FAMU-FSU College of Engineering

Ghost Controls Lock Mechanism
VDR1

Senior Design Team 510

October 15, 2024

Sponsor and Advisor

Engineering Mentor
Darryl Beadle
Head Engineer Ghost Controls

Academic Advisor
Shayne McConomy, Ph.D.
Senior Design Professor

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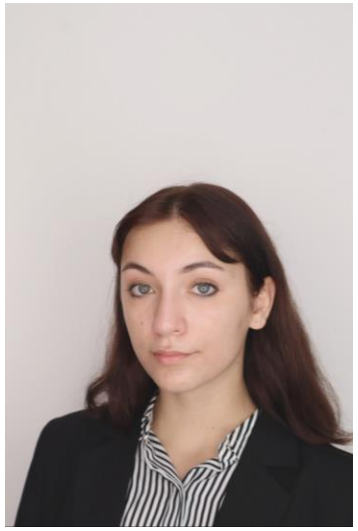
Team Introductions



Kayla Boudreaux
Systems Engineer

Jacob Brock
Hardware/Software Engineer

Ernest Patton III
Quality Engineer

Dior Reece
Test Engineer

Olivia Walton
Design Engineer

Bradley Wiles
Materials Engineer

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Objective

The objective of this project is to design an innovative gate latch mechanism that effectively addresses current issues with misalignment and improper latching, our goal is to develop a solution that ensures reliable engagement, enhanced durability, and ease of installation.

About Ghost Controls

- Tallahassee Local Company
- Automatic Gate Openers
- Variety of applications

Product Lineup

- Gate Arm
- Control Module
- Accessories
  - Solar Panels
  - Long Range Openers
  - Keypads
  - Bluetooth/Wireless additions
  - ZombieLock

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Olivia Walton

Current Design – Zombie Lock

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Current Design – Zombie Lock

- Latch Style
- Weather Resistant
- Easy to Install
- Resists Force

User Issues

Failure to Close

Latch Misalignment

Poor Gate Installation

Markets

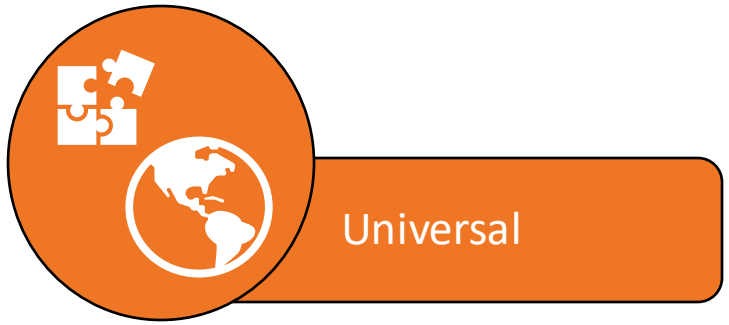
Primary

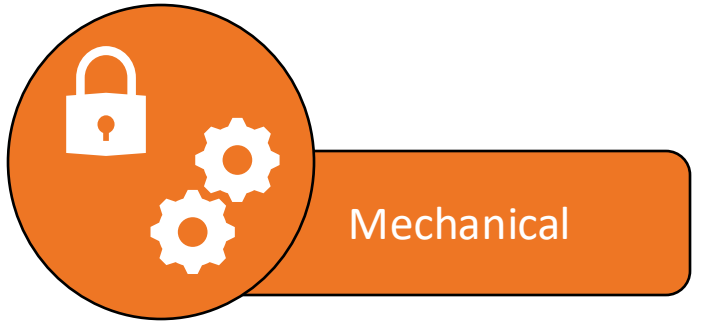
- Homeowners
- Farmworkers
- Other Property Owners
- Large Corporations

