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

NHTSA

DOT HS 812 565

July 2018

Special Crash Investigations Alleged Inadvertent Frontal Air Bag Deployment Crash Investigation Vehicle: 2014 RAM 1500 Location: Maryland Crash Date: October 2015

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The crash investigation process is an inexact science which requires that physical evidence such as skid marks, vehicular damage measurements, and occupant contact points be coupled with the investigator's expert knowledge and experience of vehicle dynamics and occupant kinematics to determine the pre-crash, crash, and post-crash movements of involved vehicles and occupants. Because each crash is a unique sequence of events, generalized conclusions cannot be made concerning the crashworthiness performance of the involved vehicles or their safety systems.

This report and associated case data are based on information available to the Special Crash Investigation team on the date this report was published.

Suggested APA Format Citation:

Crash Research & Analysis, Inc. (2018, July). *Alleged inadvertent frontal air bag deployment crash investigation; vehicle: 2014 RAM 1500; location: Maryland; crash date: October 2015* (Report No. DOT HS 812 565). Washington, DC: National Highway Traffic Safety Administration.

TECHNICAL REPORT STANDARD TITLE PAGE

1. Report No. DOT HS 812 565	*2. Government Accession No.*	*3. Recipient's Catalog No.*	
4. Title and Subtitle Alleged Inadvertent Frontal Air Bag Deployment Crash Investigation Vehicle: 2014 RAM 1500 Pickup Truck Location: Maryland Crash Date: October 2015		*5. Report Date*: July 2018 *6. Performing Organization Code*	
7. Author Crash Research & Analysis, Inc.		*8. Performing Organization Report No.* CR15026	
9. Performing Organization Name and Address Crash Research & Analysis, Inc. PO Box 302 Elma, NY 14059		*10. Work Unit No.* *11. Contract or Grant No.* DTNH22-12-C-00269	
12. Sponsoring Agency Name and Address National Highway Traffic Safety Administration 1200 New Jersey Avenue SE. Washington, D.C. 20590		*13. Type of Report and Period Covered* Technical Report Crash Date: October 2015 *14. Sponsoring Agency Code*	
15. Supplementary Note An investigation into the alleged inadvertent deployment of the frontal air bag system in a 2014 RAM 1500, and the corresponding injuries to a 56-year-old male driver.			
16. Abstract The interest of this on-site investigation was the alleged inadvertent deployment of the driver's frontal air bag in a 2014 RAM 1500 pickup truck. The 56-year-old male driver of the RAM alleged that the frontal air bag inadvertently deployed while he was operating the vehicle on a local roadway, which he claimed rendered him unconscious and resulted in a roadside departure/multiple event crash. The RAM was equipped with Certified Advanced 208-Compliant (CAC) frontal, seat-mounted side impact, and inflatable curtain (IC) air bags. All air bags except the front right seat-mounted air bag were deployed. As a result of this investigation, there was no evidence found or documented to support the driver's allegation of inadvertent air bag deployment. The SCI investigator determined that the frontal air bag system was operating as designed, with no illumination of the air bag warning lamp or diagnostic trouble codes (DTCs) present prior to the crash. The totality of the evidence suggested that the driver sustained a neurologic medical emergency, which precipitated the multiple-event crash.			
17. Key Words alleged inadvertent deployment unrestrained event data recorder EDR deployment		*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* 70	*22. Price*

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LOCATION: MARYLAND
CRASH DATE: OCTOBER 2015

BACKGROUND

The interest of this on-site investigation was the alleged inadvertent deployment of the driver's frontal air bag in a 2014 RAM 1500 pickup truck (**Figure 1**). The 56-year-old male driver of the RAM alleged that the frontal air bag inadvertently deployed while he was operating the vehicle on a local roadway, which he claimed rendered him unconscious and resulted in a roadside departure/multiple event crash. The RAM was equipped with Certified Advanced 208-Compliant (CAC) frontal, seat-mounted side impact, and inflatable curtain (IC) air bags. All air bags except the front right seat-mounted air bag were deployed.

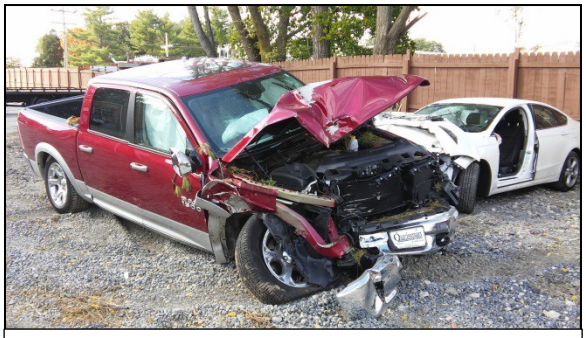


Figure 1: Front right oblique view of the RAM. Image supplied by the vehicle's owner/driver.

Notification of the crash was provided to the National Highway Traffic Safety Administration by the driver of the RAM on October 18, 2015, and forwarded to the Special Crash Investigations (SCI) group for further research. The crash was subsequently assigned for on-site investigation on November 19, 2015, pursuant to an active recall campaign concerning the possible inadvertent deployment of the RAM's driver frontal air bag. The SCI investigator contacted the driver to obtain details of the crash and established cooperation with the vehicle's insurer to inspect the involved RAM. The driver reported that the RAM had been serviced for the recall campaign on the day preceding the crash. The on-site portion of this investigation occurred November 23 and 24, 2015. This included a joint inspection of the RAM at a vehicle salvage facility by the SCI investigator, a manufacturer's representative, and technical professionals hired by the driver's insurance counsel. Data was imaged from the RAM during the inspection by the SCI investigator using the Bosch Crash Data Retrieval (CDR) tool/software. The SCI investigator also documented the crash site and conducted a complete in-person interview of the driver. As a result of this investigation, there was no evidence found or documented to support the driver's allegation of inadvertent air bag deployment. The SCI investigator determined that the frontal air bag system was operating as designed, with no illumination of the air bag warning lamp or diagnostic trouble codes (DTCs) present prior to the crash. The totality of the evidence suggested that the driver sustained a neurologic medical emergency, which precipitated the multiple-event crash.

SUMMARY

Crash Site

The crash occurred on a two-lane local roadway during late afternoon in October 2015. According to the National Weather Service, conditions in the rural locale at the time of the crash included clear skies with a temperature of 16.7 °C (62 °F), 49-percent relative humidity, and calm winds. Asphalt roadway surfaces were dry. The local roadway consisted of a 3.0 m (9.8 ft) wide travel lane in both the northbound and southbound directions, delineated by a double-solid yellow centerline. Single-solid white fog lines supported the roadway's outboard edges. In the area of the crash, and in the RAM's southbound trajectory, the roadway transitioned from a straight section to a left curve. Speed was regulated by a posted limit of 48 km/h (30 mph).

Figure 2: South-facing view of the roadway for the RAM's pre-crash travel trajectory.

On the west side of the roadway was a 1.9 m (6.2 ft) wide grass swale that separated the roadway from an expansive soybean field (**Figure 2**). Near the entrance to the curve was a wooden utility pole located 5.3 m (17.4 ft) west of the roadway edge. The pole was supported by a cable guy wire, which was anchored into the ground by a large steel augured stake. Approximately perpendicular to the roadway in the area of the left curve's exit was a line of trees. They were planted evenly-spaced in two rows, beginning 7.6 m (24.9 ft) west of the roadway edge and extending west along the south side of the soybean field. The individual trees ranged in diameter from 25- 40 cm (9.8-15.7 in) and in height from 9-12 m (30-40 ft). At the east end of the roadway, located 2.8 m (9.2 ft) west of the roadway's edge, was a fire hydrant. This hydrant and the guy wire anchor location served as reference points in the SCI documentation of the crash site. A crash diagram is included at the end of this report.

