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Special Crash Investigations: On-Site Side Air Bag Crash Investigation; Vehicle: 2019 Cadillac Escalade; Location: Missouri; Crash Date: September 2022

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16. Abstract This report documents the on-site investigation of the side air bag deployment of a 2019 Cadillac Escalade during a side impact with a 1999 Dodge Ram 1500. The Cadillac driver pulled off the roadway to check the vehicle's tires then got back into the vehicle and attempted a U-turn in front of the Dodge. The Dodge's front plane struck the Cadillac's left side. The unbelted 89-year-old male driver of the Cadillac sustained serious injuries that contributed to his death 5 days later. The Cadillac's belted 83-year-old female right-front passenger sustained police reported B-level (non-incapacitating) injuries. She was transported by ambulance to a trauma center where she was treated and released. The Dodge was driven by a belted 73-year-old male who was not injured or transported for treatment.			
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Special Crash Investigations
On-Site Side Air Bag Crash Investigation
Case No: CR22014
Vehicle: 2019 Cadillac Escalade
Location: Missouri
Crash Date: September 2022

Background

This report documents the on-site investigation of the side air bag deployment of a 2019 Cadillac Escalade (Figure 1) during a side impact with a 1999 Dodge Ram 1500. The unbelted 89-year-old male Cadillac driver sustained serious injuries that contributed to his death 5 days later. The Cadillac's belted 83-year-old female right-front passenger sustained police reported B-level (non-incapacitating) injuries. The Dodge was driven by a belted 73-year-old male who was not injured or transported for treatment.



Figure 1. Left-front oblique view of the Cadillac

Crash Research & Analysis, Inc., identified the crash from the Missouri State Highway Patrol's Online Traffic Crash Reports database and forwarded it to NHTSA's Special Crash Investigation (SCI) group for review in October 2022. It was assigned for on-site investigation in October 2022.

The SCI team contacted the Cadillac driver's insurance company and established cooperation for an on-site investigation. The inspection of the Cadillac included documentation, measurements, and photographs of the exterior, interior, and safety systems, and imaging of the event data recorder (EDR). The inspection of the Dodge included documentation, measurements, and photographs of the exterior. The crash site was also photographed and documented using a Nikon total station. Both vehicle and scene investigations were completed in October 2022.

Crash Summary

Crash Site

The crash occurred on a dark, unlit, three-lane rural roadway in the evening. Reported weather conditions included fair skies, a temperature of 27 °C (80 °F), 52-percent humidity, and winds from the south-southeast at 12 km/h (7 mph). The roadway was level and traversed in an east-west direction. The lanes were 3.7 m (12.1 ft) wide. The eastbound and westbound lanes were separated by an opposable left-turn lane marked by double solid yellow lines. Figure 2 shows the east view of the roadway on approach to the crash site. The posted speed limit was 105 km/h (65 mph). A crash diagram is included at the end of this report.



Figure 2. Eastbound view of the Cadillac's and Dodge's pre-crash approach to the crash site

Pre-Crash

According to medical records the Cadillac was traveling east and the driver pulled off the south side of the road to check the vehicle's tires. After checking the tires, the driver got back into the vehicle and attempted a U-turn to the left to proceed west. The driver crossed both eastbound and westbound lanes while trying to make the U-turn then reversed the vehicle back into the eastbound lane. Just before the crash the driver accelerated forward, per the EDR data.

The Dodge was traveling eastbound at an unknown speed as it approached the Cadillac. According to the police crash report (PCR) the Dodge driver said he could see the Cadillac's taillights for a short time, but lost sight of them prior to the crash.

Crash

The Dodge's front struck the Cadillac's left side. The impact redirected the Cadillac into the westbound lane and induced a counterclockwise rotation. According to the on-scene tow truck operator, the Cadillac came to final rest facing east in the westbound lane. The Dodge continued forward and came to final rest facing northeast, straddling the double yellow lines between the left-turn lane and eastbound lane.

Post-Crash

Local emergency services were notified and arrived 7 minutes later. According to official medical documents, EMS removed the driver from the Cadillac while unconscious or not

oriented to time or place. Emergency personnel helped the front passenger out of the vehicle. The Cadillac driver sustained fatal injuries and was transported to a trauma center where he succumbed to his injuries 5 days later. The Cadillac's front passenger sustained police-reported B-level injuries and was transported by ambulance to a trauma center, where she was treated and released. The PCR said the Dodge driver was not injured. Both vehicles were towed from the crash scene due to disabling damage.

2019 Cadillac Escalade

Description

The 2019 Cadillac Escalade (Figure 3) was manufactured in August 2018 with the Vehicle Identification Number 1GYS3HKJ2KRxxxxxx. The Cadillac was a rear-wheel drive SUV powered by a 6.2 liter, 8-cylinder, gasoline/E85 engine linked to a continuous variable transmission. Its service brakes were power-assisted 4-wheel disc with an antilock brake system. The gross vehicle weight rating was 3,311 kg (7,300 lb). The vehicle manufacturer's recommended tire size was P285/45R22. The Cadillac had Hankook Ventus ST tires on both front wheels and the left-rear wheel was of the manufacturer recommended size. Each had 7 mm (8/32) of tread. The right-rear tire was a Firestone "temporary use only" tire with 5 mm (6/32) of tread with a tire size of P265/70R17. None of the tires were damaged.



Figure 3. Right-front oblique view of the Cadillac

The Cadillac's interior had seating for seven (2/2/3) with front- and second-row bucket seats, second-row folding seats, and a third-row split bench with folding backs. All seating positions, except the third-row-center seating position, had adjustable head restraints. Manual restraint systems had 3-point lap and shoulder belts for all seating positions. Supplemental restraint systems included front-row-only seat belt pretensioners and seven air bags consisting of driver's and passenger's frontal, driver, and passenger front outboard seat-mounted side impact, driver inboard seat-mounted side impact, and left and right inflatable curtain (IC) air bags.

Exterior Damage

The Cadillac sustained direct damage to the left plane (Figure 4) during the impact with the Dodge. The direct damage began 10 cm (3.9 in) forward of the left-rear axle and extended forward 198 cm (78.0 in). The field-L was 220 cm (86.6 in). The crush measurements taken at mid-door level were C1 = 0 cm, C2 = 0 cm, C3 = 20 cm (7.8 in), C4 = 24 cm (9.4 in), C5 = 9 cm (3.5 in), and C6 = 2 cm (0.7 in). Maximum crush was located 125 cm (49.2 in) forward of the left-rear axle. Direct damage included the left B-pillar with the maximum crush in the passenger compartment area. Sill and maximum crush height measurements were taken to obtain the door sill differential, which was 33 cm (13.0 in). The collision deformation classification for this damage profile was 10LZEW3.



Figure 4. Left-plane view of the Cadillac

Event Data Recorder

The 2019 Cadillac Escalade had an air bag control module mounted under the center tunnel that monitored three-dimensional acceleration and roll rate and commanded the actuation and deployment of pretensioners and inflatable supplemental restraint systems. It also had EDR capabilities. During the SCI inspection the Cadillac's EDR data was imaged using the Bosch Crash Data Retrieval (CDR) tool/software version 23.0, by connecting directly to the module. The data was later read with software version 24.1.289 and is included in the Appendix.

Time (sec)	Speed km/h (mph)	Accel. Pedal (%)	Service Brake
-5.0	3 (2)	0	On
-4.5	3 (2)	0	On
-4.0	3 (2)	0	Off
-3.5	2 (1)	0	Off
-3.0	1 (1)	0	Off
-2.5	0 (0)	0	Off
-2.0	0 (0)	0	Off
-1.5	0 (0)	0	Off
-1.0	1 (1)	48	Off
-0.5	7 (4)	21	Off

The recorded data showed the vehicle moving slowly. Based on the medical data the driver was making a U-turn. Vehicle movement reconstruction showed that from -5.0 to -3.0 the vehicle was likely reversing and then stopped in the eastbound lane. The service brake being on at -5.0 seconds prior to algorithm enabled (AE) also is indicative that the driver was coming to a stop, which occurred at -2.5 seconds prior to AE. The driver then likely shifted into drive and accelerated forward just before impact.

Interior Damage

An interior inspection of the Cadillac revealed that there was minor intrusion into the vehicle's occupant compartment. All the Cadillac's doors remained closed during the crash. The left-rear door was jammed shut by the crush damage, but all other doors remained operational post-crash. None of the Cadillac's glazing, except for the second-row-left and rear windows, sustained

damage or occupant contact. A scuff was found on the left-front door arm rest on the upper rear quadrant (Figures 5 and 6). The left A-pillar cover was missing and was not in the vehicle at the time of the inspection. Because of this, contacts to the A-pillar could not be determined during the SCI inspection. A contact to the driver's seat belt padding (Figures 7 and 8) was found as well. It was determined that the driver's head likely contacted the padding either during the crash events or post-crash as he was being treated by local emergency services, as there was blood located on it. Otherwise, there were no discernable contacts.

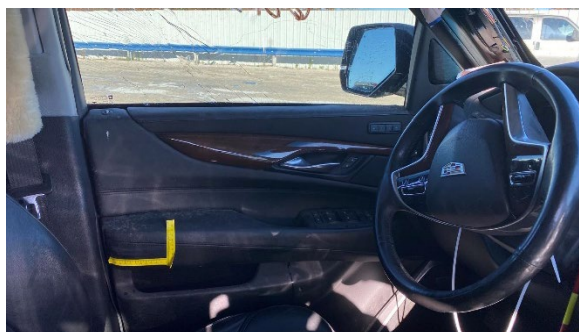


Figure 5. Contact point on driver's door



Figure 6. Close-up of the contact point on driver's door

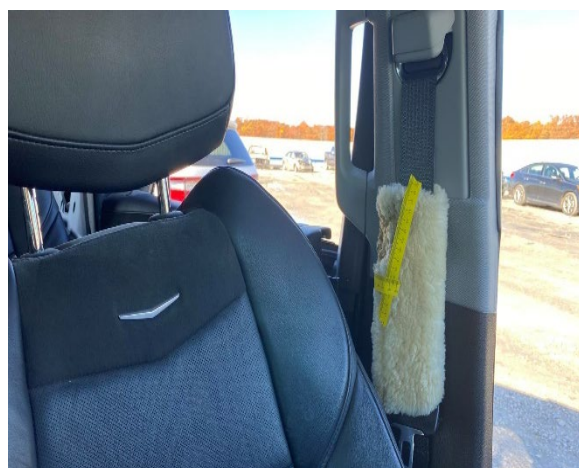


Figure 7. Contact point on the driver's seat belt padding



Figure 8. Close-up of the contact point on the driver's seat belt padding

The Cadillac's interior sustained lateral intrusion damage from the impact with the Dodge. The lower left B-pillar intruded into the passenger compartment 10 cm (3.9 in). The second-row-left door on the lower forward quadrant intruded 18 cm (7.1 in).

