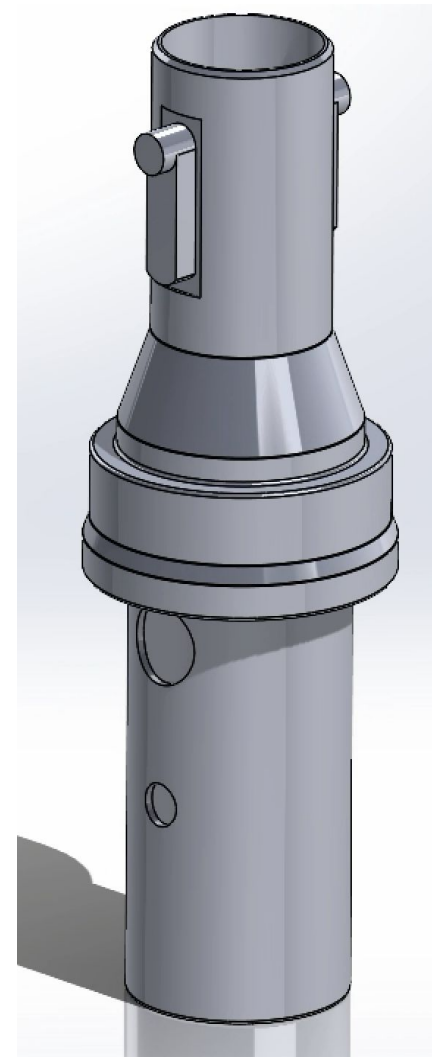
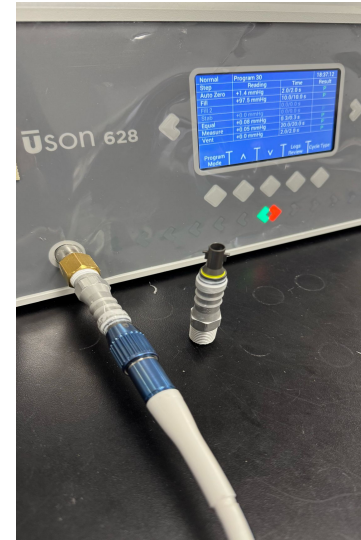
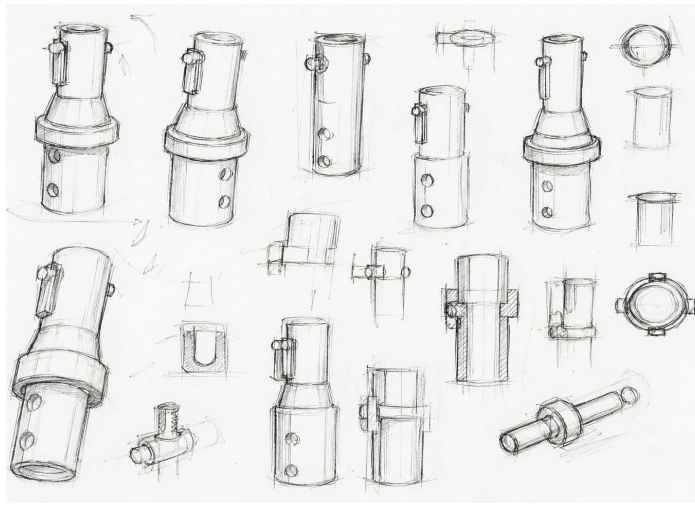
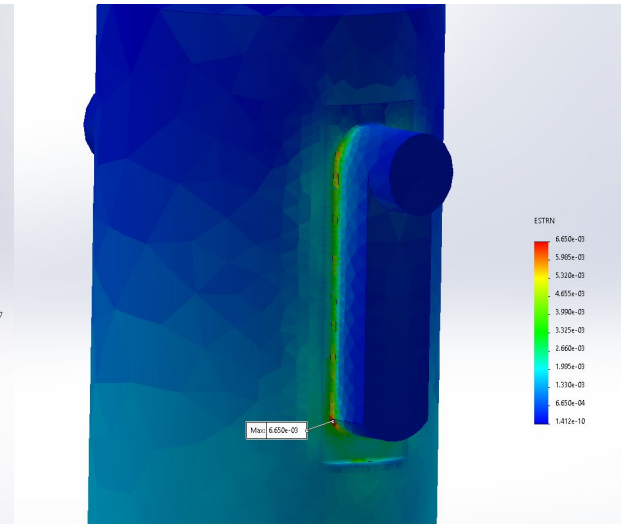
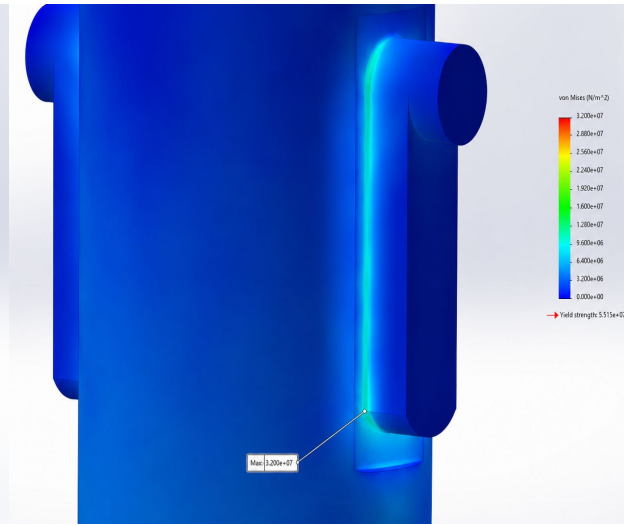
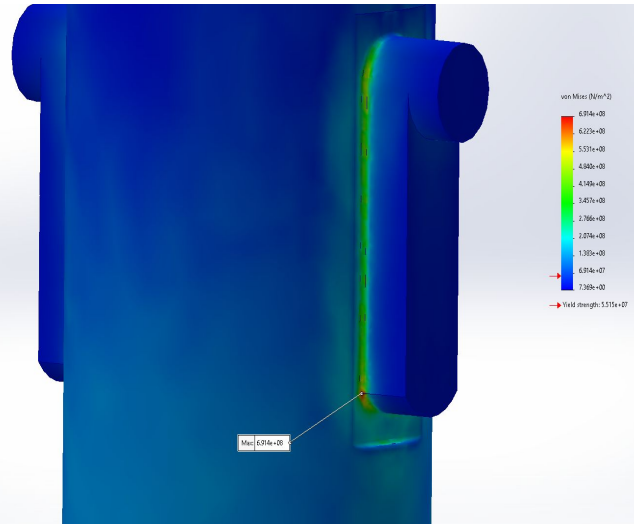