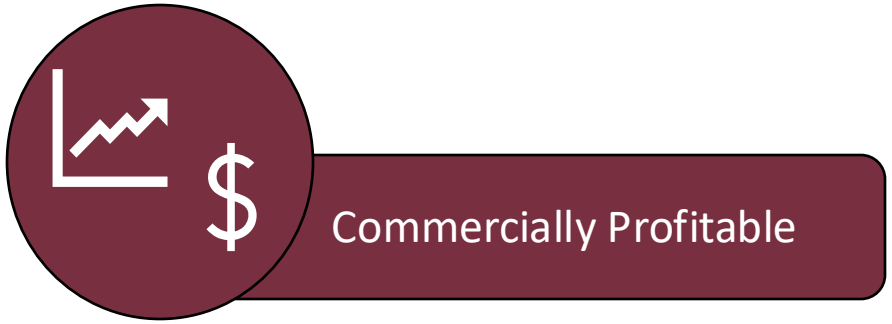
Secondary

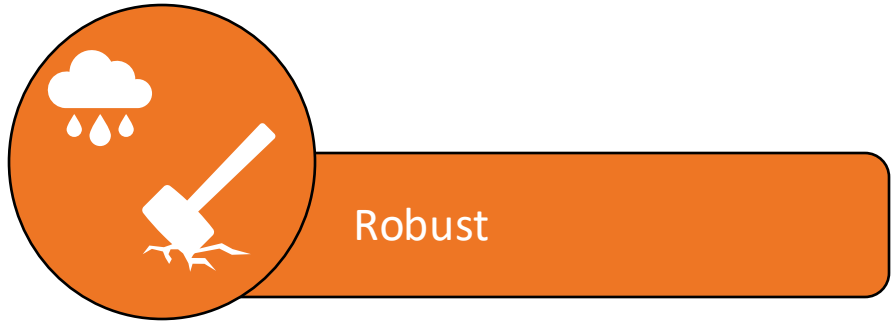
- Gate Installation Businesses
- Fence Contractors
- Retail Distributors

Key Goals









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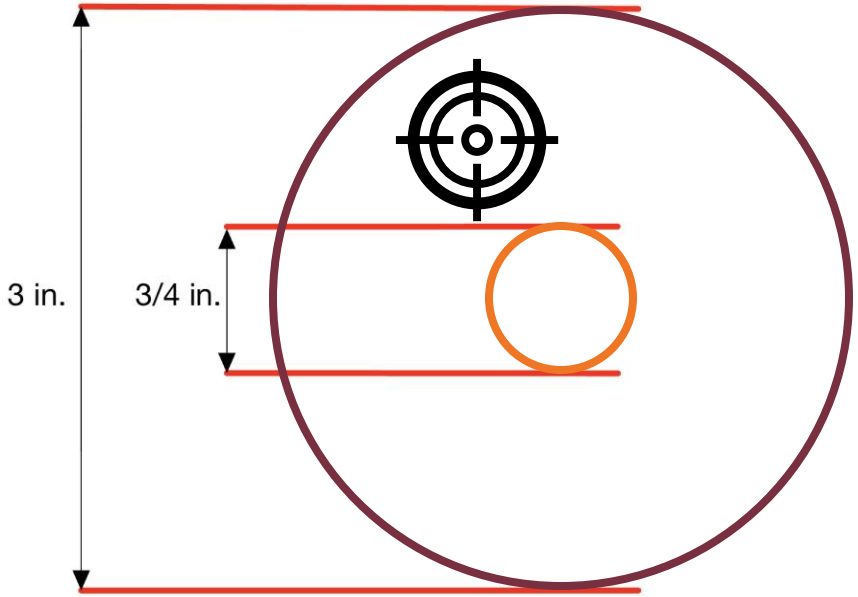
Misalignment Tolerance



Current Design - ¾ in. diameter of misalignment

New Design – 3 in. diameter for misalignment

Assumptions

A 12V DC power source is available

Installer will have the necessary tools to complete installation

The system will be exposed to a variety of environmental conditions

The gate will not be supported by wheels and will swing freely

The gates using this product will not exceed 20 feet in length or 30% covered surface area

Stakeholders

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Shayne McConomy
Project Coordinator

