Exponent®
Engineering & Scientific Consulting

Joe Palazzolo

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Professional Profile

Mr. Palazzolo has over 30 years of experience in the automotive industry, specializing in vehicle propulsion and power distribution systems. He advises clients on a wide range of automotive systems and components, including propulsion systems (internal combustion engines, electric, and hybrid), transmissions (automatic, manual, CVT, hybrid, and DCT), clutches, transfer cases, all-wheel drive, driveshafts, halfshafts, axles, power transfer units, brakes, torque management devices, bearings, shafts, gears and castings. Mr. Palazzolo works with clients to help manage their transition to electric and hybrid drive systems. He has industry experience with intellectual property (IP) specializing in providing technical support to clients in legal disputes, and patent infringement matters. Mr. Palazzolo specializes in developing and accelerating the commercialization of innovative vehicle technologies and has obtained numerous patents for his unique and novel technical solutions.

Mr. Palazzolo has experience leading teams, designing, developing, and validating programs to help them meet emerging automotive trends and to develop cutting-edge technology. This work has ranged from early concept inception, full system and component Failure Mode and Effects Analysis (FMEA), Design Verification Plan and Report (DVP&R), validation to volume production while leveraging his expertise and background with root case analysis techniques to pinpoint areas of concern. He has also worked directly with and advised automotive original equipment manufacturers (OEMs), tier suppliers, off-highway OEMs, and construction equipment manufacturers.

Mr. Palazzolo is a Society of Automotive Engineers (SAE) Fellow (Class of 2013), a current SAE Master Instructor for drivetrain and all-wheel drive systems and has authored award-winning books on axles. He is the lead editor for the AWD Design Manual and has authored multiple chapters for Automotive Engineering Encyclopedia with J.W. Wiley & Sons. He was the recipient of the SAE McFarland Award in professional development. He is trained and skilled in the field of automotive repair, diagnostics and practiced as a National Institute for Automotive Service Excellence (ASE) Certified Master Technician & Undercar Specialist for 23 years. He is an accomplished fabricator and mechanic having diagnosed thousands of vehicle issues and failures for 40 years. With all of this background, he consults on preventative maintenance and diagnostics, service and repair, warranty issues, standard of care and best practices.

Academic Credentials & Professional Honors

Masters, Automotive Engineering, Lawrence Technological University, 1999

Bachelors, Mechanical Engineering, Cleveland State University, 1994

International Automotive Media Award, 2010

SAE Forest R. McFarland Award, 2007

Patents

US Patent 9,903,420 Shift Collar Assembly For A Power Transfer Unit, February 2018 (Engerer, Gerding, Arden, Ohsiek, Oram)

US Patent 9,003,925 Twin Electronic Torque Management Device, April 2015 (Corliss, Oram, Schmalenberg

US Patent 8,234,955 Power Transfer Unit With Disconnecting Input Shaft, August 2012 (Bock)

US Patent 7,270,026 Differential Assembly, September 2007 (Atkinson

US Patent 7,256,526 Integrated Stator-Axle For In-Wheel Motor Of An Electric Vehicle, August 2007 (Perkins, Peyghaleh, Benson)

US Patent 7,059,460 Hydraulic Coupling System, June 2006 (Duan, Macklem, Rahaim, Anwar, Monkaba, Perkins, Wisniewski, Kendall)

US Patent 6,830,529 Torque Transfer Assembly With Planetary Differential, December 2004 (Phelan, Perkins, Kendall)

US Patent 6,783,474 Torque Controller For Controlling Torque To Two Or More Shafts, August 2004 (Phelan)

US Patent 6,725,744 Power Train Assembly, April 2004

US Patent 6,719,660 Power Train Assembly, April 2004

US Patent 6,702,701 Oil Pump With Integral Fast Acting Valve For Controlling Planetary System Torque, March 2004 (Phelan, Kendall)

US Patent 6,688,851 Oil Pump For Controlling Planetary System Torque, February 2004 (Phelan)

