

VEAR Services

Leading Edge Technologies

Software

- Multidimensional multi-vehicle reconstruction simulation
- Commercial vehicle braking efficiency
- Driver's perception/reaction time estimation
- Crush energy calculation
- Professional computer aided drafting
- Statistical simulation
- Linear and rotational momentum
- Mathematical photogrammetry

Hardware

- Scanning electron microscope
- Passenger car crash data retrieval
- Heavy truck event data retrieval
- ABS module diagnostics
- Powertrain control module diagnostics
- Total station laser mapping
- Accelerometer with data acquisition and logging
- GPS and inertial based accelerometer
- Digital photography
- High definition videography
- 42 inch wide plotter printer

Education and Training

- VEAR staff includes four Ph.D.s in the fields of engineering, physics and psychology
- Two licensed Professional Engineers
- Two graduate engineers
- Dedicated to continuous education in accident reconstruction methods through conference attendance, presentations and publications
- Three nationally accredited reconstructionists



Technologies for Accident Reconstruction

- HVE Simulation Software
- Black Box downloads
- Pressure transducers
- HP Tuners
- Powertrain Module
- Accelerex Accelerometer
- Braking System Tester
- AutoCad

Analysis:

- Computer Modeling
- Engineering Design
(Provided by Vista Engineering, LLC.)
- Design Evaluation
- Process Modeling
- Failure Analysis
- Fasteners (bolts, screws, rivets)
- Scanning Electron Microscopy
- Image Analysis, Digital Imaging and Chemical Evaluation
- Corrosion and Exposure Analysis and Testing

Mechanical Testing of Materials:

- Fatigue
- Creep
- Adhesion
- Tensile
- Compression
- Hardness
- Microhardness
- Shore
- Impact

“We stay years ahead so you stay a step ahead”

P 205.307.6543

P 888.323.VEAR (8327)

www.vearexperts.com



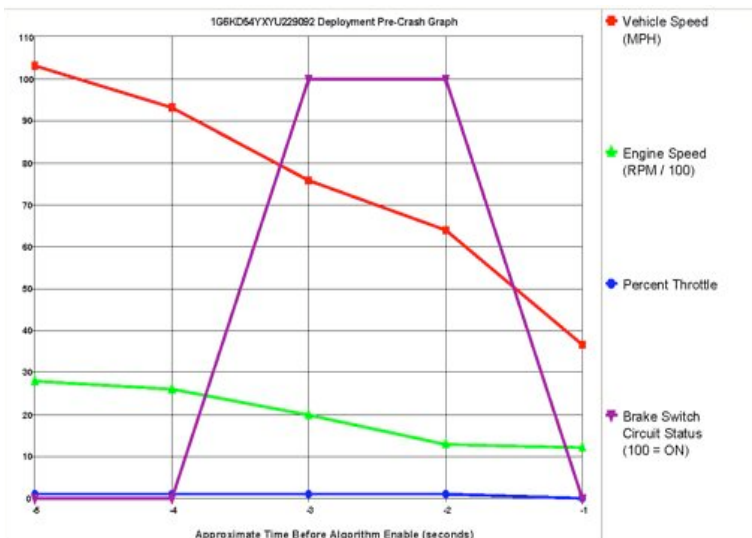
Event Data Recorder Downloads

Most on highway vehicles that are in use today have some form of Event Data Recorder (EDR), either in the engine control unit, powertrain control module or the airbag control module. Although some EDRs are not publicly accessible, VEAR has the training and equipment needed to safely harvest and evaluate data from all manufacturers that allow access to the data. This includes heavy trucks equipped with Detroit Diesel/Mercedes, Cummins, and Caterpillar engines and passenger cars manufactured by General Motors, Ford, and Chrysler.

You want relevant information from the abundance of data contained in an ECM data recorder such as speed, engine load, cruise control status, brake status, and fault code information. Some heavy trucks monitor over 100 different parameters. VEAR has expertise in both extracting event data as well as interpreting the data in relation to the events.

Experts are required to correctly extract information from event data recorders. Some will automatically reset data if the user is not properly trained. VEAR's staff has completed hundreds of successful downloads from every supported truck engine and passenger vehicle.

VEAR creates value for their clients through accurate data downloads for every commercially available event data recorder and the ability to relate that data to the events of the accident.



Downloading Capabilities

VEAR is factory trained by:

- Detroit Diesel/Mercedes
- Caterpillar
- Cummins
- Bosch/Vetronix
 - GM
 - Ford
 - Chrysler

VEAR has the software, hardware, and experience to access and read the Event Data Recorders built into those vehicles either in the lab or in the field.

“We are factory trained”

Factory trained by Bosch/ Vetronix since June 2000. VEAR experts purchased one of the first commercially available Crash Data Retrieval (CDR) units in April of 2000. A VEAR expert attended the first CDR Technician Instructor course in February 2006. Our staff includes certified CDR analysts and technicians.

VEAR has conducted downloads for attorneys, insurance companies, rental car companies, trucking companies, railroad companies and law enforcement. VEAR experts have interpreted downloads for district and state attorneys general and a judge advocate for the United States Marine Corps.

