RAY W. HERRICK LABORATORIES

An Experimental and Numerical Study on Dynamic Characteristics of Linear Compressors

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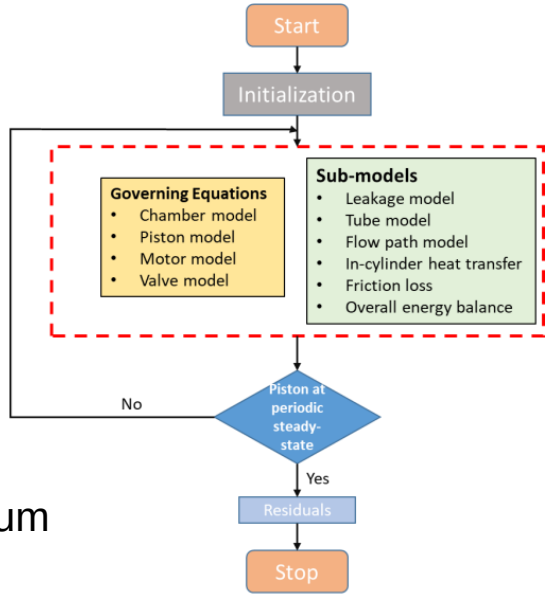
Sponsor: CHPB

Project Description

- Develop a comprehensive simulation model to simulate the dynamic performance of a linear compressor
- Exercise the experimentally validated model to identify the key parameters affecting the compressor performance
- A prototype linear compressor is designed and manufactured to achieve better performance.

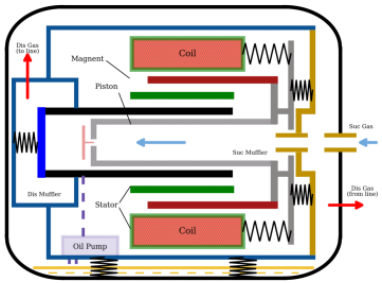
Approach

- The compression process model is based upon mass and energy conservation equations.
- All thermodynamic properties are assumed as one-dimensional uniform within each control volume.
- Working fluid follows a quasi-equilibrium state during the entire process.



Discussion

- More design possibilities
- Easy capacity control
- Less friction points
- Less noise and vibration



Results

1. **Dynamic in-cylinder pressure variation**
2. **Experimental setup for linear compressors testing**
3. **The prototype linear compressor design**

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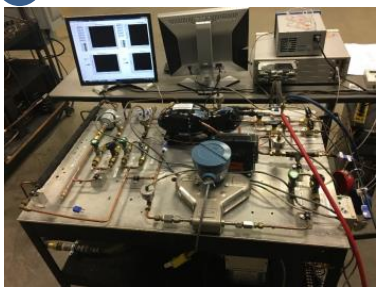

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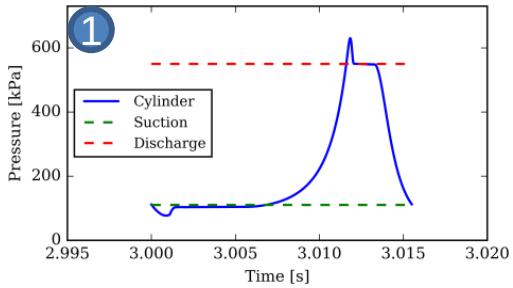

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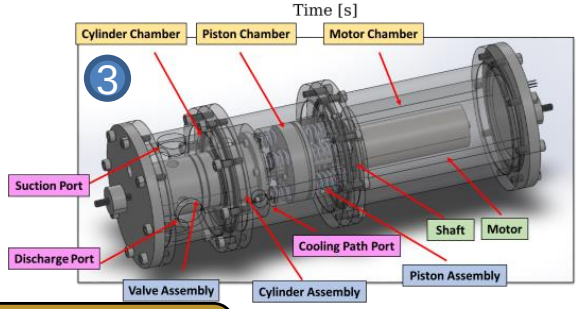

Linear Compressor Dynamic Characteristics

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