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Assistant General Manager, Volvo Group R&D, Bangalore, India



A Purpose Driven Leader and R&D professional with skills & knowledge on Product development/Project Management [ICE-Powertrain-Diesel, LNG, H2-ICE]/EV-Powertrain (e-mobility/FCEV)/Vehicle Integration]

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## Core Competencies

Leadership & People Management Skills

Strategic Thinking & Vision

Research & Development (R&D)

Technology/Sustainability/Product Roadmap

Innovation and Creative Thinking

## Technical Purview

Vehicle Integration/Product Development

ICE- Engine or Powertrain Integration (Fuel, Exhaust, Cooling & Intake System)

ICE/BEV/EV-PT/H2-FCEV /H2-ICE/LNG

Thermal Management /Mech. Design

Innovation/IPR(Patent), Publications

DVPR, Validation, Certification process

Design Optimization, DOE, DFSS /VAVE

Digitization (XR/AI-ML) / Sustainability

## IT Skills

- Pro-E/Creo, CATIA V5, AutoCAD
- Teamcenter PLM, KOLA, EDB
- ANSYS (CAE/CFD), AVL Cruise, VMS MS Office 2016

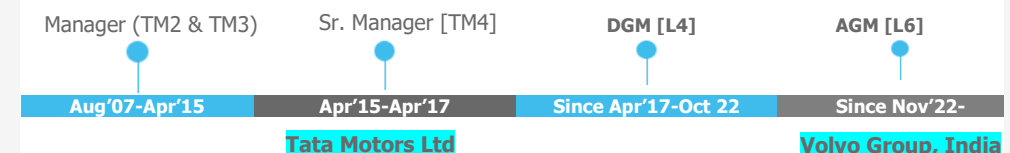
## Key Achievements & Awards

- 14 Patents (IPRs)\*
- 26 Publications\*
- 15 DFSS projects
- TML Black Belt Certified (DFSS)
- VAVE Projects (~ 100 Cr)
- 5 Innovation Awards (TML)
- Idea displayed I3 -2012 (CII &DST)
- Bronze Awards for IPR lead (2022)
- AIAG & AIAG-VDA DFMEA Trainer
- CXO Incubator Certification
- Author -2 Books (Technical & Leadership)

## Profile Summary

- A **Purpose Driven Leader** of **Ph.D (Mech Engineering)** background, having exposure and rich experience to work on different functions of **Automotive R&D Centre** from [ICE-Powertrain integration (Fuel & Exhaust System/ H2-ICE) to EV-Powertrain System (BEV/H2-FCEV/H2-HSS) (both PV/CV). Total ~**18.7 years** of experience with **14 IPRs/Patents; 26 publications (SAE/IEEE/Springer)** & more than **25 Projects** handling/Project management exposure.
  - a. **Project Manager /Vehicle Integration (VI)-7 Years 6 months**
  - b. **Engine or Powertrain integration (EI) -4 Years 3 Months**
  - c. **EV-Product Development (Engineering)- 3 Years 6 Months**
  - d. **Product Owner/Manager -CSE (Eu7, H2 ICE, LNG, H2-FCEV & Diesel)- 3+ Years**
- Proficient in **Project management/ Global Product Owner (PO)** from **concept stage to launch ((DR0 to DR5 /ABCP gate) or E2E)** of vehicle involving **Project planning**, organizing, controlling, layout, product design, DVP finalization, Testing/Validation, Certification, Engineering Signoff (ESO)/ Final gate (FiG) in co-ordination with internal /external/Global stakeholders. **Experience working in both PV (EV & ICE) and CVs (ICE, H2-ICE, LNG).**
- Managing **Design Quality Engineering** of **EV & FCEV** through Robust DFMEA process, potential Risk (CIB) monitoring, DVP/CTR review with CFT to include DFMEA output, Reliability Target setting, FDJ (First Design Judgment), and inputs for ESO. **Occurrence prevention of field issues** by updating Project DFMEA, Foundation DFMEA, DGDR and DVP/CTR to prevent recurrence of same failure in on-going and upcoming models. Well Understanding in **Thermal Management (EV-BTMS and ICE) , Battery Pack Architecture**, and **Vehicle architecture of Defense, CVs, Electric vehicles (EVs) & FCEV; understanding of ISO:26262 & EV –Testing Standards, Hydraulics Pipe, tube and Hoses**
- Significant exposure in **designing & development of products in collaboration with global suppliers** meeting **SQD**, enhancing customer satisfaction & **driving profitability.**
- Proficient in Reactive Quality (**Field Failure issue Analysis using 7QC , 8D, FTA and Problem resolution**) and **Proactive Quality (DFMEA, PAA etc.)**
- Knowledge of IQD and **Engine IQA trials**, Turbocharger Validation, Fuel System LPC Trials, Compressor & Fan Duty Cycle Trials, Fuel System, **Exhaust/After treatment design/validation** with **Global Suppliers** and Certification Process. **FE improvement using multiple injections and Drive train optimization**
- Proficiency in **DFMEA, DFSS, DOE, 8D, ICR/VAVE, Publications, Patents (IPRs), Innovation** and Well Familiar with **IPTV, 3D (DFA, DFM, DFS)** and certification; **Agile way of working.**
- **Tata Motors Black Belt Certified** professional, successfully working on **15 Nos of Design for six sigma (DFSS) projects and VAVE projects (~ 100 Cr).**
- A professional with experience in effective **Team handling, leadership, and people management** skills of different team sizes in the last 10+ years. Exposure Manufacturing/Testing setup development
- **Global Product development exposure** in a multi-brand and multinational organisation (MNC-OEM) following **Agile way of working.** Exposure of the **Global Taskforce** handling.