Manual Restraint Systems

The Cadillac had 3-point lap and shoulder seat belts for all seven seating positions. All the seat belts had continuous loop webbing with lightweight locking latch plates. The front row had retractor-mounted pretensioners and adjustable upper anchors.

The driver was not restrained by the seat belt. At the time of the SCI inspection, the seat belt was tight against the left B-pillar, indicating actuation of the retractor pretensioner in an unused position.

The passenger's upper anchor was adjusted to the full-up position and the pretensioner actuated during the crash. The front passenger's locked retractor showed actuation of the pretensioner. No damage to the seat belt or buckle was seen during the SCI inspection.

Supplemental Restraint Systems

The Cadillac had dual-stage driver's and passenger's frontal air bags, driver's and front passenger's outboard seat-mounted side impact air bags, a driver's inboard seat-mounted side impact air bag, and IC air bags that provided protection for all outboard seat positions. The driver's frontal air bag was mounted in the steering wheel hub, while the passenger's frontal air bag was a top-mount design in the right instrument panel. The front seat-mounted side impact air bags, outboard and inboard, provided supplemental protection for lateral (side) crash forces. The IC air bags were mounted to the roof side rails and concealed by the vehicle's headliner, designed to provide outboard protection for all seating rows.

The driver's side impact inboard (Figure 9), driver's side impact outboard (Figure 10), and both IC air bags deployed during the crash. At the time of the SCI inspection, the driver's IC air bag was observed to have been cut and was not present in the vehicle.



Figure 9. Driver's deployed side impact inboard air bag



Figure 10. Driver's deployed side impact outboard air bag

2019 Cadillac Escalade Occupants

Driver Demographics

Age/sex: 89 years/male
 Height: 183 cm (72 in)
 Weight: 109 kg (240 lb)
 Eyewear: Unknown
 Seat type: Forward-facing bucket seat with adjustable head restraint
 Seat track position: Seat at rear most track position
 Manual restraint usage: Lap and shoulder belt available; none used
 Usage source: Vehicle inspection and EDR
 Air bags: Frontal, outboard seat-mounted, inboard seat-mounted, and IC air bags available; outboard seat-mounted, inboard seat-mounted, and IC air bags deployed
 Alcohol/drug involvement: No alcohol or drug involvement
 Egress from vehicle: Removed from vehicle while unconscious or not oriented to time or place
 Transport from scene: EMS ambulance to Level II trauma center
 Type of medical treatment: Hospitalized for 5 days; deceased

Driver Injuries

Inj. No.	Injury	Injury Severity AIS 2015	Involved Physical Component (IPC)	IPC Confidence Level
1	Tiny subdural hemorrhage in right frontal region, maximum thickness 8 mm; tiny amount of subdural hemorrhage along right tentorium	140651.3	Tandem IPC Primary: Left air bag – left roof side rail Secondary: Left side – left A-pillar	Possible Probable
2	Subarachnoid hemorrhage in right temporal and parietal lobes	140693.2	Tandem IPC Primary: Left air bag – left roof side rail Secondary: Left side – left A-pillar	Possible Probable
3	Nondisplaced fracture of lateral limb of left pterygoid plate	150200.3	Tandem IPC Primary: Left air bag – left roof side rail Secondary: Left side – left B-pillar	Possible Probable

Inj. No.	Injury	Injury Severity AIS 2015	Involved Physical Component (IPC)	IPC Confidence Level
4	Nondisplaced left posterior parietal skull fracture; nondisplaced fracture in left temporal bone through the mastoid air cells	150402.2	Tandem IPC Primary: Left air bag – left roof side rail Secondary: Left side – left B-pillar	Possible Probable
5	Fracture of medial wall of left maxillary sinus and medial wall of right maxillary sinus	250800.2	Tandem IPC Primary: Left air bag – left roof side rail Secondary: Left side – left A-pillar	Possible Probable
6	Rib fractures: left 3-6, posterolateral	450203.3	Tandem IPC Primary: Left air bag – left seatback outboard Secondary: Left side – left B-pillar	Possible Probable
7	Trace left anterior pneumothorax, 8.3 mm in thickness	442202.2	Isolated IPC Left door panel – left door panel unknown/multiple quadrant	Probable
8	Mildly displaced left medial scapular fracture	750951.2	Isolated Left side – left B-pillar	Probable
9	Laceration to left temporal scalp, 3 cm; laceration to left occipital scalp, 1 cm	110602.1	Isolated Left side – left B-pillar	Probable
10	Large left posterior parietal scalp hematoma	110402.1	Isolated Left side – left B-pillar	Probable
11	Mild scalp hematoma right frontal region	110402.1	Isolated Left side – left A-pillar	Probable
12	Diffuse bruising to left face	210402.1	Isolated Left side – left B-pillar	Probable
13	Bruising to nose	210402.1	Isolated Left side – left A-pillar	Probable

Inj. No.	Injury	Injury Severity AIS 2015	Involved Physical Component (IPC)	IPC Confidence Level
14	Bruising to right anterior chest	410402.1	Isolated Front – steering wheel (combination of rim and hub/spoke)	Probable
15	Laceration to left flank, NFS	510600.1	Isolated Left door panel – left door panel unknown/multiple quadrant	Probable
16	Contusion to left flank	510402.1	Isolated Left door panel – left door panel unknown/multiple quadrant	Probable
17	Abrasion to left flank	510202.1	Isolated Left door panel – left door panel unknown/multiple quadrant	Probable
18	Laceration to left posterior shoulder	710600.1	Isolated Left side – left B-pillar	Probable
19	Contusion to left posterior shoulder	710402.1	Isolated Left side – left B-pillar	Probable
20	Abrasion to left posterior shoulder	710202.1	Isolated Left side – left B-pillar	Probable
21	Bruising to left forearm	710402.1	Isolated Left door panel – left door panel unknown/multiple quadrant	Probable
22	Bruising to right hand	710402.1	Unknown	Unknown
23	Bruising to left hand	710402.1	Isolated IPC Left door panel – left door panel unknown/multiple quadrant	Probable
24	Laceration to anterior left thigh, NFS	810600.1	Isolated	Probable

Inj. No.	Injury	Injury Severity AIS 2015	Involved Physical Component (IPC)	IPC Confidence Level
			Left door panel – left rear lower quadrant	
25	Contusion to anterior left thigh	810402.1	Isolated Left door panel – left rear lower quadrant	Probable
26	Abrasion to anterior left thigh	810202.1	Isolated Left door panel – left rear lower quadrant	Probable

Source: Hospital records

Driver Kinematics

At the time of the crash the driver was unrestrained by the lap and shoulder seat belt. The driver's seat was in the rear-most track position at the time of the SCI inspection. The impact with the Dodge displaced the driver forward and to the left, resulting in the driver striking the A-pillar through the IC air bag and left-front door with the front and left side of his head. As the vehicle rotated counterclockwise after impact, the driver was redirected left and rearward toward the left B-pillar, where he struck the IC air bag and B-pillar. It is likely that he struck the B-pillar at a minimally inflated section of the IC air bag with the back of his head.

The driver sustained serious injuries and was transported to a local hospital. He died 5 days later from injury complications and comorbidities.

Front-Row-Right Passenger Demographics

Age/sex: 83 years/female
Height: 152 cm (60 in)
Weight: 60 kg (132 lb)
Eyewear: Unknown
Seat type: Forward-facing bucket seat with adjustable head restraint
Seat track position: Seat at rear most track position
Manual restraint usage: Lap and shoulder belt
Usage source: Vehicle inspection and EDR
Air bags: Frontal, outboard seat-mounted, and IC air bags available; IC air bag deployed
Egress from vehicle: Exited vehicle with help
Transport from scene: EMS ambulance to Level II trauma center
Type of medical treatment: Treated and released

Front-Row-Right Passenger Injuries

Inj. No.	Injury	Injury Severity AIS 2015	Involved Physical Component (IPC)	IPC Confidence Level
1	Chest wall contusion	410402.1	Isolated Interior – shoulder part of belt restraint	Probable

Source: Emergency room records

Front-Row-Right Passenger Kinematics

The passenger was seated in the first-row-right seating position and was restrained by her 3-point lap and shoulder belt. The seat was in the rear-most track position at the time of the SCI inspection. At impact with the Dodge, the passenger responded forward and to the left, loading the shoulder part of her seat belt. After impact, the Cadillac began rotating counterclockwise on its wheels. The counterclockwise rotation resulted in the passenger responding left and rearward into the seatback until the vehicle came to final rest.

EMS helped the passenger from the Cadillac and transported her to a local hospital by ambulance due to perceived injuries. She was treated and released.

1999 Dodge Ram 1500

Description

The 1999 Dodge Ram 1500 (Figure 11) was a four-door pickup truck with the Vehicle Identification Number 1B7HF13Z3XJxxxxxx. It was a 4-wheel drive, 2-door truck powered by a 5.9 liter, 8-cylinder, gasoline engine that was linked to a continuous variable transmission. Its service brakes were power-assisted 4-wheel disc with an antilock brake system. The gross vehicle weight rating was 2,994 kg (6,600 lb). The vehicle manufacturer's recommended tire size was 245/75R16. All four wheels had BF Goodrich All-Terrain T/A tires with the tire size 265/75R16. The left- and right-front tires had 7 mm (9/32) of tread, the left-rear tire had 8 mm (10/32) of tread, and the right-rear had 9 mm (12/32) of tread. The left- and right-front tires were de-beaded from their respective wheels. The left-front tire was restricted.