Simone Hruda
Project Advisor

Stakeholders

Darryl Beadle
Sponsor

GHOST® CONTROLS

Mickey Nguyen
Sponsor

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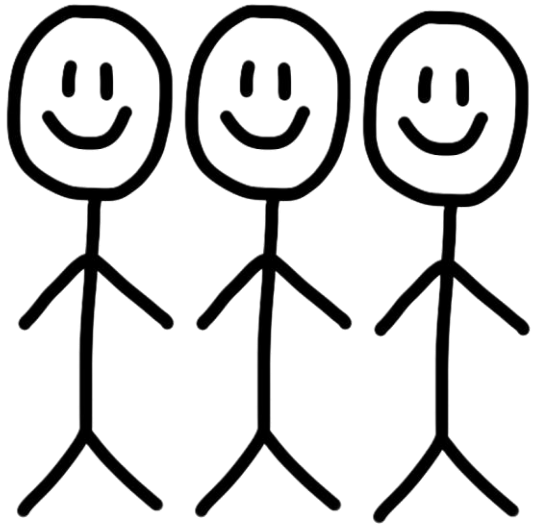
Stakeholders



Consumers

NIOSH

ANSI OSHA

Compliance and Safety Organizations

Customer Needs

Gate will stay locked in closed position

Gate can withstand 50 lbf

A design that can be marketed at a $99 price point

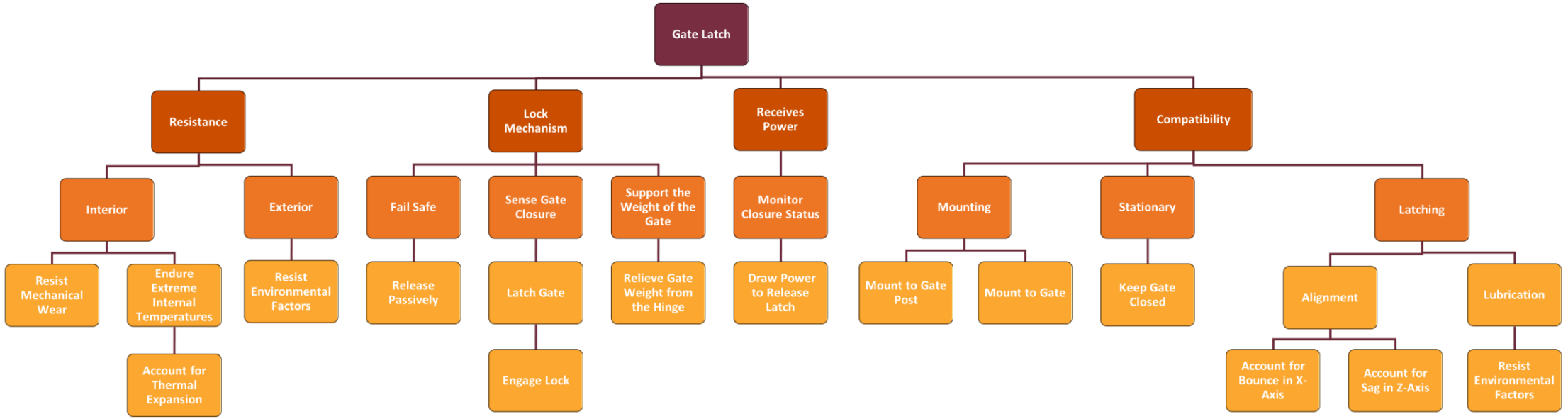
Gate performs in all environments