## Growth Path



## Education

- # **PhD (Mechanical Engineering)** from Jadavpur University, Kolkata ,2023  
**Thesis Title:** Investigation on the effects of Quadruple Injection strategy on Noise, Performance (BSFC, Fuel Economy) and emission characteristics of the Automotive Diesel Engine, **Year-2016-23.**
- # **M.E (Mechanical Engineering-Thermal)** from **Jadavpur University, Kolkata,2007,8.07/10 CGPA(GATE in 2005)**  
**Project Title:** Development of an Effective combination silencer for 4 Stroke Diesel Engine
- # **B. Tech. (Mechanical Engineering)** from KGEC, under WBUT, Kolkata, 2005, 7.63/10 CGPA  
**Project Title:** Heat Treatment of HSS T15 PM part Cutting tool Tip

## Work Experience

### 1. Present Organization: Volvo Group India Pvt Ltd (Nov 2022 to Present)

#### **Product Development (Chassis)- EU6/7/ H2-ICE/ LNG /H2-FCEV / Diesel ICE) : Nov 2022 to Present (Team Size-28 \*\*)**

Leading a team towards sustainable, modular Chassis System development (Fuel & Exhaust) for Global Trucks focuses on Net Zero emissions. The works covers E2E development of – **EU6/7 +NNR3, Alternative fuels, BEV, FCEV, and Diesel –ICE**. Product developed - **FH/FM 780 hp D17 EU6 and FH/FM 42T LNG Truck**. Key Products under development phase are **EU6/7+NNR3, Gen2 H2-FCEV, LR-BEV, FH/FM L3 cab, T3, Indonesia B35/50, HPDI H2-ICE & CT 2.0**. Leading/contributing to the area of **Sustainability (CO2 Reduction, R- framework, SOC), Roadmap, Optimization** etc.

### 2. Previous organization: Tata Motors Ltd (Aug 07- Oct 22)

#### **A. Product Development (Engineering Quality)- Battery Electric Vehicle (BEV) : April 2019 to Oct 2022 (Team-12)**

Working as SPOC towards development of **PV-EV/CV-EV / FCEV and Transmission/Drive train**, managing associated project deliverables as per project Timeline /NPI DR Gateway and WCQ Guideline until Engineering Signoff (ESO). *Few key deliverables as follows-* (PMXU discussion and **Architecture /DFMEA/Proto plan finalization, Critical Engineering review for Thermal, EV-Powertrain, HV-Battery Pack, FCEV and Transmission/drive train, FDJ assessment closure, CIB monitoring, DVP/CTR test co-ordination, technical review & project risk assessment**).

- Well understanding of the area of **EV-Powertrain System [HV-Battery Pack, Battery Chemistry, e-Motor, e-Gearbox, e-Axle], Thermal Management [Battery & Traction cooling system], TCO analysis, Fuel cell EV & its validation plan/DVP/CTR and design optimization**.
- Excellent Understanding of **Architecture & layout** (System/subsystem/component of EV), design, validation & certification cycle.
- **Part of EV Standard making CFT**. Awareness of different standards associated for xEVs and functional Safety ISO: 26262.
- Project handling experience as Engineering –SPOC for Nexon-EV, Tigor-EV, Punch-EV, Tiago-EV, ACE-EV and 8/10T EV Trucks ongoing etc.
- **Field issues resolution** as per WCQ guideline issues Though occurrence prevention by updating Project DFMEA, Foundation DFMEA, DGDR and DVP/CTR to prevent re-occurrence of same failure in on-going and upcoming models