Cable Leak Test

- Developed the fixture from initial sketches through CAD modeling, prototyping, and final manufacturing
- Applied DFMA principles across multiple design iterations, refining critical tolerances, dimensions, assembly features & material selection.
- Integrated a latch-toggle mechanism that securely locks the fixture onto the cable, ensuring a gap-free fit without loosening or unintended movement

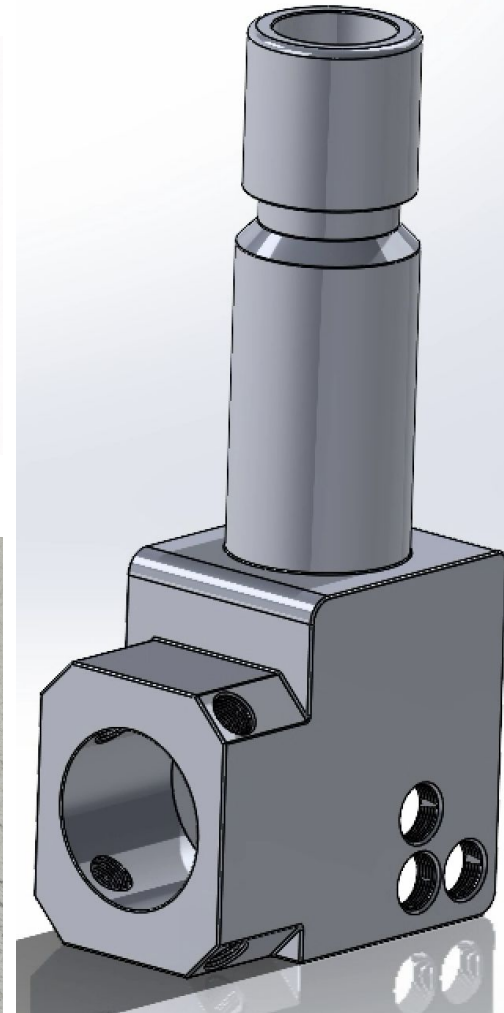
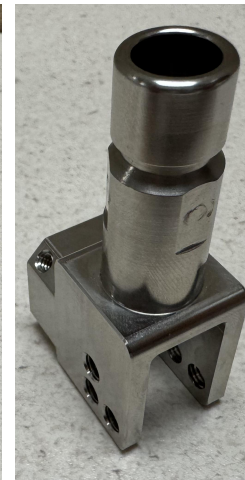
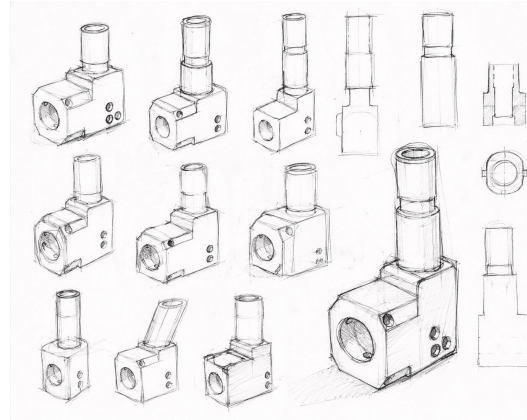