Mechanism works for gates up to 20 ft

Mechanical fail-safe in case of failure

Kayla Boudreaux

Hierarchy Chart



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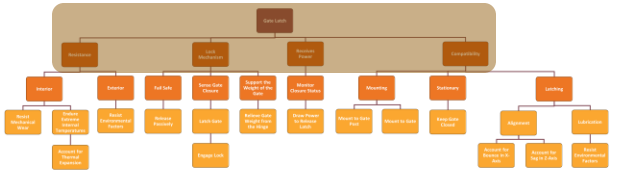
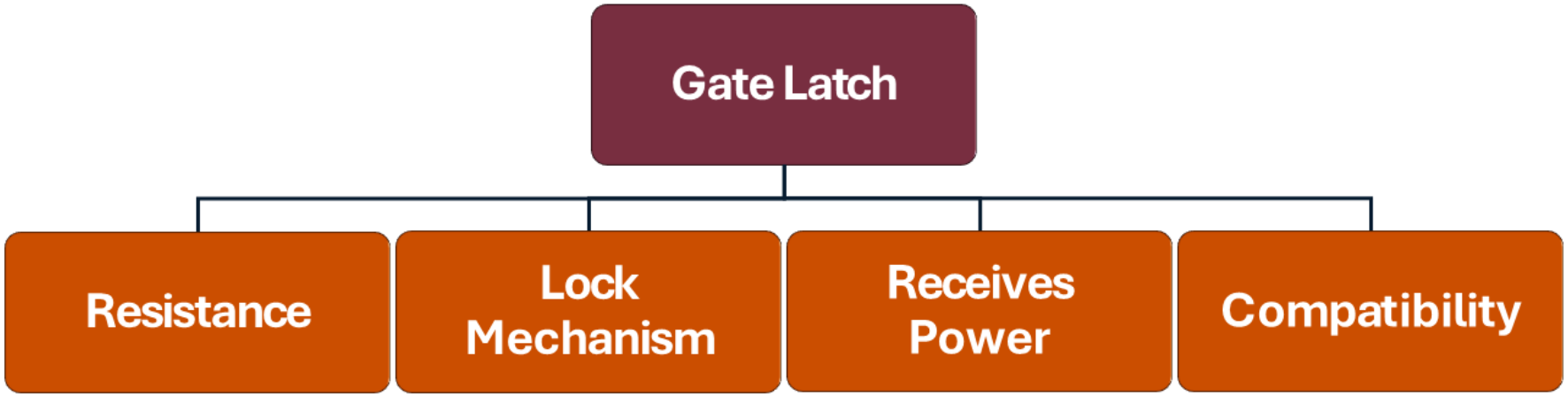


Kayla Boudreaux

Main Components



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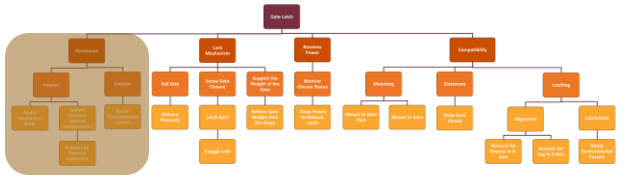

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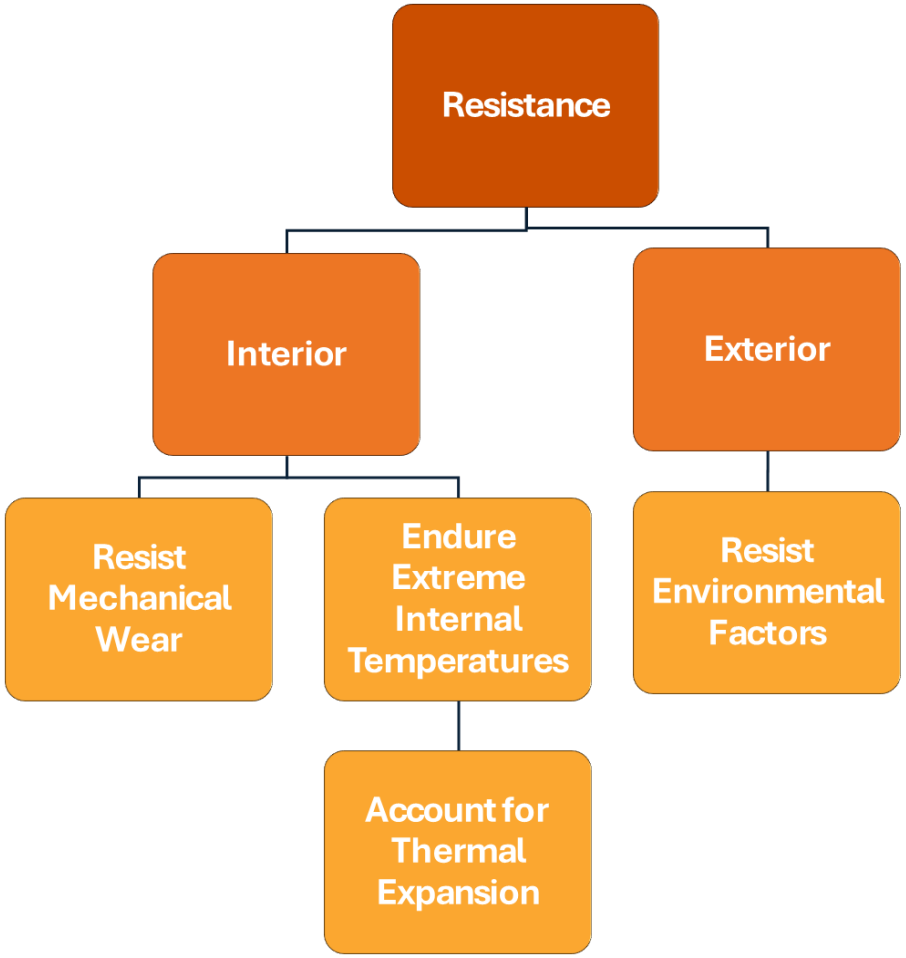
Subsystem- Resistance



