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NHTSA

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February 2025

Special Crash Investigations: On-Site Rollover Crash Investigation; Vehicle: 2018 Honda Pilot EXL; Location: Florida; Date: June 2022

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15. Supplementary Notes

Each crash represents a unique sequence of events, and generalized conclusions cannot be made concerning the crashworthiness performance of the involved vehicles or their safety systems. This report and associated case data are based on information available to the Special Crash Investigation team on the date this report was submitted.

16. Abstract

This on-site investigation documents the roadway departure/rollover crash of a 2018 Honda Pilot EXL in Florida in June 2022 when a belted 47-year-old female drove through a T-intersection and departed the roadway. The Honda traveled through a drainage ditch, striking the edge of a concreate sidewalk at the top of an embankment. This non-horizontal impact deployed the driver's frontal air bag, the driver's outboard seat-mounted side-impact air bag, and the driver's inflatable curtain air bag and started a slight clockwise rotation leading to a left-side-leading rollover event that deployed the passenger's outboard seat-mounted side-impact air bag and the passenger's inflatable curtain air bag. The Honda rolled a total of five-quarter turns and came to final rest on its left side. The driver was transported by ambulance to a nearby medical facility with police-reported incapacitating (A-level) injuries.

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Special Crash Investigations
On-Site Rollover Crash Investigation
Case Number: CR22012
Vehicle: 2018 Honda Pilot EXL
Location: Florida
Crash Date: June 2022

Background

This on-site investigation documents the roadway departure/rollover crash of a 2018 Honda Pilot EXL (Figure 1). The crash sequence developed as the belted 47-year-old female drove the Honda while traveling east on a highway exit ramp that came to a T-intersection. The Honda proceeded through the intersection and departed the roadway. It traveled through a drainage ditch, striking the edge of a concrete sidewalk at the top of an embankment with the front bumper's lower valance (Event 1). This non-horizontal impact deployed the driver's frontal air bag, the driver's outboard seat-mounted side-impact air bag, and the driver's IC air bag. The Honda began a slight clockwise rotation. Due to the rotation and contact with the soft earth directly after the sidewalk, the Honda entered a left-side-leading rollover event (Event 2). The rollover event deployed the front-right passenger's outboard seat-mounted side-impact air bag and the right inflatable curtain (IC) air bag. The Honda rolled five-quarter turns and came to final rest on its left side facing south. The driver was transported by ambulance to a nearby medical facility with police-reported incapacitating (A-level) injuries. The vehicle was uprighted and towed to a secure salvage insurance lot where it remained for this investigation.

Figure 1. Front-left oblique view of the Honda

The crash was identified by the Crash Research Sampling System (CRSS) in August 2022. The police crash report (PCR) was forwarded to NHTSA's Crash Investigation Division. The Special Crash Investigations team at Crash Research & Analysis, Inc. was assigned an on-site investigation in August 2022. The SCI team contacted and obtained cooperation with the insurance adjustor who had custody of the vehicle. An inspection of the Honda was conducted in August 2022 to measure exterior deformation, interior damage, and supplemental restraint

systems. The Honda had an event data recorder (EDR), which was imaged during the inspection process with the Bosch Crash Data Retrieval tool. The crash site was also photographed, documented, and measured by total station. The driver was contacted but refused an interview.

Summary

Crash Site

The crash occurred at night at a lighted multi-lane 3-leg intersection. At the time of the crash the National Weather Service reported the conditions as clear with a temperature of 28.3 °C (83 °F), 67 percent humidity, and SSE directional winds of 8 km/h (5 mph).

The intersection consisted of a straight and level four-lane south-easterly exit ramp that terminated into a controlled three-lane divided north/south roadway divided by a raised 7.2 m (23.6 ft) wide grass median. The exit ramp was 14.5 meters (47.5 ft) wide with two right turn lanes and two left turn lanes each measuring 3.7 meters (12.1 ft) wide. The lanes were separated by a solid white lane line, and each had a designated painted turn arrow indicator and traffic-controlled, tri-colored turn signal. The adjacent roadway was 29 meters (95.1 ft) wide with lanes measuring 3.7 meters (12.1 ft) wide. The lanes were separated by solid and dashed painted white lane lines. The posted speed limit was 72 km/h (45 mph). Each section of the roadway was traffic-controlled with corresponding tri-colored traffic signal. The far side of the intersection transitioned into a drainage ditch that was 12 meters (39.3 ft) wide and 69 cm (27.1 in) deep. The drainage ditch transitioned to a 3 meter (9.8 ft) wide concrete sidewalk. Beyond the sidewalk was a large flat grass field. Figures 2 and 3 show the intersection and roadside along the Honda's trajectory.

Figure 2. View of the Honda's east trajectory into the intersection

Figure 3. East-view across the median dividing the south and north lanes of travel

Pre-Crash

The Honda was traveling eastbound along the highway at an EDR-reported indicated speed of 112 km/h (70 mph) as it entered an exit ramp 5 seconds prior to algorithm enabled (AE). The exit ramp merged into four lanes as it approached the intersection. The Honda was in the second lane from the left. The belted driver braked, slowing to an indicated speed of 107 km/h (66 mph) 1.5 seconds prior to AE. The Honda drove across the south lanes of the intersection and grass median for unknown reasons and with an average indicated speed of 99 km/h (61 mph) from 1.5 to 0.5 seconds prior to AE. The Honda then traveled over the north lanes of the roadway and into the drainage ditch.

Crash

The Honda's front bumper lower valance stuck the upslope of the embankment and edge of the sidewalk (Event 1; Figure 4). This nonhorizontal impact deployed the driver's frontal air bag, the driver's outboard seat-mounted side-impact air bag, and the driver's IC air bag. The vehicle traveled 15 meters (49 ft) over the sidewalk into the soft grass area beyond and began to rotate clockwise. As the Honda contacted the ground, the left front and rear wheels furrowed into the soft earth and tripped the vehicle into a left-side-leading rollover event (Event 2). The rollover initiation deployed the front row passenger's outboard seat-mounted side-impact air bag and right-side IC air bag. The Honda rolled five quarter-turns over approximately 18 meters (59 ft) and came to rest on its left side facing south.

Figure 4. Facing east, viewing the point of impact. Cones represent curb strike and gouge marks.

Post-Crash

A bystander notified police and EMS personnel and responded to the scene. EMS personnel removed the windshield and rear backlight to render aid to the driver. They removed the driver through the rear cargo door due to the vehicle's post-crash orientation. The police report indicated no suspected alcohol or drug usage. The driver was transported by ambulance to a nearby trauma center. Her medical report showed her BAC was .128 g/dL at the time of her admittance. The driver was treated over the next 6 days for two lumbar vertebra endplate fractures and a small laceration to her right lower shin.

The Honda was uprighted and towed from the scene of the crash. It was subsequently transferred to an insurance salvage yard where it was located for this investigation.

2018 Honda Pilot EXL

Description

The 2018 Honda Pilot EXL was a 4-door SUV (Figure 5) manufactured in February 2018 and identified by the VIN 5FNYF6H53JBxxxxxx. It was constructed on a 282 cm (111.0 in) wheelbase and powered by a 3.5-liter; V6-cylinder gasoline engine linked to a 6-speed automatic transmission with all-wheel drive. The service brakes were a power-assisted 4-wheel disc system with ABS. Steering was operated by a speed-sensitive electric rack and pinon system. The Honda had an antilock braking system, electronic stability control, traction control, and daytime running lights.

Figure 5. Front-right oblique view of the Honda

The manufacturer's recommended tire size was P245/60R18 front and rear with a recommended cold tire pressure of 220 kPa (32 psi). At the time of the SCI inspection, the Honda had a Cooper Discoverer SPX on the left-front wheel and Douglas All-Season tires of the recommended size on the other three wheels. All four tires were mounted on OEM aluminum alloy rims. The left-front tire tread measured 3 mm (4/32 in), and the other tire treads were 7 mm (9/32 in) or greater. The Honda had two rows of seats for seating of five occupants, two in the front and three in the second row. All seating surfaces were leather. At the time of the SCI inspection, the driver's seat was reclined approximately 60° aft of vertical, which was attributed to occupant removal by EMS. All seat positions had 3-point-lap and shoulder seat belts for manual restraints. Supplemental restraints were provided by front seat belt retractor and lower anchor pretensioners, driver's and passenger's frontal air bags, outboard seat-mounted side-impact air bags, and dual sensing (side impact and rollover) roof rail side IC air bags.

Vehicle History

According to its Carfax, the Honda was purchased new by its first owner in March 2018 and registered in Pennsylvania. In October 2018 it was involved in a minor crash with damage on the right rear. In June 2020 it was offered for sale and purchased by its second and current owner a few days later. It remained registered in Pennsylvania. In January 2021 it was again involved in a

minor crash with damage on the right rear. It was serviced in Florida in March 2022 and again in June 2022. The June 2022 crash in this investigation was reported in September.

NHTSA Recalls and Investigations

A search of the NHTSA database website www.nhtsa.gov/recalls using the Honda's VIN at the time of assignment in August 2022 revealed no open or unrepaired recalls. Upon searching the VIN at the time of this report in November 2024, one incomplete recall for this 2018 Honda Pilot EXL was found. The recall number 23V-858 was about the fuel pump impeller and did not appear to conflict with this investigation.

Exterior Damage

The Honda sustained damage across the front bumpers lower valance from the initial contact with the ground/sidewalk (Event 1 - Figure 6). The direct contact damage was primarily non-horizontal and was located below the structural bumper bar with direct contact at the centerline and left aspect of the front undercarriage/engine compartment and left front wheel assembly. The left and right wheelbases each measured 277 cm (109.0 in) with a track width of 168 cm (66.1 in). The exposed front bumper was measured with a total station that resulted in a maximum induced deformation of 4 cm (1.6 in) at the left corner of the bumper bar. Due to the non-horizontal forces associated with this impact, this profile was outside the scope of the barrier algorithm of the WinSMASH program, and an analysis was not generated. The collision deformation classification (CDC) assigned to the damage pattern for Event 1 is 00FDLW1.

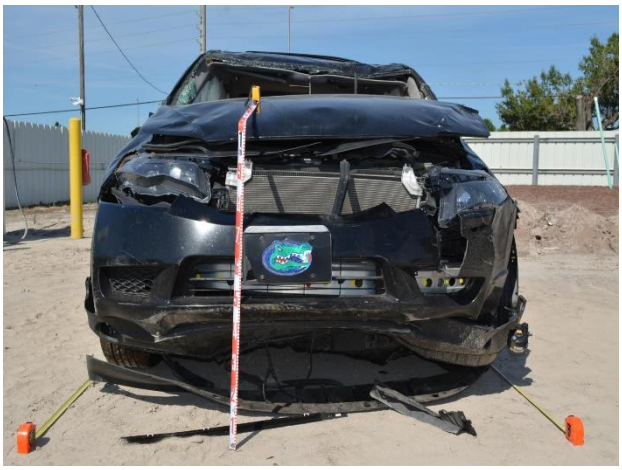


Figure 6. Damage to the front undercarriage of the Honda in association to Event 1

The Honda sustained moderate damage during the five-quarter turn rollover (Event 2). The event was initiated when the non-horizontal impact to the front frame/engine lifted the vehicle and caused an unloading of suspension, resulting in a clockwise rotation. The Honda began to sideslip through the soft earth and tripped over its left tires approximately 15 m (49 ft) from the sidewalk/ground impact. The left tires were debeaded with grass and mud embedded in the spokes. Heavy scraping and gouging were present across the driver's A-pillar and roof rail (Figure 7). There was some minor crush to the front side panel that was aligned with the hood. During the rollover, the Honda landed on its roof causing 8 cm (3.1 in) of vertical intrusion to the

windshield header (Figure 8). The hood of the engine compartment and headlight components were also crushed in and rearwards approximately 10 cm (4 in) as the Honda rolled and traveled across the ground to final rest. The right side of the Honda sustained some minor abrasions and slight crush to the right roof rail and A-pillar (Figure 9). The Honda rolled approximately 18 meters (59 ft) coming to rest on its left side facing south (Figure 10). The CDC assigned to the damage pattern for Event 2 is 00TYDO2.

