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CONCEPTUAL DESIGN OF THE INNER CRYOSTAT SUPPORT
AND JACK

BY

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Introduction:

The Endcap Cryostat will be supported by the End Barrel Tilecalorimeter at four points. The outer support points will be carried by a structure that is external to the End Barrel modules while the inner support points will be directly on the modules. This paper concerns the design of these inner support points.

The design parameters for the inner support points are:

1. Must be able to support twice the front load from the Endcap Cryostat (70 tons)
2. The support point must make contact on the inner radius surface provided on the Endcap Cryostat
3. Vertical adjust must be allowed of up to $\pm 6\text{mm}$
4. The support must be a simple support
5. The support must be contained within the envelope of one End Barrel submodule

Proposed Design:

The proposed design is shown in Figs. 1, 2, 3 and 4. This design consists of a permanent shim on which the Endcap Cryostat is placed during installation. This shim rests upon the body of a hydraulic jack as shown in Fig. 2. This jack consists of two hydraulic chambers that drive two pistons. When it is desired to vertically reposition the cryostat, a 45mm thick bar is inserted above these pistons. This bar contacts the second outer radius surface on the cryostat support pad. The purpose of the bar is to distribute the load from the hydraulic cylinder so that the force is distributed across a large area and the compressive yield stress is not reached. The surface area of the bar is $13,750\text{mm}^2$, which results in a compressive stress of 67.3 N/mm^2 . The gusset on the cryostat is made of 5083 aluminum that has compressive yield strength of 180 N/mm^2 .

The vertical position of the cryostat will be adjusted by applying hydraulic pressure to the jack with the lifting bar in place, which will initially lift the cryostat. The existing shim will then be removed and the cryostat will be raised or lowered as needed. Once the final position is reached, the required shim size will be measured and then placed into location. The hydraulic pressure will then be removed from the jack so that the entire load from the cryostat is carried on the shim. Finally, the lifting bar will be removed.

Outstanding Issues:

There are two main outstanding issues that must be resolved with the cryostat group. First, are the size and location of the mounting surfaces shown adequate and incorporated into the current cryostat design? Second, what are the space requirements for the cryostat installation fixturing? This is a critical issue that remains to be resolved since it impacts the design of the special submodules that surround the cryostat support point.

Figure 1

DIMENSIONS ARE IN mm.
 ORSAY REF. DWG. NO. 1080DB100 REV. C

AT530

Figure 2

DIMENSIONS ARE IN mm.
ORSAY REF. DWG. NO. I080DB100 REV. C

Figure 3

DIMENSIONS ARE IN mm.
OKSAY REF. DWG. NO. 1080DB100 REV. C

Figure 4