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Special Crash Investigations: On-Site Rollover and Child Restraint System Crash Investigation; Vehicle: 2018 Hyundai Tucson; Location: Georgia; Date: February 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 report documents the on-site investigation of the rollover crash of a 2018 Hyundai Tucson and 2018 Mercedes-Benz GLC in Georgia. The Hyundai was driven by a belted 27-year-old female with a 10-month-old male passenger secured in a child restraint system. The Mercedes-Benz was driven by a belted 16-year-old female. The crash occurred when the eastbound Mercedes-Benz crossed the centerline of the two-lane road resulting in the left front corner of the Mercedes-Benz and the left front corner of the Hyundai striking. This redirected the Hyundai off the roadway. Subsequently, the Hyundai's right side struck a tree, resulting in a left-side-leading roll. After the initial impact, the Mercedes-Benz rotated counter-clockwise and rolled, right-side-leading, coming to final rest on its top in the roadway. The Hyundai driver sustained police-reported non-incapacitating (B-Level) injuries. The 10-month-old male passenger sustained police-reported possible (C-level) injuries. The Mercedes-Benz driver was not injured.

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Special Crash Investigations
On-Site Rollover and Child Restraint System Crash Investigation
SCI Case No: CR22006
Vehicle: 2018 Hyundai Tucson
Location: Georgia
Crash Date: February 2022

Background

This report documents the on-site investigation of the rollover crash of a 2018 Hyundai Tucson (Figure 1) and 2018 Mercedes-Benz GLC (Figure 2). The crash occurred when the eastbound Mercedes-Benz crossed the centerline of the two-lane road, resulting in the left front corner of the Mercedes-Benz and the left front corner of the Hyundai striking. This redirected the Hyundai off the roadway. The Hyundai's right side then struck a tree, resulting in a left-side-leading roll. After the initial impact, the Mercedes-Benz rotated counterclockwise and rolled, right-side leading, coming to rest on its top in the roadway. The Hyundai's belted 27-year-old female driver sustained police-reported non-incapacitating (B-level) injuries. A 10-month-old male passenger was secured in a child restraint system in the second-row center position, and sustained police-reported possible (C-level) injuries. The belted 16-year-old female Mercedes-Benz driver was not injured. Both vehicles were towed from the scene to a local salvage yard.

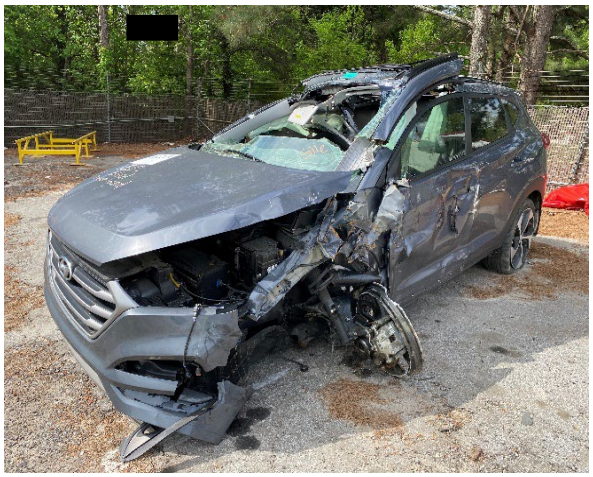


Figure 1. Left front oblique view of the 2018 Hyundai Tucson

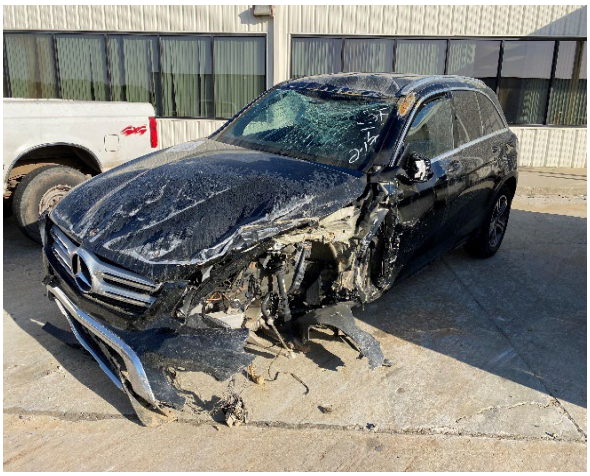


Figure 2. Left front oblique view of the 2018 Mercedes-Benz GLC

This crash was identified through the National Highway Traffic Safety Administration's Police Accident Reporting Sampling Engine in April 2022. The crash was then assigned for on-site investigation to the SCI team at Crash Research & Analysis, Inc. for further research. Cooperation with the Hyundai's and Mercedes-Benz's insurers was obtained, and an on-site investigation occurred in April 2022.

Crash Summary

Crash Site

This crash occurred on a two-lane rural roadway during the day. The reported weather conditions in the locale included fair conditions, a temperature of 19 °C (66 °F), winds from the west-southwest at 15 km/h (9 mph), and the roadway surface condition as being dry. Speed was regulated by a posted limit of 64 km/h (40 mph). Figure 3 shows the Hyundai's west travel lane, while Figure 4 shows the Mercedes-Benz's east travel lane in the pre-crash approaches to the crash site. At the scene there was a tree line with fencing north of the roadway and an embankment with chain link fencing south of the roadway. A crash diagram is attached at the end of this report.

Figure 3. Westward view of the Hyundai's pre-crash approach to the crash site

Figure 4. Eastward view of the Mercedes-Benz's pre-crash approach to the crash site

Pre-Crash

The Hyundai was traveling in the west travel lane of the two-lane roadway at an event data recorder (EDR)-reported speed of 88 km/h (54 mph), 5 seconds prior to algorithm enabled (AE). The Hyundai driver was restrained by the lap and shoulder belt. The child passenger was secured in a child restraint system (CRS) in the second-row center seat. The driver negotiated the slight left curve while maintaining the Hyundai in the original travel lane. The Mercedes-Benz was traveling in the east travel lane at an EDR-reported speed of 57 km/h (35 mph), 5 seconds prior to AE. The Mercedes-Benz driver was restrained by the lap and shoulder belt. The Mercedes-Benz began crossing into the west travel lane for unknown reasons. The Hyundai driver steered right and applied the brakes in an attempt to avoid striking the Mercedes-Benz.

Crash

The left-front corner of the Hyundai and the left-front corner of the Mercedes-Benz struck one another (Event 1). The Hyundai was redirected off the north side of the roadway and struck a tree (Event 2) with its right plane. The impact on the tree resulted in the Hyundai rotating clockwise. The Hyundai continued west and began a left-side-leading roll (Event 3). The Hyundai rolled two quarter turns coming to rest on its top plane facing east along the road edge. After the initial frontal offset impact with the Hyundai (Event 1), the Mercedes-Benz continued east on the roadway while rotating counterclockwise, then began a right-side-leading roll (Event 4). The Mercedes-Benz rolled two quarter turns, coming to rest on its top plane in the roadway facing west.

Post-Crash

Local emergency services were notified of the incident. The Hyundai driver and child occupant were extricated from the vehicle by local emergency personnel. The driver and child were transferred to a local hospital by ambulance with non-life-threatening injuries as reported by the police crash report (PCR). The PCR stated that the driver of the Mercedes-Benz was not transported for treatment from the crash site.

2018 Hyundai Tucson

Description

The 2018 Hyundai Tucson (Figure 5) was identified by the Vehicle Identification Number (VIN) KM8J33A20JUxxxxxx. It had front-wheel drive with a 1.6-liter, 4-cylinder gasoline engine linked to a 7-speed automatic transmission. It had a power-assisted four-wheel disc antilock braking system (ABS). The gross vehicle weight rating was 2,110 kg (4,652 lb). At the time of the SCI inspection, the Hyundai had Kumho Grugen tires, size 245/45R19, for the left rear, right rear, and right front tires. The left front tire was damaged during impact with the Mercedes-Benz and was not present at the time of the SCI inspection. The Hyundai had front seat belt pretensioners, certified advanced frontal air bags, front outboard seat-mounted side impact air bags, and dual sensing (side impact and rollover) inflatable curtain (IC) air bags that deployed during the crash.

Figure 5. Right front oblique view of the 2018 Hyundai Tucson

The interior had seating for five occupants (2/3) with front-row bucket seats and a second-row split bench with folding seat backs. All seating positions had adjustable head restraints. Manual restraint systems had three-point lap and shoulder seat belts for all seating positions. The driver and front passenger seating positions had retractor pretensioners with their seat belt systems. Additional supplemental restraint systems included six air bags with driver's and passenger's frontal, front outboard seat-mounted side impact, and IC air bags.

Exterior Damage

The crash involved the front and left planes for Event 1. This damage was indicative of a corner impact. No crush was observed along the front bumper reinforcement bar. Direct damage was located 76 cm (29.9 in) left of the front center point extending 2 cm (0.8 in) left. However, the direct damage extended rearward down the left plane of the vehicle 220 cm (86.6 in). The collision deformation classification[1] (CDC) for this damage profile was 12FLEE7.

[1] SAE J224_202205 – SAE Recommended Practice describing vehicle collision damage in an alphanumeric format

The crash also involved a right plane impact for Event 2. A crush profile was documented on the right side of the vehicle. The corresponding direct damage was 306 cm (120.4 in) wide, beginning 2 cm (0.8 in) rear of the right front axle extending rearward. The field-L was 340 cm (133.8 in) starting 10 cm (3.9 in) forward of the right front axle extending rearward. The residual crush at the mid-door level was: C1 = 15 cm (5.9 in), C2 = 0 cm, C3 = 17 cm (6.6 in), C4 = 13 cm (5.1 in), C5 = 0 cm, C6 = 6 cm (2.3 in). Maximum crush was observed to be 17 cm (6.6 in) and located 173 cm (68.1 in) rear of the right front axle. The CDC for this damage profile was 01RDAW2.

Damage from the rollover was noted on the left and top planes of the Hyundai, consistent with two-quarter turns. The rollover resulted in a maximum vertical crush of 5 cm (1.9 in) and a maximum lateral crush of 2 cm (0.8 in) located at the right B-pillar. The CDC was 00TDDO2.

Event Data Recorder

The Hyundai had an air bag control module that performed the diagnostic, sensing, and deployment command functions for the vehicle's supplemental restraint systems. This module has EDR capabilities and was located on the center tunnel of the vehicle. The EDR component was imaged with the Hyundai/Kia GIT Retrieval tool and software version E-N-H-01-00-0048 via direct connection to the module. The imaged data is reported with version EDR001-R01. The EDR report is included in Appendix A.

The Hyundai EDR recorded the tri-axial acceleration and roll data and stored two events, deployment or non-deployment event types. A deployment event is recorded if an air bag is commanded to deploy. This event type is locked and cannot be overwritten. A non-deployment event is a physical occurrence that reaches the level to require recording but does not deploy air bags, i.e., a pretensioner-only actuation. Non-deployment events are not locked and can be overwritten. A 5-second buffer that records various pre-crash vehicle operational parameters (such as speed, brake, steering, etc.) was stored and linked to each record.

The imaged data recorded one stored deployment event imaged at ignition cycle 5463 and one reported event at 5469. The driver's seat belts were reported "On" and the air bag warning lamp was off. The maximum longitudinal delta V was -27 km/h (-17 mph) at 300.0 milliseconds. The maximum lateral delta V was 13 km/h (8 mph) at 60.0 milliseconds. The actuation/deployment times are presented in the table below.

Actuation/Deployment Times for the Hyundai

Device	Time after AE milliseconds	Device	Time after AE milliseconds
Driver pretensioner	24	Passenger pretensioner	---
Driver air bag stage 1	31	Passenger air bag stage 1	---
Driver air bag stage 2	35	Passenger air bag stage 2	---
Driver side air bag	38	Passenger side air bag	319
Driver IC air bag	38	Passenger IC air bag	319

The Hyundai's EDR data file found that all three SCI crash events were recognized and recorded by the EDR. It was noted that the actuation and deployment times for the driver's safety and supplemental restraint systems were consistent with Event 1. The deployments of the passenger's side impact and IC air bags occurred 319 msec after AE and was attributed to the Hyundai's impact with the tree (Event 2). Examination of the roll data (Appendix A) found that the left-side-leading rollover began approximately 800 msec after AE.

The trends of pre-crash data showed the Hyundai approached the impact at a constant speed of approximately 89 km/h (55 mph). An avoidance reaction was recorded 0.5 seconds before AE when the driver lifted from the accelerator pedal and applied the brakes (recorded On at AE). A right steering avoidance maneuver was also recorded at AE. The recorded impact speed of the Hyundai was 81 km/h (50 mph).

Interior Damage

The interior of the Hyundai had lateral intrusions to the right side in the front row, second row, and at the right B-pillar. The maximum intrusion in the front row was 12 cm (4.7 in). The maximum intrusion in the second row was 16 cm (6.2 in). The maximum intrusion of the B-pillar was 6 cm (2.3 in). No contacts were observed at the time of the SCI inspection. It should be noted that the interior was soiled from the debris placed into the vehicle, making it impossible to definitively discern contact points in the vehicle.

Manual Restraint Systems

The Hyundai had manual three-point lap and shoulder seat belt systems for all five seating positions. All three-point lap and shoulder belt systems had continuous loop webbing with sliding latch plates. The driver's and front passenger's seat belt systems used retractor pretensioners and retracted onto an emergency locking retractor (ELR). The second-row seat belt system used a switchable ELR/automatic locking retractor. The driver's seat belt was cut during the extrication process and the pretensioner was observed to be actuated.

Supplemental Restraint Systems

The Hyundai had multiple supplemental restraints for its occupants. These included dual-stage driver's and passenger's frontal air bags, front seat-mounted side impact air bags, and IC air bags. The IC air bags could deploy for rollover and/or side impact collisions. The driver's frontal (Figure 6), left side-impact (Figure 7), right-side impact, and both IC air bags deployed during the crash sequence.

Figure 6. View of the driver's frontal air bag in the Hyundai

Figure 7. View of the driver's seat-mounted side impact air bag in the Hyundai

Child Restraint System

The CRS was a Graco Snug Ride (Figure 8). The 10-month-old male was secured in the CRS located in the second-row center seating position (Figure 9). The CRS was secured to the base. The base was secured to the seat with the available lap and shoulder belt that was routed through the base in the rear-facing position. The CRS did not use the available Lower Anchors and Tethers for Children (LATCH) system in this incident. Per the owner's manual, the second-row center seating position is not a LATCH-approved position. The manufacturer label on the CRS showed that it was produced on October 23, 2020. The CRS would not have been expired at the time of the incident.

Figure 8. CRS that was secured in the second-row center seating position of the Hyundai.

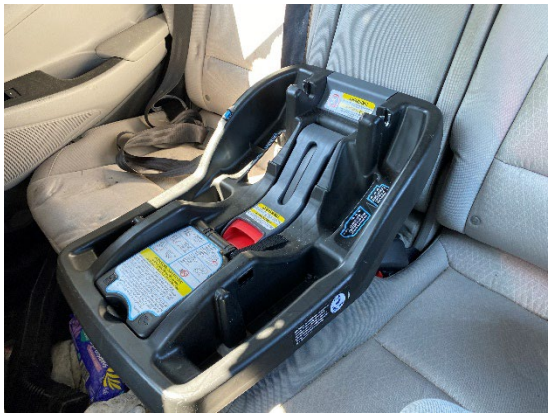


Figure 9. View of the CRS base in the second-row center seating position

2018 Hyundai Tucson Occupants

Driver Demographics

Age/sex:	27 years/female
Height:	166 cm (65 in)
Weight:	102 kg (224 lb)
Eyewear:	Unknown
Seat type:	Forward-facing bucket seat with adjustable head restraint
Seat track position:	Seat between forwardmost and middle track positions
Manual restraint usage:	Lap and shoulder belt
Usage source:	Vehicle inspection and EDR
Air bags:	Dual-stage driver's frontal, seat-mounted, and IC air bags available; all deployed
Alcohol/drug involvement:	Alcohol = 0; no drug test given
Egress from vehicle:	Removed from vehicle due to perceived serious injuries
Transport from scene:	EMS ambulance to Level II trauma center
Type of medical treatment:	Hospitalized for 1 day

Driver Injuries

Inj. No.	Injury	Injury Severity AIS 2015	Involved Physical Component (IPC)	IPC Confidence Level
1	Right distal radius fracture, intra-articular	752361.2	ICS #1: Isolated IPC Front - Center instrument panel (Event 1) ICS #2: Isolated IPC Front - Center instrument panel (Event 3)	Possible Possible
2	Right distal radius dislocation	772230.1	Isolated Front - Center instrument panel	Possible
3	Right non-displaced avulsion fracture of ulnar styloid	772410.1	Isolated Front - Center instrument panel	Possible
4	Left neck contusion	310402.1	Isolated	Certain

Inj. No.	Injury	Injury Severity AIS 2015	Involved Physical Component (IPC)	IPC Confidence Level
			Interior - Shoulder portion of belt restraint	
5	Bruise to left chest	410402.1	Isolated Interior - Shoulder portion of belt restraint	Probable
6	Lower anterior abdominal wall contusion	510402.1	Isolated Interior - Lap portion of belt restraint	Certain
7	Lower abdominal abrasions	510202.1	Isolated Interior - Lap portion of belt restraint	Certain
8	Bruise to left anterior forearm	710402.1	Isolated Left Door Panel – Left forward upper quadrant	Possible
9	Small superficial abrasion to left hand	710202.1	Isolated Left Door Panel – Left forward upper quadrant	Possible
10	Superficial abrasion along right anterior lower leg	810202.1	Isolated Front – Left lower instrument panel (includes knee bolster)	Probable

Source: Hospital records

Driver Kinematics

The 27-year-old female Hyundai driver used the three-point lap and shoulder seat belt system. The driver's seat was between the forward-most and middle track positions at the time of the SCI inspection. At the initial Hyundai's frontal plane impact (Event 1), the seat belt system pretensioner actuated. Her right arm responded forward, likely striking the center instrument

panel during this event, although it is possible that the injury occurred during the rollover event (Event 3). At the same time, her left arm responded forward and left into the upper forward quadrant of the left door. When the Hyundai's right plane struck the tree (Event 2), began the left-leaning roll (Event 3), then came to rest on its top plane, the driver remained secured to her seat. Emergency medical services extricated the Hyundai driver and transported her to a local hospital by ambulance.

Second-Row Center Occupant Demographics

Age/sex:	10 months/male
Height:	Unknown
Weight:	10 kg (21 lb)
Eyewear:	Unknown
Seat type:	Forward-facing split-bench with folding seatback and adjustable head restraint
Seat track position:	Not adjustable
Manual restraint usage:	Lap and shoulder belt with an infant CRS
Usage source:	Vehicle inspection
Air bags:	No available air bags
Egress from vehicle:	Removed from vehicle due to perceived serious injuries
Transport from scene:	EMS ambulance to Level I pediatric trauma center
Type of medical treatment:	Treated and released

Second-Row Center Occupant Injuries

Inj. No.	Injury	Injury Severity AIS 2015	Involved Physical Component (IPC)	IPC Confidence Level
1	Right parietal scalp hematoma, 2 x 2 cm	110402.1	Isolated Interior – Child car seat shell (i.e., interior, exterior, base, cup holder, padding, head restraint, handle)	Probable
2	Right parietal scalp abrasion	110202.1	Isolated Interior – Child car seat shell (i.e., interior, exterior, base, cup holder, padding, head restraint, handle)	Probable
3	Scratch to lips	210202.1	Injured, unknown source	Unknown

Inj. No.	Injury	Injury Severity AIS 2015	Involved Physical Component (IPC)	IPC Confidence Level
4	Abrasion to right lateral neck	310202.1	Isolated Interior – Child car seat harness system (i.e., straps, retainer clip, latchplate, buckle)	Probable

Source: Emergency room record

Second-Row Center Occupant Kinematics

The 10-month-old male child was in a rear-facing CRS in the second-row center seating position. The CRS was secured to the base that was secured with the available lap and shoulder seat belt routed through the base in the rear-facing position. The child was secured in the CRS using the 5-point harness system. Throughout the entire crash sequence, the child remained in the CRS with no ejection. During the rollover event, the child's head likely responded towards the left striking the CRS shell resulting in minor injuries. Additionally, the child sustained an abrasion on the right side of his neck from the harness straps. Emergency personnel extricated the child from the Hyundai and transported him to a local hospital by ambulance.