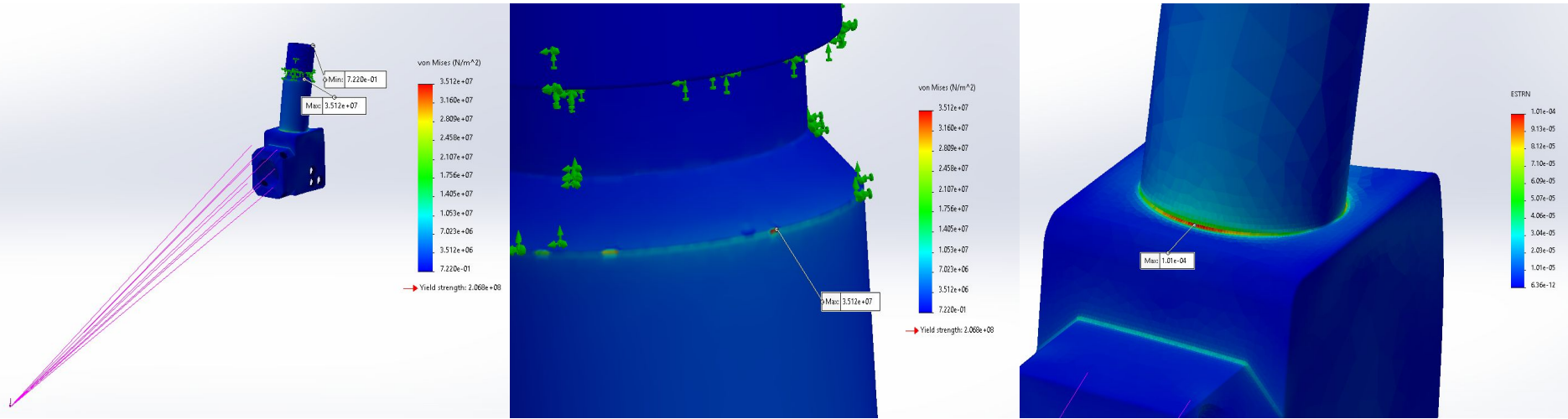


- Conducted static torsional FEA to evaluate twisting loads on the fixture during cable unlatching and identify potential failure points
- Identified critical stress concentrations around latch connection & narrow transition region; added larger fillets & increased thickness to improve load distribution.
- Identifying critical stress concentrations at the latch interface; reduced peak stress by approximately 95.4% from 691.4 to 32.1 mpa

Cable Bend Relief Test 1.0

- Designed a fixture for bend-relief durability testing of CarboThane-jacketed cables.
- Applied similar DFMA principles across design iterations, refining tolerances & dimensions to improve manufacturability and test repeatability.
- Validated mechanical integrity & electrical continuity through 90° bend-relief testing under a 1.5-lb load with continuous 360° rotation, completing 675,000 cycles with a 100% pass rate across 5 samples.

