



**Particle Physics Division
Mechanical Department Engineering Note**

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Project Internal Reference: none

Project: NOvA

Title: Block Pivoter Kneeling Cylinder Loads

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Reviewer(s):

Key Words: NOvA, Block Raiser, Block Pivot Table, Hydraulic Cylinder

Abstract Summary:

The NOvA Block Pivoter for the Far Detector Installation will be tested with the FHEP pivoter.

Kneeling cylinders used on the FHEP will also be used on the far detector pivoter. While loads for the FHEP are less, the synchronized lift criteria are the same.

This note documents the kneeling cylinder loads and synchronized lift criteria.

Applicable Codes: not applicable. This note only calculates loads.

Cylinder Specifications:

Number of cylinders required:	4
Cylinder Retracted (Closed) Length (maximum)	13.25 inches
Cylinder Extended Length (minimum)	17.0 inches
Cylinder Orientation when retracted	vertical
Cylinder Orientation when fully extended	vertical
Max. Cylinder Load when fully extended	225,000 pounds
Max. Cylinder Load when fully retracted	225,000 pounds
Min. Cylinder Load when full retracted	0 pounds
Target Life Cycles	200
Ambient Operating Temperature (Fahrenheit)	60 to 90 degrees
Desired Cylinder Minimum Design Capacity, tons	350
Cylinder Connections: Base End Fitting	flat base
Cylinder Connections: Rod End Fitting	flat rod end
Lifting rate under full load:	0.5 inches per minute
Lowering rate under full load:	1.0 inches per minute
Maximum cylinder to cylinder stroke variation:	0.05 inches