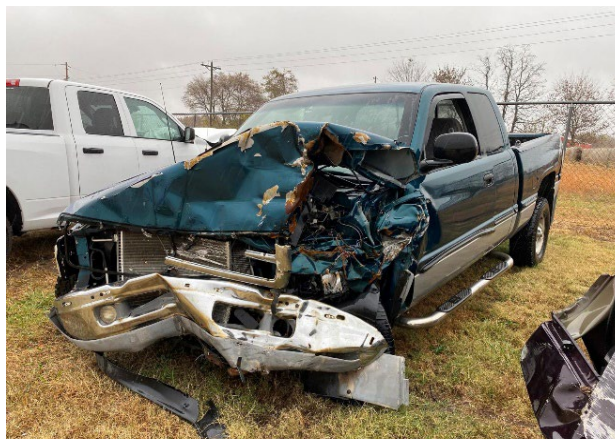


Figure 11. Left-front oblique view of the Dodge

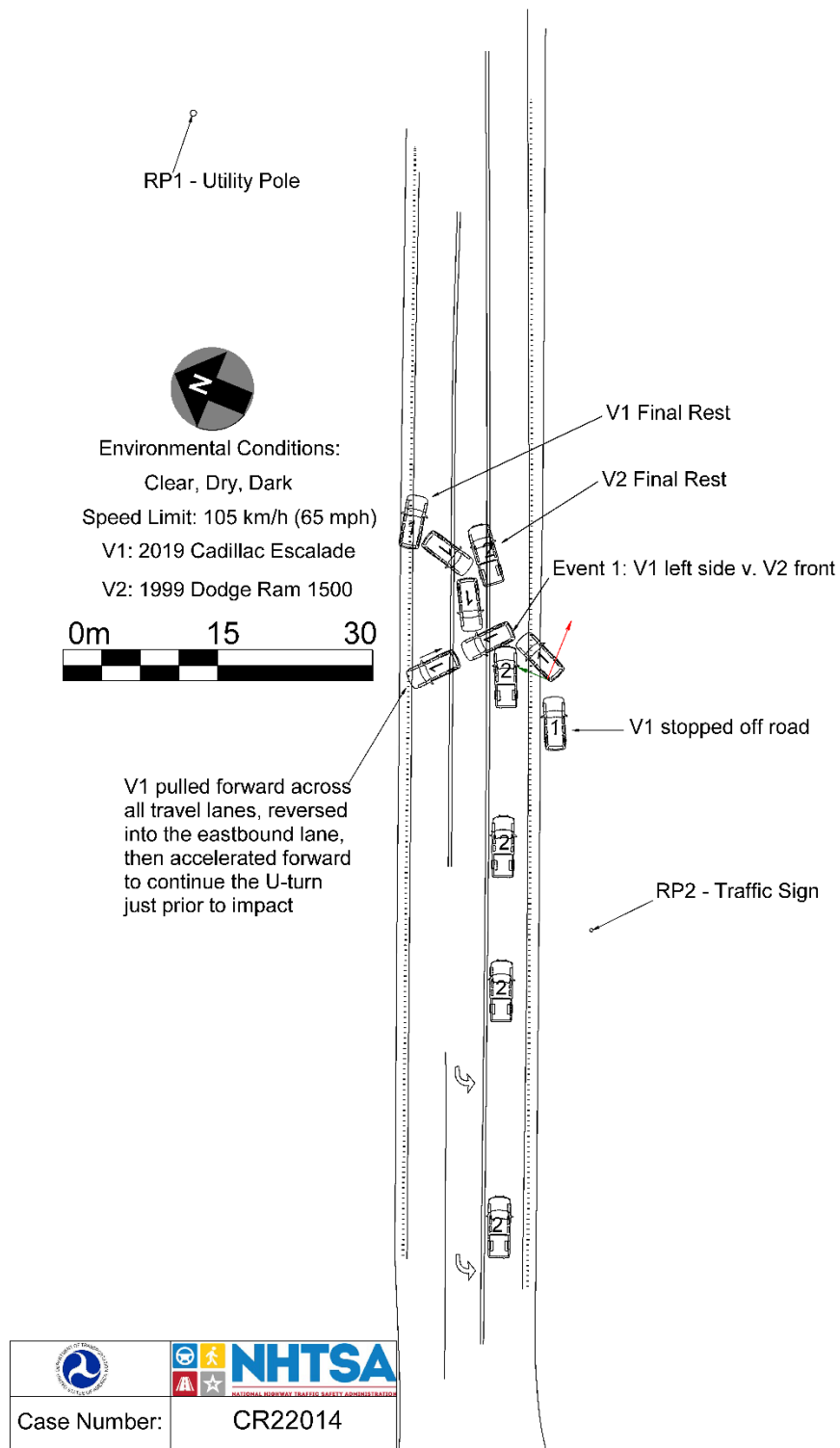
Exterior Damage

The Dodge sustained damage to the front plane during the crash with the Cadillac. A residual crush profile was documented at bumper level. The direct damage began 98 cm (38.5 in) left of center and extended 68 cm (26.7 in) right. The field-L was 180 cm (70.8 in). The crush measurements were C1 = 118 cm (46.4 in), C2 = 106 cm (41.7 in), C3 = 78 cm (30.7 in), C4 = 62 cm (24.4 in), C5 = 40 cm (15.7 in), and C6 = 27 cm (10.6 in). Maximum crush was 118 cm (46.4 in) located 98 cm (38.5 in) left of the front center point. The collision deformation classification for this damage profile was 12FYEW5.

Occupant Data

The Dodge was driven by a belted 73-year-old male. The PCR said the driver did not sustain any injury and was not transported. Further details are unknown.

Crash Diagram



Appendix A: 2019 Cadillac Escalade Event Data Recorder Report¹

¹ The EDR report in this report was imaged using the current version of the Bosch CDR software at the time of the vehicle inspection. The CDR report 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	1GYS3HKJ2KR*****
User	
Case Number	
EDR Data Imaging Date	
Crash Date	
Filename	CR22014_V1_ACM.CDRX
Saved on	
Imaged with CDR version	Crash Data Retrieval Tool 23.0
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 24.1.289
Reported with Software Licensed to (Company Name)	NHTSA
EDR Device Type	Airbag Control Module
Event(s) recovered	Record 1 (Deployment)

Comments

No comments entered.

Data Limitations

Recorded Crash Events:

There are two types of recorded crash events for Front, Side, and Rear (FSR) Events. The first is the Non-Deployment Event. A Non-Deployment Event records data but does not deploy the air bag(s). The minimum SDM Recorded Vehicle Velocity Change, that is needed to record a Non-Deployment Event, is five MPH [8 km/h]. A Non-Deployment Event contains Pre-Crash and Crash data. The oldest Non-Deployment event can be overwritten by a Deployment Event, if all three records are full and the Non-Deployment Event is not locked. A Non-Deployment Event can be overwritten by a more recent Non-Deployment Event if all three records are full and the Non-Deployment is older than approximately 250 ignition cycles. Also, a Non-Deployment event can be recorded if one of the following occurs without the Deployment of any of the frontal air bags, side air bags, pretensioners, or roll bars:

- Head Rest Deployment
- Battery Cut-Off Deployment

The second type of SDM recorded crash event for FSR Events is the Deployment Event. It also may contain Pre-Crash and Crash data. Deployment Events cannot be overwritten or cleared by the SDM.

Rollover Events contains Pre-Crash and Crash data. Rollover event follow the same rules as FSR Deployment events.

The SDM can store up to three Events.

There are two types of PedPro crash events. The first is the Non-Deployment PedPro Event. A Non-Deployment PedPro Event records data but does not deploy anything. A Non-Deployment PedPro Event may contain Pre-Crash and Crash data. The second type of PedPro recorded crash event is the Deployment PedPro Event. It also may contain Pre-Crash and Crash data. Deployment Events cannot be overwritten or cleared by the SDM.

The SDM can store up to two PedPro Events.

Data:

For FSR Events, SDM Recorded Vehicle Velocity Change reflects the change in velocity that the sensing system experienced during the recorded portion of the event. SDM Recorded Vehicle Velocity Change is the change in velocity during the recording time and is not the speed the vehicle was traveling before the event and is also not the Barrier Equivalent Velocity. For Deployment and Non-Deployment Events, the SDM will record up to 300 milliseconds of data after time zero. The SDM will also record up to 300 milliseconds of Vehicle Acceleration data after time zero.

For Rollover Events, the SDM may record Lateral Acceleration, Vertical Acceleration, and Roll Rate data, if the SDM is rollover capable. This data reflects what the sensing system experienced during the recorded portion of the event. For Rollover Deployment Events, the SDM will record up to 700 milliseconds of data before the Deployment criteria is met and 290 milliseconds after the Deployment criteria is met.

-Time between events is recorded in 10 msec intervals and is displayed in seconds for a maximum time of 655.33 seconds. The counter measures the time from the start of one event to the start of the next event, if both events occur within the same ignition cycle.

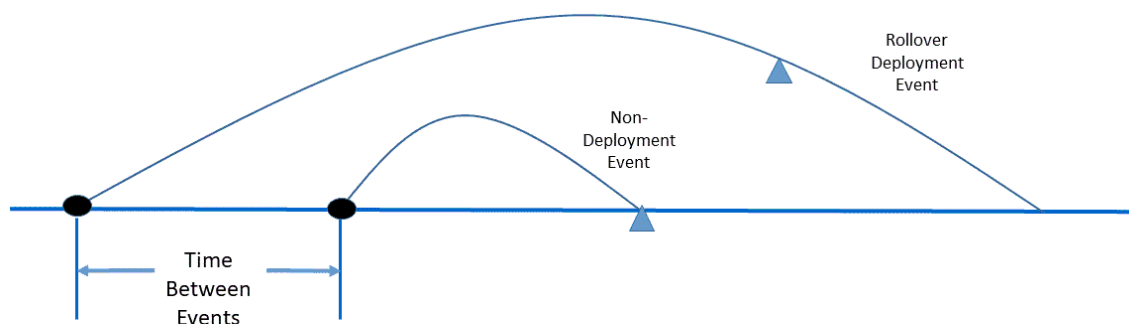
-The Maximum SDM Recorded Vehicle Velocity Change may occur between the recorded 10 millisecond sample points of the SDM Recorded Vehicle Velocity Change.

