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Electric Motor Dynamometer Manufacturability

Client: ABE/TSM 363 Lecture/Lab

Problem Statement

- Develop a manufacture-ready electric motor dynamometer based on a prototype system.
- System will be replicated and utilized in ABE/TSM 363 Lecture/Lab demonstrations and testing

Objectives

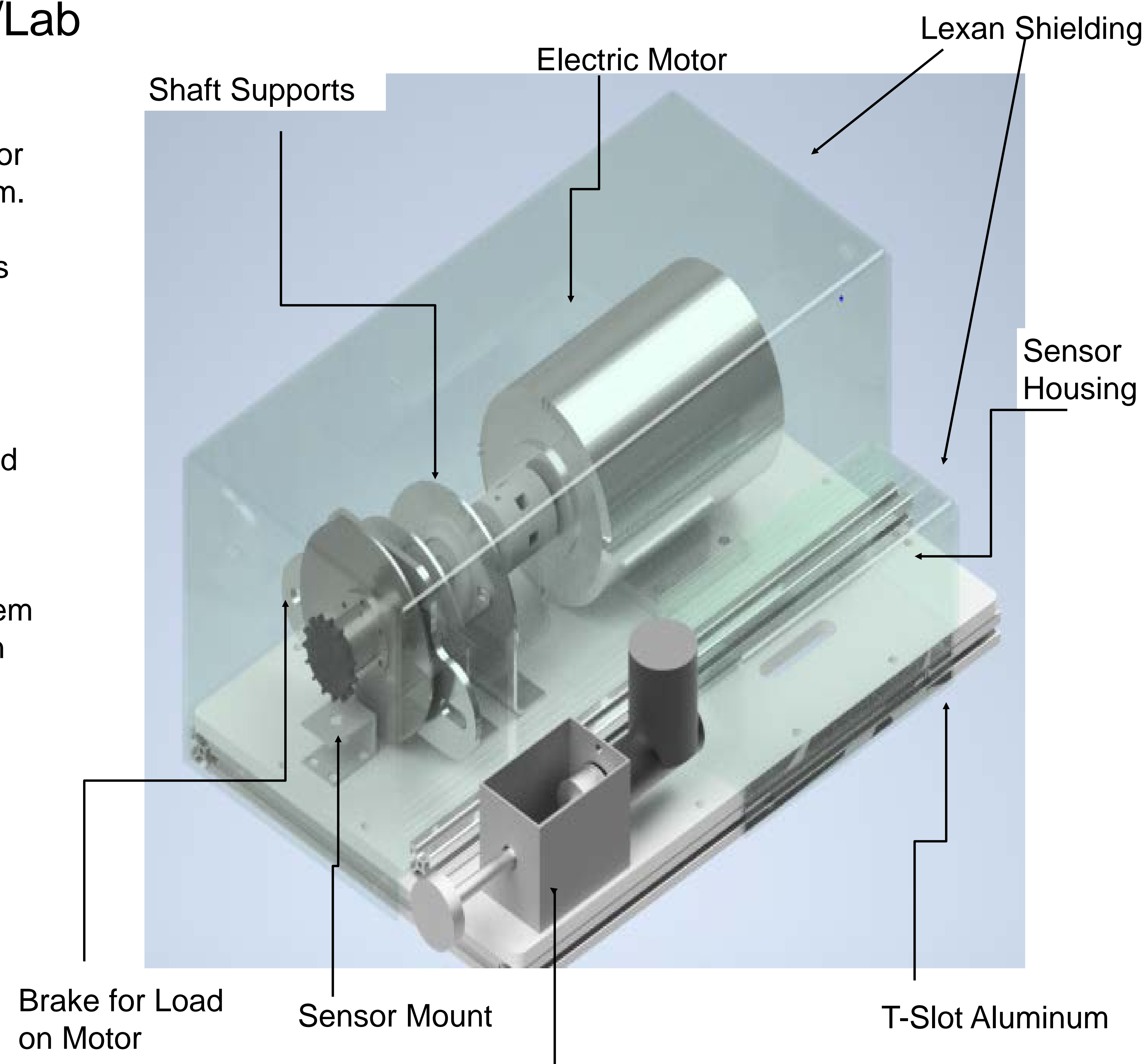
- Create a complete, visually appealing, and operational mechanical system including:
 - Appropriate safety shielding and electrical protection
 - Functioning instrumentation system
 - User interface and data collection system

Constraints

- Able to measure manually or digitally
- Budget: \$2000
- Metal surfaces must resist rust

Timeline

- Design approved December
- BOM approved parts ordered January
- Manufacture completed March
- Finalized documentation April



Scope

- Manufacturable design complete with documentation
- Finalized visually appealing product
- Automated data collection
- Ability to manually and digitally collect data

Methods/Approach

- Inventor design
- Waterjet cut components to exact dimension
- Assemble parts on prototype board
- Finalize assembly design
- Document for repeatability

Major Deliverables

- Design of manufacture-ready dynamometer
- Bill of material
- Replication instructions

Recommendations

- Future project group should incorporate instrumentation to this design
- This design should eventually replace dynamometer used in ABE/ TSM 363

References

- Department of Agricultural and Biosystems Engineering. "TSM 415/416 PROJECT DEVELOPMENT FORM: ABE Dynamometer." 9 July 2019.
- Grainger. "OSHA Requirements: Machine Guarding." *Grainger Industrial Supply*, 31 Mar. 2017, www.grainger.com/know-how/safety/machine-safeguarding/people-protection/kh-osa-requirements-machine-guarding
- Design based on previous prototype
- Autodesk Inventor used for CAD design
- LabView will be used in future for digital readings