Figure 7. Rollover damage to the left side

Figure 8. Vertical intrusion to the windshield header during the rollover event

Figure 9. Rollover damage to the right side

Figure 10. On-scene image of the Honda at final rest. Photo obtained from investigating law enforcement.

Event Data Recorder

The Honda had an air bag control module that monitored and controlled the diagnostic, sensing, and deployment commands for the vehicle's supplemental safety systems. The module had EDR capabilities. It was imaged with the version 21.5.1 of the Bosh Crash Data Retrieval software through a direct-to-module imaging process by the SCI investigator. The imaged data reported with version 23.0.2 of the software is attached as an appendix at the end of this report.

The EDR could store up to two crash events, termed either non-deployment or deployment events. Non-deployment events occur when the recording trigger threshold is met or exceeded. Data from non-deployments can be overwritten by subsequent events. Deployment events cannot be overwritten from the ACM. This ACM also categorizes non-air bag deployment events when there is an event in which non-air bag devices, such as pretensioners, have actuated. This type of event can be overwritten given a subsequent air bag deployment event. Associative to each reported event was a 5.0-second pre-crash buffer. Data points were recorded on a recurring basis of 0.5 seconds, including: vehicle speed indicated, accelerator pedal position (% full), service

brake (on/off), ABS activity (on/off), stability control (on, off, engaged), steering input (degrees), engine rpm, PCM derived accelerator pedal position (% full). Two locked frontal events were recorded by the EDR. It was determined that the data was consistent with the SCI investigation.

First Record

The ignition cycle count at the time of the recording was 8,497 and 8,498 at the time of imaging. The air bag warning lamp was off. The driver's seat belt indicator was ON (fastened), and the front passenger's seat belt was OFF (unfastened). The Honda's forward undercarriage struck the embankment/sidewalk edge (Event 1) initiating AE. The driver's retractor pretensioner actuated at 7 milliseconds with the anchor pretension at 15 milliseconds into AE. The driver's frontal air bag deployed at 25 milliseconds, followed by the driver's IC air bag at 27 milliseconds, driver's outboard side air bag at 29 milliseconds, and the driver's frontal air bag's second-stage deployment at 55 milliseconds into AE. The maximum longitudinal delta V of this impact was -27 km/h (-17 mph) at 75 milliseconds with a lateral maximum delta V of 3 km/h (2 mph) at 67.5 milliseconds.

A portion of the 5.0 second pre-crash data of the first record is included in Table 1 below.

Table 1. Pre-crash data for Events 1 and 2

Time (sec) Ev.1	Vehicle Speed Indicated km/h (mph)	Engine rpm	Accelerator Pedal % Full	PCM derived accelerator pedal position % Full	Service Brake (on/off)	ABS Activity	Stability Control (on/off/ engaged)	Steering wheel Angle (deg.) (+L)
-5.0	112 (70)	2400	47	47	OFF	OFF	ON Non-engaged	-5
-4.5	113 (70)	2400	47	47	OFF	OFF	ON Non-engaged	-5
-4.0	114 (71)	2400	47	47	OFF	OFF	ON Non-engaged	-5
-3.5	114 (71)	2500	47	47	OFF	OFF	ON Non-engaged	-5
-3.0	115 (71)	2500	39	39	OFF	OFF	ON Non-engaged	-5
-2.5	115 (71)	2000	0	0	OFF	OFF	ON Non-engaged	-5
-2.0	113 (70)	1800	0	0	ON	OFF	ON Non-engaged	-10
-1.5	107 (66)	1500	0	0	ON	OFF	ON Non-engaged	-5
-1.0	23 (14)	500	0	0	ON	ON	ON Non-engaged	-5

Time (sec) Ev.1	Vehicle Speed Indicated km/h (mph)	Engine rpm	Accelerator Pedal % Full	PCM derived accelerator pedal position % Full	Service Brake (on/off)	ABS Activity	Stability Control (on/off/ engaged)	Steering wheel Angle (deg.) (+L)
-0.5	91 (57)	900	0	0	ON	ON	ON Non-engaged	-15
0	91 (57)	1300	0	0	ON	ON	ON Non-engaged	-5

The EDR reported that the Honda, initially traveling at an indicated speed of 112 km/h (70 mph) was not in cruise control and continued to increase in speed to 115 km/h (71 mph) up until -2.0 seconds when brake application was indicated. At AE, the reported speed was 91 km/h (57mph). Reconstruction of the crash determined that the Honda slowed but continued through the intersection, driving over the center median at the -1.0 seconds prior to AE. The 23 km/h (14 mph) indicated speed reported at this interval is under-reported likely due to ABS activities, and interpolation was used to derive an approximate speed of 99 km/h (61 mph). The Honda continued over the median, right travel lanes, and through the drainage ditch.

Second Record

This EDR record was consistent with the rollover (Event 2) that occurred approximately 0.5 seconds after the ground/sidewalk impact. The passenger's outboard seat-mounted side-impact air bag and the right IC air bag deployed at AE (time 0.0 sec). The driver's outboard side-impact seat-mounted air bag, IC air bag, and pretensioners were also commanded to deploy at AE but had previously deployed during Event 1. The recorded data indicated left-side-leading rollover (counterclockwise rotation = positive roll angle).

Columns 1 and 2 in Table 2 below represent the recorded time history of the vehicle's roll rate in 0.2 second intervals. The SCI-calculated roll angle of the Honda is presented in column 3. The calculated angle was consistent with the rollover event.

Table 2. Roll data for Event 2

Time (sec)	Roll Rate (degrees/sec)	Calculated Roll Angle (degrees)
-1.0	35.8	3.58
-0.8	0	5.53
-0.6	0	5.53
-0.4	-104.2	-11.07
-0.2	169.3	1.95
0	162.8	34.83
0.2	153.0	65.75
0.4	143.2	94.72
0.6	133.5	121.74
0.8	231.1	168.61
1.0	117.2	194.33
1.2	104.2	215.82
1.4	146.5	240.89
1.6	257.1	290.04
1.8	208.3	327.47
2.0	221.3	372.06

Interior Damage

There was minor interior damage which was associated to the intrusion, air bag deployment, and occupant contacts. There was an 8 cm (3.1 in) intrusion of the roof into the front passenger compartment (Figure 11). The driver contacts consisted of scuffs to the knee bolster, upper door panel, driver's IC and outboard seat-mounted side-impact air bags, driver's frontal air bag, and sunroof header (Figure 12).

Figure 11. Overview of the front row

Figure 12. Driver's contacts

Sand and mud were embedded in the driver's A-pillar and was scattered throughout the front row. There was no interior damage to the second row or rear cargo space of the Honda.

Manual Restraint Systems

The Honda had 3-point continuous loop lap and shoulder seat belts for each of the five seating positions. The front row used sliding latch plates and adjustable D-rings. The second row used sliding latch plates. The Honda was also equipped with retractor and lower anchor pretensioners (Figure 13) that had actuated due to the crash forces associated with Event 1.

Figure 13. Viewing the driver's actuated lower anchor pretensioner

At the time of the SCI inspection, it was observed that the driver's seat belt was locked out from the retractor and hanging loosely from the full-up positioned D-ring (Figure 14). Sand particles were embedded in the webbing of the lap portion of the seat belt. Friction burns from the webbing by the pretensioner actuation and occupant loading were found on the latch plate (Figure 15). Based on the belt evidence and the EDR report, the driver was belted at the time of the crash.

Figure 14. Driver's seat belt

Figure 15. Driver's latch plate with friction burns

Supplemental Restraint Systems

The Honda had dual-stage driver's and passenger's frontal air bags, outboard seat-mounted side-impact air bags and IC air bags. Both drivers and passenger's seat-mounted side-impact air bags (Figures 16 and 17), IC air bags (Figures 18 and 19) and the driver's frontal air bag (Figure 20) deployed due to the crash forces. There were occupant contacts to the driver's frontal, seat-mounted side-impact and IC air bags.

Figure 16. Driver's outboard seat-mounted air bag

Figure 17. Front passenger's outboard seat-mounted air bag

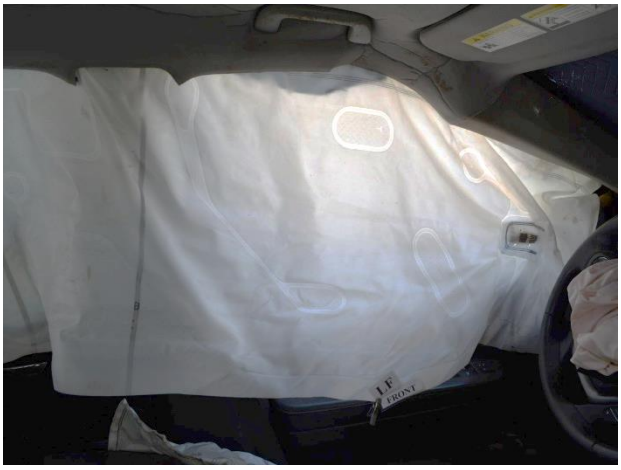


Figure 18. Driver's IC air bag

Figure 19. Front passenger's IC air bag

Figure 20. Driver's frontal air bag

2018 Honda Pilot EXL Occupant Data

Driver Demographics

Age/sex:	47 years/female
Height:	171 cm (67 in)
Weight:	79 kg (175 lb)
Eyewear:	Unknown
Seat type:	Forward-facing bucket seat with adjustable head restraint
Seat track position:	Seat between forward-most and middle-track position
Manual restraint usage:	Lap and shoulder belt
Usage source:	Vehicle inspection, EDR, PCR
Air bags:	Driver's frontal, seat-mounted, and IC air bags available; all deployed
Alcohol/drug involvement:	Alcohol = .128 g/dL; no drugs found source medical records PCR indicated no suspected alcohol
Egress from vehicle:	Removed through rear cargo door
Transport from scene:	Ambulance to Level 1 trauma center
Type of medical treatment:	Hospitalized for 6 days

Driver Injuries

Injury No.	Injury	Injury Severity AIS 2015	Involved Physical Components (IPC)	IPC Confidence Level
1	L1 endplate fracture of vertebral body	650632.2	Isolated IPC Interior/this occupant seat cushion	Probable
2	L2 endplate fracture of vertebral body	650632.2	Isolated IPC Interior/this occupant seat cushion	Probable
3	2 cm laceration of distal right shin	810602.1	Isolated Floor/foot controls including parking brake	Possible

