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Reliability

Give Soft Foot the Boot: Discover the Hard Facts

Presented by: Aztech Reliability

Best Practices Webinar Series

Meet the Speaker

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President of Aztech Reliability

- A proud Fluke Reliability partner representing East Texas
- Subject matter expert in alignment
- Certified in Level 2 vibration and Level 1 ultrasound
- Over 13 years in maintenance and reliability

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Agenda

Defining and visualizing soft foot

Types of soft foot

Why soft foot is problematic and its consequences

Diagnosing and correcting

Benefits of soft foot correction

3

What is Soft Foot?

Soft foot occurs when one or more feet of a machine are not making proper contact with its base, causing uneven support.

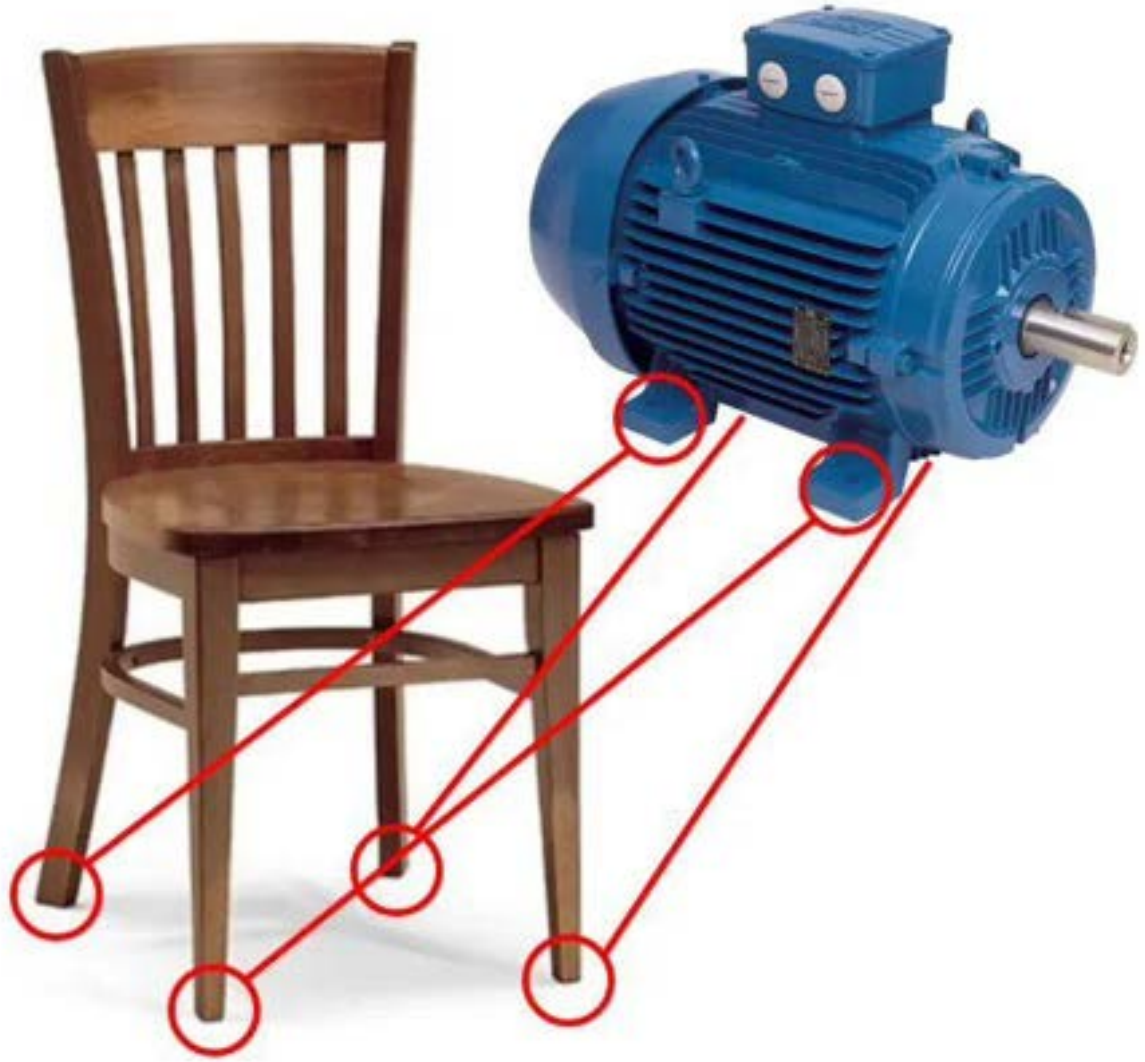
Impact: Leads to machine misalignment, vibration, stress on components, and potential wear or failure over time.

