

SANJOY BISWAS ,Ph.D.

Assistant General Manager(Group Manager-Fuel & Exhaust), Volvo Group, Bangalore, India

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

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Core Competencies

Leadership & People Management Skills

Strategic Thinking & Vision

Research & Development (R&D)

Technology/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

- **15 Patents (IPRs)***
- **28 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 -3 Books (Technical & Leadership)**

Profile Summary

- A **purpose-driven leader with a PhD (Mech Engineering) background, having exposure and rich experience working on different functions of the Automotive R&D Centre,** from [ICE-Powertrain integration (Fuel & Exhaust System/ H2-ICE) to BEV-Powertrain System (BEV/LNG/H2-FCEV/H2-HSS) (both PV/CV). Total ~**19+ years** of experience with **15 IPRs/Patents; 28 publications (SAE/IEEE/Springer)** & more than **25+ Projects** 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)- ~4** 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). Driving Technology and Product Roadmap.**
- 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 an **Agile way of working**. Exposure to **Global Taskforce** handling.

Growth Path

Manager (TM2 & TM3)	Sr. Manager [TM4]	DGM [L4]	AGM [L6]
Aug'07-Apr'15	Apr'15-Apr'17	Since Apr'17-Oct 22	Since Nov'22-
	Tata Motors Ltd		Volvo Group, India

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)

Leading teams towards sustainable, modular Chassis System development (Fuel & Exhaust) for global trucks, focusing on net-zero emissions. The work covers **E2E development of EU6/7 +NNR3**, Alternative fuels, BEV, FCEV, and Diesel–ICE. Products 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)

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)

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 HDFE** 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 HDFE Norms*

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

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:	6th 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 Defence – 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 [28 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 **(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 **(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 [15 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 **(EP0- P2025-0025EP01**), July 2025
- Flex Bellow for automotive Exhaust application **(P2025-0384 SE01),** July 2025
- EATS Installation system for Vehicle **(P2025-1076EP01)** Dec 2025/
- Aerodynamic Exhaust Tail pipe **(P2025-1115EP01)** /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**
3. Yoga for busy People: The 30-Minute habit for a better life