



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



DOT HS 812 769

July 2019

Special Crash Investigations On-Site Air Bag Non- Deployment Crash Investigation

**Vehicle: 2015 Chevrolet
Camaro**

Location: California

Crash Date: July 2017

Disclaimer

This publication is distributed by the U.S. Department of Transportation, National Highway Traffic Safety Administration, in the interest of information exchange. The opinions, findings, and conclusions expressed in this publication are those of the authors and not necessarily those of the Department of Transportation or the National Highway Traffic Safety Administration. The United States Government assumes no liability for its contents or use thereof. If trade or manufacturers' names or products are mentioned, it is because they are considered essential to the object of the publication and should not be construed as an endorsement. The United States Government does not endorse products or manufacturers.

Suggested APA Format Citation:

Dynamic Science, Inc. (2019 July). *Special Crash Investigations; On-Site Air Bag Non-Deployment Crash Investigation; Vehicle: 2015 Chevrolet Camaro; Location: California; Crash Date: July 2017* (Report No. DOT HS 812 769). Washington, DC: National Highway Traffic Safety Administration.

Technical Report Documentation Page

1. Report No. DOT HS 812 769	2. Government Accession No.	3. Recipient's Catalog No.	
4. Title and Subtitle Special Crash Investigations; On-Site Air Bag Non-Deployment Crash Investigation; Vehicle: 2015 Chevrolet Camaro; Location: California; Crash Date: July 2017		5. Report Date July 2019	
		6. Performing Organization Code	
7. Author Dynamic Science, Inc.		8. Performing Organization Report No. Case No. DS17013	
9. Performing Organization Name and Address Dynamic Science, Inc. 299 West Cerritos Avenue Anaheim, CA 92805		10. Work Unit No. (TRAIS)	
		11. Contract or Grant No. DTNH22-12-C00271	
12. Sponsoring Agency Name and Address National Highway Traffic Safety Administration 1200 New Jersey Ave, SE Washington, DC 20590		13. Type of Report and Period Covered Technical Report Crash Date: June 2017	
		14. Sponsoring Agency Code	
15. Supplementary Notes This report documents the on-site investigation of the alleged non-deployment of the driver's air bags in a 2015 Chevrolet Camaro involved in a crash and the injuries sustained by the driver. 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.			
16. Abstract A notification stated the driver's air bags did not deploy while front right occupant's air bags did deploy. The SCI inspection revealed the driver's frontal and IC air bags did deploy and the vehicle's EDR report indicated both air bags deployed during the crash. This single-vehicle rollover crash occurred at night on a westbound interstate highway in the state of California during June 2017. The Chevrolet was being driven by a belted 20-year-old male. A belted 18-year-old female occupant was seated in the front right position. According to the interviewee, the driver of the Chevrolet was street-racing another vehicle prior to the crash. The driver of the Chevrolet lost control of the vehicle and it departed the roadway on the right edge and overturned while traveling down an embankment, causing damage to all planes. Following the crash, the driver was transported to a local hospital, where he died four days later as a result of his injuries. The front right occupant was transported to a local hospital, treated for minor injuries, and released. The Chevrolet was towed due to damage.			
17. Key Words air bag, non-deployment, deployment, injury, fatality, rollover		18. Distribution Statement Document is available to the public from the National Technical Information Service, www.ntis.gov .	
19 Security Classif. (of this report) Unclassified	20. Security Classif. (of this page) Unclassified	21 No. of Pages 67	22. Price

Form DOT F 1700.7 (8-72)

Reproduction of completed page authorized

Table of Contents

BACKGROUND	1
SUMMARY	2
Crash Site	2
Pre-Crash.....	2
Crash	3
Post-Crash	4
2015 CHEVROLET CAMARO.....	4
Description	4
Exterior Damage.....	5
Event Data Recorder.....	6
Interior Damage.....	6
Manual Restraint Systems.....	7
Supplemental Restraint Systems	7
NHTSA Recalls and Investigations	8
Rollover Mitigation	9
2015 CHEVROLET CAMARO OCCUPANTS.....	10
Driver Demographics.....	10
Driver Injuries	10
Driver Kinematics	12
Front Right Occupant Demographics	12
Front Right Occupant Injuries.....	13
Front Right Occupant Kinematics	13
CRASH DIAGRAMS.....	14
APPENDIX A: Event Data Recorder Report 2015 Chevrolet Camaro.....	A-1

Special Crash Investigations
On-Site Air Bag Non-Deployment Crash Investigation
Case Number: DS17013
Vehicle: 2015 Chevrolet Camaro
Location: California
Crash Date: July 2017

BACKGROUND

This report documents the on-site investigation of the alleged non-deployment of the driver's air bags and the injuries sustained by the driver of a 2015 Chevrolet Camaro (**Figure 1**) that was involved in a single-vehicle rollover crash. This case was initiated in response to a notification sent to the National Highway Traffic Safety Administration. The Special Crash Investigations (SCI) group assigned the case to Dynamic Science, Inc., in August 2017. The notification stated that the vehicle sustained significant damage to the front end and the air bags on the driver's side did not deploy while air bag deployment did occur on the passenger's side of the vehicle.



Figure 1. 2015 Chevrolet Camaro

The inspection revealed the frontal air bag did deploy at the driver seat position from the steering wheel hub and the left inflatable curtain (IC) air bag did deploy from the roof side rail. The investigation was intended to determine occupant restraint usage, kinematics, injury sources, and air bag deployment parameters for this vehicle. The Chevrolet was located at the home of the registered owner where the vehicle inspection was completed in August 2017. It was supported by the Bosch Crash Data Retrieval (CDR) system and the vehicle's event data recorder (EDR) was imaged during the inspection. The EDR report indicated the driver's frontal and side air bags deployed during the first event, which was a frontal impact. The passenger's frontal air bag, IC air bag, and seat-mounted side air bag also deployed during the crash. During the interview, the contact who submitted the notification clarified her belief that the driver's frontal air bag deployed late in the crash sequence sometime after the initial frontal impact, causing the driver to strike the steering wheel resulting in severe injuries to the face and head.

This single-vehicle rollover crash occurred at approximately 2330 hours on a westbound interstate highway in California during June 2017. The Chevrolet was being driven by a belted 20-year-old male. A belted 18-year-old female occupant was seated in the front right position. According to the interviewee, the driver of the Chevrolet was street-racing another vehicle. The driver of the Chevrolet lost control of the vehicle, it departed the roadway on the right edge, and overturned while traveling down an embankment. The vehicle sustained damage to all planes.

The driver of the vehicle was transported to a local hospital where he died 4 days later as a result of his injuries. The front right occupant was transported to a local hospital and treated for minor injuries. The Chevrolet was towed due to damage and later removed by the registered owner.

SUMMARY

Crash Site

The crash site was the westbound lanes of a three-lane divided interstate highway in California (**Figure 2**). The concrete roadway was straight, level, and dry. The three travel lanes measured 3.6 m (12.0 ft) wide and were separated by dashed white lines. The roadway was bordered on the right by a white fog line, an asphalt shoulder, and a descending embankment. It was bordered on the left by a yellow fog line, an asphalt shoulder, an unpaved median, and a guardrail. The posted speed limit was 113 km/h (70 mph). Conditions were dark with illumination, clear and dry. Crash diagrams are included at the end of this technical report.



Figure 2. Crash site looking west



Figure 3. Crash site looking west, yaw marks indicate area of departure

Pre-Crash

The Chevrolet was traveling westbound in the third lane from the right at an EDR-reported vehicle speed of 199.0 km/h (134.0 mph) at -4.0 seconds to algorithm enable (AE). The interviewee said the driver was street-racing another vehicle.

Accelerator pedal position and engine throttle were 99 percent “Full,” the service brake was “Off,” engine rpm was 6,400, , and cruise control was “Off.” At some point prior to impact, the driver attempted to pass a non-contact vehicle traveling directly ahead of the Chevrolet. He steered left, departing the roadway on the left edge, and traveled parallel to the roadway with the vehicle’s left tires on the dirt median and the right tires on the paved shoulder. Tire yaw marks beginning on the paved shoulder suggested the driver lost control of the vehicle prior to returning to the roadway. The driver braked at -3.0 seconds and again at -2.0 seconds to AE. The Chevrolet then traveled to the right, crossing all lanes of the roadway and depositing three yaw marks while rotating clockwise (**Figure 3**). It departed the roadway on the right edge and traveled down a descending embankment with an estimated slope of -8.0 percent. EDR-reported vehicle-indicated speeds at -2.5 seconds and -1.0 second were used to calculate the distance traveled in the yaw as 41 m (135 ft). During the final 1.0 second prior to impact, the vehicle was airborne. The pre-crash distance traveled is shown in the table on the following page.

Time	Vehicle Speed		Distance Traveled			
			Incremental		Cumulative	
-sec	km/h	mph	m	ft	m	ft
5	196	122	NA	NA	NA	NA
4.5	200	124	27.5	90.2	27.5	90.2
4	216	134	28.8	94.6	56.3	184.8
3.5	198	123	28.7	94.2	85	279
3	161	100	24.9	81.8	110	360.8
2.5	119	74	19.4	63.8	129.4	424.6
2	93	58	14.8	48.4	144.2	473
1.5	84	52	12.3	40.3	156.5	513.3
1	79	49	11.3	37	167.7	550.3
0.5	68	42	10.2	33.4	177.9	583.7

The vehicle's EDR-reported pre-crash driver input status at Time 0.0 seconds is stated in the table below:

Time (sec) -0.5 at Event	Accelerator Pedal (%)	Service Brake Activation	Engine rpm	Engine Throttle (%)	Speed, Vehicle Indicated (mph [km/h])
First Record	0	OFF	1,984	12	42 (67)

Crash

After going airborne the Chevrolet's front plane struck the ground of the descending embankment in a non-horizontal configuration (Event 1). The EDR report indicated a frontal event with a maximum longitudinal delta-V of -44 km/h (-27 mph) and maximum lateral delta-V of 11 km/h (7 mph). The driver's frontal air bag Time to 1st Stage Deployment was 58 milliseconds (ms) and the Time to 2nd Stage Deployment was 71 ms. The left inflatable curtain (IC) air bag Time to Deploy was 71 ms and the driver's seat belt pretensioner Time to Fire was 58 ms. Air bag deployments and times were identical on the front right passenger's side of the vehicle. The non-horizontal impact precluded a WinSMASH reconstruction.

The Chevrolet initiated a post-impact trip-over rollover, left side leading (Event 2). The EDR reported this as a rollover occurring 0.11 seconds after the prior event. It was identified as a deployment-level event but no air bag deployments or times were documented in this EDR record. The vehicle rolled downhill in a counterclockwise rotation along its longitudinal axis for a total of four quarter-turns. Scene evidence indicated a probable minimal roll distance of 15.0 m (49 ft).

At the base of the descending embankment the vehicle's right plane struck a concrete drainage culvert (Event 3), triggering the deployment of the front right occupant's seat-mounted side impact air bag at 0 ms. The EDR reported a third deployment event occurring 0.55 seconds after the prior event with maximum longitudinal and lateral delta-V's of 44 km/h (27 mph) and -32 km/h (-20 mph). The driver's seat-mounted side impact air bag was not commanded to deploy during this event.

The vehicle continued in a forward trajectory, striking and traveling through a chain-link fence (Event 4) in a non-deployment event. The Chevrolet came to rest near the fence upright and facing an unknown direction on level ground.

Post-Crash

Following the crash, the driver was unconscious and both doors were jammed shut. Responders forced open the driver's door and removed him from the vehicle due to his perceived serious injuries. The front right occupant was assisted from the vehicle through the same door. Both occupants were transported by ambulance to a local hospital. The driver was removed from life support four days after the crash and declared deceased. The front right occupant was treated and released the night of the crash. The Chevrolet was towed on orders of police and removed two days later by the registered owner to her residence.

2015 CHEVROLET CAMARO

Description

The 2015 Chevrolet Camaro was a two-door coupe identified by the Vehicle Identification Number 2G1FJ1EW8F9xxxxxx. The vehicle was manufactured in June 2015 and the owner-estimated mileage was 51,500 km (32,000 mi). It was configured with an 8-cylinder, 6.2-liter, gasoline engine, with manual transmission and rear-wheel drive. Standard equipment included daytime running lights, tilt steering, and antilock brakes. Optional equipment included a power moon roof. The vehicle manufacturer recommended 285/35ZR20 tires for the front and rear. The vehicle was equipped with Falken Azenis FK493CC tires size 275/40R20 on the front and size 295/40R20 on the rear manufactured in April 2016. The specific tire data is in the table below.

Position	Measured Tread Depth	Restricted	Damage
LF	5 mm (6/32in.)	No	Cut, de-beaded and flat, wheel and tire off vehicle
LR	2 mm (2/32in.)	No	De-beaded and flat
RR	2 mm (2/32in.)	No	De-beaded and flat
RF	5 mm (6/32in.)	Yes	None

The Chevrolet was configured with seating for four occupants. The front row was equipped with bucket seats with integral head restraints. Both front seats were adjusted to the middle track position with the seat backs slightly reclined.

Exterior Damage

The Chevrolet sustained moderate severity front plane damage from the non-horizontal impact with the ground (**Figure 4**). The front bumper fascia and backing bar were displaced from the vehicle. A fractured section of fascia measuring 64 cm (23.2 in.) was missing. The backing bar was repositioned for the purpose of obtaining crush measurements during the inspection. The direct damage and Field L extended from bumper corner to bumper corner and measured 180 cm (70.9 in.). Thirteen measurements were taken at bumper level by the Nikon Total Station and the Faro Blitz program computed crush measurement in six increments, as follows: C1 = 18 cm (7.1 in.), C2 = 16 cm (6.3 in.), C3 = 15 cm (5.9 in.), C4 = 12 cm (4.7 in.), C5 = 7 cm (2.8 in.), C6 = 3 cm (1.2 in.). The principal direction of force was calculated at 340 degrees. Both frame rails were shifted 15 cm (5.9 in.) to the right. The Collision Deformation Classification (CDC) for the Chevrolet in Event 1 was 00FDEW1.



Figure 4. Front plane crush measurement, 2015 Chevrolet Camaro



Figure 5. Rollover measurements, 2015 Chevrolet Camaro

The Chevrolet sustained moderate severity damage to the top plane during the rollover event (**Figure 5**). Direct damage was distributed laterally from roof side rail to roof side rail and measured 124 cm (48.8 in.) in width. Direct damage was distributed longitudinally beginning at the leading edge of the hood and extending to the trunk lid. Maximum vertical crush was located on the left roof at 40 cm (15.7 in.) forward of the rear axle and measured 15 cm (5.9 in.). Maximum lateral crush was documented at the same location and measured 22 cm (8.6 in.). The CDC for the rollover event was 00TDDO3.

The Chevrolet sustained estimated moderate severity damage to the right plane from the impact with the culvert. The sheet metal sustained crush damage from bumper corner to bumper corner and the right rear wheel was canted outboard of the wheel well. This was a non-horizontal impact and the CDC for this impact was 00RDEW2.

The vehicle sustained masked damage at the impact with the chain link fence. The fence yielded as the vehicle traveled through it displacing the fence and posts. The CDC for this event was 9999999.

Event Data Recorder

The Chevrolet's EDR was imaged during the vehicle inspection using the data link connector interface with power supplied by a jump box connected to the vehicle's service battery. The EDR was imaged using Bosch CDR Tool version 17.4 and reported using version 18.0.2. The complete EDR report is included in this report as Appendix A.

The EDR report captured three records. Record 1 was a deployment level frontal impact with an embankment during which the driver's and passenger's frontal air bags deployed in two stages (58 ms and 71 ms, respectively), their seat belt pretensioners actuated (58 ms) and both IC air bags deployed (71 ms). This record suggested the alleged air bag non deployment claim by the vehicle owner was unfounded.

Record 2 was a deployment level rollover event occurring 0.11 seconds after the first event. The IC air bags had deployed in the prior event so there were no deployments in this event. The EDR indicated a negative sign notation roll rate in the crash pulse data indicated the vehicle rolled in a counterclockwise (right to left) rotation.

Record 3 was a deployment level right side impact occurring 0.55 seconds after the prior event during which the front right occupant's seat-mounted side impact air bag deployed at 0 ms. According to the vehicle owner's manual, the seat-mounted side air bags were designed to deploy on the side of the vehicle that is struck. Given those parameters, there was no evidence to suggest the driver's seat-mounted side impact air bag should have deployed. The EDR data suggested the vehicle's air bags deployed as intended by the manufacturer.

Interior Damage

The Chevrolet's interior sustained damage resulting from impact forces, air bag deployments and occupant contacts. Both doors were jammed shut and the driver's side door was later forced open. The windshield was fractured, the roof glass was displaced, the backlight and right front glazing was disintegrated. Five air bags deployed and two seat belt pretensioners actuated.

Both seat belts revealed evidence of occupant contact. Both rows of the interior were reduced by vertical and lateral intrusion. The front row was reduced by intrusion in order of the magnitude as follows: middle roof 9 cm (3.5 in.), middle windshield header 5 cm (2.0 in.), left roof side rail 3 cm (1.2 in.). The front row was reduced by vertical intrusion as follows: left front door/rear upper quadrant 3 cm (1.2 in.). The second row was reduced by vertical intrusion as follows: left roof 19 cm (7.5 in.) and left backlight header 7 cm (3.1 in.). The second row was reduced by lateral intrusion of the left side panel rear of B-pillar 20 cm (7.8 in.).

