Resume - Vern Caron

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Caron Engineering - Kalamazoo, Michigan

May 2012-Present

Design and development of off-highway hybrid and electric vehicle systems for Fairfield Division of Oerlikon. The initial project scope is the design of a full hybrid-electric drive train for application on 30-Metric Ton wheel loaders. Components include electric drive axles, dual 65kW power inverters, a 227kW switched reluctance generator and a 700KJ ultracapacitor module. Prototype components are under test with a construction equipment OEM in Korea.

Meritor, ArvinMeritor, Troy, Michigan

Apr 2003-Apr 2012

Director, Commercial Vehicle Hybrid Engineering, 9/2009 to 4/2012

Responsible for managing mechanical and electrical aspects of Meritor hybrid programs. The primary project was development of a dual mode hybrid system for the DOE funded Super Truck program; a 4-year, $14M project. The dual mode system includes a pair of 200kW+ e-machines, a dual 200kW, 700V inverter, and an electronically controlled transmission. The primary OEM partner was Navistar. Other projects included turbine and diesel powered hybrid programs with PACCAR and several electric axle projects.

Director, Commercial Vehicle Systems Electronics 4/2003 to 9/2009

Overall engineering responsibility for all Commercial vehicle electronics outside of Meritor-Wabco JV. CVS Electronics had a staff of 22, and budget of 3.7M. Projects included:

Dual-Mode Class-8 (80,000 GVW) Hybrid vehicle developed under contract with Wal- Mart. This vehicle operated in pure electric mode at speeds up to 48-mph. It had two 180kW switch reluctance machines (jointly developed with Emerson) and a 58kW-hr NCA Lithium battery pack.

Battery-Electric drive train in partnership with Unicell Corp, currently under evaluation by Purolator Courier. The power train designed for this vehicle has two 77kW machines and an 80kW-hr sodium-nickel-chloride battery pack.

Suspension and Central Tire Inflation Systems for BAE/Armor Holdings, LMT and Navistar military projects, MSV, JLTV. And MXT vehicles.DDeveloped and released particulate emissions electronics for Volvo-Mack vocational vehicles (This business was spun off to EMCON in early 2007)

Caron Engineering, 5725 Venture Park, Kalamazoo, Mi

Apr 2000
Apr 2003

Set up an Engineering Firm (S-Corp.) based on a multi-year contract with Wabash National. During the period of this contract WNC became the 2nd largest provider of trailer anti-lock systems in North America. Also provided engineering design services to Valeo, Eaton, AM General and 55-Brake corporation. Typical projects included software and hardware for Valeo windshield wiper module used on GMC trucks and differential lock control system for the commercial version of the Humvee. Provided design analysis for Eaton Lightning transmission and FMVSS brake compliance analysis for 55-Brake corp.

Eaton Corp – Galesburg, Michigan (1988-2000)

May 1988
Apr 2000

Manager, Engineering and Product Planning - Automated Products Division Initiated design of the next generation of Eaton heavy-duty automatic transmission controls. The concept was based on use of the Black Oak Power PC with packaging for direct transmission mounting. Coordinated discussions with Motorola AIEG (Later sold to Conti) and other production suppliers. Continued to manage engineering and warranty administration for Eaton's ABS program as it was phased out.

Manager, Engineering and Product Planning – Advanced Chassis Controls Managed product planning, application engineering and service for the Eaton- Bosch ABS. This product lined grew to a level of 45K units per year generating approximately 12m in revenue. Also managed engineering activity related to Eaton's tire pressure management product line. Eaton maintained a dominant presence in the military side of this business (e.g. Oshkosh MTVR program) while growing the commercial tire pressure monitoring & maintenance business. In Q3 of 98, Bosch transferred their part of the ABS activity into a JV controlled by Knorr–Bremse. In Sept. 99, Eaton sold the TPM Business to Dana Corp.

Chief Engineer, Antilock Brake Systems – Axle and Brake Division

Formed a product team to develop ABS for the heavy and medium duty truck market. Also provided electronics for Eaton's Central Tire Inflation Program (FMTV contract) and CEMT automatic transmission program. Components developed and released to production included In-Axle speed sensors, ABS modulator valves and a family of electronic control units. The annual budged for combined programs was approximately 2.8M per year.