2018 Mercedes-Benz GLC

Description

The 2018 Mercedes-Benz GLC (Figure 10) was identified by VIN WDC0G4JB2JVXXXXXX. It had a 2.0 liter, inline 4-cylinder gasoline engine. It had power-assisted four-wheel disc ABS. The gross vehicle weight rating was 2,315 kg (5,103 lb). At the time of the SCI inspection, the Mercedes had Arroyo Eco Pro H/T tires, size P235/60R18. Information for the left front tire is unknown due to the wheel and tire separating from the vehicle during the crash sequence. The wheel and tire were not available for inspection.

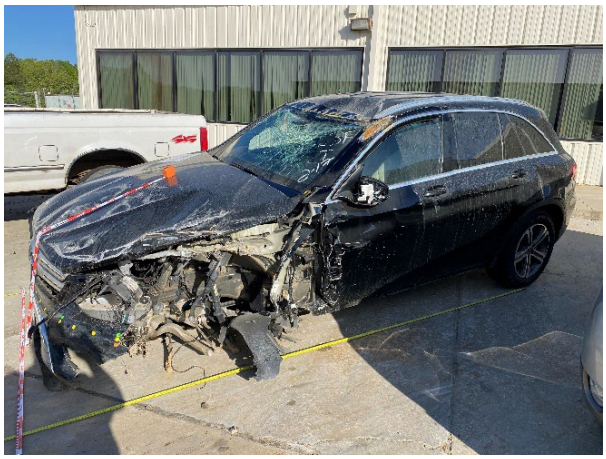


Figure 10. View of the damage to the front

Exterior Damage

The crash involved the front and left plane for Event 1. A crush profile documented the front bumper fascia of the vehicle. The corresponding direct damage was 32 cm (12.5 in) wide beginning 52 cm (20.4 in) left of the front center point extending left. The field-L was 168 cm (66.1 in) extending across the entire front bumper. The residual crush was documented across the front bumper fascia and the crush values are: C1 = 48 cm (18.8 in), C2 = 18 cm (7.1 in), C3 = 7 cm (2.7 in), C4 = 6 cm (2.3 in), C5 = 7 cm (2.7 in), C6 = 14 cm (5.5 in). Maximum crush was observed to be 48 cm (18.8 in) and located 84 cm (33.1 in) left of the front center point. The CDC for this damage profile was 12FLEE6.

Damage from the rollover was noted on the right and top planes of the Mercedes-Benz, consistent with two-quarter turns. The rollover caused a maximum vertical crush of 1 cm (0.4 in) and a maximum lateral crush of 3 cm (1.1 in) both located at the left A-pillar. The CDC was 00TDDO2.

Event Data Recorder

The Mercedes-Benz had an air bag control module (ACM) that monitored and controlled the diagnostic, sensing, and deployment commands for the vehicle's supplemental safety systems. The ACM had EDR capabilities, and its data was imaged with version 21.5 of the Bosch Crash Data Retrieval software and is reported with version 24.1.197. Electrical power was supplied to the vehicle by an external battery and the data was imaged via direct connection to the diagnostic link connector. The EDR report is attached in Appendix B.

The EDR could store up to six crash events, termed non-deployment or deployment events. Non-deployment events occur when the recording trigger threshold is met or exceeded (minimum of 8 km/h [5 mph]). Data from non-deployments can be overwritten by subsequent events. Deployment events are characterized by a severity that requires the deployment/actuation of a safety device (air bag or pretensioner) and cannot be overwritten by subsequent events. A 5.0-second pre-crash data buffer associated with each crash event was recorded in 0.5-second intervals including vehicle speed, accelerator pedal percentage, and service brake activation.

The EDR data had five events at ignition cycle 26,682 that were stored in reverse chronological order. The EDR data was imaged on ignition cycle 26,686. It was determined that all the events were related to the crash under investigation. The driver was recorded as belted.

Record 5 was the first recorded event and was related to the frontal impact with the Hyundai (Event 1). The maximum longitudinal delta V was -23 km/h (-14.3 mph) at 258 milliseconds and the maximum lateral delta V was 9 km/h (5.6 mph) at 90 milliseconds. The following deployment times were recorded in the table below.

Actuation/Deployment Times for the Mercedes-Benz

Device	Time after AE milliseconds	Device	Time after AE milliseconds
Driver pretensioner 1	19	Passenger pretensioner	---
Driver pretensioner 3	25	Passenger pretensioner	---
Driver air bag stage 1	23	Passenger air bag stage 1	---
Driver air bag stage 2	28	Passenger air bag stage 2	---
Driver IC air bag	33	Passenger IC air bag	---

The pre-crash speed of the vehicle gradually increased from 57 km/h (35 mph) at 5 seconds before AE to 69 km/h (43 mph) at AE. The pre-crash speed was consistent with its descent down the grade of the roadway. The accelerator percentage remained constant at 22 percent and there was no brake application.

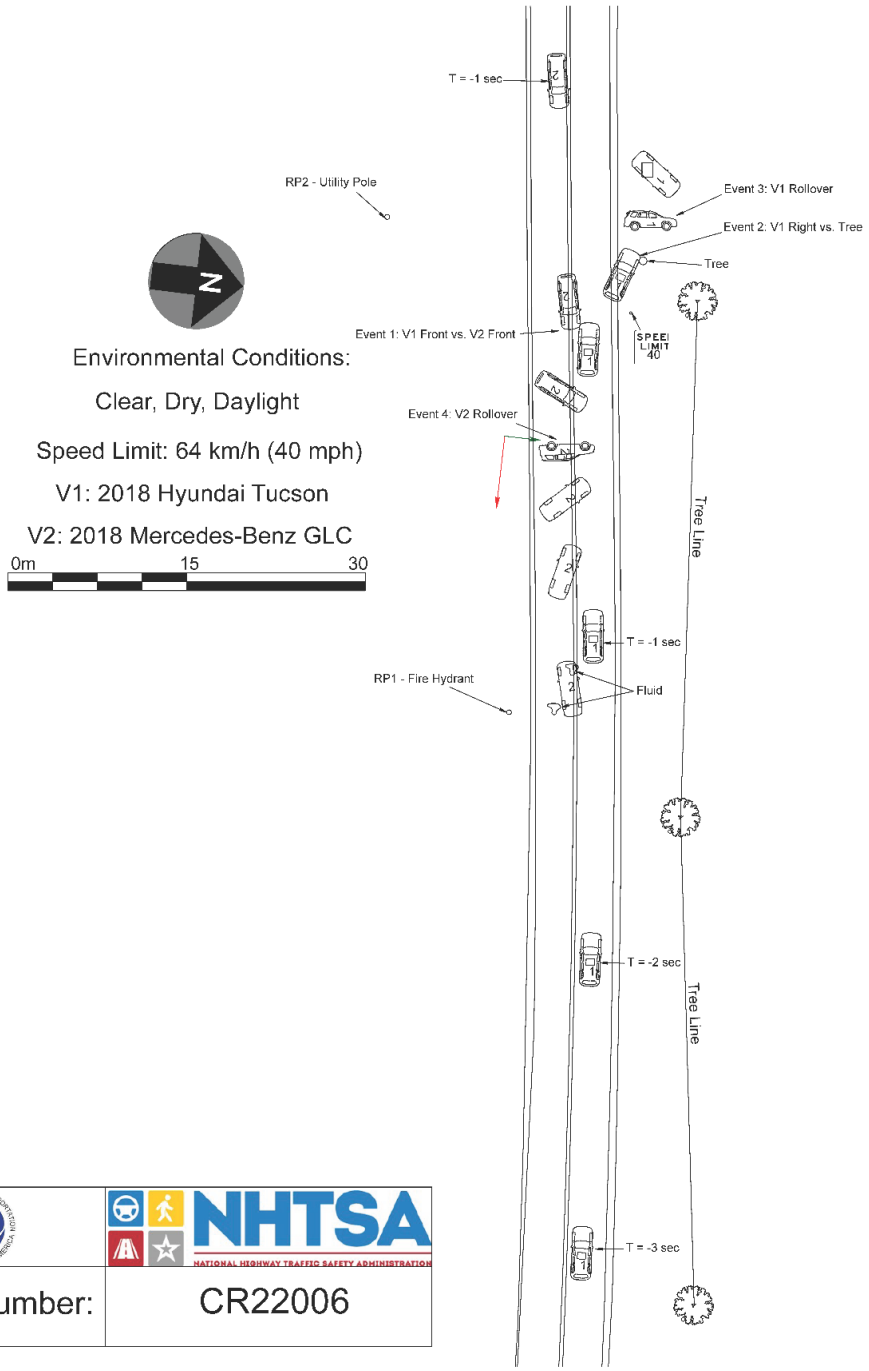
Record 4 was the second recorded event in the sequence and was considered a rollover event. This event enabled 0.507 seconds after Record 5 and was attributed to SCI Event 4. The driver pretensioner and IC air bags were commanded to actuate/deploy at 2 msec. Note the driver's pretensioner and the left IC air bag had previously deployed in Record 5.

A review of the balance of the imaged data found that Records 3, 2, and 1 were all related to ground contact of the vehicle's right and top planes during its rollover to final rest.

Occupant Data

A belted 16-year-old female drove the Mercedes-Benz. The driver's frontal, driver's knee, and both IC air bags deployed during the crash sequence. The driver did not sustain any injuries and was not taken for treatment. No drug or alcohol test was given according to the PCR.

Crash Diagram



	NHTSA NATIONAL HIGHWAY TRAFFIC SAFETY ADMINISTRATION
Case Number:	CR22006

Appendix A: 2018 Hyundai Tucson Event Data Recorder Report

[1] The EDR report contained in this technical report was imaged using the current version of the Hyundai 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. Hexadecimal data is sanitized due to possible Personal Identifiable Information.

Vehicle Information

HYUNDAI | TUCSON(TL) | 2018 | AIRBAG SYSTEM	
VIN as Programmed into EMS	

Additional Information

User-entered VIN	KM8J33A20JU
User Name	
Case Number	
Crash Date	
Saved-on Date	
EDR Tool Version	E-N-H-01-00-0048
EDR Report Version	EDR001-R01
Tire Size(s)	
Memo	

Data Limitation

General Information:

Tools for downloading and interpreting the EDRs in Hyundai vehicles have been developed for vehicles produced after September 1, 2012. Currently, there is no tool for downloading and accurate interpreting data from the EDRs in Hyundai vehicles produced prior to this date.

The EDR Report requires Adobe Reader Version 9.00 or higher to open.

EDR(Event Data Recorder):

- The EDR function is part of the Airbag Control Unit(ACU).

- ACU can store up to two events.

- Event means a crash or other physical occurrence that causes the trigger threshold to be met or exceeded, or any non-reversible deployable restraint to be deployed, whichever occurs first:

    1. Deployment Event:
       1) the event which is recorded if an airbag is commanded to deploy.
       2) the event is locked and cannot be overwritten.

    2. Non-deployment Event:
       1) the event which is recorded, but in which an airbag is not commanded to deploy
       2) the event is not locked and can be overwritten by a subsequent event (Deployment or Non-deployment event), for example, Pretensioner(s) only deployment
       3) An example of a non-deployment event is a pretensioner-only deployment with no airbag deployments

- Ignition cycle count will increment by 1 in the following cases

    1. the power mode change from OFF/Accessary to IGN ON/RUN

    2. EDR data download by tools

- The ACU can record data for all or some of the following events. But, depending on the vehicle's configurations, data for side crash and/or rollover crash(event) may not be recorded.

- If power supply to the ACU is lost during an event, all or part of the data may not be recorded.

Data Limitation

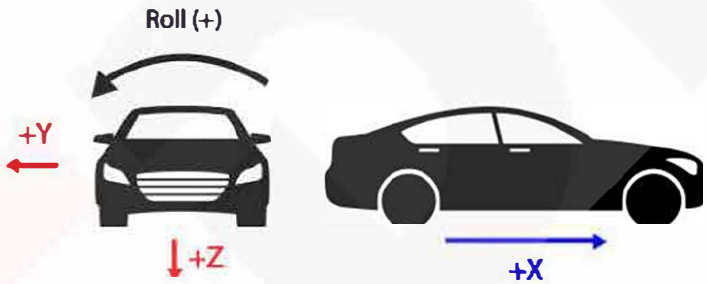
Data Element Sign Convention:

The following table provides an explanation of the sign notation for data elements that may be included in the EDR report. Directional references to sign convention are from the point of view of the driver.

Data element name	Positive sign	Note
* Longitudinal acceleration	Forward direction	+X at the figure 1
Delta V, longitudinal	Forward direction	+X at the figure 1
Lateral acceleration	Left to Right direction	+Y at the figure 1
Delta V, lateral	Left to Right direction	+Y at the figure 1
Normal(vertical) acceleration	Downward direction	+Z at the figure 1
Vehicle roll angle	Clockwise about the longitudinal axis	Roll(+) at the figure 1
Steering input	Counterclockwise rotation	-

* The forward direction of longitudinal acceleration for front side impact sensor may be different for each vehicle

Figure 1. Sign Conventions



Data Sources:

Many EDR data elements are sourced from other control modules in the vehicle.

1. Most of them can be measured and calculated by the ACU. For example, Delta-V and Rollover angle can be calculated from internal sensors in the ACU (if applicable).

2. The following pre-crash data can be transmitted to the ACU via the vehicle's communication network.
   - Vehicle Speed
   - Engine RPM
   - Engine Throttle
   - Acceleration Pedal
   - Service Brake
   - ABS Activity
   - Stability Control
   - Steering Input Angle

   *Note) Depending on the vehicle's configuration and the conditions described above, some items may not be recorded.

3. Pre-crash data is recorded in discrete intervals. Due to different refresh rates within the vehicle's electronics, the data recorded may be asynchronous to each other.

Data Limitation

Data Definitions:

- Data recorded by the ACU and imaged by the EDR tool is displayed relative to Time zero(T0). Time zero(T0) is not typically the time at which the vehicle made contact with another vehicle or object.
- Time zero (T0) means whichever of the following occurs first
  1. For systems with ''wake-up'' air bag control systems, the time at which the occupant restraint control algorithm is activated; or
  2. For continuously running algorithms,
     1) The first point in the interval where a longitudinal cumulative delta-V of over 0.8 km/h (0.5 mph) is reached within a 20msec time period; or
     2) For vehicles that record ''delta-V, lateral,'' the first point in the interval where a lateral cumulative delta-V of over 0.8 km/h (0.5 mph) is reached within a 5msec time period; or
  3. Deployment of a non-reversible deployable restraint.
- Multi-event crash means the occurrence of 2 events, the first and last of which begin not more than 5 seconds apart. If an event is not part of a multi-event crash, the value of this data element will be "1".
- Service brake, on or off means the status of the device that is installed in or connected to the brake pedal system to detect whether the pedal was pressed. The device can include the brake pedal switch or other driver-operated service brake control,
- Engine RPM means
  1. For vehicles powered by internal combustion engines, the number of revolutions per minute of the main crankshaft of the vehicle's engine, and
  2. For vehicles not entirely powered by internal combustion engines, the number of revolutions per minute of the motor shaft at the point at which it enters the vehicle transmission gearbox.
- Engine Throttle is a measure of the throttle position.
- Accelerator Pedal is a measure of the accelerator pedal value.
- Seat belt status is determined by whether the buckle switch is open or closed.
- Delta-V means the cumulative change in velocity, and is calculated from internal sensors in the ACU
- 'Invalid data' means
  1. The data sources sent invalid data
  2. The data sources did not send data
  3. The data does not be recorded depending on design standard
  4. The data could not be recorded in some conditions such as the loss of power in vehicle
- 'Not supported' means : The system is not applied in that vehicle

EDR Information

Part No. (EOL Code) as programmed into ACU	95910-D3250(D351)
ECU SW Version as programmed into ACU	1.00
EDR Version as programmed into ACU	

< Event 1 >

Event Status at Event

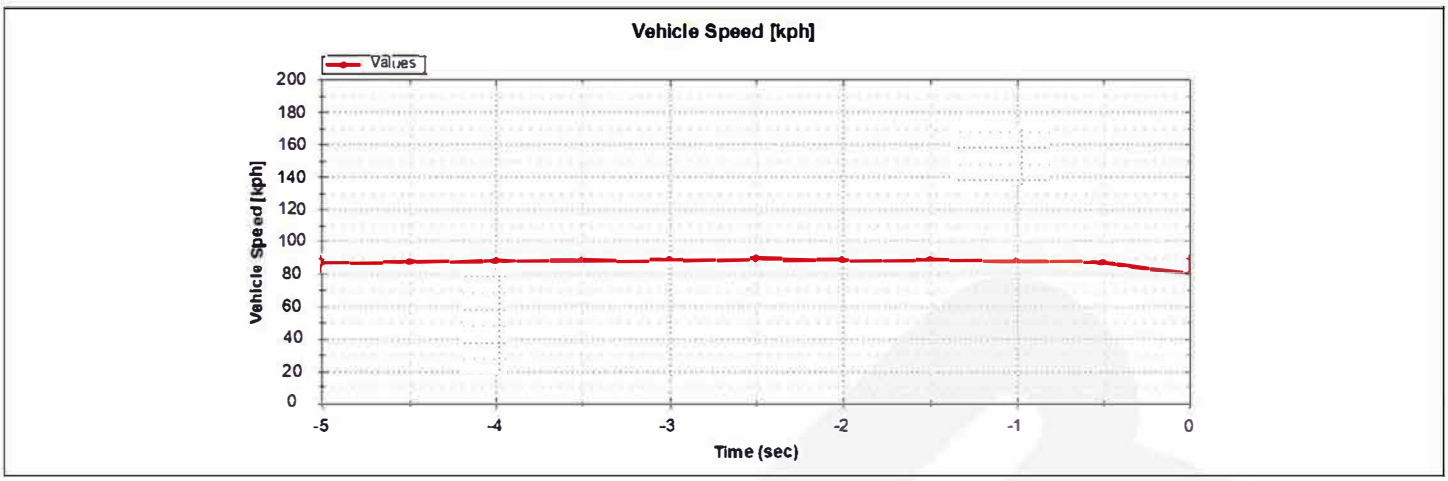
Multi-event, Number of Event (1 or 2)	1 event
Time from Event 1 to 2 [msec]	0
Completed File Recorded (Yes or No)	YES
Ignition cycle, crash [cycle]	5463
Ignition cycle, download [cycle]	5469

Pre-Crash Information (-5 ~ 0 sec)

Time (sec)	Vehicle Speed [kph]	Engine RPM [rpm]	Engine Throttle [%]	Acceleration Pedal [%]	Service Brake [on/off]	ABS Activity [on/off]	Stability Control [on/off/engaged]	Steering Input [degree]
5.0	88	1800	21	22	OFF	OFF	on	0
4.5	88	1800	21	22	OFF	OFF	on	0
4.0	89	1800	21	22	OFF	OFF	on	0
3.5	89	1800	16	19	OFF	OFF	on	0
3.0	89	1800	15	17	OFF	OFF	on	0
2.5	90	1800	15	17	OFF	OFF	on	0
2.0	89	1800	14	16	OFF	OFF	on	0
1.5	89	1800	10	12	OFF	OFF	on	0
1.0	89	1800	10	12	OFF	OFF	on	0
0.5	88	1700	4	0	OFF	OFF	on	0
0.0	81	1600	4	0	on	OFF	on	15

