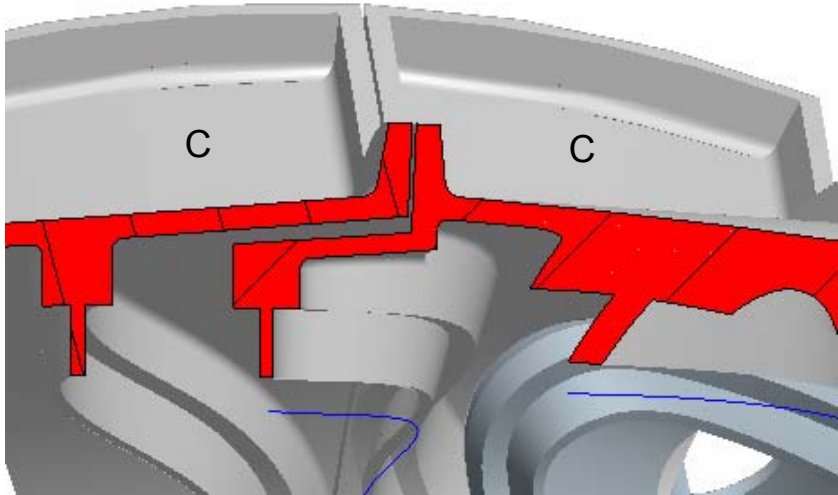
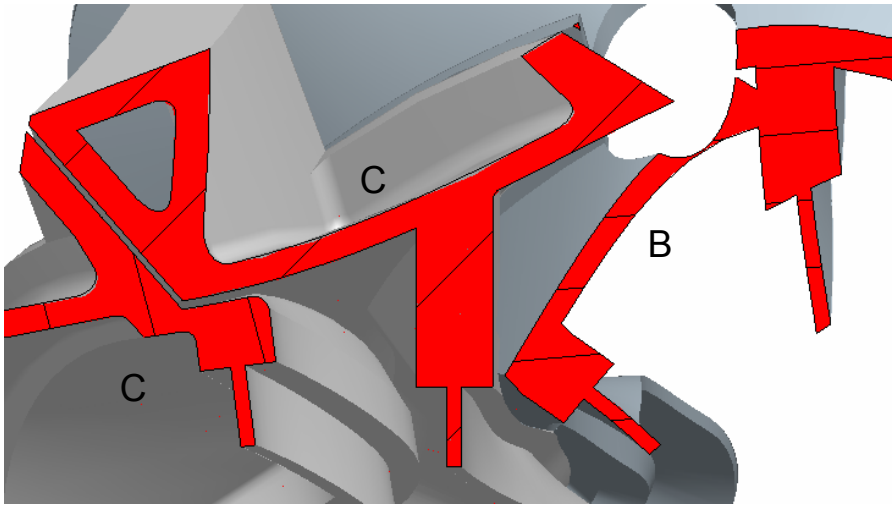
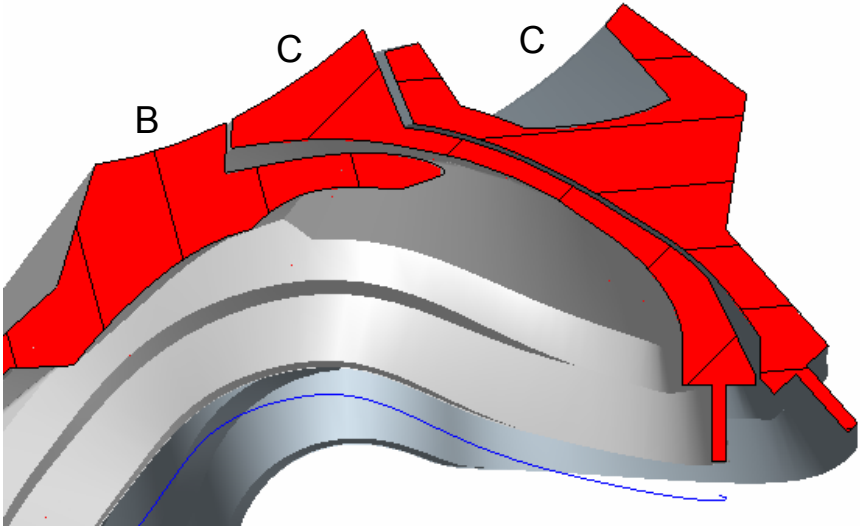
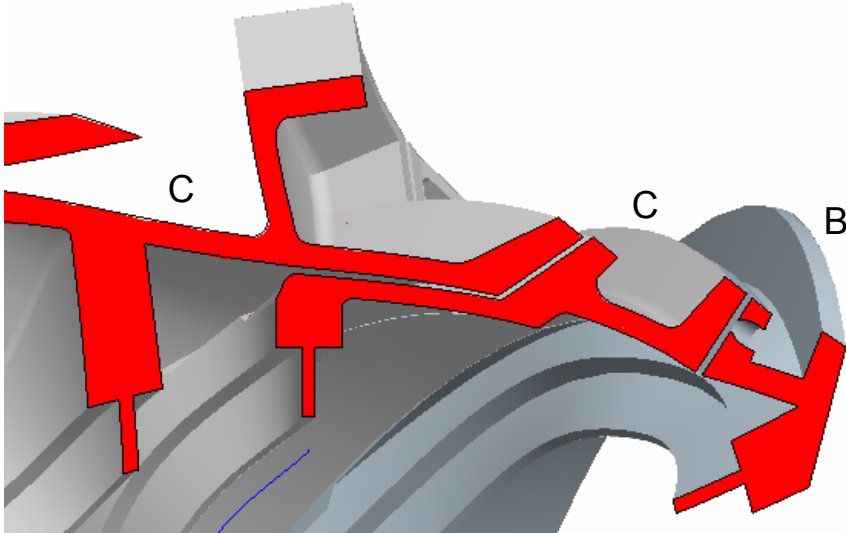


