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

Vehicle: 2013 Ford Edge

Location: California

Crash Date: November 2015

DISCLAIMER

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16. Abstract

This report documents the on-site investigation of the non-deployment of the inflatable curtain (IC) air bags in a 2013 Ford Edge involved in a rollover crash. This single-vehicle crash occurred in the eastbound lanes of a divided State highway in California. It was dark at the time of the crash and the roadway was straight and level. The Ford was being driven by a restrained 54-year-old male. There were three additional occupants in the vehicle: a restrained 12-year-old female in the front row right seat, a restrained 14-year-old female in the second row left seat, and a restrained 9-year-old female in the second row middle seat. All three passengers were reported to be asleep. The Ford was traveling in the fourth lane from the right at an event data recorder (EDR) report speed of 123 km/h (76 mph). The police indicated that the driver was under the influence of alcohol. The driver lost control of the vehicle, crossed the three adjacent lanes, departed the roadway, and struck a curb and bushes located on the south side of the roadway. The Ford subsequently overturned and came to rest off the roadway on its roof. The Ford was equipped with frontal air bags for the front row, seat-mounted side impact air bags for both rows and combination roll-sensing/side impact IC air bags for both rows. The vehicle was not certified to FMVSS No. 226. The driver's frontal air bag was the only air bag that deployed during the crash. All four occupants of the Ford sustained injuries. The driver and both second row occupants were transported to local hospitals for treatment. The vehicle was towed from the scene due to damage and declared a total loss by the insurance company. The IC air bags did not deploy in this crash. Due to the interaction with the bushes the rollover developed too slowly to trigger their deployment.

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BACKGROUND

This report documents the on-site investigation of the non-deployment of the Inflatable Curtain (IC) air bags in a 2013 Ford Edge involved in a rollover crash (**Figure 1**). This investigation was initiated by the Office of Defects Investigation (ODI) in response to a driver notification. The Special Crash Investigations (SCI) group of the National Highway Traffic Safety Administration assigned the case to Dynamic Science, Inc., in March, 2016. The inspection was completed in March, 2016. The Ford was supported by the Bosch Crash Data Retrieval (CDR) system and the vehicle's event data recorder (EDR) was imaged during the inspection.

Figure 1. 2013 Ford Edge

This single-vehicle crash occurred during November 2015 at 0004 hours in the eastbound lanes of a divided State highway in California. It was dark at the time of the crash and the roadway was straight and level. The Ford was being driven by a restrained 54-year-old male. There were three additional occupants in the vehicle: a restrained 12-year-old female in the front row right seat, a restrained 14-year-old female in the second row left seat, and a restrained 9-year-old female in the second row middle seat. All three passengers were reported to be asleep. The Ford was traveling in the fourth lane from the right at an EDR-reported speed of 123 km/h (76 mph). The police indicated that the driver was under the influence of alcohol. The driver lost control of the vehicle, crossed the three adjacent lanes, and impacted a curb. The vehicle then departed the roadway, and struck bushes located on the south side of the roadway. The Ford subsequently overturned and came to rest off the roadway on its roof. The Ford was equipped with frontal air bags for the front row, seat-mounted side-impact air bags for both rows, and combination roll-sensing/side impact IC air bags for both rows. The vehicle was not certified to FMVSS No. 226. The driver's frontal air bag was the only air bag that deployed during the crash. All four occupants of the Ford sustained injuries. The driver and both second-row occupants were transported to local hospitals for treatment. The two second-row occupants sustained vertebra fractures and were hospitalized. The vehicle was towed from the scene due to damage and declared a total loss by the insurance company. The IC air bags did not deploy in this crash. Due to the interaction with the bushes, the rollover developed too slowly to trigger their deployment. The maximum left side leading rollover roll rate was -58.87 deg/sec at 2.6 seconds from time 0.

SUMMARY

Crash Site

The crash site was in the eastbound lanes of a divided State highway **(Figure 2)**. The four straight eastbound travel lanes were separated from the westbound lanes by a concrete median with an asphalt shoulder. The lanes were separated by dashed white lines and raised pavement markers. The asphalt roadway was bordered on the right by an asphalt shoulder, a 20.3 cm (8.0 in) concrete curb, and a 9.7 m (32.0 ft) wide dirt/grass shoulder with bushes. The shoulder was adjacent to a 3.9 m (13.0 ft) wide asphalt off ramp lane. It was dark at the time of the crash and there were no streetlights present.

Figure 2. Eastbound approach

The posted speed limit was 105 km/h (65 mph). The weather at the nearest reporting station was 11 degrees C (52 degrees F), 74 percent humidity, 16 km (10 miles) visibility, and the winds were out of the south southwest at 14.8 km/h (9.2 mph). A crash diagram is included at the end of this technical report on page 12.

Pre-Crash

The Ford was traveling in the fourth lane from the right at an EDR-reported speed of 123 km/h (76 mph) 5 seconds prior to algorithm enable (AE). The police indicated that the driver was under the influence of alcohol. A witness reported that the Ford traveled to the right and began to cross the adjacent three travel lanes. The EDR indicated that the driver was braking and steering to the right. Just prior to curb impact, the Ford's travel speed was 93 km/h (58 mph), the ABS was engaged, and the vehicle was yawing slightly clockwise.

Figure 3. Roadway departure, looking east

Crash

The Ford departed the roadway on the right and impacted a concrete curb with both front tires (**Figure 3**). The EDR reported a longitudinal delta-V of -8.98 km/h (-5.58 mph) and a lateral delta-V of 3.03 km/h (1.89 mph). The driver's frontal air bag deployed and both front row seat belt pretensioners actuated. Based on the air bag deployment times, it would appear that the reported Delta-Vs did not cause the deployment and actuations. The values reported were locked at 300 ms per the 563 regulations. The deployments and actuations occurred 726 ms after AE. The close proximity of the curb impacts was probably a confounding factor. After impact, the driver steered to the left and then back to the right as vehicle traveled approximately 73 m (239

ft). The vehicle's front plane then struck and overrode a series of oleander bushes **(Figure 4)**. The Ford began a clockwise rotation, tripped, and began a left-side leading rollover. The EDR reported the beginning of the left-side roll at 2.2 seconds after impact. The roll angle increased to -32.36 degrees at 3.1 seconds and maintained a similar roll angle until the 5-second buffer was filled. The vehicle rolled onto its left side and then onto its roof.

Figure 4. Impact with oleander bushes, looking east

Post-Crash

The Ford came to rest on its roof on the grass shoulder facing west. The driver exited the vehicle under his own power. The other occupants remained in the vehicle until being extricated by rescue personnel. The driver sustained police reported "C" (complaint of pain) injuries. He complained of pain to his chest and right upper thigh. He was transported by police to a local hospital after being arrested. The front row right occupant sustained police-reported "B" (other visible) injuries. She complained of pain to her flank, right ear, and right shoulder. She sustained lacerations to her right foot. She did not seek treatment and was released to a relative. The second row left occupant sustained police-reported "B" (other visible) injuries. She complained of pain to her back and pelvis. She sustained a contusion to her forehead. She was transported by ambulance to a children's hospital where she was hospitalized for 10 days. The second-row middle occupant sustained "C" (complaint of pain) injuries. She complained of pain to her chest and right upper thigh. She was transported by ambulance to a children's hospital where she was hospitalized for four days. The Ford was towed from the scene due to damage and was declared a total loss by the insurance company.

2013 FORD EDGE

Description

The 2013 Ford Edge was a five-door, five-passenger sport utility vehicle. The Ford was identified by the Vehicle Identification Number (VIN) 2FMDK3KCXDBxxxxxx and was manufactured in December 2012. The mileage was 69,692 km (43,305 miles). A CARFAX vehicle history report indicated that the vehicle had one owner and no previous reported crashes. The vehicle was equipped with a 3.5-liter 6-cylinder gasoline engine coupled to a 6-speed automatic transmission, front wheel drive, AdvanceTrac with roll stability control with anti-roll, 4-wheel disc brakes, and ABS. The vehicle manufacturer's recommended front and rear tire size was P245/50R20 with a cold pressure of 241 kPa (35 psi). The vehicle was equipped with Pirelli Scorpion tires of the recommended size. The specific tire information was as follows:

Position	Measured Pressure	Measured Tread Depth	Restricted	Damage
LF	Tire Flat	5 mm (6/32 in)	No	De-beaded
LR	221 kPa (32 psi)	4 mm (5/32 in)	No	None
RR	159 kPa (23 psi)	4 mm (5/32 in)	No	None
RF	Tire Flat	4 mm (5/32 in)	No	Sidewall cut

The Ford was configured with seating for five occupants. The front row was equipped with bucket seats with adjustable head restraints. The driver's head restraint was adjusted to 5.0 cm (1.9 in) above the seat; the passenger's was adjusted to 9.0 cm (3.5 in) above the seat. The second row was equipped with a split bench seat with a folding back. All three seat positions were configured with adjustable head restraints.

Figure 5. Right front tire, 2013 Ford Edge

Exterior Damage

The Ford sustained moderate damage to the front tires/wheels during the impact with the concrete curb (Events 1 and 2). The right front tire sidewall was cut **(Figure 5)** and left front rim was deformed **(Figure 6)**. The Collision Deformation Classifications (CDCs) for the right and left wheels were 12FRWN3 and 12FLWN3, respectively.

Figure 6. Left front rim, 2013 Ford Edge

The Ford sustained minor contact damage to the front bumper fascia from the impact with the line of oleander bushes (Event 3). The direct damage consisted of minor scuffing across the front plane. The bumper fascia was displaced at both ends of the bumper backing bar **(Figure 7)**. The Field L began at the left bumper corner and extended 111.0 cm (43.7 in) to the right. Six crush measurements were taken at the bumper backing bar as follows: C1 =1.0 cm (0.4 in), C2 = 2.0 cm (0.8 in), C3 = 1.0 cm (0.4 in), C4 = 0 cm, C5 = 0 cm, C6 = 0 cm. The calculated Principal Direction of Force (PDOF) was 345 degrees. The CDC was 12FDEW1.

During the rollover (Event 4), the Ford sustained direct damage to the left frame rail (**Figure 8**) and to the top plane. The damage to the top plane included the hood and roof **(Figure 9)**. The damage extended from roof side rail to roof side rail and measured 133.0 cm (52.3 in) wide and extended from the hood edge rearward to the rear spoiler and measured 410.0 cm (161.4 in). The maximum vertical crush was located at left windshield header and measured 12.0 cm (4.7 in).The maximum lateral crush was located at the left A-pillar and measured 10.0 cm (3.9 in). The CDC was 00TDDDO2.