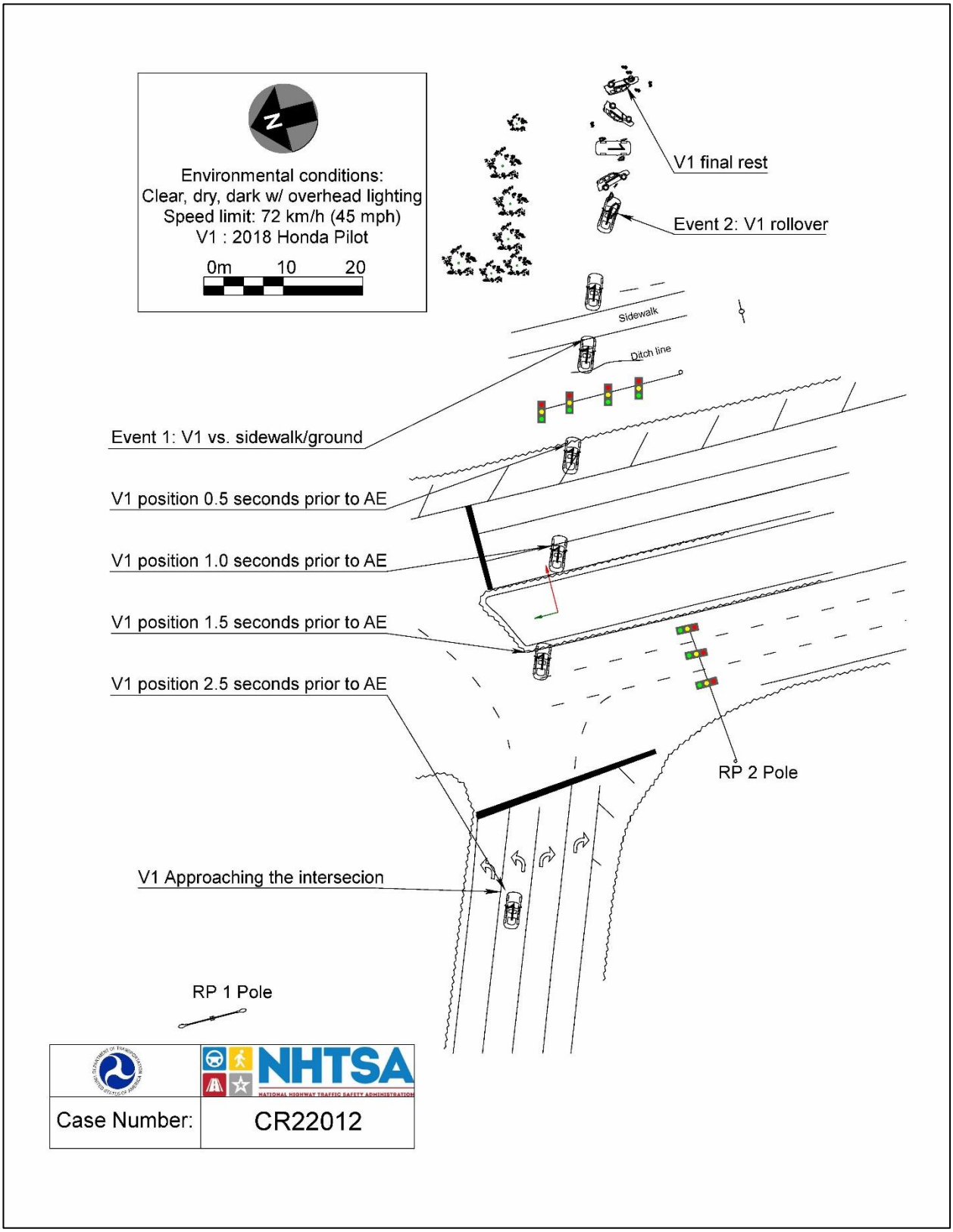
Source: Hospital records

Drivers Kinematics

At the time of the crash, the driver was restrained by the lap and shoulder belt and the seat track adjustment appeared to be set between the forward-most and middle-track positions. The initial non-horizontal impact with the ground/sidewalk nominally displaced her forwards and to the right within her seat belt with a possible contact to the deployed frontal air bag. The driver loaded her seat cushion causing the L1 and L2 endplate fractures. When the Honda struck the soft ground and the rollover event was initiated, the driver was restrained within her seat by the seat belt and possibly displaced to the left contacting the left IC air bag. Along the course of the five-quarter turns in the rollover event, the driver was tossed to her left and right as well as up and down with respect to her relative position. Her right shin possibly contacted the foot controls

causing the small laceration. Due to the vehicle post-crash orientation, the driver was removed by the EMS personnel through the rear cargo door and transported by ambulance to a Level 1 trauma center. The driver was hospitalized for 6 days and released.

Crash Diagram



Appendix: 2018 Honda Pilot EXL Event Data Recorder Report[1]

[1] The EDR contained in this technical report was imaged using the current version of the Bosch CDR software at the time of the vehicle inspection. The CDR report contained in the associated Crash Viewer application may differ relative to this report.

IMPORTANT NOTICE: Robert Bosch LLC and the manufacturers whose vehicles are accessible using the CDR System urge end users to use the latest production release of the Crash Data Retrieval system software when viewing, printing or exporting any retrieved data from within the CDR program. Using the latest version of the CDR software is the best way to ensure that retrieved data has been translated using the most current information provided by the manufacturers of the vehicles supported by this product.

CDR File Information

User Entered VIN	5FNYF6H53JB******
User	
Case Number	
EDR Data Imaging Date	
Crash Date	
Filename	CR22012ACM.CDRX
Saved on	
Imaged with CDR version	Crash Data Retrieval Tool 21.5.1
Imaged with Software Licensed to (Company Name)	Company Name information was removed when this file was saved without VIN sequence number
Reported with CDR version	Crash Data Retrieval Tool 23.0.2
Reported with Software Licensed to (Company Name)	NHTSA
EDR Device Type	Airbag Control Module
Event(s) recovered	2

Comments

No comments entered.

Data Limitations

General Information:

These limitations are intended to assist you in reading the event data that has been imaged from the vehicle's SRS control unit. They contain general information and are not specific to this particular event. Event data should be considered in conjunction with other available physical evidence from the vehicle and scene.

Honda and Acura passenger vehicles designated as 2013 or later model year production are designed to be compatible with the Bosch CDR tool. Only some 2012 model year vehicles are compatible with the Bosch CDR tool.

Recorded Crash Events:

Data for front, side, rear and rollover events can be recorded as either non-deployment or deployment events. Both types of events can contain pre-crash and crash data.

- A non-deployment event is recorded if the change in longitudinal or lateral velocity equals or exceeds 8km/h over a 150ms timeframe or another type of non-reversible deployable restraint device other than a front, side, or side curtain airbag (e.g. seatbelt pretensioner) is commanded to deploy. Except as indicated below, non-deployment events are not locked into memory and can be over-written by subsequent non-deployment or deployment events.
- A deployment event is recorded if front airbag(s), side airbag(s), or side curtain airbag(s) are commanded to deploy. Deployment events are locked into memory and cannot be over-written.

The SRS control unit typically records only one event. Two events can be recorded if the T0 (time zero) values for each event occur within 5 seconds of each other. Therefore, a non-deployment event can be recorded and locked if it occurs within 5 seconds of a deployment event.

T0 is established by whichever of the following occurs first: (1) the change in longitudinal velocity at the SRS control unit equals or exceeds 0.8km/h over a 20ms timeframe; or (2) the change in lateral velocity at the SRS control unit equals or exceeds 0.8km/h over a 5ms timeframe; or (3) the occupant restraint control algorithm is activated; or (4) a commanded deployment of any type of non-reversible deployable restraint device (e.g. airbag or seatbelt pretensioner). If the time to deploy equals 0, then the command to deploy occurred at T0 or the device was not commanded to deploy during the event.

TEnd (end of event) is established by whichever of the following occurs first: (1) the change in longitudinal and lateral Delta V equals or falls below 0.8km/h over a 20ms timeframe; or (2) the occupant restraint control algorithm resets; or (3) time from T0 exceeds 300ms.

Data:

- Data recorded by the SRS control unit and imaged by the CDR tool is displayed relative to T0, not the time at which the vehicle made contact with another vehicle or object.
- Pre-crash data is recorded at 2 samples per second within the 5 seconds before T0. The sampling point at 0.0 is taken at T0 and is asynchronous with the other sample points. The time between -0.5 and 0.0 is not recorded and is between 1 and 500ms.
- Delta V data is recorded at 100 samples per second from T0 to 250ms or T0 to TEnd plus 30ms.
- Acceleration data is recorded at 100 samples per second from T0 to 250ms.
- Delta V, longitudinal reflects the change in velocity that the SRS control unit experienced in the longitudinal direction during the recorded portion of the event and is not the speed the vehicle was traveling before the event.
- Depending on the severity of the event and the accelerometer characteristics, saturation of the SRS control unit longitudinal or lateral accelerometers may occur, decreasing the recorded Delta V value.

- Time, accelerometer range exceeded is recorded if saturation of the SRS control unit longitudinal, lateral and/or normal (vertical) accelerometer occurs. The recorded data is the time at which the sensor range is first exceeded.
- The maximum recording capability of Deployment Command Data is 254ms or 255ms depending on vehicle model. A recorded value of 254ms or 255ms may indicate that the recording maximum was exceeded. In this case, the deployment command may have occurred between the recorded time and TEnd.
- Speed, vehicle indicated data is the speed indicated to the driver by the speedometer, not actual vehicle ground speed. Data accuracy can be affected by various factors, including but not limited to the following:
    - Significant changes in tire size from the factory setting
    - Wheel lockup or spin
    - Data latency or filtering and hysteresis within the speedometer module
- Accelerator pedal position, percent full is the ratio of accelerator pedal position compared to the fully depressed position.
- PCM (Powertrain Control Module) derived accelerator pedal position, percent full may differ from the accelerator pedal position, percent full under circumstances such as brake override activation or cruise control system engagement. These circumstances are based on vehicle equipment application and vary by model.
- Steering input angle is recorded in 5 degree increments.
- Side air bag suppression system status, right front passenger is recorded when the vehicle is equipped with the Occupant Position Detection System (OPDS).
- Occupant size classification, right front passenger airbag suppressed data is recorded as yes (suppressed) if the front passenger seat weight sensor system determined the passenger seat was empty or occupied by a child-size occupant.
- EV mode data records the vehicle powertrain status, not a driver selected operation mode. EV mode is recorded as On when the vehicle is moving and the internal combustion engine is not operating. EV mode may be recorded as On or Off when the vehicle is stopped.
- If power to the SRS control unit is lost during an event, all or part of the data may not be recorded.

Roll Rate Data:
- Vehicle roll rate data is recorded separately from the non-deployment and deployment events as described above. Therefore, the T0 for the roll rate data may differ from the T0 for the other data in this report.
- Roll rate recording trigger (T0) is established by whichever of the following occurs first: (1) a rollover algorithm ON judgment (SRS control unit decision to command deployment);, or (2) a change in relative roll angle at the SRS control unit equal to or exceeding 30 degrees (roll angle is not measured, but is calculated from the roll rate data); or (3) the rollover algorithm is activated.
- Once a recording trigger has been met, roll rate data is recorded for one rollover event at 10 samples per second from 1 second before to 2 seconds after T0. If a roll angle trigger is satisfied without a rollover algorithm ON judgment, the recorded roll rate data is unlocked and can be over-written by a subsequent rollover event. Roll rate data triggered by or recorded during a rollover algorithm ON judgment is locked into memory and cannot be over-written.
- If roll rate is detected at the SRS control unit during a non-deployment or deployment event but the recording trigger has not been satisfied, no roll rate data will be recorded. A graph of roll rate data will only be present in this report if roll rate data is recorded.

