

GEOTAB

management by measurement

Accident Reconstruction



Accident Reconstruction: Overview

- + How to find the necessary data to digitally reconstruct an accident
- + What the data means and how to interpret it
- + How to view the accident on the map

Why is Accident Data important?

- + Understand what the driver was doing
- + What actually happened to the vehicle
- + Very important with court cases, and insurance

Introduction

- The GO device will detect an “accident level event” when a vehicle collision occurs and the accelerometer threshold exceeds 2.5G (front or back, or side to side)
- During this “event” the GO device will record second-by-second data of the accident at 100 Hz frequency.
- This data is automatically transmitted to MyGeotab for interpretation.



What types of data are sent during an Accident Level Event?

What exactly is sent?

The main sets of data sent are:

- + Latitude, longitude
- + Speed
- + Accelerometer
- + Other sets of data normally recorded, such as Engine Data, Auxiliary information etc. can be used in conjunction with this data to reconstruct the accident



How do I interpret Accident Data?

- There are various tools available within MyGeotab that can be used to interpret the raw data from the device.
- In this document we will review these different tools.
- For illustration purposes, the information below comes from reconstruction of a real accident:

Case Study: Front end Collision

Accident Reconstruction: Key Reports

- + Trips History
- + Accident and Log Data
- + Engine Measurements
- + Speed Profile
- + Exception Report

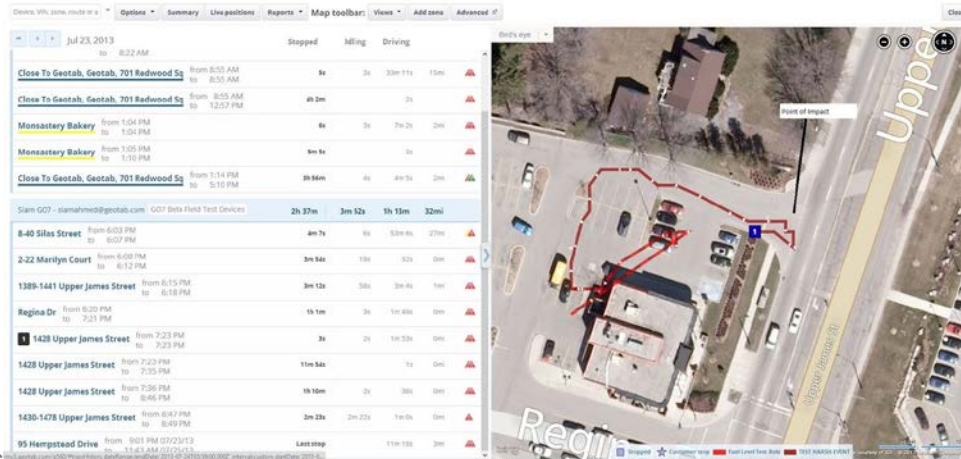
Case Study: Front End Collision

Step 1: View on Map

The first step to reconstructing accident data is to view the accident in the vehicle's trips history.

This can be done by clicking on Map > Trips History [report](#)

+ Specify the vehicle, and choose the date and the time of the accident



Case Study: Front End Collision

Step 2: Log data

- The Log Details and Accidents report (Drivers and Activity > [View Accidents and Log Data](#)) shows the individual logs as they are reported by the device
- Look for the timestamp of the 'accident level detection'
- Note that, by default, accident level detection occurs whenever the GO device accelerometer reading exceeds **2.5 G** in any direction.

