



Company Information

Company Name	DAUCH - Newton	Date Submitted	04/15/2026
Project Title	Design of a Universal Safe Launch Inspection Station (DAUCH_SAFE)	Planned Starting Semester	Fall 2026

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.

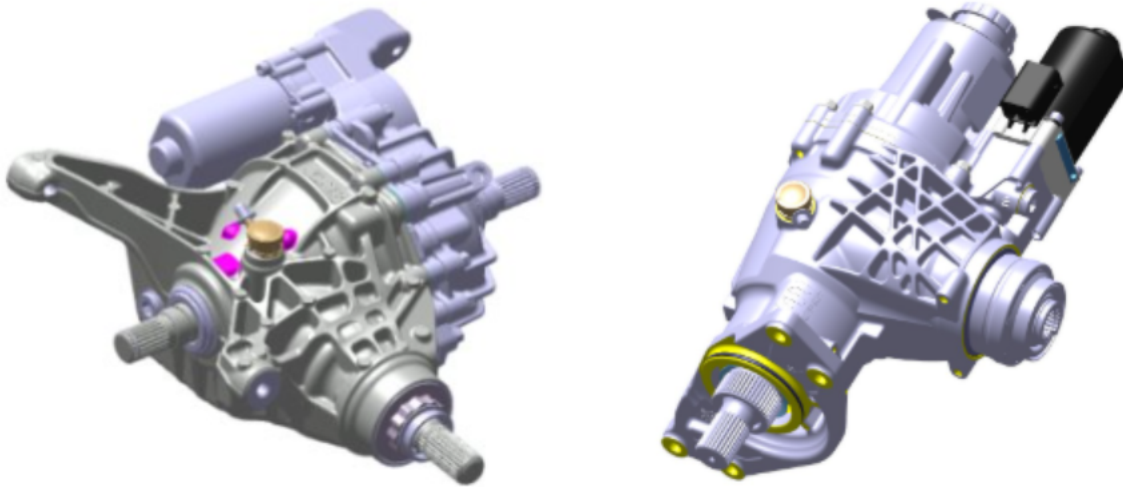
Discipline	Number	Discipline	Number
Mechanical	4	Electrical	1
Computer	1	Systems	0-1

Company and Project Overview:

DAUCH Newton, formerly GKN Automotive, is a leader in Tier 1 automotive axle assembly and component manufacturing. There are two plants on the Newton site, Machining (Plant 1) and Assembly (Plant2). Plant 1 is the machining facility where differential ring gears and pinions are machined and manufactured. Plant 2 is the axle assembly plant. With 14 assembly lines and 4 major products, it is a lean and diverse facility. The four main products that are manufactured are RDM (Rear Drive Module), FDU (Front Drive Unit), PTU (Power Transmission Unit), and Hydraulic disconnect clutches. With each of these units there are variants of clutch engagement, differential gear ratio, and axle size.



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Project Requirements:

Being a leader in Tier 1 Automotive Assembly and Manufacturing, we often have many new projects and products being launched. With any new launch comes the Industry Standard practice of “Safe Launch.” Safe Launch is an additional off-line inspection of specified characteristics for a defined period immediately after Start of Production (SOP). It involves the application of a manufacturing or assembly Control Plan based on 100% re-inspection checks of the pre-defined characteristics, using attribute values that can be determined by both Visual and Tactile Inspection including the use of appropriate gages and fixtures. At the DAUCH Newton site, there is no set/permanent Safe Launch Inspection Table or area for our projects. With multiple new launches coming up, we strongly desire to have a “Universal” Safe Launch Inspection Table that can accommodate the various parts that we assemble.

A Safe Launch Inspection Table, by our company practices, has a few mandatory requirements that must be included in the design. These include things such as Inspector safety (must observe all required PPE), incorporation of handling devices such as hoists so that safe handling is ensured, inspection fixtures to securely mount the parts above the Safe Launch Table surface which in turn allow for no manual handling of the part during inspection as well as helping to ensure that the Safe Launch Inspector has both hands free. At the Table, the Inspector must be able to record results using our standard documentation. For this, it is recommended that a system with pre-defined Safe Launch finding bar-codes is developed so that the inspectors can quickly scan any findings into a computer or database. The actual design of the table is up to the students; part of the project will be to propose an optimal design for the function once the student team considers the possible items to include and surveys use cases in the factory to determine what will have the most value. The next section has items to be considered in the design. Once the factory is surveyed, students can propose including other items on this list if they deem them to be valuable. The final definition of the design plan will be agreed at CDR by the students and Dauch.



Expected Deliverables/Results:

- One (1) fully functional Universal Safe Launch Inspection Table that is a table to be relocated if needed (moveable with lockable casters/wheels)
- Adjustable table height to account for ergonomics/inspector height
- Downlighting for part inspection (adjustable light pointed towards parts, needs to be on the side out of the hoists way)
- Must allow Inspectors to follow proper PPE practices (cut resistant gloves, safety glasses, steel toe shoes)
- Table set up must be able to work easily with a hoist for placing parts
- Parts must be able to be suspended from the surface of the table (e.g. On fixtures)
- PLC or Database system to capture inspection results (e.g. scanner connected to Excel document, electronic database, etc.), manual input of results
- Easy moveability of units on the Inspection Table (e.g. Lockable, serviceable/greaseable, rotating surface in the center)
- T-tracks on the sides/corners of the table surface to account for fixtures with the ability to easily remove clamps
- Consider vision or 3D scanners
- Universal mounting fixture to accommodate various 3D printed part holding fixtures
- Ability to recall and display Standardized Work Instructions (digital monitor) and safe launch records (so that the inspector can see them while working)
- Storage space in/on/around the table to hold all necessary gages and removable fixtures (must have a way to mount/store inspection tools – store/covered when not in use, mount when inspecting)
- Table cover for when not in use to maintain cleanliness

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):

- Creo Parametric
- GD&T and Engineering Drawing Understanding
- 5S and Lean Thinking
- Controls Engineering/Programming (for scanner incorporation)
- Ability to travel to Dauch in Newton, NC as required to fully understand the environment being designed to and for verification testing. Mileage reimbursed according to ISL Purchasing processes.