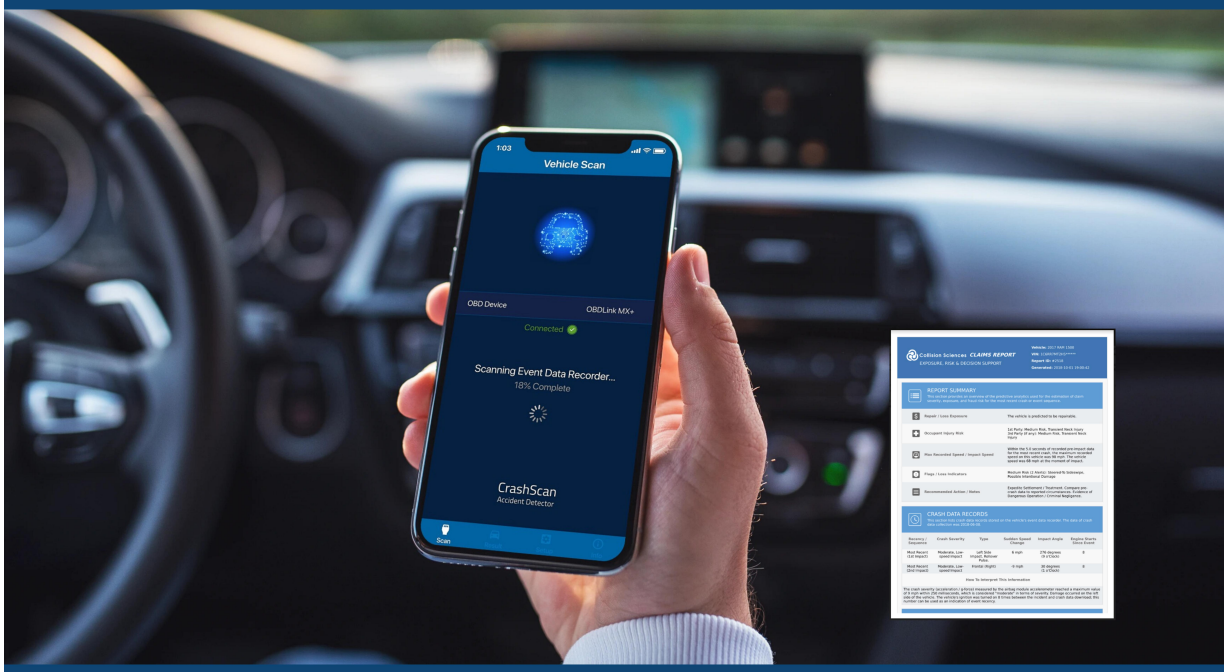
# THE FUTURE OF CLAIMS INVESTIGATIONS

Collision Sciences

EDR-TO-CLOUD DATA SCIENCE
NARRATIVE REPORTS & ENGINEERING SUPPORT

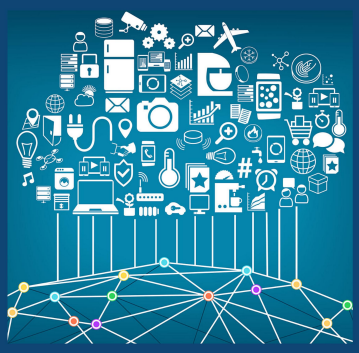



## BETTER DATA. BETTER OUTCOMES.

WE EMPOWER INSURERS TO RETRIEVE AND ANALYZE
"BLACK BOX" EDR DATA FOR EVERY COLLISION

START SOLVING CLAIMS WITH SCIENCE TO IMPROVE
FRAUD AND LIABILITY OUTCOMES







The Future of Claims Investigations

CrashScan EDR Tool, Contextual EDR Reports & Engineering Support

**Better Data. Better Case Outcomes.**

*Collision Sciences Inc. (CSI) is a global technology and information provider that enables organizations significant financial and operational benefits through scaled access and intelligent application of vehicle "black box" pre-crash data, biomechanical injury severity risk data, diagnostic repair data, and reconstructed motor incident data.*