Pre-Crash

On the day preceding the crash, the driver took the RAM to a local manufacturer dealership for routine maintenance and service. This visit was precipitated by a mailing that the driver had received from the vehicle's manufacturer, alerting him of a recall requiring service. The recall was associated with the potential inadvertent deployment of the vehicle's driver frontal air bag system. Associated service/repair for this recall campaign was completed by the dealership. The driver specified during interview that on the day of the crash, he had departed his residence immediately prior to the crash and stopped to speak with a neighbor. Although he admitted that he habitually operated the RAM unrestrained, he was adamant that he used the manual restraint system in this particular circumstance because he had become annoyed by the audible chime emitted by the vehicle (which signaled a lack of restraint usage) while he was talking with the neighbor prior to his final departure.

Data imaged from the RAM's EDR indicated the driver was unrestrained at the time of the crash. After departing the residence, he traveled approximately 1.3 km (0.8 mi) and entered the straight section of the roadway. The driver stated that he operated the vehicle at a speed of 48 to 56 km/h (30 to 35 mph) along the straight section of the roadway. According to the driver's recollection during interview, he inexplicably lost consciousness as he continued southbound and approached the curve. However, he later stated that a medical professional discussed a seizure disorder with him during his follow-up evaluation in the days after the crash. It is possible that he had an ongoing medical condition that produced seizures.

Regardless, the driver alleged that the frontal air bag inadvertently deployed as he operated the vehicle southbound, a conclusion he reached based on a combination of his receipt of the recall mailer, the service performed on the vehicle the day prior, and his endeavor to determine the root cause of his control loss. The driver associated this as the only conceivable explanation for him to have been rendered unconscious and to have lost directional/operational control of the vehicle. Despite the driver's allegations, the RAM drifted right in the straight section of the roadway, departed the right roadway edge, and entered the grass swale. Based on a time-distance analysis of the imaged EDR pre-crash buffer data, the RAM's speed in the swale following its roadside departure was 68 km/h (42 mph). As the RAM maintained an errant trajectory, its right tires entered the soybean field. The vehicle continued forward, and its front plane approached the guy wire support of the utility pole.

Crash

The first crash event occurred as the front plane of the RAM struck the guy wire in the west roadside. This impact was located 52.6 m (172.6 ft) along the RAM's travel path from the roadway's edge (**Figure 3**). Associated forces deformed the guy wire's steel ground anchor and sheared the guy wire from the ground anchor's eyelet, but didn't affect the RAM's trajectory or induce a kinematic response from the driver. The RAM maintained its forward trajectory and continued south through the soybean field. The RAM exited the south side of the soybean field, traversed across a 4.0 m (13.1 ft) wide lawn area, and approached the line of trees. The second impact event occurred as the front plane of the RAM struck a large diameter tree in the first row, 36.6 m (120.0 ft) from the previous guy wire impact (in a straight-line trajectory). The struck tree was located 94.5 m (310 ft) south of the RAM's initial roadside departure, 14.5 m (47.6 ft) west of the roadway. Associated forces sheared the tree's roots and trunk immediately below ground level, which displaced the tree and deformed multiple front plane components of the RAM. Corresponding engagement induced a clockwise rotation to the RAM as it maintained forward momentum.

Figure 3: Location of the guy wire (Event 1) impact and the RAM's trajectory through the soybean field.

The third crash event occurred as the right front corner aspect of the RAM struck a second large diameter tree. This tree was located in the second row of trees, 17.2 m (56.4 ft) west of the roadway edge. Engagement with the second tree accentuated the RAM's CW rotation, and its left plane then struck a third tree (Event 4). This tree was also located in the second row of trees, 14.4 m (47.4 ft) west of the roadway edge. Nearly simultaneous to the third tree impact, the RAM struck a fourth tree (Event 5) with the rear corner aspect of its left plane. This tree was located in the first row of trees, 12.3 m (40.4 ft) west of the roadway. The RAM came to final rest in the second row of trees, wedged between the second (Event 3) and third (Event 4) struck trees. **Figure 4** depicts the location of the multiple tree impacts and the RAM's final rest, with the impacted trees numbered in order of the crash event sequence. Numerous branches concealed the vehicle in the line of trees.

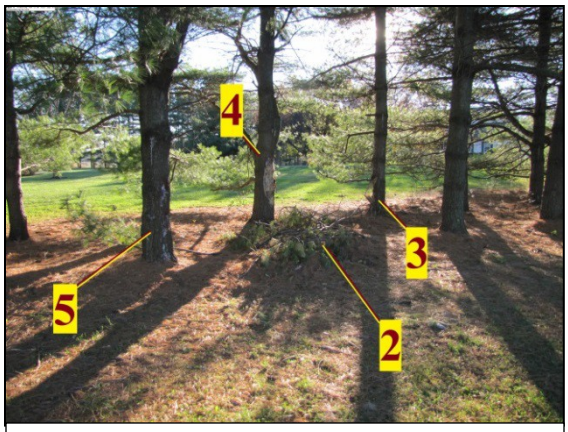


Figure 4: South-facing view of the rows of trees and the locations of impact Events 2, 3, 4, and 5.

Post-Crash

According to the driver, there were no immediate witnesses to the crash. He reported that he came to and discovered himself in the RAM, and observed that all the air bag systems were deployed. He crawled over the center console and exited the vehicle through the right front door. The driver then alerted the emergency response system via cellular phone.

Law enforcement and emergency medical services (EMS) personnel responded to the crash site. The driver was evaluated at the crash scene by EMS personnel, who provided treatment for soft tissue injuries to the driver's head and face. The EMS personnel strongly encouraged the driver to be transported by ambulance to a local hospital. However, he refused transport. Law enforcement documented on the police crash report (PAR) that the driver sustained non-incapacitating (B-level) injuries. After returning home and notifying his insurance company of the crash, the driver elected to seek evaluation at a local hospital. The RAM was removed from the crash scene by a local towing and recovery service and transferred to a local yard. It was later deemed a total loss by its insurer and transferred to the vehicle salvage facility.

2014 RAM 1500

Description

The 2014 RAM 1500 pickup was manufactured in September 2014 and identified by the Vehicle Identification Number 1C6RR7NT5ESxxxxxx. Its electronic odometer reading at the time of the SCI vehicle inspection was 17,791 km (11,055 mi). The odometer reading at the time of the crash event as reported by the imaged EDR data was 17,793 km (11,055.7 mi). It was a four-door pickup truck equipped with a 1.7 m (5.7 ft) cargo bed, constructed on a four-wheel drive platform. The 2014 RAM 1500 was equipped with the Laramie trim package.

The RAM (**Figure 5**) was powered by a 5.7 liter V-8 gasoline engine linked to an 8-speed automatic transmission. The vehicle had a 356 cm (140.0 in) wheelbase with a gross vehicle weight rating of 3,130 kg (6,900 lb). Both the front and rear gross axle weight ratings were 1,770 kg (3,900 lb). According to the registration information, the RAM's curb weight was 2,530 kg (5,578 lb). The vehicle manufacturer's recommended tire size was P275/60R20 front and rear, with recommended cold tire pressures of 269 kPa (39 PSI). At the time of the SCI inspection, the RAM was equipped with Goodyear Wrangler SR-A tires of the recommended size mounted on all four wheels OEM aluminum-alloy wheels. The tires had matching Tire Identification Numbers of M6YN JD1R 3414. Specific tire data at the time of the SCI inspection were as follows.