Figure 7. Frontal damage, 2013 Ford Edge

Event Data Recorder

The Ford was equipped with a restraint control module (RCM). The RCM had EDR capability and was configured to store deployment and non-deployment events. The data from events which do not qualify as deployable events can be overwritten by subsequent events. The RCM can store up to two deployment events. Both events can contain pre-crash and crash data. For the pre-crash data there is a 5-second buffer that records vehicle speed, accelerator pedal percentage, service brake status, engine RPM, ABS activity, brake powertrain torque request, driver gear selection, traction control, wheel torque, steering wheel angle, lateral acceleration, longitudinal acceleration, stability control yaw rate, and stability control roll rate.

Figure 8. Left frame rail damage, 2013 Ford Edge

The data from the Ford's EDR was imaged using the Bosch Crash Data Retrieval Tool version 16.4 via the diagnostic link connector (DLC) using vehicle power and reported using version 17.6.1. Two events were recovered from ignition cycle 6,693: a locked frontal event and an unlocked event. The Bosch CDR report is included at the end of this report, and the EDR-reported data not discussed elsewhere in this report was summarized as follows:

Figure 9. Top damage, 2013 Ford Edge

The first record resulted from the impact with the curb and was locked. The maximum longitudinal delta-V was -8.98 km/h (-5.58 mph). The maximum lateral delta-V was 3.03 km/h (1.89 mph).

The pre-crash data at time 0 was as follows:

Speed vehicle indicated:	93 km/h (58 mph)
Accelerator pedal, % full:	0.0
Service brake, on/off:	On
Engine RPM:	1,576
ABS activity:	Engaged
Brake PowertrainTorque Request:	No Driver Gear Selection: Drive
Traction Control via Brakes	Non-engaged
Wheel Torque:	-68
Steering Wheel Angle:	1.4 (steering right from -5.0 to -0.2 seconds)
Lateral Acceleration (g):	0.382
Longitudinal Acceleration (g):	-1.4
Yaw Rate (deg/sec):	-5.37[1]
Roll Rate (deg/sec):	-7.0[2]

The roll sensor data from the first record was positive from time 0 to 2.2 seconds and negative from 2.3 to 5.0 seconds. At 3.1 seconds the roll angle generally stabilized at -34 to -36 degrees.

The second record resulted from the rollover and was an unlocked non-deployment event. The second record began 2.6 seconds after the first record (Event 1). Diagnostic trouble code (DTC) B1193-00 was present at the start of the event. This code indicates that the crash event storage is full and locked. This DTC indicates the vehicle has been involved in a collision and that a new RCM and impact sensors need to be installed.

The maximum longitudinal Delta-V was 17.64 km/h (10.96 mph). The maximum lateral delta-V was 6.45 km/h (4.01 mph).

The pre-crash data at time 0 was as follows:

Speed vehicle indicated:	0
Accelerator pedal, % full:	0.0
Service brake, on/off:	Off
Engine RPM:	0
ABS activity:	Engaged
Brake Powertrain Torque Request:	Yes
Driver Gear Selection:	Drive
Traction Control via Brakes	Non-engaged Wheel Torque: 3,216
Steering Wheel Angle:	0

[1] The polarity for steering and yaw rate are reversed. A positive number is counterclockwise.
[2] Roll data follows the normal convention of a positive value being a clockwise motion.

Lateral Acceleration (g):	-0.329
Longitudinal Acceleration (g):	-0.4
Yaw Rate (deg/sec):	-61.87
Roll Rate (deg/sec):	-30.12

The roll sensor data from the second record was negative from 0.1 to 5.0 seconds with a maximum rate of -58.87 at -2.6 seconds. At 1.3 seconds the roll angle generally stabilized at -24 to -25 degrees.

Interior Damage

The Ford sustained minor interior damage as a result of intrusions, occupant contacts, and integrity loss (**Figure 10**). The vehicle sustained vertical intrusions to the front row at the left A-pillar [4.0 cm (1.6 in)], left windshield header [8.0 cm (3.1 in)], middle windshield header [1.0 cm (0.4 in)], left roof side rail [5.0 cm (1.9 in)], and left roof [8.0 cm (3.1 in)]. There were also vertical intrusions to the second row at the left C-pillar [15.0 cm (5.0 in)] and left roof side rail [9.0 cm (3.5 in)]. The left rear door and hatch were jammed shut. The laminated glazing to the windshield and left front window was cracked and the tempered glazing at the left rear and hatch was disintegrated. There was loading evidence documented to the driver's and front right passenger's seat belts.

Figure 10. Intrusion, 2013 Ford Edge

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, an emergency locking retractor (ELR), and an adjustable upper anchor that was adjusted to the full up position. The front right passenger's seat belt was equipped the same as the driver's, but had a switchable ELR/automatic locking retractor (ALR). The adjustable upper anchor was adjusted to the full up position. The front seat positions were equipped with retractor-mounted seat belt pretensioners which actuated during the crash. Both seat belts were locked in the spooled-out position. Inspection of the driver's seat belt assembly revealed historical usage scratches on the latch plate and a 13.0 cm (5.1 in) area of stretching located 33.0 cm (12.9 in) below the D-ring. The vehicle's EDR reported the driver's seat belt status as "Driver Buckled." The passenger's seat belt had a 14.0 cm (5.5 in) area of stretching located 2.0 cm (0.8 in) above the stop loop. The vehicle's EDR reported the passengers's seat belt status as "Passenger Buckled." The second-row lap and shoulder seat belts revealed historical usage scratches to the latch plates.

Supplemental Restraint Systems

The Ford's Supplemental Restraint Systems included a restraint control module, driver and front passenger frontal air bags, front row seat-mounted side impact air bags, and front and second row combination roll-sensing/side impact IC air bags. The vehicle was not certified to FMVSS No. 226.

Figure 11. Driver's air bag, 2013 Ford Edge

Both stages of the driver's frontal air bag deployed from the steering wheel hub during the impact with the curb (**Figure 11**). The air bag measured 45.0 cm (17.7 in) side to side and 53.0 cm (20.8 in) top to bottom. The EDR reported that the occupant size classification for the front passenger position as Child Size = Yes, and it is presumed that the passenger frontal air bag was suppressed.

The left and right IC air bags did not deploy. Roll data was captured in both EDR data records. There was an overlap of the data between the two records. The maximum left side leading roll rate was -58.87 deg/sec which occurred just after the impact with the oleander bushes (time 0 for the first record) and at -2.6 seconds of the second record. It appears that this was a relatively slow developing rollover that likely occurred because of the vehicle's interaction with the bushes during the pending rollover sequence.

Rollover Mitigation

NHTSA has given this vehicle model a four-star rating on a five-star scale[3] with a risk of rollover of 18.5 percent for the front-wheel drive model. The Ford's mitigation features consisted of standard AdvanceTrac with RSC (roll stability control) and ABS. The control loss was the result of impact forces associated with the impact with the curb and chain of oleander bushes. As the Ford struck the bushes, it overrode the bushes, and then began a clockwise rotation. After the vehicle had rotated approximately 90 degrees, the vehicle tripped on the ground, and began a left side leading rollover. The vehicle rolled two quarter-turns and came to rest on its roof while sliding on its roof to the east. The rollover distance was unknown.

NHTSA Recalls and Investigations

There were no open recalls for this vehicle.

[3] www.safercar.gov

2013 FORD EDGE OCCUPANTS

Driver Demographics

Age/Sex:	54 years/male
Height:	190 cm (75 in)
Weight:	86 kg (190 lbs)
Eyewear:	Unknown
Seat type:	Bucket
Seat track position:	Unknown
Manual restraint usage:	Lap and shoulder belt used
Usage source:	Vehicle inspection, EDR report
Air bags:	Driver's frontal air bag deployed, seat-mounted side and IC air bags did not deploy
Alcohol/Drug Data:	Under the influence of alcohol
Egress from vehicle:	Under own power
Transport from scene:	Placed under arrest for felony DUI. Transported by police to hospital.
Type of medical treatment:	Transported, examined, and released to police

Driver Injuries

Inj. No.	Injury	Injury Severity AIS 2015	Involved Physical Component (IPC)	IPC Confidence Level
1	Head contusion	110402.1	B-pillar	Possible
2	Multiple abrasions to body	910200.1	Unknown	Unknown

Source: Discharge summary, radiology report, police report

Driver Kinematics

The 54-year-old male driver was seated in an unknown posture in the bucket seat. He was restrained by the lap and shoulder seat belt. According to the EDR report, the service brakes were on, the steering wheel was turned clockwise, and the vehicle had slowed to 93 km/h (58 mph). At impact with the curb, the frontal air bag deployed and the seat belt pretensioner actuated. The driver was displaced slightly forward and loaded the locked seat belt. As the vehicle began a clockwise rotation, he was displaced to the left. During the rollover, he was displaced to the left and then towards the roof as the vehicle came to rest. He exited the vehicle under his own power and was transported to a hospital by the police after being arrested. He reported a mild headache and no loss of consciousness. He underwent a CT scan and the results were negative. He was then released into the custody of the police.

Front Right Occupant Demographics

Age/Sex:	12 years/female
Height:	Unknown
Weight:	Unknown
Eyewear:	Unknown
Seat type:	Bucket
Seat track position:	Unknown
Manual restraint usage:	Lap and shoulder belt used
Usage source:	Vehicle inspection, EDR report
Air bags:	Passenger frontal, seat-mounted side, and IC air bags did not deploy
Egress from vehicle:	Assisted by EMS
Transport from scene:	Home by relative
Type of medical treatment:	None

Front Right Occupant Injuries

Inj. No.	Injury	Injury Severity AIS 2015	Involved Physical Component (IPC)	IPC Confidence Level
1	Left ear laceration	210600.1	Flying glass	Probable
2	Right foot lacerations	810600.1	Unknown	Unknown

Source: Police report

Front Right Occupant Kinematics

The 12-year-old female front right occupant was sleeping in an unknown posture in the bucket seat. She was restrained by the lap and shoulder seat belt. According to the EDR report, the service brakes were on, the steering wheel was turned clockwise, and the vehicle had slowed to 93 km/h (58 mph). At impact with the curb, the seat belt pretensioner actuated. The front right occupant was displaced slightly forward and loaded the locked seat belt. As the vehicle began a clockwise rotation, she was displaced to the left. During the rollover, she was displaced to the left and then towards the roof as the vehicle came to rest. She was extricated by emergency personnel and transported from the scene by her mother.