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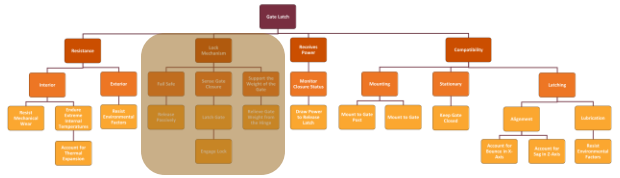

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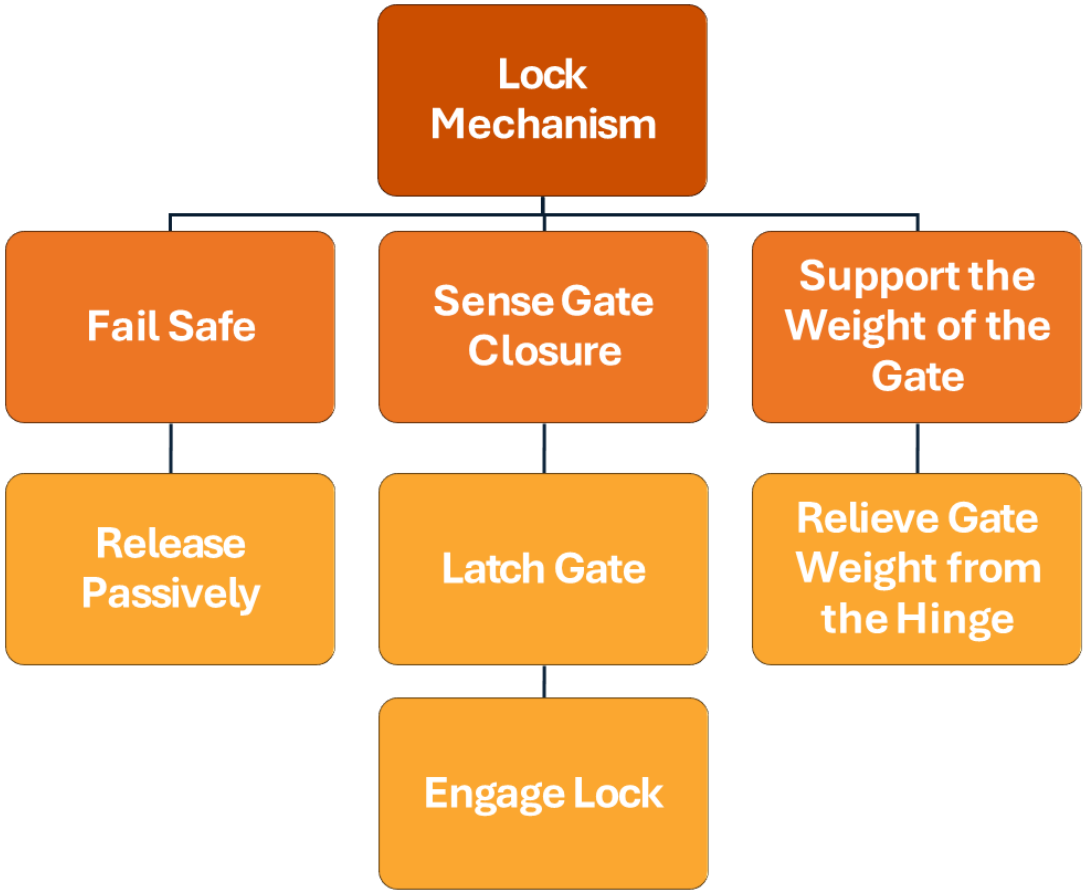
Subsystem- Lock Mechanism