Figure 5: Right plane view of the 2014 RAM 1500.

Position	Measured Pressure	Measured Tread Depth	Restricted	Damage
LF	186 kPa (27 PSI)	8 mm (10/32 in)	No	None
LR	200 kPa (29 PSI)	6 mm (8/32 in)	No	None
RR	200 kPa (29 PSI)	6 mm (7/32 in)	No	None
RF	Tire Flat	7 mm (9/32 in)	Yes	None visible; debeaded

The RAM's interior was configured for the seating of up to five occupants. The driver and front right seats were leather-surfaced bucket seats, while the second row was equipped with a three-passenger bench seat. Both front row seats featured electronic seat track and seatback recline adjustments. At the time of the SCI inspection, the driver's seat was adjusted to a track position between middle and full-rear, while the front right seat was in its rearmost track position. A center console with armrest and storage space was located between the two front seats. All seat positions were equipped with adjustable head restraints and 3-point lap and shoulder seat belt systems. Supplemental restraint was provided by front seat belt retractor pretensioners and the CAC frontal, front seat-mounted, and IC air bag systems.

Vehicle History

The 2014 RAM 1500 was purchased new by the driver/owner in November 2014. He obtained the new vehicle from a local manufacturer dealership. Aside from the recall service performed on the day preceding the crash, the RAM had only received routine maintenance during its ownership period.

Exterior Damage

Damage from the multiple event crash was located on the RAM's front, left, and right planes. The first event with the guy wire produced minor severity damage on the front plane, which was overlapped by subsequent events. Thus, the extent of damage could not be fully assessed.

However, a review of the RAM's imaged EDR data (*see **Page 8***) revealed that the guy wire impact was not recognized or recorded by the EDR. This was indicative that the event was of insufficient magnitude to induce a deceleration that surpassed the ACM's threshold. Thus, it is probable that minimal, if any, deformation was sustained by the front bumper and surrounding components. Therefore, the estimated CDC assigned to the RAM for the Event 1 impact was estimated as 12FCEN1. No WinSMASH calculations could be performed because of insufficient deformation data relative to the impact.

Figure 6: View of the RAM's front crush profile and the Event 2 deformation pattern.

Direct contact damage associative to the first large diameter tree impact (Event 2) measured 36 cm (14.2 in) in width. It began on the leading edge of the hood, 17 cm (6.7 in) right of center, and extended to the right. This damage was a distinct U-shaped deformation that represented the shape and size of the large diameter tree. In the damage pattern, the front bumper beam, hood, and surrounding components were deformed longitudinally (**Figure 6**). The grille and polymer bumper trim were disintegrated and separated from the vehicle. Underhood components, inclusive of the radiator support and heat exchanger, were also deformed rearward. The steel bumper beam was partially fractured in the area of greatest deformation.

With exception to the minor severity guy wire event, Event 2 was the only impact to the RAM's frontal plane that was located between the vehicle's frame rails. Therefore, a residual crush profile documented to the RAM's deformed bumper beam produced valid measurements from the C1 through C5 locations. Using a direct and induced damage (Field-L) width of 172 cm (67.7 in) across the end width of the RAM's front bumper beam, the crush profile produced the following resultant measurements: C1–C2 = 0 cm (0 in), C3 = 9 cm (3.5 in), C4 = 24 cm (9.5 in), C5 = 1 cm (0.4 in), and C6 = 0 cm (0 in). Maximum crush measured 40 cm (15.7 in), located 30 cm (11.8 in) right of center between C4 and C5. The CDC assigned to the RAM for the Event 2 damage pattern was 12FZEN2. Using the damage algorithm of the WinSMASH model, a reconstruction of the Event 2 impact was performed. The calculated velocity change (delta-V) was 18 km/h (11.2 mph), with respective longitudinal and lateral components of -18 km/h (-11.2 mph) and zero. These results appeared reasonable.

The second large diameter tree impact (Event 3) was located on the right aspect of the front plane, outboard of the right frame rail. In the damage pattern, the front bumper beam was deformed, the right headlight assembly was disintegrated, and the right front fender was crushed longitudinally and laterally. Suspension components of the right front wheel/axle position were fractured and deformed rearward, and the right front tire was deflated.

Figure 7 depicts an oblique view of the RAM and the Event 3 damage. It should be noted that the right corner of the RAM's bumper beam was deformed forward during the vehicle's recovery from in-between the trees. No crush measurements could be obtained for the side-swiping-type Event 3 damage. The CDC assigned to the RAM for the Event 3 impact was 12FRES5. Due to the location of the impact, insufficient deformation data, and the sideswiping nature of the damage pattern, no WinSMASH calculations for Event 3 could be performed.

Figure 7: Front right oblique view of the RAM and the damage associative to Event 3.

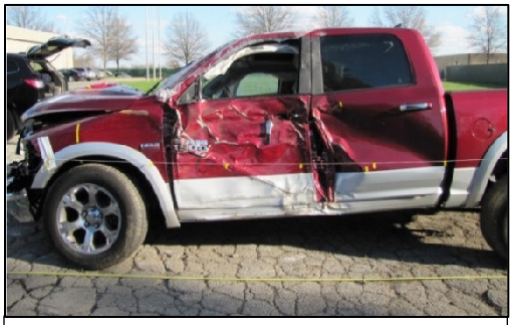


Figure 8: Left plane view of the RAM and the Event 4 deformation pattern from the third tree impact.

Damage from the third large diameter tree impact (Event 4) was located on the RAM's left plane. Direct contact began 10 cm (3.9 in) forward of the left front axle position and extended 222 cm (87.4 in) rearward to 148 cm (58.3 in) forward of the left rear axle position on the left rear door. In the damage pattern was lateral deformation to the left front fender and both left doors, with corresponding occupant compartment intrusion (**Figure 8**). The left front glazing was disintegrated by the Event 4 impact. Using a Field-L of 282 cm (111.0 in) from 10 cm (3.9 in) forward of the left front axle position to the rear edge of the left rear door, a residual crush profile was documented using the body contour method. This produced the following resultant measurements: C1 = 0 cm (0 in), C2 = 8 cm (3.1 in), C3 = 16 cm (6.3 in), C4 = 10 cm (3.9 in), C5 = 4 cm (1.6 in), and C6 = 0 cm (0 in). Maximum crush was observed at the C3 measurement location on the left front door. The CDC assigned to the RAM for the Event 4 damage profile was 11LYAW2. A borderline reconstruction of the Event 4 impact was performed for analysis purposes using the barrier algorithm of the WinSMASH model. The calculated velocity change (delta-V) was 14 km/h (8.7 mph), with respective longitudinal and lateral components of -14 km/h (-8.7 mph) and 5 km/h (3.1 mph). These results appeared to be reasonable.

The fourth and final large diameter tree impact (Event 5) was located on the rear aspect of the left plane. Within the damage pattern was minor deformation to the rear fender and corner of the RAM's cargo box (**Figure 9**). The left rear taillight assembly was disintegrated. Direct damage measured 73 cm (28.7 in) in width and began 50 cm (19.7 in) rearward of the left rear axle position. The maximum lateral crush measured 10 cm (3.9 in).