Winding law cross-sections (JPP and SE141-116P)

$S = 0.53$



Winding law cross-sections (SE141-116P and SE141-116P)



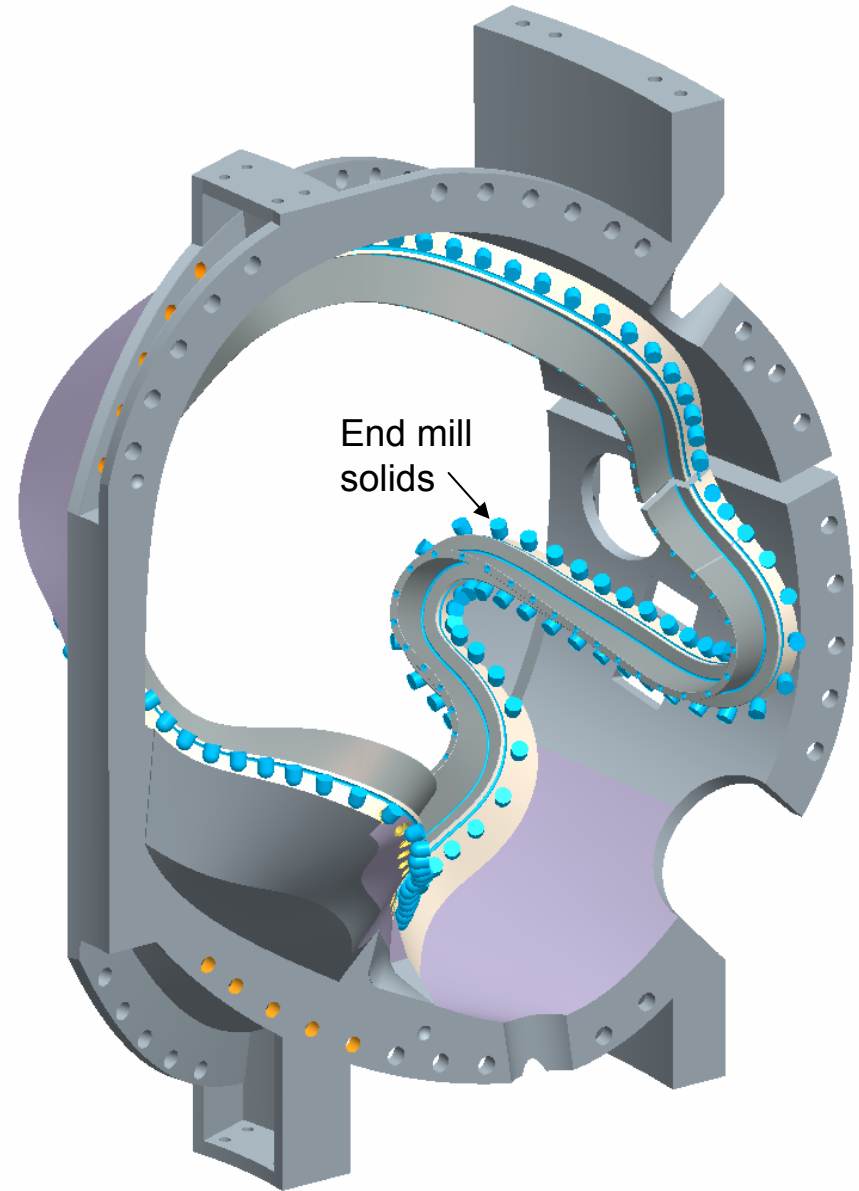
Most machining features are “tool solids”, can be used on any model

Machining operations:

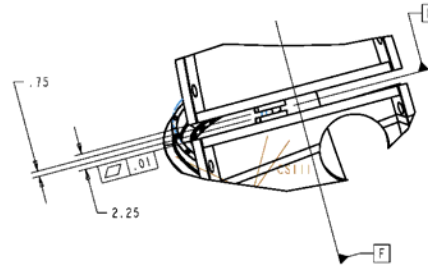
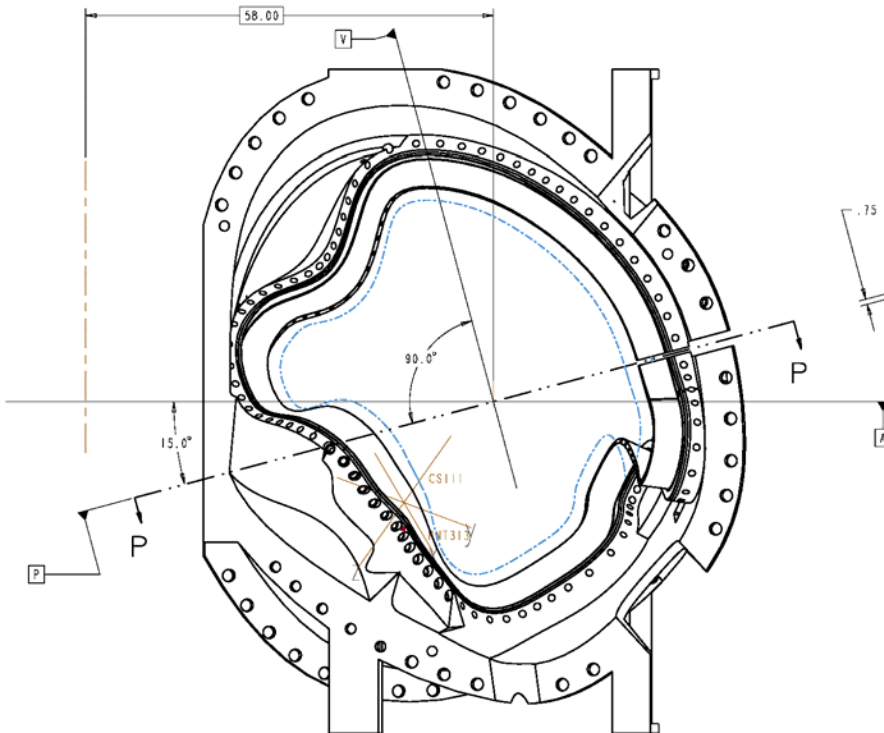
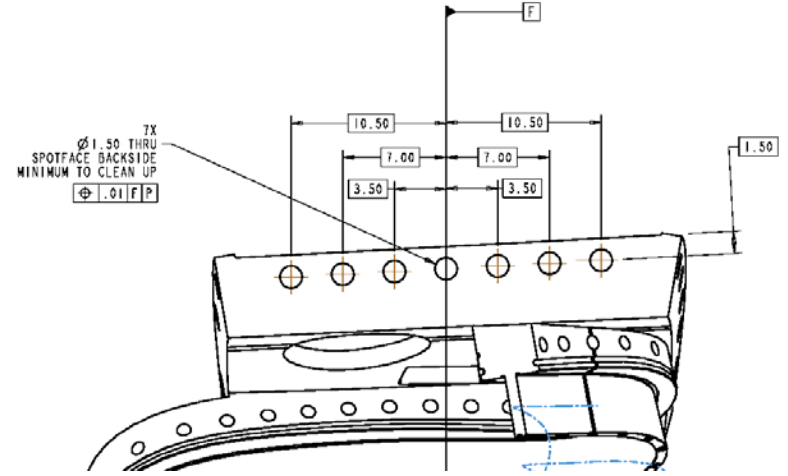
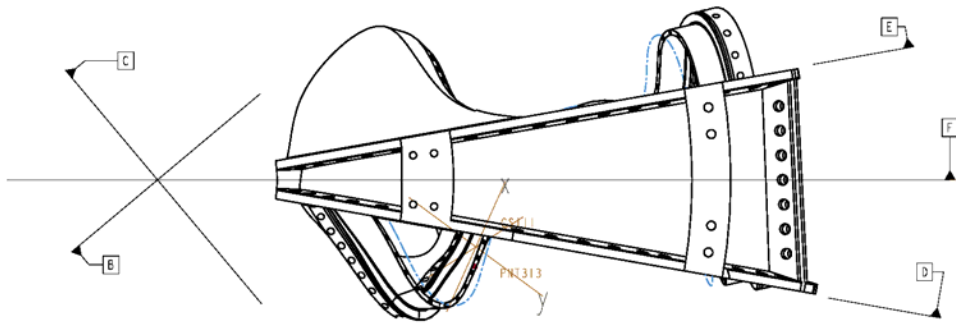
- Poloidal break cut, bolt holes
- Flange through, tapped holes
- Flange alignment seats, holes
- Vessel port openings
- Tee relief cut
- VPI sealing groove, bleed holes
- Clamp attachment seats, holes
- Electrical lead cutouts
- Wing support cutouts
- TF support interface holes

Tolerances:

- Tee profile 0.020-in bilateral
- Wings, cut areas 0.125
- Holes and grooves, .01-.03

