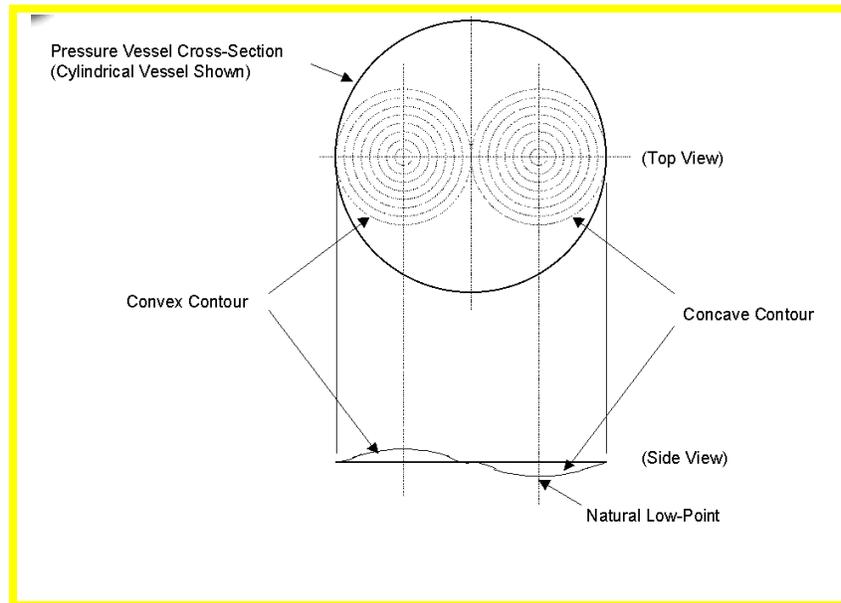




Asymmetric Low-Profile Bulkhead



Objective

This effort will determine whether asymmetric low-profile bulkheads provide any benefit to a launch vehicle system by producing a design proof of concept for an asymmetric low-profile bulkhead which consists of both a concave and convex contour. The effort will compare the results of an asymmetric low-profile bulkhead designed for a given set of requirements with a conventional bulkhead designed with the same set of requirements.

Why Needed

The asymmetric low-profile bulkhead has several distinct advantages over typical conventional bulkheads. The nonflat contour allows a thinner shell design compared to a flat bulkhead, for a higher mass efficiency. The asymmetric low-profile contour is more volumetric efficient than either the concave or convex shell. The lower profile reduces the amount of additional unpressurized structure needed to support a pressure vessel in an upright position. The asymmetric contour provides a single natural low-point for fluids to drain into, and minimize the amount of residual fluid left in the pressure vessel when a vortex forms in the outlet. The asymmetric low-profile bulkhead used in double tank systems allows better integration than a common-bulkhead optimized for minimum mass, while maintaining the other advantages over typical bulkheads. The low-profile design may also be easier to manufacture and integrate, therefore helping to reduce cost.

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Sponsor

Center Director's Discretionary Fund (CDDF)