Data Element Sign Convention:
Except as noted below, all data is displayed in SAE J211 sign convention. The following table provides an explanation of the sign notation for data elements that may be included in this CDR report. All directional references to sign notation are from the perspective of the driver when seated in the vehicle facing the direction of forward vehicle travel.

Data element name	Positive sign indicates
Longitudinal Acceleration	Forward direction acceleration
Delta-V, Longitudinal	Forward direction acceleration
Lateral Acceleration	Left to right direction acceleration
Delta-V, Lateral	Left to right direction acceleration
Normal (Vertical) Acceleration	Downward direction acceleration
Vehicle Roll Rate*	See roll rate graph and data (if recorded)
Steering Input Angle*	Left Turn

*Not SAE J211 sign convention

Data Source:
All recorded data is measured and calculated within the SRS control unit except for the following parameters (if applicable) which are transmitted via the vehicle's communication network to the SRS control unit:
- Speed, vehicle indicated
- Accelerator pedal position, percent full
- Service brake
- ABS activity
- Stability control
- Steering input angle
- Engine RPM
- PCM derived accelerator pedal position, percent full
- EV mode
- Forward Collision Warning
- Collision Mitigation Braking System information
- Lane Keeping Assist System information
- Lane Departure Warning
- Road Departure Mitigation information
- Cruise Control status
- Adaptive Cruise Control status

Depending on vehicle feature content, capability, or conditions described above, the following items may not be recorded. If these items are not recorded, they will not be present in this document.
- EV mode

- Forward Collision Warning
- Collision Mitigation Braking System information
- Lane Keeping Assist System information
- Lane Departure Warning
- Road Departure Mitigation information
- Cruise Control status
- Adaptive Cruise Control status

Hexadecimal Data:
All data that has been specified for imaging is shown in the hexadecimal data section of this report. However, not all of this data is translated by the CDR tool. The SRS control unit may contain additional data that is not retrievable by the CDR tool.

Data Imaging:
If the SRS control unit is imaged outside of the vehicle, ensure that it is not moved, tilted or turned while connected to the CDR tool. Also, after imaging is complete, wait 3 minutes after removing the CDR tool before moving the SRS control unit. Not following this guideline could cause current non-deployment event data to be overwritten and a new event to be recorded. Current fault status could also be altered if the SRS control unit is imaged outside of the vehicle.

04002_HondaSRS_GEN2_r002

System Status at Retrieval

EDR Version	1.3.2.0

System Status at Event (Event Record 1)

Multi-Event, Number of Events (1, 2)	1
Complete File Recorded (Yes/No)	Yes
Ignition Cycle, Download	8498
Maximum Delta-V, Longitudinal (MPH [km/h])	-17 [-27]
Time, Maximum Delta-V, Longitudinal (msec)	75.0
Maximum Delta-V, Lateral (MPH [km/h])	2 [3]
Time, Maximum Delta-V, Lateral (msec)	67.5
Time, Maximum Delta-V, Resultant (msec)	75.0
Time, Accelerometer Range Exceeded, Longitudinal (msec)	0
Time, Accelerometer Range Exceeded, Lateral (msec)	0
Time, Accelerometer Range Exceeded, Normal (msec)	0

Deployment Command Data (Event Record 1)

Pretensioner Deployment, Time to Fire, Driver (msec)	7
Pretensioner Deployment, Time to Fire, Right Front Passenger (msec)	0
Lap Pretensioner Deployment, Time to Fire, Driver (msec)	15
Lap Pretensioner Deployment, Time to Fire, Right Front Passenger (msec)	0
Frontal Air Bag Deployment, Time to Deploy First Stage, Driver (msec)	25
Frontal Air Bag Deployment, Time to Deploy First Stage, Right Front Passenger (msec)	0
Frontal Air Bag Deployment, Time to 2nd Stage, Driver (msec)	55
Frontal Air Bag Deployment, Time to 2nd Stage, Right Front Passenger (msec)	0
Side Air Bag Deployment, Time to Deploy, Driver (msec)	29
Side Air Bag Deployment, Time to Deploy, Right Front Passenger (msec)	0
Side Curtain/Tube Air Bag Deployment, Time to Deploy, Driver Side (msec)	27
Side Curtain/Tube Air Bag Deployment, Time to Deploy, Right Side (msec)	0
Frontal Air Bag Deployment, 2nd Stage Disposal, Driver (Yes/No)	No
Frontal Air Bag Deployment, 2nd Stage Disposal, Right Front Passenger (Yes/No)	No

Pre-Crash Data -1 sec (Event Record 1)

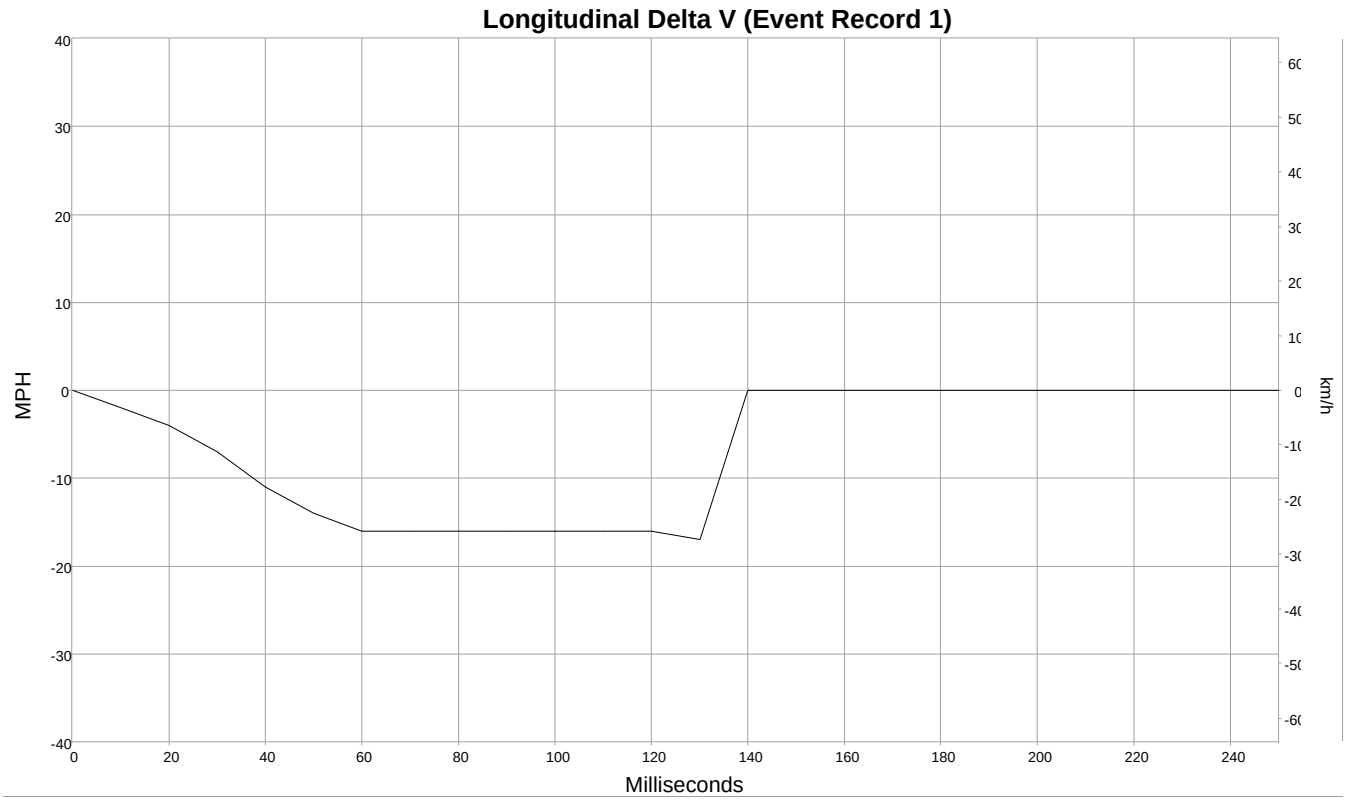
Safety Belt Status, Driver	On
Safety Belt Status, Right Front Passenger	Off
Seat Track Position Switch, Foremost, Status, Driver	No
Occupant Size Classification, Right Front Passenger Airbag Suppressed (Yes/No)	Yes
Frontal Air Bag Warning Lamp (On, Off)	Off
Ignition Cycle, Crash	8497

Pre-Crash Data -5 to 0 sec [2 samples/sec] (Event Record 1) - Table 1 of 2

Time Stamp (sec)	Speed, Vehicle Indicated (MPH [km/h])	Accelerator Pedal Position, % full	Service Brake (On, Off)	ABS Activity (On, Off)	Stability Control (On, Off, Engaged)	Steering Input (deg)	Engine RPM	PCM Derived Accelerator Pedal Position, % full
-5.0	70 [112]	47	Off	Off	On Non-Engaged	-5	2,400	47
-4.5	70 [113]	47	Off	Off	On Non-Engaged	-5	2,400	47
-4.0	71 [114]	47	Off	Off	On Non-Engaged	-5	2,400	47
-3.5	71 [114]	47	Off	Off	On Non-Engaged	-5	2,500	47
-3.0	71 [115]	39	Off	Off	On Non-Engaged	-5	2,500	39
-2.5	71 [115]	0	Off	Off	On Non-Engaged	-5	2,000	0
-2.0	70 [113]	0	On	Off	On Non-Engaged	-10	1,800	0
-1.5	66 [107]	0	On	Off	On Non-Engaged	-5	1,500	0
-1.0	14 [23]	0	On	On	On Non-Engaged	-5	500	0
-0.5	57 [91]	0	On	On	On Non-Engaged	-15	900	0
0.0	57 [91]	0	On	On	On Non-Engaged	-5	1,300	0

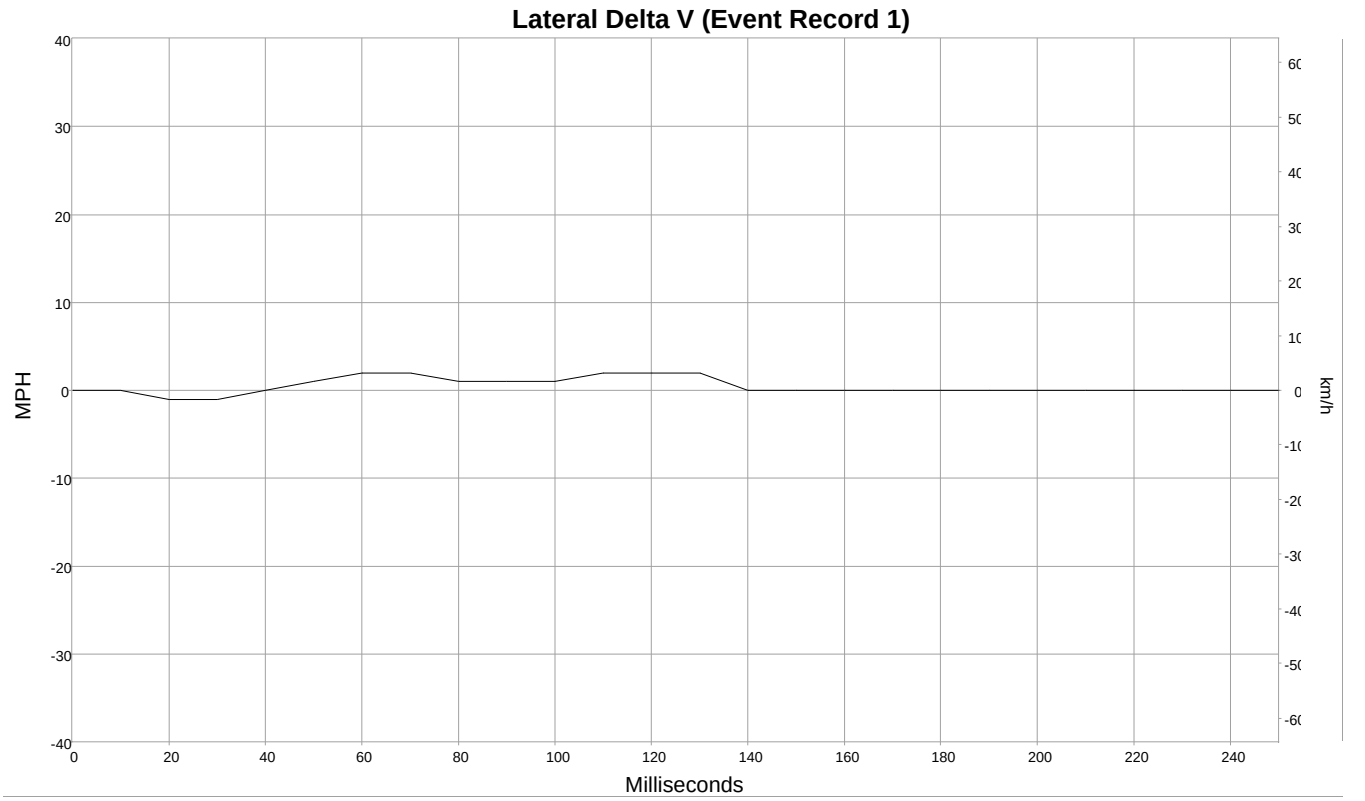
Pre-Crash Data -5 to 0 sec [2 samples/sec] (Event Record 1) - Table 2 of 2