-If the SDM Recorded Vehicle Velocity Change data exceeds the max output range of -127 km/h then the exceeded values will be displayed with an offset of a +256 km/h. If the SDM Recorded Vehicle Velocity Change data exceeds the max output range of +126 km/h then the exceeded values will be displayed with an offset of a -256 km/h.

-Event Recording Complete will indicate if data from the recorded event has been fully written to the SDM memory or if it has been interrupted and not fully written.

-SDM Recorded Vehicle Speed accuracy can be affected by various factors, including but not limited to the following:

- Significant changes in the tire's rolling radius
- Final drive axle ratio changes
- Wheel lockup and wheel slip
- Brake Switch Circuit Status indicates the open/closed state of the brake switch circuit or the commanded state of the brake lamps.
- Pre-Crash data is recorded asynchronously. The 0.5 second Pre-crash data value (most recent recorded data point) is the data point last sampled before Time Zero. That is to say, the last data point may have been captured just before Time Zero but no more than 0.5 second before Time Zero. All subsequent Pre-crash data values are referenced from this data point.
- Pre-Crash Electronic Data Validity Check Status indicates "Data Invalid" if:
 - The SDM receives a message with an "invalid" flag from the module sending the pre-crash data
- Pre-Crash Electronic Data Validity Check Status indicates "Data Not Available" if:
 - No data is received from the module sending the pre-crash data
- For diesel powered vehicles, the data displayed as Throttle Position (%) is actually the data for the Air Inlet Flap Position. This is not the same as the throttle position for a gasoline powered engine.
- Belt Switch Circuit Status indicates the status of the seat belt switch circuit.
- The ignition cycle counter will increment when the power mode cycles from OFF/Accessory to RUN. Applying and removing of battery power to the module will not increment the ignition cycle counter.
- Ignition Cycles Since DTCs Were Last Cleared can be recorded with a maximum value of 253 cycles and can only be reset by a scan tool.
- Dynamic Deployment Event Counters tracks the number of Deployment events that have occurred during the SDM's lifetime.
- Dynamic Event Counters tracks the number of qualified events (either Deployments, Non-deploy, or Rollover events) that have occurred during the SDM's lifetime.
- For Deployment Events, DTC B0052 (Deployment commanded) shall be recorded with the remainder of the data for this event even though it occurred after Event Enable.
- For frontal Deployment Events, only the highest severity event is reported. For example, Stage 2 severity events include Pretensioner severity and Stage 1 severity.
- Once a firing loop has been commanded to be deployed, it will not be commanded to be deployed again during the same ignition cycle. Firing loop times for subsequent deployment type events, during the same ignition cycle, will record the deployment times as N/A.
- The airbag control module may continue to function after the vehicle has been turned off or to accessory, for a set period of time, this is called Prolongation. However, all other vehicle modules may have their functions shut down during Prolongation. For example, if the SIR warning lamp is commanded on by the airbag control module, during Prolongation, and is recorded in the EDR as being commanded on, the actual state of the warning lamp would be off to an observer since the vehicle display cluster would have been in the off state. Vehicle pre-event and system data may be recorded in the EDR as their commanded state, default state, or data invalid state.
- A Concurrent Event is when two events are happening nearly simultaneously. The "Concurrent Event Flag Set" parameter will indicate "Yes" if one event begins, but before that event is qualified, another event begins and is qualified.
- A Non-Deployment event typically becomes qualified if that event exceeds the 5 MPH (8 km/h) delta V recording threshold and the event has concluded. A deployment event (FSR or Rollover) becomes qualified when a deployment has been commanded for that event.
- Example of a Concurrent Event:
A Rollover event begins. Before the Rollover event is qualified, a Non-Deployment event begins and is qualified. Sometime after the Non-Deployment event is qualified, the Rollover event is qualified. The Non-Deployment event will be recorded in the first open record even though the Rollover event enabled before the Non-Deployment event. The Rollover event will be recorded in the next open record. The "Concurrent Event Flag Set" parameter will indicate "Yes" for the Rollover event. The "Time Between Events" parameter will indicate the time from the start of the Rollover event to the start of the Non-Deployment event.



Event Record #1	Event Record #2
Event Record Type = Non – Deployment	Event Record Type = Rollover
Concurrent Event Flag = No	Concurrent Event Flag = Yes
Time Between Events = NA	Time Between Events = XX seconds

- The GM parameter name is displayed in parentheses after the NHTSA Part 563 parameter name.
- All data should be examined in conjunction with other available physical evidence from the vehicle and scene.

Data Source:

All SDM recorded data is measured, calculated, and stored internally, except for the following:

- Vehicle Status Data (Pre-Crash) is transmitted by the Body Control Module, via the vehicle's communication network.
- The Belt Switch Circuit is wired directly to the SDM.

Data Element Sign Convention:

The following table provides an explanation of the sign notation for data elements that may be included in this CDR report. Directional references to sign notation are all from the perspective of the driver when seated in the vehicle facing the direction of forward vehicle travel.

Data Element Name	Positive Sign Notation Indicates
Longitudinal Acceleration	Forward
Longitudinal Velocity Change	Forward
Lateral Acceleration	Left to Right
Lateral Velocity Change	Left to Right
Vertical Acceleration	Downward
Roll Rate	Clockwise Rotation

Hexadecimal Data:

Data that the vehicle manufacturer has specified for data retrieval is shown in the hexadecimal data section of the CDR report. The hexadecimal data section of the CDR report may contain data that is not translated by the CDR program. The control module contains additional data that is not retrievable by the CDR tool.

01059_SDM40-delphi_r011

System Status at Time of Retrieval

ESS # 1 Traceability Data, Component Identifier	AU
ESS # 1 Traceability Data, Part Number/Broadcast Code	8264
ESS # 1 Traceability Data, Supplier Code	D
ESS # 1 Traceability Data, Traceability Number	A00000000
ESS # 1 Verification Data	13,518,264
ESS # 2 Traceability Data, Component Identifier	AT
ESS # 2 Traceability Data, Part Number/Broadcast Code	8264
ESS # 2 Traceability Data, Supplier Code	D
ESS # 2 Traceability Data, Traceability Number	A00000000
ESS # 2 Verification Data	13,518,264
ESS # 3 Traceability Data, Component Identifier	AH
ESS # 3 Traceability Data, Part Number/Broadcast Code	9421
ESS # 3 Traceability Data, Supplier Code	D
ESS # 3 Traceability Data, Traceability Number	A00000000
ESS # 3 Verification Data	13,519,421
ESS # 4 Traceability Data, Component Identifier	AJ
ESS # 4 Traceability Data, Part Number/Broadcast Code	9421
ESS # 4 Traceability Data, Supplier Code	D
ESS # 4 Traceability Data, Traceability Number	A00000000
ESS # 4 Verification Data	13,519,421
ESS # 5 Traceability Data, Traceability Number	A00000000
ESS # 5 Traceability Data, Component Identifier	DA
ESS # 5 Traceability Data, Part Number/Broadcast Code	1010
ESS # 5 Traceability Data, Supplier Code	D
ESS # 5 Verification Data	26,671,010
ESS # 6 Traceability Data, Component Identifier	DB
ESS # 6 Traceability Data, Part Number/Broadcast Code	1010
ESS # 6 Traceability Data, Supplier Code	D
ESS # 6 Traceability Data, Traceability Number	A00000000
ESS # 6 Verification Data	26,671,010
ESS # 7 Traceability Data, Component Identifier	
ESS # 7 Traceability Data, Part Number/Broadcast Code	0000
ESS # 7 Traceability Data, Supplier Code	D
ESS # 7 Traceability Data, Traceability Number	A00000000
ESS # 7 Verification Data	0
ESS # 8 Traceability Data, Component Identifier	
ESS # 8 Traceability Data, Part Number/Broadcast Code	0000
ESS # 8 Traceability Data, Supplier Code	D
ESS # 8 Traceability Data, Traceability Number	A00000000
ESS # 8 Verification Data	0
AOS Data Key	0
SDM Primary Key Definition (Key 1-2)	41
SDM Primary Key Definition (Key 3-4)	38
Dynamic Deployment Event Counter	1
Multi-Event, Number of Events (Dynamic Event Counter)	1
Dynamic OnStar Notification Event Counter	1
Driver Frontal Stage 2 Commanded after Event End for Event Record #1	No
Passenger Frontal Stage 2 Commanded after Event End for Event Record #1	No
Driver Frontal Stage 2 Commanded after Event End for Event Record #2	No
Passenger Frontal Stage 2 Commanded after Event End for Event Record #2	No
Driver Frontal Stage 2 Commanded after Event End for Event Record #3	No
Passenger Frontal Stage 2 Commanded after Event End for Event Record #3	No
Longitudinal Accelerometer Range (g)	113
Lateral Accelerometer Range (g)	113
Dynamic PedPro Deploy Event Counter	0
Dynamic PedPro Event Counter	0
Vehicle Identification Number (VIN)	1GYS3HKJ2KR*****
System Type	Delphi SDM40 with integrated IMU
Ignition Cycle, Download (Ignition Cycles at Investigation)	11,248

System Status at Event (Record 1)

