

Dean Nelson

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SUMMARY

Senior mechanical design engineer with 10 years of experience developing gearboxes, **drivetrain components**, precision mechanisms, and motion control products for demanding industrial applications. Leads work from customer requirements and concept development through prototype builds, testing, validation, engineering change, and production release. Applies SolidWorks, GD&T, **tolerance stack up analysis**, material selection, **Design for Manufacturability**, CNC machining knowledge, and PLM controlled documentation to create practical, reliable products. Partners with customers, Sales, Application Engineering, Manufacturing, Quality, and Operations on complex designs, field issues, and cost goals. Uses KISSsoft, MITCalc, root cause analysis, **corrective and preventive action**, and structured technical reviews to improve outcomes. Mentors junior engineers and brings thoughtful technical leadership that supports safer decisions, stronger products, and dependable production results.

EXPERIENCE

Senior Mechanical Design Engineer

April 2023 - Present

Vector Peak Drives

Naperville, IL

Leads gearbox and drivetrain development for custom motion control applications, guiding requirements, design reviews, prototypes, validation, engineering changes, and production release. Provides technical direction for junior engineers and collaborates with customers, Sales, Application Engineering, Manufacturing, Quality, and Operations.

- Led gearbox designs from **customer requirements** through validated **production release** for custom motion control applications.
- Applied SolidWorks, **GD&T**, and tolerance stack ups for machining and assembly capable designs.
- Translated customer loads into mechanical requirements through reviews with **Sales** and **Application Engineering**.
- Directed prototype builds and validation tests, resolving design risks before production release.
- Managed **PLM engineering changes** through evaluation, drawing updates, BOM revisions, testing, and implementation.
- Mentored junior engineers through gear design reviews, DFM decisions, tolerance studies, and drawing improvements

Mechanical Design Engineer

January 2020 - March 2023

Midwest Precision Motion

Elgin, IL

Developed precision gearbox assemblies and power transmission components for automation programs, combining CAD design, gear analysis, production documentation, prototype support, and field issue resolution. Worked closely with machining, Quality, customers, and Operations to protect performance while improving manufacturability and reliability.

- Developed precision gearbox assemblies for automation and **power transmission** applications using SolidWorks.
- Evaluated gearing concepts with KISSsoft and MITCalc calculations, supporting practical design decisions.
- Created **engineering drawings**, BOMs, assembly documents, specifications, and **test reports** for release.
- Resolved **CNC machining** issues with **Manufacturing** and Quality while preserving functional requirements.
- Investigated prototype and field failures through **root cause analysis** and corrective design actions.
- Supported customers and Operations with technical analysis of application and product performance issues

Mechanical Engineer

June 2017 - December 2019

Lakefront Automation Components

Aurora, IL

Designed machined components and assemblies for industrial automation products under senior engineering guidance. Supported drawing control, tolerance analysis, prototype fabrication, test documentation, manufacturing improvements, and resolution of production nonconformances through disciplined product change work.

- Designed machined components and assemblies for industrial **automation** products under senior engineering guidance.
- Applied **GD&T** and tolerance analysis to CNC machined parts and assembly interface drawings.
- Coordinated prototype fabrication and recorded dimensional, functional, and durability test results.
- Updated **BOMs** and engineering documents through controlled product change processes.
- Worked with machinists to improve feature access, setup practicality, and repeatable production **quality**.
- Investigated production nonconformances, documented root causes, and supported approved design corrections

Junior Mechanical Engineer

June 2016 - May 2017

Prairie Industrial Systems

Rockford, IL

Supported senior engineers with SolidWorks modeling, detailed drawings, tolerance studies, material comparisons, prototype documentation, and manufacturing communication for precision mechanical assemblies used in industrial equipment.

- Produced **SolidWorks** models and detailed drawings for precision mechanical equipment assemblies.
- Supported tolerance studies, material comparisons, and design documentation under senior engineer guidance.
- Prepared BOM updates and assembly instructions for prototype and low volume production builds.
- Observed **CNC machining** and assembly operations, identifying practical DFM improvements.

- Recorded prototype test data and organized findings for engineering design reviews.
- Resolved drawing questions with **Manufacturing** through established engineering change procedures

PROJECTS

Gearbox Platform Validation 2023

A reliable gearbox begins with decisions made before production. Led a distinct validation effort covering prototype builds, load testing, documentation, and release readiness for custom motion control applications.

Precision Drive Cost Improvement 2022

Cost is a design choice, not a final adjustment. Improved a precision power transmission design through gear analysis, CNC machining review, tolerance study, and manufacturability focused documentation.

LEADERSHIP & AWARDS

- Engineering Mentorship Recognition, Vector Peak Drives, 2025. Recognized for practical guidance that helped junior engineers improve design reviews and documentation.
- Mechanical Design Review Lead, Vector Peak Drives, 2024 - Present. Coordinates focused reviews that connect customer needs, design decisions, manufacturing realities, and release quality.

EDUCATION

Bachelor's Degree in Mechanical Engineering

2016

Northern Illinois University GPA: 3.5

DeKalb, IL

Coursework: Machine design, mechanics of materials, manufacturing processes, engineering materials, thermodynamics

CERTIFICATIONS

- Certified SolidWorks Professional  2019
- GD&T Professional Development Certificate  2021

TECHNICAL SKILLS

- **CAD Design:** SolidWorks, 3D modeling, engineering drawings
- **Gear Design Analysis:** KISSsoft, MITCalc, gear calculations
- **Geometric Dimensioning:** GD&T, tolerance stack up, datum schemes
- **Manufacturing Processes:** CNC machining, assembly, prototype fabrication
- **Product Documentation:** BOMs, specifications, test reports
- **Product Lifecycle:** PLM systems, engineering changes, release control
- **Validation Testing:** Prototype testing, load testing, durability testing
- **Quality Methods:** Root cause analysis, corrective action, preventive action
- **Design Methodologies:** Design for Manufacturability, material selection, tolerance analysis
- **Motion Systems:** Gearboxes, drivetrain components, power transmission

SKILLS

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|-------------------------|---------------------------|--------------------------------|---------------|
| • Gearbox design | • Power transmission | • Tolerance stack up | • KISSsoft |
| • Gearing | • Precision manufacturing | • Material selection | • MITCalc |
| • Drivetrain components | • SolidWorks | • Design for Manufacturability | • PLM systems |
| • Motion control | • GD&T | • CNC machining | |

PROFESSIONAL AFFILIATIONS

- Mechanical design review community, Vector Peak Drives, 2024 - Present. Shares practical review habits across engineering and manufacturing teams.
- Professional engineering development participant, precision motion industry, 2021 - Present. Maintains active learning across design analysis, GD&T, and production methods.

LANGUAGES

- English (Native)
- Spanish (Intermediate)

ADDITIONAL INFORMATION

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

REFERENCES

AVAILABLE ON REQUEST