< Event 1 >

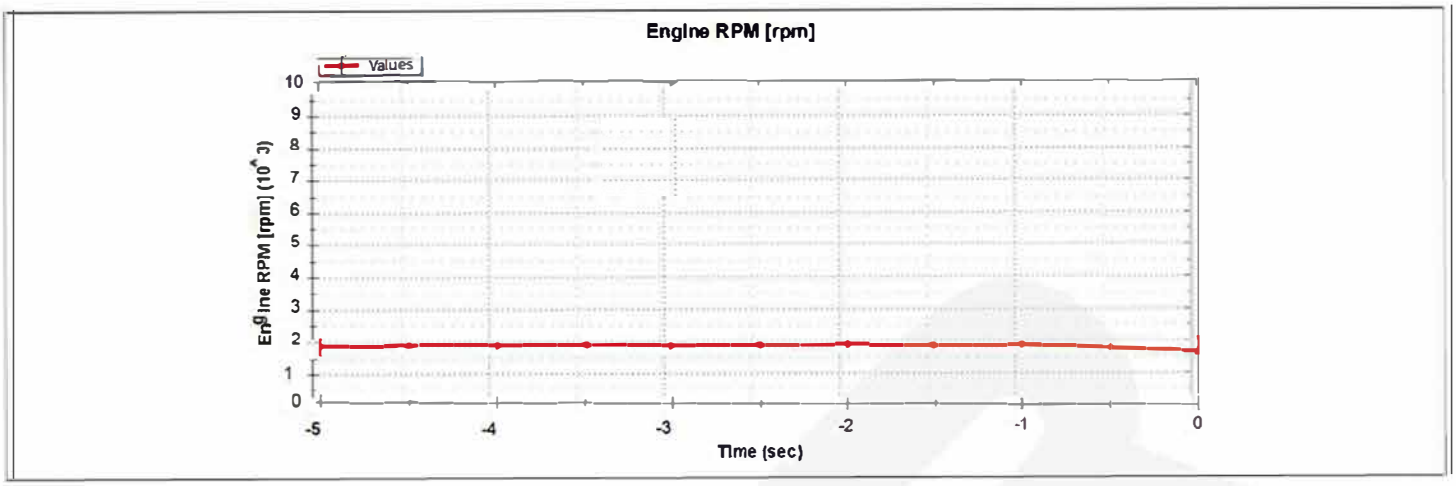
Vehicle Speed



Num	Time (sec)	Vehicle Speed [kph]
1	-5.0	88
2	-4.5	88
3	-4.0	89
4	-3.5	89
5	-3.0	89
6	-2.5	90
7	-2.0	89
8	-1.5	89
9	-1.0	89
10	-0.5	88
11	0.0	81

‹ Event 1 ›

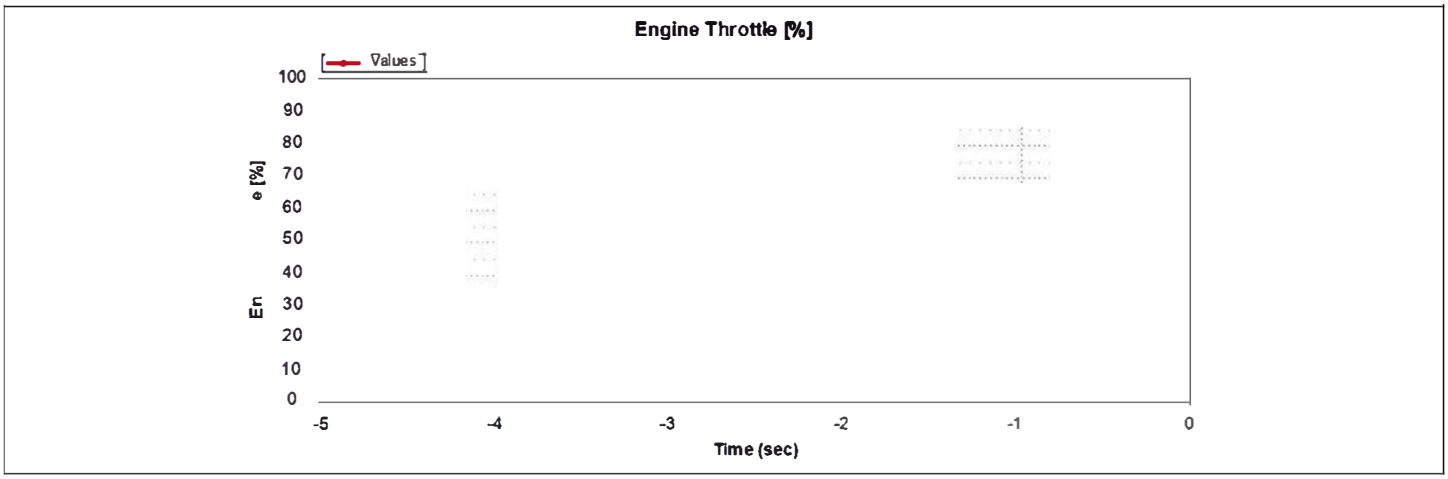
Engine RPM



Num	Time (sec)	Engine RPM [rpm]
1	-5.0	1800
2	-4.5	1800
3	-4.0	1800
4	-3.5	1800
5	-3.0	1800
6	-2.5	1800
7	-2.0	1800
8	-1.5	1800
9	-1.0	1800
10	-0.5	1700
11	0.0	1600

< Event 1 >

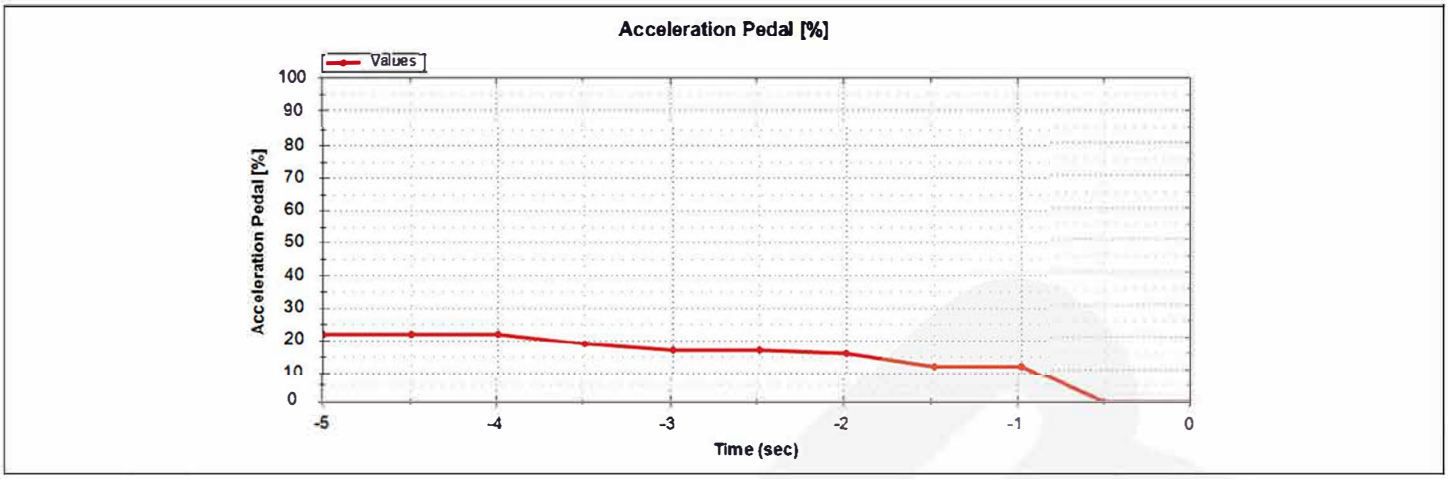
Engine Throttle



Num	Time (sec)	Engine Throttle [%]
1	-5.0	21
2	-4.5	21
3	-4.0	21
4	-3.5	16
5	-3.0	15
6	-2.5	15
7	-2.0	14
8	-1.5	10
9	-1.0	10
10	-0.5	4
11	0.0	4

< Event 1 >

Acceleration Pedal



Num	Time (sec)	Acceleration Pedal [%]
1	-5.0	22
2	-4.5	22
3	-4.0	22
4	-3.5	19
5	-3.0	17
6	-2.5	17
7	-2.0	16
8	-1.5	12
9	-1.0	12
10	-0.5	0
11	0.0	0

< Event 1 >

Service Brake

Num	Time (sec)	Service Brake [on/off]
1	-5.0	OFF
2	-4.5	OFF
3	-4.0	OFF
4	-3.5	OFF
5	-3.0	OFF
6	-2.5	OFF
7	-2.0	OFF
8	-1.5	OFF
9	-1.0	OFF
10	-0.5	OFF
11	0.0	ON

ABS Activity

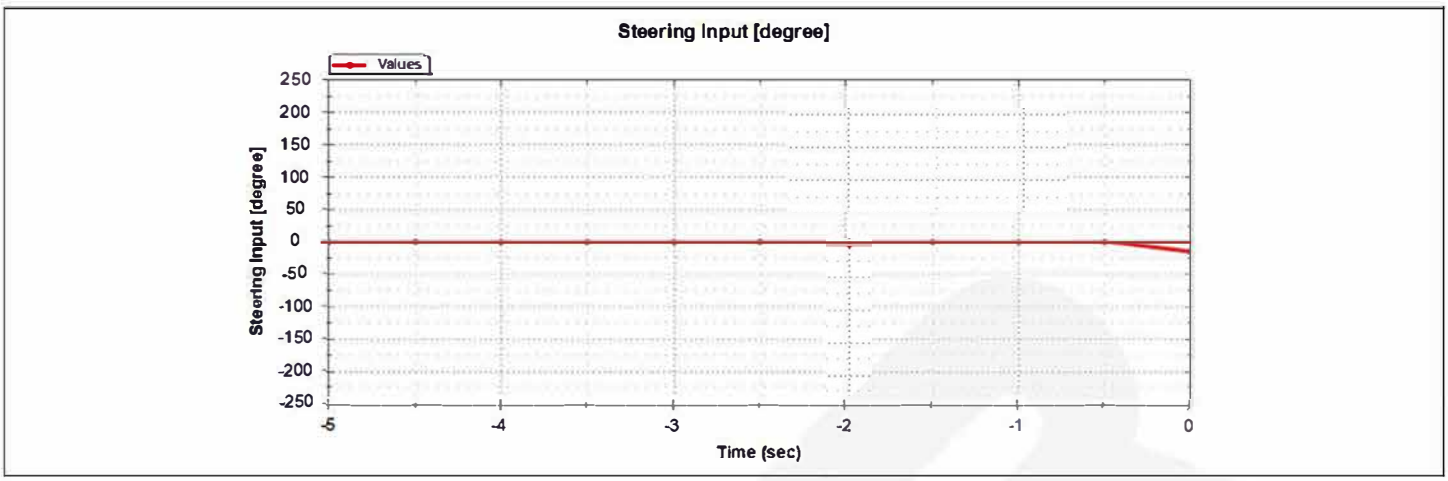
Num	Time (sec)	ABS Activity [on/off]
1	-5.0	OFF
2	-4.5	OFF
3	-4.0	OFF
4	-3.5	OFF
5	-3.0	OFF
6	-2.5	OFF
7	-2.0	OFF
8	-1.5	OFF
9	-1.0	OFF
10	-0.5	OFF
11	0.0	OFF

Stability Control

Num	Time (sec)	Stability Control [on/off/engaged]
1	-5.0	ON
2	-4.5	ON
3	-4.0	ON
4	-3.5	ON
5	-3.0	ON
6	-2.5	ON
7	-2.0	ON
8	-1.5	ON
9	-1.0	ON
10	-0.5	ON
11	0.0	ON

< Event 1 >

Steering Input



Num	Time (sec)	Steering Input [degree]
1	-5.0	0
2	-4.5	0
3	-4.0	0
4	-3.5	0
5	-3.0	0
6	-2.5	0
7	-2.0	0
8	-1.5	0
9	-1.0	0
10	-0.5	0
11	0.0	-15

Note) Positive value(CCW), Negative value(CW)

< Event 1 >

System Status at Event

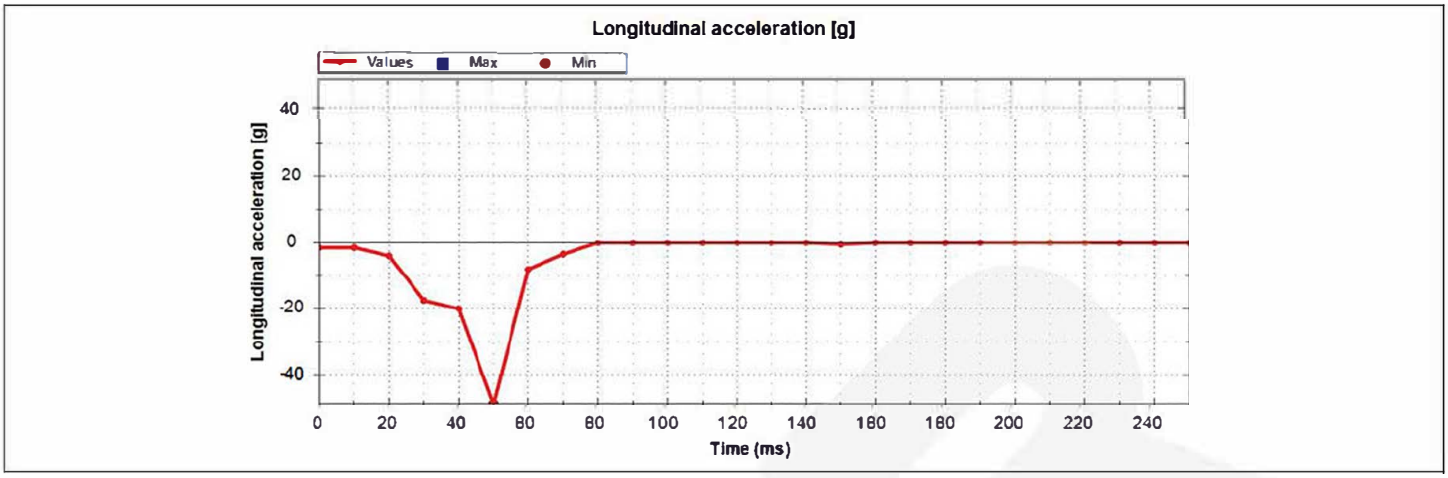
Airbag warning lamp on/off	OFF
Safety seat belt status, driver	ON
Safety seat belt status, passenger	OFF
Seat track position switch foremost status, driver	Not Supported
Seat track position switch foremost status, passenger	Not Supported
Occupant size classification, driver (5% female or larger)	Not Supported
Occupant size classification, passenger (child)	YES

Deployment Command Data at Event

Front airbag deployment time, driver (first stage) [msec]	31
Front airbag deployment time, passenger (first stage) [msec]	No deployment
Front airbag deployment time, driver (second stage) [msec]	35
Front airbag deployment time, passenger (second stage) [msec]	No deployment
Front airbag deployment time, driver (third stage) [msec]	Not supported
Front airbag deployment time, passenger (third stage) [msec]	No deployment
Front airbag disposal deployment, driver (second stage) (Yes or No)	NO
Front airbag disposal deployment, passenger (second stage) (Yes or No)	NO
Front airbag disposal deployment, driver (third stage) (Yes or No)	NO
Front airbag disposal deployment, passenger (third stage) (Yes or No)	NO
Front side airbag deployment time, driver [msec]	38
Front side airbag deployment time, passenger [msec]	319
Curtain airbag deployment time, driver [msec]	38
Curtain airbag deployment time, passenger [msec]	319
Seat belt pretensioner deployment time, driver [msec]	24
Seat belt pretensioner deployment time, passenger [msec]	No deployment

< Event 1 >

Longitudinal crash pulse_acceleration (g, 0 ~ 250msec)

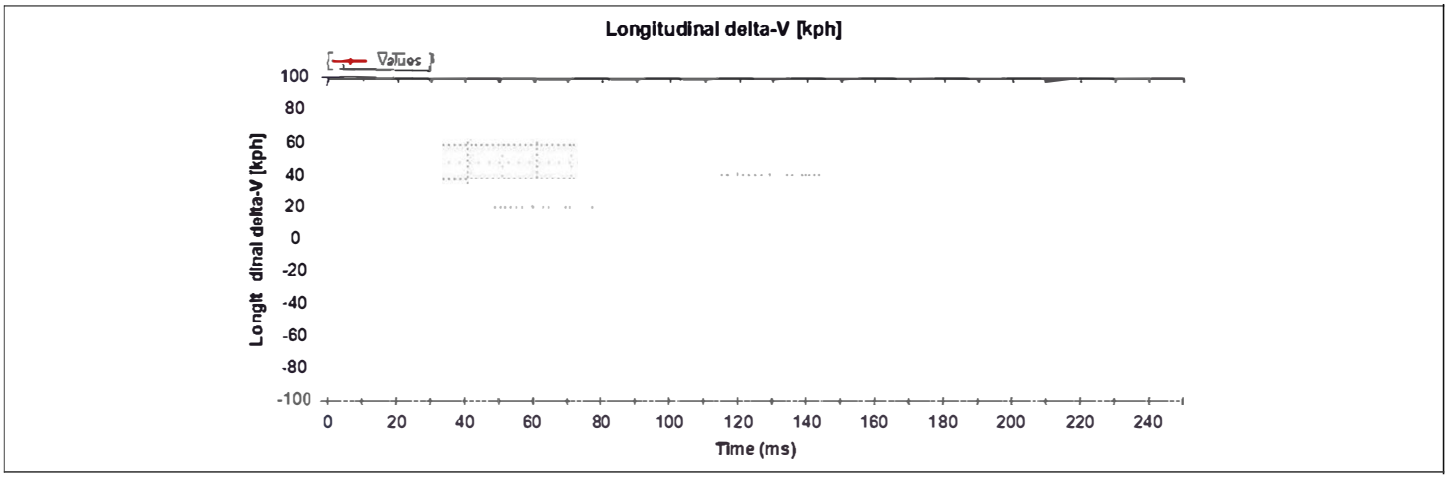


Num	Time (ms)	Longitudinal acceleration [g]
1	0.0	-1.5
2	10.0	-1.5
3	20.0	-4.0
4	30.0	-17.5
5	40.0	-20.0
6	50.0	Exceed the minimum sensor range
7	60.0	-8.0
8	70.0	-3.5
9	80.0	0.0
10	90.0	0.0
11	100.0	0.0
12	110.0	0.0
13	120.0	0.0
14	130.0	0.0
15	140.0	0.0
16	150.0	-0.5
17	160.0	0.0
18	170.0	0.0
19	180.0	0.0
20	190.0	0.0
21	200.0	0.0
22	210.0	0.0
23	220.0	0.0
24	230.0	0.0
25	240.0	0.0
26	250.0	0.0

< Event 1 >

Longitudinal crash pulse_delta-v (kph, 0 ~ 250msec)

