RANJITH THANGAPANDI

Automotive Design Engineer | Vehicle Systems Engineer | R&D Engineer | Mechanical Design Engineer | Product Development Engineer | HVAC Engineer (Automotive) | Hydraulics & Pneumatics Engineer | Functional Safety Engineer

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ranjith-thangapandi-Design

The Lowdown

Hey! I'm an automotive design engineer with 4+ years of experience, and the last 2 years in full R&D really leveled me up. I've worked on everything from hydraulics, pneumatics, HVAC, diesel & AdBlue systems to chassis, suspension, steering, engines, transmissions, cabins, and firefighting vehicle systems.

One of my favorite achievements? Brake system integration. I designed a brake that meets NFPA standards, and in the real world, it works flawlessly—you can release the handbrake within 5 seconds of starting your engine and just drive off. It's one of those moments where engineering really feels like magic.

I'm all about turning wild ideas into real, functioning vehicles, experimenting, innovating, and optimizing with SolidWorks, Creo, and AutoCAD. Vehicles aren't just machines—they're puzzles I get to solve every day, and honestly, I love it.

Tech Arsenal

CAD & Drafting: AutoCAD 2D Drafting | 3D CAD Modeling (SolidWorks, Creo)
Simulation & Analysis: Expert-level Mathcad | Ansys | Automation Studio | LS-DYNA
PLM / Collaboration Tools: Teamcenter | Windchill | Wrench
ERP/Engineering Systems: SAP and ORACLE ECO | ECR | ECN | BOM Management
Standards & Material Knowledge: ISO | ASME | EN | NFPA Standards

Core Competencies

- Team Player | Fosters collaboration and drives collective success
- Problem Solver | Quickly identifies challenges and implements effective solutions
- Project Manager | Plans, executes, and delivers successful outcomes
- Critical Thinker | Applies strategic and logical analysis to decision-making

Achivements

- 2 times Best Employe of the month for Introducing the Thermostat Bypass valve, brake release in 5 sec.
- Intersec Award winner in 2025 for ARFF-NAFFCO

Language Competencies

- English (Spoken, read & Written)
- Tamil (Spoken, Read & Written)
- Malayalam (Spoken)
- Hindi (Spoken)
- Japanese (Introductory)

Learning Journey

DIPLOMA IN MECHANICAL ENGINEERING (12+3 YEARS)

Institution: government polytechnic college under directorate of technical education, INDIA
Year of Graduation: 2022

DIGITAL MANUFACTURING AND DESIGN (

Institution: University at buffalo, The state university of Newyork summary : Industrial 4.0 manufacturing method advantages, better quality products,intelligent machining ,productivity Period:2023

Professional Experience

NAFFCO-CHASSIS MANUFACTURING- JAFZA DUBAI

MECHANICAL-DESIGN ENGINEER

JAN 2024 to PRESENT

At NAFFCO, I was responsible for the complete design, integration, and implementation of vehicle brake systems and hydraulic systems, including power packs, steering, diesel tank lines, cooler connection lines, AdBlue tank lines, and cabin heater lines. I independently handled the full air brake system using WABCO components, including system modification, integration, and the creation of detailed diagrams. My role also involved product improvement through brake force calculations, selection of appropriate hydraulic and pneumatic fittings, pump and valve specifications, and compressor selection for pneumatic applications. I developed technical bulletins, chose suitable hoses, created complete assembly drawings, and determined optimal locations for sheet metal brackets. All of this was driven by my innovative thinking, hands-on problem-solving, and a strong focus on system reliability and performance.

KEY PROJECTS:

- Hydraulic System Design: Designed 3D hydraulic component routing for ARFF-IAF vehicles using CAD, ensuring performance and military compliance.
- Brake System Engineering: Developed and enhanced brake system schematics, improving safety and reliability under extreme conditions.
- Structural Testing: Engineered and tested engine trestle and SCR DEF tank mountings, ensuring structural integrity.
- Cabin Heating Innovation: Created DEFA-based cabin heating system with custom circuits, validated through in-vehicle testing.
- EV System Integration: Led EV system design, including AC-DC converters, motors, and liquid-cooled battery mountings, with 3D models and cooling diagrams.
- HVAC System Optimization: Designed cabin HVAC systems, optimizing evaporator, condenser, and duct routing for comfort.
- Documentation Expertise: Authored vehicle service and operation manuals for maintenance and troubleshooting.
- Prototype Development: Developed CAN bus-based steer-by-wire rear steering prototype, enhancing maneuverability.

Majore issue and implementation :

- **Resolved Mercedes vehicle brake system towing issue:** Implemented and tested yellow/red connection configurations, ensuring reliable towing and compliance.
- **Mitigated torque converter and transmission overheating:** Designed 87°C thermostatic valve to control oil flow, routing to cooler above threshold to prevent failures.
- **Optimized ARFF vehicle hand brake release time**: Reduced release time from 14 to 5 seconds with patented air dryer connection, exceeding 15-second requirement.
- **Addressed overpressure in hydraulic steering loop line**: Installed flow control valve to regulate pump output, redirecting excess flow to eliminate failures.