Manual Restraint Systems

The front row was equipped with driver and front right passenger lap and shoulder seat belts. The driver's belt was equipped with continuous loop belt webbing, a sliding latch plate, emergency locking retractor, and a non-adjustable D-ring. The front right occupant's belt was configured similarly with the addition of a switchable ELR/automatic locking retractor. The front row belts were equipped with retractor-mounted seat belt pretensioners which were configured to actuate during moderate-to-severe front, side and rear crashes, as well as rollover crashes. Both front row belts were commanded to actuate at 58 ms of the Event 1 impact.

Both belt components including the webbing and latch plates revealed evidence of historical usage. The driver was belted at the time of the crash. The EDR report indicated the seat belt was buckled. The latch plate revealed evidence of loading on the plastic and the belt revealed scuff marks at 27 cm (10.6 in.) above the stop button.

The front right occupant was belted at the time of the crash. The seat belt was reported as being buckled in the EDR report. The latch plate revealed scuff marks on the plastic and the belt was scuffed at 12 cm (4.7 in.) above the stop button.

Supplemental Restraint Systems

The Chevrolet's supplemental restraint systems included a restraint control module, driver and front passenger frontal air bags, seat-mounted front row side impact air bags, and front and second row combination side impact/roll-sensing IC air bags. The owner of the vehicle stated the air bags were original and had never been serviced. According to the vehicle owner's manual, the seat-mounted side impact air bags are configured to deploy only on the side of the vehicle that is struck. Both IC air bags will deploy in the event of a severe frontal impact, an impact to either side of the vehicle or if the system senses a rollover situation.

In this crash, both frontal and IC air bags deployed during Event 1. The frontal air bags deployed the 1st stage at 58 ms and the 2nd stage at 71 ms. The IC air bags deployed at 71 ms and the seat belt pretensioners actuated at 58 ms. The front right passenger's seat-mounted air bag deployed at 0 ms during Event 3 and the driver's seat-mounted side air bag did not deploy.

The driver's frontal air bag deployed from the steering wheel hub (**Figures 6 and 7**). The air bag measured 57 cm (22.4 in.) in diameter and was configured with vent ports and tethers. The air bag and cover flaps were unremarkable. The notification stated this air bag did not deploy. During the interview the owner clarified the



Figure 6. Driver's deployed frontal air bag, front panel, 2015 Chevrolet Camaro

statement to indicate the driver's frontal air bag deployed late in the crash sequence and not at the time of the frontal impact. The EDR report indicated this air bag deployed both stages in the 1st Event at times 58 ms and 71 ms, respectively. The investigation has revealed no evidence to indicate otherwise. The steering wheel and cover flaps revealed no evidence of occupant contact.

The passenger's frontal air bag deployed from the top instrument panel. The front panel measured 40 cm (15.7 in.) wide and 50 cm (19.7 in.) long. It was configured with vent ports. This air bag revealed a ragged hole in the front panel measuring 3 cm (1.2 in.) in diameter (**Figure 8**). The source of this damage was unknown. The center region of the front panel exhibited a few striation marks. It was otherwise unremarkable.

The left IC air bag deployed from the roof side rails above the front and second rows. It measured 160 cm (63.3 in.) in width and 44 cm (17.3 in.) in length. In its deflated state the lower edge hung 18 cm (7.0 in.) below the bottom edge of the side glass. This air bag was configured without tethers and the leading edge attached directly to the left A-pillar. It covered the front and rear side glass entirely. The inner side of the air bag revealed a few drops of blood in the area above the left door armrest. No damage was documented.

The right IC air bag deployed from the roof side rail above the front and second rows. It was configured similar to the left IC air bag and was unremarkable.

The right seat-mounted air bag deployed from the outer aspect of the front right passenger's seat back. It measured 50 cm (19.7 in.) long and 20 cm (7.9 in.) wide. This air bag revealed no evidence of contact or damage.

NHTSA Recalls and Investigations

A VIN search on safercar.gov revealed no recalls for the Chevrolet. A Year/Make/Model search on the website revealed one potential air-bag-related recall for certain vehicles as outlined in the table below. The recall indicated the seat-mounted side air bag modules may rupture during



Figure 7. Driver's deployed frontal air bag, back panel, 2015 Chevrolet Camaro



Figure 8. Front right passenger's deployed frontal air bag, hole in front panel, 2015 Chevrolet Camaro

Deployment.¹ The vehicle owner indicated no recall notices were sent regarding the air bags. It is unknown whether the Chevrolet involved in this crash was subject to the recall. No NHTSA investigations were found for this vehicle.

NHTSA Campaign Number	Components	Potential Number of Units Affected
15V666000	Air Bags	395

Rollover Mitigation

According to the website safercar.gov, the Chevrolet had a 5-star (out of a possible 5) safety rating for rollover crashes. The vehicle was determined to have an 8.70 percent rollover resistance, meaning it had a relatively low probability of rolling in a single-vehicle crash. It was configured with the following equipment designed to mitigate the chance of rollover: traction control, to limit wheel spin; electronic stability control (ESC), to assist with directional control in difficult driving conditions; tire pressure monitoring system, to help maintain recommended tire pressure; antilock brake system to improve vehicle stability on hard stops; and brake assist, to assist the driver in stopping the vehicle in emergency driving conditions. In this crash, the driver was operating at an EDR-reported pre-crash speed of 199 km/h (134 mph). The driver began braking, likely engaging the vehicle's traction control, ESC and brake assist. The vehicle initiated a clockwise yaw and departed the roadway, which launched the vehicle into an airborne trajectory over a steep, descending embankment. The vehicle's front plane struck the ground causing a trip-over type rollover left-side-leading along its horizontal axis. The dynamics of the free-falling trajectory and non-horizontal impact superseded the rollover mitigation technology on this vehicle because it was not tracking. The vehicle continued to roll down the embankment impacting the concrete culvert and fence in its roll path. Following four quarter-turns the vehicle came to rest in an upright orientation on level ground. Scene evidence indicated a probable minimal roll distance of 15 m (49 ft).

¹ In the event of a crash necessitating deployment of one or both of the side impact air bags, the air bag's inflator may rupture and the air bag may not properly inflate. The rupture could cause metal fragments to strike the vehicle occupants, potentially resulting in serious injury or death. Additionally, if the air bag does not properly inflate, the driver or passenger is at an increased risk of injury.

2015 CHEVROLET CAMARO OCCUPANTS

Driver Demographics

Age/Sex: 20 years/male
 Height: 178 cm (70 in.)
 Weight: 73 kg (160 lb)
 Eyewear: None
 Seat type: Bucket
 Seat track position: Middle-rearward
 Manual restraint usage: Lap and shoulder seat belt
 Usage source: Vehicle inspection, EDR report
 Air Bags: Frontal and IC air bags deployed, seat-mounted side impact air bag did not deploy
 Alcohol/drug data: None
 Egress from vehicle: Removed from vehicle while unconscious
 Transport from scene: Ambulance to hospital
 Type of medical treatment: Admitted, removed from life support systems, and declared deceased 4 days later

Driver Injuries

Inj. No.	Injury	AIS 2015	Involved Physical Component (IPC)	IPC Confidence Level
1	Brain swelling, cerebrum, obliterated basal cisterns with herniation	140666.5	Tandem IPC Roof - Roof or convertible top	Possible
2	Subdural hematoma, left cerebrum, 5 mm thickness	140656.5	Tandem IPC Roof - Roof or convertible top	Possible
3	Right basilar fracture, skull, extending through the right mastoid, extending through the roof and floor of right sphenoid sinus, comminuted extending from temporal to parietal	150206.4	Tandem IPC Roof - Roof or convertible top	Possible
4	Contusion, right temporal cerebrum NFS	140602.3	Tandem IPC Roof - Roof or convertible top	Possible

Inj. No.	Injury	AIS 2015	Involved Physical Component (IPC)	IPC Confidence Level
5	LOC; coma greater than 6 hours	161009.3	Tandem IPC Roof - Roof or convertible top	Possible
5	LOC; coma greater than 6 hours	161009.3	Tandem IPC Roof - Roof or convertible top	Possible
6	Contusions, bilateral lungs, scattered (multifocal)	441411.3	Tandem IPC Interior – Shoulder portion of belt restraint	Possible
7	Fracture, nasal septum	251006.2	Tandem IPC Left Air Bag - Steering wheel hub	Possible
8	pneumomediastinum	442209.2	Tandem IPC Interior – Shoulder portion of belt restraint	Possible
9 10	bilateral pneumothoraces	442202.2 442202.2	Tandem IPC Interior – Shoulder portion of belt restraint	Possible
11	Laceration, right posterior scalp	110602.1	Roof	Probable
12	Fracture, nasal bone	251000.1	Steering wheel	Probable
13	Abrasions, face	210202.1	Frontal air bag	Probable
14	Contusion, right eye	210402.1	Frontal air bag	Probable

Source: EMS report, police report

Driver Kinematics

The belted 20-year-old male driver was seated in an upright posture and operating the vehicle at high speeds exceeding 161 km/h (100 mph). The Chevrolet departed its original lane, initiated a clockwise yaw, and departed the roadway on the right edge while the driver steered and applied braking. After departing the roadway, the vehicle momentarily became airborne above a steep descending embankment prior to its front end striking the embankment in a frontal configuration. At impact, the driver was displaced sharply forward and left in response to the 340 degree PDOF. He loaded and stretched the actuated seat belt with his chest and possibly loaded the deployed frontal air bag with his chest, face and head. Abrasions to the face and a contusion to the right eye suggested possible contact with the air bag. The driver's face, head and chest continued to be displaced forward past the deployed frontal air bag possibly contacting the steering wheel and causing a fracture to the nasal bone and septum, a contusion to the right eye, contusions to the bilateral lungs, bilateral pneumothoraces and a pneumomediastinum.

The vehicle initiated a left-side-leading rollover and during the second quarter-turn the Chevrolet's roof contacted the ground, causing vertical intrusion and reducing the front row space. The driver was displaced toward the roof and his head possibly contacted the roof and left roof side rail, causing more severe injuries including brain swelling, subdural hematoma, complex and comminuted basal skull fractures, contusions of the cerebrum, and prolonged loss of consciousness. During the rollover, the vehicle's right plane struck a concrete culvert at the base of the embankment and the driver was displaced to the right, loading his seat back and the center console. The vehicle struck a fence, which yielded, and then completed a four-quarter turn rollover, coming to rest in upright on level ground.

Following the crash, the driver was unconscious and not oriented to time and place. He was removed from the vehicle and transported by ambulance to a local hospital, where he was admitted. Doctors decided surgery would be futile and not beneficial given the driver's injury severity. He did not regain consciousness and following 4 days of treatment the driver was removed from life support systems and pronounced deceased.

Front Right Occupant Demographics

Age/Sex:	18 years/female
Height:	170 cm (67 in.)
Weight:	82 kg (180 lb)
Eyewear:	None
Seat type:	Bucket
Seat track position:	Middle-rearward
Manual restraint usage:	Lap and shoulder seat belt
Usage source:	Vehicle inspection, EDR report
Air bags:	Frontal air bag, seat-mounted side air bag, and IC air bag deployed

Alcohol/drug data:	Unknown
Egress from vehicle:	Exited vehicle with assistance
Transport from scene:	Ambulance to hospital
Type of medical treatment:	Treated and released

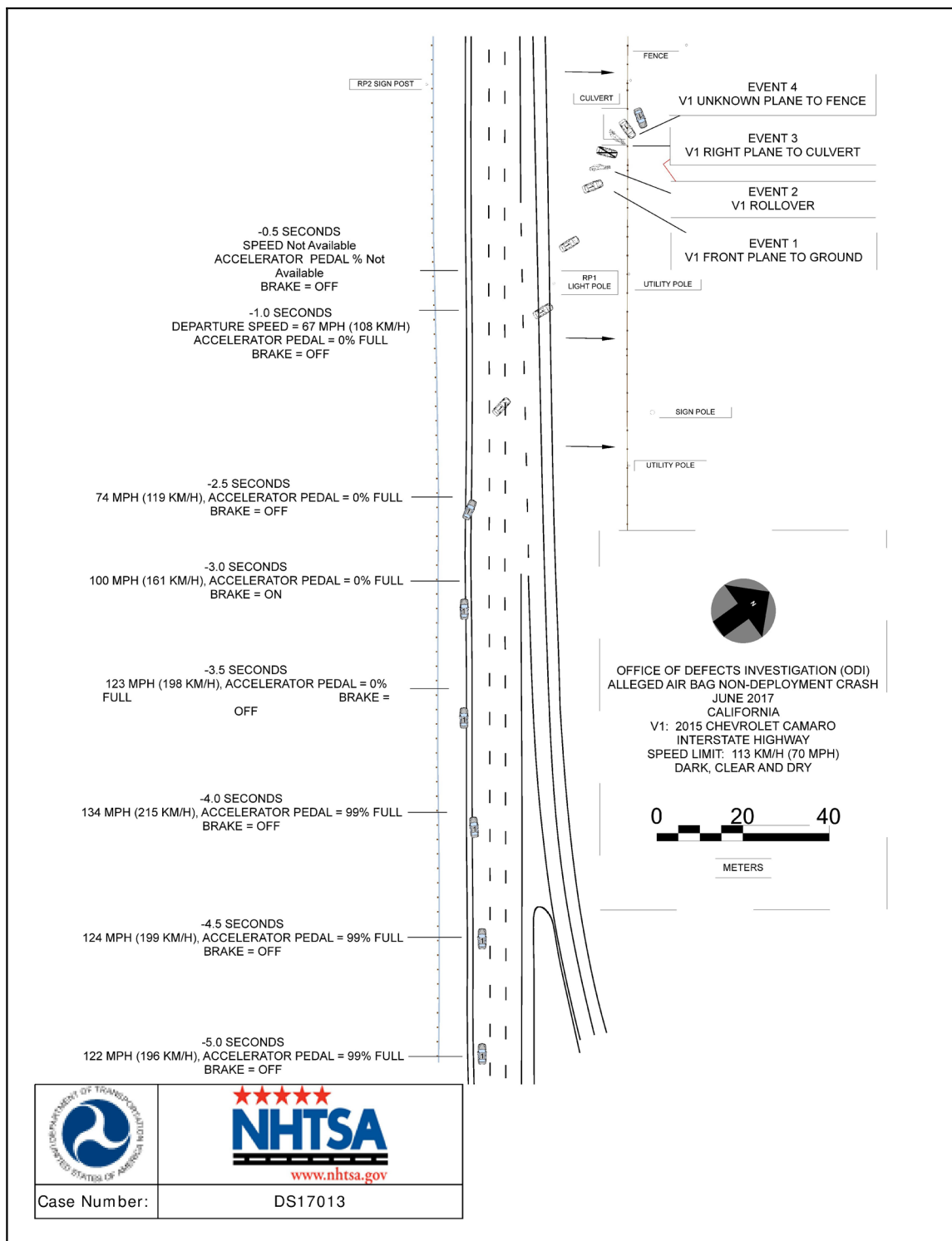
Front Right Occupant Injuries

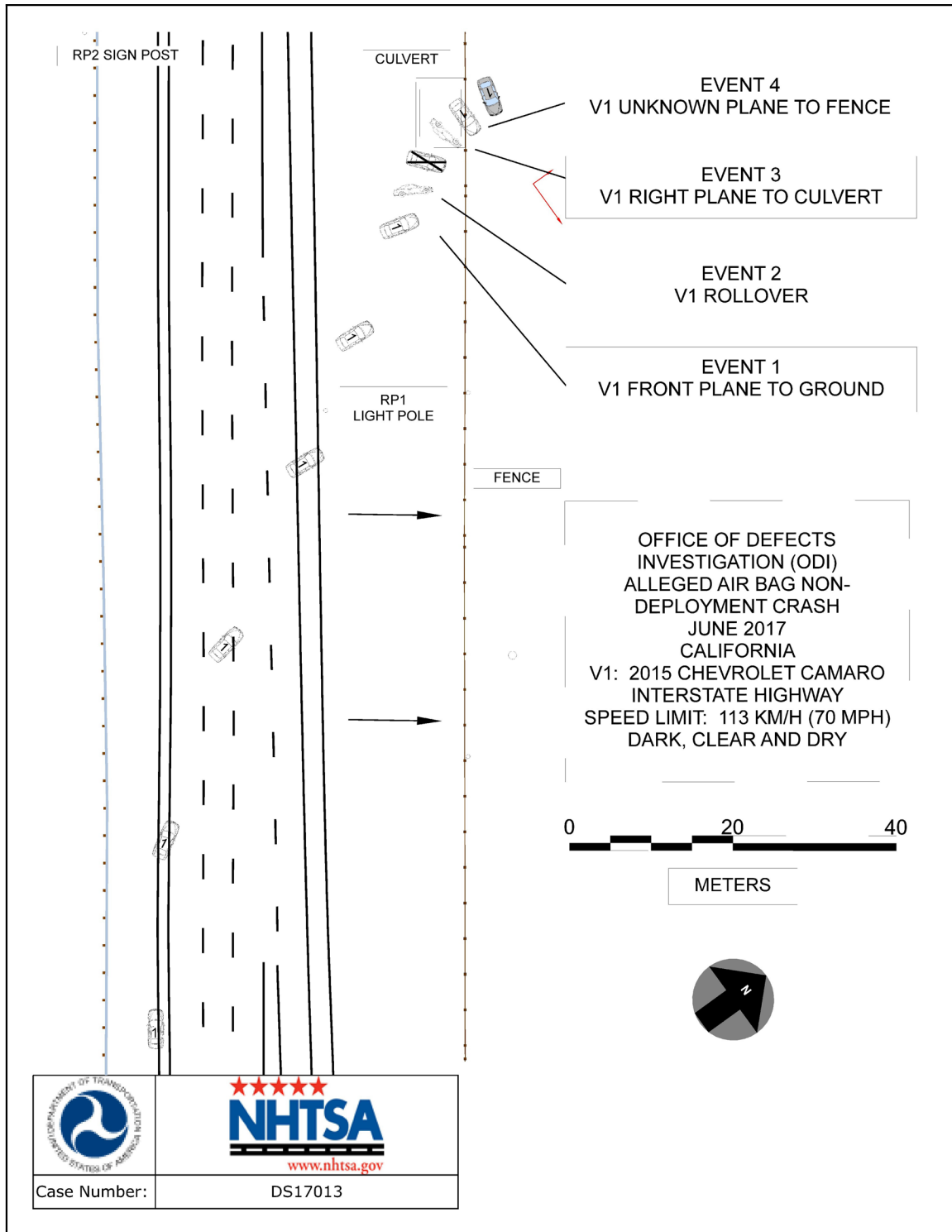
According to the police report, the front right occupant complained of pain throughout her body. Her posterior scalp revealed an unspecified swollen area caused by an unknown source. There were no documented codeable injuries. SCI requested her medical records but the hospital declined to release them.