## Summary


- ❑ **Key Links & Resources**
- ❑ **Collision Sciences Team**
- ❑ **Overview of Available Data**
- ❑ **Process, Implementation**
- ❑ **Sample Reports & Data**
- ❑ **FAQ & Pricing**
- ❑ **Next steps**


## Key Links & Resources

**Purchase EDR Kit.** Should you be interested in an EDR Kit, one can be purchased with a credit card at this link: https://secure.collisionsciences.ca/info/buy_edr_field_kit

**Purchase EDR Direct-to-Module Lab Kit.** Should you be interested in an EDR Kit, one can be purchased with a credit card at this link: https://secure.collisionsciences.ca/info/buy_edr_lab_kit

**Resource Material**. Sample EDR reports, a sample EDR consent/authorization form, a Chain of Custody form, and free EDR Training Course material (including certification) can be found in our shared resources folder at this link here.

## Collision Sciences Team

We are a team of technical Automotive Engineering, Accident Reconstruction, Cloud Security, Software Engineering, and Data Science experts. Our aim is to provide easy and cost-effective access to EDR data - and contextualize the information for expedited and easy case handling.

We have global partners in the USA, UK, Europe, South Africa and Australia. We can connect you with a local partner for additional support, based on time zone or regional language, if required.

If you have any technical questions when in the field, or about report data, please feel free to contact us at support@collisionsciences.ca or 1.877.363.1996.

## Overview of Report Data

**What is EDR (Event Data Recorder) crash data?**

EDR (Event Data Recorder) data is crash data stored on the airbag module, following a sensed and triggered vehicle crash event. Data varies by vehicle but typically includes 5.0 seconds of pre-crash data (vehicle speed, brake and accelerator pedal use, steering), crash recency (via ignition cycles, mileage or date/time), and severity (impact direction, g-forces), number of occupants and seatbelt use, and more.

**What data points are available?**

EDR supported vehicles can record the following raw data:

- Crash event list: up to six (6) crash events, including crash event order, severity (Delta-V) and crash pulse time, type of impact (ex. front/rear (longitudinal), side (lateral), and recency (based on mileage, ignition cycles since the event, and/or date/time of collision event), note some makes only record up to 2 events
- Pre-Crash Data sets (55 to 75 data points per record) - raw data points include vehicle wheel speed, brake pedal use (on/off), accelerator pedal use (%), steering (degrees), and engine speed (rpm), anti-lock brake activation, gear position
- Seatbelt Use, Airbag Deployment, and Occupancy Status
  *certain data points vary by make and region

In addition to raw EDR data, we provide the following **contextual** information:

- Crash event records organized and provided with contextual data, including: crash events ordered in table format, added severity context (minor, moderate, severe), calculated forces (g-force) and calculated direction of impact (Ex. left front, 12 o'clock)

- Calculated “reconstruction-type” pre-crash data points include: vehicle deceleration (g-force's) and braking force level (light braking, emergency braking), steering direction (degrees AND left/right direction), distance to impact (rough estimate)
- 1st & 3rd Party Statistical Injury Risk Analysis (Biomechanical / Epidemiological Data), data science links Delta-V to EDR studies on injury risk
- Potential Fraud Flags via algorithmic analysis of the pre-crash data (such as staged accidents)
- Liability Flags (driver speeding, distracted driver, avoidance opportunity)
- Vehicle Health Diagnostics (Engine and Transmission module DTCs (Diagnostic Trouble Codes), Emissions Test failure flags, Enhanced Vehicle Diagnostics (DTCs), including code definitions where possible
- Freeze Frame Data for some DTCs if supported by the OEM (Ex. Indicated Vehicle Speed at time DTC was set, Distance Travelled since DTC was set)
- Diagnostic Safety Codes (Brakes, Tires, Steering, etc.)
- DTC-based Repair and Cost information
- Recall Information & Insurance Institute for Highway Safety (IIHS) Safety Flags
- Vehicle Market Value, based on recent historical (USA market data)
- Vehicle Specifications, such as vehicle weight
- VIN History (CARFAX-like data), including salvage/junk records (USA market)