Time Stamp (sec)	Cruise Control (Not Engaged/ Engaged)	Cruise Control (On/Off)
-5.0	Not Engaged	Off
-4.5	Not Engaged	Off
-4.0	Not Engaged	Off
-3.5	Not Engaged	Off
-3.0	Not Engaged	Off
-2.5	Not Engaged	Off
-2.0	Not Engaged	Off
-1.5	Not Engaged	Off
-1.0	Not Engaged	Off
-0.5	Not Engaged	Off
0.0	Not Engaged	Off



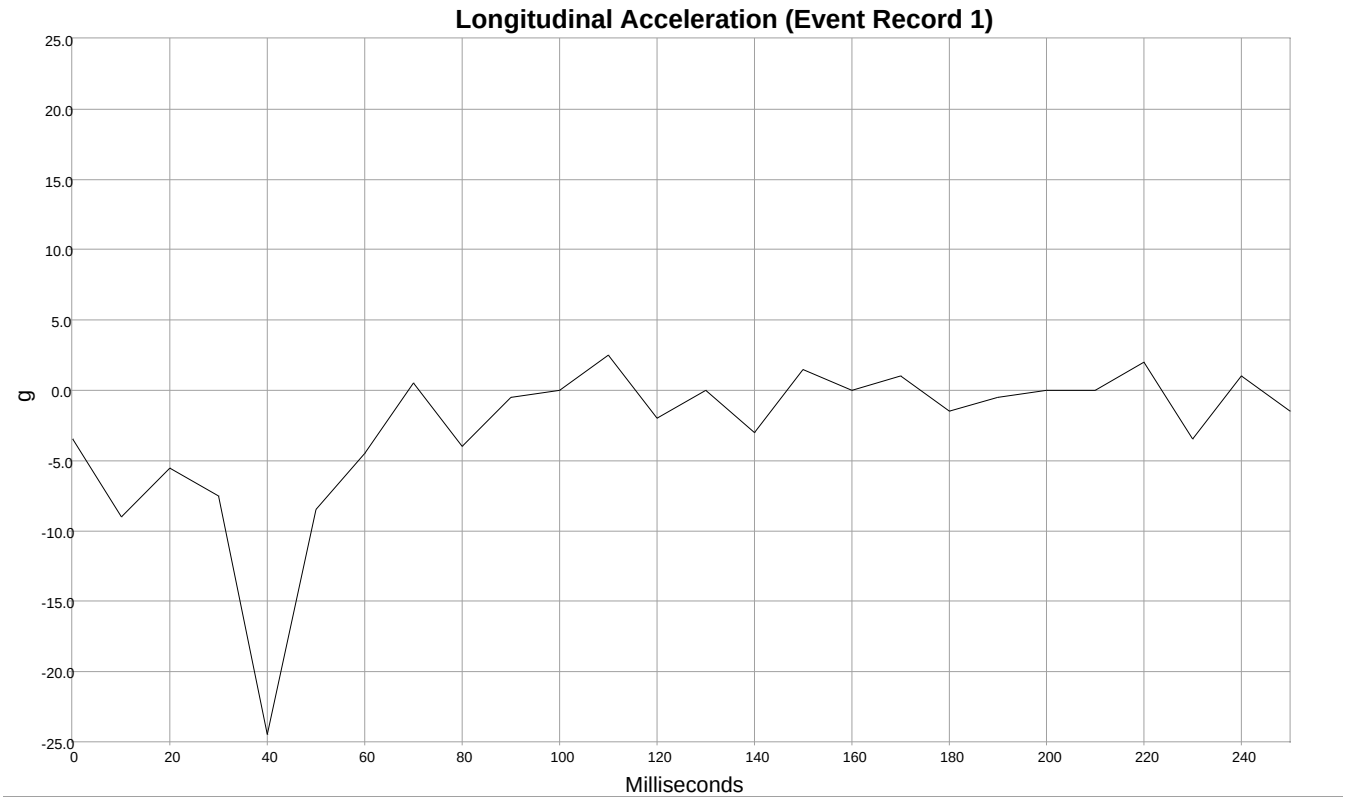
Longitudinal Delta V (Event Record 1)

Time (msec)	MPH [km/h]
0	0 [0]
10	-2 [-3]
20	-4 [-7]
30	-7 [-11]
40	-11 [-17]
50	-14 [-23]
60	-16 [-25]
70	-16 [-26]
80	-16 [-26]
90	-16 [-26]
100	-16 [-26]
110	-16 [-26]
120	-16 [-26]
130	-17 [-27]
140	0 [0]
150	0 [0]
160	0 [0]
170	0 [0]
180	0 [0]
190	0 [0]
200	0 [0]
210	0 [0]
220	0 [0]
230	0 [0]
240	0 [0]
250	0 [0]



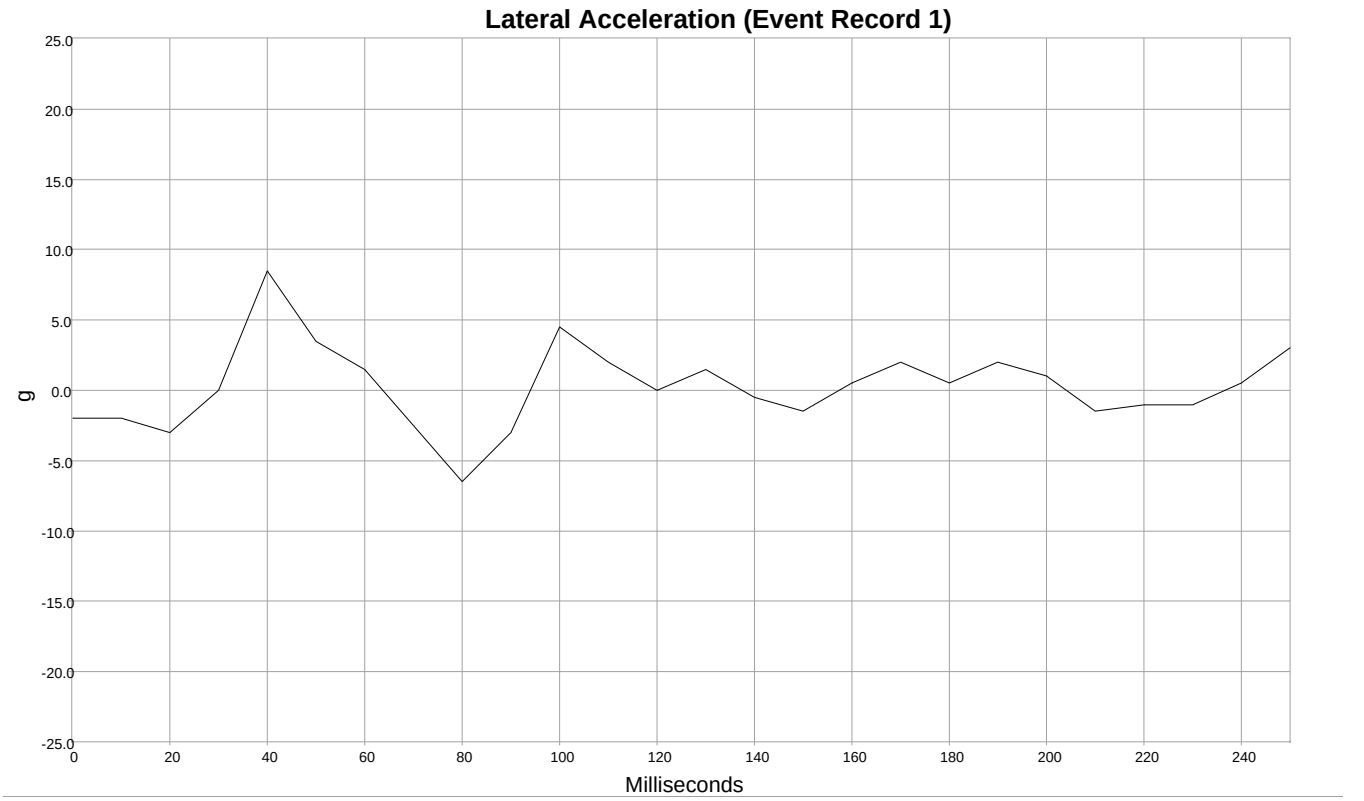
Lateral Delta V (Event Record 1)

Time (msec)	MPH [km/h]
0	0 [0]
10	0 [0]
20	-1 [-1]
30	-1 [-1]
40	0 [0]
50	1 [2]
60	2 [3]
70	2 [3]
80	1 [2]
90	1 [1]
100	1 [1]
110	2 [3]
120	2 [3]
130	2 [3]
140	0 [0]
150	0 [0]
160	0 [0]
170	0 [0]
180	0 [0]
190	0 [0]
200	0 [0]
210	0 [0]
220	0 [0]
230	0 [0]
240	0 [0]
250	0 [0]