#### **B. Project Manager/Vehicle Integration – MHCV Tipper (July 2017- March 2019) (Team Size – 7)**

As a Project manager of Vehicle ( Off Road –Mining Tipper) having the working experience to Analyze the customer needs to ESO sign-off for production go ahead following 5 stages DR Gate (**DR0 - DR5 or E2E**) from concept finalization, detail layout, Project Strategy, design & validation, PALs, PATs, critical issues closures and certification within sign-off project timeline and manpower. TCO improvement through VAVE, Weight reduction and FE enhancement (e.g. - Prima Lx 2530.K). Key projects as below

- **IAL and HDPE projects** (Prima Lx 2830.K, Prima Lx 2825.K –HRT, Prima Lx 2823.TK, Prima Lx 3530.K, Prima Lx3535.K).
- **BS6 Proto development (Ashwamedha-5.6L & Atulya-6.7L), DVPRs finalization along with Benchmark data collection for PALs.**
- **8L TML engine adaptation in Prima and Signa range tipper. First time Re-PTO engine adaptation in RMC Tipper models**
- **Dipper Oil Sump Validation & implementation for engine oil change interval enhancement of Tipper**
- **FE improvement by Driveline Optimization & Engine calibration updation for HDPE Norms**

#### **C. Powertrain Integration (Fuel & Exhaust System)– CV ( April 2013- June2017) (Team Size -7)**

Spearheaded a team for **Powertrain integration (Engine peripheral system)**. *The team developed and implemented the exhaust systems and Fuel system for BS-IV /BS-VI program (E2E) for commercial vehicles (LCV to MHCV) platform.*

- Galvanized Fuel tank development completed, Stainless Steel and plastic fuel tank for new generation vehicle
- 5+25 Micron Fuel system with PA grade Fuel lines for all MHCVs
- Creating, optimizing and validating **Exhaust System** (SCR system and EGR+DOC-POC), Review with global supplier
- Engine IQA trial, which covers **Cooling trials, NVH and LPC measurement (Fuel System)**, and certification.
- Developing the following VAVE innovative and new products:
  - I. New concept silencer, such as Tiny Silencer, Dual functional Silencer (exhaust heat recovery & noise reduction),
  - II. Hybrid Silencer to reduce vehicle cost & weight, five chamber silencer for front POL, silencer for vertical exhaust.
  - III. Fuel tank development with optimized baffle , spot welding pitch and neck position
  - IV. Total VAVE from FY 14-15 to FY 16-17 around **35.2 Cr as COC of Exhaust / Fuel System**
- Serving as a part of few major testing set up development and testing Methodology/procedure finalization

#### **D. Defence- Powertrain/Chassis and Vehicle Integration (Aug 2007- Mar2013)**

Designing and development of **Engine peripheral system [Exhaust, fuel, Engine Mounts, Cooling, Intake system]** and Chassis system (Frame, Clutch Control, Propeller shaft, Accelerator control system) for 10T-16T -4x4 /6x6 Defense projects. *Drivability performance optimization of vehicle.* Key projects delivered in this period are LPT 1615 TFF, LPTA1413, CASPIR, MPV, SD1015, SAK/SA 1212 and LPTA 1623 RTN. Worked on **mined protected vehicle CASPIR & TML initiated MPV**. Coordinate the CMVR and CQAV documentation. Lead the **Clutch booster implementation. Hydraulic Pipe, tube and Hoses** for steering/Clutch/Cooling system.

#### EV – TS preparation CFT

- 13 Nos ( Example:- TS 55301 - HV Battery Pack , TS 55302 – Battery Management System, TS 55101 – e-Drive System)

#### Additional Responsibility / Activities

- IPR Coordinator for Engineering Research Centre (R&D)-Department level
- Supervision of under graduate (B.E/B.Tech) internship- 6 Nos and PGT (M.E/M. Tech) Thesis Guide- 6 Nos
- IIP-CFT (Innovation, IPR & Publication ) lead of Department (TML-EQ), Leading External Collaboration (Volvo), Leading the i-Ph.D framework (Volvo).

