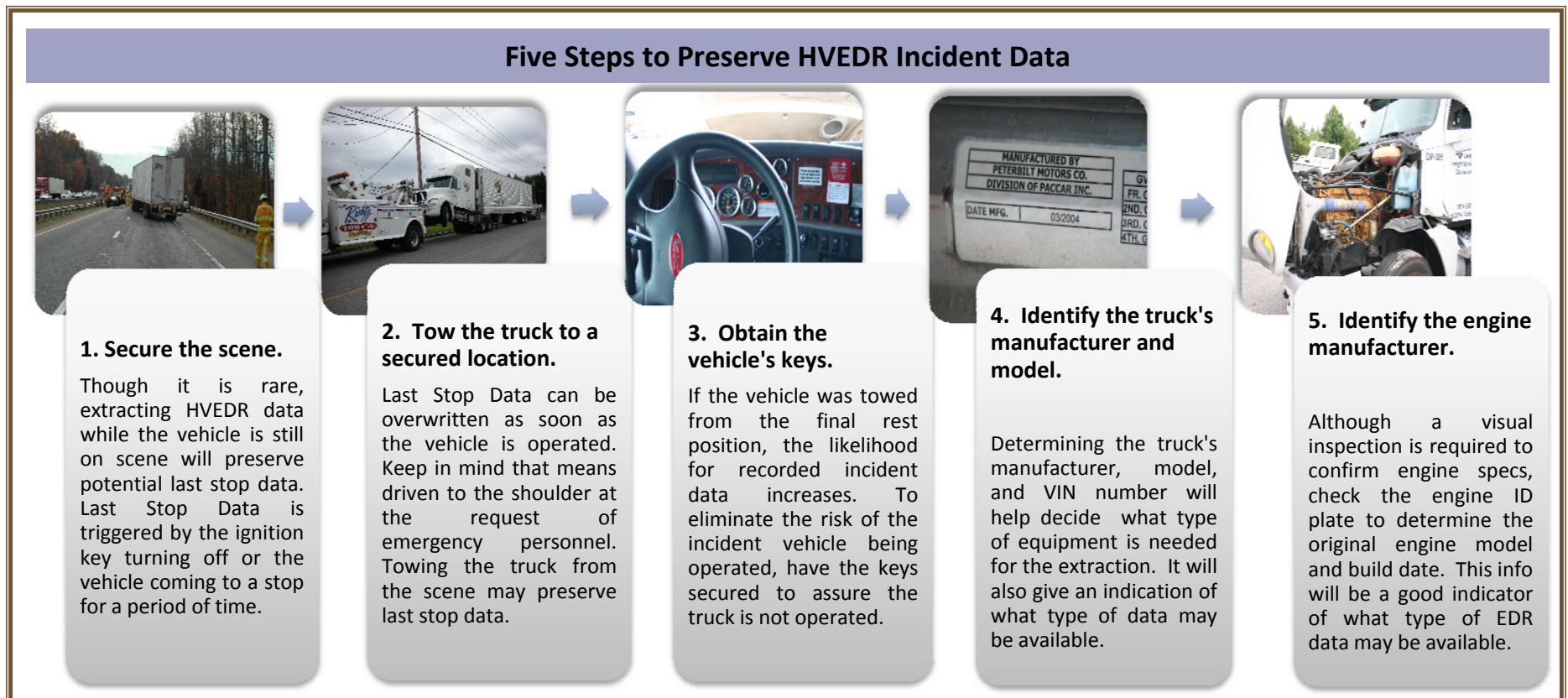


# LITTLE KNOWN SECRETS OF THE BLACK BOX: HVEDR DATA PRESERVATION STRATEGIES

As you will recall, our first e-mail familiarized you with HVEDR equipment and recording events. (For another look at that information, visit <http://deltavinc.com/elearning/little-known-secrets-of-the-black-box/>.) The purpose of this paper is to further explore HVEDR data, and more importantly, how to preserve and retrieve its valuable information.

## **Five Steps to Preserve HVEDR Incident Data**

The biggest challenge in dealing with HVEDR data is preserving it until the data extraction can be completed. It is important to remember that while the vehicle is in operation, its ECM is constantly receiving and recording new data from vehicle sensors, switches and networks. As the ECM stores the new data, it may overwrite the oldest data including potential incident triggered recordings. Therefore, prompt attention to the five items listed below is critical to preserving incident related data.



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## Three Extraction Methods for HVEDR Incident Data

Accessing the incident data via manufacturer specific hardware and software is called a data extraction or download. The three most commonly performed methods for HVEDR data extractions include **Incident Truck**, **Surrogate Truck**, and **Bench-Top** downloads. Each technique requires specialized cables, an equipped laptop, and engine manufacturer specific software to harvest the data.

### Three Extraction Methods for HVEDR Incident Data

#### Incident Truck

This method is performed by plugging into the involved vehicle's EDR. Again, it is extremely important that the incident truck not be driven until the extraction is complete.



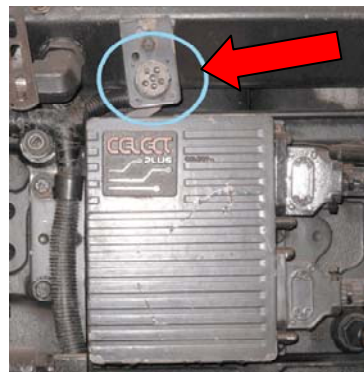
The above photo shows a laptop plugged into the under-dash mount connection. (Photo courtesy of Northwestern University CPS.)

