



Company Information

Company Name	<i>Daimler Truck – Mt Holly TMP</i>	Date Submitted	<i>05/01/2024</i>
Project Title	<i>Design of a Universal Attachment for a PowerPusher® (DAIMLER_PUSH)</i>	Planned Starting Semester	<i>Fall 2024</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	5	Electrical	
Computer		Systems	

Company and Project Overview:

Daimler Trucks & Buses is one of the world's largest commercial vehicle manufacturers, with more than 35 primary locations around the world and around 100,000 employees. The company brings seven vehicle brands under one roof:

[Mercedes-Benz](#) (light, medium and heavy trucks as well as city, intercity and touring coaches) and [Setra](#) (intercity, long-distance and premium coaches) are our traditional European brands; our U.S. brands [Freightliner Trucks](#) (trucks in weight classes 5 to 8 for a wide range of commercial vehicle applications), [Western Star](#) (heavy trucks for specialized and long-haul transports) and [Thomas Built Buses](#) (light- to medium-duty buses); and our Asian brands [BharatBenz](#), based in Chennai, India (trucks in the weight classes 9 to 55 t and medium- and heavy-duty buses) and [FUSO](#), headquartered in Japan (trucks and buses for Asia, Middle East, Africa, Europe and Latin America).

The Mount Holly Truck Manufacturing plant produces the full line of Freightliner medium-duty Business Class® M2 / SD models. As a truck chassis goes through the build process, it is riding on dollies that support the axles. The dollies are pulled down the assembly line by an in-floor chain



driven tow conveyor. Occasionally, the production process requires us to move a chassis sideways off the conveyor and park it in a designated area. The scope of this project is to create an interface that allows a person using the Nu-Star PowerPusher® to safely and ergonomically steer the chassis dollies in the direction the chassis needs to move. Dollies have swivel casters, but they must be moving to change their direction and the goal of the project is to be able to steer the PowerPusher® while moving the chassis. The video in this link will give you an idea of what a PowerPusher® is [PowerPusher® Corporate Video \(youtube.com\)](https://www.youtube.com/watch?v=PowerPusher_Corporate_Video). Because of the limited capabilities of the current pushers, employees often use the pusher in a manner not intended and can knock a chassis off the dolly, or in a manner that puts tremendous strain on the body risking injury.



Project Requirements:

Design and fabricate an interface that is permanently attached to the PowerPusher® and temporarily attaches to the chassis dolly with a coupling or hook. There is significant variation from truck to truck from axle position to forward frame extensions and engine supports which affects clearance for the PowerPusher® to reach the dolly which will require the project team to develop a universal solution. The movement of the chassis must always be controlled by the PowerPusher® and this includes stopping once it is in the right location.

A new adapter or feature may need to be designed that is permanently attached to the chassis



dolly. Dollies operate in a brutally tough environment. Dollies go through a chassis paint booth and build up quite a bit of paint that is eventually burned off. When a dolly disengages from the truck, it slides, free-fall, down a ramp where it can collide with the dolly in front. Any adapter or feature added to the dolly must hold up to the daily abuse dollies experience.

Expected Deliverables/Results:

- Engineering drawings of all components and the finished assembly
- Bill of Material including material specifications
- Assembly instructions
- Testing on site at Mt. Holly facility
- Spare Parts List

Disposition of Deliverables at the End of the Project:

Students are graded based on their display and presentation of their team's work product. It is mandatory that they exhibit at the Expo, so if the work product was tested at the supporter's location, it must be returned to campus for the Expo. After the expo, the team and supporter should arrange the handover of the work product to the industry supporter. This handover must be concluded within 7 days of the Expo.

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

- CAD Design and Modelling
- Stress analysis, Statics, dynamics, materials
- Ability to travel to DTNA Mt. Holly, NC facility as required