Front Right Occupant Kinematics

The belted 18-year-old female occupant was seated in an upright posture. The vehicle departed the roadway, traveled over the embankment, and struck the ground in a frontal configuration. At impact, the occupant was displaced sharply forward and left in response to the 340-degree PDOF. She loaded and stretched the actuated seat belt with her chest and possibly loaded the deployed frontal air bag with her chest, face, and head. The vehicle initiated a left side leading rollover and traveled down the embankment. The occupant was displaced to the left and then in all directions, and while remaining in her seated position she possibly loaded the deployed right IC air bag with her head and face. She sustained swelling to her posterior scalp. The vehicle's right plane struck a concrete culvert at the base of the embankment and the occupant was displaced to the right, likely loading her seat back and the deployed right seat-mounted side air bag with her flank and arm. The vehicle struck a fence, which yielded, and then completed a four-quarter turn rollover, coming to rest in an upright orientation on level ground while the occupant remained in her seated position. Following the crash, the occupant exited the vehicle with assistance from responders. She was transported by ambulance to a local hospital, where she was treated and released. The police report stated she complained of pain to her entire body.

CRASH DIAGRAMS





APPENDIX A: Event Data Recorder Report 2015 Chevrolet Camaro²

² 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 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	2G1FJ1EW8F9*****
User	
Case Number	
EDR Data Imaging Date	
Crash Date	
Filename	DS17013_V1_ACM.CDRX
Saved on	
Imaged with CDR version	Crash Data Retrieval Tool 17.4
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 18.0.2
Reported with Software Licensed to (Company Name)	NHTSA
EDR Device Type	Airbag Control Module
Event(s) recovered	Deployment, Deployment, 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, or roll bars:

- Pretensioner(s) only Deployment
- Head Rest Deployment
- Battery Cut-Off Deployment

The second type of SDM recorded crash event for FSR Events is the Deployment Event. It also contains 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.

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.

-Deployment loops may be displayed as being deployed in a Non-Deployment event record, if a Deployment event is qualified during the Non-Deployment event. That is, if two or more events are occurring at the same time and one is a Non-Deployment event and one of the others is a Deployment event, and the Deployment event is qualified while the Non-Deployment is still active, the deployed loops may be recorded in the Non-Deployment event record.

-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.

-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.

-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 engines.

-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 record a maximum value of 253 cycles and can only be reset by a scan tool.

-Dynamic Deployment Event Counter tracks the number of Deployment events that have occurred during the SDM's lifetime.

-Dynamic Event Counter tracks the number of qualified events (either Deployments, Non-deploy, or Rollover events) that have occurred during the SDM's lifetime.

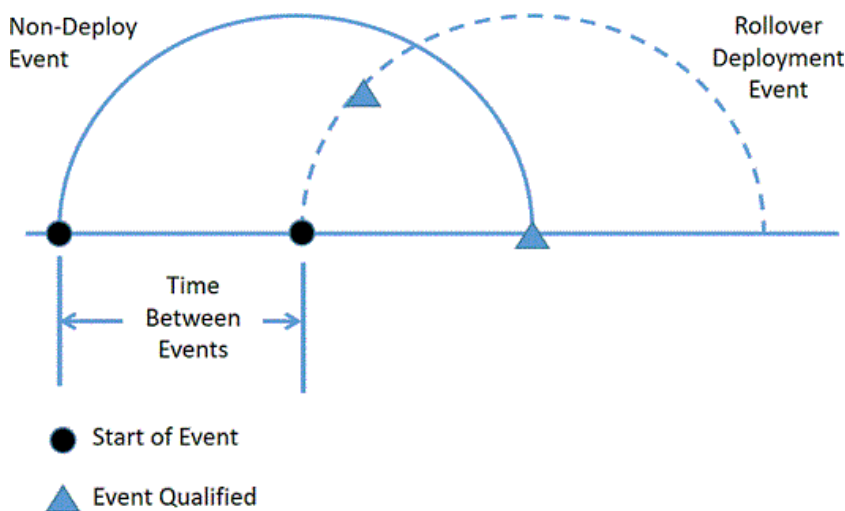
-For Deployment Events, DTC B0052 (Deployment commanded) shall be recorded with the remainder of the data for this event even though it occurred after Event Enable.

-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.

-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 Non-Deployment event begins. Before the Non-Deployment event is qualified, a Rollover Deployment event begins and is qualified. Sometime after the Rollover event is qualified, the Non-Deployment event is qualified. The Rollover event will be recorded in the first open record even though the Non-Deployment event enabled before the Rollover event. The Non-Deployment event will be recorded in the next open record. The "Concurrent Event Flag Set" parameter will indicate "Yes" for the Non-Deployment event. The "Time Between Events" parameter will indicate the time from the start of the Non-Deployment event to the start of the Rollover event.



Event Record #1	Event Record #2
-----------------	-----------------

Event record Type = Rollover	Non-deployment
Concurrent Event Flag = No	Concurrent Event Flag = Yes
Time Between Events = N/A	Time Between Events = XX seconds

- The GM parameter name is displayed in parentheses after the NHTSA Part 563 parameter name.
- The reported range of the longitudinal and lateral acceleration values is approximately ± 50 g.
- 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.

01043_SDM10P-conti_r015

System Status at Time of Retrieval

Dynamic Deployment Event Counter	3
Multi-Event, Number of Events (Dynamic Event Counter)	3
Dynamic OnStar Notification Event Counter	3
Vehicle Identification Number (VIN)	2G1FJ1EW8F9*****
Ignition Cycle, Download (Ignition Cycles at Investigation)	5881
End Model Part Number	00CF6757
System Type	Continental
Software Module Identifier 1	00CF6754
Software Module Identifier 2	015E810B
Software Module Identifier 3	00CF2D8A
Manufacturing Traceability Data, Component Identifier	AS
Manufacturing Traceability Data, Part Number/Broadcast Code	2407
Manufacturing Traceability Data, Supplier Code	T
Manufacturing Traceability Data, Traceability Number	151373039
ESS # 1 Traceability Data, Component Identifier	AU
ESS # 1 Traceability Data, Part Number/Broadcast Code	2341
ESS # 1 Traceability Data, Supplier Code	T
ESS # 1 Traceability Data, Traceability Number	6JJ5TQF8N
ESS # 2 Traceability Data, Component Identifier	AT
ESS # 2 Traceability Data, Part Number/Broadcast Code	2341
ESS # 2 Traceability Data, Supplier Code	T
ESS # 2 Traceability Data, Traceability Number	MLR2LQN8N
ESS # 3 Traceability Data, Component Identifier	AH
ESS # 3 Traceability Data, Part Number/Broadcast Code	2340
ESS # 3 Traceability Data, Supplier Code	T
ESS # 3 Traceability Data, Traceability Number	8G07EI38L
ESS # 4 Traceability Data, Component Identifier	AJ
ESS # 4 Traceability Data, Part Number/Broadcast Code	2340
ESS # 4 Traceability Data, Supplier Code	T
ESS # 4 Traceability Data, Traceability Number	8GM32A38L
ESS # 5 Traceability Data, Component Identifier	00
ESS # 5 Traceability Data, Part Number/Broadcast Code	0000
ESS # 5 Traceability Data, Supplier Code	T
ESS # 5 Traceability Data, Traceability Number	000000000
ESS # 6 Traceability Data, Component Identifier	00
ESS # 6 Traceability Data, Part Number/Broadcast Code	0000
ESS # 6 Traceability Data, Supplier Code	T
ESS # 6 Traceability Data, Traceability Number	000000000
ESS # 7 Traceability Data, Component Identifier	00
ESS # 7 Traceability Data, Part Number/Broadcast Code	0000
ESS # 7 Traceability Data, Supplier Code	T
ESS # 7 Traceability Data, Traceability Number	000000000
ESS # 8 Traceability Data, Component Identifier	00
ESS # 8 Traceability Data, Part Number/Broadcast Code	0000
ESS # 8 Traceability Data, Supplier Code	T
ESS # 8 Traceability Data, Traceability Number	000000000

System Status at Event (Event Record 1)

Event Record Type	Deployment
OnStar Deployment Status Data Sent	Yes
Complete file recorded (Event Recording Complete)	Yes
Crash Record Locked	Yes
OnStar SDM Recorded Vehicle Velocity Change Data Sent	Yes
Deployment Event Counter	1
Multi-Event, Number of Events (Event Counter)	1
OnStar Notification Event Counter	1
Time From Event 1 to 2 (Time Between Events) (seconds)	Data Not Available
Ignition Cycle, Crash (Ignition Cycles at Event)	5848
Algorithm Active: Frontal	Yes
Algorithm Active: Side	Yes
Algorithm Active: Rollover	No
Algorithm Active: Rear	Yes
Concurrent Event Flag Set	No
Event Severity Status: Frontal Pretensioner	Yes
Event Severity Status: Frontal Stage 1	Yes
Event Severity Status: Frontal Stage 2	Yes
Event Severity Status: Left Side	No
Event Severity Status: Right Side	No
Event Severity Status: Rear	No
Event Severity Status: Rollover	No
Safety Belt Status, Driver (Driver Belt Switch Circuit Status)	Buckled
Safety Belt Status, Right Front Passenger (Passenger Belt Switch Circuit Status)	Buckled
Center Front Row Belt Switch Circuit Status (If Equipped)	Data Not Available
Left Row 3 Belt Switch Circuit Status (If Equipped)	Data Not Available
Center Row 3 Belt Switch Circuit Status (If Equipped)	Data Not Available
Right Row 3 Belt Switch Circuit Status (If Equipped)	Data Not Available
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 (Small 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)	655330
Number of Ignition Cycles SIR Warning Lamp was ON/OFF Continuously	5848
Ignition Cycles Since DTCs Were Last Cleared 0.5 Seconds Prior to Time Zero	216
Maximum Delta-V, Longitudinal (Maximum Longitudinal SDM Recorded Vehicle Velocity Change for FSR Event) MPH [km/h]	-27 [-44]
Time, Maximum Delta-V (Time From FSR Time Zero to Maximum Longitudinal SDM Recorded Vehicle Velocity Change)(msec)	196
Maximum Delta-V, Lateral (Maximum Lateral SDM Recorded Vehicle Velocity Change for FSR Event) MPH [km/h]	7 [11]
Time Maximum Delta-V, Lateral (Time From FSR Time Zero to Maximum Lateral SDM Recorded Vehicle Velocity Change)(msec)	128

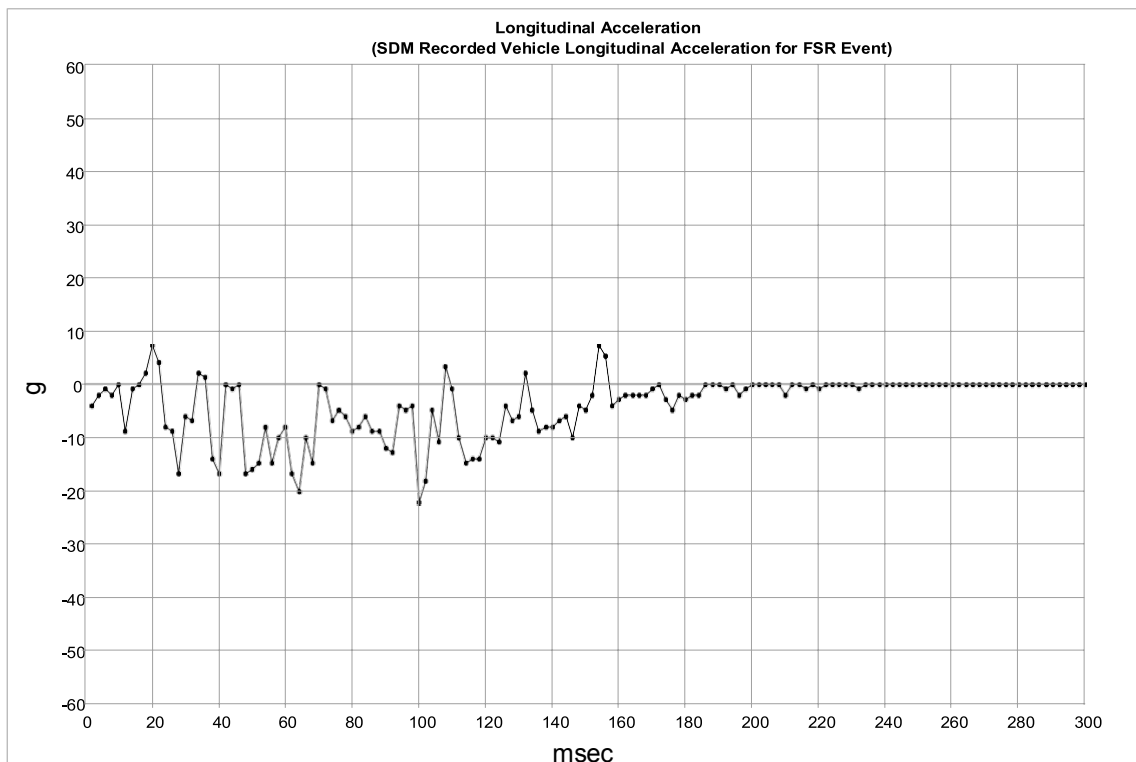
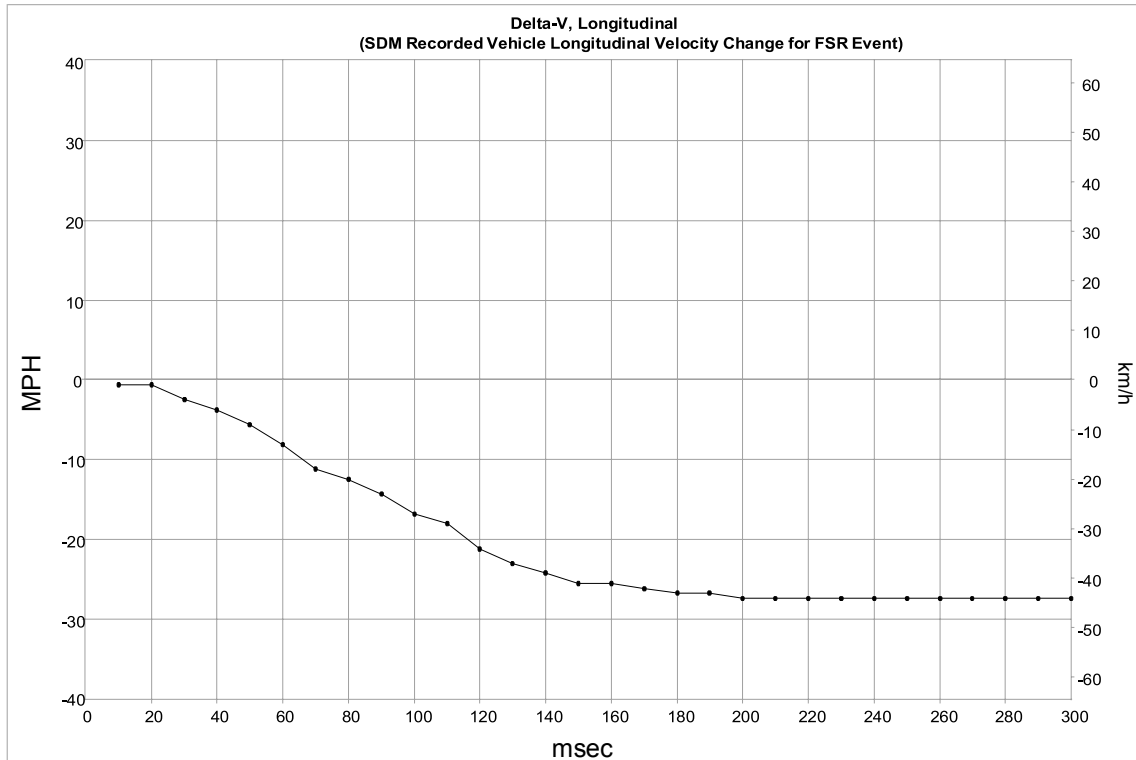
DTCs Present at Time of Event (Event Record 1)