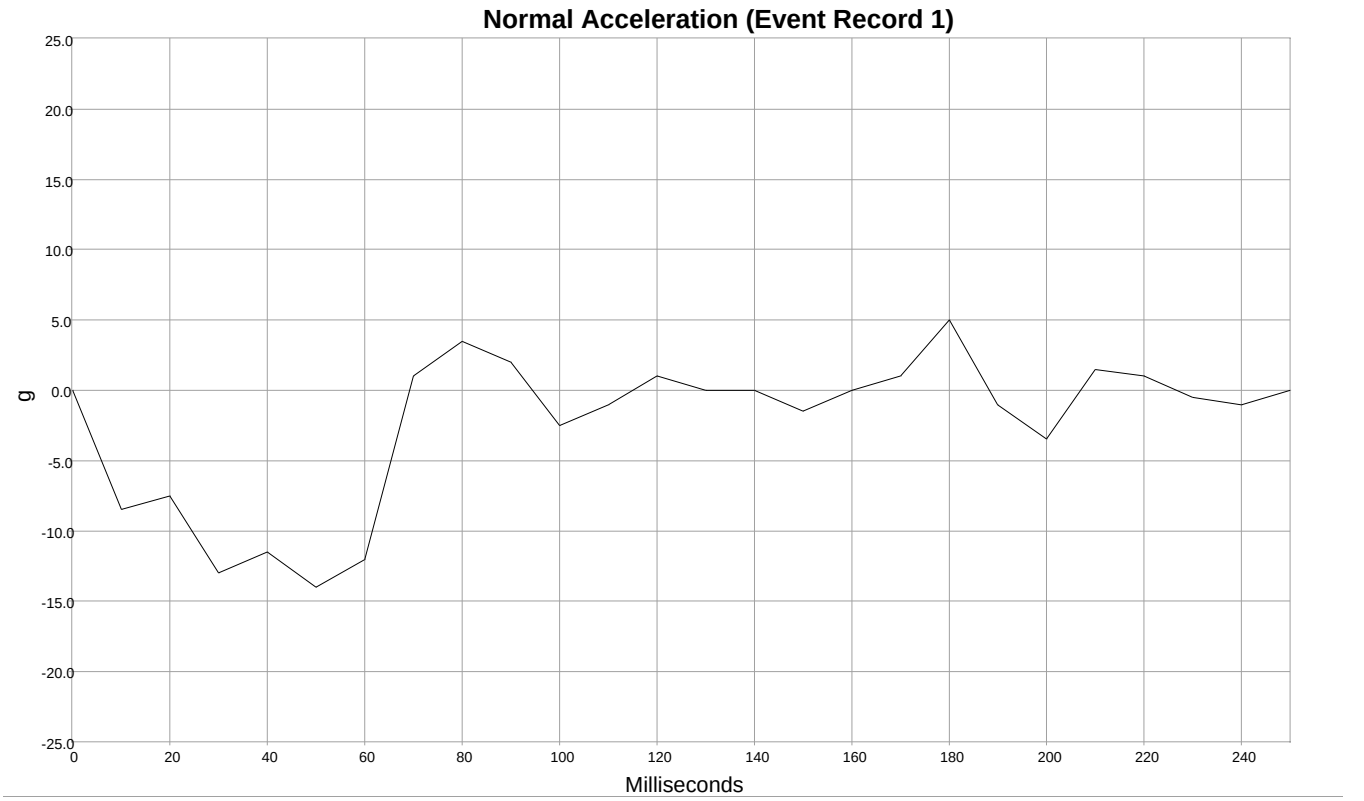
Longitudinal Acceleration (Event Record 1)

Time (msec)	g
0	-3.5
10	-9.0
20	-5.5
30	-7.5
40	-24.5
50	-8.5
60	-4.5
70	0.5
80	-4.0
90	-0.5
100	0.0
110	2.5
120	-2.0
130	0.0
140	-3.0
150	1.5
160	0.0
170	1.0
180	-1.5
190	-0.5
200	0.0
210	0.0
220	2.0
230	-3.5
240	1.0
250	-1.5



Lateral Acceleration (Event Record 1)

Time (msec)	g
0	-2.0
10	-2.0
20	-3.0
30	0.0
40	8.5
50	3.5
60	1.5
70	-2.5
80	-6.5
90	-3.0
100	4.5
110	2.0
120	0.0
130	1.5
140	-0.5
150	-1.5
160	0.5
170	2.0
180	0.5
190	2.0
200	1.0
210	-1.5
220	-1.0
230	-1.0
240	0.5
250	3.0



Normal Acceleration (Event Record 1)

Time (msec)	g
0	0.0
10	-8.5
20	-7.5
30	-13.0
40	-11.5
50	-14.0
60	-12.0
70	1.0
80	3.5
90	2.0
100	-2.5
110	-1.0
120	1.0
130	0.0
140	0.0
150	-1.5
160	0.0
170	1.0
180	5.0
190	-1.0
200	-3.5
210	1.5
220	1.0
230	-0.5
240	-1.0
250	0.0

System Status at Event (Event Record 2)

Multi-Event, Number of Events (1, 2)	2
Complete File Recorded (Yes/No)	Yes
Ignition Cycle, Download	8498
Time from Event 1 to 2 (sec)	0.1
Maximum Delta-V, Longitudinal (MPH [km/h])	0 [0]
Time, Maximum Delta-V, Longitudinal (msec)	42.5
Maximum Delta-V, Lateral (MPH [km/h])	0 [0]
Time, Maximum Delta-V, Lateral (msec)	27.5
Time, Maximum Delta-V, Resultant (msec)	35.0
Time, Accelerometer Range Exceeded, Longitudinal (msec)	0
Time, Accelerometer Range Exceeded, Lateral (msec)	0
Time, Accelerometer Range Exceeded, Normal (msec)	0

Deployment Command Data (Event Record 2)

Pretensioner Deployment, Time to Fire, Driver (msec)	0
Pretensioner Deployment, Time to Fire, Right Front Passenger (msec)	0
Lap Pretensioner Deployment, Time to Fire, Driver (msec)	0
Lap Pretensioner Deployment, Time to Fire, Right Front Passenger (msec)	0
Frontal Air Bag Deployment, Time to Deploy First Stage, Driver (msec)	0
Frontal Air Bag Deployment, Time to Deploy First Stage, Right Front Passenger (msec)	0
Frontal Air Bag Deployment, Time to 2nd Stage, Driver (msec)	0
Frontal Air Bag Deployment, Time to 2nd Stage, Right Front Passenger (msec)	0
Side Air Bag Deployment, Time to Deploy, Driver (msec)	0
Side Air Bag Deployment, Time to Deploy, Right Front Passenger (msec)	0
Side Curtain/Tube Air Bag Deployment, Time to Deploy, Driver Side (msec)	0
Side Curtain/Tube Air Bag Deployment, Time to Deploy, Right Side (msec)	0
Frontal Air Bag Deployment, 2nd Stage Disposal, Driver (Yes/No)	No
Frontal Air Bag Deployment, 2nd Stage Disposal, Right Front Passenger (Yes/No)	No

Pre-Crash Data -1 sec (Event Record 2)

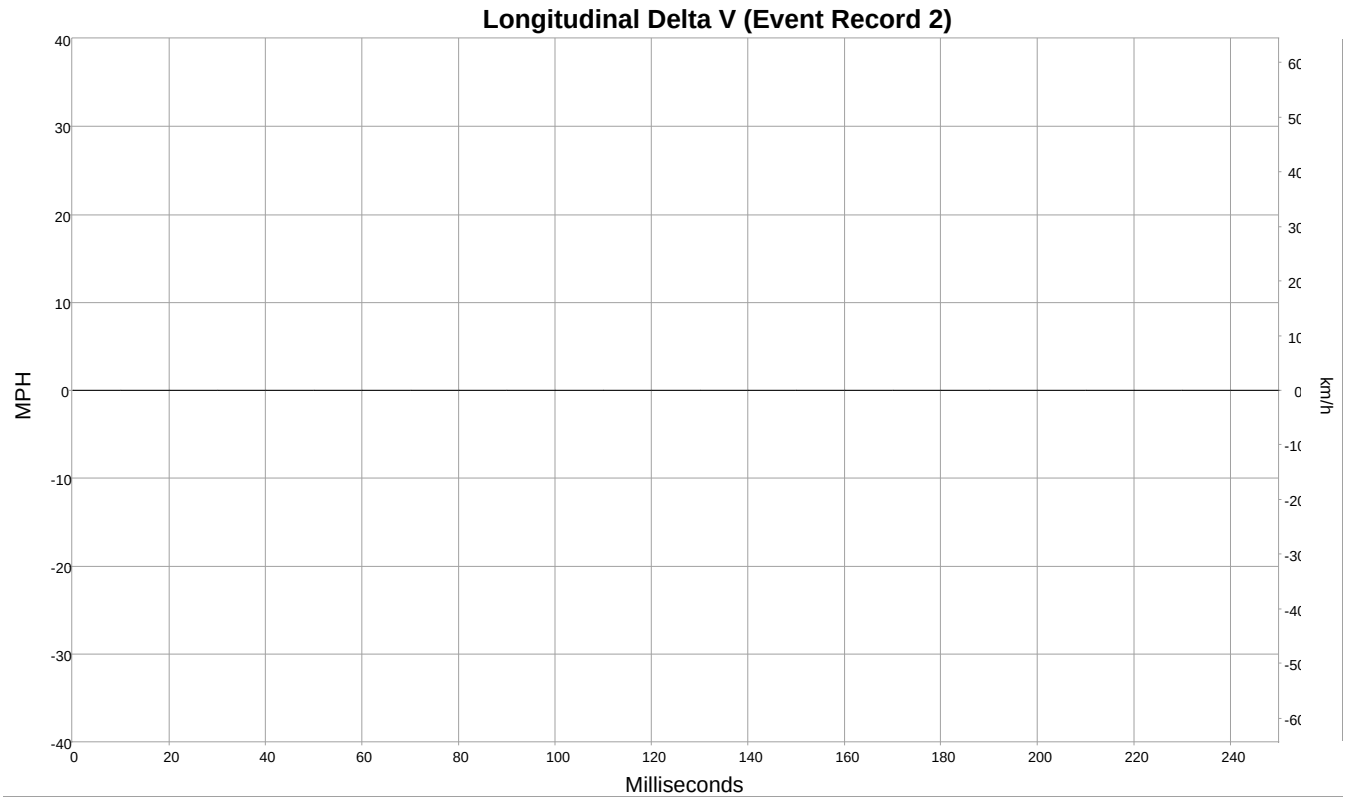
Safety Belt Status, Driver	On
Safety Belt Status, Right Front Passenger	Off
Seat Track Position Switch, Foremost, Status, Driver	No
Occupant Size Classification, Right Front Passenger Airbag Suppressed (Yes/No)	Yes
Frontal Air Bag Warning Lamp (On, Off)	Off
Ignition Cycle, Crash	8497

Pre-Crash Data -5 to 0 sec [2 samples/sec] (Event Record 2) - Table 1 of 2

Time Stamp (sec)	Speed, Vehicle Indicated (MPH [km/h])	Accelerator Pedal Position, % full	Service Brake (On, Off)	ABS Activity (On, Off)	Stability Control (On, Off, Engaged)	Steering Input (deg)	Engine RPM	PCM Derived Accelerator Pedal Position, % full
-5.0	70 [113]	47	Off	Off	On Non-Engaged	-5	2,400	47
-4.5	71 [114]	47	Off	Off	On Non-Engaged	-5	2,400	47
-4.0	71 [114]	47	Off	Off	On Non-Engaged	-5	2,500	47
-3.5	71 [115]	39	Off	Off	On Non-Engaged	-5	2,500	39
-3.0	71 [115]	0	Off	Off	On Non-Engaged	-5	2,000	0
-2.5	70 [113]	0	On	Off	On Non-Engaged	-10	1,800	0
-2.0	66 [107]	0	On	Off	On Non-Engaged	-5	1,500	0
-1.5	14 [23]	0	On	On	On Non-Engaged	-5	500	0
-1.0	57 [91]	0	On	On	On Non-Engaged	-15	900	0
-0.5	57 [91]	0	On	On	On Non-Engaged	0	1,300	0
0.0	35 [56]	18	On	On	On Non-Engaged	20	1,300	18