Complete File Recorded (Event Recording Complete)	Yes
Event Record Type	Deployment
Crash Record Locked	Yes
OnStar Deployment Status Data Sent	Yes
OnStar SDM Recorded Vehicle Velocity Change Data Sent	Yes
High Voltage Disable Notification Sent	Yes
Power Loss Detected for Deployment Event	No
Deployment Event Counter	1
Multi-Event, Number of Events (Event Counter)	1
OnStar Notification Event Counter	1
Algorithm Active - Frontal	Yes
Algorithm Active - Side	Yes
Algorithm Active - Rollover	Yes
Algorithm Active - Rear	Yes
Ignition Cycle, Crash (Ignition Cycles at Event)	11,209
Time From Event 1 to 2 (Time Between Events) (msec)	Data Not Available
Concurrent Event Flag Set	No
Event Severity Status: Frontal Pretensioner	No
Event Severity Status: Frontal Stage 1	No
Event Severity Status: Frontal Stage 2	No
Event Severity Status: Left Side	Yes
Event Severity Status: Right Side	No
Event Severity Status: Rear	No
Event Severity Status: Rollover	No
Event Severity Status: Battery Disconnect Switch - Side Event	No
Safety Belt Status, Driver (Driver Belt Switch Circuit Status)	Not Buckled
Safety Belt Status, Right Front Passenger (Passenger Belt Switch Circuit Status)	Buckled
Seat Track Position Switch, Foremost, Status, Driver (Driver Seat Position Status)	No (Rearward)
Passenger Seat Occupancy Status	Occupied
Occupant Size Right Front Passenger Child (Passenger Classification Status)	No (Adult)
Passenger Air Bag ON Indicator Status	On
Passenger Air Bag OFF Indicator Status	Off
Low Tire Pressure Warning Lamp Status 0.5 Seconds prior to Time Zero	Off
Frontal Air Bag Warning Lamp (SIR Warning Lamp Status 0.5 Seconds Prior to Time Zero)	Off
SIR Warning Lamp ON/OFF Time Continuously (seconds)	655,330
Number of Ignition Cycles SIR Warning Lamp was ON/OFF Continuously	6,771
Ignition Cycles Since DTCs Were Last Cleared 0.5 Seconds Prior to Time Zero	253
Maximum Delta-V, Longitudinal (Maximum Longitudinal SDM Recorded Vehicle Velocity Change for FSR Event) (MPH [km/h])	-14 [-22]
Time, Maximum Delta-V (Time From FSR Time Zero to Maximum Longitudinal SDM Recorded Vehicle Velocity Change) (msec)	184
Maximum Delta-V, Lateral (Maximum Lateral SDM Recorded Vehicle Velocity Change for FSR Event) (MPH [km/h])	14 [22]
Time Maximum Delta-V, Lateral (Time From FSR Time Zero to Maximum Lateral SDM Recorded Vehicle Velocity Change) (msec)	210
Maximum Resultant Delta-V – Longitudinal Component for FSR Event (MPH [km/h])	-14 [-22]
Maximum Resultant Delta-V – Lateral Component for FSR Event (MPH [km/h])	13 [21]
Time from FSR Time Zero to time of the Maximum Resultant Delta-V (msec)	196
Blended Event FSR 1 Severity Type	Side (Left or Right Side)
Blended Event FSR 2 Severity Type	Data Not Available
Blended Event Time from FSR 1 Time Zero to FSR 2 Time Zero (msec)	Data Not Available
Blended Event FSR 3 Severity Type	Data Not Available

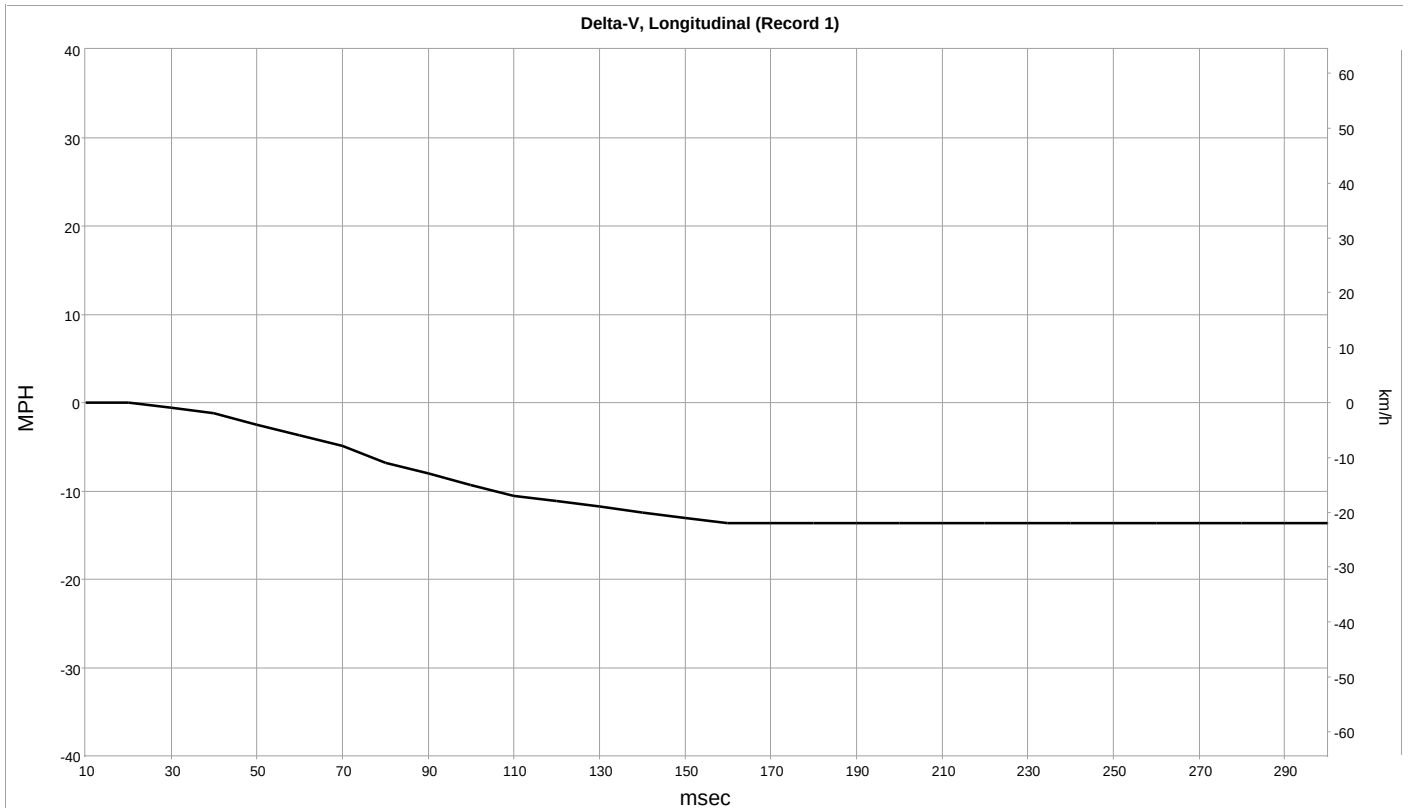
Blended Event Time from FSR 1 Time Zero to FSR 3 Time Zero (msec)	Data Not Available
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Diagnostic Trouble Codes 0.5 Seconds Prior to Time Zero (Record 1)

DTC 1	B0052-00
DTC 2	N/A
DTC 3	N/A
DTC 4	N/A
DTC 5	N/A
DTC 6	N/A
DTC 7	N/A
DTC 8	N/A
DTC 9	N/A

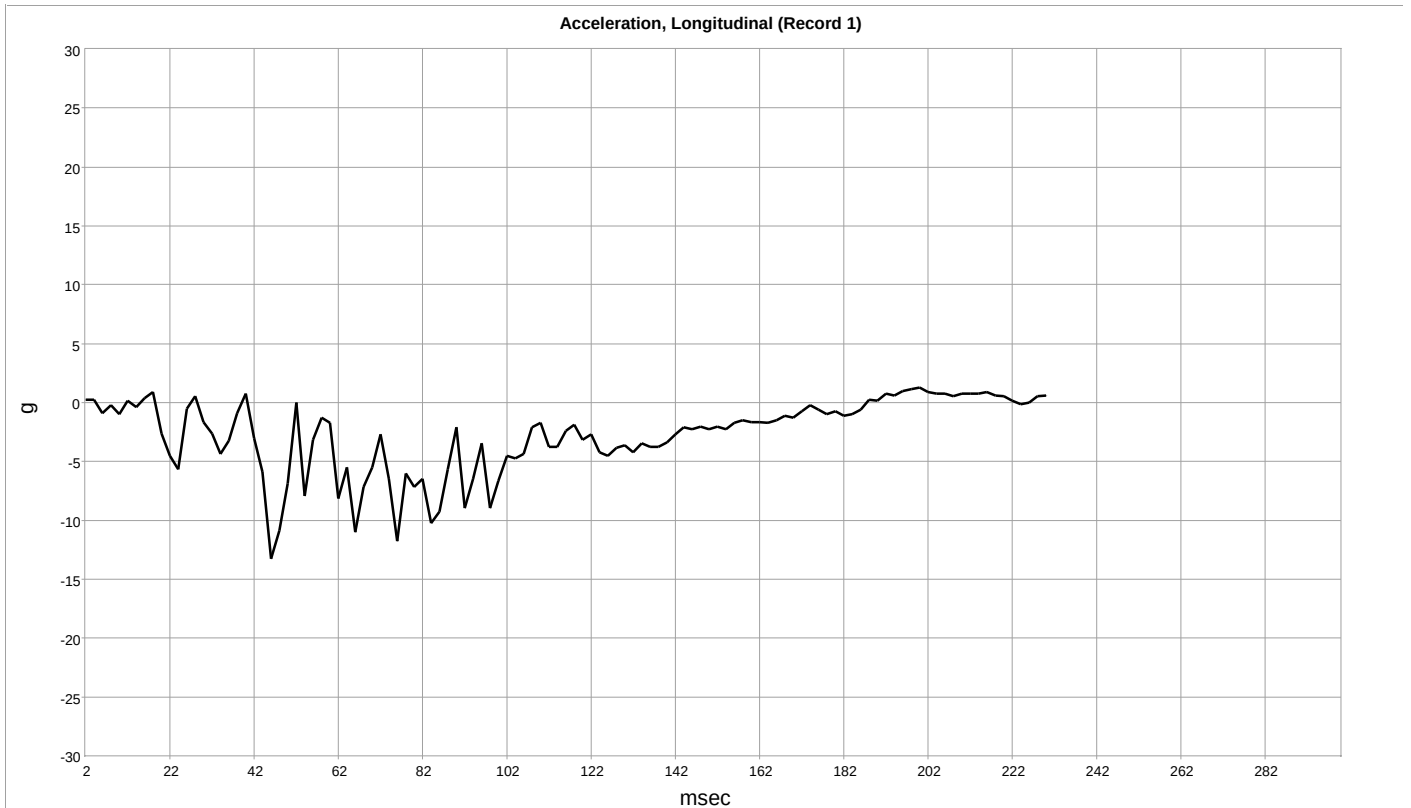
Deployment Command Data (Record 1)