B0052-00

Event Data (Event Record 1)

Driver 1st Stage Deployment Loop Commanded	Yes
Passenger 1st Stage Deployment Loop Commanded	Yes
Driver 2nd Stage Deployment Loop Commanded	Yes
Passenger 2nd Stage Deployment Loop Commanded	Yes
Driver Pretensioner Deployment Loop #1 Commanded	Yes
Passenger Pretensioner Deployment Loop #1 Commanded	Yes
Driver Thorax Loop Commanded	No
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)	58
Frontal Air Bag Deployment, Time to 2nd Stage, Driver (Driver 2nd Stage Time From Time Zero to Deployment Command Criteria Met) (msec)	71
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)	58
Frontal Air Bag Deployment, Time to 2nd Stage, Right Front Passenger (Passenger 2nd Stage Time From Time Zero to Deployment Command Criteria Met) (msec)	71
Side air bag deployment, time to deploy, driver (Driver Thorax/Curtain Time From Time Zero to Deployment Command Criteria Met) (msec)	71
Side air bag deployment, time to deploy, right front passenger (Passenger Thorax/Curtain Time From Time Zero to Deployment Command Criteria Met) (msec)	71
Pretensioner Deployment, Time to Fire, Driver (Driver Pretensioner Time From Time Zero to Deployment Loop #1 or Loop #2 Command Criteria Met) (msec)	58
Pretensioner Deployment, Time to Fire, Right Front Passenger (Passenger Pretensioner Time From Time Zero to Deployment Loop #1 or Loop #2 Command Criteria Met) (msec)	58

Longitudinal Crash Pulse (Event Record 1)



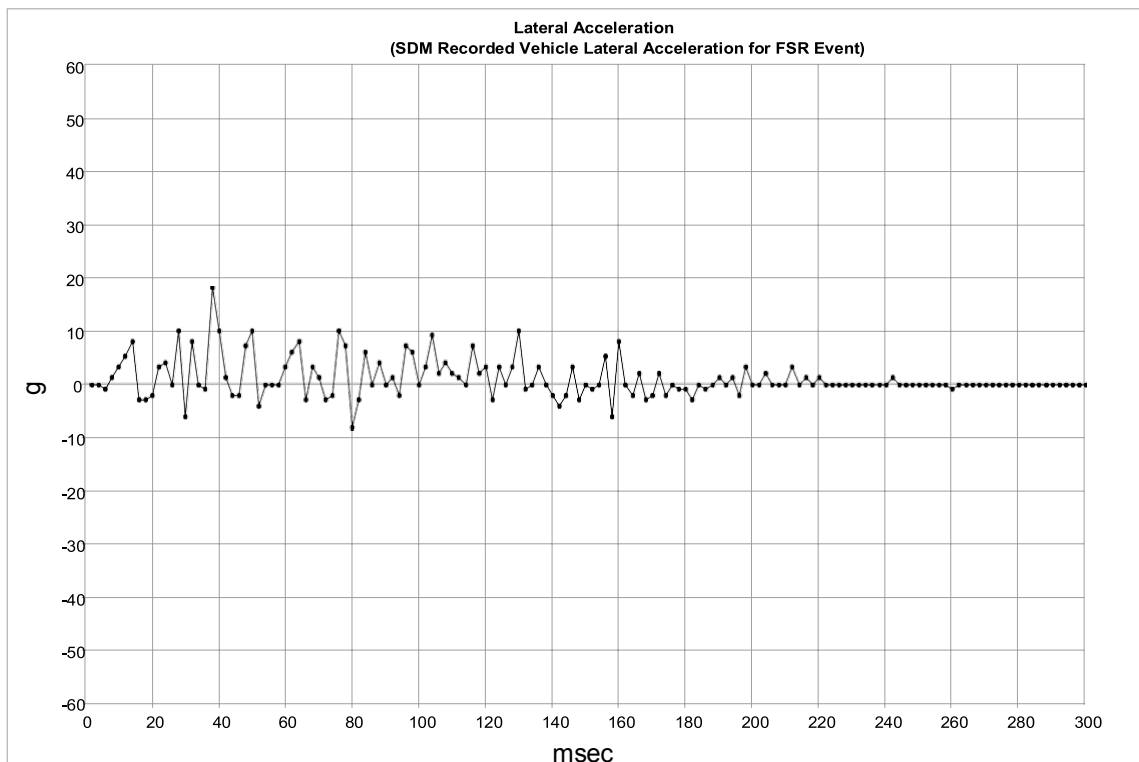
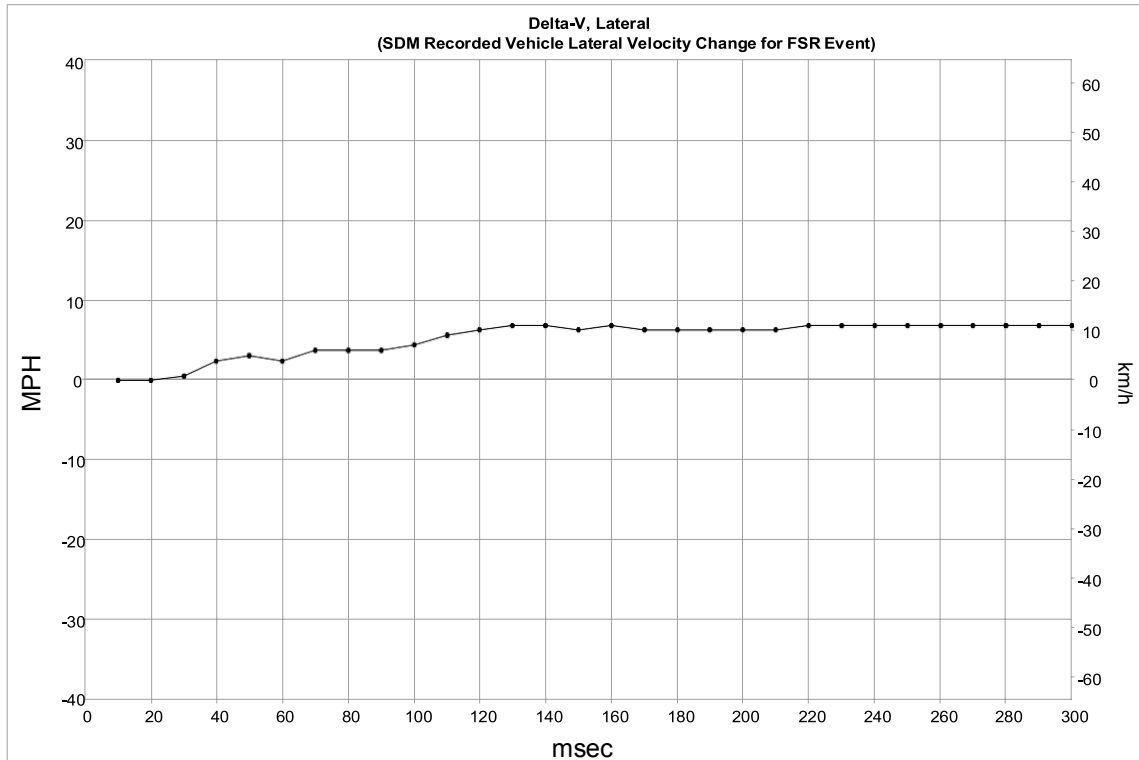
Longitudinal Crash Pulse (Event Record 1)

Time (msec)	Delta-V, Longitudinal (SDM Recorded Vehicle Longitudinal Velocity Change for FSR Event) (MPH)	Delta-V, Longitudinal (SDM Recorded Vehicle Longitudinal Velocity Change for FSR Event) (km/h)
10	-0.6	-1.0
20	-0.6	-1.0
30	-2.5	-4.0
40	-3.7	-6.0
50	-5.6	-9.0
60	-8.1	-13.0
70	-11.2	-18.0
80	-12.4	-20.0
90	-14.3	-23.0
100	-16.8	-27.0
110	-18.0	-29.0
120	-21.1	-34.0
130	-23.0	-37.0
140	-24.2	-39.0
150	-25.5	-41.0
160	-25.5	-41.0
170	-26.1	-42.0
180	-26.7	-43.0
190	-26.7	-43.0
200	-27.3	-44.0
210	-27.3	-44.0
220	-27.3	-44.0
230	-27.3	-44.0
240	-27.3	-44.0
250	-27.3	-44.0
260	-27.3	-44.0
270	-27.3	-44.0
280	-27.3	-44.0
290	-27.3	-44.0
300	-27.3	-44.0

Longitudinal Crash Pulse (Event Record 1)

Time (msec)	Longitudinal Acceleration (SDM Recorded Vehicle Longitudinal Acceleration for FSR Event) (g)	Time (msec)	Longitudinal Acceleration (SDM Recorded Vehicle Longitudinal Acceleration for FSR Event) (g)	Time (msec)	Longitudinal Acceleration (SDM Recorded Vehicle Longitudinal Acceleration for FSR Event) (g)
2	-4.2	102	-18.2	202	-0.2
4	-2.2	104	-5.0	204	-0.2
6	-1.0	106	-11.0	206	-0.2
8	-2.2	108	3.0	208	-0.2
10	-0.2	110	-1.0	210	-2.2
12	-9.0	112	-10.2	212	-0.2
14	-1.0	114	-15.0	214	-0.2
16	-0.2	116	-14.2	216	-1.0
18	1.8	118	-14.2	218	-0.2
20	7.0	120	-10.2	220	-1.0
22	3.8	122	-10.2	222	-0.2
24	-8.2	124	-11.0	224	-0.2
26	-9.0	126	-4.2	226	-0.2
28	-17.0	128	-7.0	228	-0.2
30	-6.2	130	-6.2	230	-0.2
32	-7.0	132	1.8	232	-1.0
34	1.8	134	-5.0	234	-0.2
36	1.0	136	-9.0	236	-0.2
38	-14.2	138	-8.2	238	-0.2
40	-17.0	140	-8.2	240	-0.2
42	-0.2	142	-7.0	242	-0.2
44	-1.0	144	-6.2	244	-0.2
46	-0.2	146	-10.2	246	-0.2
48	-17.0	148	-4.2	248	-0.2
50	-16.2	150	-5.0	250	-0.2
52	-15.0	152	-2.2	252	-0.2
54	-8.2	154	7.0	254	-0.2
56	-15.0	156	5.0	256	-0.2
58	-10.2	158	-4.2	258	-0.2
60	-8.2	160	-3.0	260	-0.2
62	-17.0	162	-2.2	262	-0.2
64	-20.2	164	-2.2	264	-0.2
66	-10.2	166	-2.2	266	-0.2
68	-15.0	168	-2.2	268	-0.2
70	-0.2	170	-1.0	270	-0.2
72	-1.0	172	-0.2	272	-0.2
74	-7.0	174	-3.0	274	-0.2
76	-5.0	176	-5.0	276	-0.2
78	-6.2	178	-2.2	278	-0.2
80	-9.0	180	-3.0	280	-0.2
82	-8.2	182	-2.2	282	-0.2
84	-6.2	184	-2.2	284	-0.2
86	-9.0	186	-0.2	286	-0.2
88	-9.0	188	-0.2	288	-0.2
90	-12.2	190	-0.2	290	-0.2
92	-13.0	192	-1.0	292	-0.2
94	-4.2	194	-0.2	294	-0.2
96	-5.0	196	-2.2	296	-0.2
98	-4.2	198	-1.0	298	-0.2
100	-22.2	200	-0.2	300	-0.2

Lateral Crash Pulse (Event Record 1)



Lateral Crash Pulse (Event Record 1)

Time (msec)	Delta-V, Lateral (SDM Recorded Vehicle Lateral Velocity Change for FSR Event) (MPH)	Delta-V, Lateral (SDM Recorded Vehicle Lateral Velocity Change for FSR Event) (km/h)
10	0.0	0.0
20	0.0	0.0
30	0.6	1.0
40	2.5	4.0
50	3.1	5.0
60	2.5	4.0
70	3.7	6.0
80	3.7	6.0
90	3.7	6.0
100	4.3	7.0
110	5.6	9.0
120	6.2	10.0
130	6.8	11.0
140	6.8	11.0
150	6.2	10.0
160	6.8	11.0
170	6.2	10.0
180	6.2	10.0
190	6.2	10.0
200	6.2	10.0
210	6.2	10.0
220	6.8	11.0
230	6.8	11.0
240	6.8	11.0
250	6.8	11.0
260	6.8	11.0
270	6.8	11.0
280	6.8	11.0
290	6.8	11.0
300	6.8	11.0

Lateral Crash Pulse (Event Record 1)

Time (msec)	Lateral Acceleration (SDM Recorded Vehicle Lateral Acceleration for FSR Event) (g)	Time (msec)	Lateral Acceleration (SDM Recorded Vehicle Lateral Acceleration for FSR Event) (g)	Time (msec)	Lateral Acceleration (SDM Recorded Vehicle Lateral Acceleration for FSR Event) (g)
2	-0.2	102	3.0	202	-0.2
4	-0.2	104	9.0	204	1.8
6	-1.0	106	1.8	206	-0.2
8	1.0	108	3.8	208	-0.2
10	3.0	110	1.8	210	-0.2
12	5.0	112	1.0	212	3.0
14	7.8	114	-0.2	214	-0.2
16	-3.0	116	7.0	216	1.0
18	-3.0	118	1.8	218	-0.2
20	-2.2	120	3.0	220	1.0
22	3.0	122	-3.0	222	-0.2
24	3.8	124	3.0	224	-0.2
26	-0.2	126	-0.2	226	-0.2
28	9.8	128	3.0	228	-0.2
30	-6.2	130	9.8	230	-0.2
32	7.8	132	-1.0	232	-0.2
34	-0.2	134	-0.2	234	-0.2
36	-1.0	136	3.0	236	-0.2
38	17.8	138	-0.2	238	-0.2
40	9.8	140	-2.2	240	-0.2
42	1.0	142	-4.2	242	1.0
44	-2.2	144	-2.2	244	-0.2
46	-2.2	146	3.0	246	-0.2
48	7.0	148	-3.0	248	-0.2
50	9.8	150	-0.2	250	-0.2
52	-4.2	152	-1.0	252	-0.2
54	-0.2	154	-0.2	254	-0.2
56	-0.2	156	5.0	256	-0.2
58	-0.2	158	-6.2	258	-0.2
60	3.0	160	7.8	260	-1.0
62	5.8	162	-0.2	262	-0.2
64	7.8	164	-2.2	264	-0.2
66	-3.0	166	1.8	266	-0.2
68	3.0	168	-3.0	268	-0.2
70	1.0	170	-2.2	270	-0.2
72	-3.0	172	1.8	272	-0.2
74	-2.2	174	-2.2	274	-0.2
76	9.8	176	-0.2	276	-0.2
78	7.0	178	-1.0	278	-0.2
80	-8.2	180	-1.0	280	-0.2
82	-3.0	182	-3.0	282	-0.2
84	5.8	184	-0.2	284	-0.2
86	-0.2	186	-1.0	286	-0.2
88	3.8	188	-0.2	288	-0.2
90	-0.2	190	1.0	290	-0.2
92	1.0	192	-0.2	292	-0.2
94	-2.2	194	1.0	294	-0.2
96	7.0	196	-2.2	296	-0.2
98	5.8	198	3.0	298	-0.2
100	-0.2	200	-0.2	300	-0.2

Rollover Crash Pulse (Event Record 1) SDM Recorded Vehicle Roll Rate

Contains No Recorded Data

Rollover Crash Pulse (Event Record 1) Lateral Acceleration (SDM Recorded Vehicle Lateral Acceleration for Rollover Event)

Contains No Recorded Data

**Vertical Crash Pulse (Event Record 1)
Normal Acceleration (SDM Recorded Vehicle Vertical Acceleration for
Rollover Event)**

Contains No Recorded Data

Pre-Crash Data -5.0 to -0.5 sec (Event Record 1)

Times (sec)	Accelerator Pedal, % Full (Accelerator Pedal Position)	Service Brake (Brake Switch Circuit State)	Engine RPM (Engine Speed)	Engine Throttle, % Full (Throttle Position)	Speed, Vehicle Indicated (Vehicle Speed) (MPH [km/h])
-5.0	99	Off	5888	99	122 [196]
-4.5	99	Off	5888	99	124 [199]
-4.0	99	Off	6400	99	134 [215]
-3.5	0	Off	5824	23	123 [198]
-3.0	0	On	4736	19	100 [161]
-2.5	0	Off	3456	16	74 [119]
-2.0	0	On	2752	12	58 [93]
-1.5	0	On	2432	12	52 [84]
-1.0	0	Off	2304	12	49 [79]
-0.5	0	Off	1984	12	42 [67]