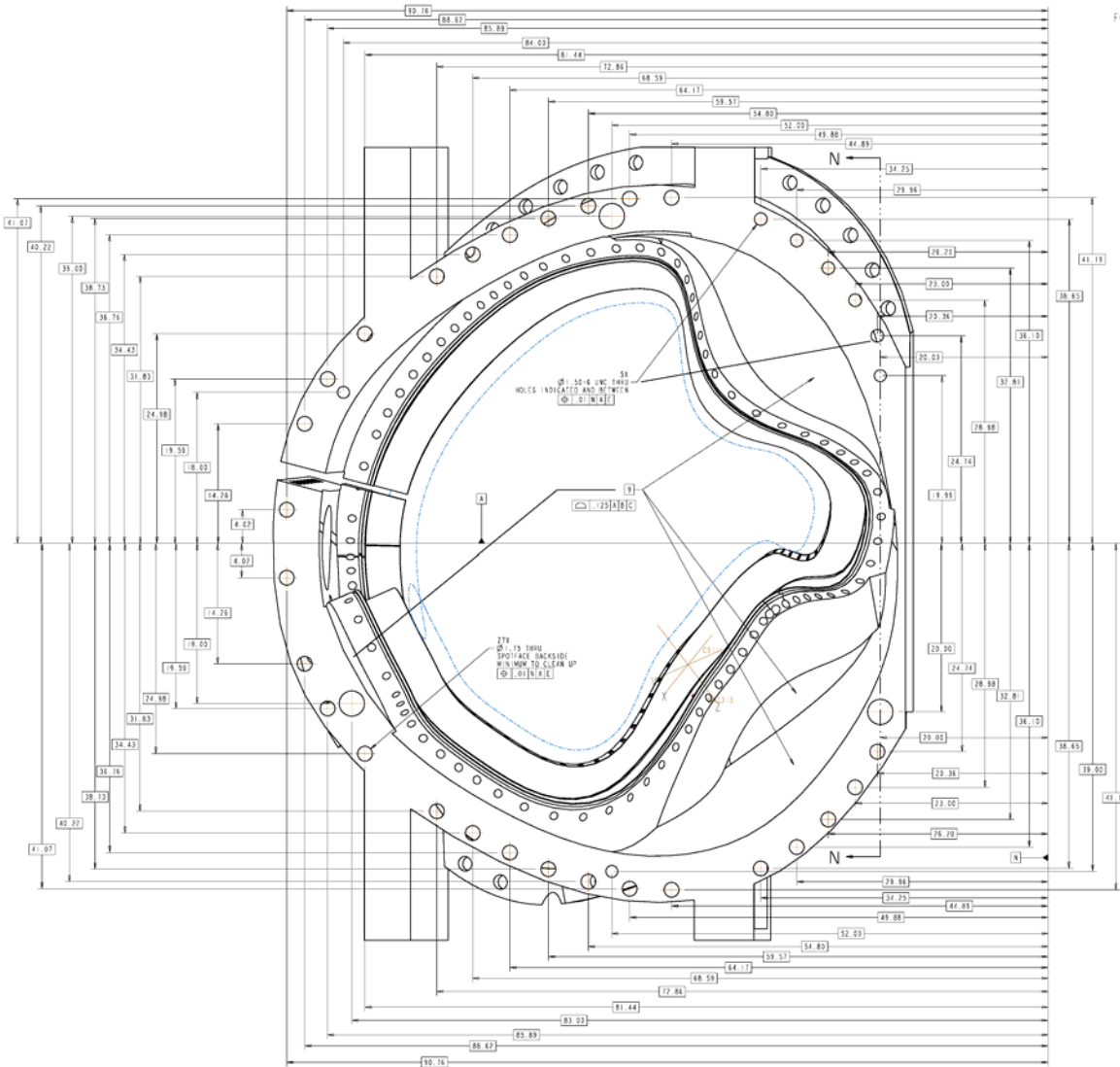


Poloidal break changed to 2.25 / 0.75-in wide cut

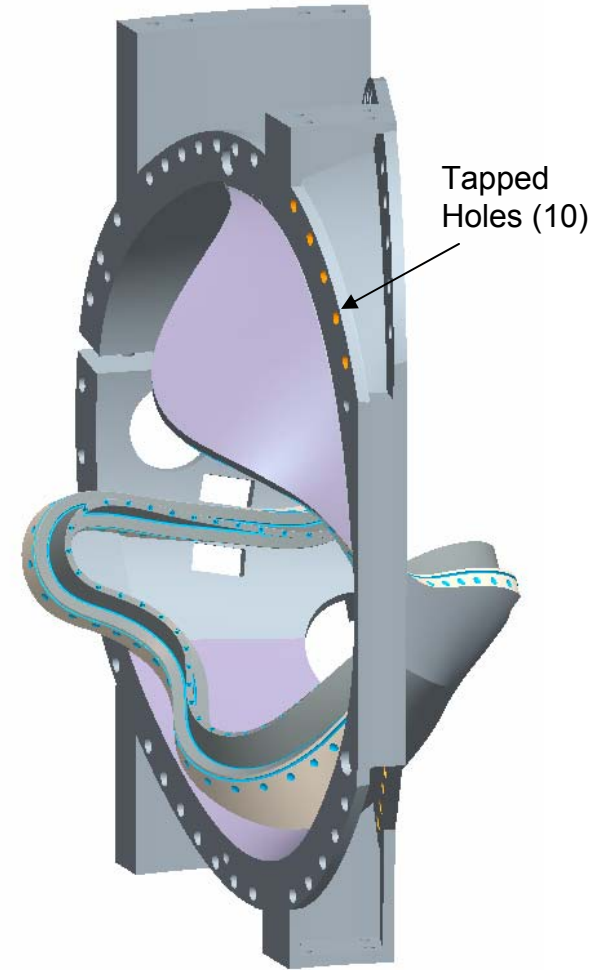


Section P-P

Flange face, holes accommodate insulator both sides (C-B and C-C)