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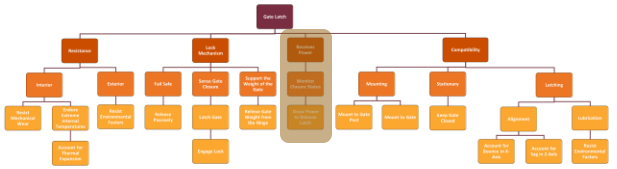

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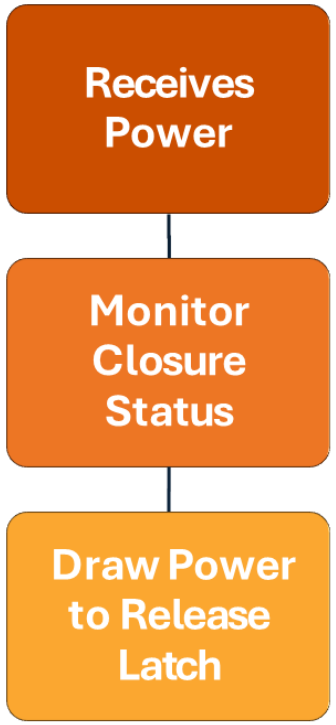
Subsystem- Receives Power



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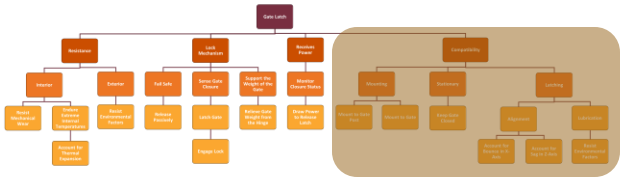