Event Data Recorder

Detroit Diesel (DDEC) and Mercedes Engines

DDEC software will extract data from Detroit diesel and Mercedes engine ECMs. When a “hard brake” event occurs (default setting for “hard brake” event is a change in wheel speed of 7 mph per second), data is captured for 1 minute before and 14 seconds after the event. Data captured includes vehicle speed, engine rpm, brake and clutch status, engine load, percent throttle, cruise control status, and diagnostic code status. Two hard brake events can be stored in memory.

Caterpillar Engines

Hard brake events are referred to as “quick stop” events. Once triggered, the time, date and a “snapshot” of all ECM recorded data of vehicle and engine condition at the time of the event are logged into the snapshot file of the ECM memory. The snapshot records data from 44 seconds before to 15 seconds after the event. VEAR will export this snapshot into an easily readable Excel format file.

Cummins

In the event of a sudden deceleration, data is captured from 59 seconds before to 15 seconds after the event. Data recorded includes vehicle speed, engine rpm, engine load, percent throttle, brake status, clutch status, cruise control status, and diagnostic code light status. The default setting is a change in wheelspeed of 9 mph per second. Up to three sudden decelerations can be stored.

Mack

Mack records event data for 15.8 seconds before an incident and 16 seconds after the incident. The data are reported in 0.2 second intervals. Mack utilizes two ECMs called a Vehicle Electronic Control Unit (VECU) and an Engine Electronic Control Unit (EECU). Data is currently only extractable by Mack and requires the removal of both ECUs from the vehicle and that they be shipped to Mack in Allentown, Pennsylvania at a cost of approximately \$2300 for the download.

Volvo

As of 2007, with the new D-16 engines, there is no incident data recorded in a Volvo engine. Volvo software will read engines back to 1998. The software will read fault codes, basic nameplate information (engine serial number, ECM and software versions) along with most parameter settings. Volvo has 2 ECU's; the Engine ECU and the Vehicle ECU.

ABS ECU

Veal also is equipped with the Model 4003 ABS-Expert™ Test System. This is a diagnostic tool for testing heavy-duty ABS, including hydraulics. The test system will test wheel speed sensors, ABS valves, ATC valves, retarder control, warning lights, and other components for most systems. Trailer diagnostics can also be performed.

Different manufacturer's systems can be tested including Meritor WABCO, Bendix, Bosch, TRW, and Haldex & Wabash (PLC).

We KNOW the Business

When a “hard brake” event occurs data is captured before and after the event. Data includes vehicle speed, engine rpm, brake and clutch status, engine load, percent throttle, cruise control status, and diagnostic code status.

“Trip” data is also recorded and is retrievable. The end of a “trip” is user defined by resetting the ECM trip memory. Examples of some of the many data recorded are hours in use, fuel used, fuel economy, maximum engine speed, idle hours, idle fuel, percent idle hours, average engine load factor, average speed and maximum speed.

Calibration data includes vehicle maximum speed; maximum cruise set speed, and vehicle speed sensor calibration. An audit trail tracks calibration changes and logs user identification. ECM clock information can also be recorded.

Heavy Truck EDR Factory Training

- Detroit Diesel/Mercedes
- Caterpillar
- Cummins

VEAR is committed to main-training the most current and up to date training, software and equipment in this continually evolving technology.



Site Mapping

VEAR uses advanced equipment to map your sites. By using its laser-based, reflectorless mapping station, accident sites can be documented to within 1/4 inch at a distance of 1000 feet.

Currently VEAR uses a laser equipped Sokkia SET530R3 map station with a maximum distance of 16,400 feet. Reflectorless technology allows us to set up on the side of a road, and measure evidence without standing in the road holding a target. We have shot points along the edge of the road almost a mile long to create a profile of the road.

A handheld data collector allows viewing the site drawing as it is being measured to help ensure accuracy and completeness.

Rendering

After a site is mapped, the data collector is downloaded and a scale drawing is rendered using AutoCAD, Autosketch, 3d Field, or MapScenes Pro depending on the circumstances.

Printing

The scale site maps can be printed on an HP DesignJet 800 PS plotter capable of producing maps 42 inches wide, and as long as necessary. The current record is 10 feet long.

Benefits

An accurately reproduced scale site map is vital to any accident reconstruction. The top down view of the site allows accurate measurement of relative distances within the site. The scale drawing can be used as demonstrative evidence, and is a necessary foundation for simulations and animations. Our experts have performed over 1000 mappings of scenes, vehicles, power lines, factory layouts, and sidewalks.

- laser equipped site mapping tools
- reflectorless distance of 1,150 feet
- maximum distance of 16,400 feet
- accuracy is ¼ inch in 1000 feet
- handheld pc data collector
- print maps 3 ½ feet x 10 feet long
- measurement of road profiles
- topographical contour maps

**“We will be there
when you need us.”**

24/7 availability

VEAR can be reached when you need us any time of the day or night. This pledge includes holidays and football weekends.

Emergency contact methods

Accidents don't keep a schedule on regular business hours. When you need service outside of business hours there is always an easy method to contact VEAR. Just call the number below.

205.307.6543
1.888.323.VEAR
205.427.1150

Plane

If the job is not close to home and you need us immediately we have a licensed pilot on staff and an airplane available to serve us.

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