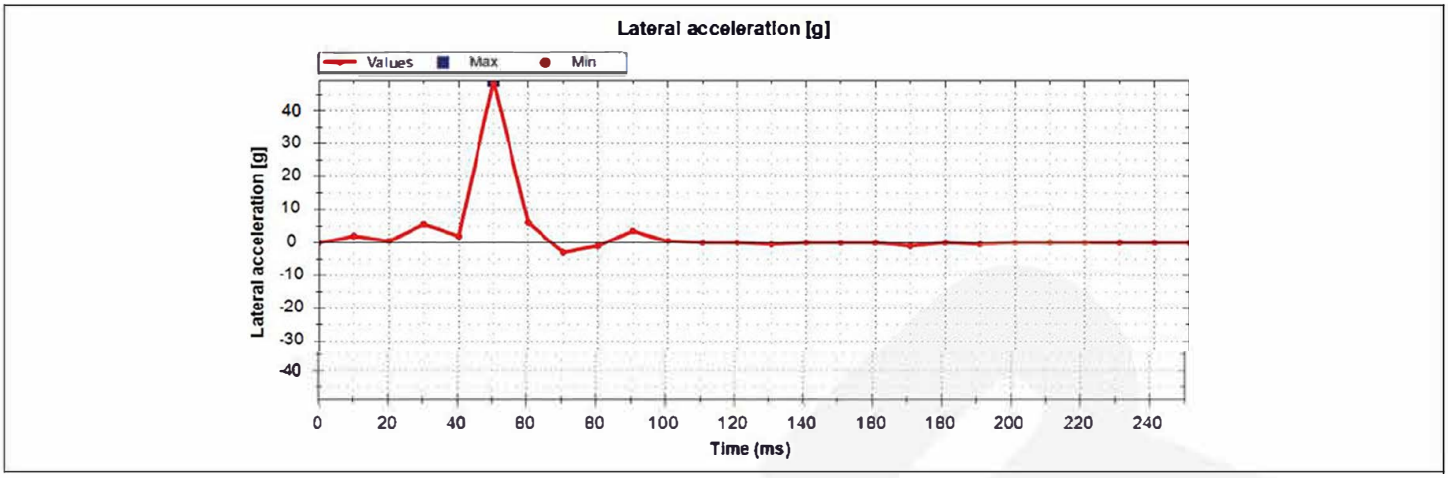
Max. delta-V [kph]	-27
Time, Max. delta-V [msec]	300.0



Num	Time (ms)	Longitudinal delta-V [kph]
1	0.0	0
2	10.0	0
3	20.0	-2
4	30.0	-8
5	40.0	-15
6	50.0	-20
7	60.0	-23
8	70.0	-24
9	80.0	-24
10	90.0	-25
11	100.0	-25
12	110.0	-25
13	120.0	-25
14	130.0	-25
15	140.0	-25
16	150.0	-25
17	160.0	-25
18	170.0	-25
19	180.0	-25
20	190.0	-26
21	200.0	-26
22	210.0	-26
23	220.0	-26
24	230.0	-26
25	240.0	-26
26	250.0	-27

< Event 1 >

Lateral crash pulse_acceleration (g, 0 ~ 250msec)

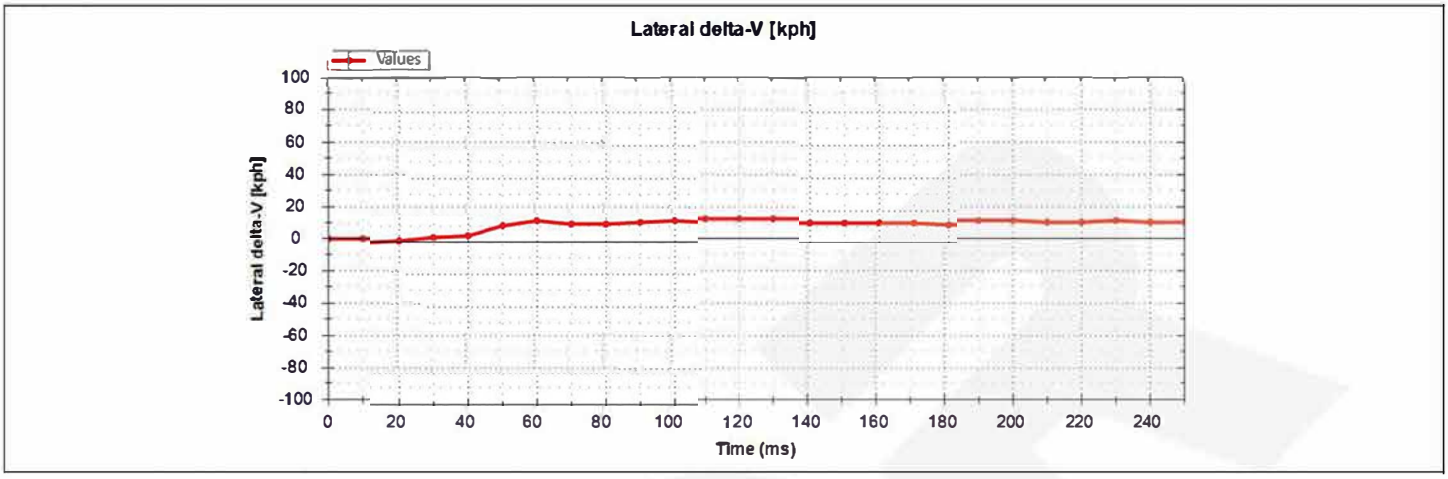


Num	Time (ms)	Lateral acceleration [g]
1	0.0	0.0
2	10.0	2.0
3	20.0	0.5
4	30.0	5.5
5	40.0	2.0
6	50.0	Exceed the maximum sensor range
7	60.0	6.0
8	70.0	-3.0
9	80.0	-1.0
10	90.0	3.5
11	100.0	0.5
12	110.0	0.0
13	120.0	0.0
14	130.0	-0.5
15	140.0	0.0
16	150.0	0.0
17	160.0	0.0
18	170.0	-1.0
19	180.0	0.0
20	190.0	-0.5
21	200.0	0.0
22	210.0	0.0
23	220.0	0.0
24	230.0	0.0
25	240.0	0.0
26	250.0	0.0

< Event 1 >

Lateral crash pulse_delta-v (kph, 0 ~ 250msec)

Max. delta-V [kph]	13
Time, Max. delta-V [msec]	60.0



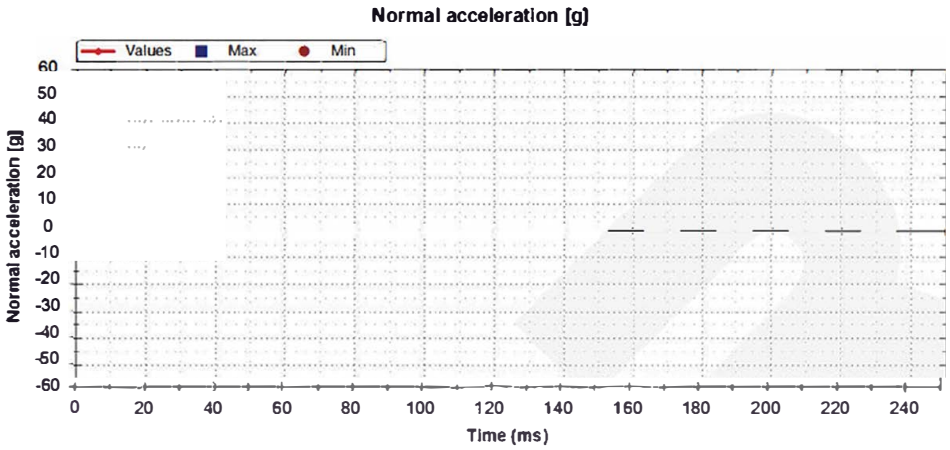
Num	Time (ms)	Lateral delta-V [kph]
1	0.0	0
2	10.0	0
3	20.0	1
4	30.0	3
5	40.0	4
6	50.0	10
7	60.0	13
8	70.0	11
9	80.0	11
10	90.0	12
11	100.0	13
12	110.0	12
13	120.0	12
14	130.0	12
15	140.0	12
16	150.0	12
17	160.0	12
18	170.0	12
19	180.0	11
20	190.0	11
21	200.0	11
22	210.0	10
23	220.0	10
24	230.0	11
25	240.0	10
26	250.0	10

< Event 1 >

Crash pulse Resultant, Time_Max. delta-V resultant (0 ~ 300 msec)

Time, Max. delta-V, resultant [msec]	117.5

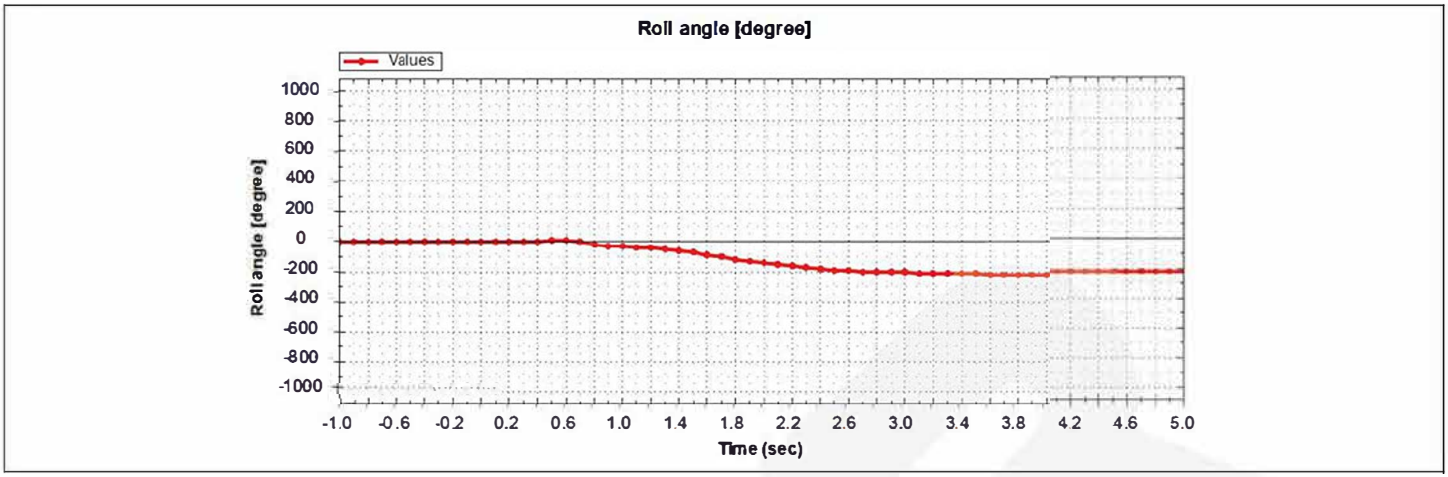
Normal acceleration (g, 0 ~ 250msec)



Num	Time (ms)	Normal acceleration [g]
1	0.0	Not supported
2	10.0	Not supported
3	20.0	Not supported
4	30.0	Not supported
5	40.0	Not supported
6	50.0	Not supported
7	60.0	Not supported
8	70.0	Not supported
9	80.0	Not supported
10	90.0	Not supported
11	100.0	Not supported
12	110.0	Not supported
13	120.0	Not supported
14	130.0	Not supported
15	140.0	Not supported
16	150.0	Not supported
17	160.0	Not supported
18	170.0	Not supported
19	180.0	Not supported
20	190.0	Not supported
21	200.0	Not supported
22	210.0	Not supported
23	220.0	Not supported
24	230.0	Not supported
25	240.0	Not supported
26	250.0	Not supported

< Event 1 >

Roll angle (degree, -1 ~ 5sec)

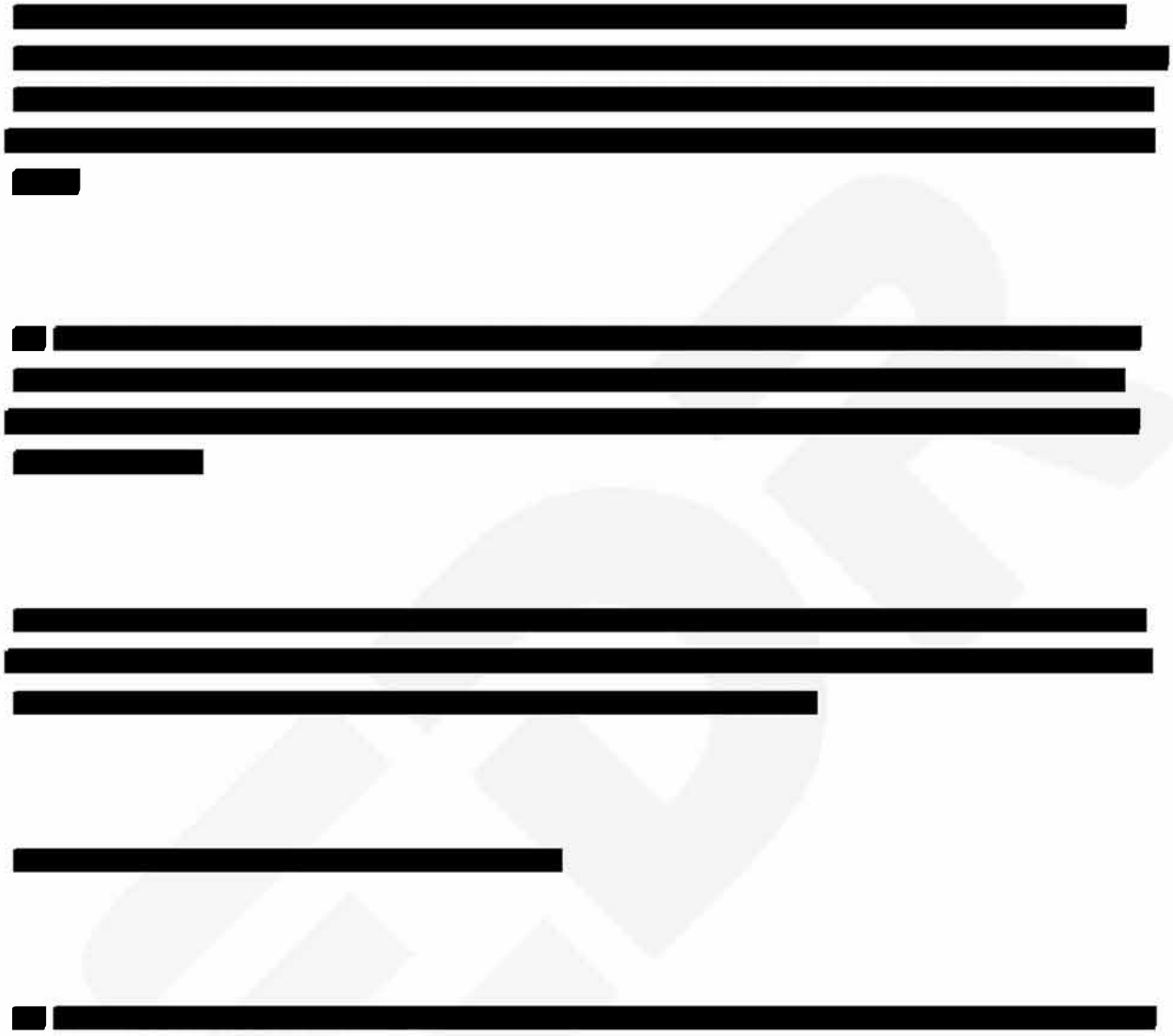


Num	Time (sec)	Roll angle [degree]
1	-1.0	0
2	-0.9	0
3	-0.8	0
4	-0.7	0
5	-0.6	0
6	-0.5	0
7	-0.4	0
8	-0.3	0
9	-0.2	0
10	-0.1	0
11	0.0	0
12	0.1	0
13	0.2	0
14	0.3	0
15	0.4	0
16	0.5	10
17	0.6	10
18	0.7	0
19	0.8	-20
20	0.9	-30
21	1.0	-30
22	1.1	-40
23	1.2	-40
24	1.3	-50
25	1.4	-60
26	1.5	-70
27	1.6	-90
28	1.7	-100
29	1.8	-120
30	1.9	-130
31	2.0	-140

32	2.1	-150
33	2.2	-160
34	2.3	-170
35	2.4	-180
36	2.5	-190
37	2.6	-190
38	2.7	-200
39	2.8	-200
40	2.9	-200
41	3.0	-200
42	3.1	-210
43	3.2	-210
44	3.3	-210
45	3.4	-210
46	3.5	-210
47	3.6	-220
48	3.7	-220
49	3.8	-220
50	3.9	-220
51	4.0	-220
52	4.1	-220
53	4.2	-220
54	4.3	-220
55	4.4	-220
56	4.5	-220
57	4.6	-220
58	4.7	-220
59	4.8	-220
60	4.9	-220
61	5.0	-220

< Event 1 >

Raw Data



< Event 2 >

There is no recorded event.

Appendix B: 2018 Mercedes-Benz GLC Event Data Recorder Report

[1] The EDR report 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	WDC0G4JB2JV******
User	
Case Number	
EDR Data Imaging Date	
Crash Date	
Filename	CR22006_V2_ACM.CDRX
Saved on	
Imaged with CDR version	Crash Data Retrieval Tool 21.5
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 24.1.197
Reported with Software Licensed to (Company Name)	NHTSA
EDR Device Type	Airbag Control Module
Event(s) recovered	Record 1 (CRC Check Failed - Saved Without VIN Sequence Number), Record 2 (CRC Check Failed - Saved Without VIN Sequence Number), Record 3 (CRC Check Failed - Saved Without VIN Sequence Number), Record 4 (CRC Check Failed - Saved Without VIN Sequence Number), Record 5 (CRC Check Failed - Saved Without VIN Sequence Number)

Comments

No comments entered.

Data Limitations

MERCEDES-BENZ SUPPLEMENTAL RESTRAINT SYSTEM (SRS) CONTROL MODULE DATA LIMITATIONS:

General Information:
SRS Control Module data limitations are intended to assist in reading event data that has been imaged from the vehicle's SRS control module. They are not intended to provide specific information regarding data interpretation. Event data should be considered in conjunction with other available physical evidence from the vehicle and scene.

Certain MY2014 and later Mercedes-Benz passenger vehicles are designed to fulfill the requirements of 49 CFR 563 - Event Data Recorders, and to be compatible with the Bosch CDR tool.

The Recorded Crash Events can be read by the CDR tool via the vehicle's OBD connector. Connecting the CDR tool directly to the SRS Control Module should ONLY be considered if the vehicle's electrical system has been compromised. If it is necessary to remove the SRS Control Module from the vehicle, proceed with CAUTION! During bench top imaging, make sure the SRS Control Module remains stationary, and is NOT moved, tilted or rotated while connected to and powered by the CDR Interface Module. Also, after CDR imaging, wait at least one minute after power is removed from the SRS Control Module before attempting to move the module. Not following these general SRS Control Module guidelines for bench top imaging could cause new events to be recorded in the Module.
NOTE: When the CDR tool is connected directly to the SRS Control Module, the current fault status will be altered if the Module is powered-up without having all of the other vehicle inputs connected (e.g., benchtop imaging). However, this will not affect the stored fault data information in any of the Event Records.

To increase data safety, the transmitted data will be first signed by the SRS Control Module. This can take up to 60 seconds for each recorded event.

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.

The SRS Control Module can store six events in total, such as Non-Deployment Events (NDE) and Deployment Events (DE):
- A Non-Deployment Event is recorded if the change in longitudinal or lateral velocity equals or exceeds 8km/h over a 150ms timeframe. Non-Deployment Events are stored into memory but (the oldest) can be over-written by subsequent Non-Deployment or Deployment Events.
- A Deployment Event is recorded if any type of non-reversible deployable restraint device (e.g., belt pretensioners, front airbag(s), side airbag (s), side curtain airbag(s), etc.) are commanded to deploy. Deployment Events are stored into memory and cannot be over-written.

The events will be imaged by the CDR tool in chronological order (e.g. the first event is the most recent one).

If power to the SRS Control Module is interrupted during an event, all data from this event will be stored (see information "Complete file recorded").

For subsequent events, all or part of the event data record may not be recorded. Such events cannot be retrieved by the CDR tool.

The "event begin" t_0 is initiated by:
- the change in longitudinal velocity equals or exceeds 0.8km/h over a 20ms timeframe (front threshold)
- the change in lateral velocity equals or exceeds 0.8km/h over a 5ms timeframe (side threshold)
- wake-up of the front, side or rear algorithm
- deployment of a restraint by the rollover algorithm.