Timestamp	Record Value	Reason for the record	Record Type
1:26:57 pm	Forward:-0.87 G Right:-2.55 G Up:0.38 G	Acceleration	EngineStatusRecord
1:26:57 pm	Forward:-1.72 G Right:0.53 G Up:2.04 G	Acceleration	EngineStatusRecord
1:26:57 pm	Forward:-0.79 G Right:0.48 G Up:1.41 G	Acceleration	EngineStatusRecord
1:26:57 pm	Forward:-0.46 G Right:0.26 G Up:0.44 G	Acceleration	EngineStatusRecord
1:26:57 pm	Forward:-1.54 G Right:0.21 G Up:1.65 G	Acceleration	EngineStatusRecord
1:26:58 pm	27 mph GPS Coordinates: 43.4492912, -79.7043991		GpsRecord
1:26:58 pm	27 mph GPS Coordinates: 43.4492912, -79.7043991		GpsRecord
1:26:58 pm	Forward:-0.3 G Right:0.22 G Up:0.56 G	Acceleration	EngineStatusRecord
1:26:58 pm	Reason for the record: ALERT: Reason limit for acceleration exceeded		EngineFaultRecord
1:26:58 pm	Forward:-0.32 G Right:0.24 G Up:0.62 G	Acceleration	EngineStatusRecord
1:26:58 pm	Forward:-0.58 G Right:0 G Up:0.87 G	Acceleration	EngineStatusRecord
1:26:58 pm	Forward:-0.85 G Right:0 G Up:1.22 G	Acceleration	EngineStatusRecord
1:26:58 pm	Forward:-0.46 G Right:0 G Up:0.85 G	Acceleration	EngineStatusRecord
1:26:58 pm	Forward:-0.68 G Right:0 G Up:1.06 G	Acceleration	EngineStatusRecord
1:26:58 pm	Forward:0 G Right:0 G Up:1.26 G	Acceleration	EngineStatusRecord
1:26:58 pm	Forward:0.18 G Right:0 G Up:1.21 G	Acceleration	EngineStatusRecord
1:26:58 pm	Forward:0 G Right:0 G Up:1.09 G	Acceleration	EngineStatusRecord

Case Study: Front End Collision

Understanding Accelerometer Data

There are two types of Accelerometer Data:

- 1) 'Acceleration Side to Side':
 - a) **Negative** values represent acceleration to the **right**
 - b) **Positive** values represent acceleration to the **left**
- 2) 'Acceleration forward or braking'
 - a) **Positive** value represents **forward** acceleration
 - b) **Negative** represents **backwards** acceleration

Case Study: Front End Collision

Step 3: Accelerometer Graph

The accelerometer graph is a useful tool that can be used to determine the direction from which the vehicle was hit and the relative force exerted in each direction due to the collision.

This information is available by going to Engine & Maintenance > Engine Data > [Engine Measurements](#).



Case Study: Front End Collision

Speed Profile

The Speed Profile is a great tool that shows **vehicle speed** vs. **time**.

- This can be used to accurately determine the speed of the vehicle in question at the time of the accident.

This can be done by clicking on Activity > [Speed Profile](#).

Below is the Speed Profile of the vehicle before, during, and after the accident.



Case Study: Front End Collision

RPM

- The RPM is important in determining if the driver attempted to avoid the accident
- Engine RPM can supplement information in the 'Speed Profile'.

Exceptions Report

Use the [Exceptions](#) report to find the exact Accelerometer value that broke the threshold ($2.5G = 25\text{m/s}^2$)

The screenshot shows the FleetLocate web interface. On the left is a navigation sidebar with options: Getting Started & Help, Dashboard, Map, Vehicles, Activity, Engine & Maintenance, Zones & Messages, Rules & Groups, Rules, Exceptions (highlighted), Groups, and Administration. The main content area is titled 'Exceptions' and shows a 'Possible Accident' event. The event details include the date '05/13/15' and three accelerometer samples from '05/13/15' at '1:26:57 pm' from the location '0mi Dorval Dr, Oakville, Ontario, L6M 3E5, Canada'. Each sample shows three acceleration values in m/s².

Possible Accident			
Accident Sample			
05/13/15:			
1:26:57 pm	0s	0mi Dorval Dr, Oakville, Ontario, L6M 3E5, Canada	-37.51 m/s ² (-25.00 m/s ²), -27.14 m/s ² (-25.00 m/s ²)
1:26:57 pm	0s	0mi Dorval Dr, Oakville, Ontario, L6M 3E5, Canada	-67.38 m/s ² (-25.00 m/s ²), -26.39 m/s ² (-25.00 m/s ²)
1:26:57 pm	0s	0mi Dorval Dr, Oakville, Ontario, L6M 3E5, Canada	-67.38 m/s ² (-25.00 m/s ²), -26.39 m/s ² (-25.00 m/s ²)

Conclusion

- + Driver was speeding (Driving above speed limit)
- + Driver was overrevving the Engine
- + Did attempt to avoid the accident (we see both Braking and turning towards the right to avoid the accident)
- + There were some fault codes that came up after the accident