

ROCHON REPORT

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AT THE FOREFRONT OF ACCIDENT RECONSTRUCTION:

Forward Thinking, Backwards Compatibility

Prepared by Jason M. Bayley, B.Eng, EIT

According to a study by the World Health Organization, motor vehicle accidents account for approximately 1.2 million deaths and 48 million injuries annually worldwide.

Since 1980, worldwide vehicle manufacturers and roadway designers have made many advances in safety and have been able to reduce collision fatalities by approximately 50% of their 1980 value. A Transport Canada study showed that this reduction value was approximately 30% for Canadian motor vehicle fatalities over the past 20 years. At this rate, Canada would only near eradicating motor vehicle accidents by the mid twenty-fifth century!

In an effort to further the safety of vehicle operations in Ontario and Canada, two new publications have been developed: the Ontario Traffic Manual and the Design Guide for Canadian Roadways, updates of the former MUTCD (Manual for Uniform Traffic Control Devices) and the Geometric Design Guide for Ontario Highways. These new documents provide more stringent safety guidance and design standards; however, the influence of vehicle deficiencies, human error and

environmental factors will continue to play a contributory role in the occurrence of most motor vehicle collisions.

Many advances in vehicle safety contribute to the reduction of collision fatalities, such as: curtain and side air bags with seat mass sensors for optimal deployment, pre-impact seat belt tensioners, advanced anti-lock braking systems, stability and traction control systems, adaptive cruise control, lane drift warnings, head's up displays and built-in crumple zones, to name a few.

We will also notice a continual technological advancement of vehicles' subsystems; especially the eco-friendly propulsion systems which may include a hybrid of bio-diesel, electric/battery, solar, wind, hydrogen combustion and hydrogen fuel cell technologies. Each of these new interrelated systems will be carefully designed, but will inevitably still arrive with a new set of issues and eventual recalls.



It will be crucial from an investigative standpoint to fully understand these new systems to evaluate potential recalls which may adversely affect public safety.



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At the forefront of the accident reconstruction field, Rochon Engineering Corporation has adopted several diagnostic aids, including the Bosch Mastertech VCI Scan Tool, and the ALLDATA® service and repair database. These resources have proven to be essential for a comprehensive understanding of vehicle systems for both repair and now, investigative purposes.



With the Bosch Mastertech VCI Scan Tool, we are able to scan a vehicle's ECU (Electronic Control Unit) for diagnostic trouble codes, also known as fault codes. Once we connect the Mastertech VCI tool to the OBD (on-board diagnostics plug), usually found under the driver's side of the dashboard, we can wirelessly connect to the scan tool with a laptop computer to browse the vehicle's Powertrain, Chassis and Body Systems. Whereas a normal repair technician may be scanning a vehicle with a known reported issue, we are scanning to look for any fault codes that may indicate an issue that could have contributed to the particular collision we are investigating.

For example, we may find that a vehicle operator was operating a vehicle with an

'SRS/Air Bag' light illuminated on the dashboard. The vehicle operator may have complained that the air bags did not deploy and that the vehicle has a potential defect or recall, where our investigation could disprove this claim.



Another example might be that the 'service engine soon' or 'check engine' light was illuminated but the vehicle operator neglected to bring the vehicle in for service, resulting in the loss of vehicle control and a collision. Another serious negligent factor could be finding that the vehicle was operated while the 'brake light' was illuminated. Generally, the brake light indicates that more hydraulic brake fluid should be added to the system; however, there are other serious safety issues that could be related with the illumination of the brake light, such as a leak in the hydraulic system.

Upon discovering any diagnostic fault codes from our Bosch vehicle system scan, we can utilize the ALLDATA® resource to evaluate the codes as contributing factors to the incident or not. ALLDATA® is the leading provider of automotive repair information and solutions to the professional automotive service industry.

ALLDATA is a comprehensive, current, and factory-correct information resource for vehicles from 1982 to present including Technical Service Bulletins,

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maintenance schedules, manufacturer recall information and factory images and



diagrams. Thousands of professional repair and collision shops depend on ALLDATA for service and repair information, and now the Accident Reconstruction industry is benefiting from the service as well.

Rochon Engineering also utilizes the Bosch Crash Data Retrieval system to obtain pre-crash data from the various control modules within the vehicle. The Bosch Crash Data Retrieval Software and Hardware products support the retrieval of crash data from Airbag Control Modules (ACM), Roll-over Sensors (ROS) and Powertrain Control Modules (PCM). Vehicle coverage currently includes General Motors vehicles since 1994, Ford vehicles since 2001 and since December of 2007, Chrysler, which includes select older model vehicles beginning in 2004. Isuzu, Mitsubishi and Suzuki have also made available select retroactive models available for the download of crash data.

Recently announced, by 2010, under United States Code of Federal Regulations Title 49 Part 563, the

Department of Transportation has made a final ruling requiring that all EDR's installed in light vehicles must:

- Record a minimum set of specified data elements;
- Support a standardized recording format;
- Ensure the crash survivability of an EDR and its data; and,
- Requires vehicle manufacturers to ensure the commercial availability of the tools necessary to enable crash investigators to retrieve data from the EDR.

*We believe it would be prudent to secure as evidence, ALL MANUFACTURER'S VEHICLE CONTROL MODULES, as we believe within the next few years, all vehicle manufacturer's modules will be available for download, which will include many retroactive vehicle models. A little **forward thinking for backwards compatibility** may prove to be invaluable in the future.*

Jason M. Bayley, B. Eng., EIT

Mr. Bayley is an engineering graduate with Rochon Engineering Incorporated. He completed his Baccalaureate of Engineering, in Materials Science and Engineering, at McMaster University. Mr. Bayley specializes in motor vehicle accident reconstructions. Mr. Bayley has been trained at the renowned Institute of Police Technology and Management situated at the University of North Florida in Advanced Accident Reconstruction Methods.