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

Times (sec)	Cruise Control Active	Cruise Control Resume Switch Active	Cruise Control Set Switch Active	Engine Torque (lb-ft [N-m])	Reduced Engine Power Mode Indicator
-2.0	No	No	No	-22 [-30]	Off
-1.5	No	No	No	-32 [-44]	Off
-1.0	No	No	No	-42 [-56]	Off
-0.5	No	No	No	-48 [-64]	Off

System Status at Event (Event Record 2)

Event Record Type	Deployment
OnStar Deployment Status Data Sent	No
Complete file recorded (Event Recording Complete)	Yes
Crash Record Locked	Yes
OnStar SDM Recorded Vehicle Velocity Change Data Sent	Yes
Deployment Event Counter	2
Multi-Event, Number of Events (Event Counter)	2
OnStar Notification Event Counter	2
Time From Event 1 to 2 (Time Between Events) (seconds)	0.11
Ignition Cycle, Crash (Ignition Cycles at Event)	5848
Algorithm Active: Frontal	No
Algorithm Active: Side	No
Algorithm Active: Rollover	Yes
Algorithm Active: Rear	No
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	No
Event Severity Status: Right Side	No
Event Severity Status: Rear	No
Event Severity Status: Rollover	Yes
Safety Belt Status, Driver (Driver Belt Switch Circuit Status)	Buckled
Safety Belt Status, Right Front Passenger (Passenger Belt Switch Circuit Status)	Buckled
Center Front Row Belt Switch Circuit Status (If Equipped)	Data Not Available
Left Row 3 Belt Switch Circuit Status (If Equipped)	Data Not Available
Center Row 3 Belt Switch Circuit Status (If Equipped)	Data Not Available
Right Row 3 Belt Switch Circuit Status (If Equipped)	Data Not Available
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 (Small 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)	655330
Number of Ignition Cycles SIR Warning Lamp was ON/OFF Continuously	5848
Ignition Cycles Since DTCs Were Last Cleared 0.5 Seconds Prior to Time Zero	216
Maximum Delta-V, Longitudinal (Maximum Longitudinal SDM Recorded Vehicle Velocity Change for FSR Event) MPH [km/h]	Data Not Available
Time, Maximum Delta-V (Time From FSR Time Zero to Maximum Longitudinal SDM Recorded Vehicle Velocity Change)(msec)	Data Not Available
Maximum Delta-V, Lateral (Maximum Lateral SDM Recorded Vehicle Velocity Change for FSR Event) MPH [km/h]	Data Not Available
Time Maximum Delta-V, Lateral (Time From FSR Time Zero to Maximum Lateral SDM Recorded Vehicle Velocity Change)(msec)	Data Not Available

DTCs Present at Time of Event (Event Record 2)

No Diagnostic Trouble Codes

Event Data (Event Record 2)

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	No
Passenger Pretensioner Deployment Loop #1 Commanded	No
Driver Thorax Loop Commanded	No
Passenger Thorax Loop Commanded	No
Left Row 1 Roof Rail/Head Curtain Loop Commanded	No
Right Row 1 Roof Rail/Head Curtain Loop Commanded	No
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 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 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, Right Front Passenger (Passenger 2nd Stage Time From Time Zero to Deployment Command Criteria Met) (msec)	Data Not Available
Side air bag deployment, time to deploy, driver (Driver Thorax/Curtain Time From Time Zero to Deployment Command Criteria Met) (msec)	Data Not Available
Side air bag deployment, time to deploy, right front passenger (Passenger Thorax/Curtain 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 or Loop #2 Command Criteria Met) (msec)	Data Not Available
Pretensioner Deployment, Time to Fire, Right Front Passenger (Passenger Pretensioner Time From Time Zero to Deployment Loop #1 or Loop #2 Command Criteria Met) (msec)	Data Not Available

**Longitudinal Crash Pulse (Event Record 2)
Delta-V, Longitudinal (SDM Recorded Vehicle Longitudinal Velocity Change
for FSR Event)**

Contains No Recorded Data

**Longitudinal Crash Pulse (Event Record 2)
Longitudinal Acceleration (SDM Recorded Vehicle Longitudinal
Acceleration for FSR Event)**

Contains No Recorded Data

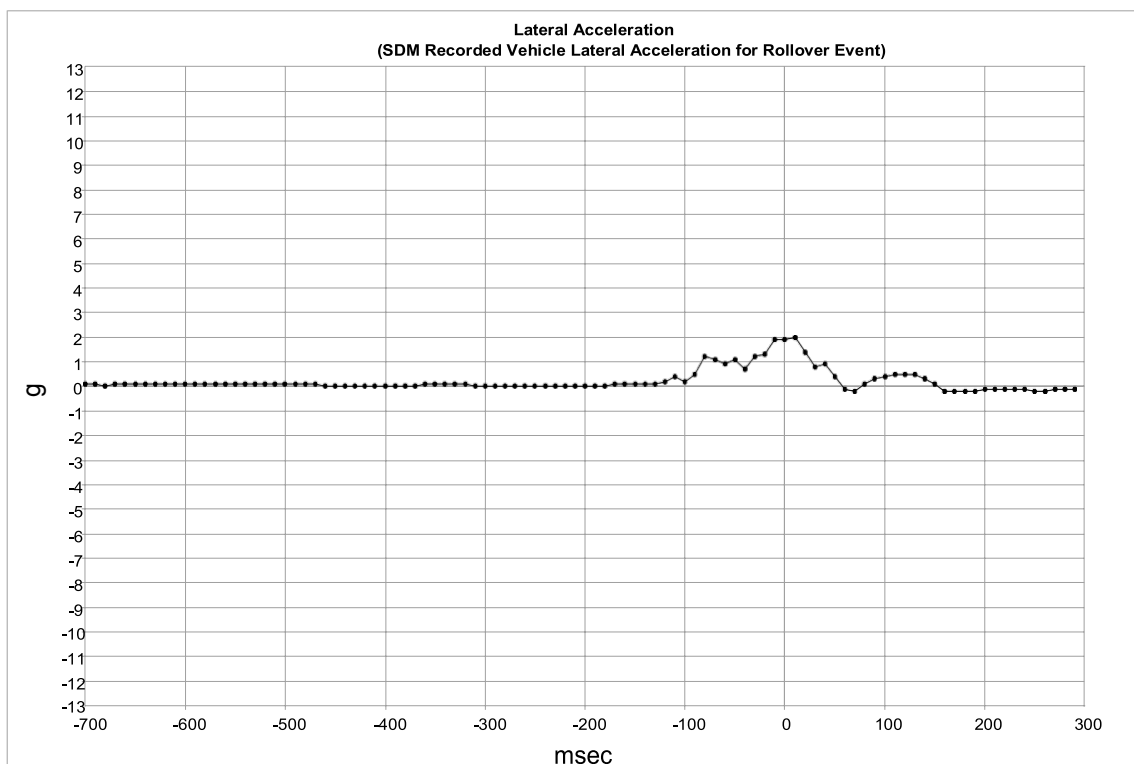
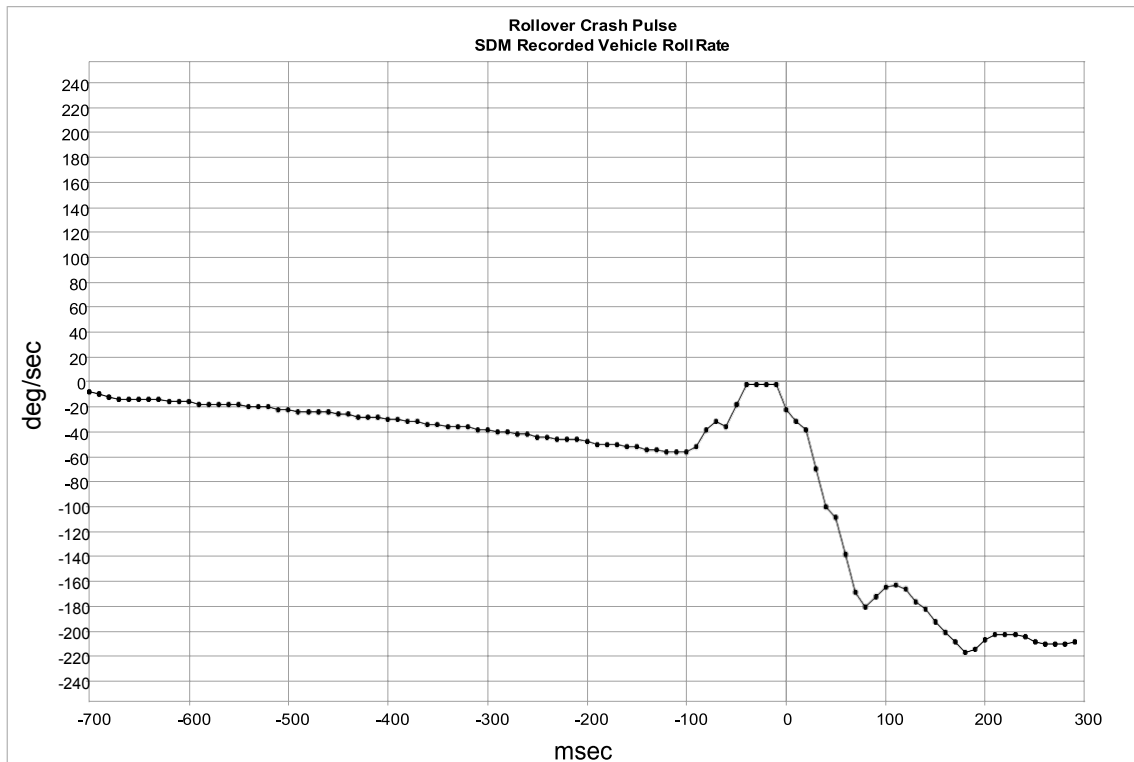
**Lateral Crash Pulse (Event Record 2)
Delta-V, Lateral (SDM Recorded Vehicle Lateral Velocity Change for FSR
Event)**

Contains No Recorded Data

**Lateral Crash Pulse (Event Record 2)
Lateral Acceleration (SDM Recorded Vehicle Lateral Acceleration for FSR
Event)**

Contains No Recorded Data

Rollover Crash Pulse (Event Record 2)



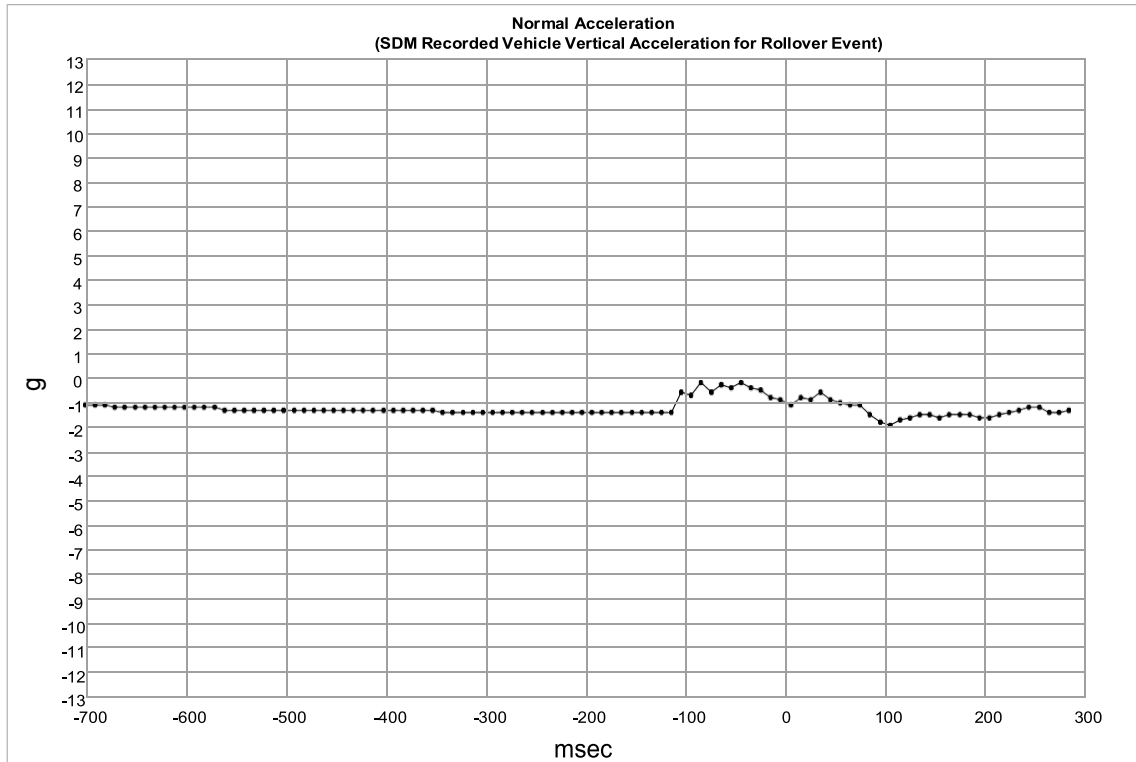
Rollover Crash Pulse (Event Record 2)

Time (msec)	SDM Recorded Vehicle Roll Rate (deg/sec)	Time (msec)	SDM Recorded Vehicle Roll Rate (deg/sec)
-700	-8	-200	-48
-690	-10	-190	-50
-680	-12	-180	-50
-670	-14	-170	-50
-660	-14	-160	-52
-650	-14	-150	-52
-640	-14	-140	-54
-630	-14	-130	-54
-620	-16	-120	-56
-610	-16	-110	-56
-600	-16	-100	-56
-590	-18	-90	-52
-580	-18	-80	-38
-570	-18	-70	-32
-560	-18	-60	-36
-550	-18	-50	-18
-540	-20	-40	-2
-530	-20	-30	-2
-520	-20	-20	-2
-510	-22	-10	-2
-500	-22	0	-22
-490	-24	10	-32
-480	-24	20	-38
-470	-24	30	-70
-460	-24	40	-100
-450	-26	50	-108
-440	-26	60	-138
-430	-28	70	-168
-420	-28	80	-180
-410	-28	90	-172
-400	-30	100	-164
-390	-30	110	-162
-380	-32	120	-166
-370	-32	130	-176
-360	-34	140	-182
-350	-34	150	-192
-340	-36	160	-200
-330	-36	170	-208
-320	-36	180	-216
-310	-38	190	-214
-300	-38	200	-206
-290	-40	210	-202
-280	-40	220	-202
-270	-42	230	-202
-260	-42	240	-204
-250	-44	250	-208
-240	-44	260	-210
-230	-46	270	-210
-220	-46	280	-210
-210	-46	290	-208

Rollover Crash Pulse (Event Record 2)

Time (msec)	Lateral Acceleration (SDM Recorded Vehicle Lateral Acceleration for Rollover Event) (g)	Time (msec)	Lateral Acceleration (SDM Recorded Vehicle Lateral Acceleration for Rollover Event) (g)
-700	0.1	-200	0.0
-690	0.1	-190	0.0
-680	0.0	-180	0.0
-670	0.1	-170	0.1
-660	0.1	-160	0.1
-650	0.1	-150	0.1
-640	0.1	-140	0.1
-630	0.1	-130	0.1
-620	0.1	-120	0.2
-610	0.1	-110	0.4
-600	0.1	-100	0.2
-590	0.1	-90	0.5
-580	0.1	-80	1.2
-570	0.1	-70	1.1
-560	0.1	-60	0.9
-550	0.1	-50	1.1
-540	0.1	-40	0.7
-530	0.1	-30	1.2
-520	0.1	-20	1.3
-510	0.1	-10	1.9
-500	0.1	0	1.9
-490	0.1	10	2.0
-480	0.1	20	1.4
-470	0.1	30	0.8
-460	0.0	40	0.9
-450	0.0	50	0.4
-440	0.0	60	-0.1
-430	0.0	70	-0.2
-420	0.0	80	0.1
-410	0.0	90	0.3
-400	0.0	100	0.4
-390	0.0	110	0.5
-380	0.0	120	0.5
-370	0.0	130	0.5
-360	0.1	140	0.3
-350	0.1	150	0.1
-340	0.1	160	-0.2
-330	0.1	170	-0.2
-320	0.1	180	-0.2
-310	0.0	190	-0.2
-300	0.0	200	-0.1
-290	0.0	210	-0.1
-280	0.0	220	-0.1
-270	0.0	230	-0.1
-260	0.0	240	-0.1
-250	0.0	250	-0.2
-240	0.0	260	-0.2
-230	0.0	270	-0.1
-220	0.0	280	-0.1
-210	0.0	290	-0.1

Vertical Crash Pulse (Event Record 2)



Vertical Crash Pulse (Event Record 2)