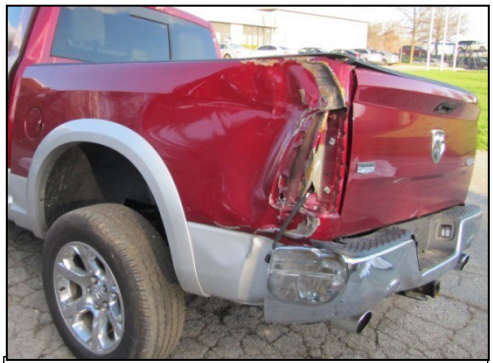


Figure 9: Left rear oblique view of the 2014 RAM 1500 and the Event 5 deformation pattern.

The CDC assigned to the RAM for the Event 5 damage pattern was 11LBEW1. No WinSMASH calculations for Event 5 could be performed due to the minimal extent of the deformation.

Event Data Recorder

The 2014 RAM 1500 was equipped with an air bag control module (ACM) that monitored and controlled the vehicle's active restraint systems (air bags and seat belt pretensioners). The ACM had EDR capabilities to record crash-related data. It was affixed to the center tunnel of the RAM, between the front row seat positions and beneath the center console. The positioning of the ACM made it difficult to access for the purposes of imaging data. Damage to the vehicle preventing access/communication with the ACM through the DLC, in conjunction with the positioning of the ACM, resulted in its removal from the vehicle during the joint inspection process. Data was then imaged from the ACM via direct connection and using version 16.2.1 of the Bosch Crash Data Retrieval (CDR) hardware and software. The imaged data was later reported using software version 17.7.1, and can be viewed as **Appendix A** of this report. The vehicle's ACM was retained by representatives of the vehicle's insurer.

According to the stated data limitations, the RAM's EDR was capable of recording both non-deployment and deployment event types. A non-deployment event did not command deployment of a supplemental restraint device, whereas by definition, a deployment event type commanded deployment of a supplemental restraint device. The EDR had the capacity to store up to three total events, regardless of event type or combination. The minimum velocity change (delta-V) required to store an event was 8 km/h (5 mph) in a 150-millisecond interval. Each event was characterized by the recording of bi-directional acceleration and angular rate crash pulse data, as well as an associated 5-second pre-crash data buffer. The pre-crash buffer data described various vehicle performance parameters, recorded in 0.1 second intervals.

Two events were stored in the RAM's EDR, both of which were related to this investigation. They occurred on Ignition Cycle 1,571, with the reported odometer reading of 17,793 km (11,055.7 mi). The recorded data was imaged on ignition cycle 1,573. There were no DTCs, and the air bag warning lamp was "Off" at the time of the recording. Both events were completely recorded, and the driver and front passenger seat belts were reported as "Not Buckled."

First Prior Event

This deployment event type was the first recognized and recorded event. It commanded the actuation of the front row seat belt retractor pretensioners and the deployment of the driver and front right frontal air bags. The pretensioner actuation command times was not recorded. First stage frontal air bag deployment was commanded at 41 milliseconds, with the second stage commanded at 51 milliseconds. The maximum longitudinal delta-V was -21 km/h (-13.0 mph) recorded at 88 milliseconds, and the maximum lateral delta-V was 3 km/h (1.9 mph) at 52 milliseconds. This event and the magnitudes of the recorded delta-V's were consistent with the RAM's frontal impact with the first large diameter coniferous tree (Event 2).

Most Recent Event

The second EDR event was recorded 0.31 seconds after the First Prior Event. This deployment event type was the second and final recognized and recorded event. The event was severe enough to warrant the actuation of the pretensioners and the deployment of the frontal air bags that were previously commanded in the First Prior Event. This event also commanded the left IC air bag, and the left front seat-mounted air bag. First stage frontal air bag deployment would have been commanded at 209 milliseconds, with the second stage at 239 milliseconds. No deployment command times for the left IC or left front seat-mounted air bags were recorded. The recorded maximum longitudinal delta-V was -37 km/h (-23.0 mph) at 260 milliseconds, and the maximum lateral delta-V was 6 km/h (3.7 mph) at 64 milliseconds. This event and the magnitudes of the recorded delta-V's were consistent with the RAM's nearly simultaneous impacts with the second and third large diameter coniferous trees (Events 3 and 4).

Pre-Crash Buffer Data

The recorded pre-crash buffer data of the two events were consistent relative to AE. The time history of the Most Recent Event contained three additional data sets (associative to the 0.31 second interval between the event recordings). A partial list of the First Prior Event's pre-crash data is depicted in the table below.

Time	Speed	Accelerator Pedal	Engine Throttle	Engine [RPM]	Service Brakes	Steering Input (degrees)
-5	68 km/h (42 mph)	15%	21%	1,500	Off	-3
-4.5	68 km/h (42 mph)	16%	25%	1,480	Off	-4
-4.0	68 km/h (42 mph)	16%	27%	1,482	Off	7
-3.5	67 km/h (42 mph)	16%	13%	1,558	Off	3
-3.0	67 km/h (42 mph)	21%	15%	1,481	Off	-6
-2.5	65 km/h (40 mph)	30%	21%	1,499	Off	1
-2.0	62 km/h (38 mph)	47%	27%	1,418	Off	7
-1.5	61 km/h (38 mph)	`100%	98%	2,518	Off	-1
-1.0	66 km/h (41 mph)	100%	100%	3,649	Off	-12
-0.5	72 km/h (45 mph)	14%	26%	3,980	Off	-18
-0.1 (AE)	66 km/h (41 mph)	22%	22%	2,844	Off	-24

Based on a time-distance analysis relative to the AE of the first recorded event, and based on the vehicle's average speed over the entire 5-second recording interval of 66.3 km/h (41.2 mph), the distance traveled by the RAM during the pre-crash buffer data was 92.1 m (302.1 ft). Thus, the entire pre-crash buffer data occurred following the RAM's initial roadside departure [because the RAM's trajectory through the roadside and soybean field to the line of trees was 94.5 m (310.0 ft)]. The pre-crash data confirmed a lack of driver avoidance input, and captured a depression of the vehicle's accelerator pedal that maintained the RAM's initial speed following the roadside departure for the entire off-road trajectory.

Further, engagement of the vehicle's stability control at the 2.0 second pre-crash interval and a spike in steering input from -2.1 to -1.8 seconds suggested that some external circumstance may have occurred. Based on the SCI scene inspection, the distance from the guy wire anchor to the first row of trees along the vehicle's trajectory path measured 36.6 m (120.0 ft). A time-distance analysis using the recorded pre-crash speed data determined an exact 2-second correlation between the guy wire impact and the First Prior Event. Thus, the guy wire impact (Event 1) occurred two seconds prior to the first tree impact (Event 2), and was of insufficient magnitude (less than the specified 8 km/h (5 mph) delta-V) to be recognized and recorded by the ACM.

Interior Damage

The interior of the RAM was inspected for crash-related damage that consisted of passenger compartment intrusion and occupant contact. Intrusion into the RAM's interior was associated with the fourth impact event with the third large diameter tree on the left plane of the vehicle. This consisted of lateral intrusion of the left front door, left B-pillar, and left rear door. Measured maximum magnitudes of the intrusions were 12 cm (4.7 in), 7 cm (2.8 in), and 11 cm (4.3 in), respectively. In their intruded states, the left front door and the left B-pillar were engaged against the left aspects of the driver's seat cushion and seat back (**Figure 10**).

Figure 10: View of the RAM's interior and the left B-pillar engaged against the driver's seat.

Figure 11: Fracture pattern to the windshield glazing resultant from driver contact during the crash.