Driver 1st Stage Deployment Loop Commanded	No
Passenger 1st Stage Deployment Loop Commanded	No
Driver 2nd Stage Deployment Loop Commanded	No
Passenger 2nd Stage Deployment Loop Commanded	No
Driver Pretensioner Deployment Loop #1 Commanded	Yes
Passenger Pretensioner Deployment Loop #1 Commanded	Yes
Driver Pretensioner Deployment Loop #2 Commanded	Yes
Passenger Pretensioner Deployment Loop #2 Commanded	Yes
Driver Thorax Loop Commanded	Yes
Passenger Thorax Loop Commanded	No
Left Row 1 Roof Rail/Head Curtain Loop Commanded	Yes
Right Row 1 Roof Rail/Head Curtain Loop Commanded	Yes
Frontal Air Bag Deployment, Time to 1st Stage Deployment, Driver (Driver 1st Stage Time From Time Zero to Deployment Command Criteria Met) (msec)	Data Not Available
Frontal Air Bag Deployment, Time to 1st Stage Deployment, Right Front Passenger (Passenger 1st Stage Time From Time Zero to Deployment Command Criteria Met) (msec)	Data Not Available
Frontal Air Bag Deployment, Time to 2nd Stage, Driver (Driver 2nd Stage Time From Time Zero to Deployment Command Criteria Met) (msec)	Data Not Available
Frontal Air Bag Deployment, Time to 2nd Stage, Right Front Passenger (Passenger 2nd Stage Time From Time Zero to Deployment Command Criteria Met) (msec)	Data Not Available
Pretensioner Deployment, Time to Fire, Driver (Driver Pretensioner Time From Time Zero to Deployment Loop #1 Command Criteria Met) (msec)	6
Pretensioner Deployment, Time to Fire, Right Front Passenger (Passenger Pretensioner Time From Time Zero to Deployment Loop #1 Command Criteria Met) (msec)	6
Pretensioner Deployment, Time to Fire, Driver (Driver Pretensioner Time From Time Zero to Deployment Loop #2 Command Criteria Met) (msec)	12
Pretensioner Deployment, Time to Fire, Right Front Passenger (Passenger Pretensioner Time From Time Zero to Deployment Loop #2 Command Criteria Met) (msec)	12
Side Air Bag Deployment, Time to Deploy, Driver (Driver Thorax Time From Time Zero to Deployment Command Criteria Met) (msec)	6
Side Air Bag Deployment, Time to Deploy, Right Front Passenger (Passenger Thorax Time From Time Zero to Deployment Command Criteria Met) (msec)	Data Not Available
Left Row 1 Curtain Time From Time Zero to Deployment Command Criteria Met (msec)	6
Right Row 1 Curtain Time From Time Zero to Deployment Command Criteria Met (msec)	6
Driver Center Inboard Loop Commanded	Yes
Driver Center Inboard Time From Time Zero to Deployment Loop Command Criteria Met (msec)	45



Longitudinal Delta-V (Record 1)

Time (msec)	Delta-V, Longitudinal (SDM Recorded Vehicle Longitudinal Velocity Change for FSR Event) (MPH [km/h])
10	0 [0]
20	0 [0]
30	-1 [-1]
40	-1 [-2]
50	-2 [-4]
60	-4 [-6]
70	-5 [-8]
80	-7 [-11]
90	-8 [-13]
100	-9 [-15]
110	-11 [-17]
120	-11 [-18]
130	-12 [-19]
140	-12 [-20]
150	-13 [-21]
160	-14 [-22]
170	-14 [-22]
180	-14 [-22]
190	-14 [-22]
200	-14 [-22]
210	-14 [-22]
220	-14 [-22]
230	-14 [-22]
240	-14 [-22]
250	-14 [-22]
260	-14 [-22]
270	-14 [-22]
280	-14 [-22]
290	-14 [-22]
300	-14 [-22]

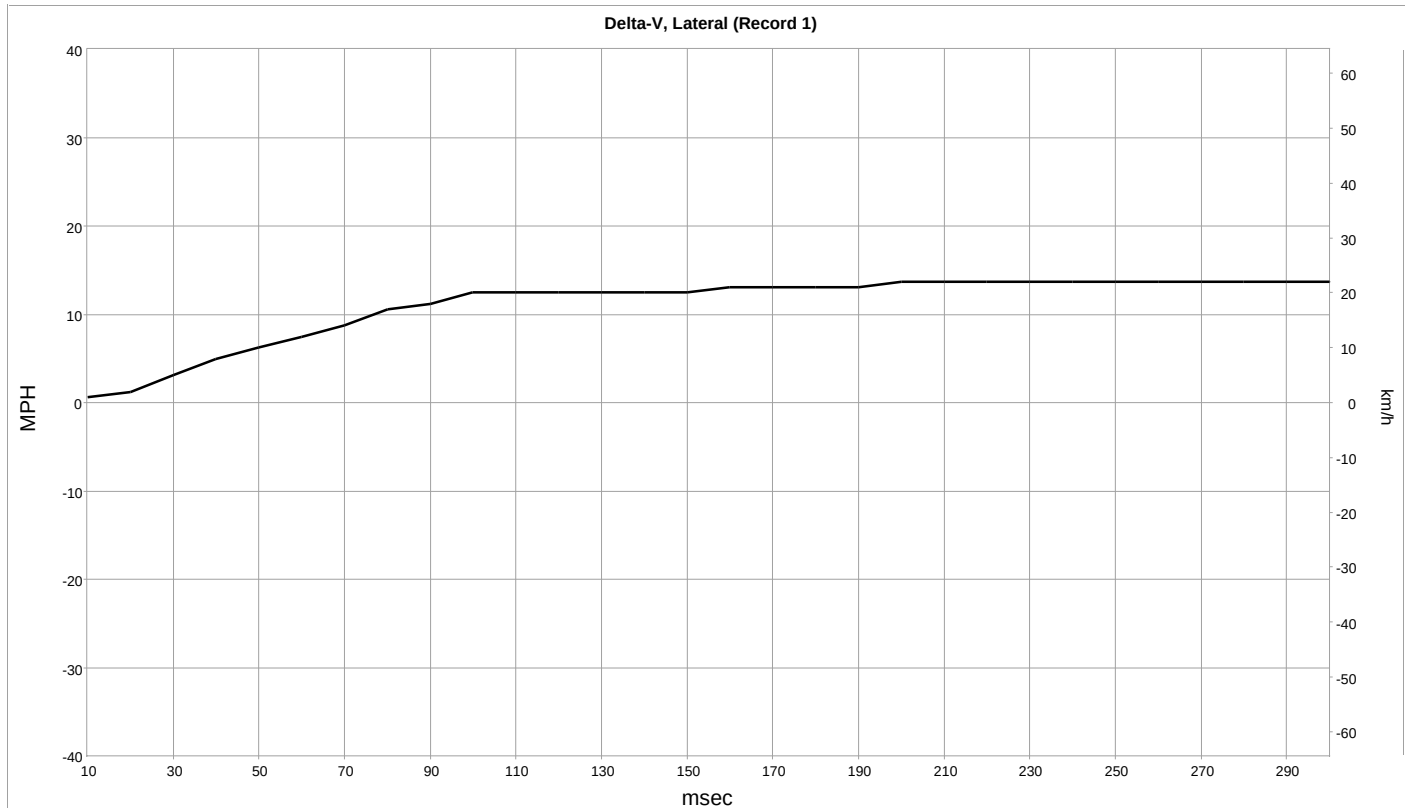


Longitudinal Acceleration (Record 1)

Time (msec)	Longitudinal Acceleration (SDM Recorded Vehicle Longitudinal Acceleration for FSR Event) (g)
2	0.25
4	0.25
6	-0.88
8	-0.25
10	-1.00
12	0.12
14	-0.38
16	0.37
18	0.87
20	-2.63
22	-4.50
24	-5.63
26	-0.50
28	0.50
30	-1.63
32	-2.63
34	-4.38
36	-3.25
38	-0.88
40	0.75
42	-3.00
44	-5.88
46	-13.25
48	-10.88
50	-6.88
52	0.00
54	-7.88
56	-3.13
58	-1.25
60	-1.75
62	-8.13
64	-5.50
66	-11.00
68	-7.13
70	-5.50
72	-2.75
74	-6.50
76	-11.75
78	-6.00
80	-7.13
82	-6.50
84	-10.25
86	-9.25
88	-5.63
90	-2.13
92	-9.00
94	-6.50
96	-3.50
98	-9.00
100	-6.63
102	-4.50
104	-4.75
106	-4.38
108	-2.13
110	-1.75
112	-3.75