**Which vehicles are supported?**

In North America, over 95% of vehicles on the road today are equipped with EDRs and CrashScan supports them all, with very few exceptions. Internationally, EDR support is approximately 50%-60%. Online Vehicle Support Lookup

The CrashScan App is the most universal EDR software on the market, and includes support for certain vehicle brands in which there is no other commercially available EDR tool available, notably Jaguar-Land Rover in the USA (and internationally), as well as international models of Ford, Mazda, Hyundai, Kia, and GM.

CrashScan support varies by region, but generally includes vehicles which require a pin-changing adapter, using our OBD Switch included in the EDR kit). CrashScan does not support the old Ford PCM (Powertrain Control Module) data retrieval, where a powered-adapter is required. Note that PCM data can be overwritten if the vehicle is driven following the collision.

A complete geographic and model-based EDR vehicle support lookup is available in the app and online via our website at this link here.

## Process & Implementation Details

Process work that may need to be solved:

- ❏ **Authorization - 1st and 3rd party**

  Please note that in the USA, the Data Privacy Act of 2015 requires that the owner or lessee of the vehicle provide consent for access to the EDR. As a best practice, it is recommended that owner authorization be collected. End-users of CrashScan are prompted in-app to confirm that they are meeting any local regulatory requirements prior to proceeding with the EDR data retrieval. A sample authorization form can be provided upon request. A sample release form can be found in our resources at this link here.

- ❏ **Admissibility, Chain of Custody**

  EDR data has been admissible in court since 1996 and requires an expert to testify to its application to the case. Collision Sciences can testify and/or provide affidavit or witness statements on matters relating to the chain of custody, with respect to raw hex data.

  Collision Sciences also offers free EDR Training course material which includes certification, to help those in preparation for testimony. The training information can be found in our resources at this link here.