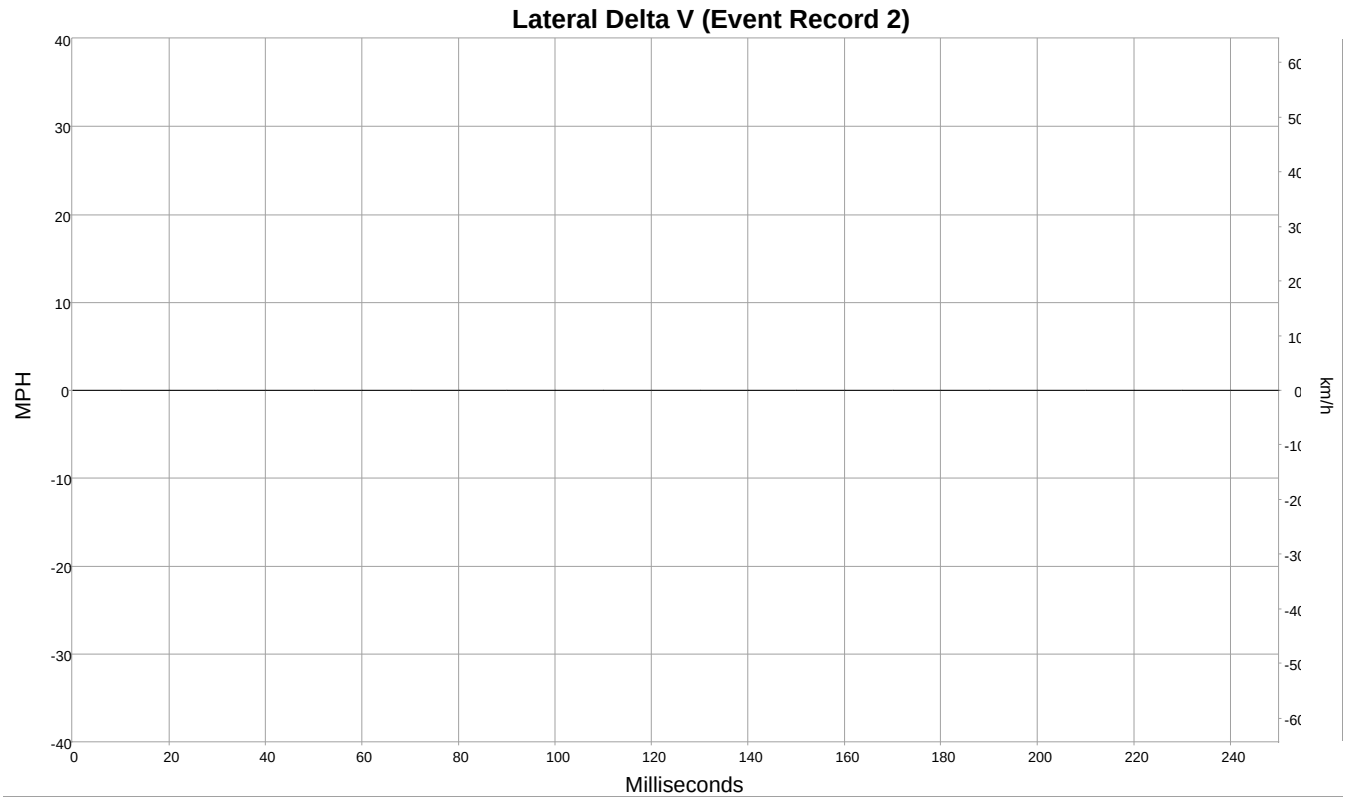
Pre-Crash Data -5 to 0 sec [2 samples/sec] (Event Record 2) - Table 2 of 2

Time Stamp (sec)	Cruise Control (Not Engaged/ Engaged)	Cruise Control (On/Off)
-5.0	Not Engaged	Off
-4.5	Not Engaged	Off
-4.0	Not Engaged	Off
-3.5	Not Engaged	Off
-3.0	Not Engaged	Off
-2.5	Not Engaged	Off
-2.0	Not Engaged	Off
-1.5	Not Engaged	Off
-1.0	Not Engaged	Off
-0.5	Not Engaged	Off
0.0	Not Engaged	Off



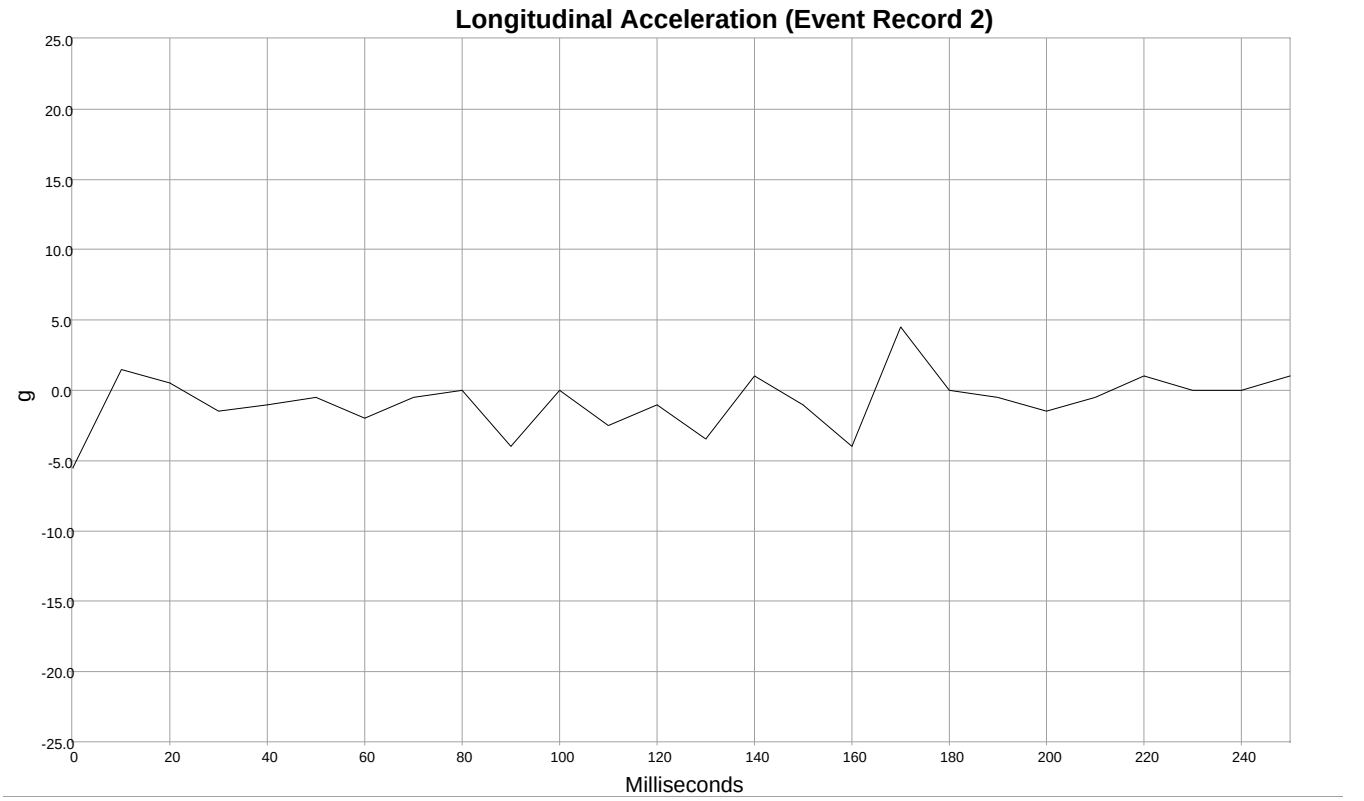
Longitudinal Delta V (Event Record 2)

Time (msec)	MPH [km/h]
0	0 [0]
10	0 [0]
20	0 [0]
30	0 [0]
40	0 [0]
50	0 [0]
60	0 [0]
70	0 [0]
80	0 [0]
90	0 [0]
100	0 [0]
110	0 [0]
120	0 [0]
130	0 [0]
140	0 [0]
150	0 [0]
160	0 [0]
170	0 [0]
180	0 [0]
190	0 [0]
200	0 [0]
210	0 [0]
220	0 [0]
230	0 [0]
240	0 [0]
250	0 [0]



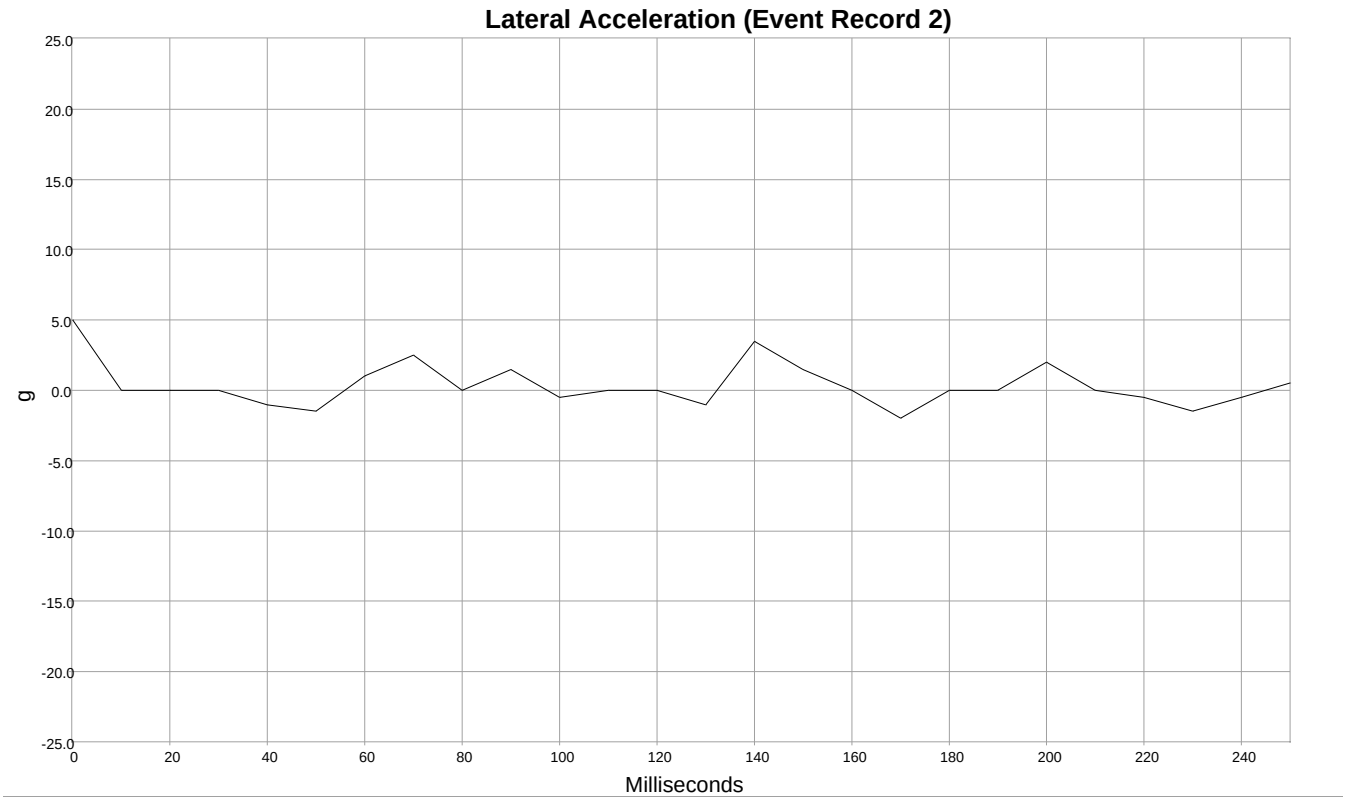
Lateral Delta V (Event Record 2)

