INDUSTRIAL SOLUTIONS LABORATORY

Company Information

Company Name	*Daimler Truck NA – Mt Holly TMP*	**Date Submitted**	*02/22/23*
Project Title	*Design of New Chassis Transport Dollies* ***(DAIMLER_DOLLY)***	**Planned Starting Semester**	*Fall 2023*

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	

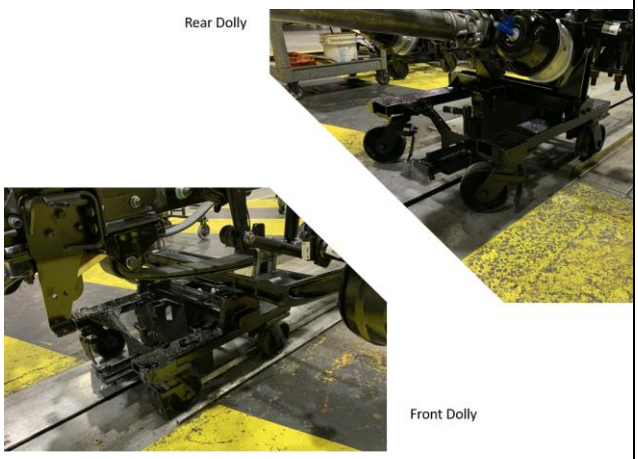
Company and Project Overview:

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. The scope of this project is to create a new front and rear chassis dolly that will hold up to the abuse of our normal production environment while improving ergonomics handling the dollies. We currently have different dollies for different truck configurations and recent product changes in axle configurations have created some interferences with the dolly and chassis.



Project Requirements:

Standardize the rear chassis dolly design to work with all suspension and axle combinations including a driven (all wheel drive) front axle. Optimize the front chassis dolly to interface with a chassis mover when a truck needs to be temporarily sidelined, or moved back to the assembly line.

Dollies operate in a brutally tough environment. They need to be durable enough to withstand the assembly process as well as the cleaning process. Dollies go through the 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. The new dolly shall not be damaged because of this action.

The last requirement is to improve the ergonomic handling of the dollies. The dollies are transported back to the beginning of the line in a train formation by hooking them front to rear. The effort needed to engage two dollies should not exceed 25 lbs of force. Target cost for a dolly is less than $2000.

Expected Deliverables/Results:

- A full-scale production ready front and rear dolly
- Engineering drawings of all components and the finished assembly
- Bill of Material including material specifications
- Assembly instructions
- 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):

- Statics, dynamics, materials
- Travel to DTNA Mt. Holly site is required.