Second Row Left Occupant Demographics

Age/Sex:	14 years/female
Height:	156 cm (61 in)
Weight:	46 kg (101 lbs)
Eyewear:	No
Seat type:	Split bench with folding back
Seat track position:	NA
Manual restraint usage:	Lap and shoulder belt used incorrectly

Usage source:	Police report
Air bags:	IC air bag did not deploy
Egress from vehicle:	Extricated by emergency personnel
Transport from scene:	Ambulance to hospital
Type of medical treatment:	Hospitalized for 10 days

Second Row Left Occupant Injuries

Inj. No.	Injury	Injury Severity AIS 2015	Involved Physical Component (IPC)	IPC Confidence Level
1	L4 comminuted burst fracture with retropulsion of verebral body into spinal canal. Complaint of hypesthesia to anterior medial aspect of both legs	630628.3	Seat belt (indirect)	Probable
2	Secondary fracture, angulation between L3 and L4	650616.2	Seat belt (indirect)	Probable
3	Right forehead contusion	210402.1	Unknown	Unknown
4 5	Right and left abrasions, under arms	710202.1 710202.1	Seat belt	Certain

Source: Discharge summary, radiology report

Second Row Left Occupant Kinematics

The 14-year-old female second row left occupant was seated in an unknown posture in the split bench seat. She was restrained by the lap and shoulder seat belt and was asleep at the time of the crash. The seat belt was being used incorrectly; the torso portion had been placed under her arms. At impact with the curb she was displaced slightly forward. As the vehicle began a clockwise rotation, she was displaced to the left. During the rollover, she was displaced to the left and then towards the roof as the vehicle came to rest. She unbuckled her seat belt and laid inside the vehicle until EMS arrived. She had pain to her back and numbness in her legs. She was extricated by EMS and transported by ambulance to a children's hospital. She arrived with a GCS score of 15. She had sustained a forehead contusion and underwent a CT scan which was negative. She had surgery to repair the lumbar fracture and was hospitalized for 10 days.

Second Row Middle Occupant Demographics

Age/Sex:	9 years/female
Height:	Unknown
Weight:	36 kg (79 lbs)
Eyewear:	Unknown
Seat type:	Split bench with folding back
Seat track position:	NA
Manual restraint usage:	Lap and shoulder belt used
Usage source:	Police report
Air bags:	NA
Egress from vehicle:	Extricated by emergency personnel
Transport from scene:	Ambulance to hospital
Type of medical treatment:	Hospitalized for four days

Second Row Middle Occupant Injuries

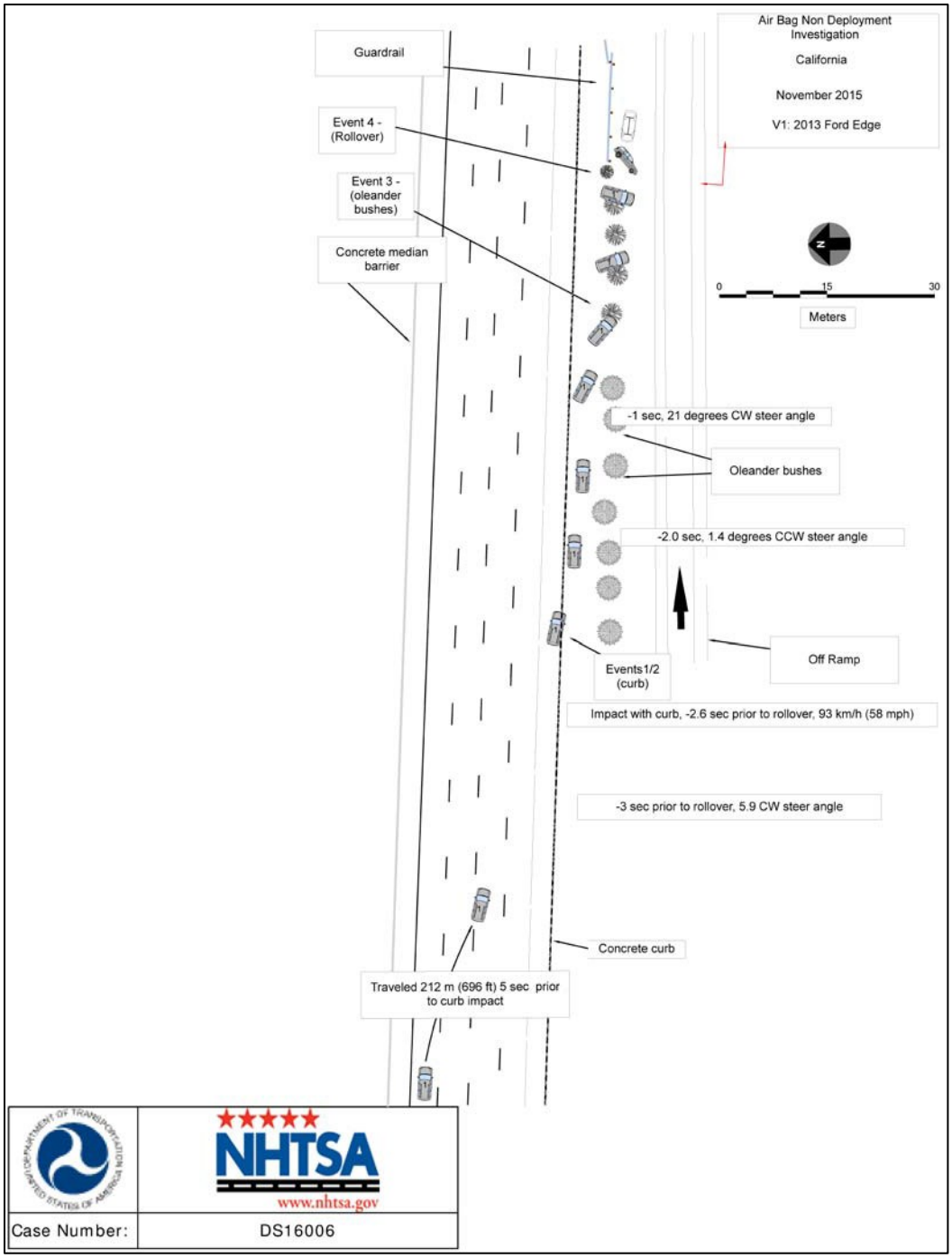
Inj. No.	Injury	Injury Severity AIS 2015	Involved Physical Component (IPC)	IPC Confidence Level
1	C7 compression fractures	650216.2	Seat belt (indirect)	Probable
2	T1 compression fracture	650416.2	Seat belt (indirect)	Probable
3	T2 compression fracture	650416.2	Seat belt (indirect)	Probable
4	T3 compression fracture	650416.2	Seat belt (indirect)	Probable
5	T4 compression fracture	650416.2	Seat belt (indirect)	Probable
6	Strain, right iliacus, right gluteal, and bilateral paraspinal muscles	840602.1	Seat belt (indirect)	Possible
7	3.0 cm (1.2 in) laceration, left posterior shoulder	710602.1	Shoulder belt	Unknown

Source: Discharge summary, radiology report

Second Row Middle Occupant Kinematics

The 9-year-old female second row middle occupant was seated in an unknown posture in the split bench seat. She was restrained by the lap and shoulder seat belt and was asleep at the time of the crash. At impact with the curb she was displaced slightly forward. As the vehicle began a clockwise rotation, she was displaced to the left. During the rollover, she was displaced to the left and then towards the roof as the vehicle came to rest. She was extricated by emergency personnel and transported by ambulance to a children's hospital. She arrived with a GCS score of 15 and was hospitalized for four days.

CRASH DIAGRAM



APPENDIX A:
EVENT DATA RECORDER REPORT 2013 FORD EDGE

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	2FMDK3KCXDB******
User	
Case Number	
EDR Data Imaging Date	
Crash Date	
Filename	201750S3DS16006_V1_ACM.CDRX
Saved on	
Imaged with CDR version	Crash Data Retrieval Tool 16.4
Reported with CDR version	Crash Data Retrieval Tool 17.6.1
Reported with Software Licensed to (Company Name)	NHTSA
EDR Device Type	Airbag Control Module
ACM Adapter Detected During Download	No
Event(s) recovered	locked frontal event unlocked event

Comments

No comments entered.

The retrieval of this data has been authorized by the vehicle's owner, or other legal authority such as a court order or search warrant, as indicated by the CDR tool user on .

Data Limitations

Restraints Control Module Recorded Crash Events:
Deployment Events cannot be overwritten or cleared from the Restraints Control Module (RCM). Once the RCM has deployed any airbag device, the RCM must be replaced. The data from events which did not qualify as deployable events can be overwritten by subsequent events. The RCM can store up to two deployment events.

Airbag Module Data Limitations:

- Restraints Control Module Recorded Vehicle Forward Velocity Change reflects the change in forward velocity that the sensing system experienced from the point of algorithm wake up. It is not the speed the vehicle was traveling before the event. Note that the vehicle speed is recorded separately five seconds prior to algorithm wake up. This data should be examined in conjunction with other available physical evidence from the vehicle and scene when assessing occupant or vehicle forward velocity change.
- Event Recording Complete will indicate if data from the recorded event has been fully written to the RCM memory or if it has been interrupted and not fully written.
- If power to the Airbag Module is lost during a crash event, all or part of the crash record may not be recorded.
- For 2011 Ford Mustangs, the Steering Wheel Angle parameter indicates the change in steering wheel angle from the previously recorded sample value and does not represent the actual steering wheel position.

Airbag Module Data Sources:

- Event recorded data are collected either INTERNALLY or EXTERNALLY to the RCM.

  - INTERNAL DATA is measured, calculated, and stored internally, sensors external to the RCM include the following:
    > The Driver and Passenger Belt Switch Circuits are wired directly to the RCM.
    > The Driver's Seat Track Position Switch Circuit is wired directly to the RCM.
    > The Side Impact Sensors (if equipped) are located on the side of vehicle and are wired directly to the RCM.
    > The Occupant Classification Sensor is located in the front passenger seat and transmits data directly to the RCM on high-speed CAN bus.
    > Front Impact Sensors (right and left) are located at the front of vehicle and are wire directly to the RCM.