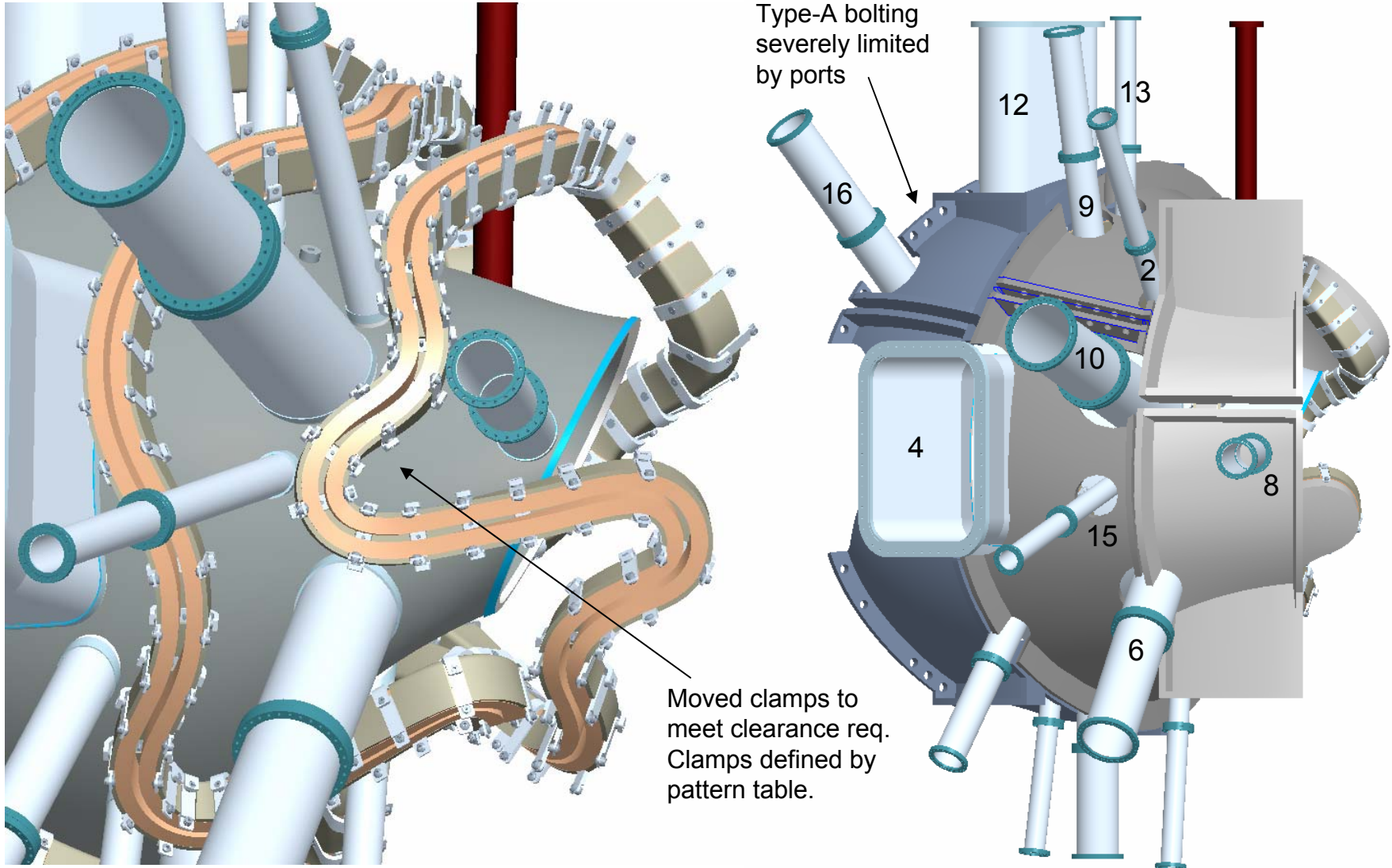


View of flange C-C

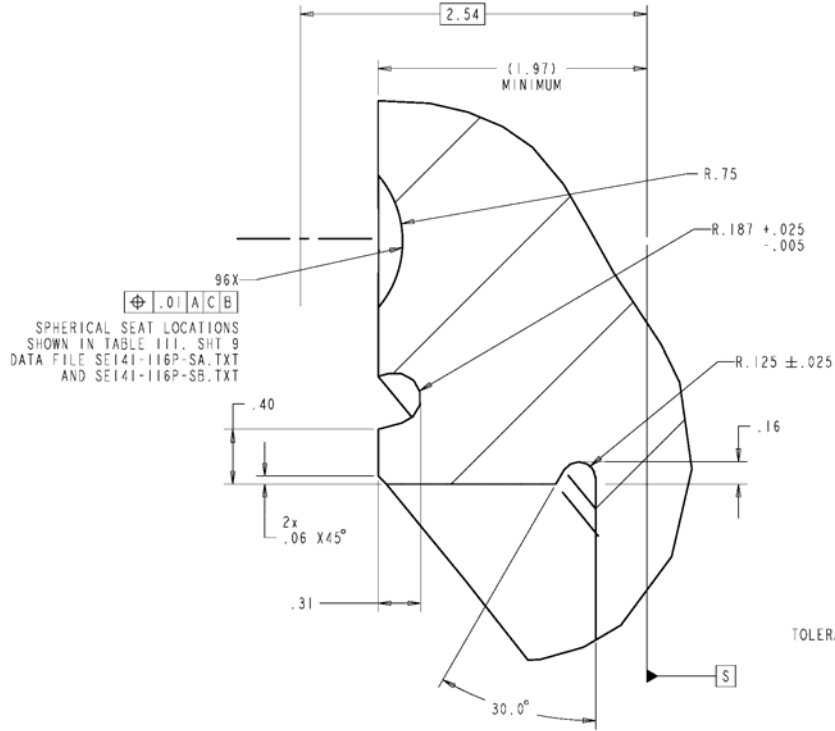


Flange bolting, clamps have been adjusted to accommodate ports

- Prototype clamp layout does NOT match latest iteration



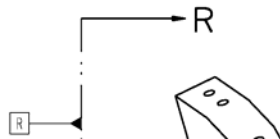
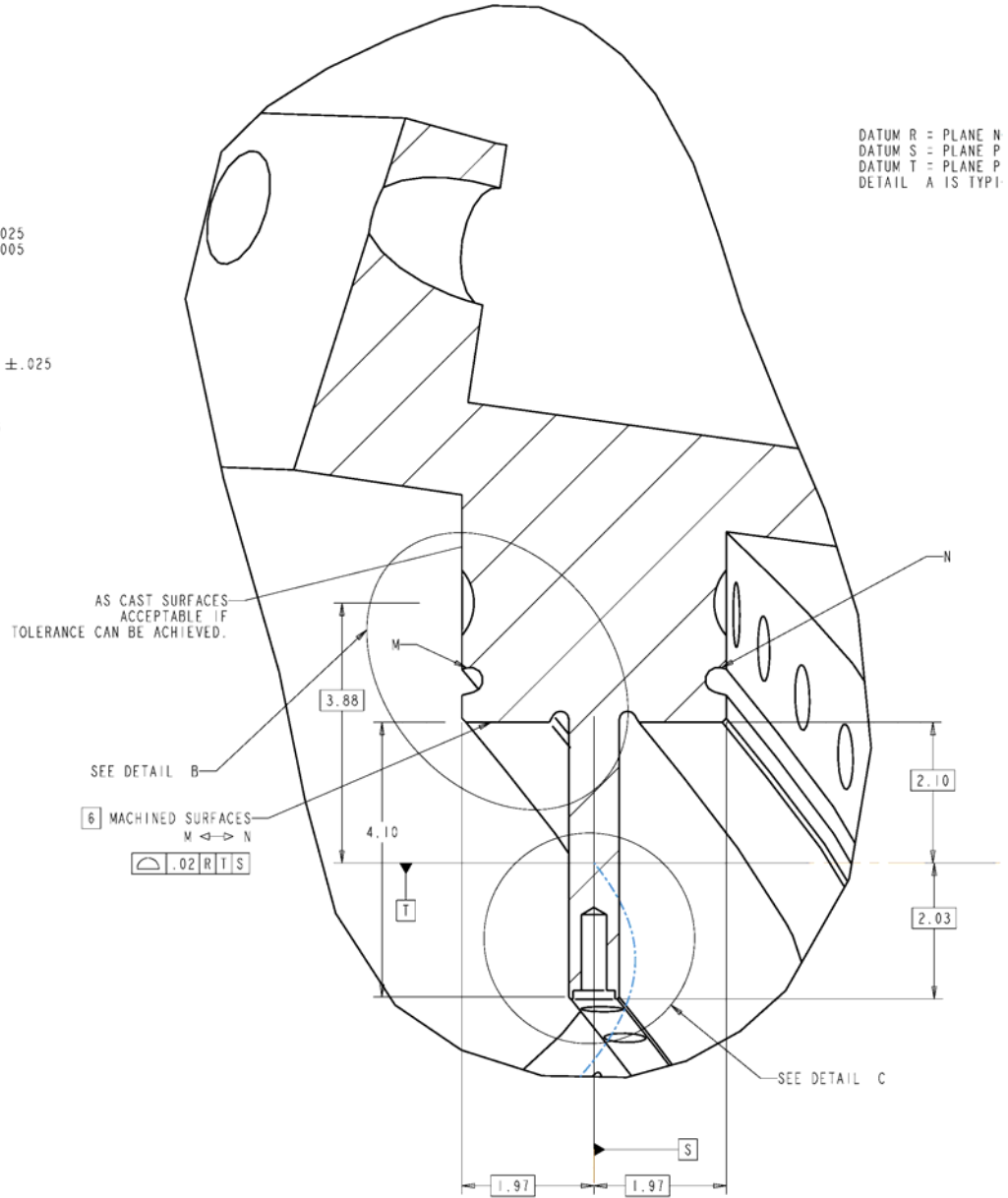
VPI groove dimensions have been changed