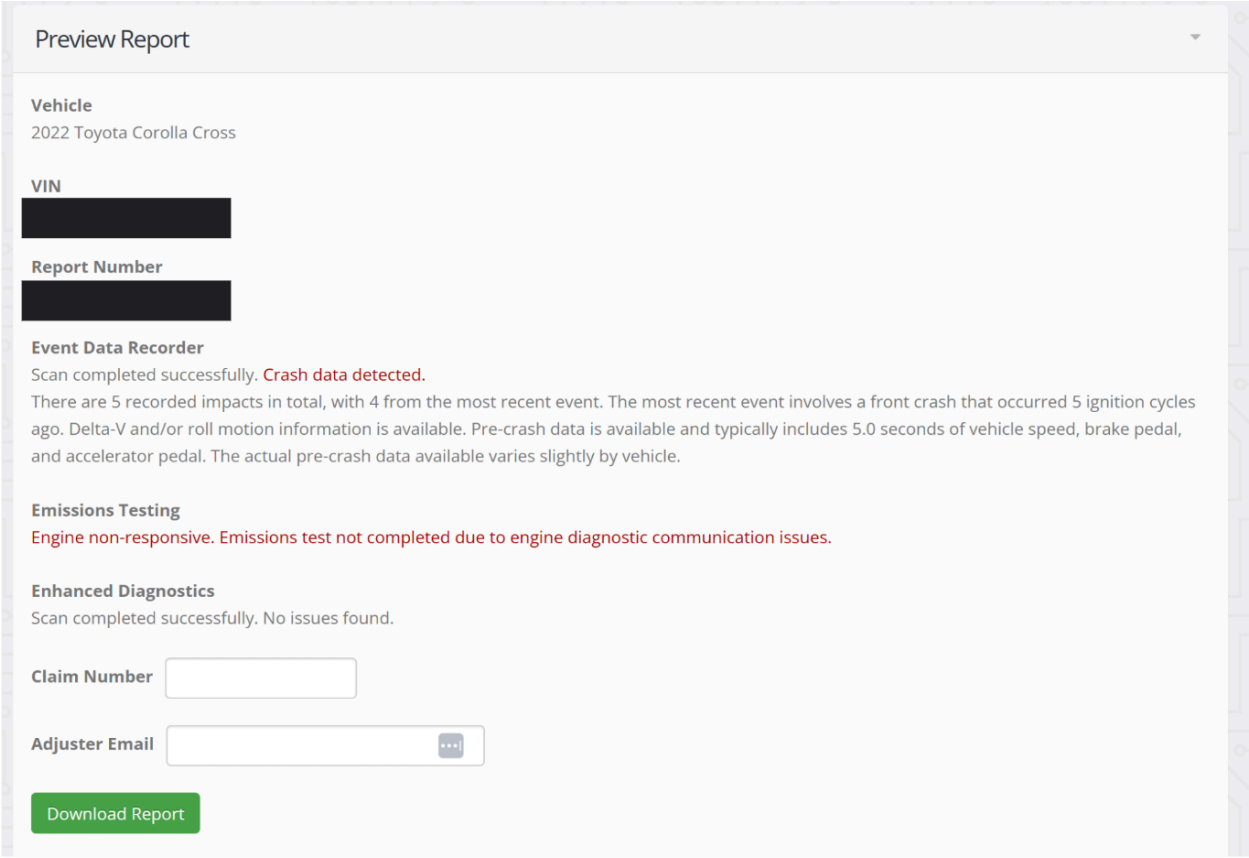
## Why use Collision Sciences?

The CrashScan solution is unique for a number of reasons:

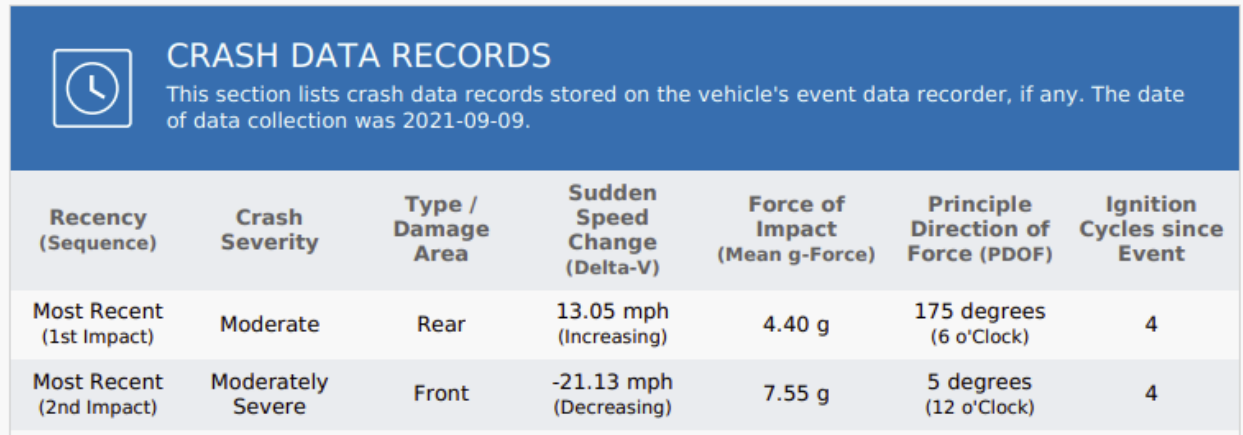
- Affordable Bluetooth OBD hardware and simple “one-button press” mobile app
- Unlimited and customizable user registration at no additional cost
- The CrashScan mobile app is the most universal EDR solution, providing support for vehicles not supported by other EDR tools; support includes Hyundai, Kia, Jaguar-Land Rover, and some international Ford and Mazda models
- The report format is contextualized, easy to read, and includes calculations and data organization. The report format can save even trained EDR analysts hours of effort, especially for complicated to interpret raw EDR reports, especially reports with multiple crash events
- The reports are customizable and inclusive of additional aggregated data
- The report fees are inclusive of engineering support by phone/email (for answering general questions, support for field user troubleshooting, and helping users understand the data as it relates to the case.
- Raw data reports (Discoverable Evidence Files) can be provided upon request