Occupant contact in the RAM was identified on frontal components, associative to the multiple event crash sequence. There was a 3 cm (1.2 in) tall by 4 cm (1.6 in) wide scuff on the right aspect of the left lower instrument panel, attributable to contact and loading from the driver's right knee. A large fracture was also observed to the windshield glazing above and slightly left of the steering wheel (**Figure 11**), attributable to contact and loading from the unrestrained driver's head/face. All of the vehicle's doors remained closed during the crash. Both left doors were jammed shut by deformation relative to the Event 4 impact, while both right doors remained operational. Aside from the occupant contact to the windshield and the disintegration of the left front glazing relative to the Event 4 impact, none of the vehicle's glazing was damaged during the crash.

Manual Restraints

The RAM was equipped with 3-point lap and shoulder seat belt systems for all five seating positions. Both the driver's and front right occupant's seat belt systems used continuous-loop webbing with sliding latch plates, and were height-adjustable at their respective D-ring locations. The driver's seat belt system retracted onto an emergency locking retractor (ELR), while the front right seat belt utilized an ELR/Automatic Locking Retractor (ALR). Both front seat belt systems were equipped with retractor pretensioners. All three second row seat belt systems consisted of continuous-loop webbing with sliding latch plates and ELR/ALR retractors. They were all fixed at their respective mounting locations.

The webbing of the driver's seat belt system was observed during the SCI vehicle inspection with the retractor locked in position as a result of pretensioner actuation. The webbing was pulled taut and compressed between the intruded B-pillar and the driver's seatback (**Figure 12**). Based on the post-crash condition of the driver's seat belt system observed during the SCI inspection, and in conjunction with the data imaged from the RAM's EDR, it was apparent that the driver's seat belt system was not in use at the time of the crash.

Figure 12: The RAM driver's 3-point lap and shoulder seat belt system.

Supplemental Restraint Systems

The RAM was equipped with multiple inflatable supplemental restraint systems to provide protection for its occupants. The first was the CAC frontal air bag system, which consisted of dual-stage frontal air bags in the steering wheel and top instrument panel and also incorporated seat belt buckle switch sensors. Both front row seat positions were further equipped with outboard seat-mounted side impact air bags. Finally, IC air bags provided protection from the roof side rails to the beltline for the outboard aspect of both the front row and second row seat positions. All of the RAM's air bags except for the front right seat-mounted air bag were deployed.

At the time of the SCI vehicle inspection, an unknown individual had cut driver's frontal air bag fabric and removed it from the vehicle. The driver's frontal air bag deployed from the steering wheel hub-mounted module through the cover flaps. The driver provided a post-crash image of the deployed driver's frontal air bag. No dimensions of the air bag were available. The image provided by the RAM's driver depicted multiple areas of blood on the fabric, attributable to the facial lacerations sustained as a result of the driver's contact with the windshield glazing. There was no evidence of occupant contact to the steering wheel or the remnants of the air bag at the time of the SCI vehicle inspection.

Figure 13: Driver frontal air bag fabric cut from the module in the RAM at the time of the SCI inspection.

Figure 14: Deployed driver frontal air bag in the RAM. Image supplied by the driver.

Figure 13 depicts the remnants of the driver's frontal air bag at the time of the SCI vehicle inspection, while **Figure 14** depicts the deployed driver air bag in an image supplied to the SCI investigator by the RAM's driver.

The driver's seat-mounted side-impact air bag (**Figure 15**) deployed through 56 cm (22.0 in) of stitching on the leading outboard aspect of the seatback. The air bag consisted of two primary fill portions: an upper portion and a lower portion. In their deflated states, the upper portion of the air bag measured approximately 27x30 cm (10.6x11.8 in) and the lower portion measured approximately 25x20 cm (9.8x7.9 in) in width by height, respectively. A vent was located at both the forward upper aspect and forward lower aspect of the air bag's upper portion. There was no discernable occupant contact to the face of the driver's seat-mounted air bag.

Figure 15: Deployed driver's seat-mounted side impact air bag in the 2014 RAM 1500.

The front right air bag deployed from the right upper instrument panel-mounted module through the H-configuration cover flaps without damage. In its deflated state, the air bag measured 36 cm (14.2 in) wide and 56 cm (22.0 in) in height. The air bag extruded a maximum of 40 cm (15.7 in) rearward at its center aspect. A 6 cm (2.4 in) diameter vent was located on each side of the air bag. Several spots of blood were visible on the deflated front right air bag (**Figure 16**), attributable to contact from the driver

Figure 16: Deployed front right air bag in the RAM.

Figure 17: Left IC air bag and deployed driver's seat- mounted air bag in the 2014 RAM 1500.

during his post-crash egress from the vehicle through the right front door.

The IC air bags deployed from the roof side rails through the edge of the headliner and provided protection for all outboard positions of the RAM. In their deflated states, the IC air bags measured 230 cm (90.6 in) in overall length. They were affixed to their respective upper A-pillars by a 14 cm (5.5 in) fabric tether. The IC air bags provided 60 cm (23.6 in) of vertical coverage at the front row and second row positions, and 52 cm (20.5 in) of vertical coverage at the B-pillar. There was no discernable occupant contact to either of the IC air bags. **Figure 17** depicts the left IC air bag and its coverage for the driver.

NHTSA Recalls and Investigations

A search of www.safercar.gov based on the RAM's VIN revealed that there were no open active Recalls or Investigations concerning this specific 2014 RAM 1500 Laramie. A search using the RAM's VIN returned two applicable recalls pertaining to the 2014 RAM 1500's supplemental restraint systems. The focus RAM received the manufacturer's service/repair for both recalls on the day preceding the crash.

The first recall was identified by the manufacturer as #R36 and referenced by the NHTSA Campaign #15V459000. It was issued on July 21, 2015. This recall concerned the potential electrical short circuit and/or inadvertent deployment of the driver's steering wheel-mounted frontal air bag that could result due to chaffing of a wire harness subject to contact with the air bag module's retainer spring ends. Repair consisted of application of a protective covering and retention to the wiring harness to prevent contact. If such a circumstance developed, a corresponding DTC would likely appear relative to the open circuit that had resulted from the air bag's deployment.

The second recall was identified by the manufacturer as #R23 and referenced by the NHTSA Campaign #15V460000. It was also issued on July 21, 2015. This recall concerned the potential inadvertent actuation of the pretensioners and/or the deployment of the IC air bags and seat-mounted side impact air bags resultant from an overly sensitive side-impact calibration of the occupant restraint control (ORC) module software. Repair consisted of the re-programming of the ORC module with updated/new software.

Alleged Inadvertent Driver Frontal Air Bag Deployment

The driver alleged and reported that the frontal air bag system inadvertently deployed, and further alleged that this precipitated the crash by rendering him unconscious. With regard to this specific claim of inadvertent deployment, the SCI investigation was inconclusive in being able to determine whether or not the inadvertent deployment occurred. However, the totality of the evidence suggests that the vehicle's active supplemental restraint systems performed as designed.

A review of the data imaged from the RAM's EDR and the observations of the SCI investigator during the vehicle inspection was conclusive of the following:

1. The air bag warning lamp was "Off" at the time of both the recognized and recorded events.

2. No DTCs were present at the time of the first recorded event.

3. The RAM's ACM controlled the commands for supplemental restraint system actuation/deployment. It was not capable of distinguishing, in the timeframe of the crash events and data recording, whether an active supplemental restraint device was already actuated/deployed. This was evident by the commands for pretensioner actuation and frontal air bag system deployment in both the First Prior and Most Recent events. That is, the ACM recorded that threshold criteria were met and if/when the corresponding command was given; it did not record when/if the devices physically actuated/deployed.