The event monitoring for recording will always be 300ms even if:
- the change in longitudinal and lateral velocity equals or falls below 0.8km/h over a 20ms timeframe
- each algorithm is inactive.

Multiple Events:
Data recorded by the SRS Control Module and imaged by the CDR tool is displayed relative to t_0, NOT the time at which the vehicle made contact with another vehicle or object.

Vehicle crash events may result in one or more stored Deployment or Non-Deployment events in the EDR.

Parallel Event: If there are more than one crash algorithms active during an accident, and if the start time for any algorithm occurs within 300ms of t_0 for another algorithm, (e.g. angular impact, where front algorithm and side algorithm starts and resets individually), then these overlapping recordings are considered a "parallel event". In this case, the initial stored event is characterized by one of the following: 1) the first triggered algorithm (e.g., front, side, or rear); 2) the first event threshold which was exceeded (e.g., longitudinal or lateral velocity threshold); or 3) the a deployment of a restraint by the rollover algorithm. Subsequent events are reported with reference to the initial event t_0

Multiple Event: If there are more than one crash algorithms active during an accident and if the algorithms do not overlap as described above, this is considered a "multiple event if t_0 for any algorithm occurs within 5 seconds of t_0 for another algorithms. The chronological sequence within a multiple event is marked by the data element "multi-event, number of events." The time period between this event and the preceding event is marked in the data element "time from event n to n+1."

Separate Events: If there are more than one crash algorithms active during an accident that do not overlap in time and for which start times t_0 are set apart more than 5 seconds, then these are considered as separate events.

Data Element Sign Convention:
The sign convention is according to "NHTSA 49 CFR 563 - Event Data Recorders".

Data Element Name	Positive Sign Notation Indicates
Delta-V, Longitudinal	Forward
Maximum Delta-V, Longitudinal	Forward
Delta-V, Lateral	Left to Right
Maximum Delta-V, Lateral	Left to Right
Vehicle Roll Angle	Clockwise Rotation around vehicles longitudinal axis

Data Elements:
Pre-Crash Data:
- Pre-Crash Data is recorded at 2 samples per second starting 5 seconds before t_0.
- Pre-Crash Data is recorded asynchronously.
- Recorded Pre-Crash Data has a time resolution of 500ms. Therefore, the indicated time associated with the first pre-crash data element may be delayed by up to 500ms.
- Pre-Crash Data indicates "Data Invalid" if a message with an "invalid" flag from the module sending the pre-crash data is sent.
- Pre-Crash Data indicates "Data Not Available" if no data is received from the module sending the pre-crash data.
- "Speed, vehicle indicated" accuracy can be affected by various factors, such as significant changes in tire size from the factory original vehicle specification, wheel lockup or slip.
- "Accelerator Pedal Position, percent full" is the ratio of accelerator pedal position compared to the fully depressed position.
- "Service Brake Status" only indicates driver-initiated braking. Automatic braking (e.g. Autonomous Cruise Control) will not be recorded.

Crash data:
- Delta-V data is recorded at 100Hz from t_0 to 250ms.
- "Delta-V, longitudinal" reflects the change in velocity that the SRS Control Module experienced in the longitudinal direction during the recorded portion of the event and is not the speed at which the vehicle was traveling before the event.
- Depending on the severity of the event relative to the range of the accelerometer, saturation of the SRS Control Module longitudinal or lateral accelerometers may occur. This condition is recorded in the EDR.
- "Restraint Deployment Time" (e.g. airbag(s)) is reported as the time t which a deployment was requested by this device.
- "Restraint Disposal" (e.g. 2nd stage of the frontal airbag(s)) is reported if a disposal request of this device occurs.
- "Seat Track Position Switch Status, front passenger" is reported as "foremost" or "not foremost".
- "Occupant size classification, right front passenger airbag suppressed" data is recorded as "yes" (suppressed), if the front passenger seat sensor system determined the passenger seat was empty or occupied by a child-seat.

Data Source:
All recorded data is measured and calculated within the SRS Control Module except for the following parameters (if applicable) which are transmitted via the vehicle's communication network to the SRS Control Module:
- Speed, vehicle indicated
- Accelerator pedal position, percent full
- Service brake

- Safety Belt Status (the Belt Switch Circuit is wired directly to the SRS Control Module)

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

Privacy Issue

As of February 2013 the following states: Arkansas, California, Connecticut, Maine, Nevada, New Hampshire, New York, North Dakota, Oregon, Texas, Virginia, and Washington all have EDR Laws to address vehicle owner's privacy and consumer concerns. Subsequently, a 2015 Federal law prescribed privacy restrictions to address these same concerns. It is the responsibility of the user and end user to observe all applicable State and Federal privacy laws.

09001_Daimler001_r004

System Status at Event (Record 1, Most Recent)

Event Type	Rollover
Time From Time Zero to Frontal Threshold (Beginning of Impact) (msec)	Threshold Not Reached
Time From Time Zero to Side Threshold (Beginning of Impact) (msec)	Threshold Not Reached
Time From Time Zero to Algo Start (Front) (msec)	Algorithm Not Started
Time From Time Zero to Algo Start (Side) (msec)	Algorithm Not Started
Time From Time Zero to Algo Start (Rear) (msec)	Algorithm Not Started
Time From Time Zero to Deployment (Rollover) (msec)	Deployment at t0
Time From Time Zero to Deployment (Pitchover) (msec)	Algorithm Not Started
Time From Time Zero to Algo Start (Pedestrian Protection) (msec)	Algorithm Not Started
Maximum Delta-V, Longitudinal (MPH [km/h])	0.6 [1]
Maximum Delta-V, Lateral (MPH [km/h])	-3.7 [-6]
Time, Maximum Delta-V, Longitudinal (msec)	243
Time, Maximum Delta-V, Lateral (msec)	300
Clipping Time Longitudinal Sensor (msec)	Clipping Not Reached
Clipping Time Lateral Sensor (msec)	Clipping Not Reached
Multi-Event, Number of Events	1. Event
Time From Previous Event to Current Event (msec)	0
Complete File Recorded, Generic, Prio 1 Data	Completed Successfully
Ignition Cycle, Crash (cycle)	26,682
Ignition Cycle, Download (cycle)	26,686
Vehicle Mileage (km)	78,680
Operating Time (min)	145,685
Vehicle Identification Number	WDC0G4JB2JV******
Event Counter (counts)	5

Deployment Command Data (Record 1, Most Recent)

Frontal Air Bag, Time to 1st Stage Deployment, Driver (msec)	Data Not Available
Frontal Air Bag, Time to 2nd Stage Deployment, Driver (msec)	Data Not Available
Frontal Air Bag, Time to 3rd Stage (Vent) Deployment, Driver (msec)	Data Not Available
Frontal Air Bag, 2nd Stage Disposal, Driver	Data Not Available
Frontal Air Bag, 3rd Stage (Vent) Disposal, Driver	Data Not Available
Frontal Air Bag, Time to 1st Stage Deployment, Front Passenger (msec)	Data Not Available
Frontal Air Bag, Time to 2nd Stage Deployment, Front Passenger (msec)	Data Not Available
Frontal Air Bag, Time to 3rd Stage (Vent) Deployment, Front Passenger (msec)	Data Not Available
Frontal Air Bag, 2nd Stage Disposal, Front Passenger	Data Not Available
Frontal Air Bag, 3rd Stage (Vent) Disposal, Front Passenger	Data Not Available
Side Air Bag, Time to Deployment 1st Stage, Driver (msec)	Data Not Available
Side Curtain/Tube Air Bag,Time to Deployment, Driver Side (msec)	2
Pretensioner (1), Time to Deploy, Driver (msec)	Data Not Available
Side Air Bag, Time to Deployment 1st Stage, Front Passenger (msec)	Data Not Available
Side Curtain/Tube Air Bag, Time to Deployment, Passenger Side (msec)	2
Pretensioner (1), Time to Deploy, Front Passenger (msec)	Data Not Available
Pretensioner (2), Time to Deploy, Driver (msec)	Data Not Available
Pretensioner (2), Time to Deploy, Front Passenger (msec)	Data Not Available
Pretensioner (3), Time to Deploy, Driver (msec)	Data Not Available
Pretensioner (3), Time to Deploy, Front Passenger (msec)	Data Not Available

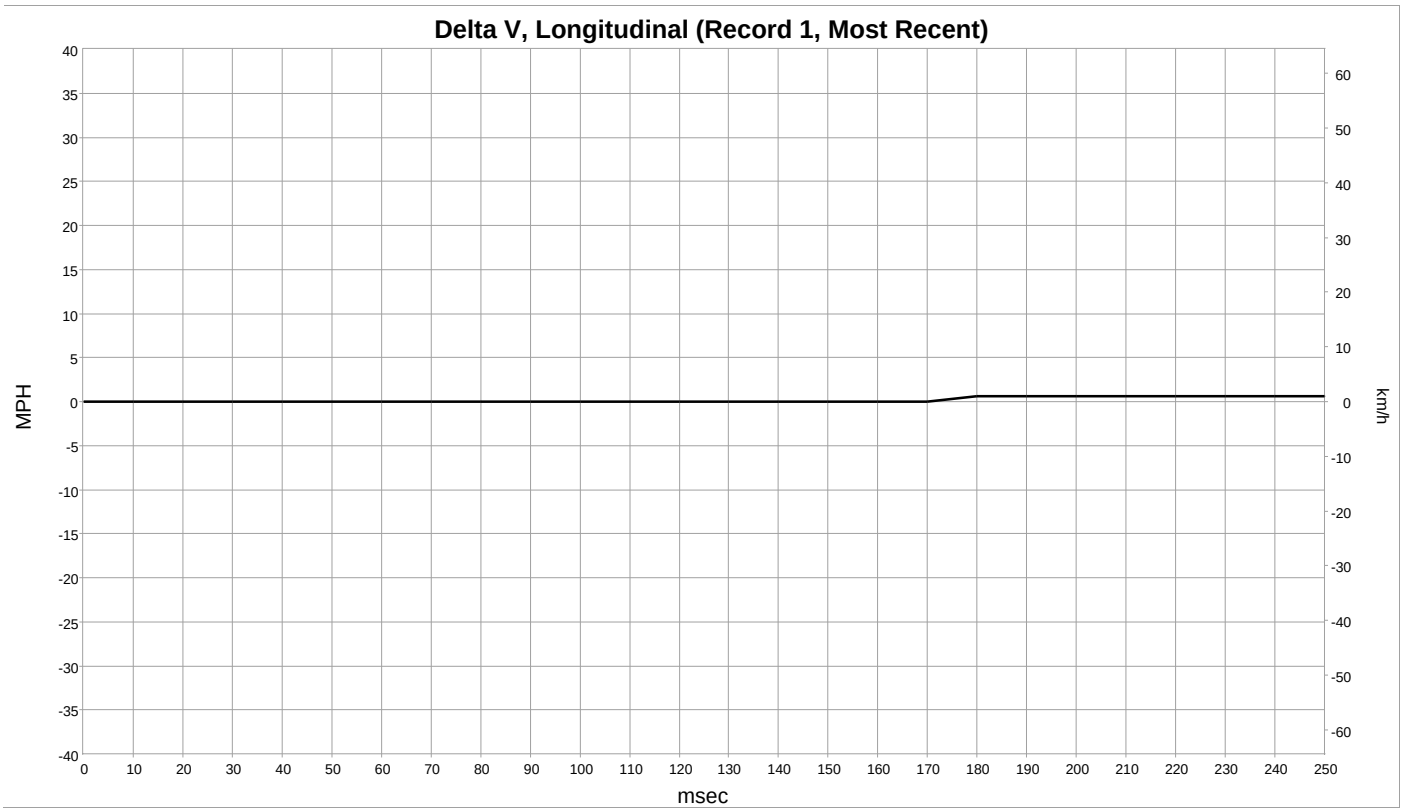
Pre-Crash Data -1 Sec (Record 1, Most Recent)

Safety Belt Status, Driver	Not Belted
Seat Track Position Switch Status, Driver	Rear
Air Bag Warning Lamp (AWL)	On
Safety Belt Status, Front Passenger	Not Belted
Seat Track Position Switch Status, Front Passenger	Rear
Occupant Size Classification, Front Passenger	Empty

Pre-Crash Data -5 to 0 sec (Record 1, Most Recent)

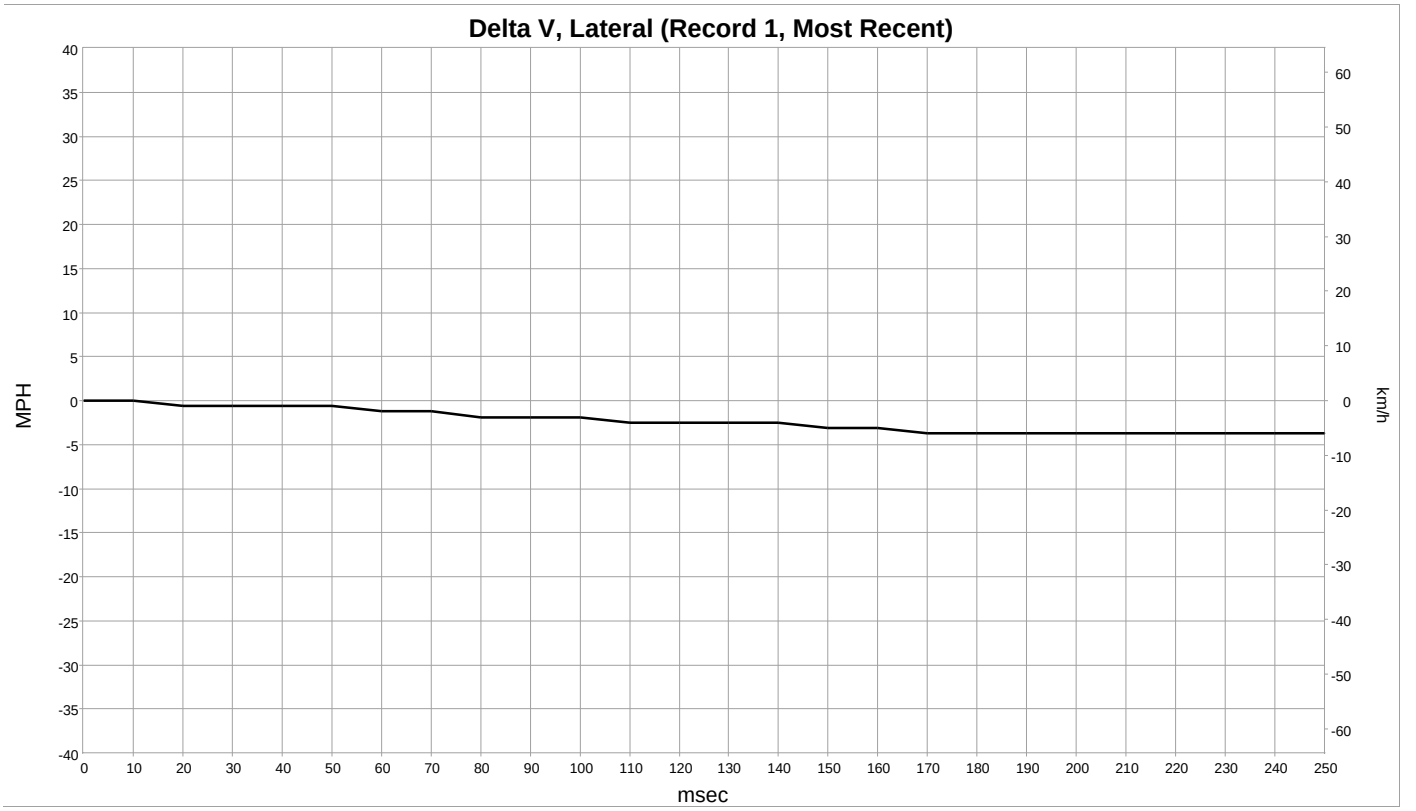
Time (sec)	Speed, Vehicle Indicated (MPH [km/h])	Accelerator Pedal (%)	Service Brake Activation
-5.0	0 [0]	0	Off
-4.5	0 [0]	0	Off
-4.0	0 [0]	0	Off
-3.5	0 [0]	0	Off
-3.0	0 [0]	0	Off
-2.5	0 [0]	0	Off
-2.0	0 [0]	0	Off
-1.5	0 [0]	0	Off
-1.0	0 [0]	0	Off
-0.5	0 [0]	0	Off
0.0	0 [0]	0	Off

Longitudinal Crash Pulse (Record 1, Most Recent)



Time (msec)	Delta-V, Longitudinal (MPH [km/h])
0	0.0 [0]
10	0.0 [0]
20	0.0 [0]
30	0.0 [0]
40	0.0 [0]
50	0.0 [0]
60	0.0 [0]
70	0.0 [0]
80	0.0 [0]
90	0.0 [0]
100	0.0 [0]
110	0.0 [0]
120	0.0 [0]
130	0.0 [0]
140	0.0 [0]
150	0.0 [0]
160	0.0 [0]
170	0.0 [0]
180	0.6 [1]
190	0.6 [1]
200	0.6 [1]
210	0.6 [1]
220	0.6 [1]
230	0.6 [1]
240	0.6 [1]
250	0.6 [1]

Lateral Crash Pulse (Record 1, Most Recent)



Time (msec)	Delta-V, Lateral (MPH [km/h])
0	0.0 [0]
10	0.0 [0]
20	-0.6 [-1]
30	-0.6 [-1]
40	-0.6 [-1]
50	-0.6 [-1]
60	-1.2 [-2]
70	-1.2 [-2]
80	-1.9 [-3]
90	-1.9 [-3]
100	-1.9 [-3]
110	-2.5 [-4]
120	-2.5 [-4]
130	-2.5 [-4]
140	-2.5 [-4]
150	-3.1 [-5]
160	-3.1 [-5]
170	-3.7 [-6]
180	-3.7 [-6]
190	-3.7 [-6]
200	-3.7 [-6]
210	-3.7 [-6]
220	-3.7 [-6]
230	-3.7 [-6]
240	-3.7 [-6]
250	-3.7 [-6]

System Status at Event (Record 2)

Event Type	Frontal
Time From Time Zero to Frontal Threshold (Beginning of Impact) (msec)	346
Time From Time Zero to Side Threshold (Beginning of Impact) (msec)	Threshold Not Reached
Time From Time Zero to Algo Start (Front) (msec)	290
Time From Time Zero to Algo Start (Side) (msec)	Algorithm Started at t0
Time From Time Zero to Algo Start (Rear) (msec)	Algorithm Not Started
Time From Time Zero to Deployment (Rollover) (msec)	Algorithm Not Started
Time From Time Zero to Deployment (Pitchover) (msec)	Algorithm Not Started
Time From Time Zero to Algo Start (Pedestrian Protection) (msec)	Algorithm Not Started
Maximum Delta-V, Longitudinal (MPH [km/h])	-2.5 [-4]
Maximum Delta-V, Lateral (MPH [km/h])	0.0 [0]
Time, Maximum Delta-V, Longitudinal (msec)	300
Time, Maximum Delta-V, Lateral (msec)	85
Clipping Time Longitudinal Sensor (msec)	Clipping Not Reached
Clipping Time Lateral Sensor (msec)	Clipping Not Reached
Multi-Event, Number of Events	4. Event
Time From Previous Event to Current Event (msec)	392
Complete File Recorded, Generic, Prio 1 Data	Completed Successfully
Ignition Cycle, Crash (cycle)	26,682
Ignition Cycle, Download (cycle)	26,686
Vehicle Mileage (km)	78,680
Operating Time (min)	145,643
Vehicle Identification Number	WDC0G4JB2JV******
Event Counter (counts)	4

Deployment Command Data (Record 2)