## Sample Report Data

**Preview Report Example.** Below is a sample of data that may be provided on a web page, prior to report purchase:




**Crash Event Organization Example**. Below is an excerpt of how the Collision Sciences report provides the crash data records in an easy-to-read and contextual format:



### CRASH DATA RECORDS

This section lists crash data records stored on the vehicle's event data recorder, if any. The date of data collection was 2021-09-09.

| Recency (Sequence) | Crash Severity | Type / Damage Area | Sudden Speed Change (Delta-V) | Force of Impact (Mean g-Force) | Principle Direction of Force (PDOF) | Ignition Cycles since Event |
|---|---|---|---|---|---|---|
| Most Recent (1st Impact) | Moderate | Rear | 13.05 mph (Increasing) | 4.40 g | 175 degrees (6 o'Clock) | 4 |
| Most Recent (2nd Impact) | Moderately Severe | Front | -21.13 mph (Decreasing) | 7.55 g | 5 degrees (12 o'Clock) | 4 |

*Samples of our full contextual EDR reports can be found in our shared resources folder at this link here.

**Pre-Crash Data Example**. Below is an excerpt Below is an excerpt of how the Collision Sciences report provides the pre-crash data table in an easy-to-read and contextual format, and includes derived/calculated data, such as steering direction, deceleration and distance to impact:

## PRE-CRASH DATA / Most Recent (2nd Impact)

This section lists pre-crash data records stored on the vehicle's event data recorder.

| Recorded Vehicle Data | | | | | | Derived Data | |
|---|---|---|---|---|---|---|---|
| Time Before Impact (sec) | Vehicle Speed (mph) | Engine RPM (Motor RPM) | Accelerator Pedal (%) | Steering Angle (deg) | Brake Status | Deceleration (g) | Distance to Impact (feet) |
| -5.00 | 68 | 1800 (1800) | 0.0 | 0.0 (Straight) | Off | N/A | 330.8 |
| -4.50 | 66 | 1900 (1800) | 0.0 | 0.0 (Straight) | On | -0.1 (Light) | 281.6 |
| -4.00 | 62 | 1700 (1600) | 0.0 | 0.0 (Straight) | On | -0.5 (Moderate) | 234.7 |
| -3.50 | 55 | 1300 (1500) | 0.0 | 0.0 (Straight) | On | -0.6 (Moderate) | 191.8 |
| -3.00 | 49 | 1200 (1300) | 0.0 | 0.0 (Straight) | On | -0.6 (Moderate) | 153.6 |
| -2.50 | 43 | 1200 (1300) | 0.0 | 0.0 (Straight) | On | -0.6 (Moderate) | 119.8 |
| -2.00 | 34 | 1200 (1400) | 0.0 | 0.0 (Straight) | On | -0.8 (Hard) | 91.6 |
| -1.50 | 25 | 1300 (1300) | 0.0 | 2.5 (Straight) | On | -0.8 (Emergency) | 69.9 |
| -1.00 | 34 | 1300 (2600) | 0.0 | 10.0 (Straight) | Off | N/A | 48.5 |
| -0.50 | 33 | 2200 (2200) | 0.0 | 45.0 (Left) | Off | -0.1 (Light) | 24.2 |
| 0.00 | 33 | 2200 (2400) | 0.0 | 62.5 (Left) | Off | 0.0 (Light) | 0.0 |

*Samples of our full contextual EDR reports can be found in our shared resources folder at this link here.