7/81-3/88

Navistar International/International Harvester (1981-1988)

Technical Center, Hinsdale Illinois and Engine Division, Melrose Park Illinois

Chief Engineer – Engine Electronics

Set up department responsible for electronic components and systems related to Navistar diesel engines. Products developed had a value of $5M per year by 1987. The annual budget was in excess of $1M with a staff of 9 people. Products included a solid-state glow plug control system for the 6.9/7.3L engines, an electronic governor for the DT-466 engine, injection timing instrumentation used for engine calibration at Navistar's Indianapolis plant. Related work included development of controls for Caterpillar and Nippondenso Unit Injectors (Navistar 94 smokeless diesel and Ford Next Generation Diesel programs). Also worked on controls for Stanadyne injection equipment, controls for Lucas CAV equipment, controls for Bosch injection equipment Navistar Diesel engine volume was approximately 120k/yr. Testified in Navistar-Caterpillar law suite regarding patent issues related to the engine controls for these engines in mid 2005.

1971-1981

<u>Chrysler Corp – Highland Park, Michigan (1971-1981)</u>

Supervisor – Electronic Carburetor Controls

Supervised Chrysler electronic carburetor controls engineering department. The department included seven engineers, five technicians, a mechanic and an electronics lab. Also provided support for sequential multipoint and throttle body injection systems used on the turbo 2.2L engine.

Senior Project Engineer, Advanced Engine Controls, Fuel Metering & Ignition Timing

Responsible for the microprocessor-based version of Chrysler's Electronic-fuel-metering system. This system made use of Texas Instruments 16-bit microprocessors and was intended to replace the analog system that appeared on 1981 and 1982 model year Chrysler Imperials.

Project Engineer – Electronic Ignition Controls

Managed design of the Chrysler "Custom Integrated Circuit" spark advance control system. This task included design and development of an engine control system incorporating three integrated circuits of custom design. Development of these ICs was coordinated with Texas Instruments, RCA, and national Semiconductor. The system was released on the 1977 ½ model year LeBaron and Diplomat and then Omni and Horizon vehicles. In excess of 1.5 Million of these units were produced through 1979 model year.

Project Engineer – Electronic Ignition Controls
Member of task force that designed, developed, and released the Electronic lean Burn System at Chrysler. Tasks included selection of sensors; design and development of interface and control

circuitry and coordination of spark timing function and parameters with the Engine/Emissions group. As the project neared production, assumed responsibility for testing and source approval of all integrated circuits used in this system. These were some of the first ICs to be used in under-hood automotive applications. Approximately 600,000 of these systems were produced.

Project Engineer – Electronic Fuel Metering System
Handled dynamometer testing of electronic fuel metering systems, transient response studies and instrumentation work.

Education

Keller Graduate School of Management, Chicago, Illinois
MBA, Nov. 1986, (3.44/4.0 GPA)

Wayne State University, Detroit, Michigan
MSME 1981 (3.45/4.0 GPA)

University of Minnesota, Minneapolis, Minnesota
BEE with Distinction in 1971 (3.4/4.0 GPS), Alcoa Scholarship, 1971

University of St. Thomas, St. Paul, Minnesota
Undergraduate engineering program, 1967-1968 (3.0/4.0 GPA), Transferred

Certification

Registered Professional Engineer
Michigan, No. 6201025243 Illinois, No. 062-041955

Patents

Author/co-author 30 patents related to vehicular electronics and controls. The majority of these are for concepts that have been incorporated into released products.

Professional

SAE, Member of Truck & Bus Council
Chairman, Advanced Drive Train / Hybrid Steering Committee
Chairman SAE Commercial Vehicle Corrosion Task Force (SAE J2721) Member
Buckendale committee, and J1455 subcommittee
Chairman SAE Heavy Duty Brake Committee from 2001 - 2008
Author of 2001 Buckendale paper “Commercial Vehicle Electronics Design”

Other

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Pilots License – Single Engine Land, Member of Aircraft Owners and Pilots Assn.