4. Contrary to the driver's statements, none of the RAM's seat belts were in use at the time of the crash.

5. Associated with the driver's lack of restraint usage was occupant contact to the windshield glazing, with corresponding soft tissue and closed head injuries to the driver.

6. There was one manufacturer recall that concerned the potential inadvertent deployment of the driver's frontal air bag. The SCI investigator attempted to disassemble the steering wheel/column assembly to examine the wire harness and air bag module clock spring, but lacked the manufacturer's proprietary tools required for disassembly. Therefore, the SCI investigator was unable to visually examine the components or determine if an electrical short had occurred. However, an electrical short (and corresponding inadvertent deployment) was unlikely given the fact that the vehicle had received service by the manufacturer's dealership for this associated recall/issue on the day preceding the crash.

2014 RAM 1500 OCCUPANT DATA

Driver Demographics

Age/Sex:	56 years / male
Height:	178 cm (70 in)
Weight:	73 kg (160 lb)
Eyewear:	None
Seat Type:	Forward-facing bucket seat with adjustable head restraint
Seat Track Position:	Middle to rear
Manual Restraint Usage:	None *(3-point lap and shoulder seat belt available)*
Usage Source:	SCI vehicle inspection, EDR
Air Bags:	Driver's CAC frontal, seat-mounted side-impact, and IC air bags available; all deployed
Alcohol/Drug Involvement:	None
Egress from Vehicle:	Exited vehicle under own power, without assistance
Transport from Scene:	None
Type of Medical Treatment:	Sought follow-up care

Driver Injuries

Injury No.	Injury	AIS 2015	Involved Physical Component (IPC)	IPC Confidence
1	Head injury, NFS	100099.9	Windshield glazing	Certain
2	Multiple minor lacerations to the left forehead	210602.1	Windshield glazing	Certain

Source – Driver interview

Driver Kinematics

The 56-year-old male was positioned in the driver's bucket seat of the RAM. He had adjusted the seat to a track position between middle and full rear, with the seat back slightly reclined and the adjustable head restraint 1 cm (0.4 in) up. Although a 3-point lap and shoulder seat belt system was available for manual restraint, the driver was unrestrained. His lack of restraint usage was determined through a combination of the post-crash observations of the SCI investigator during the vehicle inspection and a review of the data imaged from the RAM's EDR.

During interview, the driver stated that a medical professional discussed a seizure disorder with him during his follow-up evaluation in the days after the crash. Contrary to the driver's statement that he was "normally" healthy prior to the crash, it is possible that the driver suffered from a medical condition that produced seizures. The driver declined to provide further detail on this topic. Requests for associated records documenting the driver's medical conditions were denied by the treating facility.

The PAR suggested that the driver sustained a medical emergency similar in nature to a neurological seizure as he operated the RAM along the straight section of the roadway. Such an occurrence would explain the driver's loss of control of the vehicle, as he would have become unresponsive to the point at which he would not have been able to control the trajectory or speed of the vehicle. With the driver unresponsive due to the medical emergency, he remained in the driver's seat as RAM departed the roadway.

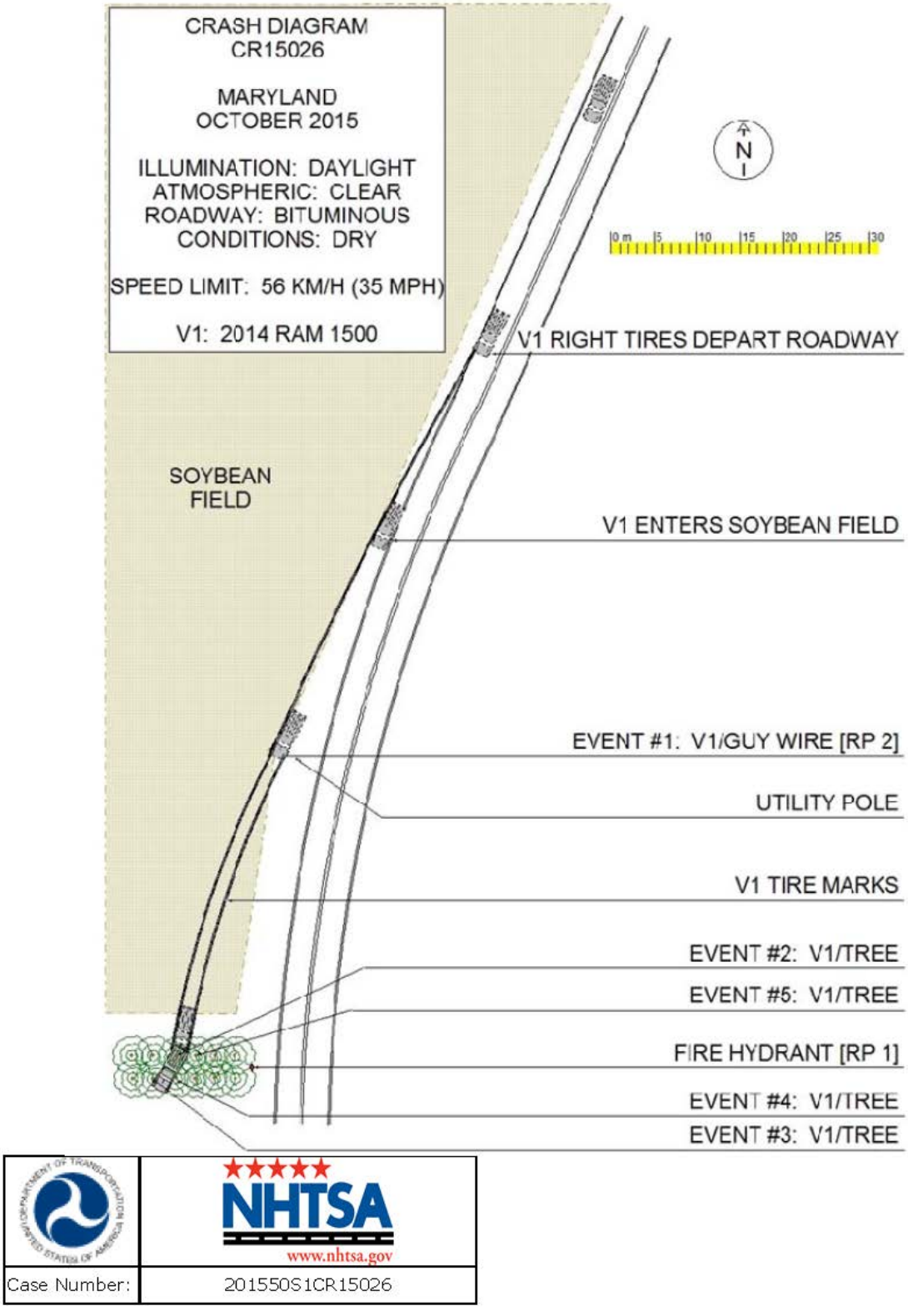
Neurologic seizures cause extension of extremities, and it is likely that this caused his foot to inadvertently depress the accelerator pedal. Although the roadside departure of the RAM and subsequent impact with the guy wire and its anchor did not produce sufficient forces to displace the driver from position or induce injury, it is likely that the guy wire impact exacerbated the driver's inadvertent depression of the accelerator pedal. The RAM continued through the soybean field and approached the trees as the driver remained unresponsive.

At impact with the first large diameter tree, the driver initiated a forward trajectory. The retractor pretensioners actuated, cinching the webbing of both front seat belt systems taut against their respective B-pillars. The driver's lack of restraint usage subjected him to unrestricted movement in the vehicle's interior.