Time (msec)	Normal Acceleration (SDM Recorded Vehicle Vertical Acceleration for Rollover Event) (g)	Time (msec)	Normal Acceleration (SDM Recorded Vehicle Vertical Acceleration for Rollover Event) (g)
-700	-1.0	-200	-1.3
-690	-1.0	-190	-1.3
-680	-1.0	-180	-1.3
-670	-1.1	-170	-1.3
-660	-1.1	-160	-1.3
-650	-1.1	-150	-1.3
-640	-1.1	-140	-1.3
-630	-1.1	-130	-1.3
-620	-1.1	-120	-1.3
-610	-1.1	-110	-1.3
-600	-1.1	-100	-0.5
-590	-1.1	-90	-0.6
-580	-1.1	-80	-0.1
-570	-1.1	-70	-0.5
-560	-1.2	-60	-0.2
-550	-1.2	-50	-0.3
-540	-1.2	-40	-0.1
-530	-1.2	-30	-0.3
-520	-1.2	-20	-0.4
-510	-1.2	-10	-0.7
-500	-1.2	0	-0.8
-490	-1.2	10	-1.0
-480	-1.2	20	-0.7
-470	-1.2	30	-0.8
-460	-1.2	40	-0.5
-450	-1.2	50	-0.8
-440	-1.2	60	-0.9
-430	-1.2	70	-1.0
-420	-1.2	80	-1.0
-410	-1.2	90	-1.4
-400	-1.2	100	-1.7
-390	-1.2	110	-1.8
-380	-1.2	120	-1.6
-370	-1.2	130	-1.5
-360	-1.2	140	-1.4
-350	-1.2	150	-1.4
-340	-1.3	160	-1.5
-330	-1.3	170	-1.4
-320	-1.3	180	-1.4
-310	-1.3	190	-1.4
-300	-1.3	200	-1.5
-290	-1.3	210	-1.5
-280	-1.3	220	-1.4
-270	-1.3	230	-1.3
-260	-1.3	240	-1.2
-250	-1.3	250	-1.1
-240	-1.3	260	-1.1
-230	-1.3	270	-1.3
-220	-1.3	280	-1.3
-210	-1.3	290	-1.2

Pre-Crash Data -5.0 to -0.5 sec (Event Record 2)

Times (sec)	Accelerator Pedal, % Full (Accelerator Pedal Position)	Service Brake (Brake Switch Circuit State)	Engine RPM (Engine Speed)	Engine Throttle, % Full (Throttle Position)	Speed, Vehicle Indicated (Vehicle Speed) (MPH [km/h])
-5.0	99	Off	5888	99	122 [196]
-4.5	99	Off	5888	99	124 [199]
-4.0	99	Off	6400	99	134 [215]
-3.5	0	Off	5824	23	123 [198]
-3.0	0	On	4736	19	100 [161]
-2.5	0	Off	3456	16	74 [119]
-2.0	0	On	2752	12	58 [93]
-1.5	0	On	2432	12	52 [84]
-1.0	0	Off	2304	12	49 [79]
-0.5	0	Off	1984	12	42 [67]

Pre-Crash Data -2.0 to -0.5 sec (Event Record 2)

Times (sec)	Cruise Control Active	Cruise Control Resume Switch Active	Cruise Control Set Switch Active	Engine Torque (lb-ft [N-m])	Reduced Engine Power Mode Indicator
-2.0	No	No	No	-22 [-30]	Off
-1.5	No	No	No	-32 [-44]	Off
-1.0	No	No	No	-42 [-56]	Off
-0.5	No	No	No	-48 [-64]	Off

System Status at Event (Event Record 3)

Event Record Type	Deployment
OnStar Deployment Status Data Sent	No
Complete file recorded (Event Recording Complete)	Yes
Crash Record Locked	Yes
OnStar SDM Recorded Vehicle Velocity Change Data Sent	No
Deployment Event Counter	3
Multi-Event, Number of Events (Event Counter)	3
OnStar Notification Event Counter	3
Time From Event 1 to 2 (Time Between Events) (seconds)	0.55
Ignition Cycle, Crash (Ignition Cycles at Event)	5848
Algorithm Active: Frontal	Yes
Algorithm Active: Side	Yes
Algorithm Active: Rollover	No
Algorithm Active: Rear	Yes
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	No
Event Severity Status: Right Side	Yes
Event Severity Status: Rear	Yes
Event Severity Status: Rollover	No
Safety Belt Status, Driver (Driver Belt Switch Circuit Status)	Buckled
Safety Belt Status, Right Front Passenger (Passenger Belt Switch Circuit Status)	Buckled
Center Front Row Belt Switch Circuit Status (If Equipped)	Data Not Available
Left Row 3 Belt Switch Circuit Status (If Equipped)	Data Not Available
Center Row 3 Belt Switch Circuit Status (If Equipped)	Data Not Available
Right Row 3 Belt Switch Circuit Status (If Equipped)	Data Not Available
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 (Small 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)	655330
Number of Ignition Cycles SIR Warning Lamp was ON/OFF Continuously	5848
Ignition Cycles Since DTCs Were Last Cleared 0.5 Seconds Prior to Time Zero	216
Maximum Delta-V, Longitudinal (Maximum Longitudinal SDM Recorded Vehicle Velocity Change for FSR Event) MPH [km/h]	27 [44]
Time, Maximum Delta-V (Time From FSR Time Zero to Maximum Longitudinal SDM Recorded Vehicle Velocity Change)(msec)	278
Maximum Delta-V, Lateral (Maximum Lateral SDM Recorded Vehicle Velocity Change for FSR Event) MPH [km/h]	-20 [-32]
Time Maximum Delta-V, Lateral (Time From FSR Time Zero to Maximum Lateral SDM Recorded Vehicle Velocity Change)(msec)	196

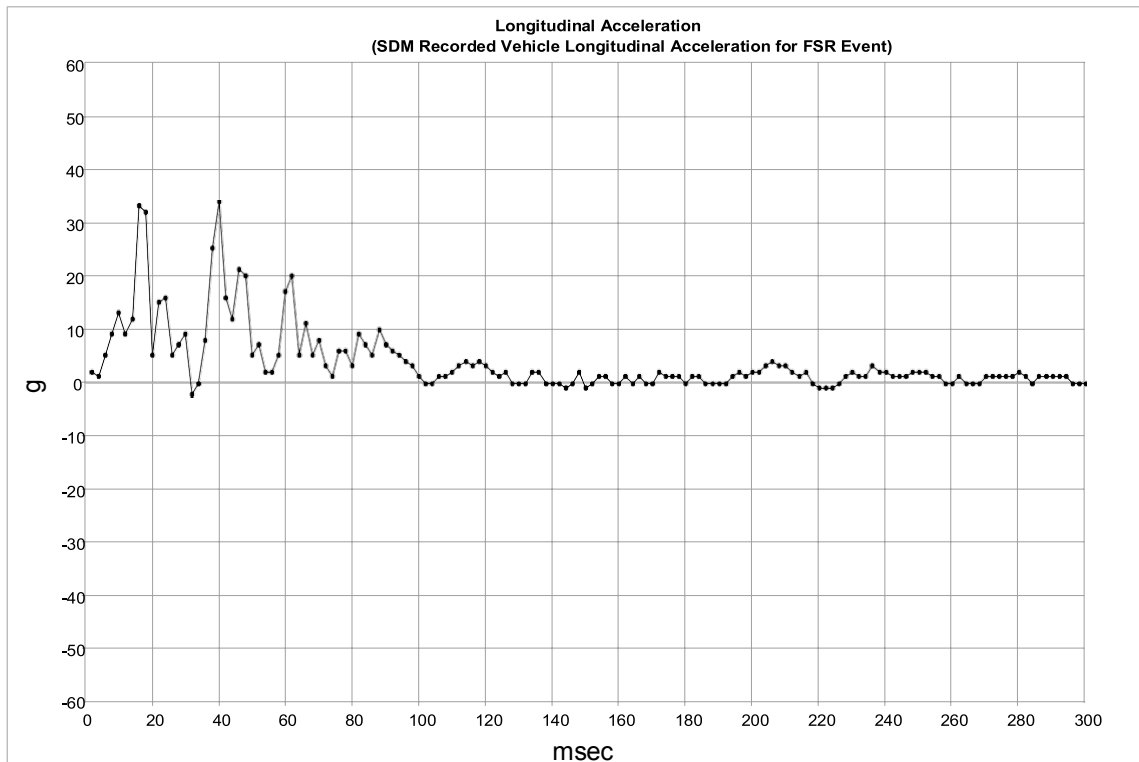
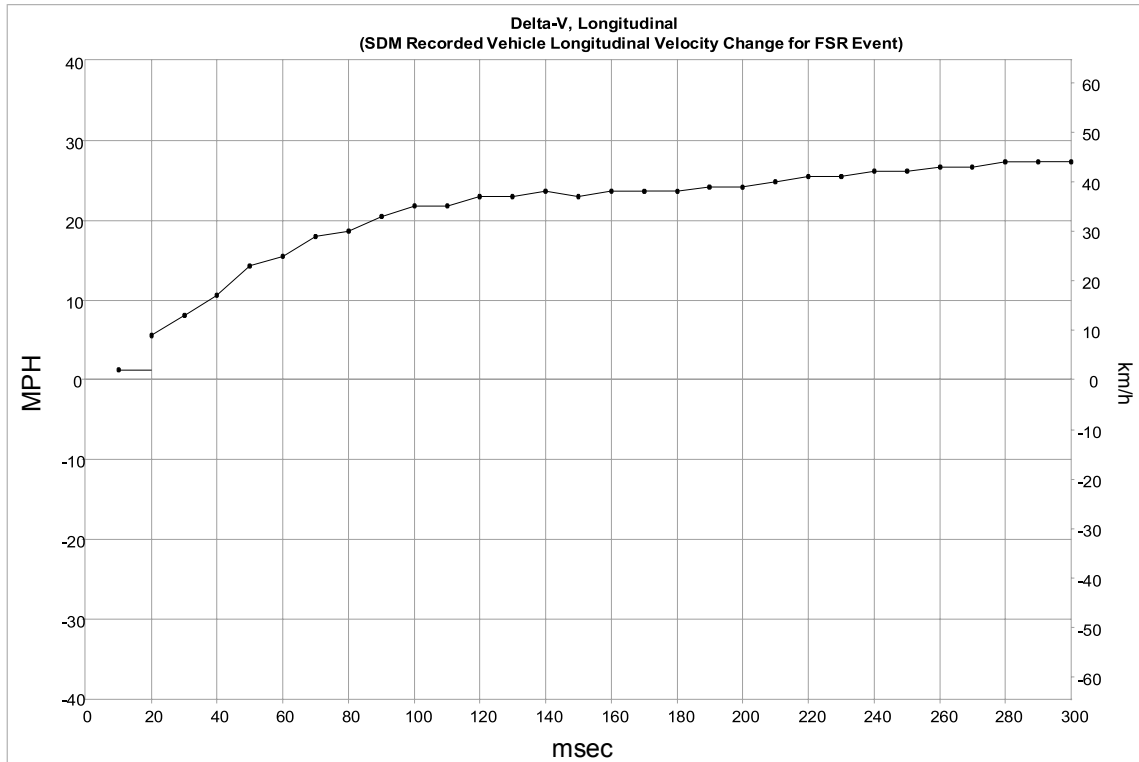
DTCs Present at Time of Event (Event Record 3)

B0052-00

Event Data (Event Record 3)

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	No
Passenger Pretensioner Deployment Loop #1 Commanded	No
Driver Thorax Loop Commanded	No
Passenger Thorax Loop Commanded	Yes
Left Row 1 Roof Rail/Head Curtain Loop Commanded	No
Right Row 1 Roof Rail/Head Curtain Loop Commanded	No
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 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 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, Right Front Passenger (Passenger 2nd Stage Time From Time Zero to Deployment Command Criteria Met) (msec)	Data Not Available
Side air bag deployment, time to deploy, driver (Driver Thorax/Curtain Time From Time Zero to Deployment Command Criteria Met) (msec)	Data Not Available
Side air bag deployment, time to deploy, right front passenger (Passenger Thorax/Curtain Time From Time Zero to Deployment Command Criteria Met) (msec)	0
Pretensioner Deployment, Time to Fire, Driver (Driver Pretensioner Time From Time Zero to Deployment Loop #1 or Loop #2 Command Criteria Met) (msec)	Data Not Available
Pretensioner Deployment, Time to Fire, Right Front Passenger (Passenger Pretensioner Time From Time Zero to Deployment Loop #1 or Loop #2 Command Criteria Met) (msec)	Data Not Available

Longitudinal Crash Pulse (Event Record 3)



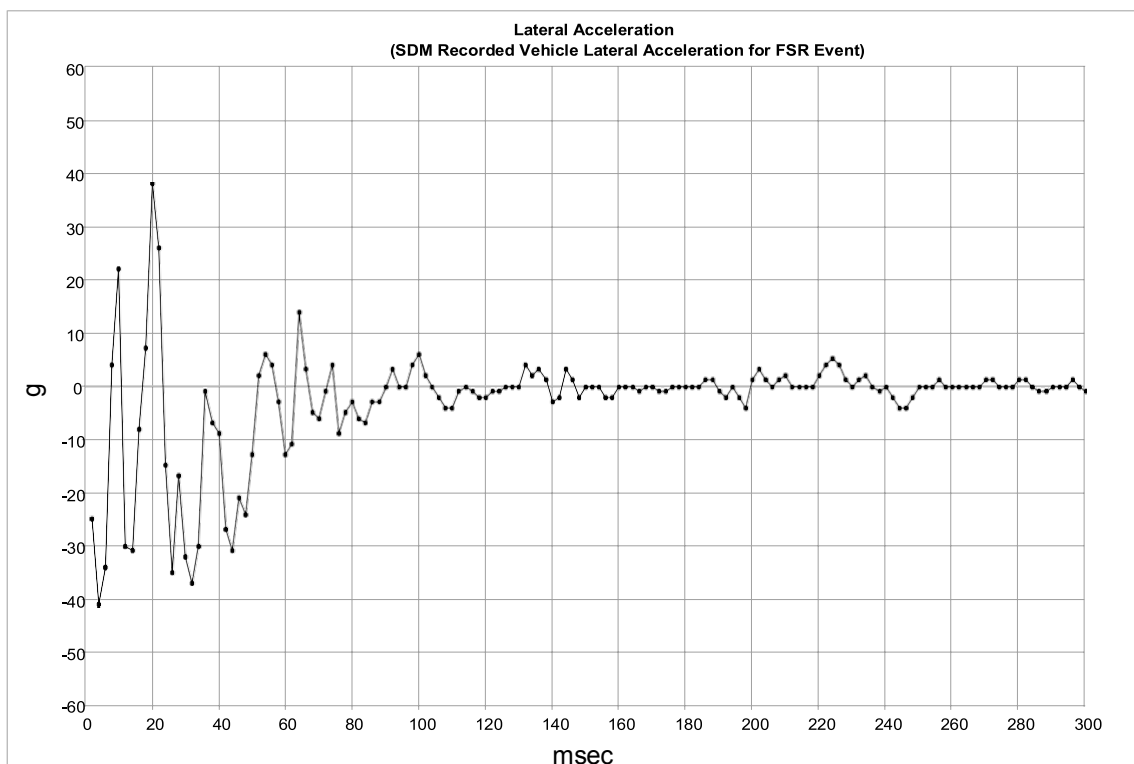
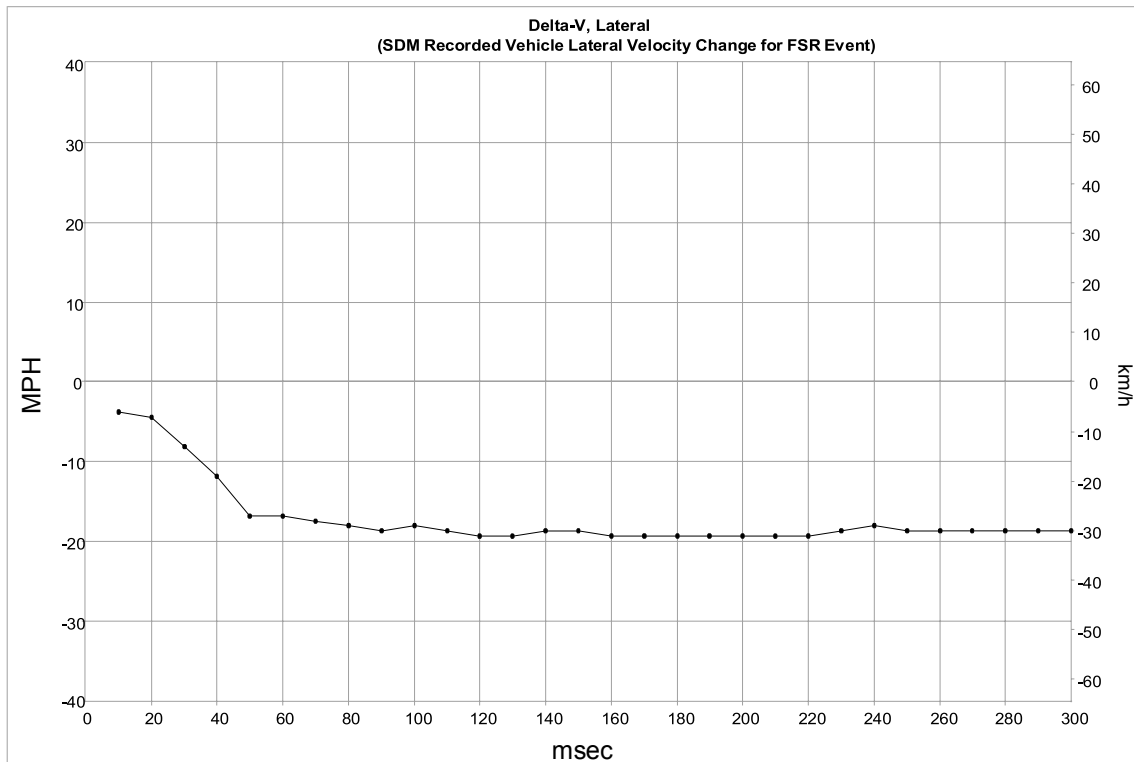
Longitudinal Crash Pulse (Event Record 3)