#### Rig Testing methodology & Setup/ Manufacturing testing setup [Featured]

- Differential Lock & Power train durability test on Chassis Dynamometer for Defense vehicle
- Silencer durability trial test rig preparation
- LNG Leak Testing setup

#### Training/Certification

- **Vehicle Dynamics, GD&T, CESS (Connected Electric Shared Safety), SAE-PDP on EV , ISO 26262 , PMP (Basic Training) , CXO Incubator.**

#### Professional Community Member

- **SAE, ISHMT, IMech, ResearchGate, CXO Incubator**

#### Soft Skills

*People Management, Transformational Leadership, Team Building skills, Problem Solving, Strategy, Agility, Collaboration & Networking, Effective Communication, Risk Management, Digital Innovation, Conflict resolution , **Coaching and Mentorship***

#### Personal Details

Date of Birth: 6<sup>th</sup> January, 1983  
Languages Known: English, Hindi & Bengali  
Address: Abbiah Reddy layout, Kaggadasapura, Bangalore 560093 //Utopia society, Gat 129, Boradewadi, Moshi, Pune-412105  
Hobbies: Listening to music, Travelling, Painting, Watching Cricket & Tennis, Writing & publication

## Annexure

### ❖ Key Projects & Impact

- Mine Protected Vehicle (MPV) for Defense – Indigenous project (Year 2009-2012)
- 5 +25 micron fuel system for MHCV - Prevent the Fuel injection pump failure /Warranty cost/Engine performance improvement (Year 2013-14)
- BS-IV /BS-VI -Migration for MHCV – Indian Legislation (2014-2017)
- IAL for Tippers (19T- 49T) - Increase axle load Norms ( Year 2018-19)
- Revamp the Prima Tippe 2530K/2830K – Operating margin (due to low DMC), TCO, Pay load ( lower weight) improved with new design (Year 2018)
- Developing EV range cars- Nexon EV , Tigor EV, Tiago EV , Punch EV - Become first Indian OEM with highest EV offering /sales (2019-2022)
- HD Eu6 17L 780hp engine Vehicle -Launched (EU and Australia)
- Developing Eu7/Eu6NNR3 , HPDI H2-ICE, LR -BEV and Gen2 FCEV- These products yet to be launched

### Research Publications [26 Nos]

#### **PhD Specific -Related to Engine (Fuel Economy, Noise & Emission reduction using Quadruple Injection Strategy)**

- "Experimental Investigation on the Effect of Two Different Multiple Injection Strategies on Emissions, Combustion Noise and Performances of an Automotive CRDI Engine," SAE Technical Paper 2016-01-0871, 2016.
- "Optimization of Multiple Injection Strategies to Improve BSFC Performance of a Common Rail Direct Injection Diesel Engine," SAE Technical Paper 2016-28-0002, <https://doi.org/10.4271/2016-28-0002>, International Mobility Conference 2016
- "Emission and Performance characteristics of CRDI Diesel Engine using Quadruple Injection Strategy with different pilots and post injection timing", Engineering Research Express 3(2021)045004,IOP Publishing, <https://doi.org/10.1088/2631-8695/ac27fe>
- "Assessment of the Quadruple Injection strategy over Triple injections to improve emissions, Performance and noise of the Automotive Diesel Engine", Facta Universities Series: Mechanical Engineering, <https://doi.org/10.22190/FUME210329049B>
- "Assessment of the Impact of Multiple Injection Strategies on Combustion Noise, Smoke and Performance Characteristics of a CRDI Heavy Diesel Engine", Int. J. Vehicle Structures & Systems, 13(5), 1-8. doi:10.4273/ijvss.13.5.05
- "Comparative Analysis of Combustion Noise, Performance and Emission of LTC Diesel Engine with Multiple Injections", Recent Advances in Mech. Engg, Lecture Notes in Mech. Engineering, Springer, pp. 653-665, [https://doi.org/10.1007/978-981-15-7711-6\\_65](https://doi.org/10.1007/978-981-15-7711-6_65) (Book Chapter)

#### **EV Specific & Alternative fuels (Decarbonization)**

- "Thermal Management System and Performance Characteristics of Electric Vehicle," SAE Tech Paper 2020-28-0022.
- "A Review of Hydrogen Storage System (HSS) and Hydrogen Internal Combustion Engine for the Potential H2-ICE Vehicle" SAE Paper 2024-028-0129

#### **Powertrain Integration Specific (Accelerator control, Intake, Mounts, Fuel and Exhaust System) [2 papers under process]**

