NASA TECH BRIEF

Marshall Space Flight Center

Modular Construction Provides Large Volume Storage Facility in Minimum Space

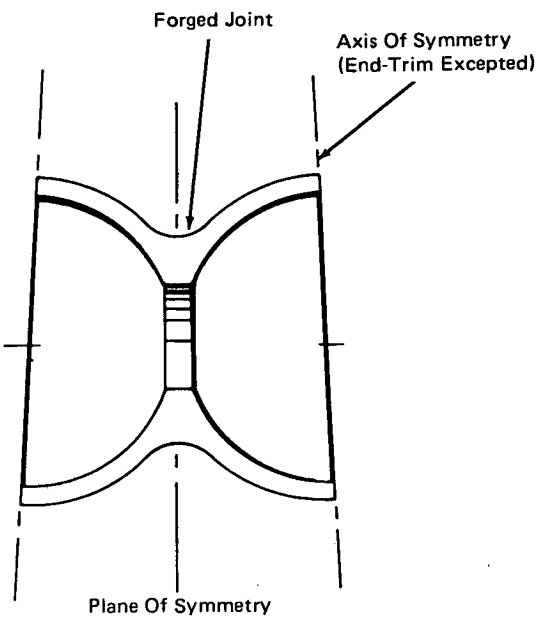

Figure 1. Horizontal Section of One Modular Element

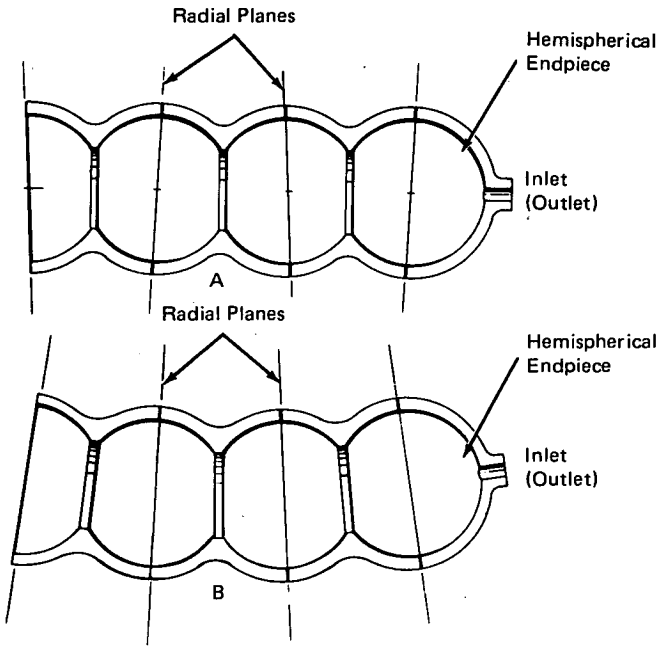

Figure 2. Straight-Line Assembly (A) and Circular Assembly (B)

Modular elements have been used to achieve a maximum storage of pressurized fluids where weight and/or space present problems. This design is useful where access is limited or cylindrical and toroidal vessels are too heavy; it has the added advantage of avoiding the inherent weakness of a system involving multiple plumbing elements, such as a system of numerous storage vessels connected to a manifold.

Each modular element (Figure 1) consists of two approximately hemispherical shells that have material removed near their apexes so that they can be forged together to form a passage. As shown in Figure 2, a number of such modular elements may then be joined together by welding at their largest dimensions. By arranging the modular elements each π rad (180°) with respect to the next, a straight-line continuous pressure vessel can be formed (A in Figure 2). An alternate, curved configuration can be achieved by welding the modular elements together in identical orientation (B in Figure 2) so that a circular vessel would result. One hemispherical endpiece is appropriately machined to receive an inlet (outlet) line.

(continued overleaf)

Note:

Requests for further information may be directed to:

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Patent status:

Inquiries concerning rights for the commercial use of this invention should be addressed to:

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