US Patent 6,672,850 Torque Control Oil Pump With Low Parasitic Loss And Rapid Pressure Transient Response, January 2004 (Phelan)

US Patent 6,663,527 Planetary Gear System for Controlling Torque In A Vehicle Driveline, December 2003 (Phelan)

US Patent 6,620,069 Power Transfer Unit, September 2003

US Patent 6,605,018 Power Transfer Unit, August 2003

Publications

Palazzolo, Joe Volume 3, Part 4: Transmission and Driveline, Chapters 99 – 101:1749 - 1781. Encyclopedia of Automotive Engineering, John Wiley & Sons, Inc. 2015

Palazzolo, Joe Ford Differentials: How to Rebuild the 8.8 and 9 Inch, Cartech Books, 2013

Palazzolo, Joe High Performance Differentials, Axles, and Drivelines, Cartech Books, 2009

Palazzolo, Joe The Global 4WD-Driveline Market, 2002 – 2010, J.D. Power-LMC, 200

Presentations

Palazzolo, Joe Drivetrain Design for Hybrid & Electric Vehicles, Society of Automotive Engineers (SAE) Virtual Drivetrain Summit 2011

Palazzolo, Joe High performance electric front axle for the Porsche 918 Spyder, Society of Automotive Engineers (SAE) All-Wheel Drive Symposium 2014.

Palazzolo, Joe Multi-mode eTransmission for the Mitsubishi Outlander, Car Training Institute (CTI) Symposium 2015.

Palazzolo, Joe Global Collaboration and Role of OEM and Suppliers in Making of Successful Electric Vehicles, IEEE Transportation and Electrification Conference (ITEC) 2015.

Palazzolo, Joe, Haeniche, Anja Innovative 2nd Generation eAxle for the new plug-in hybrid BMW 225XE, Society of Automotive Engineers (SAE) All-Wheel Drive Symposium 2016.

Palazzolo, Joe The Past and Future of Electrified Vehicle Industry, IEEE Transportation and Electrification Conference (ITEC) 2016.

Palazzolo, Joe Transmissions in Electrified Propulsion Systems, IEEE Transportation and Electrification Conference (ITEC) 2016.

Palazzolo, Joe Multi-mode Transmission a unique Hybrid Transmission Concept, Car Training Institute (CTI) Symposium 2016.

Palazzolo, Joe, Haeniche, Anja Innovative 2nd Generation eAxle for the new plug-in hybrid BMW 225XE, Car Training Institute (CTI) Symposium 2017.

Palazzolo, Joe Impact of Electrification of Passenger Vehicles on Traditional Mechanical Design and Integration, IEEE Transportation and Electrification Conference (ITEC) 2018.

Palazzolo, Joe An Innovative Approach to a Coaxial Planetary P4 eAxle, Society of Automotive Engineers (SAE) Innovations in Mobility 2019.

Palazzolo, Joe An Innovative Approach to a Coaxial Planetary P4 eAxle, Car Training Institute (CTI) Symposium 2020.

Palazzolo, Joe Modular and Scalable Electric Rigid Beam Axles for Next Generation Trucks and SUVs, Car Training Institute (CTI) Symposium 2022.

All-Wheel Drive A Practical Manual, First edition 2009, Second edition 2016. Lead Outside Editor & Contributor

Fundamentals of Automotive Technology Principles and Practice, Jones & Bartlett Learning 2014

Editorships & Editorial Review Boards

As a direct result of my professional work and ability to explain complex systems in laymen's terms, I have been commissioned by the Society of Automotive Engineers (SAE) to create and deliver three separate Professional Development Seminars. These seminars have been recognized and my approach has earned me the Masters Instructor credential and McFarland Award. These seminars cover the broad areas of propulsion systems (transmissions, propshafts, All-wheel drive, axles, brakes), vehicle dynamics and controls. Hundreds of engineers and non-engineers have attended these courses since their

inception.

As a direct result of my professional work and mechanic experience, I was commissioned by CarTech Books to author two books focusing on axle design and repair, while “ghost” authoring and illustrated multiple others.