Visualizing Soft Foot

Imagine a wobbly chair with one leg shorter or obstructed...

Similar effect in machinery: If feet aren't evenly supported, the machine will wobble or become unstable.

Result: Imbalanced, misaligned machinery, causing inefficiency and possible damage



Types of Soft Foot

Rocking

- Uneven feet or bases

Angled

- Bent feet
- Bowed baseplate

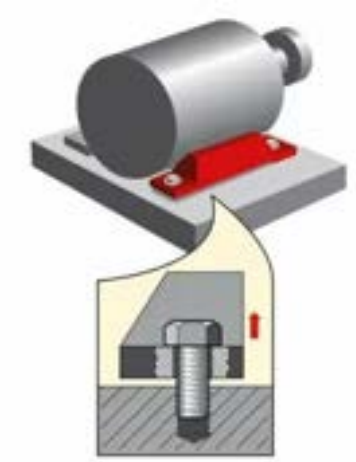
Squishy

- Debris buildup under feet
- Too many shims

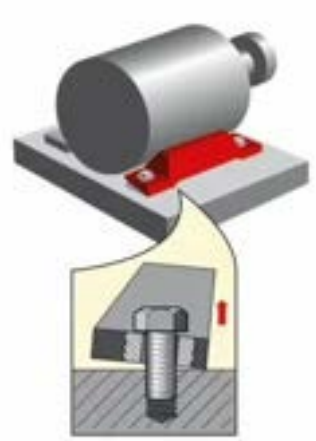
Induced

- External forces: misaligned machine frame, pipe strain

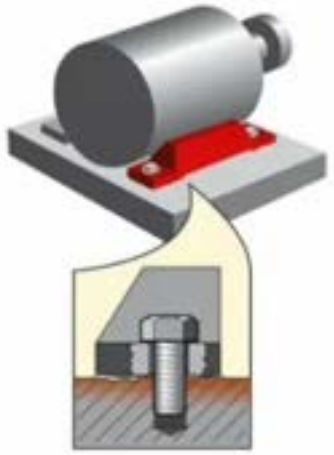
PARALLEL SOFT FOOT



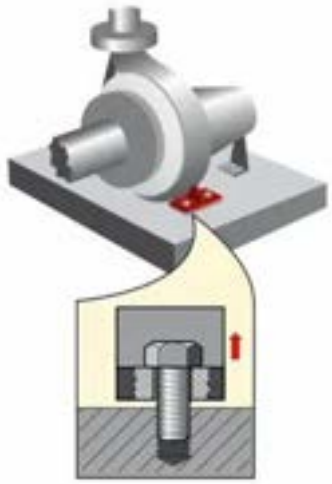
ANGULAR SOFT FOOT



SQUISHY FOOT



INDUCED SOFT FOOT



Why Is Soft Foot a Problem?

Complicates alignment:

- Makes it harder to achieve repeatable measurements during alignment
- Even a small wobble causes the machine to stand slightly differently each time, slowing down the alignment process

Strain on machine components:

- Increases load on bearings once the machine is bolted down
- Causes strain on the machine casing
- Misaligned, **long-term damage**: shafts, bearings, pump and gearbox issues, seal failure, and bent shafts
- **Increased energy consumption** and **corrosion**
- **Cracks** can form in the machine casing

Equipment failure: Left unchecked, these issues can lead to catastrophic equipment failure

Consequences of Soft Foot

Vibration: Improper contact leads to excessive vibrations

Increased wear: Misalignment accelerates wear on machine components

Decreased efficiency: Loss of operational performance

Potential machine failure: Over time, can cause catastrophic failure if not addressed

Energy loss: Soft foot causes the machine to run inefficiently, leading to higher energy consumption

Diagnosing Soft Foot

Challenges:

- Hard to spot, especially for inexperienced crews
- Diagnosing soft foot can be a slow and patient process

Tools:

- Specialized diagnostic tools can help identify soft foot quickly and accurately

Correcting Soft Foot

Adjusting machine feet: Ensure all feet make full contact with the base

Shimming: Use shims to level and support uneven feet

Cleaning: Remove debris or obstructions under machine feet

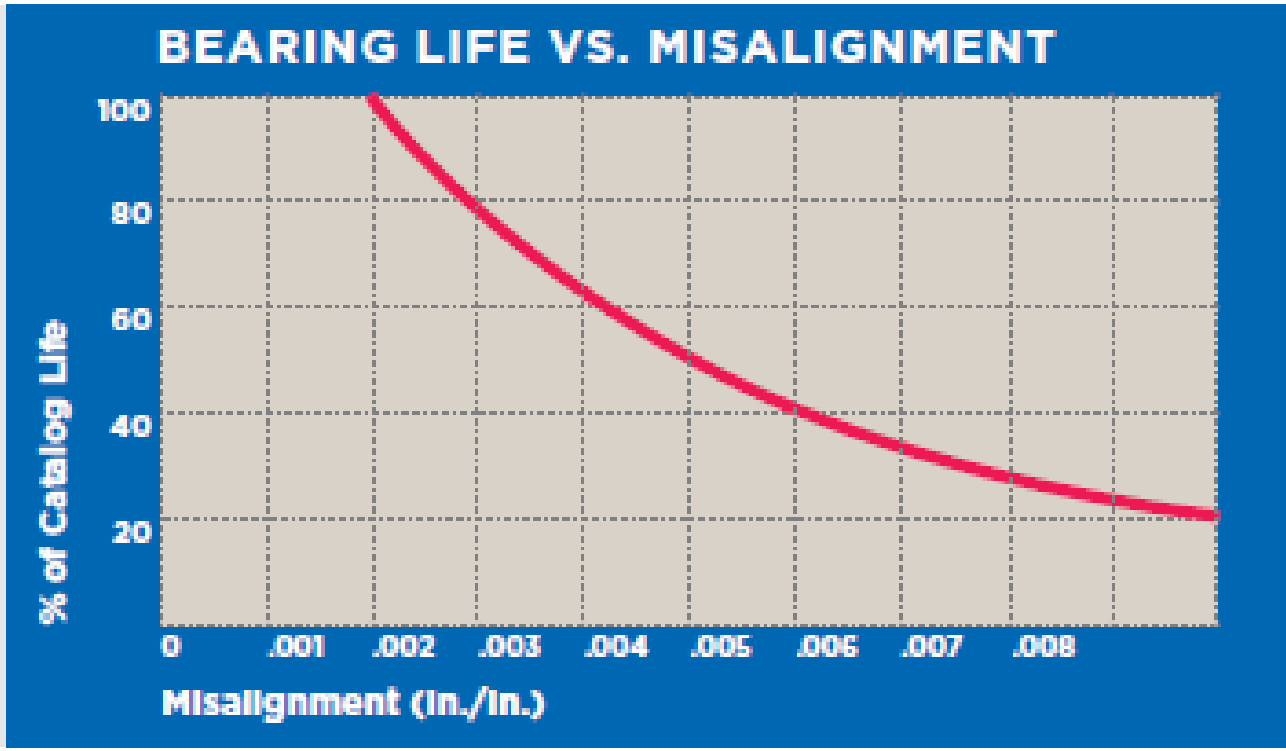
Alignment: Re-align the entire machine frame to correct the imbalance

Benefits of Correcting Soft Foot

Improved operational efficiency: Correct alignment leads to smoother, more efficient operation.

Reduced maintenance costs: Prevents further damage and wear on components.

Increased machine lifespan: Proper support and alignment extend the life of the equipment.



Source: Robert E. Biggs, Engineering Conference 1990

Reliability Hits the Road!

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POLL QUESTION No. 1

Question?

(Click only one answer)

- Answer 1
- Answer 2
- Answer 3
- Answer 4

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POLL QUESTION No. 2

Question?

(Click only one answer)

- Answer 1
- Answer 2
- Answer 3
- Answer 4

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Q & A

QUESTIONS?

Thank you!

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