

Beau Cardenas

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SUMMARY

Senior **Mechanical Integration** Engineer with 11 years of progressive experience integrating **rolling stock** and complex vehicle systems from concept through **manufacturing readiness**. Leads full train digital mock ups, 3D mechanical integration analysis, interface control, tolerance stack up studies, assembly definition, and component design for frames, brackets, and **supporting structures**. Uses CATIA, Creo, Autodesk, DOORS, Word, and Excel to produce clear engineering reports, controlled drawings, requirements evidence, and practical actions. Works closely with manufacturing, suppliers, multidisciplinary engineering teams, and international partners to resolve packaging conflicts and protect build quality. Provides technical coaching, reviews engineering work, and manages changing priorities independently. A master's degree in mechanical engineering supports practical rail vehicle knowledge, sound design decisions, and reliable delivery across safety sensitive transportation programs.

EXPERIENCE

Senior Mechanical Integration Engineer

February 2022 - Present

Atlantic Rolling Stock Engineering

Baltimore, MD

Leads mechanical integration for passenger rail vehicle programs, owning vehicle level interfaces, digital mock ups, tolerance analysis, manufacturing drawings, supplier coordination, requirements traceability, and technical development across multidisciplinary and international teams.

- Resolved **CATIA** packaging conflicts across propulsion, braking, HVAC, and interiors before manufacturing release.
- Maintained **full train** digital mock ups and converted interface findings into clear engineering actions.
- Directed tolerance stack up studies for mounts and structural interfaces before controlled drawing release.
- Produced **assembly drawings** that guided build sequencing, fit checks, and manufacturing decisions.
- Reviewed supplier CAD models for **frames, brackets**, and supports against rail vehicle requirements.
- Coached engineers through integration reviews and used **DOORS** for requirements traceability.

Mechanical Integration Engineer

May 2019 - January 2022

Potomac Mobility Design

Rockville, MD

Integrated equipment and structural interfaces for rail vehicle modernization programs, moving layouts from preliminary concepts through released manufacturing configurations while coordinating CAD, suppliers, requirements, access, and production feasibility.

- Built **Creo** assemblies that exposed packaging conflicts before physical installation and prototype work.
- Completed tolerance analyses for mounted equipment and access critical assemblies with **manufacturing** input.
- Released **assembly drawings** for brackets, supports, and structural attachments after shop feedback.
- Coordinated supplier models with mechanical, electrical, and systems teams across vehicle **interfaces**.
- Applied engineering change practices to preserve service access, requirements, and production feasibility.
- Recorded interface risks and technical actions during multidisciplinary **design reviews**.

Mechanical Design Engineer

July 2017 - April 2019

Chesapeake Vehicle Systems

Columbia, MD

Designed transportation vehicle structures and equipment supports, translating packaging constraints into detailed CATIA models, production drawings, bills of material, and documented engineering decisions for prototype and production releases.

- Designed CATIA structures that balanced packaging constraints, access needs, and manufacturability.
- Created frames, brackets, and supports with controlled interfaces and practical tolerance requirements.
- Prepared drawing packages and bills of material for prototype and production releases.
- Checked neighboring subsystem interfaces and reported clearance findings before release milestones.
- Compared supplier models with interface definitions and documented actions for technical closure.
- Prepared **Word** and **Excel** reports, review records, issue logs, and calculation summaries.

Mechanical Engineer

June 2015 - June 2017

Blue Ridge Mechanical Solutions

Gaithersburg, MD

Developed mechanical assemblies for complex mobile equipment under senior engineering guidance, supporting CAD modeling, production drawings, prototype builds, fit investigations, interface coordination, and traceable design documentation.

- Developed 3D assemblies and production drawings under senior engineering guidance.
- Evaluated packaging, mounting concepts, service access, and tolerance conditions before prototype fabrication.
- Designed fabricated brackets and supports in **Autodesk** tools for material and shop constraints.
- Investigated prototype fit issues by comparing physical conditions with CAD models.
- Coordinated mechanical interfaces with electrical and manufacturing personnel during **design reviews**.

- Maintained revision records, calculation notes, engineering files, and technical reports.

PROJECTS

Passenger Rail Vehicle Integration 2024

Directed a vehicle level integration effort covering digital mock ups, subsystem interfaces, tolerance studies, supplier models, and manufacturing assembly definition for reliable rail vehicle delivery.

Rail Vehicle Modernization Layout 2021

Advanced a modernization layout from preliminary concept through controlled manufacturing configuration, resolving equipment packaging, service access, supplier data, and structural interface risks.

LEADERSHIP & AWARDS

- Technical Mentor, Mid Atlantic Mechanical Design Peer Forum, 2023 to Present
- Recognized by engineering peers for clear interface reviews and practical supplier design guidance
- Trusted reviewer for vehicle integration evidence, drawing quality, and requirements traceability

EDUCATION

Master of Science in Mechanical Engineering 2015

University of Maryland, College Park GPA: 4.0 College Park, MD

Coursework: Mechanical systems design, vehicle dynamics, engineering analysis, manufacturing processes

Bachelor of Science in Mechanical Engineering 2013

University of Maryland, Baltimore County GPA: 4.0 Baltimore County, MD

Coursework: Machine design, mechanics of materials, CAD modeling, engineering materials

CERTIFICATIONS

- Autodesk Certified Professional in Design for Manufacturing  2020
- DOORS Requirements Management Training  2021

TECHNICAL SKILLS

- **3D CAD Platforms:** CATIA, Creo, Autodesk Inventor
- **Digital Mock Up:** Full train mock ups, interface envelopes, assembly configuration
- **Tolerance Analysis:** Tolerance stack ups, clearance analysis, fit verification
- **Rail Vehicle Systems:** Carbody, propulsion, braking, HVAC
- **Mechanical Design:** Frames, brackets, supports
- **Engineering Drawings:** Assembly drawings, installation details, bills of material
- **Requirements Tools:** DOORS, requirements traceability, change records
- **Office Applications:** Microsoft Word, Microsoft Excel, review records
- **Supplier Engineering:** Supplier CAD review, co design, technical actions
- **Rail Engineering Standards:** Rail standards, railway regulations, safety sensitive work
- **Engineering Reviews:** Design reviews, quality checks, technical decisions
- **Manufacturing Support:** Build sequencing, shop feedback, prototype fit checks

SKILLS

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|---------------------------|-------------------|----------------------|---------------------------|
| • Mechanical Integration | • CATIA | • Tolerance Analysis | • Requirements Management |
| • Rolling Stock | • Creo | • Assembly Drawings | • Rail Standards |
| • Railway Vehicle Systems | • Autodesk | • Component Design | • Engineering Reviews |
| • 3D CAD | • Digital Mock Up | • Supplier Co Design | |

PROFESSIONAL AFFILIATIONS

- Technical Mentor, Mid Atlantic Mechanical Design Peer Forum
- Professional participant in rail vehicle engineering and mechanical design communities

LANGUAGES

- English (Native)
- Spanish (Intermediate)

ADDITIONAL INFORMATION

Work Status : Authorized to work in United States. No sponsorship required.

REFERENCES

AVAILABLE ON REQUEST