**Pros to this method:** Logistically convenient. Module is not removed from vehicle making this method the least risky.

**Cons to this method:** Vehicle must remain out of operation until extraction is performed. Heavily damaged vehicle may prohibit connection.

#### Surrogate Truck

In this extraction, the EDR is removed from the incident vehicle and stored until the download is performed. During the time of data retrieval, the module is placed on a surrogate truck for power during the extraction.



The above photo shows an ECM port found inside of the engine compartment of the truck. (Photo courtesy of Northwestern University CPS.)

**Pros to this method:** Less time sensitive because the module has been stored. Can be performed when incident vehicle is damaged.

**Cons to this method:** Surrogate vehicle must have similar specs to the incident vehicle.

#### Bench-top

Like the previous extraction, this method requires the EDR be removed from the incident vehicle although, no vehicle is required during this extraction. The HVEDR plugs directly into laptop during the download.



The photo above demonstrates a bench-top download. (Photo courtesy of Northwestern University CPS.)

**Pros to this method:** Modules can be shipped to extractor's location.

**Cons to this method:** May not download diagnostic trouble codes or fault codes. May require additional hardware to complete the extraction.

# LITTLE KNOWN SECRETS OF THE BLACK BOX: HVEDR DATA PRESERVATION STRATEGIES

## HVEDR Data Availability – Other Determining Factors

HVEDR features, defaults, settings, and limitations are dependent on the following three things: Engine Manufacturer, Engine Build Date, and Operator Settings. Therefore, these three factors will also have a huge impact on the availability of incident data.

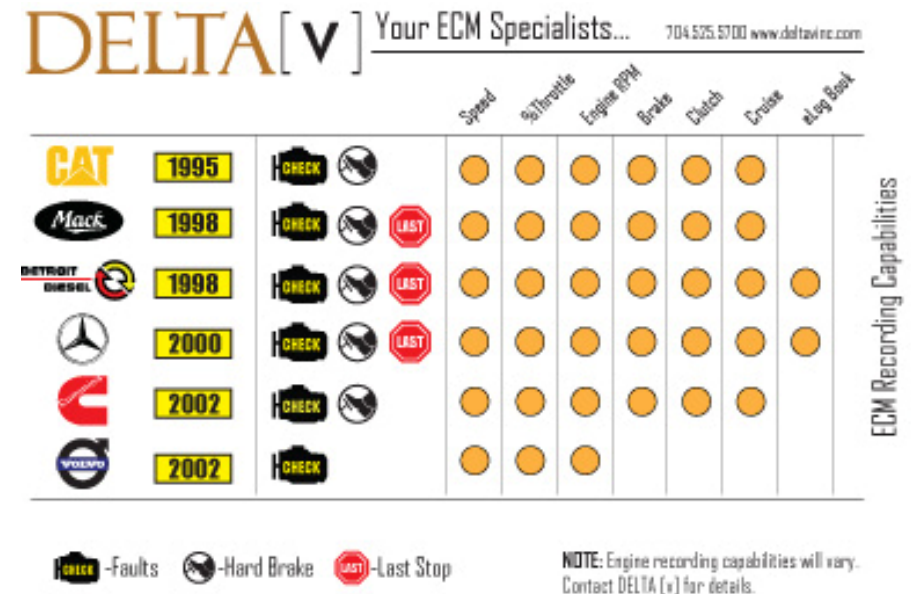
### **Engine Manufacturer**

As previously stated in this series, the type of data your vehicle contains is influenced by the recording capabilities of the engine. We will cover each engine manufacturer in great detail in future e-mails. For now, remember that the *truck's* manufacturer may help determine the equipment type. The table below outlines the most commonly installed engine for each truck model.

| Truck Model w/ Most Common Engine Manufacturer |   |
|--|---|
| Truck/Tractor                                  | Most Common Engines                                 |
| Freightliner                                   | Caterpillar, Cummins, Detroit Diesel, Mercedes-Benz |
| International (Heavy Duty)                     | Caterpillar, Cummins, International                 |
| International (Medium Duty)                    | International                                       |
| Kenworth                                       | Caterpillar, Cummins                                |
| Mack   | Mack, Cummins                                       |
| Peterbilt (Heavy Duty)                         | Caterpillar, Cummins                                |
| Peterbilt (Medium Duty)                        | Paccar  |
| Sterling (Heavy Duty)                          | Detroit Diesel, Mercedes-Benz, Caterpillar          |
| Sterling (Medium Duty)                         | Cummins, Mercedes-Benz                              |
| Volvo  | Volvo, Cummins                                      |
| Western Star                                   | Detroit Diesel, Mercedes-Benz, Caterpillar          |

### **Engine Build Date**

Event data recording technology has greatly advanced in recent years. The yellow number in the graph below represents the year each engine manufacturer introduced its EDR technology.



### **Operator/Fleet Settings**

Most HVEDR equipment has pre-programmed defaults set by the manufacture, although the user/operator does have the ability to manually change many of the standard settings. User modifications made to the HVEDR default settings can influence the recorded incident data.

### **Conclusion**

All heavy vehicles have data recording capabilities. Carefully employed strategies will ensure that if your vehicle contains *incident-specific* data, it is properly preserved and extracted.