- "An Approach to Reduce the Product Variants through Design of Hybrid Muffler for Commercial Vehicle Application, SAE Technical Paper 2013-26-0096
- Experimental Investigation on the Effect of Shell Design on Noise Quality and Performance of an Automotive Exhaust Muffler, SAE Paper 2020-28-0478
- Investigation on the Effect of Design Feature on Acoustic Performance of Exhaust Muffler for Vehicle," SAE Technical Paper 2022-28-0488, 2022
- A Novel Approach to develop the Exhaust Backpressure Measurement System for Automotive Application," SAE Technical Paper 2025-28-0168, 2025
- "Improved Cable type Accelerator Control System with Slider Mechanism for Commercial Vehicles". International Journal of Vehicle Structures & Systems (IJVSS), ISSN: 0975-3060 (Print), 0975-3540 (Online) Volume 4, Number 3 (2012) pp. 18-22
- "An Approach to Minimization of Drive Train Noise through Redesign of Engine Mounts". International Journal of Vehicle Structures & Systems (IJVSS), Volume 9, Number 4 (2017) pp. 18-22 ; DOI: <http://dx.doi.org/10.4273/ijvss.9.4.11>
- "Combination Muffler is more effective than Reactive Muffler even in Small Size" International Conference of Frontiers in Automobile and Mechanical Engineering (FAME-2010)/Proceeding & IEEE Xplore / ISSN: 978-1-4244-9081-3
- "Design Analysis and Pressure Loss Optimization of Automobile Muffler", Intelligent Manufacturing and Energy Sustainability. Smart Innovation, Systems and Technologies, vol 169. Springer. [https://doi.org/10.1007/978-981-15-1616-0\\_10](https://doi.org/10.1007/978-981-15-1616-0_10) (Book Chapter)
- "Methodology to Development of Air Intake System for Heavy Commercial Vehicles", International Journal of Applied Engineering, Research (IJAER)/ ISSN: 0973-4562, Volume 7, Number 2 (2012) pp. 191-201
- "Design of hybrid accelerator control system for a mine protected vehicle", Int. J. Mechanical & Automobile Engg, 12(1), 14-20
- "Reduction of Cab Floor Vibration Through Re-design of Engine Mounts to Improve Drivers Comfort-ability" Int. J. Mech & Auto Engg, 14(5), 39-48.
- "Validation of Rear Axle with Differential Lock for Off-Road Vehicles", Int. J. Vehicle Structures & Systems, 3(4), 241-246. doi:10.4273/ijvss.3.04.05

### Intellectual Property Rights (IPRs)/Patents [14 Nos]

- A Fuel Tank Design for M & HCV – 222084/ Year 2009
- Design of Cost Effective Vortex Flow Muffler for M&HCV- 957/MUM/2010 (314107)
- Combination Type Muffler with Annular Dissipation Chamber for M&HCV- 955/MUM/2010 (306895)
- Hybrid Accelerator Control System for Medium & Heavy Commercial Vehicles- 1079/MUM/2011 (343843)
- An Exhaust Muffler and Method of Assy thereof- 3707/MUM/2011 (332791)
- Exhaust Muffler Assembly with Heat Recovery Unit - 736/MUM/2012 (305509)
- Device for Cooling of Compressor Outlet Gases - 2645/Mum/2012 ( )
- Muffler & Heat Recovery Device for HVAC & Exhaust System - 3345/Mum/2012 (346745)
- Field Failure issues occurrence prevention (Application 1140/21)
- Prevention measure close-looping of supplier DFMEA (Application 1167/21)
- Battery mounting device for vehicle (EPO- P2023-0092EP01), Oct 2024
- Anti-Siphoning Fuel tank Assy (EPO- P2025-0025EP01), July 2025
- Flex Bellow for automotive Exhaust application (P2025-0384 SE01), July 2025
- EATS Installation system for Vehicle (P2025-1076EP01) Dec 2025/ Under review -New Auto-clean Air Filter /hydrogen storage system, etc.

### ❖ VAVE Projects [Featured]

- Cost-Effective Fuel Tank Bracket Design
- Spot Welding Pitch/Diameter modularization for Fuel tank
- 4 Nos of Cost-Effective Silencer design
- Common exhaust design for 31T Truck with part count reduction
- Flex Bellow Design Optimization
- Common vertical exhaust for heavy-duty tipper
- 3 Axle Mining Tipper (ICR- 4 lakhs)

### Research Community ID

- Google Scholar: - <https://scholar.google.co.in/citations?user=6355FFsAAAAJ&hl=en>
- ORCID iDs :- <https://orcid.org/0000-0002-3830-6561>
- Research Gate :- <https://www.researchgate.net/profile/Sanjoy-Biswas-4>

### ❖ Books (Author)

1. An Overview of Modern Fuel Injection Strategies for Automotive Diesel, LNG, and Hydrogen Engines (Available on Amazon, Flipkart, Notion)
2. Growth Mindset: From Ordinary to Success and Contribution (Currently Available on Amazon, Flipkart), ASIA BOOKS OF RECORDS Certified