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Customer Background:

Proportion-Air is a electronic air regulators and flow control valve manufacturer. Their subsidiary, Burling Valve, makes dome-loaded pressure-reducing valves

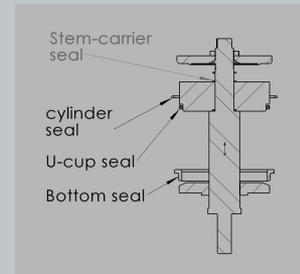
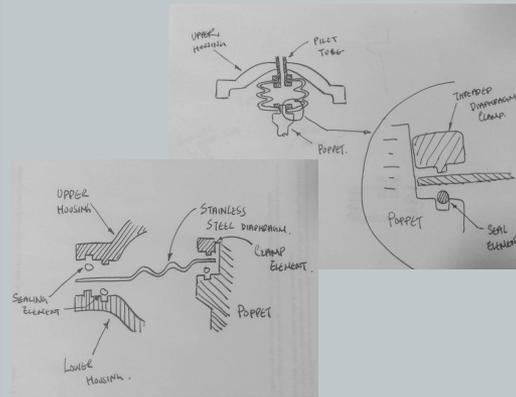
Problem Statement:

Modify the existing Burling Valve to function with superheated steam.

Project Requirements:

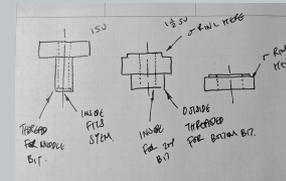
- Minimal tooling and process changes
- Superheated steam compatibility
- Operating temperatures up to 450°C (850°F)
- Operating pressures up to 300PSI (2000kPa)

Initial Concepts:

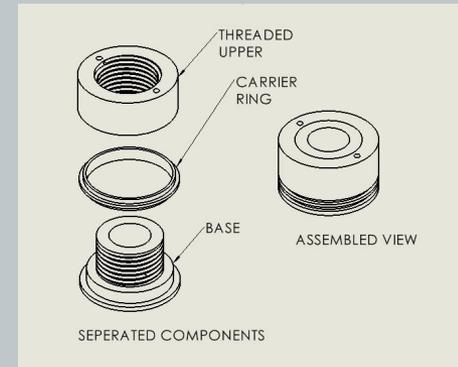


Above: Seals to be replaced

Below: initial concept for new piston

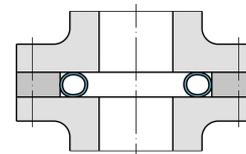


Final Design:



Wills Rings

Essentially a metal O-ring, wills rings can be installed to replace polymer O-rings. Due to their construction, modifications have to be included to enable their use.



Testing Procedures:

1. Run on compressed air with polymer seals to prove function
2. Test with Wills rings
3. Test with superheated steam
4. Long-term operation testing