As the RAM engaged and sheared the tree, the driver contacted the deployed frontal air bag with his chest and face. His right knee contacted the right aspect of the left lower instrument panel, evidenced by the scuff documented during the SCI vehicle inspection. The driver remained in a forward position as the RAM continued forward and struck the second large diameter tree. The combination of these impacts induced CW rotation to the RAM, and the driver initiated a left lateral trajectory as the vehicle's left plane struck the third large diameter tree (Event 4). The combination of the driver's extended loading of the air bag, his out-of-position location, and the velocity change of the vehicle directed the driver over the steering wheel and column. The left aspect of his face and forehead contacted the windshield glazing, which fractured the windshield and induced an unspecified head injury with soft tissue injuries. The fifth impact event was of insufficient magnitude to affect the driver's kinematics or induce injury.

The driver rebounded rearward as the RAM came to final rest in the line of trees. After an unknown period of time, he regained consciousness. The driver exited the vehicle without assistance through the right front door, contacting the deployed front right air bag during his egress. Following the arrival of EMS personnel, the driver was treated for his soft tissue injuries. He refused medical transport from the scene and returned to his residence. After consulting with his insurance company, the driver sought evaluation at a local hospital in the days following the crash. No further medical information concerning the driver, his course of treatment, or his medical conditions was available.

CRASH DIAGRAM



APPENDIX A:
2014 RAM 1500 Event Data Recorder Report[1]

[1] *The Event Data Recorder (EDR) report published as part of this technical report is the latest software version of the Bosch CDR Tool at the time of publication. The CDR report contained within the associated CISSWEB application may be of an earlier software version of the Bosch CDR Tool and 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	1C6RR7NT5ES******
User	
Case Number	
EDR Data Imaging Date	
Crash Date	
Filename	CR15026_V1_ACM.CDRX
Saved on	
Imaged with CDR version	Crash Data Retrieval Tool 16.2.1
Reported with CDR version	Crash Data Retrieval Tool 17.7.1
Reported with Software Licensed to (Company Name)	NHTSA
EDR Device Type	Airbag Control Module
Event(s) recovered	Most Recent Event 1st Prior Event

Comments

No comments entered.

Data Limitations

AIRBAG CONTROL MODULE (ACM) DATA LIMITATIONS:

GENERAL INFORMATION:

CAUTION: During direct-to-module imaging where the Airbag Control Module (ACM) is disconnected and removed from a vehicle, make sure the ACM is not moved, tilted or turned over while connected to and powered by the CDR Interface Module (with appropriate adaptors in place, where required). Also, after a CDR imaging process, wait 2 minutes after power is removed from the ACM before attempting to move the module. Not following these general ACM guidelines for direct-to-module imaging may cause new events to be recorded in the ACM.

- For additional definitions, please refer to the CDR Help File Glossary.
- As the VIN may be used to determine the configuration of the restraint system, it is imperative that the correct VIN be entered into the CDR Tool during the imaging process.
- For Fiat vehicles, the “Read VIN from Vehicle” feature in the CDR Tool will not work. The VIN will have to be manually entered.
- The 2019 MY RAM 1500 may take up to 30 minutes to retrieve the EDR data.
- Lateral Delta V will not be displayed for the 2013 MY Jeep Compass and Patriot.
- Ignition Cycle, download/crash - For RAMs and Dodge Vipers, there are 2 internal ignition counters in the ACM. It is possible for the ignition cycles at download to be different than the ignition cycles at event due to the 2 different counters.
- The following table provides an explanation of the sign notation for data elements that may be included in this CDR report. All directional references to sign notation are from the perspective of the driver when seated in the vehicle facing the direction of forward vehicle travel.

Data Element Name	Positive Sign Notation Indicates
Delta-V, Longitudinal	Forward
Maximum Delta-V, Longitudinal	Forward
Delta-V, Lateral	Left to Right
Maximum Delta-V, Lateral	Left to Right
Angular Rate	Clockwise rotation around the longitudinal axis
Peripheral Sensors, X and Y	Outside to Inside
Pressure Sensors	Compression of air
Internal Y Acceleration	Left to Right
Low-g Z Acceleration	Downward
Steering Input	Steering wheel turned counter clockwise
Yaw Rate	Counter clockwise rotation

CDR FILE INFORMATION:

- An event will be stored when the delta V is approximately 5 mph (8 km/h) or greater within a 150 ms interval.
- For non-NAFTA ACMs that control pedestrian protection devices, a non-deployment event will be stored when the pedestrian protection devices are

activated.
- For the 2014+ MY Jeep Grand Cherokee and Dodge Durango, a non-deployment event will be stored with activation of the Active Head Restraints.

Event(s) Recovered definitions:
- None - There are no stored events in the ACM
- Not Retrievable - Event Data may be stored in the ACM but is not retrievable by the CDR Tool.
- Most Recent Event - Data of the most recent event is displayed in the report
- 1st Prior Event - Two events are stored in the ACM, Data displayed is of the first prior event.
- 2nd Prior Event - Three events are stored in the ACM, Data displayed is of the second prior event.
- For 2013 and 2014 MY Dodge Journey and Fiat Freemont:
    - Event Record 1 - Data from an event is stored in the ACM (not necessarily in chronological order)
    - Event Record 2 - Data from another event is stored in the ACM (not necessarily in chronological order)
- For TRW modules:
    - If there is a side impact, two EDR events may be stored for the one side impact event. The second event may be recorded due to the Lateral Delta V exceeding 5 mph (8 km/h) within a 150 ms interval after the side deployment occurred.
- For some Fiat vehicles:
    - Two EDR events may be stored for one impact event. The second event may be recorded due to the deployment of the frontal airbag, 3rd stage passenger.
- During an event, if power to the ACM is lost, all or part of the event data record may not be recorded. An indication may be observed in the recorded data under this condition: The restraint data is recorded first and then the vehicle data.
    - “None” may be displayed in the “Event(s) Recovered” section of the report indicating no pre-crash vehicle data.
    - An event may be displayed in the “Event(s) Recovered” section of the report and “Interrupted” will be displayed for Pre-Crash Recorder Status.

SYSTEM STATUS AT RETRIEVAL:

- Original VIN - The VIN is captured by the ACM and then recorded as the Original VIN after 10 consecutive ignition cycles of capturing the same number. Once it has been recorded, this number cannot be changed.

SYSTEM CONFIGURATION AT RETRIEVAL/EVENT:

- The System Configuration data tables indicate the components that the ACM for a particular vehicle monitors and/or controls.
- Active Head Restraint (AHR) - This refers to some active head restraint systems that are electronically controlled by the ACM. AHRs may activate but not store an EDR Record if the delta V does not exceed the minimum delta V threshold. Activation of only the AHRs, if stored, will be a non-deployment event.