  - EXTERNAL DATA recorded by the RCM are data collected from the vehicle communication network from various sources such as Powertrain Control Module, Brake Module, etc.

02007_RCM-RC6_r002

System Status at Time of Retrieval

VIN as programmed into RCM at factory	2FMDK3KCXDB******
Current VIN from PCM	2FMDK3KCXDB******
Ignition cycle, download (first record)	6,696
Ignition cycle, download (second record)	6,696
Restraints Control Module Part Number	DT43-14B321-AC
Restraints Control Module Serial Number	7010565300000000
Restraints Control Module Software Part Number (Version)	CT43-14C028-AB
Left/Center Frontal Restraints Sensor Serial Number	172C97FF
Left Side Restraint Sensor 1 Serial Number	ECC166A2
Left Side Restraint Sensor 2 Serial Number	172BF1DD
Right Frontal Restraints Sensor Serial Number	172BD76D
Right Side Restraint Sensor 1 Serial Number	A3C036A2
Right Side Restraints Sensor 2 Serial Number	172F6C0F

System Status at Event (First Record)

Recording Status	Locked Record
Complete file recorded (yes,no)	Yes
Multi-event, number of events (1,2)	1
Time from event 1 to 2 (msec)	N/A
Lifetime Operating Timer at event time zero (seconds)	4,701,005
Key-on Timer at event time zero (seconds)	2,055
Vehicle voltage at time zero (Volts)	13.608
Energy Reserve Mode entered during event (Y/N)	No

Faults Present at Start of Event (First Record)

No Faults Recorded

Deployment Data (First Record)

Frontal airbag deployment, time to first stage deployment, driver (msec)	726.0
Frontal airbag deployment, time to 2nd stage, driver (msec)	876.0
Pretensioner (retractor) deployment, time to fire, driver (msec)	726.0
Pretensioner (retractor) deployment, time to fire, right front passenger (msec)	726.0
Maximum delta-V, longitudinal (MPH [km/h])	-5.58 [-8.98]
Time, maximum delta-V longitudinal (msec)	300
Maximum delta-V, lateral (MPH [km/h])	1.89 [3.03]
Time, maximum delta-V lateral (msec)	278
Left or center front, satellite Sensor discriminating deployment	Yes
Left or center, front satellite Sensor safing	Yes
Right, front satellite sensor safing	Yes
RCM, front sensor discriminating deployment	Yes
RCM, front sensor safing	Yes
Longitudinal Delta-V Time Zero Offset	3.5 ms
Lateral Delta-V Time Zero Offset	3.5 ms
Roll Angle Time Zero Offset	43.5 ms

Pre-Crash Data -1 sec (First Record)

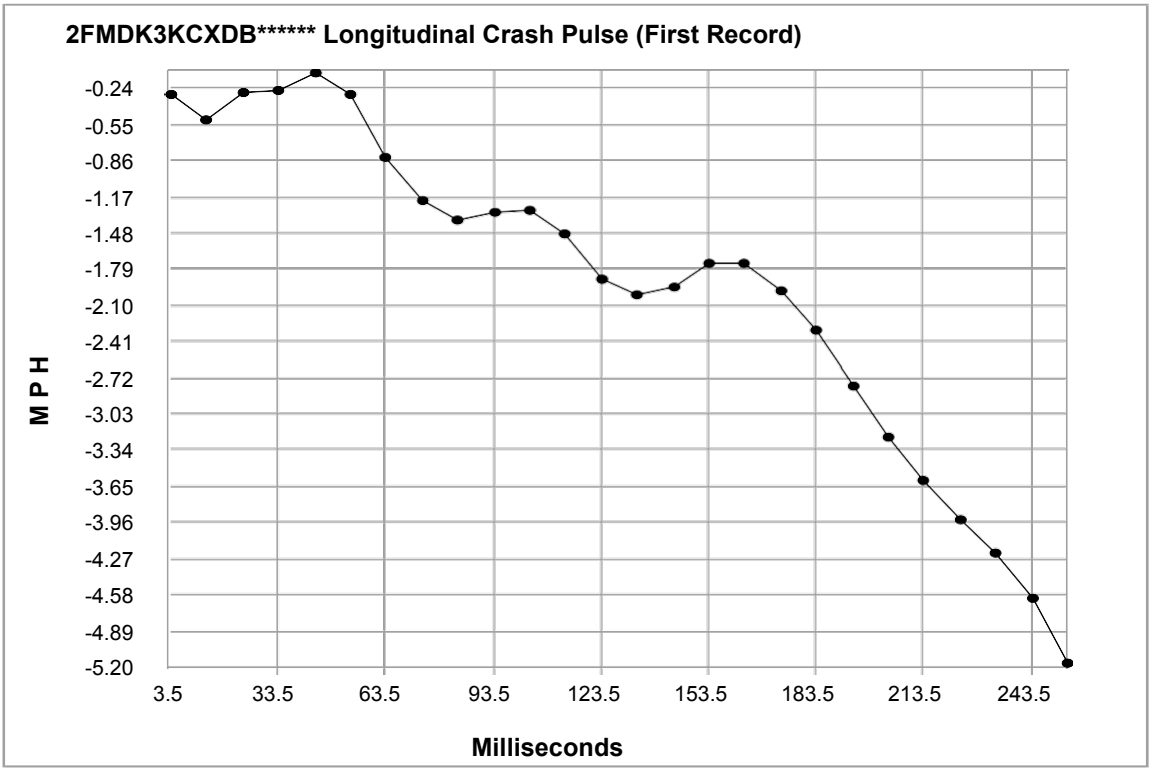
Ignition cycle, crash	6,693
Frontal air bag warning lamp, on/off	Off
Occupant size classification, front passenger (Child size Yes/No [Hex value])	Yes [$02]
Safety belt status, driver	Driver Buckled
Seat track position switch, foremost, status, driver	Not Forward
Safety belt status, front passenger	Passenger Buckled
Brake Telltale	Off
ABS Telltale	Off
ESC/TC Telltale	Off
ESC/TC Off Telltale	Default
Powertrain Wrench Telltale	Off
Speed Control Telltale	Off
MIL Telltale	Off

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

Times (sec)	Speed vehicle indicated MPH [km/h]	Accelerator pedal, % full	Service brake, on/off	Engine RPM	ABS activity (engaged, non-engaged)	Brake Powertrain Torque Request	Driver Gear Selection	Traction Control via Brakes	Wheel Torque
- 5.0	76 [123]	0.0	On	2,098	non-engaged	No	Drive	non-engaged	-136
- 4.5	76 [123]	0.0	On	2,098	non-engaged	No	Drive	non-engaged	-140
- 4.0	76 [122]	0.0	On	2,088	non-engaged	No	Drive	non-engaged	-140
- 3.5	75 [121]	0.0	On	2,070	non-engaged	No	Drive	non-engaged	-140
- 3.0	75 [120]	0.0	On	2,058	non-engaged	No	Drive	non-engaged	-136
- 2.5	74 [119]	0.0	On	2,046	non-engaged	No	Drive	non-engaged	-136
- 2.0	74 [119]	0.0	On	2,036	non-engaged	No	Drive	non-engaged	-136
- 1.5	72 [116]	0.0	On	1,982	non-engaged	No	Drive	non-engaged	-136
- 1.0	65 [105]	0.0	On	1,826	non-engaged	No	Drive	non-engaged	-136
- 0.5	66 [107]	0.0	On	1,828	engaged	No	Drive	non-engaged	-80
0.0	58 [93]	0.0	On	1,576	engaged	No	Drive	non-engaged	-68

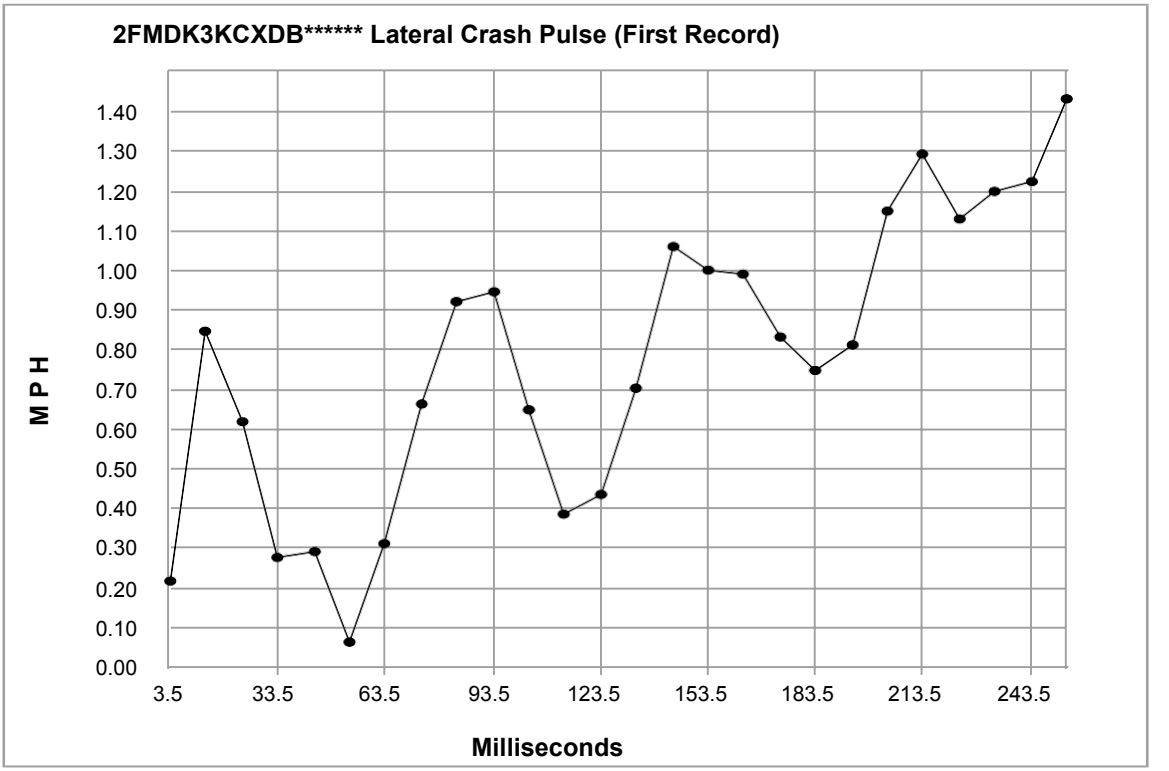
Pre-Crash Data -5 to 0 sec [10 samples/sec] (First Record)