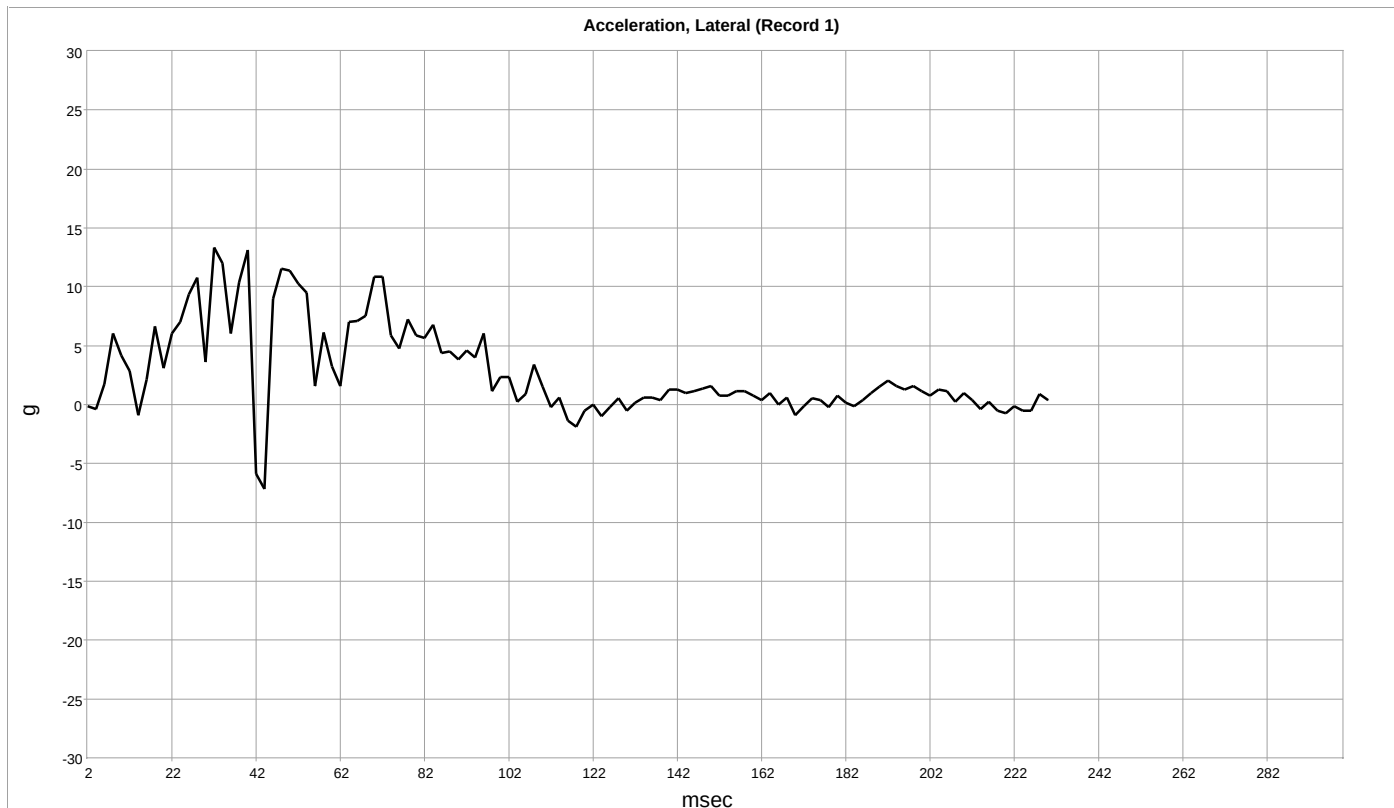
Time (msec)	Longitudinal Acceleration (SDM Recorded Vehicle Longitudinal Acceleration for FSR Event) (g)
114	-3.75
116	-2.38
118	-1.88
120	-3.13
122	-2.75
124	-4.25
126	-4.50
128	-3.88
130	-3.63
132	-4.25
134	-3.50
136	-3.75
138	-3.75
140	-3.38
142	-2.75
144	-2.13
146	-2.25
148	-2.00
150	-2.25
152	-2.00
154	-2.25
156	-1.75
158	-1.50
160	-1.63
162	-1.63
164	-1.75
166	-1.50
168	-1.13
170	-1.25
172	-0.75
174	-0.25
176	-0.63
178	-1.00
180	-0.75
182	-1.13
184	-1.00
186	-0.63
188	0.25
190	0.12
192	0.75
194	0.62
196	1.00
198	1.12
200	1.25
202	0.87
204	0.75
206	0.75
208	0.50
210	0.75
212	0.75
214	0.75
216	0.87
218	0.62
220	0.50
222	0.12
224	-0.13
226	0.00

Time (msec)	Longitudinal Acceleration (SDM Recorded Vehicle Longitudinal Acceleration for FSR Event) (g)
228	0.50
230	0.62
232	Data Not Available
234	Data Not Available
236	Data Not Available
238	Data Not Available
240	Data Not Available
242	Data Not Available
244	Data Not Available
246	Data Not Available
248	Data Not Available
250	Data Not Available
252	Data Not Available
254	Data Not Available
256	Data Not Available
258	Data Not Available
260	Data Not Available
262	Data Not Available
264	Data Not Available
266	Data Not Available
268	Data Not Available
270	Data Not Available
272	Data Not Available
274	Data Not Available
276	Data Not Available
278	Data Not Available
280	Data Not Available
282	Data Not Available
284	Data Not Available
286	Data Not Available
288	Data Not Available
290	Data Not Available
292	Data Not Available
294	Data Not Available
296	Data Not Available
298	Data Not Available
300	Data Not Available



Lateral Delta-V (Record 1)

Time (msec)	Delta-V, Lateral (SDM Recorded Vehicle Lateral Velocity Change for FSR Event) (MPH [km/h])
10	1 [1]
20	1 [2]
30	3 [5]
40	5 [8]
50	6 [10]
60	7 [12]
70	9 [14]
80	11 [17]
90	11 [18]
100	12 [20]
110	12 [20]
120	12 [20]
130	12 [20]
140	12 [20]
150	12 [20]
160	13 [21]
170	13 [21]
180	13 [21]
190	13 [21]
200	14 [22]
210	14 [22]
220	14 [22]
230	14 [22]
240	14 [22]
250	14 [22]
260	14 [22]
270	14 [22]
280	14 [22]
290	14 [22]
300	14 [22]



Lateral Acceleration (Record 1)

Time (msec)	Lateral Acceleration (SDM Recorded Vehicle Lateral Acceleration for FSR Event) (g)
2	-0.13
4	-0.38
6	1.75
8	6.00
10	4.12
12	2.87
14	-0.88
16	2.12
18	6.62
20	3.12
22	6.00
24	7.00
26	9.37
28	10.75
30	3.62
32	13.37
34	12.00
36	6.00
38	10.37
40	13.12
42	-5.88
44	-7.13
46	9.00
48	11.50
50	11.37
52	10.25
54	9.50
56	1.62
58	6.12
60	3.25
62	1.62
64	7.00
66	7.12
68	7.50
70	10.87
72	10.87
74	5.87
76	4.75
78	7.25
80	5.87
82	5.62
84	6.75
86	4.37
88	4.50
90	3.87
92	4.62
94	4.00
96	6.00
98	1.12
100	2.37
102	2.37
104	0.25
106	0.87
108	3.37
110	1.50
112	-0.25
114	0.62

Time (msec)	Lateral Acceleration (SDM Recorded Vehicle Lateral Acceleration for FSR Event) (g)
116	-1.38
118	-1.88
120	-0.50
122	0.00
124	-1.00
126	-0.25
128	0.50
130	-0.50
132	0.12
134	0.62
136	0.62
138	0.37
140	1.25
142	1.25
144	1.00
146	1.12
148	1.37
150	1.62
152	0.75
154	0.75
156	1.12
158	1.12
160	0.75
162	0.37
164	1.00
166	0.00
168	0.62
170	-0.88
172	-0.13
174	0.50
176	0.37
178	-0.25
180	0.75
182	0.12
184	-0.13
186	0.37
188	1.00
190	1.50
192	2.00
194	1.62
196	1.25
198	1.62
200	1.12
202	0.75
204	1.25
206	1.12
208	0.25
210	1.00
212	0.37
214	-0.38
216	0.25
218	-0.50
220	-0.75
222	-0.13
224	-0.50
226	-0.50
228	0.87
230	0.37

Time (msec)	Lateral Acceleration (SDM Recorded Vehicle Lateral Acceleration for FSR Event) (g)
232	Data Not Available
234	Data Not Available
236	Data Not Available
238	Data Not Available
240	Data Not Available
242	Data Not Available
244	Data Not Available
246	Data Not Available
248	Data Not Available
250	Data Not Available
252	Data Not Available
254	Data Not Available
256	Data Not Available
258	Data Not Available
260	Data Not Available
262	Data Not Available
264	Data Not Available
266	Data Not Available
268	Data Not Available
270	Data Not Available
272	Data Not Available
274	Data Not Available
276	Data Not Available
278	Data Not Available
280	Data Not Available
282	Data Not Available
284	Data Not Available
286	Data Not Available
288	Data Not Available
290	Data Not Available
292	Data Not Available
294	Data Not Available
296	Data Not Available
298	Data Not Available
300	Data Not Available

Roll Rate (Record 1)

Contains No Recorded Data

Acceleration, Lateral, Rollover (Record 1)

Contains No Recorded Data

Acceleration, Normal, Rollover (Record 1)

Contains No Recorded Data

Pre-Crash Data -5.0 to -0.5 sec (Record 1) - Table 1 of 2

Time (sec)	Service Brake (Brake Switch Circuit State)	Accelerator Pedal Position, % Full (Accelerator Pedal Position) (%)	Engine RPM (Engine Speed) (RPM)	Engine Throttle, % Full (Throttle Position) (%)	Speed, Vehicle Indicated (Vehicle Speed) (MPH [km/h])	System Power Mode Status	System Backup Power Mode Status
-5.0	On	0	512	10	2 [3]	Run	Run
-4.5	On	0	576	10	2 [3]	Run	Run
-4.0	Off	0	704	11	2 [3]	Run	Run
-3.5	Off	0	576	9	1 [2]	Run	Run
-3.0	Off	0	512	9	1 [1]	Run	Run
-2.5	Off	0	576	10	0 [0]	Run	Run
-2.0	Off	0	576	10	0 [0]	Run	Run
-1.5	Off	0	576	9	0 [0]	Run	Run
-1.0	Off	48	1,216	35	1 [1]	Run	Run
-0.5	Off	21	1,792	32	4 [7]	Run	Run

Pre-Crash Data -5.0 to -0.5 sec (Record 1) - Table 2 of 2

Time (sec)	System Backup Power Mode Enabled	CommEnable Status	SDM Power Mode Status	Ignition Prolongation Timer (seconds)
-5.0	No	Active	Run	0.0
-4.5	No	Active	Run	0.0
-4.0	No	Active	Run	0.0
-3.5	No	Active	Run	0.0
-3.0	No	Active	Run	0.0
-2.5	No	Active	Run	0.0
-2.0	No	Active	Run	0.0
-1.5	No	Active	Run	0.0
-1.0	No	Active	Run	0.0
-0.5	No	Active	Run	0.0

Pre-Crash Data -2.0 to -0.5 sec (Record 1)

