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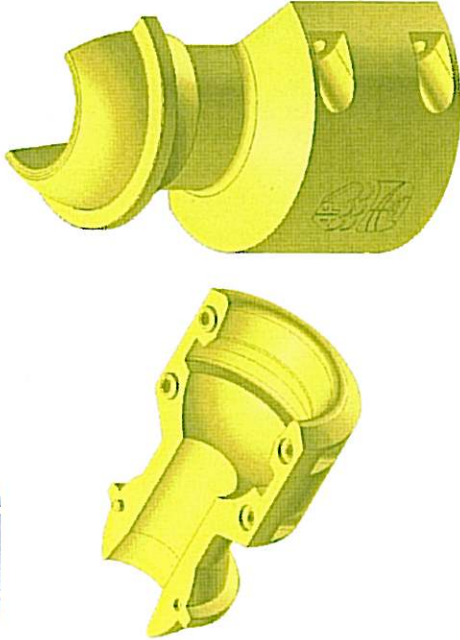
FACTSHEET

March 2009

Vertebrae Bend Restrictors

The **Vertebrae Bend Restrictor (VBR)** is designed to prevent damage to the umbilical it supports. It offsets the action of applied loads which could kink or buckle the internal conduits of an umbilical, cable, flexible riser pipe, or MUX line.

The characteristics of the VBR allow the umbilical to freely flex in any direction, limiting it at the Minimum Bend Radius (MBR). At that point the segments of the VBR will lock on each other with sufficient strength to withstand specified tensile loads applied to the device at the specified MBR and swept angle. The VBR will accommodate lines 0.5" to 16.0" in diameter, and is made from either polyurethane or steel depending on the need.



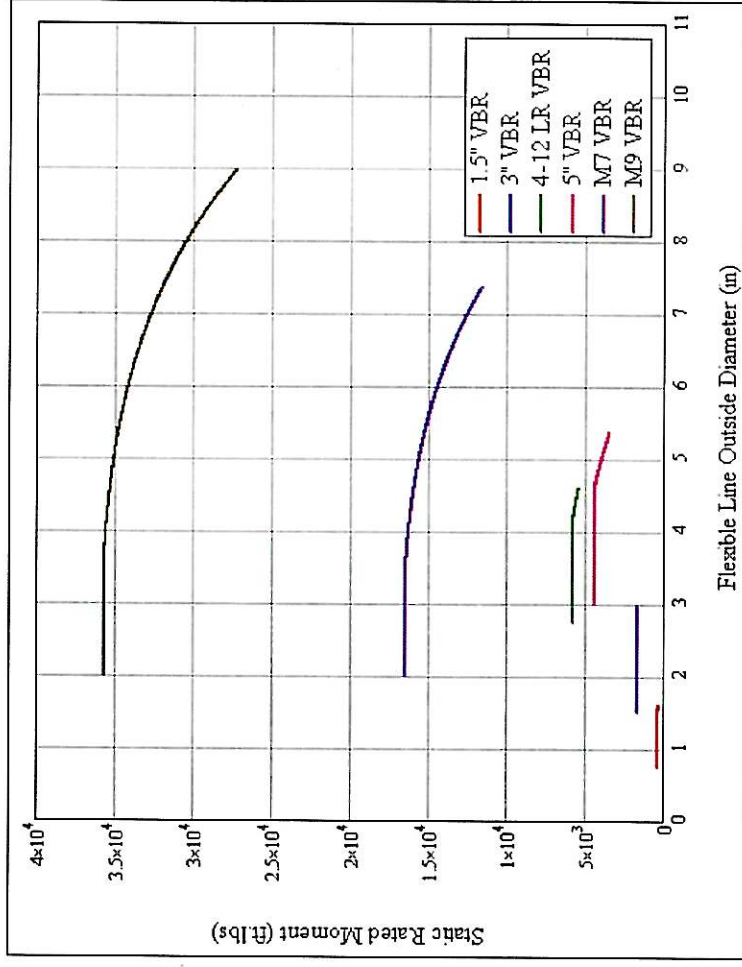
3" VBR Made of Polyurethane



VBR as part of the Arch Support



Assembled VBR.



VBR Product Line Umbilical OD vs. Static Rated Moment