Times (sec)	Steering Wheel Angle (degrees)	Stability Control Lateral Acceleration (g)	Stability Control Longitudinal Acceleration (g)	Stability Control Yaw Rate (deg/sec)	Stability Control Roll Rate (deg/sec)
- 5.0	-5.9	-0.012	-0.08	-0.5	-0.87
- 4.9	-4.4	-0.025	-0.087	-0.37	-0.75
- 4.8	-4.4	-0.024	-0.053	-0.62	-0.75
- 4.7	-4.4	-0.021	-0.07	-0.5	-1.62
- 4.6	-4.4	0.023	-0.073	-0.62	-2.75
- 4.5	-4.4	-0.029	-0.073	-0.5	-2.37
- 4.4	-4.4	0.004	-0.073	0.0	-0.87
- 4.3	-4.4	-0.011	-0.075	0.25	1.25
- 4.2	-4.4	-0.03	-0.091	-0.12	-0.75
- 4.1	-4.4	-0.027	-0.099	0.0	-2.87
- 4.0	-4.4	-0.024	-0.091	-0.62	-1.37
- 3.9	-4.4	-0.011	-0.063	0.12	0.25
- 3.8	-4.4	-0.03	-0.084	-0.12	-1.37
- 3.7	-4.4	0.026	-0.078	-0.25	-3.25
- 3.6	-4.4	-0.012	-0.091	-0.25	-2.12
- 3.5	-4.4	0.0	-0.073	0.0	-0.75
- 3.4	-4.4	-0.021	-0.08	0.0	1.25
- 3.3	-4.4	-0.015	-0.063	0.12	-0.12
- 3.2	-4.4	-0.018	-0.083	-0.25	-1.25
- 3.1	-4.4	-0.013	-0.087	-0.37	-2.12
- 3.0	-4.4	-0.038	-0.091	0.37	-1.25
- 2.9	-4.4	-0.045	-0.091	-0.37	-1.37
- 2.8	-4.4	-0.009	-0.073	0.12	-3.0
- 2.7	-4.4	-0.018	-0.096	0.0	-2.0
- 2.6	-4.4	-0.011	-0.073	0.25	1.25
- 2.5	-4.4	-0.064	-0.094	0.75	2.75
- 2.4	-4.4	-0.021	-0.068	0.37	2.37
- 2.3	-4.4	-0.059	-0.091	0.25	2.87
- 2.2	-4.4	-0.072	-0.073	-0.37	7.75
- 2.1	-5.9	-0.548	0.075	3.25	-23.25
- 2.0	-5.9	0.32	0.362	-5.75	-34.62
- 1.9	-2.9	0.012	-0.015	-2.87	8.87
- 1.8	-1.4	-0.21	-0.099	0.12	7.0
- 1.7	-1.4	-0.109	-0.091	0.12	-11.37
- 1.6	2.9	-0.552	0.091	6.75	23.12
- 1.5	-4.4	-0.634	-0.181	4.12	27.0
- 1.4	-4.4	-0.281	-0.173	0.62	-0.25
- 1.3	1.4	-0.185	-0.168	3.0	-3.37
- 1.2	1.4	0.008	-0.299	2.12	-10.0
- 1.1	0.0	0.208	-0.28	3.5	-16.62
- 1.0	-5.9	0.048	-0.393	3.75	-19.62
- 0.9	-13.4	0.037	-0.362	3.75	-18.37
- 0.8	-10.5	0.142	-0.458	1.5	-8.12
- 0.7	-11.9	-0.028	-0.304	-1.25	4.12
- 0.6	-11.9	0.079	-0.585	-3.37	-5.87
- 0.5	-10.5	-0.145	-0.342	-3.75	-25.25
- 0.4	-8.9	0.17	0.046	-4.87	-13.0
- 0.3	-5.9	-0.054	-0.405	-1.25	5.87
- 0.2	-2.9	-0.455	-0.598	-4.25	-1.25
- 0.1	0.0	-0.431	-0.675	-3.37	5.12
0.0	1.4	0.382	-1.4	-5.37	-7.0



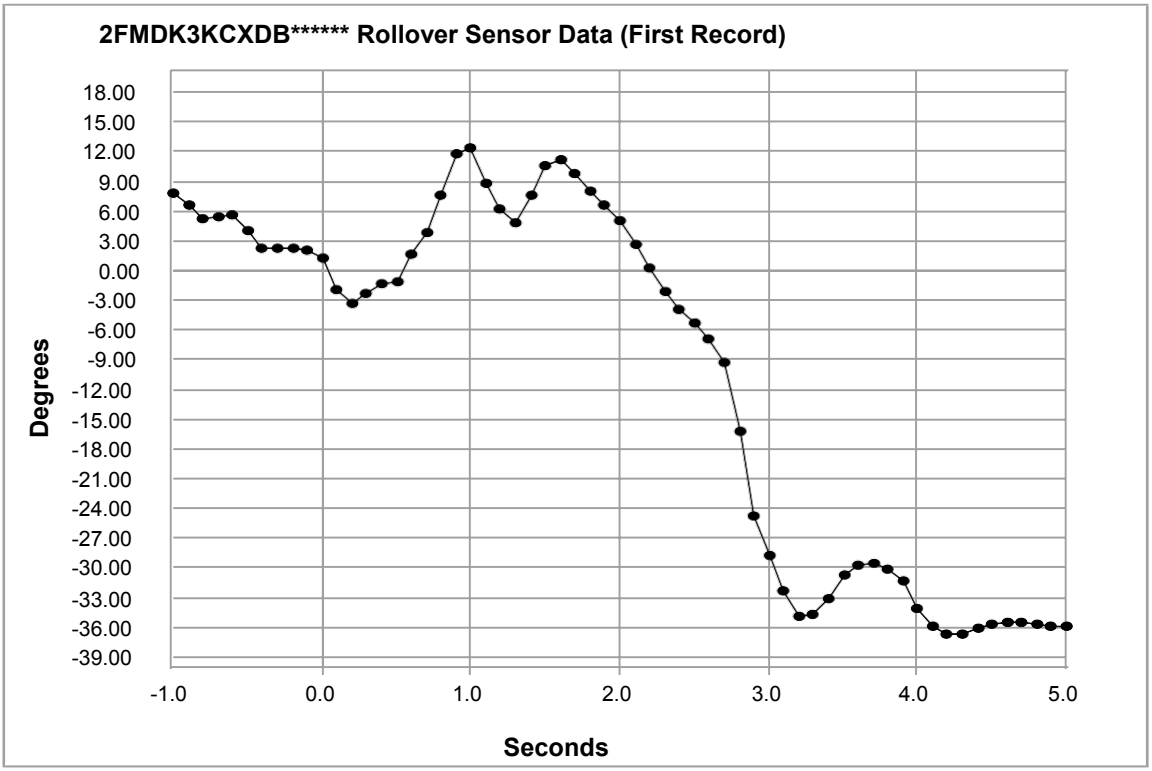
Longitudinal Crash Pulse (First Record)

Time (msec)	Delta-V, longitudinal (MPH)	Delta-V, longitudinal (km/h)
3.5	-0.30	-0.49
13.5	-0.51	-0.83
23.5	-0.29	-0.47
33.5	-0.26	-0.42
43.5	-0.11	-0.18
53.5	-0.30	-0.49
63.5	-0.84	-1.36
73.5	-1.21	-1.95
83.5	-1.38	-2.22
93.5	-1.32	-2.12
103.5	-1.29	-2.07
113.5	-1.50	-2.41
123.5	-1.88	-3.03
133.5	-2.03	-3.26
143.5	-1.95	-3.13
153.5	-1.75	-2.81
163.5	-1.75	-2.81
173.5	-1.98	-3.19
183.5	-2.32	-3.74
193.5	-2.79	-4.50
203.5	-3.23	-5.20
213.5	-3.61	-5.80
223.5	-3.95	-6.35
233.5	-4.23	-6.80
243.5	-4.61	-7.42
253.5	-5.17	-8.31



Lateral Crash Pulse (First Record)

Time (msec)	Delta-V, lateral (MPH)	Delta-V, lateral (km/h)
3.5	0.22	0.35
13.5	0.84	1.36
23.5	0.62	1.00
33.5	0.28	0.44
43.5	0.29	0.47
53.5	0.06	0.10
63.5	0.31	0.50
73.5	0.66	1.07
83.5	0.92	1.48
93.5	0.95	1.52
103.5	0.65	1.05
113.5	0.39	0.62
123.5	0.44	0.70
133.5	0.70	1.13
143.5	1.06	1.71
153.5	1.00	1.61
163.5	0.99	1.59
173.5	0.83	1.34
183.5	0.75	1.20
193.5	0.81	1.31
203.5	1.15	1.85
213.5	1.29	2.08
223.5	1.13	1.82
233.5	1.20	1.93
243.5	1.22	1.96
253.5	1.43	2.30



Rollover Sensor Data (First Record)

Time (sec)	Vehicle roll angle (degrees)
-1.0	7.7
-0.9	6.46
-0.8	5.16
-0.7	5.37
-0.6	5.53
-0.5	3.97
-0.4	2.18
-0.3	2.1
-0.2	2.12
-0.1	1.91
0.0	1.18
0.1	-1.92
0.2	-3.3
0.3	-2.45
0.4	-1.37
0.5	-1.1
0.6	1.67
0.7	3.8
0.8	7.53
0.9	11.63
1.0	12.22

Time (sec)	Vehicle roll angle (degrees)
1.1	8.79
1.2	6.08
1.3	4.73
1.4	7.5
1.5	10.58
1.6	11.14
1.7	9.75
1.8	7.99
1.9	6.49
2.0	4.87
2.1	2.62
2.2	0.1
2.3	-2.1
2.4	-3.92
2.5	-5.42
2.6	-6.89
2.7	-9.28
2.8	-16.26
2.9	-24.82
3.0	-28.7
3.1	-32.36

Time (sec)	Vehicle roll angle (degrees)
3.2	-34.86
3.3	-34.57
3.4	-33.01
3.5	-30.6
3.6	-29.77
3.7	-29.59
3.8	-30.05
3.9	-31.31
4.0	-34.06
4.1	-35.86
4.2	-36.59
4.3	-36.54
4.4	-35.99
4.5	-35.56
4.6	-35.4
4.7	-35.45
4.8	-35.68
4.9	-35.74
5.0	-35.75