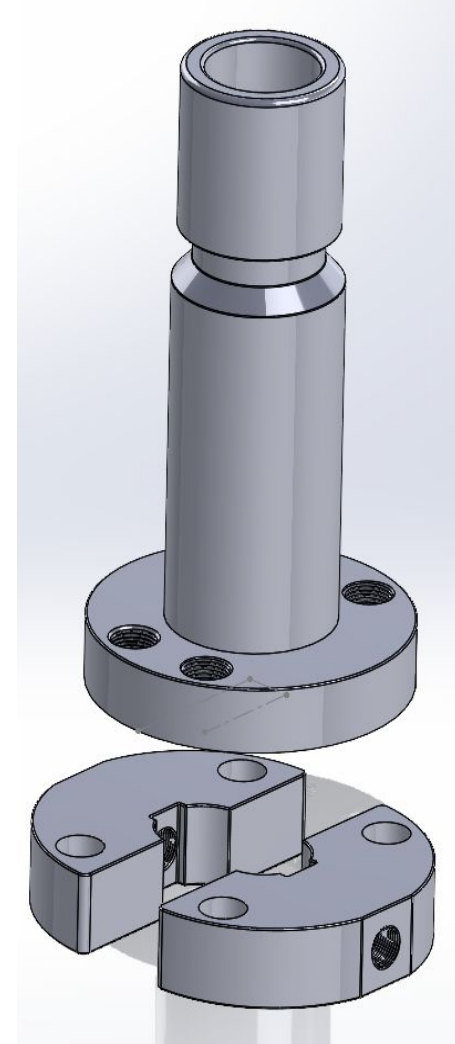




- Conducted static FEA using a 1.5-lb remote mass applied to the cable secured within the fixture, evaluating the resulting bending loads and stress distribution during bend-relief testing.
- Identified peak stress/strain concentrated around the cylindrical neck-to-base transition. The rest of the fixture experiences relatively low stress; increased dia and added more curvature to reduce localized stress concentration and distribute bending loads
- Maximum von Mises stress of 35.1 MPa and 0.0101% strain—well below the 206.8 MPa yield strength and providing a 5.9 factor of safety

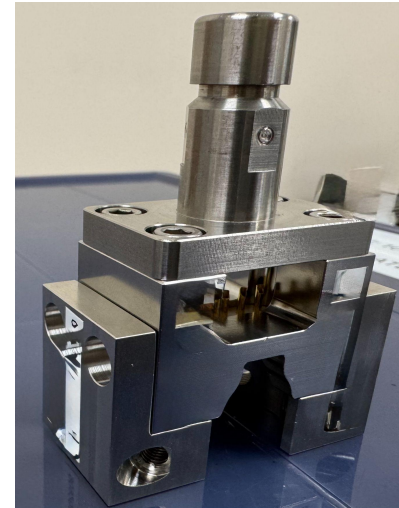
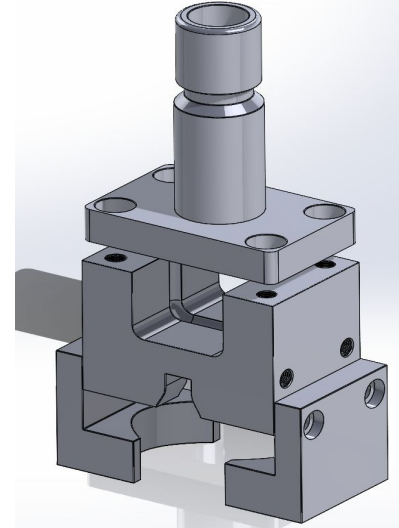
Cable Bend Relief Test 2.0

- Designed a 2nd fixture for bend-relief durability testing of another sort of cables
- Manufactured 15 CNC-machined components in collaboration with Manufacturing, creating GD&T-based technical drawings to define inspection requirements & validation using a CMM
- MMC positional tolerances, and perpendicularity controls for critical bores and mounting holes; collaborated with Quality to translate assembly-fit; all parts met geometric tolerances & dims



Cable Bend Relief Test 3.0

- Designed a custom snap-fit component to secure the cable's electrical connection and maintain continuity throughout testing
- Conducted worst-case & RSS tolerance stack-up analyses to verify adequate base clearance & ensure smooth assembly rotation without mechanical interference
- Conducted daily mechanical inspections during cable installation & removal, confirming fixture integrity with no signs of fatigue-related damage under repeated loading; all samples completed testing successfully



HeartMate Device Testing

- Designed a custom HeartMate LVAD stand, with 50 units produced for feasibility testing to verify proper pump self-test operation.
- Positioned the pump in its intended implanted orientation, creating a repeatable benchtop setup that replicated its placement within the heart.
- Applied topology optimization to target a 28% reduction in material volume, developing a ribbed structure while preserving the base, three cradle levels, critical contact surfaces, and primary load paths.