Professional Experience

AXISCADES TECHNOLOGIES LIMITED -CHENNAI
(CATERPILLAR)
ASSISTANT DESIGN ENGINEER
JUNE 2023 TO JAN 2024

Involved in Caterpillar design projects, contributing to the definition of product specifications, features, and functional requirements in compliance with safety, regulatory, and internal standards. Involved in 3D modeling and 2D drafting using Creo Parametric for solid and sheet metal components, including engine castings, fasteners, hardware, tires, rim assemblies, and air filtration systems.
Involved in the NPDI process, prototype support, engineering change management (ECR/ECO), and DFMEA-based product risk assessments. Contributed to converting drawings from multiple industry standards into Caterpillar-compliant specifications, maintaining organized documentation, collaborating with suppliers, supporting innovation, guiding junior engineers, and demonstrating ethics and integrity.

KEY PROJECTS:

- **Chassis Modification for Caterpillar 950GC**: Led the modification of the chassis to enhance performance and durability for the CAT 950GC loader.
- **Engine ALUW 06 DTI Support for Caterpillar 320D3 Crawler Excavators**: Successfully executed modifications and supported integration of the ALUW 06 DTI engine into the Caterpillar 320D3 Excavator, optimizing engine performance.
- **Perkins to CAT Part Conversion:** Oversaw the conversion of various components, including radiators, engine pipelines, and DEF hoses, from Perkins to CAT standards, ensuring seamless compatibility and performance.
- **Heat Shield Upgrade (1975 to Current Model):** Directed the design and upgrade of heat shields from the 1975 version to the current model, improving operational efficiency and safety.
- **Cabin Safety Guard Modification for CAT 246D3**: Spearheaded the design and modification of cabin safety guard systems for the CAT 246D3 to enhance operator safety and meet updated safety standards.
- **Tire and Rim Modeling & Detailing (200+ Models)**: Managed the 3D modeling and detailed design of over 200 tire and rim models, ensuring precise specifications for various CAT equipment.
- **Fastener Supplier Print to CAT Print Conversions (1000+ Parts):** Executed the conversion of over 1000 fastener designs from supplier prints to CAT-specific standards, ensuring high-quality and cost-effective parts integration.
- **Coupling Modeling & Print Conversion (150+ Parts)**: Led the modeling and conversion of 150+ coupling designs from supplier prints to CAT-specific drawings, optimizing system performance and durability.

Professional Experience

TECHNICAL APPRENTICESHIP
LARSEN AND TOUBRO-COIMBATORE
PRODUCT DEVELOPMENT CENTER
AUGUST 2022 TO JUNE 2023

I have been involved in the development of a wide range of heavy engineering and industrial machinery projects, including rail feeder cars, track slab laying cars, and straddle carriers, as well as L&T construction equipment such as compactors, wheel loaders, excavators, and skid steer loaders.
I also played a key role in tyre processing machinery development, including tyre building machines, hydraulic tyre curing presses, and variable-size tube splicers, managing both new product development and customer-specific modifications.
As a Design Engineer, I have successfully contributed to 15+ engineering projects, with hands-on responsibility for hydraulic system routing on 7+ tyre processing machines, ensuring performance optimization, safety compliance, and ease of maintenance. I actively participated in research and development activities, applying innovative engineering concepts to enhance product functionality, reliability, and manufacturability.
My work involved translating concepts into production-ready designs using Creo and SolidWorks, supporting end-to-end product development from concept design and layout planning to detailed engineering and final implementation

KEY PROJECTS:

- Created 3D models for conveyors, cutters, and rollers used in tyre building machines for major tyre manufacturing applications.
- Successfully completed the full brake system design for a Rail Feeder Car, which was validated and handed over for Indian Railways operations.
- Designed complete chassis layouts and engine exhaust hose routing for L&T construction equipment, including Compactors and Wheel Loaders, ensuring compliance with packaging and thermal constraints.
- Developed outer body 3D models for Skid Steer Loaders as part of L&T product development programs.
- Executed full hydraulic routing design for Excavator tyre holding frame systems, focusing on reliability, safety, and serviceability.
- Created 3D models for Pneumatic Tyre Loaders used in L&T material handling applications.
- Designed tyre mould body 3D models for Tyre Curing Presses used in tyre manufacturing systems.
- Completed 25-inch piping design for Tyre Curing Presses, including 17.5-inch systems, meeting industrial manufacturing and pressure standards.
- Led hydraulic piping and routing design for Track Slab Laying Car projects, covering both concept and detailed design stages.
- Developed the full concept design for a 17.5-inch tire building machine, from initial layout to functional system integration.