System Status at Event (Second Record)

Recording Status	Unlocked Record
Complete file recorded (yes,no)	Yes
Multi-event, number of events (1,2)	2
Time from event 1 to 2 (msec)	2,600
Lifetime Operating Timer at event time zero (seconds)	4,701,010
Key-on Timer at event time zero (seconds)	2,060
Vehicle voltage at time zero (Volts)	11.988
Energy Reserve Mode entered during event (Y/N)	No

Faults Present at Start of Event (Second Record)

B1193-00

Deployment Data (Second Record)

Maximum delta-V, longitudinal (MPH [km/h])	10.96 [17.64]
Time, maximum delta-V longitudinal (msec)	300
Maximum delta-V, lateral (MPH [km/h])	4.01 [6.45]
Time, maximum delta-V lateral (msec)	150
Longitudinal Delta-V Time Zero Offset	3.5 ms
Lateral Delta-V Time Zero Offset	3.5 ms
Roll Angle Time Zero Offset	53.5 ms

Pre-Crash Data -1 sec (Second Record)

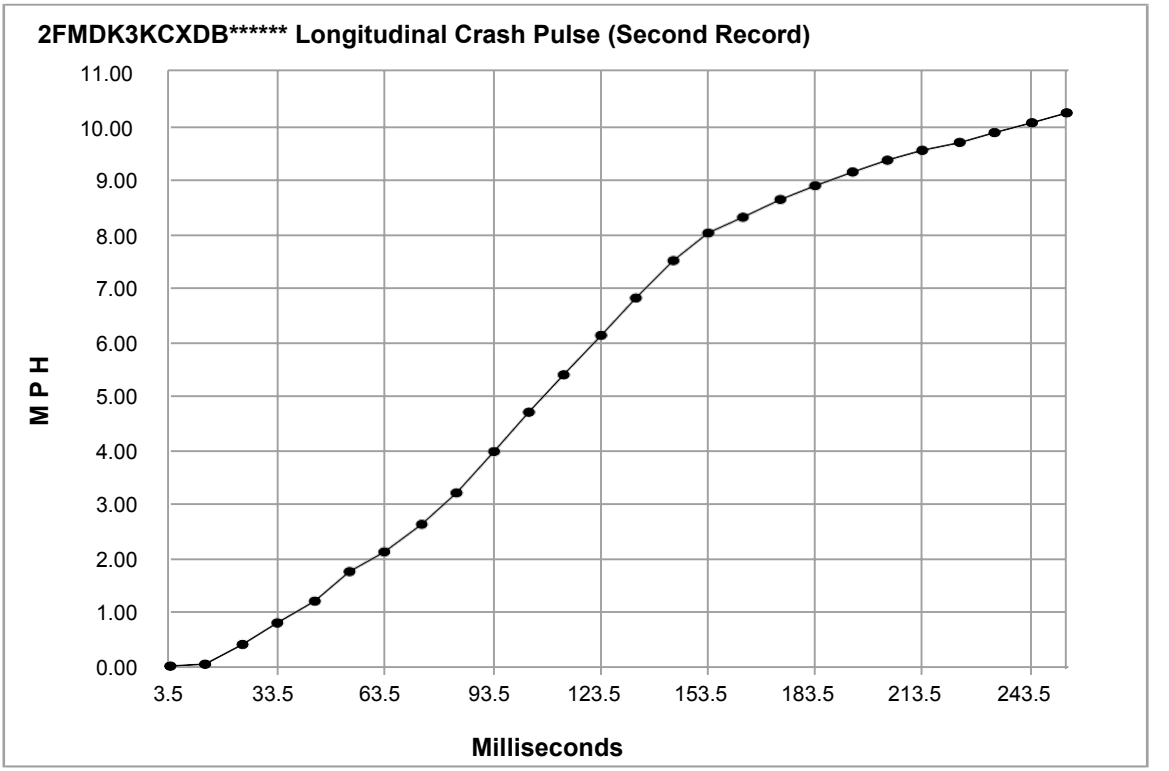
Ignition cycle, crash	6,693
Frontal air bag warning lamp, on/off	On
Occupant size classification, front passenger (Child size Yes/No [Hex value])	Yes [$02]
Safety belt status, driver	Driver Buckled
Seat track position switch, foremost, status, driver	Not Forward
Safety belt status, front passenger	Passenger Buckled
Brake Telltale	Off
ABS Telltale	Off
ESC/TC Telltale	On
ESC/TC Off Telltale	Default
Powertrain Wrench Telltale	Off
Speed Control Telltale	Off
MIL Telltale	Off

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

Times (sec)	Speed vehicle indicated MPH [km/h]	Accelerator pedal, % full	Service brake, on/off	Engine RPM	ABS activity (engaged, non-engaged)	Brake Powertrain Torque Request	Driver Gear Selection	Traction Control via Brakes	Wheel Torque
- 5.0	74 [119]	0.0	On	2,036	non-engaged	No	Drive	non-engaged	-136
- 4.5	72 [116]	0.0	On	1,982	non-engaged	No	Drive	non-engaged	-136
- 4.0	65 [105]	0.0	On	1,826	non-engaged	No	Drive	non-engaged	-136
- 3.5	66 [107]	0.0	On	1,828	engaged	No	Drive	non-engaged	-80
- 3.0	58 [93]	0.0	On	1,576	engaged	No	Drive	non-engaged	-68
- 2.5	38 [61]	0.0	On	998	engaged	Yes	Drive	non-engaged	-56
- 2.0	27 [44]	0.0	On	830	engaged	Yes	Drive	non-engaged	68
- 1.5	5 [8]	0.0	On	432	engaged	Yes	Drive	non-engaged	240
- 1.0	0 [0]	0.0	On	252	engaged	Yes	Drive	non-engaged	1,092
- 0.5	0 [0]	0.0	On	0	engaged	Yes	Drive	non-engaged	3,340
0.0	0 [0]	0.0	Off	0	engaged	Yes	Drive	non-engaged	3,216

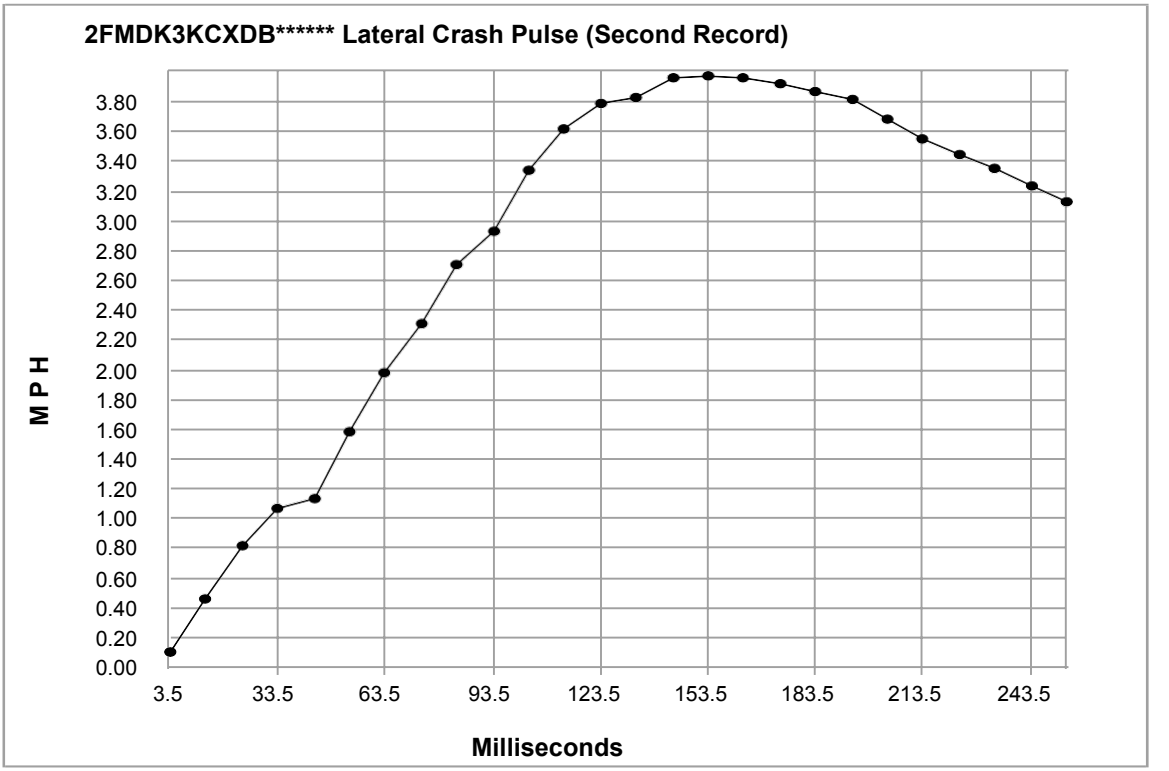
Pre-Crash Data -5 to 0 sec [10 samples/sec] (Second Record)

