

CARR ENGINEERING, INC.

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Technical Biography for James Walker, Jr.

I am a resident of the State of Texas and an employee of Carr Engineering, Inc. (CEI), a Texas corporation at 12500 Castlebridge Drive, Houston, Texas 77065. I received my bachelor's degree in Automotive Mechanical Engineering from General Motors Institute in Flint, Michigan, in 1994 and I am currently a Licensed and Registered Professional Engineer in the State of Texas. Over the course of my professional career, I have compiled over 25 years of automotive engineering experience in motor-vehicle related areas including component design, vehicle dynamics, electronic control system calibration, failure analysis, and crash reconstruction.

From 1989 until 1995, I was employed as a Powertrain System Test Engineer at AC Rochester, a division of General Motors. In this role, I was responsible for the specification, design, and testing of multiple vehicle systems and components including fuel injection systems, air intake systems, valvetrain systems, and overall vehicle dynamic response.

From 1995 until 2006, I was employed as a Brake Controls Engineer and Manager at a variety of automotive manufacturers and industry-leading suppliers of hydraulic brake systems and electronic brake and chassis control systems including Kelsey-Hayes, Saturn Corporation (a division of General Motors), the Robert Bosch Corporation, Ford Motor Company, and Delphi. In these roles, I was responsible for the specification, design, calibration, testing, integration, and validation of hydraulic brake systems and electronic brake and chassis control systems. In addition, I was responsible for the training of development test drivers, the generation of standardized testing protocol, and was jointly responsible for the management of cold weather testing facilities in northern Michigan and northern Minnesota.

From 2006 until the present, I have been employed as a Principal Engineer at CEI. In this role, I perform investigations to determine the causes, conditions, and circumstances of motor vehicle crashes. In addition, I analyze vehicle motions and vehicle responses to driver commands in order to evaluate braking capacities, acceleration capacities, handling capacities, stability capacities, and the possible interactions with active chassis and brake control systems such as anti-lock braking systems (ABS), traction control systems (TCS), and electronic stability control (ESC).

I also have special expertise in the fields of automobile racing, racecar mission, design, and performance, and the specialized equipment used in the racing environment. This expertise has been accumulated over a period of 20 years in the course of my personal racecar design, fabrication, and competition activities. I have been a licensed competitor (driver) in sanctioned road racing events since 1997 with organizations such as the Sports Car Club of America (SCCA), the Historic Motor Sports Association (HMSA), and the International Motor Sports Association (IMSA).

To this day, I continue as an advanced driving instructor for a variety of organizations such as the Porsche Club of America and the BMW Car Club of America, specializing in driver

education and limit handling training. These experiences have allowed me to develop advanced driving techniques and vehicle dynamic evaluation skills while simultaneously providing me with the opportunity to observe both novice and advanced drivers first-hand in a limit-handling and braking environment.

As a direct result of my professional work and motorsports experience, I have been commissioned by SAE International to create and instruct five separate Professional Development Seminars in the areas of hydraulic brake systems, electronic brake control systems, and vehicle dynamics. Hundreds of automotive industry engineers have attended these courses since their inception, and in recognition of the quality of the seminars, I was awarded the SAE Forest R. McFarland Award in 2005 and was designated as an SAE Master Instructor in 2010 (in fact, the very first recipient of this recognition).

Also as a direct result of my professional work and motorsports experience, I was commissioned by CarTech Books to author a book focusing on brake system design and analysis. Published in 2007, High-Performance Brake Systems has sold nearly ten thousand copies worldwide and has been reprinted three times.