Frontal Air Bag, Time to 1st Stage Deployment, Driver (msec)	Data Not Available
Frontal Air Bag, Time to 2nd Stage Deployment, Driver (msec)	Data Not Available
Frontal Air Bag, Time to 3rd Stage (Vent) Deployment, Driver (msec)	Data Not Available
Frontal Air Bag, 2nd Stage Disposal, Driver	Data Not Available
Frontal Air Bag, 3rd Stage (Vent) Disposal, Driver	Data Not Available
Frontal Air Bag, Time to 1st Stage Deployment, Front Passenger (msec)	Data Not Available
Frontal Air Bag, Time to 2nd Stage Deployment, Front Passenger (msec)	Data Not Available
Frontal Air Bag, Time to 3rd Stage (Vent) Deployment, Front Passenger (msec)	Data Not Available
Frontal Air Bag, 2nd Stage Disposal, Front Passenger	Data Not Available
Frontal Air Bag, 3rd Stage (Vent) Disposal, Front Passenger	Data Not Available
Side Air Bag, Time to Deployment 1st Stage, Driver (msec)	Data Not Available
Side Curtain/Tube Air Bag,Time to Deployment, Driver Side (msec)	Data Not Available
Pretensioner (1), Time to Deploy, Driver (msec)	Data Not Available
Side Air Bag, Time to Deployment 1st Stage, Front Passenger (msec)	Data Not Available
Side Curtain/Tube Air Bag, Time to Deployment, Passenger Side (msec)	Data Not Available
Pretensioner (1), Time to Deploy, Front Passenger (msec)	Data Not Available
Pretensioner (2), Time to Deploy, Driver (msec)	Data Not Available
Pretensioner (2), Time to Deploy, Front Passenger (msec)	Data Not Available
Pretensioner (3), Time to Deploy, Driver (msec)	Data Not Available
Pretensioner (3), Time to Deploy, Front Passenger (msec)	Data Not Available

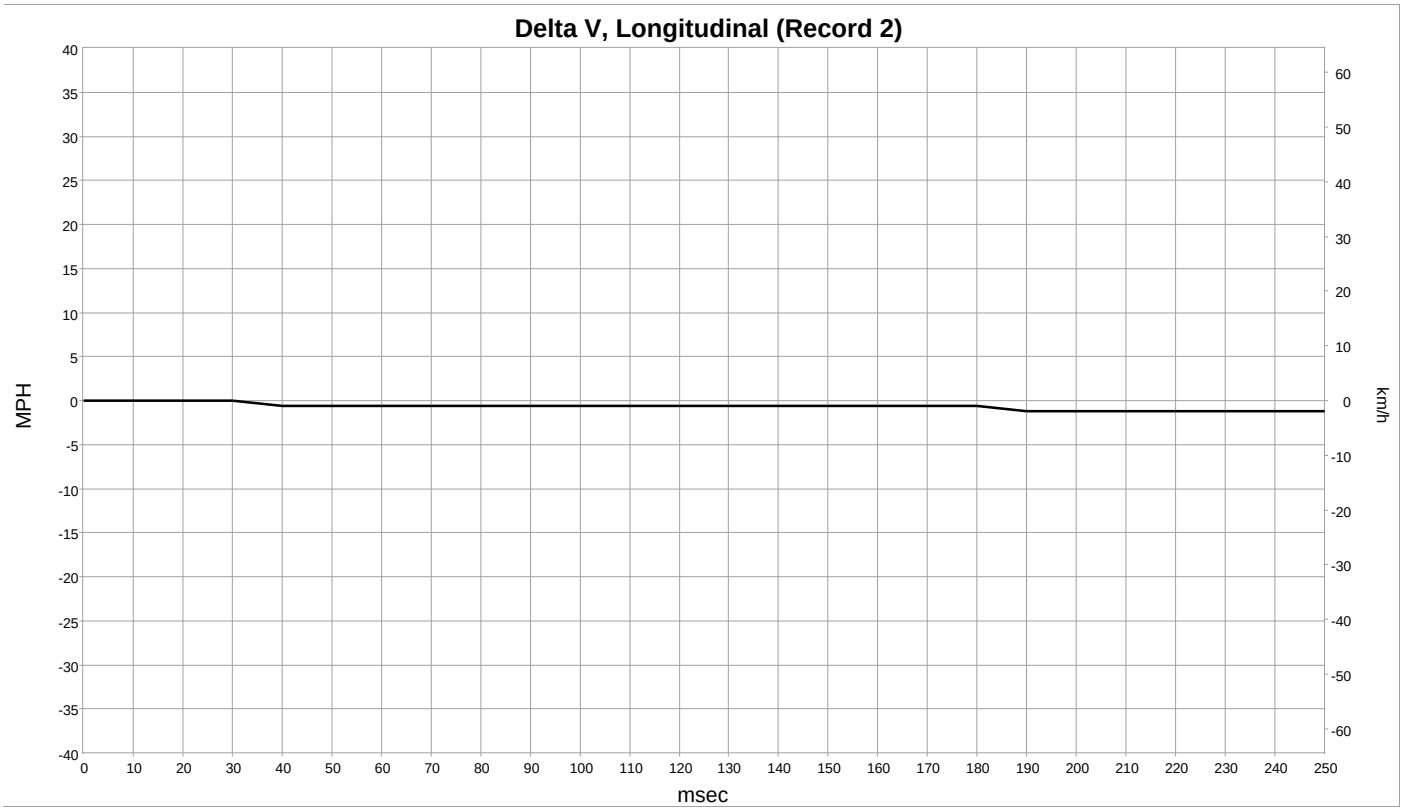
Pre-Crash Data -1 Sec (Record 2)

Safety Belt Status, Driver	Belted
Seat Track Position Switch Status, Driver	Rear
Air Bag Warning Lamp (AWL)	Off
Safety Belt Status, Front Passenger	Not Belted
Seat Track Position Switch Status, Front Passenger	Rear
Occupant Size Classification, Front Passenger	Empty

Pre-Crash Data -5 to 0 sec (Record 2)

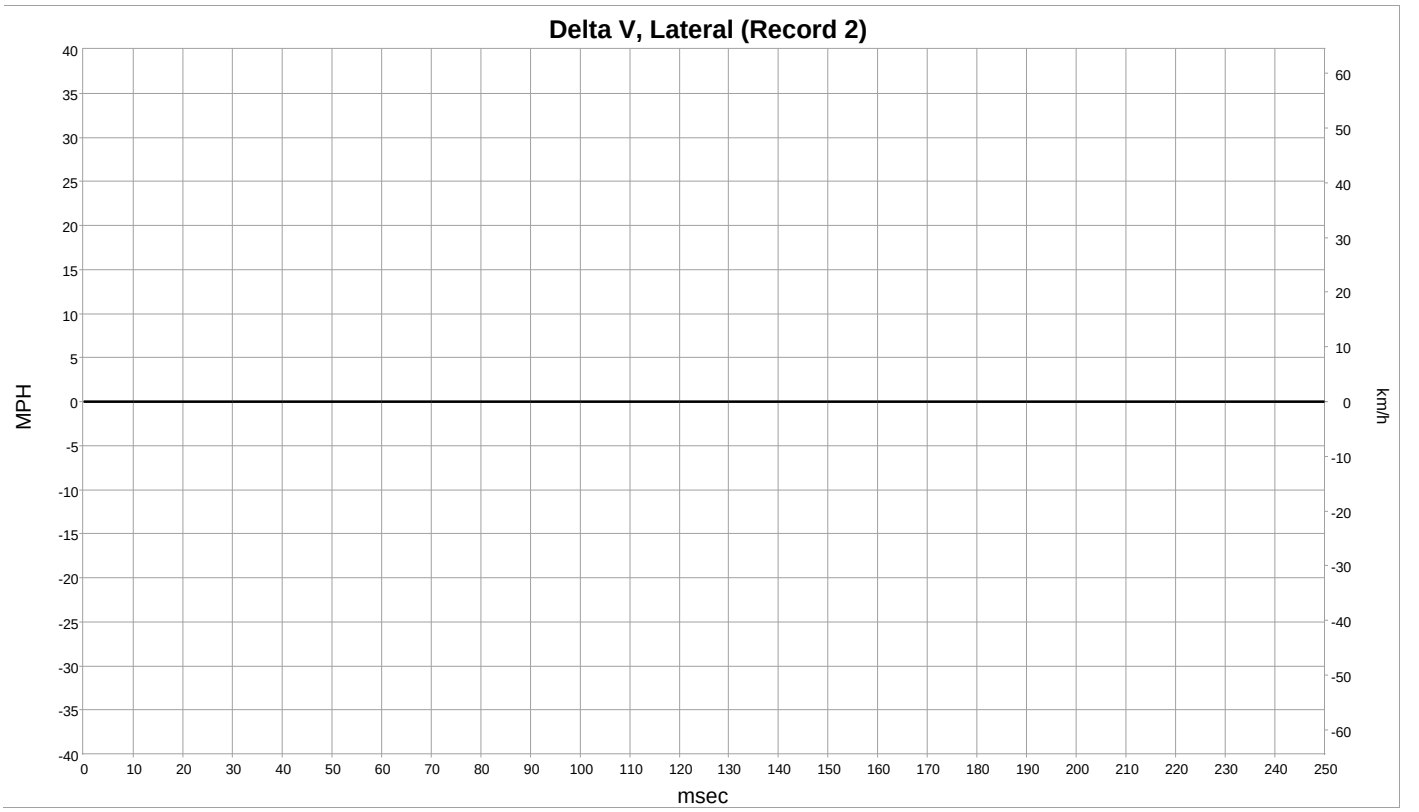
Time (sec)	Speed, Vehicle Indicated (MPH [km/h])	Accelerator Pedal (%)	Service Brake Activation
-5.0	37 [59]	22	Off
-4.5	38 [61]	22	Off
-4.0	39 [62]	22	Off
-3.5	39 [63]	22	Off
-3.0	40 [64]	22	Off
-2.5	41 [66]	22	Off
-2.0	42 [67]	22	Off
-1.5	42 [68]	22	Off
-1.0	43 [69]	22	Off
-0.5	39 [63]	0	On
0.0	30 [48]	0	Off

Longitudinal Crash Pulse (Record 2)



Time (msec)	Delta-V, Longitudinal (MPH [km/h])
0	0.0 [0]
10	0.0 [0]
20	0.0 [0]
30	0.0 [0]
40	-0.6 [-1]
50	-0.6 [-1]
60	-0.6 [-1]
70	-0.6 [-1]
80	-0.6 [-1]
90	-0.6 [-1]
100	-0.6 [-1]
110	-0.6 [-1]
120	-0.6 [-1]
130	-0.6 [-1]
140	-0.6 [-1]
150	-0.6 [-1]
160	-0.6 [-1]
170	-0.6 [-1]
180	-0.6 [-1]
190	-1.2 [-2]
200	-1.2 [-2]
210	-1.2 [-2]
220	-1.2 [-2]
230	-1.2 [-2]
240	-1.2 [-2]
250	-1.2 [-2]

Lateral Crash Pulse (Record 2)



Time (msec)	Delta-V, Lateral (MPH [km/h])
0	0.0 [0]
10	0.0 [0]
20	0.0 [0]
30	0.0 [0]
40	0.0 [0]
50	0.0 [0]
60	0.0 [0]
70	0.0 [0]
80	0.0 [0]
90	0.0 [0]
100	0.0 [0]
110	0.0 [0]
120	0.0 [0]
130	0.0 [0]
140	0.0 [0]
150	0.0 [0]
160	0.0 [0]
170	0.0 [0]
180	0.0 [0]
190	0.0 [0]
200	0.0 [0]
210	0.0 [0]
220	0.0 [0]
230	0.0 [0]
240	0.0 [0]
250	0.0 [0]

System Status at Event (Record 3)

Event Type	Side
Time From Time Zero to Frontal Threshold (Beginning of Impact) (msec)	Threshold Not Reached
Time From Time Zero to Side Threshold (Beginning of Impact) (msec)	36
Time From Time Zero to Algo Start (Front) (msec)	Algorithm Started at t0
Time From Time Zero to Algo Start (Side) (msec)	Algorithm Started at t0
Time From Time Zero to Algo Start (Rear) (msec)	33
Time From Time Zero to Deployment (Rollover) (msec)	Algorithm Not Started
Time From Time Zero to Deployment (Pitchover) (msec)	Algorithm Not Started
Time From Time Zero to Algo Start (Pedestrian Protection) (msec)	Algorithm Not Started
Maximum Delta-V, Longitudinal (MPH [km/h])	-3.7 [-6]
Maximum Delta-V, Lateral (MPH [km/h])	-8.7 [-14]
Time, Maximum Delta-V, Longitudinal (msec)	298
Time, Maximum Delta-V, Lateral (msec)	295
Clipping Time Longitudinal Sensor (msec)	Clipping Not Reached
Clipping Time Lateral Sensor (msec)	Clipping Not Reached
Multi-Event, Number of Events	3. Event
Time From Previous Event to Current Event (msec)	339
Complete File Recorded, Generic, Prio 1 Data	Completed Successfully
Ignition Cycle, Crash (cycle)	26,682
Ignition Cycle, Download (cycle)	26,686
Vehicle Mileage (km)	78,680
Operating Time (min)	145,643
Vehicle Identification Number	WDC0G4JB2JV******
Event Counter (counts)	3

Deployment Command Data (Record 3)

Frontal Air Bag, Time to 1st Stage Deployment, Driver (msec)	Data Not Available
Frontal Air Bag, Time to 2nd Stage Deployment, Driver (msec)	Data Not Available
Frontal Air Bag, Time to 3rd Stage (Vent) Deployment, Driver (msec)	Data Not Available
Frontal Air Bag, 2nd Stage Disposal, Driver	Data Not Available
Frontal Air Bag, 3rd Stage (Vent) Disposal, Driver	Data Not Available
Frontal Air Bag, Time to 1st Stage Deployment, Front Passenger (msec)	Data Not Available
Frontal Air Bag, Time to 2nd Stage Deployment, Front Passenger (msec)	Data Not Available
Frontal Air Bag, Time to 3rd Stage (Vent) Deployment, Front Passenger (msec)	Data Not Available
Frontal Air Bag, 2nd Stage Disposal, Front Passenger	Data Not Available
Frontal Air Bag, 3rd Stage (Vent) Disposal, Front Passenger	Data Not Available
Side Air Bag, Time to Deployment 1st Stage, Driver (msec)	Data Not Available
Side Curtain/Tube Air Bag,Time to Deployment, Driver Side (msec)	Data Not Available
Pretensioner (1), Time to Deploy, Driver (msec)	Data Not Available
Side Air Bag, Time to Deployment 1st Stage, Front Passenger (msec)	Data Not Available
Side Curtain/Tube Air Bag, Time to Deployment, Passenger Side (msec)	Data Not Available
Pretensioner (1), Time to Deploy, Front Passenger (msec)	Data Not Available
Pretensioner (2), Time to Deploy, Driver (msec)	Data Not Available
Pretensioner (2), Time to Deploy, Front Passenger (msec)	Data Not Available
Pretensioner (3), Time to Deploy, Driver (msec)	Data Not Available
Pretensioner (3), Time to Deploy, Front Passenger (msec)	Data Not Available

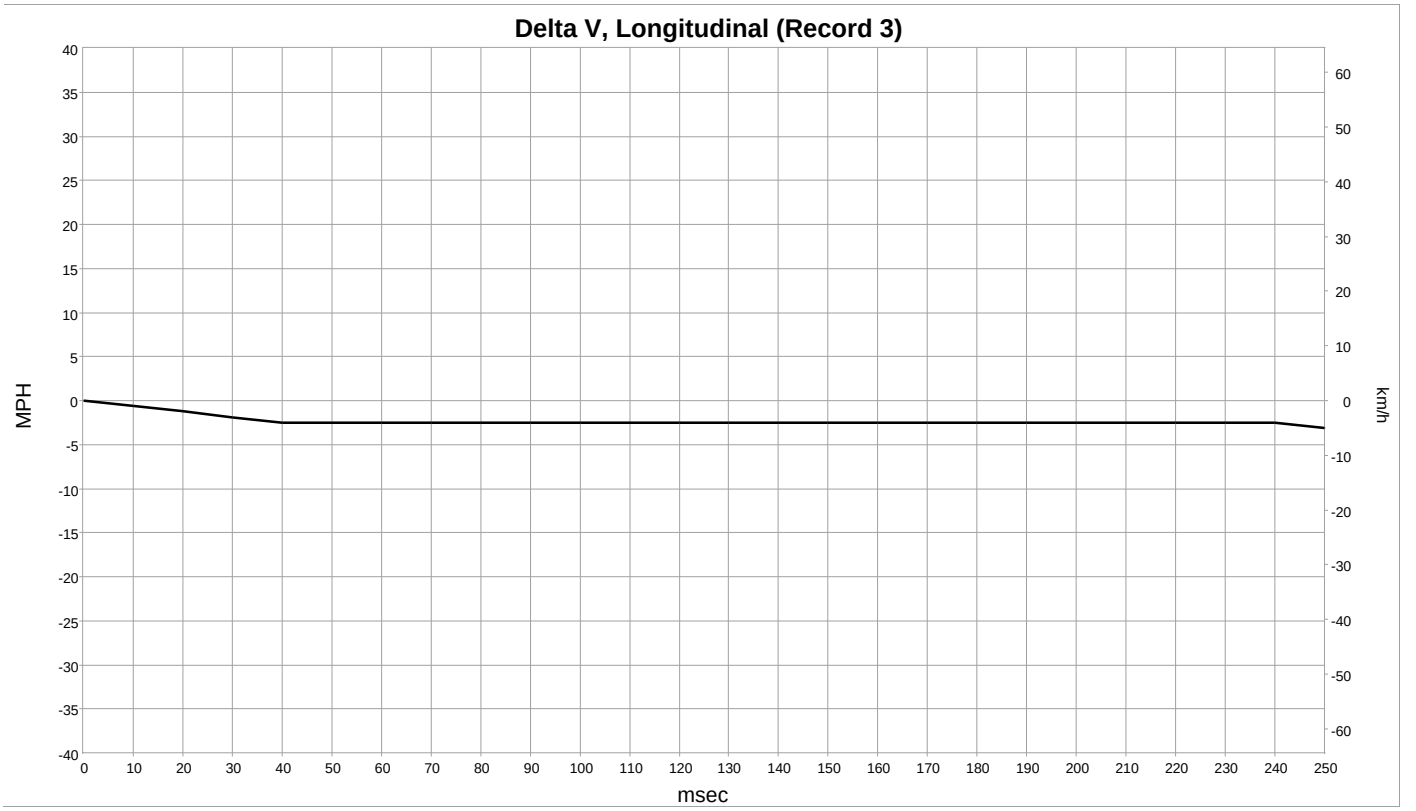
Pre-Crash Data -1 Sec (Record 3)

Safety Belt Status, Driver	Belted
Seat Track Position Switch Status, Driver	Rear
Air Bag Warning Lamp (AWL)	Off
Safety Belt Status, Front Passenger	Not Belted
Seat Track Position Switch Status, Front Passenger	Rear
Occupant Size Classification, Front Passenger	Empty

Pre-Crash Data -5 to 0 sec (Record 3)