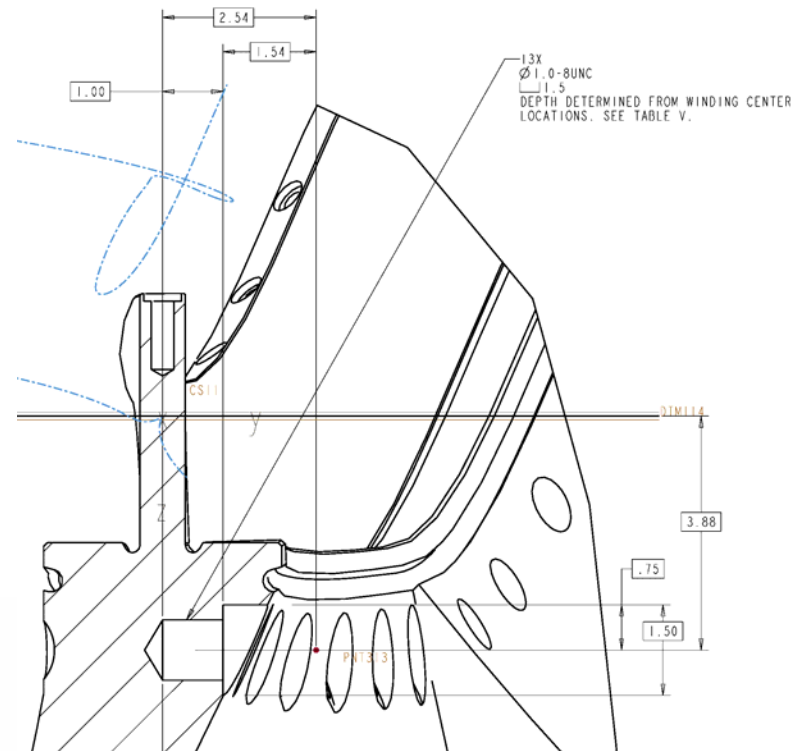
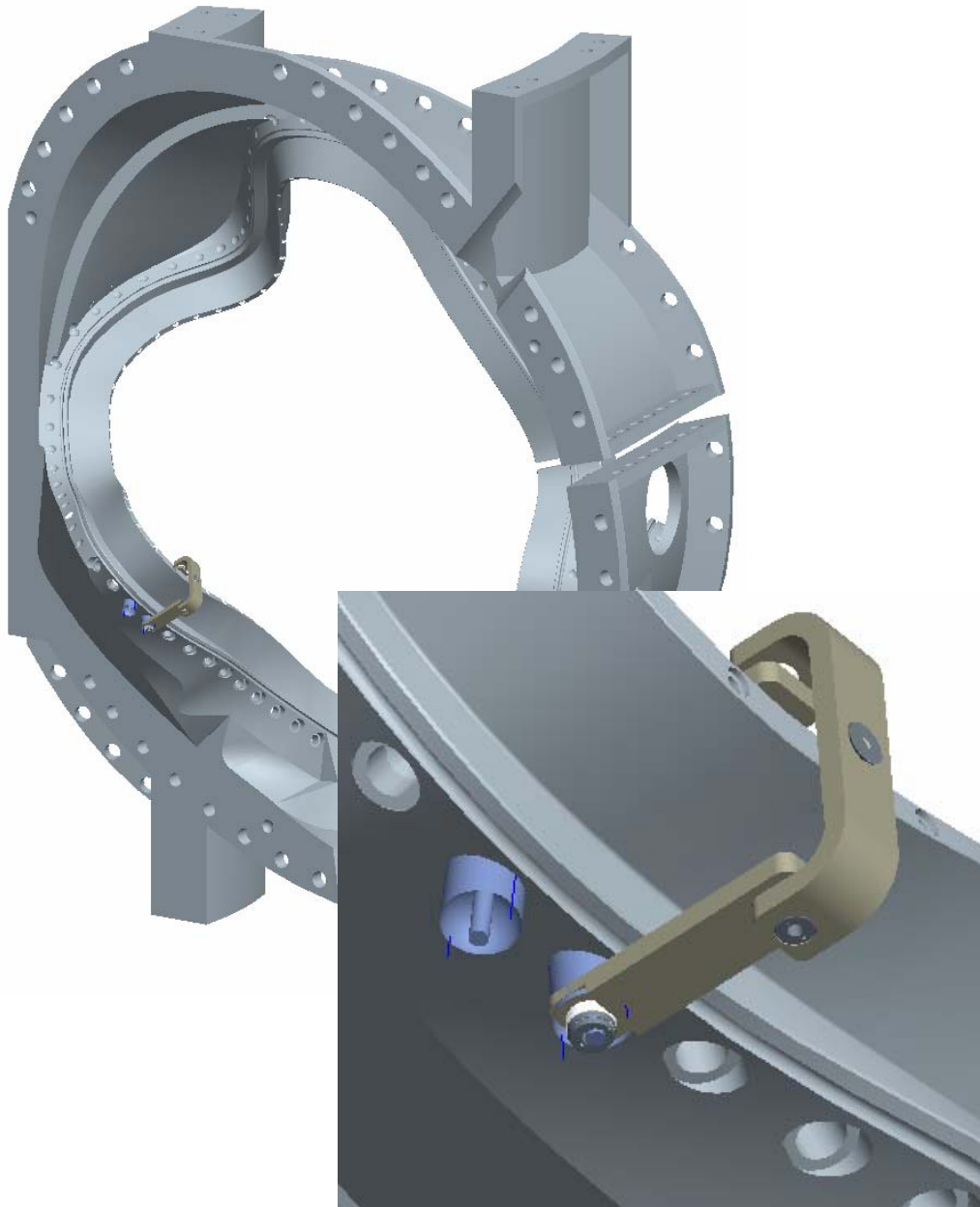
DETAIL B
SCALE 2.000