## FAQ & Pricing

We offer cost-effective hardware and offer EDR reports on-demand, on a pay-per-report basis, which includes consultation on the data if required. Unlimited company users may be registered.

Our **EDR kit cost** is a one time fee of **$200 USD** and includes the OBDLink MX+, a soft carrying case and 1-foot OBD extender, an OBD Switch (OBD pin changing device), and includes shipping cost (worldwide). The OBDLink accessories are recommended so the OBDLink tool is protected and not misplaced, or left behind in a vehicle.

> An EDR Kit can be purchased with a credit card at this link here:
>
> https://buy.stripe.com/dR6cN58Qu1w7bnO6or




The EDR Kit also now includes an “OBD Switch” pin-changing adapter which adds support for select Alfa Romeo, Fiat, Jeep, Maserati and RAM vehicles. For more information on usage and vehicle support, see here: https://secure.collisionsciences.ca/info/obd_switch_guide




*“OBD Switch” pin-changing adapter (attached between yellow cable and OBDLink)*

**Vehicle scans are free**. Following a vehicle scan, you receive a confirmation email with links to access the report. You will be provided a **free web-based preview** of the data as shown above.

If the full **contextual EDR report** is desired, there is an e-commerce checkout (payment by credit card) in the scan confirmation email. The fee is **$350 USD**, which includes a quality review from our engineering team and email/phone support on any follow-up questions relating to the data. Reports are emailed on the same or next day, often within 2 minutes to 20 minutes during normal business hours. If you require supplemental raw data following the use of the CrashScan App, please contact us at support@collisionsciences.ca.

Under this model, you may freely preserve crash data for any vehicle, even if you own other EDR tools. This means that you can use CrashScan as a backup system and companion tool for your other EDR tools. CrashScan has worked on numerous vehicles where the other systems have failed to make 3 successful imaging passes in the field (Ex. Dodge Caravan culprits, and others). Further, should you retrieve a complicated report with multiple crash events, you’ll have the opportunity to purchase our organized contextual report on-demand, to save you time in data analysis, organization, calculation, research and reporting.

**CrashScan Direct-to-Module Lab Kit (Add-on Hardware)**

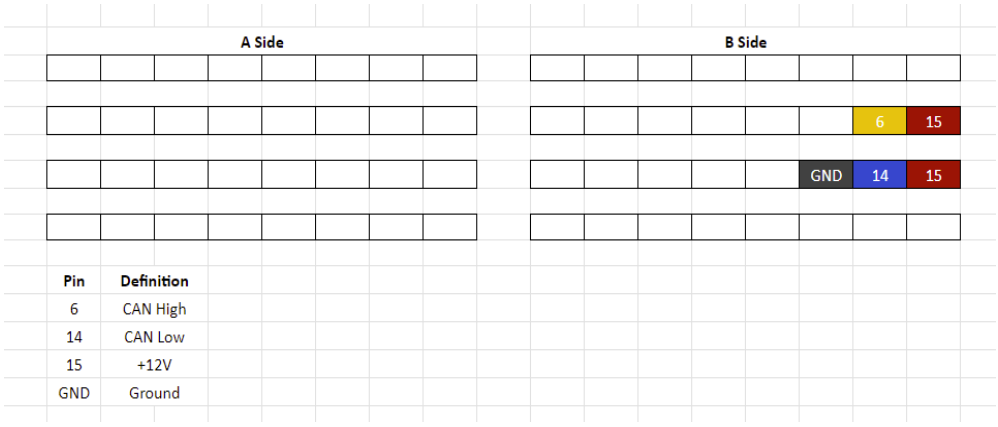
We offer a Direct-to-Module EDR Lab kit which will support most vehicles and eliminate the need for Direct-to-Module cables (i.e. the many cables that cost ~$275 USD each). The Kit fee is a one-time cost of **$1000 USD.** This Direct-to-Module Kit requires the OBDLink MX+ Bluetooth device (from the $200 USD CrashScan EDR Field Kit).