Time (msec)	Delta-V, Longitudinal (SDM Recorded Vehicle Longitudinal Velocity Change for FSR Event) (MPH)	Delta-V, Longitudinal (SDM Recorded Vehicle Longitudinal Velocity Change for FSR Event) (km/h)
10	1.2	2.0
20	5.6	9.0
30	8.1	13.0
40	10.6	17.0
50	14.3	23.0
60	15.5	25.0
70	18.0	29.0
80	18.6	30.0
90	20.5	33.0
100	21.7	35.0
110	21.7	35.0
120	23.0	37.0
130	23.0	37.0
140	23.6	38.0
150	23.0	37.0
160	23.6	38.0
170	23.6	38.0
180	23.6	38.0
190	24.2	39.0
200	24.2	39.0
210	24.9	40.0
220	25.5	41.0
230	25.5	41.0
240	26.1	42.0
250	26.1	42.0
260	26.7	43.0
270	26.7	43.0
280	27.3	44.0
290	27.3	44.0
300	27.3	44.0

Longitudinal Crash Pulse (Event Record 3)

Time (msec)	Longitudinal Acceleration (SDM Recorded Vehicle Longitudinal Acceleration for FSR Event) (g)	Time (msec)	Longitudinal Acceleration (SDM Recorded Vehicle Longitudinal Acceleration for FSR Event) (g)	Time (msec)	Longitudinal Acceleration (SDM Recorded Vehicle Longitudinal Acceleration for FSR Event) (g)
2	1.8	102	-0.2	202	1.8
4	1.0	104	-0.2	204	3.0
6	5.0	106	1.0	206	3.8
8	9.0	108	1.0	208	3.0
10	13.0	110	1.8	210	3.0
12	9.0	112	3.0	212	1.8
14	11.8	114	3.8	214	1.0
16	33.0	116	3.0	216	1.8
18	31.8	118	3.8	218	-0.2
20	5.0	120	3.0	220	-1.0
22	15.0	122	1.8	222	-1.0
24	15.8	124	1.0	224	-1.0
26	5.0	126	1.8	226	-0.2
28	7.0	128	-0.2	228	1.0
30	9.0	130	-0.2	230	1.8
32	-2.2	132	-0.2	232	1.0
34	-0.2	134	1.8	234	1.0
36	7.8	136	1.8	236	3.0
38	25.0	138	-0.2	238	1.8
40	33.8	140	-0.2	240	1.8
42	15.8	142	-0.2	242	1.0
44	11.8	144	-1.0	244	1.0
46	21.0	146	-0.2	246	1.0
48	19.8	148	1.8	248	1.8
50	5.0	150	-1.0	250	1.8
52	7.0	152	-0.2	252	1.8
54	1.8	154	1.0	254	1.0
56	1.8	156	1.0	256	1.0
58	5.0	158	-0.2	258	-0.2
60	17.0	160	-0.2	260	-0.2
62	19.8	162	1.0	262	1.0
64	5.0	164	-0.2	264	-0.2
66	11.0	166	1.0	266	-0.2
68	5.0	168	-0.2	268	-0.2
70	7.8	170	-0.2	270	1.0
72	3.0	172	1.8	272	1.0
74	1.0	174	1.0	274	1.0
76	5.8	176	1.0	276	1.0
78	5.8	178	1.0	278	1.0
80	3.0	180	-0.2	280	1.8
82	9.0	182	1.0	282	1.0
84	7.0	184	1.0	284	-0.2
86	5.0	186	-0.2	286	1.0
88	9.8	188	-0.2	288	1.0
90	7.0	190	-0.2	290	1.0
92	5.8	192	-0.2	292	1.0
94	5.0	194	1.0	294	1.0
96	3.8	196	1.8	296	-0.2
98	3.0	198	1.0	298	-0.2
100	1.0	200	1.8	300	-0.2

Lateral Crash Pulse (Event Record 3)



Lateral Crash Pulse (Event Record 3)

Time (msec)	Delta-V, Lateral (SDM Recorded Vehicle Lateral Velocity Change for FSR Event) (MPH)	Delta-V, Lateral (SDM Recorded Vehicle Lateral Velocity Change for FSR Event) (km/h)
10	-3.7	-6.0
20	-4.3	-7.0
30	-8.1	-13.0
40	-11.8	-19.0
50	-16.8	-27.0
60	-16.8	-27.0
70	-17.4	-28.0
80	-18.0	-29.0
90	-18.6	-30.0
100	-18.0	-29.0
110	-18.6	-30.0
120	-19.3	-31.0
130	-19.3	-31.0
140	-18.6	-30.0
150	-18.6	-30.0
160	-19.3	-31.0
170	-19.3	-31.0
180	-19.3	-31.0
190	-19.3	-31.0
200	-19.3	-31.0
210	-19.3	-31.0
220	-19.3	-31.0
230	-18.6	-30.0
240	-18.0	-29.0
250	-18.6	-30.0
260	-18.6	-30.0
270	-18.6	-30.0
280	-18.6	-30.0
290	-18.6	-30.0
300	-18.6	-30.0

Lateral Crash Pulse (Event Record 3)

Time (msec)	Lateral Acceleration (SDM Recorded Vehicle Lateral Acceleration for FSR Event) (g)	Time (msec)	Lateral Acceleration (SDM Recorded Vehicle Lateral Acceleration for FSR Event) (g)	Time (msec)	Lateral Acceleration (SDM Recorded Vehicle Lateral Acceleration for FSR Event) (g)
2	-25.0	102	1.8	202	3.0
4	-41.0	104	-0.2	204	1.0
6	-34.2	106	-2.2	206	-0.2
8	3.8	108	-4.2	208	1.0
10	21.8	110	-4.2	210	1.8
12	-30.2	112	-1.0	212	-0.2
14	-31.0	114	-0.2	214	-0.2
16	-8.2	116	-1.0	216	-0.2
18	7.0	118	-2.2	218	-0.2
20	37.8	120	-2.2	220	1.8
22	25.8	122	-1.0	222	3.8
24	-15.0	124	-1.0	224	5.0
26	-35.0	126	-0.2	226	3.8
28	-17.0	128	-0.2	228	1.0
30	-32.2	130	-0.2	230	-0.2
32	-37.0	132	3.8	232	1.0
34	-30.2	134	1.8	234	1.8
36	-1.0	136	3.0	236	-0.2
38	-7.0	138	1.0	238	-1.0
40	-9.0	140	-3.0	240	-0.2
42	-27.0	142	-2.2	242	-2.2
44	-31.0	144	3.0	244	-4.2
46	-21.0	146	1.0	246	-4.2
48	-24.2	148	-2.2	248	-2.2
50	-13.0	150	-0.2	250	-0.2
52	1.8	152	-0.2	252	-0.2
54	5.8	154	-0.2	254	-0.2
56	3.8	156	-2.2	256	1.0
58	-3.0	158	-2.2	258	-0.2
60	-13.0	160	-0.2	260	-0.2
62	-11.0	162	-0.2	262	-0.2
64	13.8	164	-0.2	264	-0.2
66	3.0	166	-1.0	266	-0.2
68	-5.0	168	-0.2	268	-0.2
70	-6.2	170	-0.2	270	1.0
72	-1.0	172	-1.0	272	1.0
74	3.8	174	-1.0	274	-0.2
76	-9.0	176	-0.2	276	-0.2
78	-5.0	178	-0.2	278	-0.2
80	-3.0	180	-0.2	280	1.0
82	-6.2	182	-0.2	282	1.0
84	-7.0	184	-0.2	284	-0.2
86	-3.0	186	1.0	286	-1.0
88	-3.0	188	1.0	288	-1.0
90	-0.2	190	-1.0	290	-0.2
92	3.0	192	-2.2	292	-0.2
94	-0.2	194	-0.2	294	-0.2
96	-0.2	196	-2.2	296	1.0
98	3.8	198	-4.2	298	-0.2
100	5.8	200	1.0	300	-1.0

Rollover Crash Pulse (Event Record 3) SDM Recorded Vehicle Roll Rate

Contains No Recorded Data

Rollover Crash Pulse (Event Record 3) Lateral Acceleration (SDM Recorded Vehicle Lateral Acceleration for Rollover Event)

Contains No Recorded Data

**Vertical Crash Pulse (Event Record 3)
Normal Acceleration (SDM Recorded Vehicle Vertical Acceleration for
Rollover Event)**

Contains No Recorded Data

Pre-Crash Data -5.0 to -0.5 sec (Event Record 3)

Times (sec)	Accelerator Pedal, % Full (Accelerator Pedal Position)	Service Brake (Brake Switch Circuit State)	Engine RPM (Engine Speed)	Engine Throttle, % Full (Throttle Position)	Speed, Vehicle Indicated (Vehicle Speed) (MPH [km/h])
-5.0	99	Off	5888	99	124 [199]
-4.5	99	Off	6400	99	134 [215]
-4.0	0	Off	5824	23	123 [198]
-3.5	0	On	4736	19	100 [161]
-3.0	0	Off	3456	16	74 [119]
-2.5	0	On	2752	12	58 [93]
-2.0	0	On	2432	12	52 [84]
-1.5	0	Off	2304	12	49 [79]
-1.0	0	Off	1984	12	42 [67]
-0.5	Data Not Available	Off	Data Not Available	25	Data Not Available

Pre-Crash Data -2.0 to -0.5 sec (Event Record 3)

Times (sec)	Cruise Control Active	Cruise Control Resume Switch Active	Cruise Control Set Switch Active	Engine Torque (lb-ft [N-m])	Reduced Engine Power Mode Indicator
-2.0	No	No	No	-32 [-44]	Off
-1.5	No	No	No	-42 [-56]	Off
-1.0	No	No	No	-48 [-64]	Off
-0.5	No	No	No	Data Not Available	Off

Hexadecimal Data

DPID \$11
FC F0 00 F0 C4 7C 00

DPID \$15
01 02 03 04 05 06 00

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

DPID \$17
00 00 00 00 00 00 00

DPID \$32
00 F9 16 F9 00 00 00

DPID \$35
78 00 00 00 00 00 00

DID \$01
41 55 32 33 34 31 54 36 4A 4A 35 54 51 46 38 4E

DID \$03
41 54 32 33 34 31 54 4D 4C 52 32 4C 51 4E 38 4E

DID \$05
41 48 32 33 34 30 54 38 47 30 37 45 49 33 38 4C

DID \$07
41 4A 32 33 34 30 54 38 47 4D 33 32 41 33 38 4C

DID \$09
30 30 30 30 30 30 54 30 30 30 30 30 30 30 30

DID \$0B
30 30 30 30 30 30 54 30 30 30 30 30 30 30 30

DID \$0D
30 30 30 30 30 30 54 30 30 30 30 30 30 30 30

DID \$0F
30 30 30 30 30 30 54 30 30 30 30 30 30 30 30

DID \$30
03 00 03 03

DID \$90
32 47 31 46 4A 31 45 57 38 46 39 2A 2A 2A 2A 2A

DID \$9A
03 01

DID \$B4
41 53 32 34 30 37 54 31 35 31 33 37 33 30 33 39

DID \$C1
00 CF 67 54

DID \$C2
01 5E 81 0B

DID \$C3

00 CF 2D 8A

DID \$CB

00 CF 67 57

DID \$31

```
0000 A5 F0 01 00 01 01 0B 16 D8 FF
0010 FF 00 FF FF 0E EB 03 00 00 00
0020 5C FC FC 30 20 60 C0 40 00 00
0030 00 00 00 00 00 63 63 63 05 10
0040 00 00 00 00 00 1F 24 26 2B 36
0050 4A 5B 64 5C 5C 06 1F 06 2F 06
0060 48 06 63 0C 0C 0C 0C 10 13 17
0070 63 63 63 43 4F 54 5D 77 A1 C6
0080 D7 C7 C4 00 FF FD 16 D8 D8 FF
0090 FF FF FF FF FF FF FF FF FF FF
0100 FF FF FF FF FF FF FF FF FF FF
0110 FF FF FF 80 52 00 53 62 8A 40
0120 3A 47 3A 47 47 47 3A 3A 7E 7F
0130 7E 7F 7B 80 79 83 76 84 72 83
0140 6D 85 6B 85 68 85 64 86 62 88
0150 5D 89 5A 8A 58 8A 56 89 56 8A
0160 55 89 54 89 54 89 53 89 53 89
0170 53 8A 53 8A 53 8A 53 8A 53 8A
0180 53 8A 53 8A 53 8A 53 8A 75 7F
0190 7A 7F 7D 7D 7A 82 7F 87 69 8C
0200 7D 93 7F 78 84 78 91 7A 89 87
0210 6B 89 69 7F 55 98 70 70 6E 93
0220 84 7F 82 7D 5C AC 55 98 7F 82
0230 7D 7A 7F 7A 55 91 57 98 5A 75
0240 6B 7F 5A 7F 66 7F 6B 87 55 8E
0250 4D 93 66 78 5A 87 7F 82 7D 78
0260 6E 7A 73 98 70 91 69 6B 6B 78
0270 70 8E 69 7F 69 89 61 7F 5F 82
0280 75 7A 73 91 75 8E 48 7F 52 87
0290 73 96 64 84 87 89 7D 84 66 82
0300 5A 7F 5C 91 5C 84 66 87 66 78
0310 64 87 75 7F 6E 87 70 98 84 7D
0320 73 7F 69 87 6B 7F 6B 7A 6E 75
0330 70 7A 66 87 75 78 73 7F 7A 7D
0340 91 7F 8C 8C 75 70 78 93 7A 7F
0350 7A 7A 7A 84 7A 78 7D 7A 7F 84
0360 78 7A 73 7F 7A 7D 78 7D 7A 78
0370 7A 7F 7F 7D 7F 7F 7F 82 7D 7F
0380 7F 82 7A 7A 7D 87 7F 7F 7F 7F
0390 7F 84 7F 7F 7F 7F 7A 7F 7F 87
0400 7F 7F 7D 82 7F 7F 7D 82 7F 7F
0410 7F 7F 7F 7F 7F 7F 7F 7F 7D 7F
0420 7F 7F 7F 7F 7F 7F 7F 7F 7F 82
0430 7F 7F 7F 7F 7F 7F 7F 7F 7F 7F
0440 7F 7F 7F 7F 7F 7F 7F 7D 7F 7F
0450 7F 7F 7F 7F 7F 7F 7F 7F 7F 7F
0460 7F 7F 7F 7F 7F 7F 7F 7F 7F 7F
0470 7F 7F 7F 7F 7F 7F 7F 7F 7F 7F
0480 7F 7F 7F 7F 7F 7F 7F 7F FF FF
0490 FF FF FF FF FF FF FF FF FF FF
0500 FF FF FF FF FF FF FF FF FF FF
0510 FF FF FF FF FF FF FF FF FF FF
0520 FF FF FF FF FF FF FF FF FF FF
0530 FF FF FF FF FF FF FF FF FF FF
0540 FF FF FF FF FF FF FF FF FF FF
0550 FF FF FF FF FF FF FF FF FF FF
0560 FF FF FF FF FF FF FF FF FF FF
0570 FF FF FF FF FF FF FF FF FF FF
```

```
0580 FF FF FF FF FF FF FF FF FF FF
0590 FF FF FF FF FF FF FF FF FF FF
0600 FF FF FF FF FF FF FF FF FF FF
0610 FF FF FF FF FF FF FF FF FF FF
0620 FF FF FF FF FF FF FF FF FF FF
0630 FF FF FF FF FF FF FF FF FF FF
0640 FF FF FF FF FF FF FF FF FF FF
0650 FF FF FF FF FF FF FF FF FF FF
0660 FF FF FF FF FF FF FF FF FF FF
0670 FF FF FF FF FF FF FF FF FF FF
0680 FF FF FF FF FF FF FF FF FF FF
0690 FF FF FF FF FF FF FF FF FF FF
0700 FF FF FF FF FF FF FF FF FF FF
0710 FF FF FF FF FF FF FF FF FF FF
0720 FF FF FF FF FF FF FF FF FF FF
0730 FF FF FF FF FF FF FF FF FF FF
0740 FF FF FF FF FF FF FF FF FF FF
0750 FF FF FF FF FF FF FF FF FF FF
0760 FF FF FF FF FF FF FF FF FF FF
0770 FF FF FF FF FF FF FF FF FF FF
0780 FF FF FF FF FF FF FF FF 00 00
0790 00 00 00 00 00 00 00 0B 00 0B
0800 00 00 7C 00 21 08 40 00 00 00
0810 00 19 05 00 00 00 00 2E 01 00
0820 00 00 00 00 07 00 5D 24 0D 8E
0830 AA 99 4D 01 E6 21 F8 10 03 FE
0840 0A 00 06 F1 06 FE FD E6 04 FC
0850 07 01 FB ED ED E3 F2 0A 0C FD
0860 CF FE FD FB F8 27 19 19 04 FE
0870 FF 0D 30 1E 09 FA 15 4E 0B 3E
0880 01 06 1F 10 1E F0 02 02 09 10
0890 F2 3E F7 03 FF 11 FA E2 03 00
0900 FB DF 09 13 04 09 EC 50 FE 52
0910 02 04 16 5F 0B 28 08 F3 F7 10
0920 04 F8 0C 0A 0B 03 07 F7 09 16
0930 F5 EB 1A 08 F4 06 27 36 0D 49
0940 01 F8 0F 47 0C 3F 15 02 28 1B
0950 38 1B 15 0E 22 0D 0D 1C 09 0D
0960 24 29 2F 21 04 FE 20 1D 18 15
0970 1C 01 1E 1A FE 20 EE 0C 0F 37
0980 28 3F 0A F3 2E 51 0D 3C 09 F9
0990 03 10 41 14 11 12 4F 34 EE 29
1000 02 00 FA 0E FE FA 0F FA FE FA
1010 1C FB 11 01 17 0B F2 27 FE 22
1020 2F 02 1C 0D 00 21 16 18 0C 25
1030 1F 1C 1C 26 0F 05 FA 21 FB 1D
1040 3A 37 25 36 F8 26 16 24 EC 02
1050 FF FF FF FF FF FF FF FF FF FF
1060 FF FF FF FF FF FF FF FF FF FF
1070 FF FF FF FF FF FF FF FF FF FF
1080 FF FF FF FF FF FF FF FF FF FF
1090 FF FF FF FF FF FF FF FF FF FF
1100 FF FF FF FF FF FF FF FF FF FF
1110 FF FF FF FF FF FF FF FF FF FF
1120 FF FF FF FF FF FF FF FF FF FF
1130 FF FF FF FF FF FF FF FF FF FF
1140 FF FF FF FF FF FF FF FF FF FF
1150 FF FF FF FF FF FF FF FF FF FF
1160 FF FF FF FF FF FF FF FF FF FF
1170 FF FF FF FF FF FF FF FF FF FF
1180 FF FF FF FF FF FF FF FF FF FF
1190 FF FF FF FF FF FF FF FF FF FF
1200 FF
```