VPI GROOVE TO BE MACHINED BY BALL AND MILL OR DISC CUTTER IF SAME TOLERANCE CAN BE ACHIEVED.

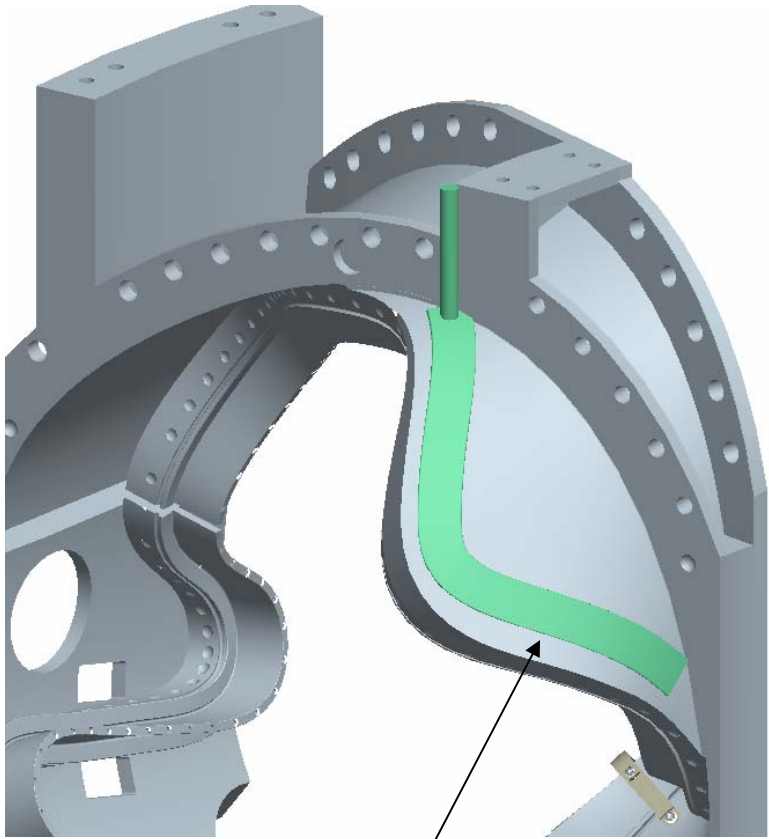
DATUM R = PLANE N
DATUM S = PLANE P
DATUM T = PLANE P
DETAIL A IS TYPICAL



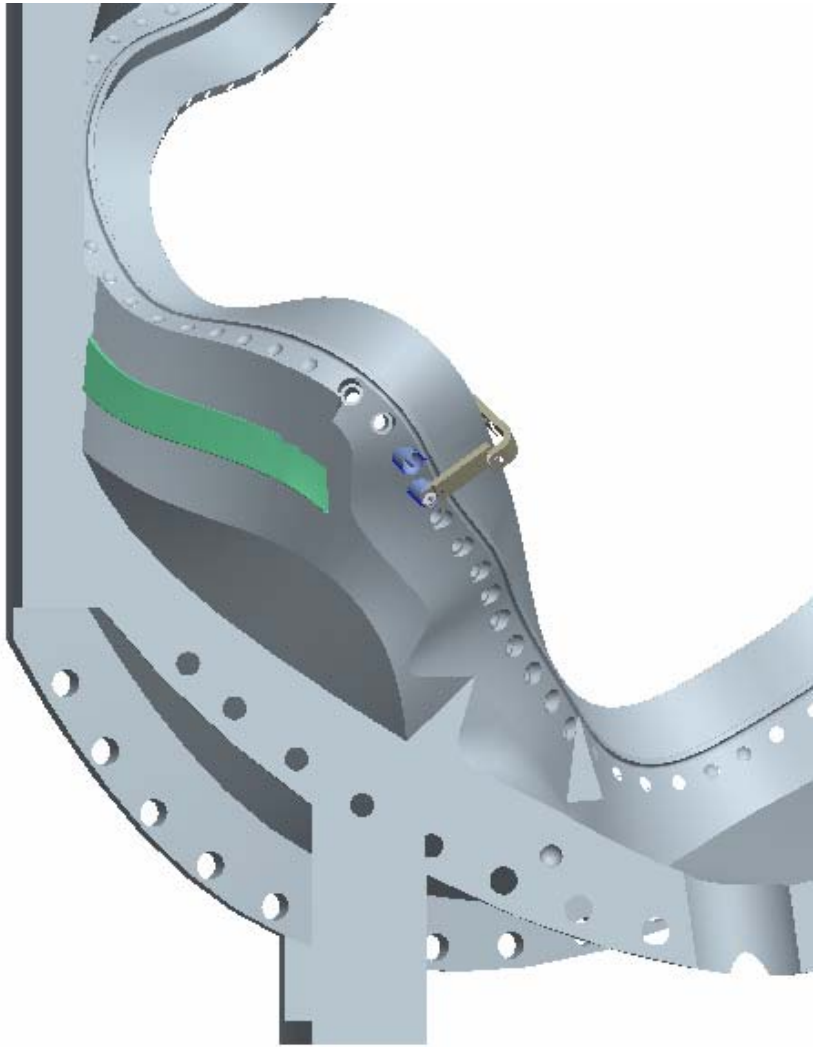
Clamp attachment feature for winding has been added