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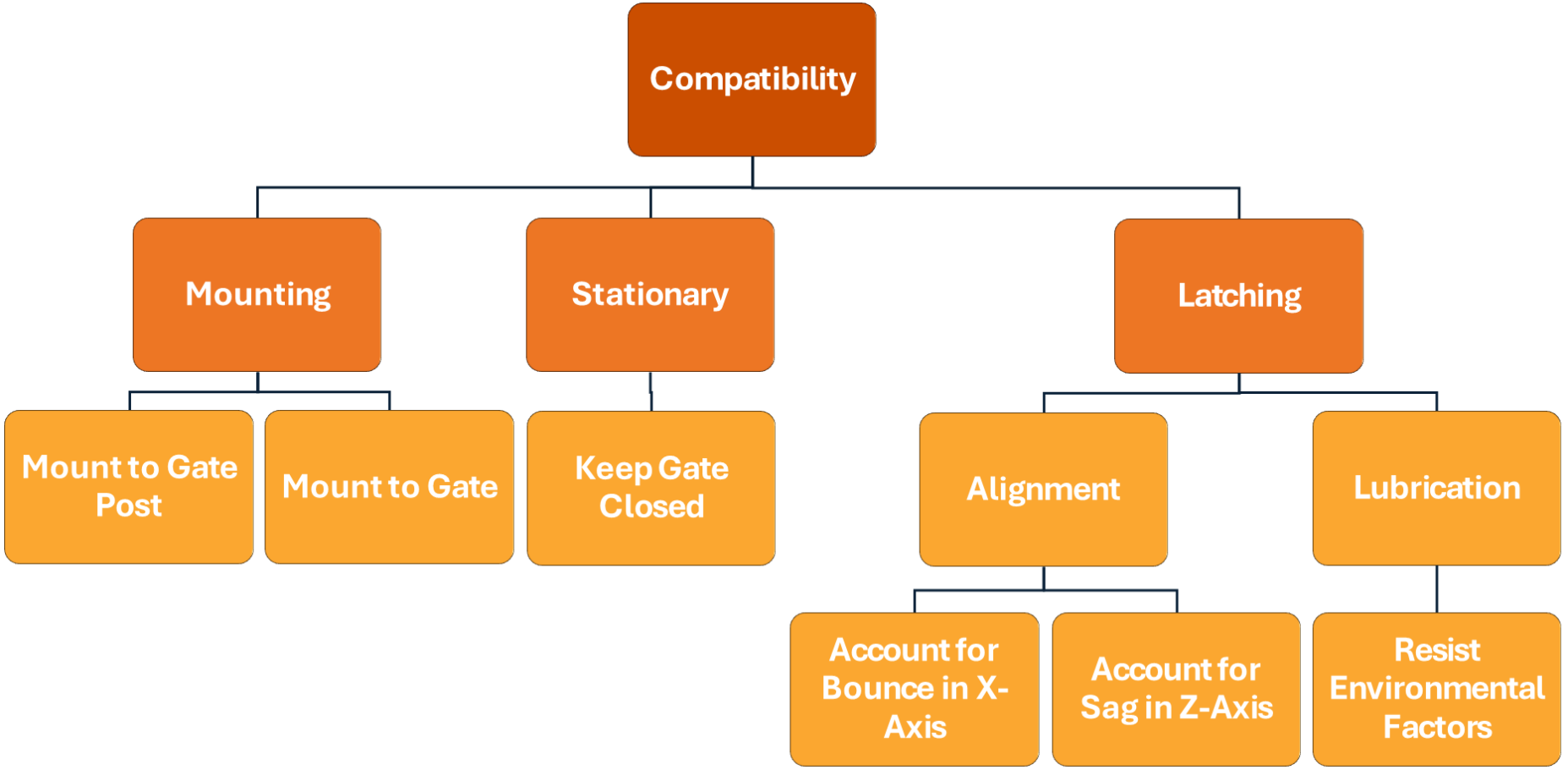
Subsystem- Compatibility



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Kayla
Boudreaux

Future Work

- Identifying UL Safety Standards
- Researching Pre-existing Latches
- Ideating New Concepts
- Looking at Mechanical Sag Sources
- Getting Sponsor Feedback

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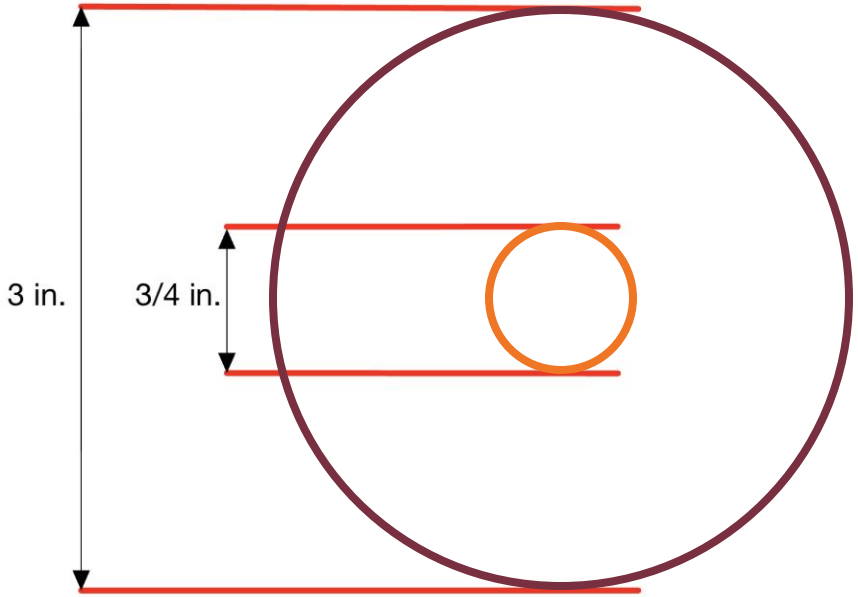
Boudreaux



Questions?

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