DID \$32

```
0000 A5 D0 02 00 02 02 04 16 D8 00
0010 0B 00 FF FF 80 00 00 00 00 00
0020 5C FC FC 30 20 60 C0 40 00 00
0030 00 00 00 00 00 63 63 63 05 10
0040 00 00 00 00 00 1F 24 26 2B 36
0050 4A 5B 64 5C 5C 06 1F 06 2F 06
0060 48 06 63 0C 0C 0C 0C 10 13 17
0070 63 63 63 43 4F 54 5D 77 A1 C6
0080 D7 C7 C4 00 FF FD 16 D8 D8 FF
0090 FF FF FF FF FF FF FF FF FF FF
0100 FF FF FF FF FF FF FF FF FF FF
0110 FF FF FF FF FF FF FF FF FF FF
0120 FF FF FF FF FF FF FF FF FF FF
0130 FF FF FF FF FF FF FF FF FF FF
0140 FF FF FF FF FF FF FF FF FF FF
0150 FF FF FF FF FF FF FF FF FF FF
0160 FF FF FF FF FF FF FF FF FF FF
0170 FF FF FF FF FF FF FF FF FF FF
0180 FF FF FF FF FF FF FF FF FF FF
0190 FF FF FF FF FF FF FF FF FF FF
0200 FF FF FF FF FF FF FF FF FF FF
0210 FF FF FF FF FF FF FF FF FF FF
0220 FF FF FF FF FF FF FF FF FF FF
0230 FF FF FF FF FF FF FF FF FF FF
0240 FF FF FF FF FF FF FF FF FF FF
0250 FF FF FF FF FF FF FF FF FF FF
0260 FF FF FF FF FF FF FF FF FF FF
0270 FF FF FF FF FF FF FF FF FF FF
0280 FF FF FF FF FF FF FF FF FF FF
0290 FF FF FF FF FF FF FF FF FF FF
0300 FF FF FF FF FF FF FF FF FF FF
0310 FF FF FF FF FF FF FF FF FF FF
0320 FF FF FF FF FF FF FF FF FF FF
0330 FF FF FF FF FF FF FF FF FF FF
0340 FF FF FF FF FF FF FF FF FF FF
0350 FF FF FF FF FF FF FF FF FF FF
0360 FF FF FF FF FF FF FF FF FF FF
0370 FF FF FF FF FF FF FF FF FF FF
0380 FF FF FF FF FF FF FF FF FF FF
0390 FF FF FF FF FF FF FF FF FF FF
0400 FF FF FF FF FF FF FF FF FF FF
0410 FF FF FF FF FF FF FF FF FF FF
0420 FF FF FF FF FF FF FF FF FF FF
0430 FF FF FF FF FF FF FF FF FF FF
0440 FF FF FF FF FF FF FF FF FF FF
0450 FF FF FF FF FF FF FF FF FF FF
0460 FF FF FF FF FF FF FF FF FF FF
0470 FF FF FF FF FF FF FF FF FF FF
0480 FF FF FF FF FF FF FF FF 7B 7E
0490 73 7A 7E 73 79 7D 73 78 7E 72
0500 78 7E 72 78 7E 72 78 7E 72 78
0510 7E 72 77 7E 72 77 7E 72 77 7E
0520 72 76 7E 72 76 7E 72 76 7E 72
0530 76 7E 71 76 7E 71 75 7E 71 75
0540 7E 71 75 7E 71 74 7E 71 74 7E
0550 71 73 7E 71 73 7E 71 73 7E 71
0560 73 7D 71 72 7D 71 72 7D 71 71
0570 7D 71 71 7D 71 71 7D 71 70 7D
0580 71 70 7D 71 6F 7D 71 6F 7D 71
0590 6E 7E 71 6E 7E 71 6D 7E 70 6D
0600 7E 70 6D 7E 70 6C 7D 70 6C 7D
0610 70 6B 7D 70 6B 7D 70 6A 7D 70
0620 6A 7D 70 69 7D 70 69 7D 70 68
0630 7D 70 68 7D 70 68 7D 70 67 7D
```

```
0640 70 66 7D 70 66 7D 70 66 7E 70
0650 65 7E 70 65 7E 70 64 7E 70 64
0660 7E 70 63 7F 70 63 81 70 63 7F
0670 78 65 82 77 6C 89 7C 6F 88 78
0680 6D 86 7B 76 88 7A 7E 84 7C 7E
0690 89 7A 7E 8A 79 7E 90 76 74 90
0700 75 6F 91 73 6C 8B 76 5C 85 75
0710 4D 86 78 49 81 75 3A 7C 74 2B
0720 7B 73 25 7E 73 29 80 6F 2D 81
0730 6C 2E 82 6B 2C 82 6D 27 82 6E
0740 24 80 6F 1F 7E 6F 1B 7B 6E 17
0750 7B 6F 13 7B 6F 14 7B 6F 18 7C
0760 6E 1A 7C 6E 1A 7C 6F 1A 7C 70
0770 19 7C 71 17 7B 72 16 7B 72 16
0780 7C 70 16 7C 70 17 7C 71 80 24
0790 00 00 04 00 00 07 00 00 00 00
0800 00 00 00 00 17 02 32 00 00 00
0810 EB FF 68 FF CF FF C3 FF F1 FF
0820 00 B1 D9 F6 9C DF FE 00 00 00
0830 00 0B 04 73 05 D6 05 00 00 00
0840 00 00 00 BF 25 00 00 00 21 00
0850 00 00 00 00 00 00 00 2B 02 00
0860 00 00 00 BD FF 55 FE 5E FE 25
0870 FF D3 FF 00 07 03 FB D5 D4 FE
0880 5D 41 5D 01 3E 00 00 00 00 00
0890 00 00 00 00 00 00 00 00 00 00
0900 00 00 00 00 00 00 00 00 00 00
0910 00 00 00 00 00 00 00 00 00 00
0920 00 00 00 00 00 00 00 00 00 00
0930 00 00 00 00 00 00 00 00 00 00
0940 00 00 00 00 00 00 00 00 00 00
0950 00 00 00 00 00 00 00 00 00 00
0960 00 00 00 00 00 00 00 00 00 00
0970 00 00 00 00 00 00 00 00 00 00
0980 00 00 00 00 00 00 00 00 00 00
0990 00 00 00 00 00 00 00 00 00 00
1000 00 00 00 00 00 00 00 00 00 00
1010 00 00 00 00 00 00 00 00 00 00
1020 00 00 00 00 00 00 00 00 00 00
1030 00 00 00 00 00 00 00 00 00 00
1040 00 00 00 00 00 00 00 00 00 00
1050 FF FF FF FF FF FF FF FF FF FF
1060 FF FF FF FF FF FF FF FF FF FF
1070 FF FF FF FF FF FF FF FF FF FF
1080 FF FF FF FF FF FF FF FF FF FF
1090 FF FF FF FF FF FF FF FF FF FF
1100 FF FF FF FF FF FF FF FF FF FF
1110 FF FF FF FF FF FF FF FF FF FF
1120 FF FF FF FF FF FF FF FF FF FF
1130 FF FF FF FF FF FF FF FF FF FF
1140 FF FF FF FF FF FF FF FF FF FF
1150 FF FF FF FF FF FF FF FF FF FF
1160 FF FF FF FF FF FF FF FF FF FF
1170 FF FF FF FF FF FF FF FF FF FF
1180 FF FF FF FF FF FF FF FF FF FF
1190 FF FF FF FF FF FF FF FF FF FF
1200 FF
```

DID \$33

```
0000 A5 C0 03 00 03 03 0B 16 D8 00
0010 37 00 FF FF 60 00 10 00 00 00
0020 5C FC FC 30 20 60 C0 40 FF 00
0030 00 00 00 00 00 00 63 63 01 44
0040 00 00 00 00 00 FF 1F 24 26 2B
```

```
0050 36 4A 5B 64 5C 0F FF 06 1F 06
0060 2F 06 48 19 0C 0C 0C 0C 10 13
0070 17 63 63 FF 43 4F 54 5D 77 A1
0080 C6 D7 C7 00 FF FD 16 D8 D8 FF
0090 FF FF FF FF FF FF FF FF FF FF
0100 FF FF FF FF FF FF FF FF FF FF
0110 FF FF FF 80 52 00 AB 8B 5F 62
0120 FF FF FF FF FF 00 FF FF 81 79
0130 88 78 8C 72 90 6C 96 64 98 64
0140 9C 63 9D 62 A0 61 A2 62 A2 61
0150 A4 60 A4 60 A5 61 A4 61 A5 60
0160 A5 60 A5 60 A6 60 A6 60 A7 60
0170 A8 60 A8 61 A9 62 A9 61 AA 61
0180 AA 61 AB 61 AB 61 AB 61 84 41
0190 82 19 8C 2A 96 89 A0 B6 96 34
0200 9D 32 D2 6B CF 91 8C DE A5 C0
0210 A7 5A 8C 28 91 55 96 2F 7A 23
0220 7F 34 93 7D BE 6E D4 69 A7 3C
0230 9D 32 B4 4B B1 43 8C 5F 91 84
0240 84 8E 84 89 8C 78 AA 5F B1 64
0250 8C A2 9B 87 8C 73 93 70 87 7D
0260 82 89 8E 69 8E 73 87 78 96 70
0270 91 6E 8C 78 98 78 91 7F 8E 87
0280 8C 7F 89 7F 87 89 82 8E 7F 84
0290 7F 7F 82 7A 82 75 84 75 87 7D
0300 89 7F 87 7D 89 7A 87 7A 84 7D
0310 82 7D 84 7F 7F 7F 7F 7F 7F 89
0320 84 84 84 87 7F 82 7F 78 7F 7A
0330 7D 87 7F 82 84 7A 7D 7F 7F 7F
0340 82 7F 82 7A 7F 7A 7F 7F 82 7F
0350 7F 7F 82 7D 7F 7F 7F 7F 84 7D
0360 82 7D 82 7F 82 7F 7F 7F 82 7F
0370 82 7F 7F 82 7F 82 7F 7D 7F 7A
0380 82 7F 84 7A 82 75 84 82 84 87
0390 87 82 89 7F 87 82 87 84 84 7F
0400 82 7F 84 7F 7F 7F 7D 84 7D 89
0410 7D 8C 7F 89 82 82 84 7F 82 82
0420 82 84 87 7F 84 7D 84 7F 82 7A
0430 82 75 82 75 84 7A 84 7F 84 7F
0440 82 7F 82 82 7F 7F 7F 7F 82 7F
0450 7F 7F 7F 7F 7F 7F 82 82 82 82
0460 82 7F 82 7F 82 7F 84 82 82 82
0470 7F 7F 82 7D 82 7D 82 7F 82 7F
0480 82 7F 7F 82 7F 7F 7F 7D FF FF
0490 FF FF FF FF FF FF FF FF FF FF
0500 FF FF FF FF FF FF FF FF FF FF
0510 FF FF FF FF FF FF FF FF FF FF
0520 FF FF FF FF FF FF FF FF FF FF
0530 FF FF FF FF FF FF FF FF FF FF
0540 FF FF FF FF FF FF FF FF FF FF
0550 FF FF FF FF FF FF FF FF FF FF
0560 FF FF FF FF FF FF FF FF FF FF
0570 FF FF FF FF FF FF FF FF FF FF
0580 FF FF FF FF FF FF FF FF FF FF
0590 FF FF FF FF FF FF FF FF FF FF
0600 FF FF FF FF FF FF FF FF FF FF
0610 FF FF FF FF FF FF FF FF FF FF
0620 FF FF FF FF FF FF FF FF FF FF
0630 FF FF FF FF FF FF FF FF FF FF
0640 FF FF FF FF FF FF FF FF FF FF
0650 FF FF FF FF FF FF FF FF FF FF
0660 FF FF FF FF FF FF FF FF FF FF
0670 FF FF FF FF FF FF FF FF FF FF
0680 FF FF FF FF FF FF FF FF FF FF
0690 FF FF FF FF FF FF FF FF FF FF
```

```
0700  FF FF FF FF FF FF FF FF FF FF
0710  FF FF FF FF FF FF FF FF FF FF
0720  FF FF FF FF FF FF FF FF FF FF
0730  FF FF FF FF FF FF FF FF FF FF
0740  FF FF FF FF FF FF FF FF FF FF
0750  FF FF FF FF FF FF FF FF FF FF
0760  FF FF FF FF FF FF FF FF FF FF
0770  FF FF FF FF FF FF FF FF FF FF
0780  FF FF FF FF FF FF FF FF 00 24
0790  00 20 04 95 00 00 00 00 00 01
0800  00 00 10 00 21 10 0C 00 00 00
0810  00 05 F9 00 00 00 00 00 06 00
0820  00 00 00 00 05 00 4F 24 0C 24
0830  00 00 00 00 00 00 00 00 00 FF
0840  01 01 00 FF 01 00 FF FF 00 00
0850  FF FF 00 01 00 FF 00 00 00 FF
0860  01 00 FF FF 01 00 FF 00 00 00
0870  00 00 01 01 00 FF 01 01 00 FF
0880  01 00 FF FF 01 00 FF 00 01 00
0890  00 00 01 00 00 00 01 00 FC 01
0900  00 01 00 05 FD 01 06 01 FE 00
0910  0C F9 03 00 07 FB 06 00 F5 FF
0920  02 00 F2 04 01 01 F9 00 FF 02
0930  FD F7 FD 02 01 EF 08 FF 0C F3
0940  0E FC 0F F5 FD F9 1C E5 15 F1
0950  26 DC 22 EA 28 CC 28 E9 4B AC
0960  1F E3 5C 9C 37 E1 64 9C 77 D2
0970  5B 9C 78 CD 37 A6 5A D9 05 D2
0980  6D DA B6 18 78 D9 9C 2F 56 DD
0990  B8 FC EF DE 16 AD 21 EA 51 9C
1000  2B DB 38 9C FB E7 26 9C F0 DB
1010  E9 9C 17 C7 9F A2 0E DC A6 9C
1020  F9 E2 9E EF F7 E8 9C 4D 0D EB
1030  9C 59 18 E3 9E 23 44 E1 9C 12
1040  32 DC BB D1 14 FE 3D 9C FE D6
1050  FF FF FF FF FF FF FF FF FF FF
1060  FF FF FF FF FF FF FF FF FF FF
1070  FF FF FF FF FF FF FF FF FF FF
1080  FF FF FF FF FF FF FF FF FF FF
1090  FF FF FF FF FF FF FF FF FF FF
1100  FF FF FF FF FF FF FF FF FF FF
1110  FF FF FF FF FF FF FF FF FF FF
1120  FF FF FF FF FF FF FF FF FF FF
1130  FF FF FF FF FF FF FF FF FF FF
1140  FF FF FF FF FF FF FF FF FF FF
1150  FF FF FF FF FF FF FF FF FF FF
1160  FF FF FF FF FF FF FF FF FF FF
1170  FF FF FF FF FF FF FF FF FF FF
1180  FF FF FF FF FF FF FF FF FF FF
1190  FF FF FF FF FF FF FF FF FF FF
1200  FF
```

Disclaimer of Liability

The users of the CDR product and reviewers of the CDR reports and exported data shall ensure that data and information supplied is applicable to the vehicle, vehicle's system(s) and the vehicle ECU. Robert Bosch LLC and all its directors, officers, employees and members shall not be liable for damages arising out of or related to incorrect, incomplete or misinterpreted software and/or data. Robert Bosch LLC expressly excludes all liability for incidental, consequential, special or punitive damages arising from or related to the CDR data, CDR software or use thereof.

DOT HS 812 769
July 2019



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