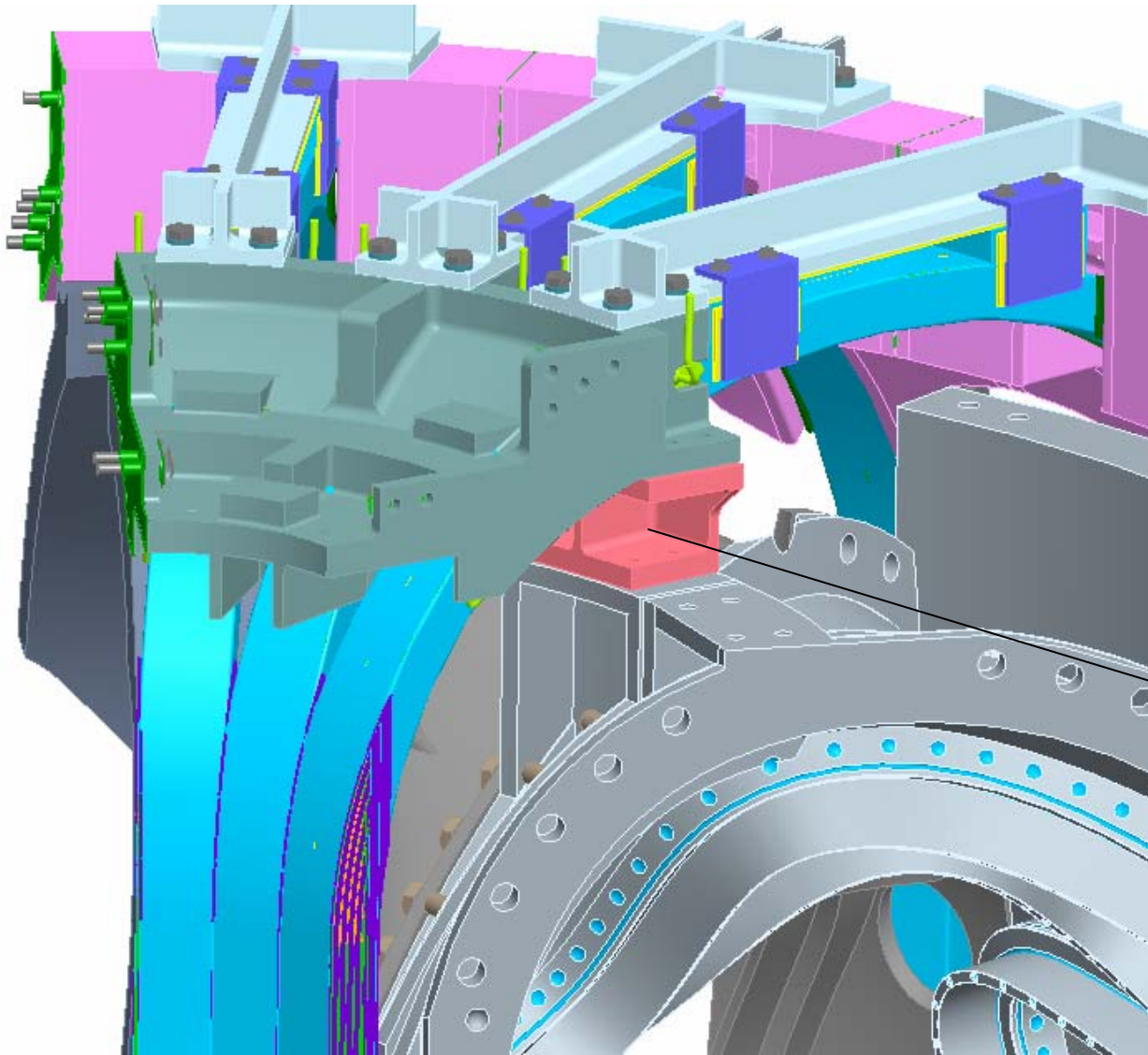
Wing support bladder cutout needs to be added



0.5 x 3.5-in
shown

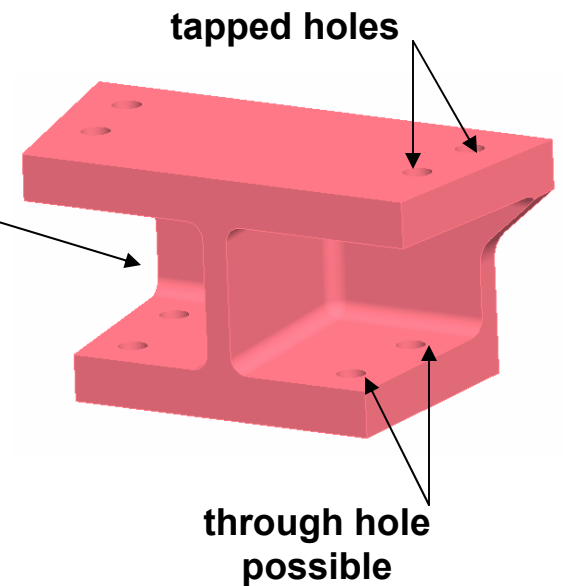


TF Interface (Tom Brown)



Transition member

Through holes possible on one side, tapped holes for final TF connection.



Summary

- Models and drawings of machining features are about 1 month behind schedule.
- Compared to SE141-113P, improvements have been made that will make the prototype much more like a production winding form.
- Final revision to be completed this week.