



Company Information

Company Name	<i>Fontaine Modification</i>	Date Submitted	<i>4/25/2023</i>
Project Title	<i>Design of a Heavy Duty Transportation Seat Removal System (FONTAINE_SEAT)</i>	Planned Starting Semester	<i>Fall 2023</i>

Senior Design Project Description

Personnel

Typical teams will have 4-6 students, with engineering disciplines assigned based on the anticipated Scope of the Project.

Please provide your estimate of staffing in the below table. The Senior Design Committee will adjust as appropriate based on scope and discipline skills.

Discipline	Number	Discipline	Number
Mechanical	4	Electrical	1

Company Overview:

Fontaine Modification is known for modifying trucks from various OEMs to meet customer request or specifications. Fontaine has exclusive ship-thru agreements with the leading OEMs to maximize end-user convenience and minimize delivery costs. These ship-thru arrangements expedite final delivery time from orders anywhere in North or Central America and facilitate modification efforts with minimal financial impact. Fontaine provides engineering solutions to meet customers' unique requirements and specific applications, all while adhering to federal safety standards. Trucks can be modified for a variety of purposes, some as simple as fleet decals, others more complex.

Some examples are:



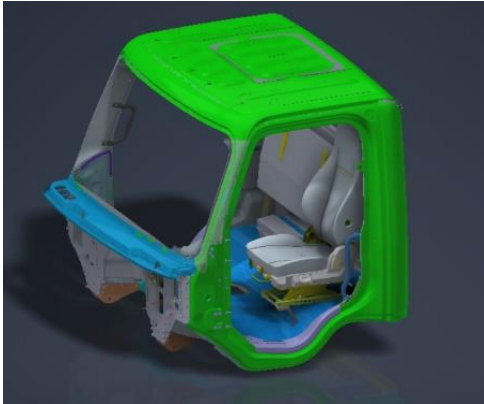
INDUSTRIAL SOLUTIONS LABORATORY



Project Overview:

The process of removing and installing seats in heavy duty trucks can be a challenging task for technicians that could potentially lead to injuries or strain due to the significant physical effort required. This project aims to develop a lift assist device that will reduce the physical effort required by technicians and improve their safety when removing and installing heavy-duty truck seats.

The device must be easy to use, safe, and efficient. Additionally, the device should be portable, allowing it to be easily moved to different locations based on production needs. The lift assist device must be able to safely reach inside the truck cab to remove / install seats, index through cab doors without damage to the cab or seat, and the place seat onto the storage rack located on the frame rails of the truck.



Project Requirements:

Design and prototype a functional device that reduces the physical effort and time required to remove and install Heavy Duty truck seats in and out of cabs. The device must have the capability to safely move seats from Freightliner M2 and M2-Plus cabs, to a storage location on the frame rail and vice versa. The device will be tested for safety, functionality and efficiency on multiple seat/cab configurations.

- Must not exceed 48" X 40" footprint when not in use.
- System must be able to effectively maneuver seats in and out of truck cab with doors installed.
- Must be easily moveable without heavy machinery such as forklifts.
- Must be able to remove both LH & RH seats without impeding process flow.
- Single person operation.
- Must meet OSHA and NIOSH safety requirements for ergonomics.
- System must accommodate trucks at different cab heights.
- System can accept all available factory truck seats configurations.
 - **Variations:** Many air ride seat configurations and solid mounted seats.



- **Note:** All seats have the same mounting location features.
- System should not require more than 50lb of exertion to operate.
- Must be self-contained unit with only possible (but not required) inputs of:
 - 90psi shop air supply.
 - 120V supply.

Expected Deliverables/Results:

- Fully functional prototype.
- 3D CAD models of system and all components.
- 2D print package of system and all components.
- Costed Bill of Materials list for full system.
 - Including vendor quotes and sourcing information.
 - Off-the-shelf component specification sheets.
- Estimated labor hours to build prototype.
- Training, User Manuals, Preventative Maintenance schedule.

Disposition of Deliverables at the End of the Project:

Typical handover following Expo is acceptable.

List here any specific skills, requirements, specific courses, knowledge needed or suggested (If none please state none):

- Design for manufacture
- CAD design
- FEA
- Travel to Fontaine site in Mt Holly, NC