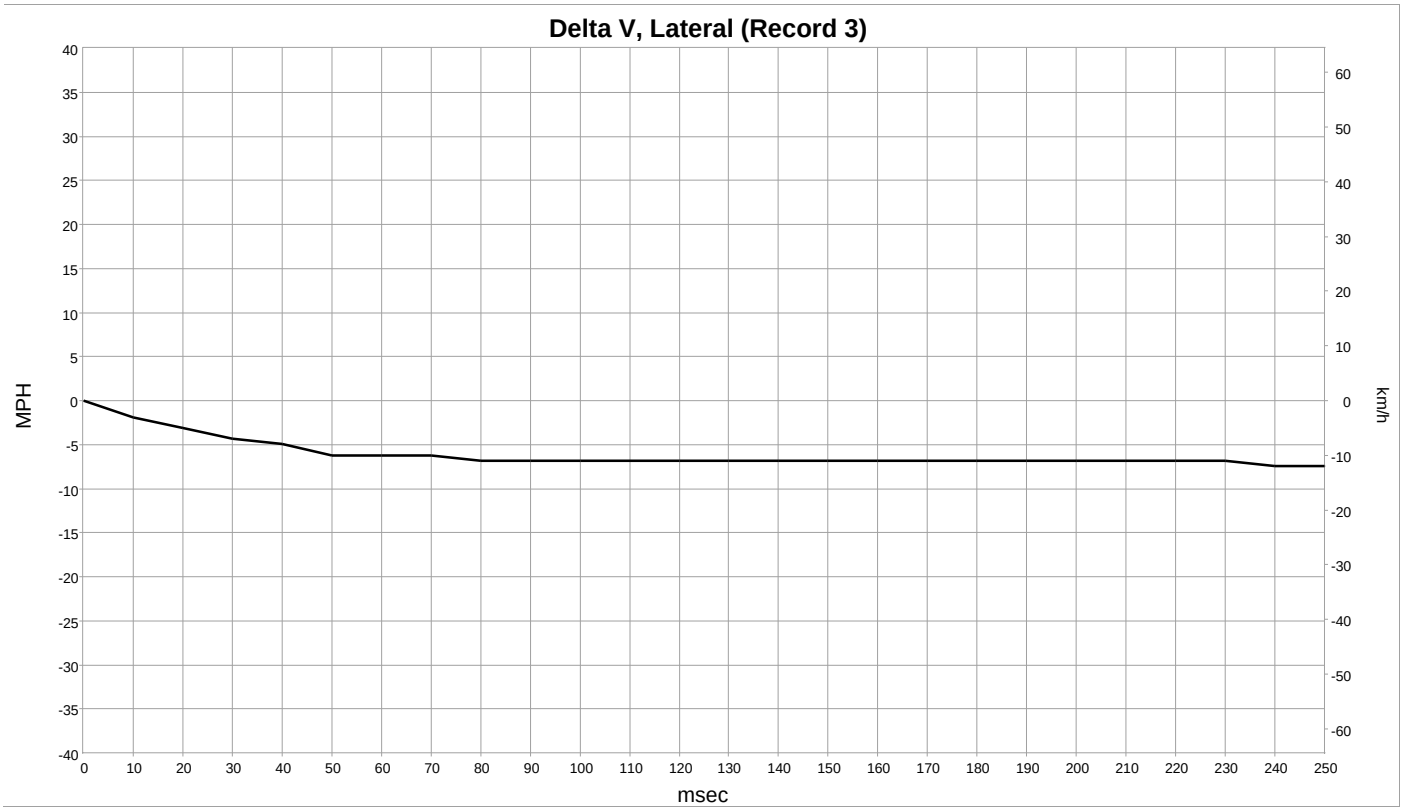
Time (sec)	Speed, Vehicle Indicated (MPH [km/h])	Accelerator Pedal (%)	Service Brake Activation
-5.0	37 [59]	22	Off
-4.5	38 [61]	22	Off
-4.0	39 [62]	22	Off
-3.5	39 [63]	22	Off
-3.0	40 [64]	22	Off
-2.5	41 [66]	22	Off
-2.0	42 [67]	22	Off
-1.5	42 [68]	22	Off
-1.0	43 [69]	22	Off
-0.5	39 [63]	0	On
0.0	30 [48]	0	Off

Longitudinal Crash Pulse (Record 3)



Time (msec)	Delta-V, Longitudinal (MPH [km/h])
0	0.0 [0]
10	-0.6 [-1]
20	-1.2 [-2]
30	-1.9 [-3]
40	-2.5 [-4]
50	-2.5 [-4]
60	-2.5 [-4]
70	-2.5 [-4]
80	-2.5 [-4]
90	-2.5 [-4]
100	-2.5 [-4]
110	-2.5 [-4]
120	-2.5 [-4]
130	-2.5 [-4]
140	-2.5 [-4]
150	-2.5 [-4]
160	-2.5 [-4]
170	-2.5 [-4]
180	-2.5 [-4]
190	-2.5 [-4]
200	-2.5 [-4]
210	-2.5 [-4]
220	-2.5 [-4]
230	-2.5 [-4]
240	-2.5 [-4]
250	-3.1 [-5]

Lateral Crash Pulse (Record 3)



Time (msec)	Delta-V, Lateral (MPH [km/h])
0	0.0 [0]
10	-1.9 [-3]
20	-3.1 [-5]
30	-4.3 [-7]
40	-5.0 [-8]
50	-6.2 [-10]
60	-6.2 [-10]
70	-6.2 [-10]
80	-6.8 [-11]
90	-6.8 [-11]
100	-6.8 [-11]
110	-6.8 [-11]
120	-6.8 [-11]
130	-6.8 [-11]
140	-6.8 [-11]
150	-6.8 [-11]
160	-6.8 [-11]
170	-6.8 [-11]
180	-6.8 [-11]
190	-6.8 [-11]
200	-6.8 [-11]
210	-6.8 [-11]
220	-6.8 [-11]
230	-6.8 [-11]
240	-7.5 [-12]
250	-7.5 [-12]

System Status at Event (Record 4)

Event Type	Rollover
Time From Time Zero to Frontal Threshold (Beginning of Impact) (msec)	Threshold Not Reached
Time From Time Zero to Side Threshold (Beginning of Impact) (msec)	Threshold Not Reached
Time From Time Zero to Algo Start (Front) (msec)	19
Time From Time Zero to Algo Start (Side) (msec)	13
Time From Time Zero to Algo Start (Rear) (msec)	17
Time From Time Zero to Deployment (Rollover) (msec)	Deployment at t0
Time From Time Zero to Deployment (Pitchover) (msec)	Algorithm Not Started
Time From Time Zero to Algo Start (Pedestrian Protection) (msec)	Algorithm Not Started
Maximum Delta-V, Longitudinal (MPH [km/h])	0.0 [0]
Maximum Delta-V, Lateral (MPH [km/h])	0.0 [0]
Time, Maximum Delta-V, Longitudinal (msec)	35
Time, Maximum Delta-V, Lateral (msec)	193
Clipping Time Longitudinal Sensor (msec)	Clipping Not Reached
Clipping Time Lateral Sensor (msec)	Clipping Not Reached
Multi-Event, Number of Events	2. Event
Time From Previous Event to Current Event (msec)	507
Complete File Recorded, Generic, Prio 1 Data	Completed Successfully
Ignition Cycle, Crash (cycle)	26,682
Ignition Cycle, Download (cycle)	26,686
Vehicle Mileage (km)	78,680
Operating Time (min)	145,643
Vehicle Identification Number	WDC0G4JB2JV******
Event Counter (counts)	2

Deployment Command Data (Record 4)

Frontal Air Bag, Time to 1st Stage Deployment, Driver (msec)	Data Not Available
Frontal Air Bag, Time to 2nd Stage Deployment, Driver (msec)	Data Not Available
Frontal Air Bag, Time to 3rd Stage (Vent) Deployment, Driver (msec)	Data Not Available
Frontal Air Bag, 2nd Stage Disposal, Driver	Data Not Available
Frontal Air Bag, 3rd Stage (Vent) Disposal, Driver	Data Not Available
Frontal Air Bag, Time to 1st Stage Deployment, Front Passenger (msec)	Data Not Available
Frontal Air Bag, Time to 2nd Stage Deployment, Front Passenger (msec)	Data Not Available
Frontal Air Bag, Time to 3rd Stage (Vent) Deployment, Front Passenger (msec)	Data Not Available
Frontal Air Bag, 2nd Stage Disposal, Front Passenger	Data Not Available
Frontal Air Bag, 3rd Stage (Vent) Disposal, Front Passenger	Data Not Available
Side Air Bag, Time to Deployment 1st Stage, Driver (msec)	Data Not Available
Side Curtain/Tube Air Bag,Time to Deployment, Driver Side (msec)	2
Pretensioner (1), Time to Deploy, Driver (msec)	2
Side Air Bag, Time to Deployment 1st Stage, Front Passenger (msec)	Data Not Available
Side Curtain/Tube Air Bag, Time to Deployment, Passenger Side (msec)	2
Pretensioner (1), Time to Deploy, Front Passenger (msec)	Data Not Available
Pretensioner (2), Time to Deploy, Driver (msec)	Data Not Available
Pretensioner (2), Time to Deploy, Front Passenger (msec)	Data Not Available
Pretensioner (3), Time to Deploy, Driver (msec)	Data Not Available
Pretensioner (3), Time to Deploy, Front Passenger (msec)	Data Not Available

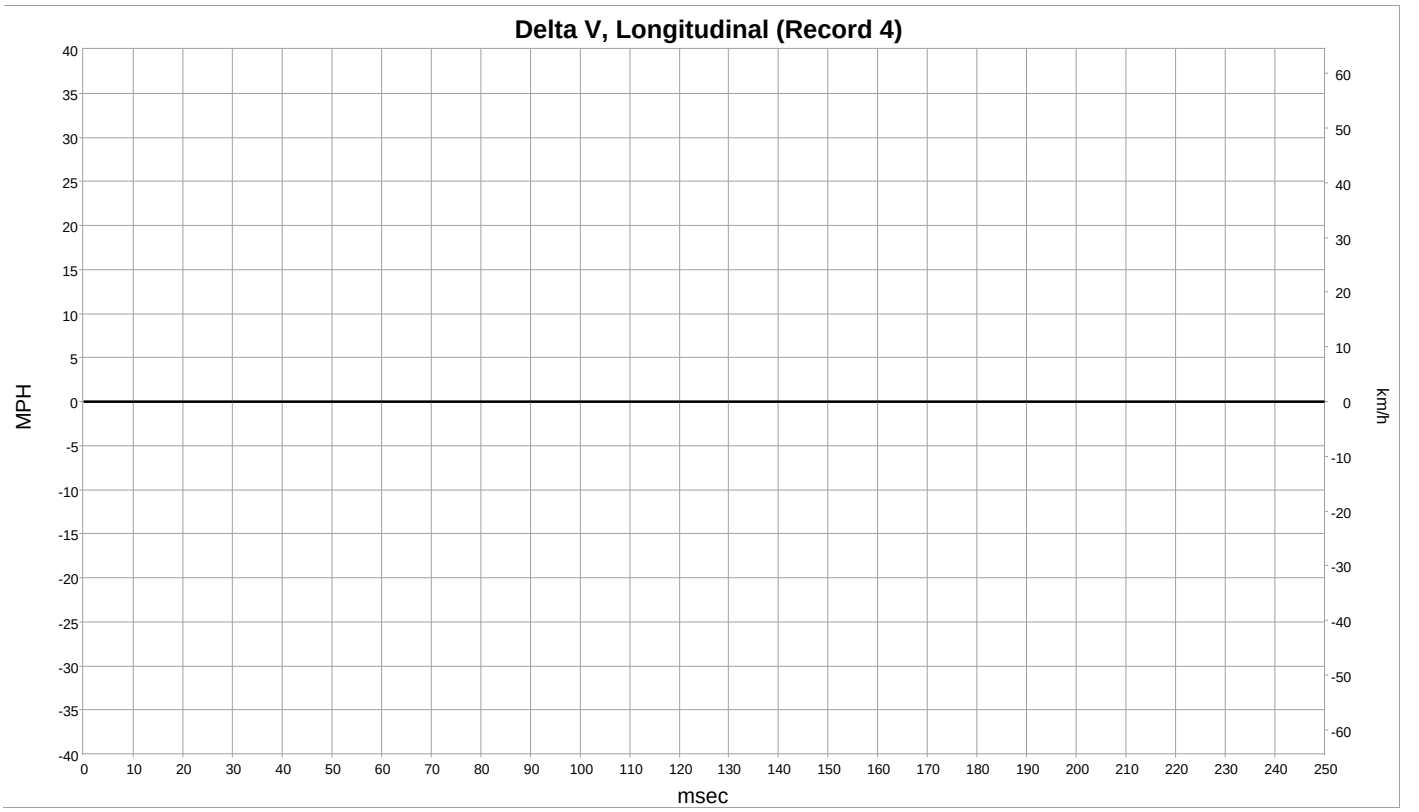
Pre-Crash Data -1 Sec (Record 4)

Safety Belt Status, Driver	Belted
Seat Track Position Switch Status, Driver	Rear
Air Bag Warning Lamp (AWL)	Off
Safety Belt Status, Front Passenger	Not Belted
Seat Track Position Switch Status, Front Passenger	Rear
Occupant Size Classification, Front Passenger	Empty

Pre-Crash Data -5 to 0 sec (Record 4)

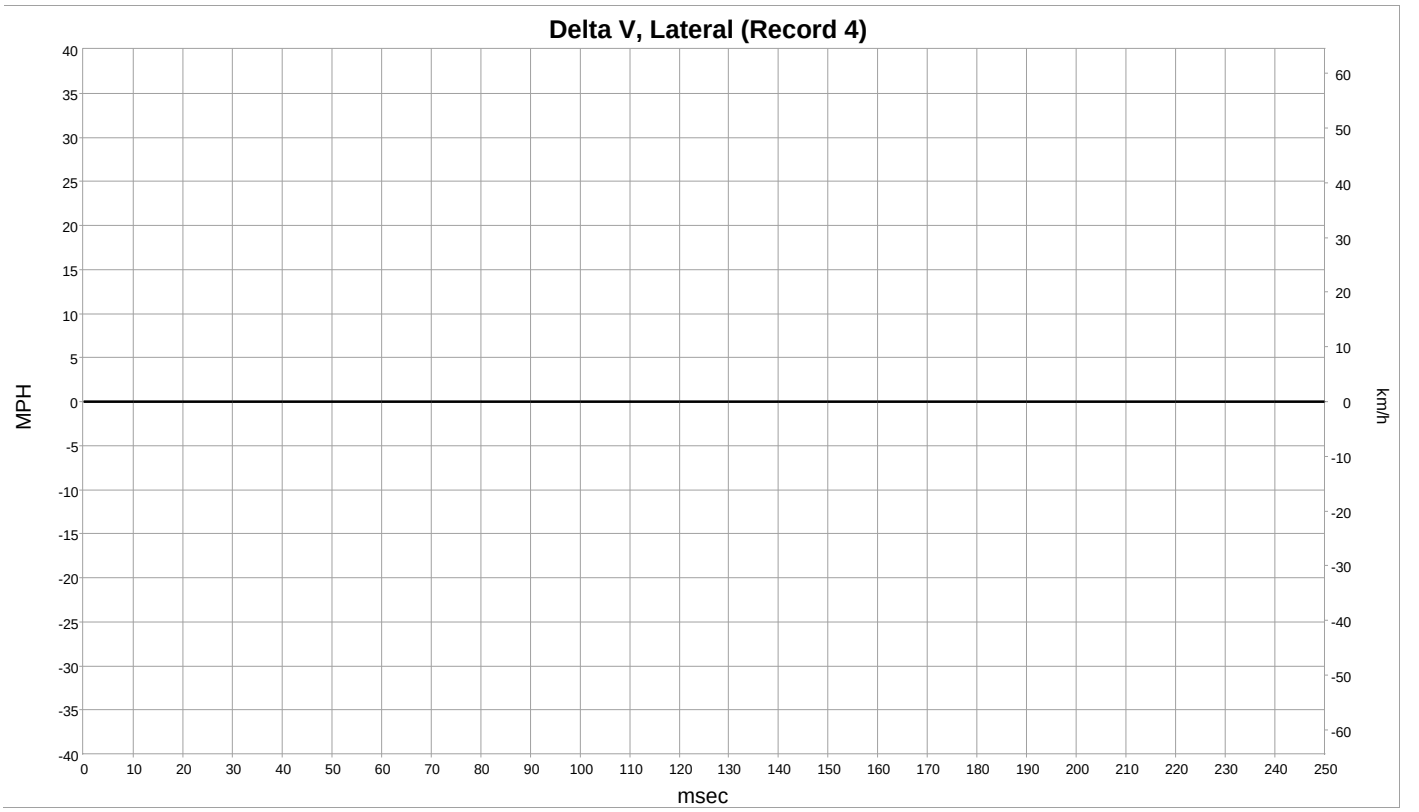
Time (sec)	Speed, Vehicle Indicated (MPH [km/h])	Accelerator Pedal (%)	Service Brake Activation
-5.0	36 [58]	22	Off
-4.5	37 [59]	22	Off
-4.0	38 [61]	22	Off
-3.5	39 [62]	22	Off
-3.0	39 [63]	22	Off
-2.5	40 [64]	22	Off
-2.0	41 [66]	22	Off
-1.5	42 [67]	22	Off
-1.0	42 [68]	22	Off
-0.5	43 [69]	22	Off
0.0	39 [63]	0	On

Longitudinal Crash Pulse (Record 4)



Time (msec)	Delta-V, Longitudinal (MPH [km/h])
0	0.0 [0]
10	0.0 [0]
20	0.0 [0]
30	0.0 [0]
40	0.0 [0]
50	0.0 [0]
60	0.0 [0]
70	0.0 [0]
80	0.0 [0]
90	0.0 [0]
100	0.0 [0]
110	0.0 [0]
120	0.0 [0]
130	0.0 [0]
140	0.0 [0]
150	0.0 [0]
160	0.0 [0]
170	0.0 [0]
180	0.0 [0]
190	0.0 [0]
200	0.0 [0]
210	0.0 [0]
220	0.0 [0]
230	0.0 [0]
240	0.0 [0]
250	0.0 [0]

Lateral Crash Pulse (Record 4)



Time (msec)	Delta-V, Lateral (MPH [km/h])
0	0.0 [0]
10	0.0 [0]
20	0.0 [0]
30	0.0 [0]
40	0.0 [0]
50	0.0 [0]
60	0.0 [0]
70	0.0 [0]
80	0.0 [0]
90	0.0 [0]
100	0.0 [0]
110	0.0 [0]
120	0.0 [0]
130	0.0 [0]
140	0.0 [0]
150	0.0 [0]
160	0.0 [0]
170	0.0 [0]
180	0.0 [0]
190	0.0 [0]
200	0.0 [0]
210	0.0 [0]
220	0.0 [0]
230	0.0 [0]
240	0.0 [0]
250	0.0 [0]

System Status at Event (Record 5)

Event Type	Frontal
Time From Time Zero to Frontal Threshold (Beginning of Impact) (msec)	32
Time From Time Zero to Side Threshold (Beginning of Impact) (msec)	Threshold Not Reached
Time From Time Zero to Algo Start (Front) (msec)	Algorithm Started at t0
Time From Time Zero to Algo Start (Side) (msec)	14
Time From Time Zero to Algo Start (Rear) (msec)	26
Time From Time Zero to Deployment (Rollover) (msec)	Algorithm Not Started
Time From Time Zero to Deployment (Pitchover) (msec)	Algorithm Not Started
Time From Time Zero to Algo Start (Pedestrian Protection) (msec)	Algorithm Not Started
Maximum Delta-V, Longitudinal (MPH [km/h])	-14.3 [-23]
Maximum Delta-V, Lateral (MPH [km/h])	5.6 [9]
Time, Maximum Delta-V, Longitudinal (msec)	258
Time, Maximum Delta-V, Lateral (msec)	90
Clipping Time Longitudinal Sensor (msec)	Clipping Not Reached
Clipping Time Lateral Sensor (msec)	Clipping Not Reached
Multi-Event, Number of Events	1. Event
Time From Previous Event to Current Event (msec)	0
Complete File Recorded, Generic, Prio 1 Data	Completed Successfully
Ignition Cycle, Crash (cycle)	26,682
Ignition Cycle, Download (cycle)	26,686
Vehicle Mileage (km)	78,680
Operating Time (min)	145,643
Vehicle Identification Number	WDC0G4JB2JV******
Event Counter (counts)	1