*CrashScan Direct-to-Module EDR Kit*

**Purchase EDR Lab Kit.** Should you be interested in an EDR Kit, one can be purchased with a credit card at this link: https://buy.stripe.com/5kAaEX1o2eiTdvWeUZ

The CrashScan Direct-to-Module Add-on is provided with a resource of information which will be supplied following purchase. The information guides the user to know which pins to attach the cables from the CrashScan Direct-to-Module EDR Kit, so that CrashScan software can be run on the module directly. A Sample of this information is below:




| Pin | Definition |
|---|---|
| 6 | CAN High |
| 14 | CAN Low |
| 15 | +12V |
| GND | Ground |

Note that this lab kit will not support all vehicle modules for all supported vehicles on our support list. If there are any issues with performing a direct-to-module scan that could be supported, Collision Sciences can assist by having you ship the module to our lab for processing.

Note that international (non-American) Mercedes modules; these Mercedes modules must be shipped to our Australia Lab for EEPROM processing. See Additional Services noted below.

## Next Steps

**Purchase EDR Kit.** Should you be interested in an EDR Kit, one can be purchased with a credit card at this link: https://buy.stripe.com/dR6cN58Qu1w7bnO6or

**Purchase EDR Direct-to-Module Lab Kit.** Should you be interested in an EDR Kit, one can be purchased with a credit card at this link: https://buy.stripe.com/5kAaEX1o2eiTdvWeUZ

**App Login**. After the purchase of an EDR Kit, our team will register you with a login for the CrashScan App. You will receive an email “Welcome to CrashScan” with instructions to get started. This brief setup video and other intstructions will be sent along with the registration email.

**Training Material**. We offer free EDR Training Course material and a certification which can be found in our shared resources folder at this link here.

A link to the certification course can be found on the last training slide, or directly here: https://secure.collisionsciences.ca/info/online_exam

## Additional Services:

**In-Lab EDR Module Processing (Canada)**

Collision Sciences' Labs Canada offers direct-to-module EDR data processing on a success fee. We will attempt to retrieve data, and will only charge a fee if the vehicle module can be successfully imaged and an EDR report can be provided. There is no fee for modules that are determined in-lab to be unsupported. We provide a report for **$350 USD**, based on this success fee. If the module requires return to sender, a fee of **$150 USD** fee applies, which is to cover the shipping cost and our time/coordination for evidence handling, including visiting the post office.

If you plan to ship us a module, please complete this Evidence Tracking Form here (and print and include the form in the shipping package:
https://collisionsciencesaustralia.snapforms.com.au/form/chain-of-custody-tracking-form-csi

**In-Lab non-American Mercedes EDR Module Processing (Australia Lab)**

For Mercedes EDRs shipped to our Australia Lab, we will similarly attempt to retrieve and process data on a success fee, and will only charge if the vehicle module's memory can be successfully imaged and an EDR report can be provided. We provide a specialized Direct-to-EEPROM lab service and EDR report for **$2250 AUD (approx $1500 USD)**. If the module requires return to sender, an additional fee applies and will be confirmed prior to invoicing. If you plan to ship an international Mercedes module, please complete this Evidence Tracking Form here (and print and include the form in the shipping package:
https://collisionsciencesaustralia.snapforms.com.au/form/chain-of-custody

## Technical Support:

For vehicle troubleshooting, or if you have a question about a report, please feel free to contact:

**1877-363-1996**
support@collisionsciences.ca

If you require supplemental raw data following the use of the CrashScan App, please submit a request to support@collisionsciences.ca.