Times (sec)	Steering Wheel Angle (degrees)	Control Lateral Acceleration (g)	Control Longitudinal Acceleration (g)	Stability Control Yaw Rate (deg/sec)	Stability Control Roll Rate (deg/sec)
- 5.0	-4.4	-0.059	-0.091	0.25	2.87
- 4.9	-4.4	-0.072	-0.073	-0.37	7.75
- 4.8	-5.9	-0.548	0.075	3.25	-23.25
- 4.7	-5.9	0.32	0.362	-5.75	-34.62
- 4.6	-2.9	0.012	-0.015	-2.87	8.87
- 4.5	-1.4	-0.21	-0.099	0.12	7.0
- 4.4	-1.4	-0.109	-0.091	0.12	-11.37
- 4.3	2.9	-0.552	0.091	6.75	23.12
- 4.2	-4.4	-0.634	-0.181	4.12	27.0
- 4.1	-4.4	-0.281	-0.173	0.62	-0.25
- 4.0	1.4	-0.185	-0.168	3.0	-3.37
- 3.9	1.4	0.008	-0.299	2.12	-10.0
- 3.8	0.0	0.208	-0.28	3.5	-16.62
- 3.7	-5.9	0.048	-0.393	3.75	-19.62
- 3.6	-13.4	0.037	-0.362	3.75	-18.37
- 3.5	-10.5	0.142	-0.458	1.5	-8.12
- 3.4	-11.9	-0.028	-0.304	-1.25	4.12
- 3.3	-11.9	0.079	-0.585	-3.37	-5.87
- 3.2	-10.5	-0.145	-0.342	-3.75	-25.25
- 3.1	-8.9	0.17	0.046	-4.87	-13.0
- 3.0	-5.9	-0.054	-0.405	-1.25	5.87
- 2.9	-2.9	-0.455	-0.598	-4.25	-1.25
- 2.8	0.0	-0.431	-0.675	-3.37	5.12
- 2.7	1.4	0.382	-1.4	-5.37	-7.0
- 2.6	2.9	1.237	-0.078	-18.87	-58.87
- 2.5	4.4	-1.039	-1.089	-7.37	-1.62
- 2.4	5.9	-0.094	-1.68	-20.75	12.62
- 2.3	7.4	-0.787	-0.263	-41.75	6.25
- 2.2	5.9	-0.221	-0.395	-39.0	9.25
- 2.1	7.4	0.261	-0.369	-46.25	35.75
- 2.0	-1.4	-0.887	-0.559	-41.37	31.25
- 1.9	1.4	-1.113	-0.889	-45.12	67.12
- 1.8	0.0	-1.668	-0.957	-41.5	35.0
- 1.7	1.4	-1.492	-1.354	-10.75	-32.37
- 1.6	-4.4	-0.588	-0.506	19.62	-37.25
- 1.5	0.0	-0.264	-0.415	30.25	-27.0
- 1.4	5.9	-0.845	-1.615	40.25	0.87
- 1.3	4.4	-0.908	-1.694	37.12	37.75
- 1.2	-5.9	-0.616	-0.974	23.25	24.87
- 1.1	-14.9	-0.67	-1.971	-8.12	-6.5
- 1.0	-21.0	-0.05	-2.0	-32.75	-21.75
- 0.9	-7.4	-0.121	-1.299	-42.25	-19.0
- 0.8	-8.9	-0.13	-1.899	-43.75	-17.75
- 0.7	-11.9	-0.264	-1.576	-44.75	-22.37
- 0.6	-10.5	-0.137	-0.73	-47.25	-27.87
- 0.5	-8.9	-0.011	-0.323	-44.5	-28.0
- 0.4	-2.9	-0.012	-0.265	-42.5	-23.25
- 0.3	4.4	-0.002	-0.26	-39.87	-20.12
- 0.2	4.4	-0.186	-0.388	-38.87	-17.25
- 0.1	2.9	-0.608	-0.516	-48.75	-20.87
0.0	0.0	-0.329	-0.4	-61.87	-30.12



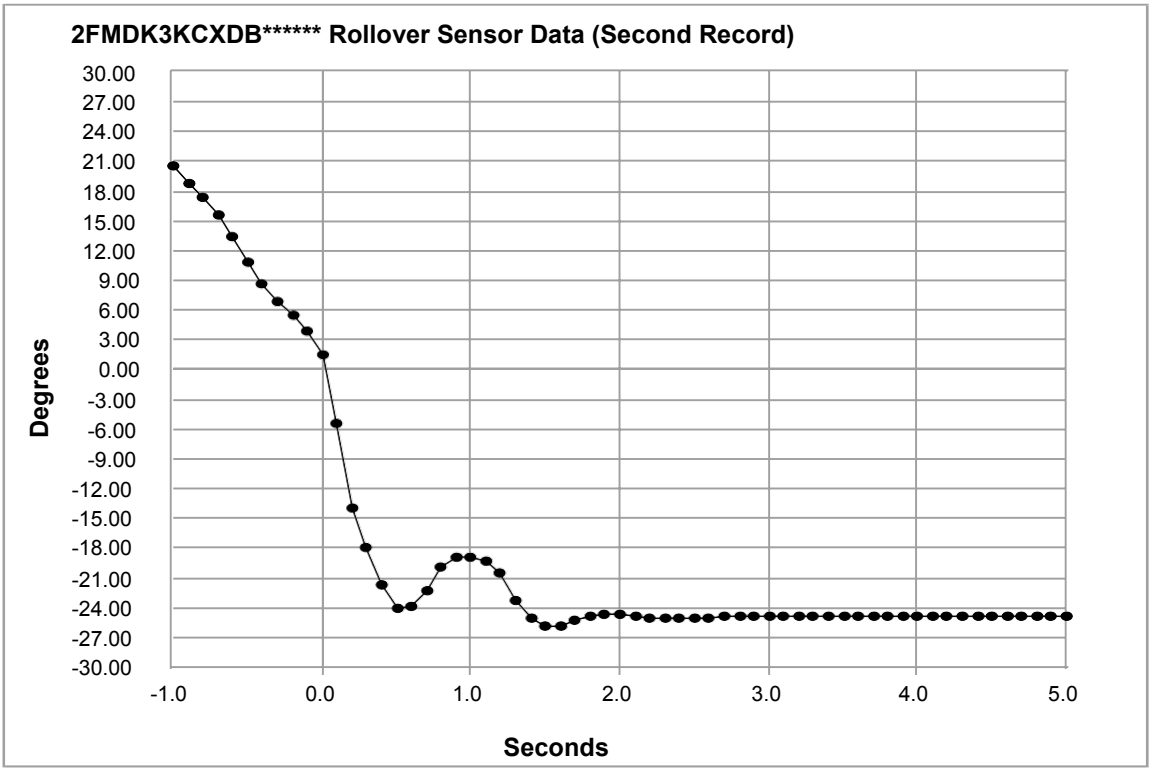
Longitudinal Crash Pulse (Second Record)

Time (msec)	Delta-V, longitudinal (MPH)	Delta-V, longitudinal (km/h)
3.5	0.02	0.03
13.5	0.09	0.14
23.5	0.42	0.68
33.5	0.84	1.34
43.5	1.24	2.00
53.5	1.79	2.89
63.5	2.16	3.47
73.5	2.64	4.24
83.5	3.22	5.18
93.5	3.99	6.42
103.5	4.71	7.58
113.5	5.42	8.72
123.5	6.15	9.89
133.5	6.83	11.00
143.5	7.51	12.08
153.5	8.03	12.92
163.5	8.33	13.40
173.5	8.63	13.89
183.5	8.90	14.32
193.5	9.15	14.72
203.5	9.38	15.09
213.5	9.55	15.37
223.5	9.70	15.61
233.5	9.86	15.86
243.5	10.05	16.18
253.5	10.22	16.45



Lateral Crash Pulse (Second Record)

Time (msec)	Delta-V, lateral (MPH)	Delta-V, lateral (km/h)
3.5	0.11	0.17
13.5	0.46	0.74
23.5	0.82	1.33
33.5	1.07	1.72
43.5	1.14	1.83
53.5	1.59	2.56
63.5	1.98	3.19
73.5	2.30	3.71
83.5	2.71	4.36
93.5	2.93	4.72
103.5	3.34	5.37
113.5	3.62	5.83
123.5	3.79	6.10
133.5	3.83	6.17
143.5	3.96	6.37
153.5	3.97	6.40
163.5	3.97	6.38
173.5	3.92	6.30
183.5	3.87	6.23
193.5	3.81	6.13
203.5	3.68	5.92
213.5	3.55	5.72
223.5	3.45	5.55
233.5	3.35	5.40
243.5	3.23	5.20
253.5	3.13	5.03



Rollover Sensor Data (Second Record)

Time (sec)	Vehicle roll angle (degrees)
-1.0	20.52
-0.9	18.76
-0.8	17.26
-0.7	15.64
-0.6	13.39
-0.5	10.87
-0.4	8.67
-0.3	6.85
-0.2	5.36
-0.1	3.88
0.0	1.49
0.1	-5.49
0.2	-14.05
0.3	-17.93
0.4	-21.59
0.5	-24.09
0.6	-23.8
0.7	-22.24
0.8	-19.83
0.9	-19.0
1.0	-18.82

Time (sec)	Vehicle roll angle (degrees)
1.1	-19.28
1.2	-20.54
1.3	-23.29
1.4	-25.08
1.5	-25.81
1.6	-25.77
1.7	-25.22
1.8	-24.79
1.9	-24.63
2.0	-24.68
2.1	-24.9
2.2	-24.97
2.3	-24.98
2.4	-24.98
2.5	-24.98
2.6	-24.97
2.7	-24.9
2.8	-24.88
2.9	-24.88
3.0	-24.88
3.1	-24.88

Time (sec)	Vehicle roll angle (degrees)
3.2	-24.88
3.3	-24.88
3.4	-24.88
3.5	-24.88
3.6	-24.88
3.7	-24.88
3.8	-24.88
3.9	-24.88
4.0	-24.88
4.1	-24.88
4.2	-24.88
4.3	-24.88
4.4	-24.88
4.5	-24.88
4.6	-24.88
4.7	-24.88
4.8	-24.88
4.9	-24.88
5.0	-24.88

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 system.