Time (msec)	MPH [km/h]
0	0 [0]
10	0 [0]
20	0 [0]
30	0 [0]
40	0 [0]
50	0 [0]
60	0 [0]
70	0 [0]
80	0 [0]
90	0 [0]
100	0 [0]
110	0 [0]
120	0 [0]
130	0 [0]
140	0 [0]
150	0 [0]
160	0 [0]
170	0 [0]
180	0 [0]
190	0 [0]
200	0 [0]
210	0 [0]
220	0 [0]
230	0 [0]
240	0 [0]
250	0 [0]



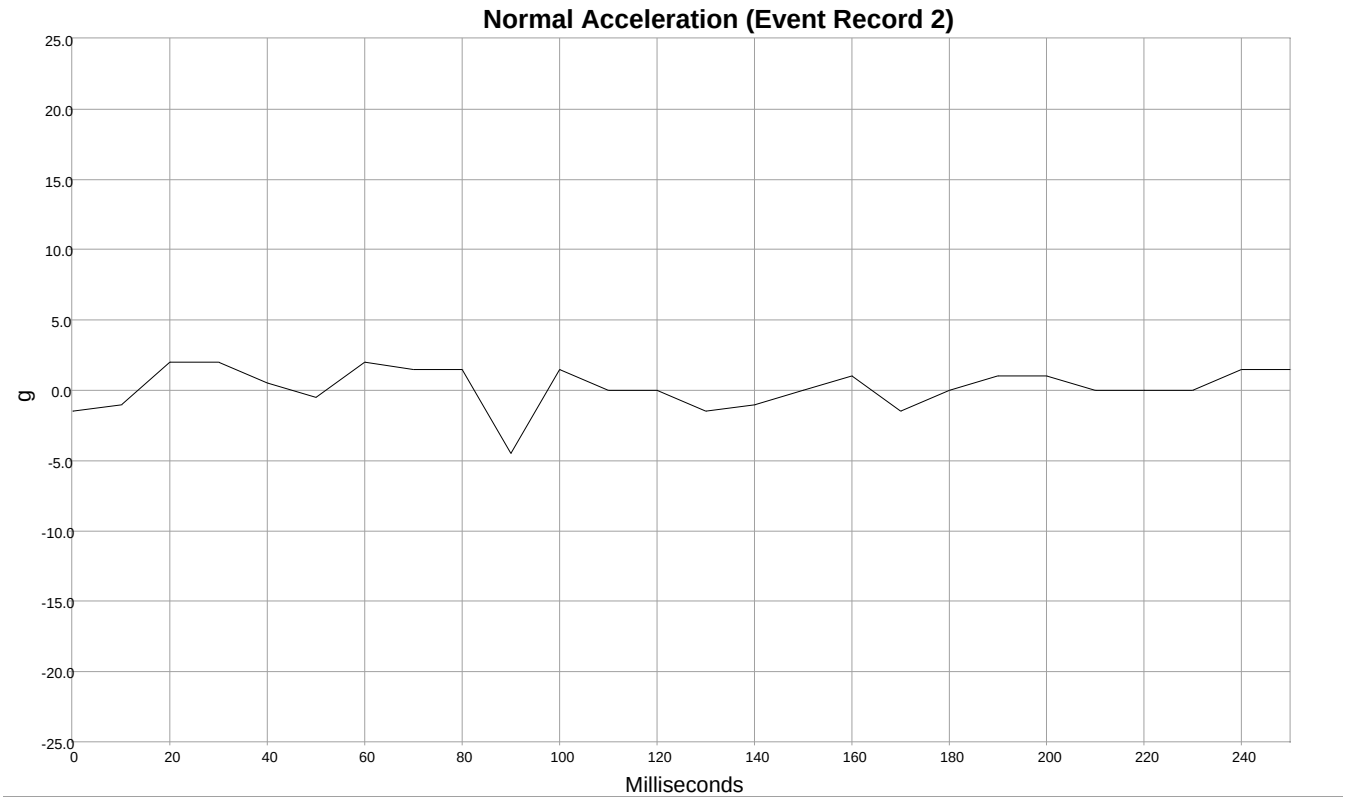
Longitudinal Acceleration (Event Record 2)

Time (msec)	g
0	-5.5
10	1.5
20	0.5
30	-1.5
40	-1.0
50	-0.5
60	-2.0
70	-0.5
80	0.0
90	-4.0
100	0.0
110	-2.5
120	-1.0
130	-3.5
140	1.0
150	-1.0
160	-4.0
170	4.5
180	0.0
190	-0.5
200	-1.5
210	-0.5
220	1.0
230	0.0
240	0.0
250	1.0



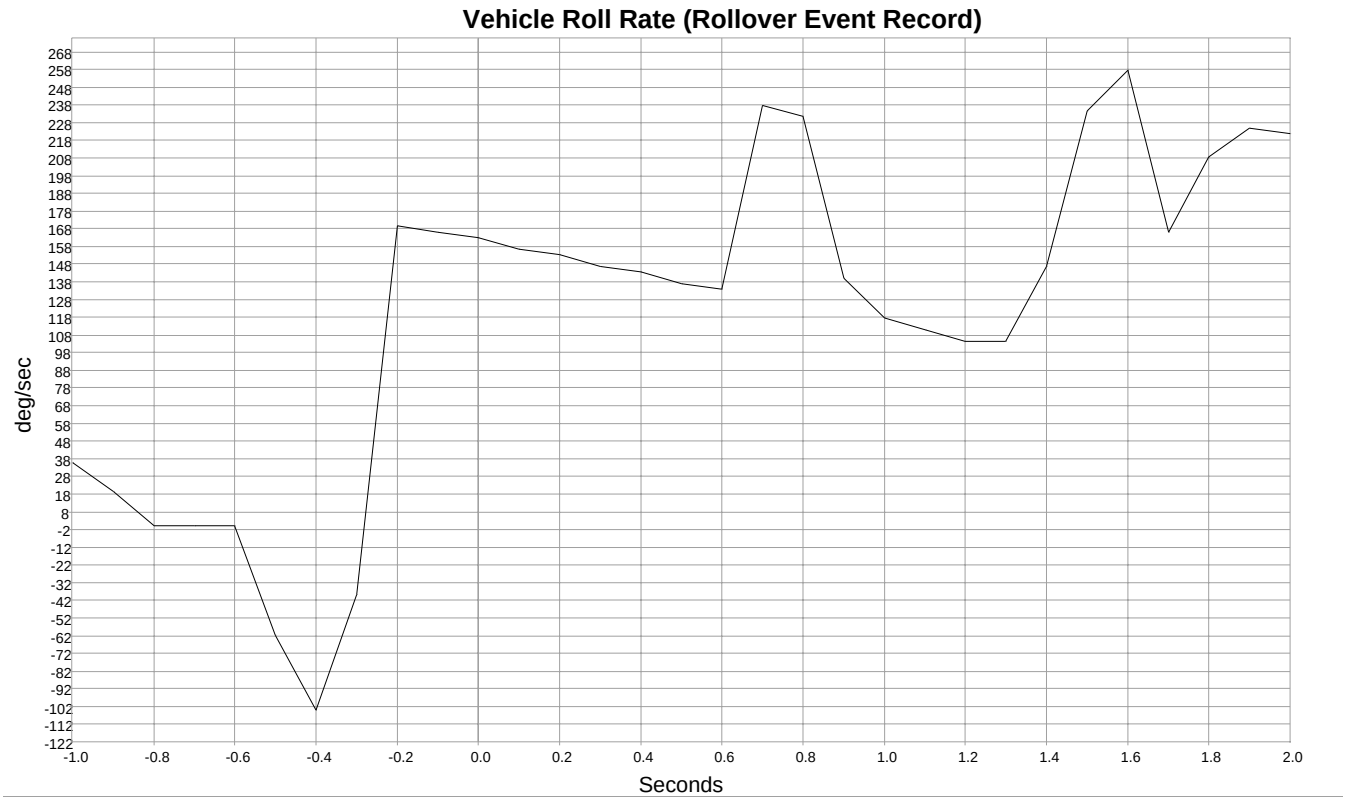
Lateral Acceleration (Event Record 2)

Time (msec)	g
0	5.0
10	0.0
20	0.0
30	0.0
40	-1.0
50	-1.5
60	1.0
70	2.5
80	0.0
90	1.5
100	-0.5
110	0.0
120	0.0
130	-1.0
140	3.5
150	1.5
160	0.0
170	-2.0
180	0.0
190	0.0
200	2.0
210	0.0
220	-0.5
230	-1.5
240	-0.5
250	0.5



Normal Acceleration (Event Record 2)

Time (msec)	g
0	-1.5
10	-1.0
20	2.0
30	2.0
40	0.5
50	-0.5
60	2.0
70	1.5
80	1.5
90	-4.5
100	1.5
110	0.0
120	0.0
130	-1.5
140	-1.0
150	0.0
160	1.0
170	-1.5
180	0.0
190	1.0
200	1.0
210	0.0
220	0.0
230	0.0
240	1.5
250	1.5



Positive roll rate indicates right-to-left (counterclockwise) rotation

Vehicle Roll Rate

Time (sec)	deg/sec	Time (sec)	deg/sec
-1.0	35.8	0.6	133.5
-0.9	19.5	0.7	237.6
-0.8	0.0	0.8	231.1
-0.7	0.0	0.9	140.0
-0.6	0.0	1.0	117.2
-0.5	-61.8	1.1	110.7
-0.4	-104.2	1.2	104.2
-0.3	-39.1	1.3	104.2
-0.2	169.3	1.4	146.5
-0.1	166.0	1.5	234.4
0.0	162.8	1.6	257.1
0.1	156.2	1.7	166.0
0.2	153.0	1.8	208.3
0.3	146.5	1.9	224.6
0.4	143.2	2.0	221.3
0.5	136.7		

Hexadecimal Data

DID #	Data
$8000	21 69 11 11 01 33 00 55 00 55 00 00 11 33 80 00 20 0F 00 E9 02 05 00 00 00 00 00 00 00 00 00 00 11 11 00 00 00 00 00 00 00 00 00 00 00 00 00 00 00 00 00 00 00 00 00 00 00 00 00 00 00 00 00 71
$8020	01 03 00 00 00 00 00 00 00 00 00 00 00 00 00 FC
$8021	AA 00 01 02 00 01 00 00 00 00 00 52 21 32 AA AA
$8022	AA 00 CC 78 66 00 00 00 07 00 00 00 0F 00 00 00 00 19 00 37 00 00 00 00 00 1D 00 00 00 1B 00 00 00 00 00 00 00 00 00 00 00 00 00 00 00 00 00 00 00 00 00 00 00 00 00 00 00 00 00 00 00 00 00 00 11 00 00 00 00 00 00 00 00 00 00 00 00 00 00 FD
$8023	AA 00 CC 78 66 00 00 00 00 00 00 00 00 00 00 00 00 00 00 00 00 00 00 00 00 00 00 00 00 00 00 00 00 00 00 00 00 00 00 00 00 00 00 00 00 00 00 00 00 00 00 00 00 00 00 00 00 00 00 00 00 00 00 00 11 00 00 00 00 00 00 00 00 00 00 00 00 00 00 9B
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February 2025

U.S. Department
of Transportation

**National Highway
Traffic Safety
Administration**

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