Deployment Command Data (Record 5)

Frontal Air Bag, Time to 1st Stage Deployment, Driver (msec)	23
Frontal Air Bag, Time to 2nd Stage Deployment, Driver (msec)	28
Frontal Air Bag, Time to 3rd Stage (Vent) Deployment, Driver (msec)	Data Not Available
Frontal Air Bag, 2nd Stage Disposal, Driver	No Disposal
Frontal Air Bag, 3rd Stage (Vent) Disposal, Driver	Data Not Available
Frontal Air Bag, Time to 1st Stage Deployment, Front Passenger (msec)	Data Not Available
Frontal Air Bag, Time to 2nd Stage Deployment, Front Passenger (msec)	Data Not Available
Frontal Air Bag, Time to 3rd Stage (Vent) Deployment, Front Passenger (msec)	Data Not Available
Frontal Air Bag, 2nd Stage Disposal, Front Passenger	Data Not Available
Frontal Air Bag, 3rd Stage (Vent) Disposal, Front Passenger	Data Not Available
Side Air Bag, Time to Deployment 1st Stage, Driver (msec)	Data Not Available
Side Curtain/Tube Air Bag,Time to Deployment, Driver Side (msec)	33
Pretensioner (1), Time to Deploy, Driver (msec)	19
Side Air Bag, Time to Deployment 1st Stage, Front Passenger (msec)	Data Not Available
Side Curtain/Tube Air Bag, Time to Deployment, Passenger Side (msec)	Data Not Available
Pretensioner (1), Time to Deploy, Front Passenger (msec)	Data Not Available
Pretensioner (2), Time to Deploy, Driver (msec)	Data Not Available
Pretensioner (2), Time to Deploy, Front Passenger (msec)	Data Not Available
Pretensioner (3), Time to Deploy, Driver (msec)	25
Pretensioner (3), Time to Deploy, Front Passenger (msec)	Data Not Available

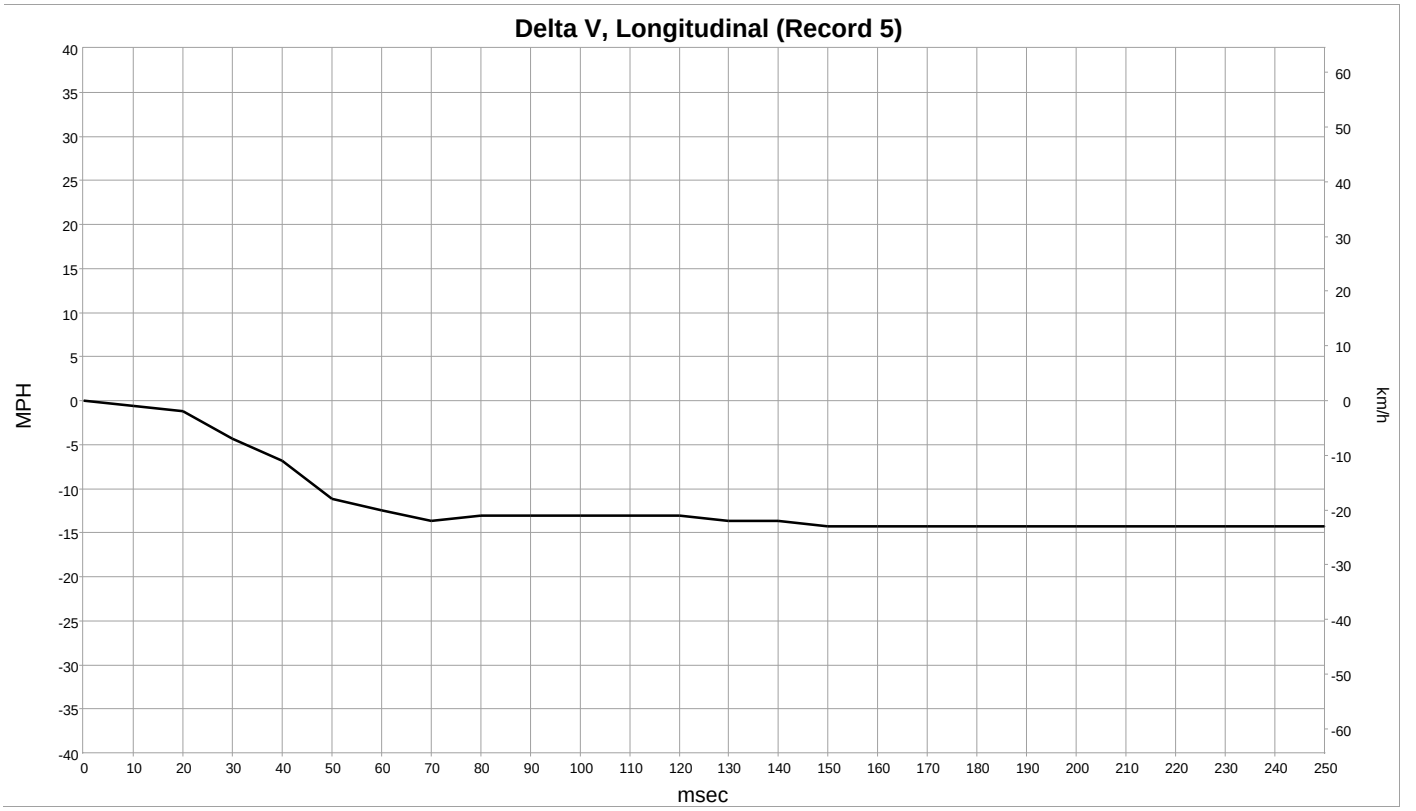
Pre-Crash Data -1 Sec (Record 5)

Safety Belt Status, Driver	Belted
Seat Track Position Switch Status, Driver	Rear
Air Bag Warning Lamp (AWL)	Off
Safety Belt Status, Front Passenger	Not Belted
Seat Track Position Switch Status, Front Passenger	Rear
Occupant Size Classification, Front Passenger	Empty

Pre-Crash Data -5 to 0 sec (Record 5)

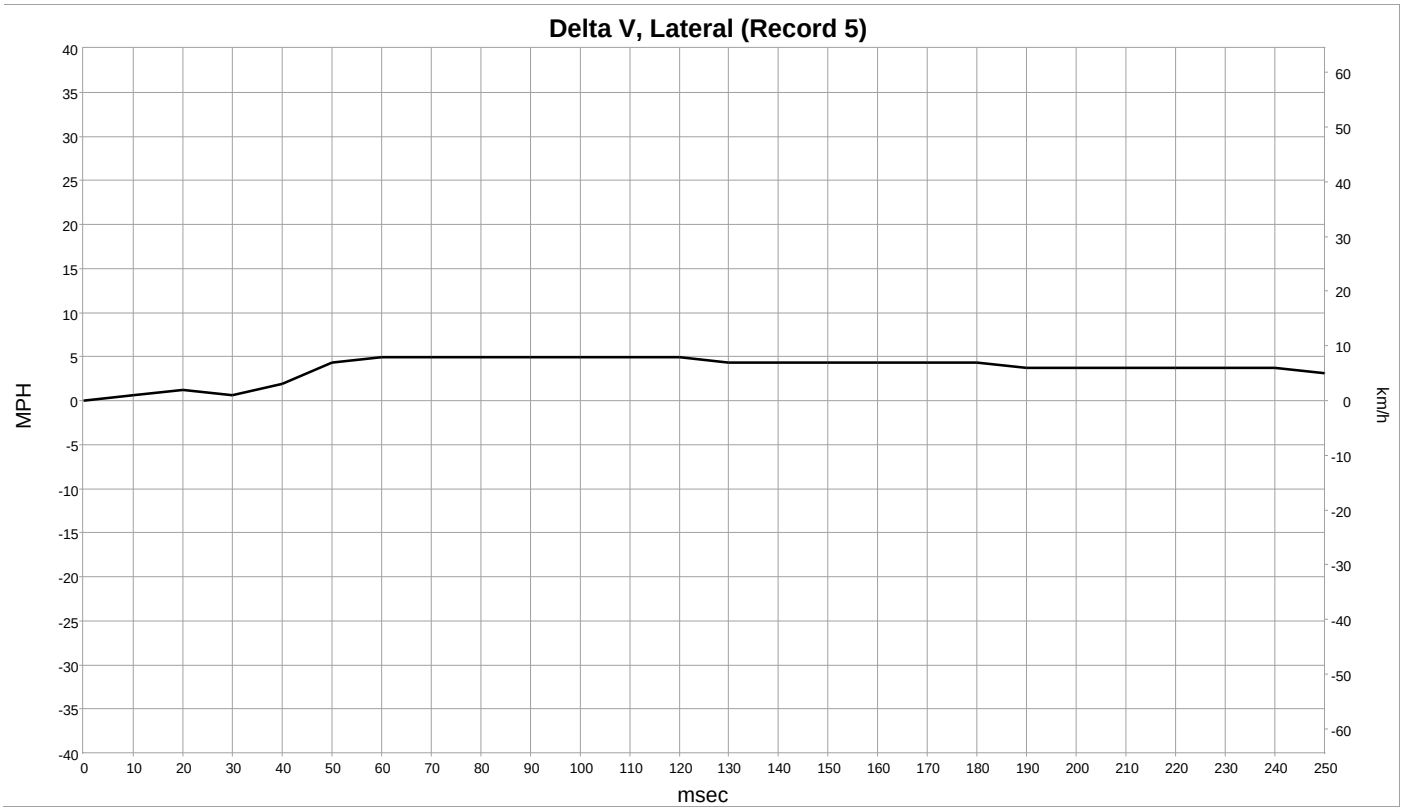
Time (sec)	Speed, Vehicle Indicated (MPH [km/h])	Accelerator Pedal (%)	Service Brake Activation
-5.0	35 [57]	21	Off
-4.5	36 [58]	22	Off
-4.0	37 [59]	22	Off
-3.5	38 [61]	22	Off
-3.0	39 [62]	22	Off
-2.5	39 [63]	22	Off
-2.0	40 [64]	22	Off
-1.5	41 [66]	22	Off
-1.0	42 [67]	22	Off
-0.5	42 [68]	22	Off
0.0	43 [69]	22	Off

Longitudinal Crash Pulse (Record 5)



Time (msec)	Delta-V, Longitudinal (MPH [km/h])
0	0.0 [0]
10	-0.6 [-1]
20	-1.2 [-2]
30	-4.3 [-7]
40	-6.8 [-11]
50	-11.2 [-18]
60	-12.4 [-20]
70	-13.7 [-22]
80	-13.0 [-21]
90	-13.0 [-21]
100	-13.0 [-21]
110	-13.0 [-21]
120	-13.0 [-21]
130	-13.7 [-22]
140	-13.7 [-22]
150	-14.3 [-23]
160	-14.3 [-23]
170	-14.3 [-23]
180	-14.3 [-23]
190	-14.3 [-23]
200	-14.3 [-23]
210	-14.3 [-23]
220	-14.3 [-23]
230	-14.3 [-23]
240	-14.3 [-23]
250	-14.3 [-23]

Lateral Crash Pulse (Record 5)



Time (msec)	Delta-V, Lateral (MPH [km/h])
0	0.0 [0]
10	0.6 [1]
20	1.2 [2]
30	0.6 [1]
40	1.9 [3]
50	4.3 [7]
60	5.0 [8]
70	5.0 [8]
80	5.0 [8]
90	5.0 [8]
100	5.0 [8]
110	5.0 [8]
120	5.0 [8]
130	4.3 [7]
140	4.3 [7]
150	4.3 [7]
160	4.3 [7]
170	4.3 [7]
180	4.3 [7]
190	3.7 [6]
200	3.7 [6]
210	3.7 [6]
220	3.7 [6]
230	3.7 [6]
240	3.7 [6]
250	3.1 [5]

Hexadecimal Data

```
FA10   02

FA12   01 00 00 06 45 00 00 05 C5

FA11   01 00 03

FA13   00 05 00 01 03 00 02 FF FF 00 03 FF FF 00 04 FF
       FF 00 05 FF FF 00 06 FF FF 00 07 00 00 00 08 FF
       FF 00 09 FF FF 00 1F 64 00 00 19 7F 7F 7F 7F 7F
       7F 7F 7F 7F 7F 7F 7F 7F 7F 7F 7F 7F 80 80 80
       80 80 80 80 80 00 20 64 00 00 19 7F 7F 7E 7E 7E
       7E 7D 7D 7C 7C 7C 7B 7B 7B 7B 7A 7A 79 79 79 79
       79 79 79 79 79 00 21 80 00 22 79 00 23 61 00 24
       78 00 28 FF 00 29 FF 00 2D 01 00 2E 00 00 00 33
       FF FF 00 34 FF FF 00 35 FF FF 00 36 FF 00 37 FF
       00 38 FF FF 00 39 FF FF 00 3A FF FF 00 3B FF 00
       3C FF 00 3D FF FF 00 3E 00 02 00 3F FF FF 00 41
       FF FF 00 42 00 02 00 43 FF FF 00 47 00 00 48 02
       00 4B 01 00 4D 00 00 4E 02 00 4F 00 00 5B 00 00
       00 00 00 00 00 00 00 00 00 00 5C 00 00 00 00 00
       00 00 00 00 00 00 00 00 5F 00 00 00 00 00 00 00
       00 00 00 00 6D FF FF 00 6E FF FF 00 70 FF FF 00
       71 FF FF 03 E8 A5 03 E9 68 3A 03 EA 68 3E 03 F1
       1E BC 03 F2 02 39 15 03 F3 57 44 43 30 47 34 4A
       42 32 4A 56 2A 2A 2A 2A 2A 2A 03 FB 04 03 FD 00
       05 03 FE 43 53 2A 36

FA14   00 04 00 01 00 00 02 01 5A 00 03 FF FF 00 04 01
       22 00 05 00 00 00 06 FF FF 00 07 FF FF 00 08 FF
       FF 00 09 FF FF 00 1F 64 00 00 19 7F 7F 7F 7F 7E
       7E 7E 7E 7E 7E 7E 7E 7E 7E 7E 7E 7E 7E 7E 7D 7D
       7D 7D 7D 7D 7D 00 20 64 00 00 19 7F 7F 7F 7F 7F
       7F 7F 7F 7F 7F 7F 7F 7F 7F 7F 7F 7F 7F 7F 7F 7F
       7F 7F 7F 7F 7F 00 21 7B 00 22 7F 00 23 78 00 24
       22 00 28 FF 00 29 FF 00 2D 04 00 2E 03 10 00 33
       FF FF 00 34 FF FF 00 35 FF FF 00 36 FF 00 37 FF
       00 38 FF FF 00 39 FF FF 00 3A FF FF 00 3B FF 00
       3C FF 00 3D FF FF 00 3E FF FF 00 3F FF FF 00 41
       FF FF 00 42 FF FF 00 43 FF FF 00 47 01 00 48 02
       00 4B 00 00 4D 00 00 4E 02 00 4F 00 00 5B 3B 3D
       3E 3F 40 42 43 44 45 3F 30 00 5C 16 16 16 16 16
       16 16 16 16 00 00 00 5F 00 00 00 00 00 00 00 00
       00 01 00 00 6D FF FF 00 6E FF FF 00 70 FF FF 00
       71 FF FF 03 E8 A5 03 E9 68 3A 03 EA 68 3E 03 F1
       1E BC 03 F2 02 38 EB 03 F3 57 44 43 30 47 34 4A
       42 32 4A 56 2A 2A 2A 2A 2A 2A 03 FB 04 03 FD 00
       04 03 FE 89 BC BC 32

FA15   00 03 00 01 01 00 02 FF FF 00 03 00 24 00 04 00
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       FF 00 09 FF FF 00 1F 64 00 00 19 7F 7E 7D 7C 7B
       7B 7B 7B 7B 7B 7B 7B 7B 7B 7B 7B 7B 7B 7B 7B 7B
       7B 7B 7B 7B 7A 00 20 64 00 00 19 7F 7C 7A 78 77
       75 75 75 74 74 74 74 74 74 74 74 74 74 74 74 74
       74 74 74 73 73 00 21 79 00 22 71 00 23 77 00 24
       76 00 28 FF 00 29 FF 00 2D 03 00 2E 02 A6 00 33
       FF FF 00 34 FF FF 00 35 FF FF 00 36 FF 00 37 FF
       00 38 FF FF 00 39 FF FF 00 3A FF FF 00 3B FF 00
       3C FF 00 3D FF FF 00 3E FF FF 00 3F FF FF 00 41
       FF FF 00 42 FF FF 00 43 FF FF 00 47 01 00 48 02
       00 4B 00 00 4D 00 00 4E 02 00 4F 00 00 5B 3B 3D
       3E 3F 40 42 43 44 45 3F 30 00 5C 16 16 16 16 16
       16 16 16 16 00 00 00 5F 00 00 00 00 00 00 00 00
       00 01 00 00 6D FF FF 00 6E FF FF 00 70 FF FF 00
       71 FF FF 03 E8 A5 03 E9 68 3A 03 EA 68 3E 03 F1
       1E BC 03 F2 02 38 EB 03 F3 57 44 43 30 47 34 4A
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        42 32 4A 56 2A 2A 2A 2A 2A 03 FB 04 03 FD 00
        03 03 FE 76 00 41 86

FA16    00 02 00 01 03 00 02 FF FF 00 03 FF FF 00 04 00
        13 00 05 00 0D 00 06 00 11 00 07 00 00 00 08 FF
        FF 00 09 FF FF 00 1F 64 00 00 19 7F 7F 7F 7F 7F
        7F 7F 7F 7F 7F 7F 7F 7F 7F 7F 7F 7F 7F 7F 7F 7F
        7F 7F 7F 7F 7F 00 20 64 00 00 19 7F 7F 7F 7F 7F
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        FF FF 00 34 FF FF 00 35 FF FF 00 36 FF 00 37 FF
        00 38 FF FF 00 39 FF FF 00 3A FF FF 00 3B FF 00
        3C FF 00 3D FF FF 00 3E 00 02 00 3F 00 02 00 41
        FF FF 00 42 00 02 00 43 FF FF 00 47 01 00 48 02
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        3D 3E 3F 40 42 43 44 45 3F 00 5C 16 16 16 16 16
        16 16 16 16 16 00 00 5F 00 00 00 00 00 00 00 00
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        1E BC 03 F2 02 38 EB 03 F3 57 44 43 30 47 34 4A
        42 32 4A 56 2A 2A 2A 2A 2A 03 FB 04 03 FD 00
        02 03 FE 85 05 3C 19

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        00 00 05 00 0E 00 06 00 1A 00 07 FF FF 00 08 FF
        FF 00 09 FF FF 00 1F 64 00 00 19 7F 7E 7D 78 74
        6D 6B 69 6A 6A 6A 6A 6A 69 69 68 68 68 68 68 68
        68 68 68 68 68 00 20 64 00 00 19 7F 80 81 80 82
        86 87 87 87 87 87 87 87 86 86 86 86 86 86 85 85
        85 85 85 85 84 00 21 68 00 22 88 00 23 67 00 24
        24 00 28 FF 00 29 FF 00 2D 01 00 2E 00 00 00 33
        00 17 00 34 00 1C 00 35 FF FF 00 36 00 00 37 FF
        00 38 FF FF 00 39 FF FF 00 3A FF FF 00 3B FF 00
        3C FF 00 3D FF FF 00 3E 00 21 00 3F 00 13 00 41
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        42 32 4A 56 2A 2A 2A 2A 2A 03 FB 04 03 FD 00
        01 03 FE DB 59 E5 83

FA18    00 00
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October 2024

U.S. Department
of Transportation

**National Highway
Traffic Safety
Administration**

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