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02 00 00 00

44 54 34 33 2D 31 34 42 33 32 31 2D 41 43 00 00 00 00 00 00 00 00 00 00

37 30 31 30 35 36 35 33 30 30 30 30 30 30 30 30

43 54 34 33 2D 31 34 43 30 32 38 2D 41 42 00 00 00 00 00 00 00 00 00 00

17 2C 97 FF 00 00 00 00 00 00 00 00 00 00 00 00

EC C1 66 A2 00 00 00 00 00 00 00 00 00 00 00 00

17 2B F1 DD 00 00 00 00 00 00 00 00 00 00 00 00

17 2B D7 6D 00 00 00 00 00 00 00 00 00 00 00 00

A3 C0 36 A2 00 00 00 00 00 00 00 00 00 00 00 00

17 2F 6C 0F 00 00 00 00 00 00 00 00 00 00 00 00

32 46 4D 44 4B 33 4B 43 58 44 42 2A 2A 2A 2A 2A 2A

32 46 4D 44 4B 33 4B 43 58 44 42 2A 2A 2A 2A 2A 2A 00 00 00 00 00 00 00
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Event Record 1
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5C CB E0 FF C0 28 00 00 EC 8F 1F 00 A7 90 1F 00 E1 8F 1F 00 C6 8F 1F 00 40 8F 1F 00
EC 8F 1F 00 CD 91 1F 00 12 93 1F 00 AB 93 1F 00 72 93 1F 00 57 93 1F 00 11 94 1F 00
6B 95 1F 00 E8 95 1F 00 A2 95 1F 00 F1 94 1F 00 F2 94 1F 00 C3 95 1F 00 F2 96 1F 00
95 98 1F 00 19 9A 1F 00 67 9B 1F 00 96 9C 1F 00 91 9D 1F 00 E7 9E 1F 00 D4 A0 1F 00
64 35 1F 00 94 37 1F 00 CB 36 1F 00 9A 35 1F 00 A8 35 1F 00 DC 34 1F 00 B9 35 1F 00
F2 36 1F 00 D9 37 1F 00 EE 37 1F 00 E7 36 1F 00 FC 35 1F 00 2A 36 1F 00 16 37 1F 00
55 38 1F 00 1E 38 1F 00 15 38 1F 00 89 37 1F 00 3D 37 1F 00 78 37 1F 00 A1 38 1F 00
24 39 1F 00 93 38 1F 00 CE 38 1F 00 E3 38 1F 00 9E 39 1F 00 29 73 22 73 D1 EC 59 E9
B5 E5 4B E6 BF E6 5D E2 58 DD 22 DD 2E DD 98 DC 90 DA E0 D1 01 CE 65 D0 6D D3 28 D4
ED DB E7 E1 56 EC CF F7 78 F9 DC EF 47 E8 80 E4 3F EC E2 F4 73 F6 8E F2 A1 ED 6E E9
E1 E4 94 DE 88 D7 5F D1 46 CC 16 C8 F5 C3 42 BD B6 A9 BD 91 DF 86 A3 7C A0 75 70 76
D2 7A 8F 81 E0 83 64 84 1B 83 92 7F E0 77 D9 72 CD 70 EF 70 76 72 AE 73 20 74 FB 73
59 73 09 3E 17 3E 27 3E 45 3E 63 3E 80 3E 8E 3E 45 3E 54 3E 54 3E 54 3E 54 3E 54 3E
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54 3E 54 3E 54 3E 54 3E 54 3E 54 3E 54 3E 54 3E 54 3E 45 3E 45 3E 63 3E 72 3E 72 3E
9D 3E 54 3E 54 3E 8E 3E 8E 3E 80 3E 45 3E FA 3D 17 3E 09 3E 87 05 7A 06 FE 07 3B 06
7A 05 2D 05 58 02 80 07 79 07 9B 07 8A 07 87 07 87 07 87 07 85 07 75 07 6D 07 75 07
91 07 7C 07 82 07 75 07 87 07 80 07 91 07 7D 07 79 07 75 07 75 07 87 07 70 07 87 07
72 07 8C 07 75 07 87 07 1B 08 3A 09 C1 07 6D 07 75 07 2B 08 1B 07 23 07 28 07 A5 06
B8 06 47 06 66 06 06 06 A0 06 1F 08 3F 07 7A 08 9A 07 09 06 21 06 4E 09 C4 07 B7 07
B8 07 BB 07 E7 07 B3 07 D4 07 C5 07 B2 07 B5 07 B8 07 C5 07 B2 07 EA 07 C4 07 D0 07
BB 07 C1 07 BE 07 C3 07 AA 07 A3 07 C7 07 BE 07 C5 07 90 07 BB 07 95 07 88 07 AC 05
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FF 44 D9 44 69 44 D3 45 A7 44 FF 44 37 44 1E 46 2B 46 12 46 1E 46 12 46 1E 46 50 46
69 46 44 46 50 46 12 46 5C 46 44 46 37 46 37 46 50 46 50 46 5C 46 37 46 2B 46 75 46
2B 46 5C 46 50 46 69 46 9B 46 75 46 69 46 2B 46 95 47 11 44 31 45 5C 46 5C 46 F3 48
EC 47 8E 46 7C 47 24 47 AE 47 C7 47 C7 47 E6 46 D3 45 E5 72 53 6B 1C 70 7B 77 B3 74
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A7 74 EB 73 5C 74 E5 74 AD 75 24 75 B3 74 5C 74 B3 74 A7 74 04 74 68 74 AD 75 43 76
1D 76 4F 76 37 78 1B 6C AA 67 A7 78 EC 77 BF 70 38 7E BC 7F 17 75 DF 73 48 71 B2 6E
86 6D 03 6E 04 72 CC 76 00 00 AC 05 00 00 00 00 AC 05 AC 05 D8 06 00 00 00 00 00 00
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Event Record 2
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26 D7 1F 00 E4 D5 1F 00 38 D4 1F 00 34 D2 1F 00 84 CF 1F 00 04 CD 1F 00 8E CA 1F 00
04 C8 1F 00 9F C5 1F 00 47 C3 1F 00 7A C1 1F 00 6E C0 1F 00 61 BF 1F 00 70 BE 1F 00
95 BD 1F 00 C7 BC 1F 00 2D BC 1F 00 A9 BB 1F 00 1C BB 1F 00 6E BA 1F 00 D7 B9 1F 00
E2 64 1F 00 1A 66 1F 00 61 67 1F 00 3D 68 1F 00 78 68 1F 00 0A 6A 1F 00 68 6B 1F 00
86 6C 1F 00 EE 6D 1F 00 B6 6E 1F 00 1D 70 1F 00 1D 71 1F 00 B1 71 1F 00 D9 71 1F 00
47 72 1F 00 56 72 1F 00 4E 72 1F 00 23 72 1F 00 FA 71 1F 00 C4 71 1F 00 50 71 1F 00
DF 70 1F 00 7F 70 1F 00 2E 70 1F 00 C2 6F 1F 00 62 6F 1F 00 29 73 22 73 22 73 22 73
2C 73 60 73 6A 73 6A 73 6A 73 6A 73 6A 73 6A 73 6A 73 6A 73 6A 73 6A 73 6A 73 6A 73
6A 73 6A 73 6A 73 6A 73 6A 73 6A 73 6A 73 6A 73 6A 73 6A 73 6A 73 8E F2 A1 ED 6E E9
E1 E4 94 DE 88 D7 5F D1 46 CC 16 C8 F5 C3 42 BD B6 A9 BD 91 DF 86 A3 7C A0 75 70 76
D2 7A 8F 81 E0 83 64 84 1B 83 92 7F E0 77 D9 72 CD 70 EF 70 76 72 AE 73 20 74 FB 73
59 73 09 3E 17 3E 27 3E 45 3E 63 3E 80 3E 8E 3E 9D 3E AC 3E BB 3E CA 3E BB 3E CA 3E
72 3E 8E 3E 80 3E 8E 3E 54 3E 80 3E BB 3E AC 3E 45 3E EB 3D AE 3D 36 3E 27 3E 09 3E
17 3E 27 3E 63 3E AC 3E AC 3E 9D 3E 80 3E 54 3E 54 3E 45 3E 45 3E 63 3E 72 3E 72 3E
9D 3E 54 3E 54 3E 8E 3E 8E 3E 80 3E 45 3E FA 3D 17 3E 09 3E 87 05 7A 06 FE 07 3B 06
7A 05 2D 05 58 02 82 07 8F 03 40 01 C9 06 45 06 5F 06 A1 05 57 04 13 04 86 02 D6 05
31 06 81 01 32 01 02 04 1D 00 00 00 BD 02 65 00 A8 01 F6 04 8D 06 C7 06 CC 06 4C 06
CC 05 40 06 75 07 87 07 1B 08 3A 09 C1 07 6D 07 75 07 2B 08 1B 07 23 07 28 07 A5 06
B8 06 47 06 66 06 06 06 A0 06 1F 08 3F 07 7A 08 9A 07 09 06 21 06 4E 09 A5 0C C1 03
72 07 BD 04 F3 06 D5 08 59 04 77 03 4C 01 FC 01 84 05 C8 06 83 04 44 04 68 05 32 05
9E 07 57 07 4E 07 C8 06 47 07 C5 07 C4 07 CE 07 16 07 70 05 87 06 95 07 88 07 AC 05
10 09 DC 07 FE 06 63 07 A8 05 56 05 B7 06 17 07 D8 07 A0 08 00 08 F5 07 5E 08 B4 07
FF 44 D9 44 69 44 D3 45 A7 44 FF 44 37 44 F1 3E 6F 43 35 3E 01 36 14 37 3F 34 27 36
B0 34 1A 36 1D 42 FA 4D 21 52 09 56 D0 54 65 4F 24 43 85 39 CF 35 39 35 D5 34 DB 33
EE 34 B6 35 BD 36 21 37 45 33 25 2E 69 46 2B 46 95 47 11 44 31 45 5C 46 5C 46 F3 48
EC 47 8E 46 7C 47 24 47 AE 47 C7 47 C7 47 E6 46 D3 45 E5 72 53 6B 1C 70 7B 77 B3 74
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6C 69 4F 76 37 78 1B 6C AA 67 A7 78 EC 77 BF 70 38 7E BC 7F 17 75 DF 73 48 71 B2 6E
86 6D 03 6E 04 72 CC 76 00 00 00 00 00 00 00 00 00 00 00 00 00 00 00 00 00 00 00 00
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00 36 90 CA D2 00 59 00 00 00 7E 00 00 81 11 00 01 00 03 00 36 90 CA D2 00 00 00 00
00 00 00 00 83 43 00 01 00 03 00 36 90 CA DE 00 00 00 00 00 00 00 00 83 24 00 00 00
03 00 36 90 CA AE 2E 84 00 00 03 FA 00 00 7F DE 00 01 00 03 00 36 90 CA AE 2D 8D 00
00 03 DF 00 00 7F DE 00 01 00 03 00 36 90 CA AE 29 5F 00 00 03 91 00 00 7F DE 00 01
00 03 00 36 90 CA BA 2A 07 00 00 03 92 00 00 7F EC 00 01 00 03 00 36 90 CA BA 24 6F
00 00 03 14 00 00 7F EF 00 01 00 03 00 36 90 CA C6 18 00 00 00 01 F3 00 00 7F F2 00
01 00 03 00 36 90 CA C6 11 61 00 00 01 9F 00 00 80 11 00 01 00 03 00 00 00 00 00 00
00 14 09 00 00 00 00 00 00 14 09 00 00 00 00 00 00 14 09 00 00 00 00 00 00 14 09 00
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August 2018

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of Transportation

**National Highway
Traffic Safety
Administration**

NHTSA

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