Time (sec)	Cruise Control Active	Cruise Control Resume Switch Active	Cruise Control Set Switch Active	Reduced Engine Power Mode Indicator	Engine Torque (N-m)
-2.0	No	No	No	Off	9
-1.5	No	No	No	Off	13
-1.0	No	No	No	Off	321
-0.5	No	No	No	Off	235

Hexadecimal Data

DPID \$11
FF 4F 00 00 3F 8E 41

DPID \$15
01 02 03 04 05 06 07

DPID \$16
08 09 0A 0D 0E 00 00

DPID \$17
22 00 00 00 00 00 00

DPID \$1F
01 01 02 02 00 00 00

DPID \$20
00 00 00 00 00 00 00

DPID \$30
00 FF 00 00 00 00 00

DPID \$32
00 FF 2B F0 00 00 00

DPID \$51
0B 00 00 00 00 00 00

DID \$01
41 55 38 32 36 34 44 41 30 30 30 30 30 30 30 30

DID \$02
00 CE 45 B8

DID \$03
41 54 38 32 36 34 44 41 30 30 30 30 30 30 30 30

DID \$04
00 CE 45 B8

DID \$05
41 48 39 34 32 31 44 41 30 30 30 30 30 30 30 30

DID \$06
00 CE 4A 3D

DID \$07
41 4A 39 34 32 31 44 41 30 30 30 30 30 30 30 30

DID \$08
00 CE 4A 3D

DID \$09
44 41 31 30 31 30 44 41 30 30 30 30 30 30 30 30

DID \$0A
01 96 F7 A2

DID \$0B
44 42 31 30 31 30 44 41 30 30 30 30 30 30 30 30

DID \$0C

01 96 F7 A2

DID \$0D

00 00 30 30 30 30 44 41 30 30 30 30 30 30 30

DID \$0E

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DID \$22

41 38

DID \$30

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0610	18	80	63	80	0B	80	95	80	4A	80
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1490	07	A5	FF	06	00	06	00	02	08	A5
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1950 35 00 15 00 19 00 24 00 30 00
1960 2D 00 38 00 04 00 4B 00 FC FF
1970 56 00 0D 00 1D 00 0E A5 FF FF
1980 15 00 6B 00 23 00 60 00 1A 00
1990 30 00 07 00 53 00 FA FF 69 00
2000 18 00 D1 FF 2F 00 C7 FF 6A 00
2010 48 00 57 00 5C 00 37 00 5B 00
2020 00 00 52 00 3F 00 4C 00 19 00
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DID \$32

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0080	FF	FF	FF	FF	FF	FF	FF	FF	FF	FF	FF	FF	FF	FF	FF
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0020	FF	FF	FF	FF	FF	FF	FF	FF	FF
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2500	FF	FF	FF	FF	FF	FF	FF	FF	FF
2510	FF	FF	FF	FF	FF	FF	FF	FF	FF
2520	FF	FF	FF	FF	FF	FF	FF	FF	FF
2530	FF	FF	FF	FF	FF	FF	FF	FF	FF
2540	FF	FF	FF	FF	FF	FF	FF	FF	FF
2550	FF	FF	FF	FF	FF	FF	FF	FF	FF
2560	FF	FF	FF	FF	FF	FF	FF	FF	FF
2570	FF	FF	FF	FF	FF	FF	FF	FF	FF
2580	FF	FF	FF	FF	FF	FF	FF	FF	FF
2590	FF	FF	FF	FF	FF	FF	FF	FF	FF
2600	FF	FF	FF	FF	FF	FF	FF	FF	FF
2610	FF	FF	FF	FF	FF	FF	FF	FF	FF
2620	FF	FF	FF	FF	FF	FF	FF	FF	FF
2630	FF	FF	FF	FF	FF	FF	FF	FF	FF
2640	FF	FF	FF	FF	FF	FF	FF	FF	FF
2650	FF	FF	FF	FF	FF	FF	FF	FF	FF
2660	FF	FF	FF	FF	FF	FF	FF	FF	FF
2670	FF	FF	FF	FF	FF	FF	FF	FF	FF
2680	FF	FF	FF	FF	FF	FF	FF	FF	FF
2690	FF	FF	FF	FF	FF	FF	FF	FF	FF
2700	FF	FF	FF	FF	FF	FF	FF	FF	FF
2710	FF	FF	FF	FF	FF	FF	FF	FF	FF
2720	FF	FF	FF	FF	FF	FF	FF	FF	FF
2730	FF	FF	FF	FF	FF	FF	FF	FF	FF
2740	FF	FF	FF	FF	FF	FF	FF	FF	FF
2750	FF	FF	FF	FF	FF	FF	FF	FF	FF
2760	FF	FF	FF	FF	FF	FF	FF	FF	FF
2770	FF	FF	FF	FF	FF	FF	FF	FF	FF
2780	FF	FF	FF	FF	FF	FF	FF	FF	FF
2790	FF	FF	FF	FF	FF	FF	FF	FF	FF

DID \$34

0000 FF FF FF FF FF FF FF FF FF FF

0010	FF	FF	FF	FF	FF	FF	FF	FF	FF
0020	FF	FF	FF	FF	FF	FF	FF	FF	FF
0030	FF	FF	FF	FF	FF	FF	FF	FF	FF
0040	FF	FF	FF	FF	FF	FF	FF	FF	FF
0050	FF	FF	FF	FF	FF	FF	FF	FF	FF
0060	FF	FF	FF	FF	FF	FF	FF	FF	FF
0070	FF	FF	FF	FF	FF	FF	FF	FF	FF
0080	FF	FF	FF	FF	FF	FF	FF	FF	FF
0090	FF	FF	FF	FF	FF	FF	FF	FF	FF
0100	FF	FF	FF	FF	FF	FF	FF	FF	FF
0110	FF	FF	FF	FF	FF	FF	FF	FF	FF
0120	FF	FF	FF	FF	FF	FF	FF	FF	FF
0130	FF	FF	FF	FF	FF	FF	FF	FF	FF
0140	FF	FF	FF	FF	FF	FF	FF	FF	FF
0150	FF	FF	FF	FF	FF	FF	FF	FF	FF
0160	FF	FF	FF	FF	FF	FF	FF	FF	FF
0170	FF	FF	FF	FF	FF	FF	FF	FF	FF
0180	FF	FF	FF	FF	FF	FF	FF	FF	FF
0190	FF	FF	FF	FF	FF	FF	FF	FF	FF
0200	FF	FF	FF	FF	FF	FF	FF	FF	FF
0210	FF	FF	FF	FF	FF	FF	FF	FF	FF
0220	FF	FF	FF	FF	FF	FF	FF	FF	FF
0230	FF	FF	FF	FF	FF	FF	FF	FF	FF
0240	FF	FF	FF	FF	FF	FF	FF	FF	FF
0250	FF	FF	FF	FF	FF	FF	FF	FF	FF
0260	FF	FF	FF	FF	FF	FF	FF	FF	FF
0270	FF	FF	FF	FF	FF	FF	FF	FF	FF
0280	FF	FF	FF	FF	FF	FF	FF	FF	FF
0290	FF	FF	FF	FF	FF	FF	FF	FF	FF
0300	FF	FF	FF	FF	FF	FF	FF	FF	FF
0310	FF	FF	FF	FF	FF	FF	FF	FF	FF
0320	FF	FF	FF	FF	FF	FF	FF	FF	FF
0330	FF	FF	FF	FF	FF	FF	FF	FF	FF
0340	FF	FF	FF	FF	FF	FF	FF	FF	FF
0350	FF	FF	FF	FF	FF	FF	FF	FF	FF
0360	FF	FF	FF	FF	FF	FF	FF	FF	FF
0370	FF	FF	FF	FF	FF	FF	FF	FF	FF
0380	FF	FF	FF	FF	FF	FF	FF	FF	FF
0390	FF	FF	FF	FF	FF	FF	FF	FF	FF
0400	FF	FF	FF	FF	FF	FF	FF	FF	FF
0410	FF	FF	FF	FF	FF	FF	FF	FF	FF
0420	FF	FF	FF	FF	FF	FF	FF	FF	FF
0430	FF	FF	FF	FF	FF	FF	FF	FF	FF
0440	FF	FF	FF	FF	FF	FF	FF	FF	FF
0450	FF	FF	FF	FF	FF	FF	FF	FF	FF
0460	FF	FF	FF	FF	FF	FF	FF	FF	FF
0470	FF	FF	FF	FF	FF	FF	FF	FF	FF
0480	FF	FF	FF	FF	FF	FF	FF	FF	FF
0490	FF	FF	FF	FF	FF	FF	FF	FF	FF
0500	FF	FF	FF	FF	FF	FF	FF	FF	FF
0510	FF	FF	FF	FF	FF	FF	FF	FF	FF
0520	FF	FF	FF	FF	FF	FF	FF	FF	FF
0530	FF	FF	FF	FF	FF	FF	FF	FF	FF
0540	FF	FF	FF	FF	FF	FF	FF	FF	FF
0550	FF	FF	FF	FF	FF	FF	FF	FF	FF

DID \$35

0000	FF	FF	FF	FF	FF	FF	FF	FF	FF
0010	FF	FF	FF	FF	FF	FF	FF	FF	FF
0020	FF	FF	FF	FF	FF	FF	FF	FF	FF
0030	FF	FF	FF	FF	FF	FF	FF	FF	FF
0040	FF	FF	FF	FF	FF	FF	FF	FF	FF
0050	FF	FF	FF	FF	FF	FF	FF	FF	FF
0060	FF	FF	FF	FF	FF	FF	FF	FF	FF
0070	FF	FF	FF	FF	FF	FF	FF	FF	FF
0080	FF	FF	FF	FF	FF	FF	FF	FF	FF
0090	FF	FF	FF	FF	FF	FF	FF	FF	FF



DID \$B3

38 31 31 38 33 39 33 33 36

DID \$B4

56 31 31 38 32 30 32 31 35 31 30 30 37 33 37 39

DID \$B7

50 AA 21 F0 7B

DID \$C1

00 CE 5F 80

DID \$C2

05 05 9D BA

DID \$C3

02 89 A3 F8

DID \$CB

00 CE 5D 00

PID \$CC00

CE 5D 1A

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December 2024



U.S. Department
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**National Highway
Traffic Safety
Administration**



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