SYSTEM STATUS AT EVENT:

- Number, Total Events - Cumulative number of events that the ACM has recorded, including those non-deployment events that have been overwritten by a subsequent event.
- Occupant Size Classification, Outboard Front Passenger - “Child” status may be used to indicate anything weighing less than a 5th percentile female adult crash dummy, including an empty seat; “Not Child” indicates anything weighing the same as or more than a 5th percentile female adult crash dummy.
- Odometer at Event - Vehicle odometer at the time of the event
- Operation via Energy Reserve Only -“Yes” indicates that the ACM had lost power at or before T0 and was only operating on energy reserve at T0.
- System Voltage at Event, ACM - Voltage at the ACM as measured by the ACM.
- System Voltage at Event, Bussed - Voltage of the vehicle system, communicated on the communication bus to other electronic modules in the vehicle.
- Temperature, Outside - Ambient Air Temperature.
- Time, Airbag Warning Lamp On - This is a cumulative time. It indicates the total amount of time that the ACM has requested the Airbag Warning Lamp be turned on.
    - This time does not include the warning lamp bulb check time, which occurs at every ignition cycle
        - For 2013 MY Minivans and new 2017+ MY Jeep Compass, this time is only cumulative for the past 10 ignition cycles.
- Time from event 1 to 2 -
    - If only one event is stored, either a value of 0 or >5 may be displayed for this data element.
    - For the 2018+ MY Promaster and 2019+ MY RAM 1500, a value of 0 may be displayed for the first event or for events >5 seconds apart.
    - If multiple events exist in the EDR, the time from event 1 to event 2 is defined as:
        - For Bosch and TRW modules, the time from the prior recorded event (even if it has been overwritten) to the current recorded event.
        - For Continental modules, the time from the prior existing recorded event (as long as it is still displayed in the CDR report) to the current recorded event. If the prior event in a multi-event condition is overwritten by a subsequent event, the multi-event status will no longer be displayed.
        - For the 2019+ MY RAM 1500, the time from event 1 to 2 may utilize a non-stored event as event 1. In this case, the total number of events and multi-event data elements will not include the non-stored event in the number of events. However, the time from event 1 to 2 will be shown as time from that non-stored event.
- Time, Operation System Time - This is a cumulative lifetime timer for the ACM. It indicates the total amount of time the ACM has been powered up.
- VIN at Event, Last 8 Digits- Last 8 digits of the VIN of the vehicle at the time the ACM records the event.

DEPLOYMENT COMMAND DATA:

- A “Yes” for a particular item indicates that the ACM commanded the deployment /activation of the associated device.
- The phrase "Exceeded Storage Range" for a particular time to deploy indicates that the deployment time is equal to or greater than the 255 milliseconds that can be stored.

DTCs PRESENT AT START OF EVENT:

- If any DTCs (diagnostic trouble codes) are present in the ACM at the start of the event, these will be listed in this section. A dealership service manual can be used to decode the DTCs.
    - DTCs Present at Start of Event are not present in the Alfa Romeo Giulia, Fiat 500X, and the Jeep Renegade.

SENSOR DATA:

- The design range for the angular rate data is:
    - +/- 240 deg/sec for Bosch ACMs
    - +/- 300 deg/sec for TRW ACMs and the 2019 MY RAM 1500
    - +/- 290 deg/sec for 2008+ MY minivans and 2009+ MY Dodge Journey
    - +/- 340 deg/sec for 2017+ MY Chrysler Pacifica and new 2017+ MY Jeep Compass
- For vehicles that store peripheral sensor data, t0 for the peripheral sensors is the same as the t0 for the delta V.
- Internal y acceleration is stored prior to t0 so the internal y acceleration data will usually be zero unless the rollover sensing algorithm has triggered storage of the EDR event.
- The words “Sensor Design Range Exceeded” and a vertical line will be displayed on the Longitudinal and Lateral Delta-V graphs the first time the applicable sensor range is exceeded.

PRE-CRASH DATA:

- The recorded Event may contain Pre-Crash data. Pre-Crash data from the various electronic control modules in the vehicle is transmitted to the Airbag Control Module via the vehicle’s communication bus.
- (if equip.) - If a parameter name is followed by the words (if equip.), then the parameter is only valid for vehicles equipped with the associated parameter/vehicle system.
- The MIL (Malfunction Indicator Lamp) Status for the various recorded systems indicates the requested state of the applicable malfunction indicator lamp at the time that the data was captured. Note: Some fault codes could be stored due to component/system damage from the accident. The appropriate diagnostic tool should be used to read any stored Diagnostic Trouble Codes (DTC’s) in the various electronic modules (ACM, PCM, ABS, TCM, etc., where applicable) for use in interpretation of some vehicle specific recorded data.
- ABS Activity - “Yes” indicates an active ABS event in which the ABS is actively controlling the brakes.
- ABS MIL- This indicates the ABS fault indicator lamp status. It will only be “On” when there is a fault in the ABS system. The Electronic brake module DTC’s should be read and recorded for final system interpretation.
- Accelerator Pedal, % Full - This indicates the actual position of the accelerator pedal. It will be “SNA” if the vehicle is in the power free mode which limits acceleration.
- Accelerator Pedal (Derived), % Full - This indicates the calculated value of the accelerator pedal for battery electric vehicles only.
- Accelerator Pedal/Engine Throttle, % Full - This indicates the actual position of the accelerator pedal unless the cruise control is engaged. If the cruise control is engaged, this indicates the actual position of the engine throttle blade.
- Cruise Control:
    - Cruise Control System/Lamp Status -“On” indicates that the Cruise Control system is turned on.
    - Cruise Control Engaged Status/Active - “Engaged”/”Yes” indicates the Cruise Control system is actively controlling vehicle speed. “Not Engaged”/”No” indicates the system is NOT controlling vehicle speed.
    - Adaptive Cruise Control (ACC) Status (if equip.)- “Off” indicates that all cruise control functionality is disabled; “NCC_On” indicates that the Normal Cruise Control system is turned on; “NCC_Set” indicates the Normal Cruise Control is actively controlling vehicle speed; “ACC_On” indicates that ACC is turned on; “ACC_Set” indicates that the ACC is actively controlling vehicle speed. If the value is SNA for all time stamps, then the vehicle is not equipped with ACC.
    - ACC Speed Set (if equip.)- This indicates the desired speed in mph that was input by the driver for the ACC system. If the value is SNA for all time stamps, then the vehicle is not equipped with ACC.
- Drive Mode - This indicates the driver selected mode of operation (e.g. normal, sport, track, …)
- Electronic Brake/Stability Control information:
    - Stability Control - This is the status of the ESC symbol - “car with squiggly lines” indicator lamp. “On” indicates that the ESC system is functional. “Off” indicates that the ESC system was turned off either by the driver or due to a fault or thermal mode shutdown. “Engaged” indicates an active ESC/TCS event. “Partial Off” indicates that engine management has been turned off but traction control is still functional.
        - For the Jeep Renegade, if the Stability Control is “Off”, the ESC Button Status is “Disabled”, and the vehicle speed exceeds 40 mph, the stability control system will operate in a reduced functionality mode with traction control turned off (“partial off” mode) even though the user disabled it. For all other conditions, when the Stability Control is “Off”, the stability control system will be off.
    - ESC Button Status - This indicates the driver selected mode for the ESC system. “Disabled” indicates that the driver pressed the ESC Button for 5 seconds to disable the ESC System. “Enabled” indicates that the ESC button has not been pressed for 5 seconds and thus the ESC System is enabled.
    - ESC/ESP MIL - This indicates the ESC/ESP fault indication lamp status. It will only be “On” when there is a fault or thermal mode shutdown in the ESC/ESP system. The ESC/ESP module DTC’s should be read and recorded for final system interpretation.
    - Brake Intervention by ESP - “Yes” indicates that the stability control system has engaged the brakes.
    - Engine Torque Applied - “No” indicates no engine torque output was applied (as in Park/Neutral for Automatic transmissions or clutch depressed on manual or during an ESP/Traction Control event). If “Yes”, then engine torque output was applied.

- Traction Control Active - “Yes” indicates that the traction control system is actively controlling the vehicle’s wheels.
- Electronic Park Brake (EPB):
  - Park Brake Engaged - “Yes” indicates that the park brake is applied.
  - EPB MIL - “On” indicates that there is a fault in the Electronic Park Brake System.
- Engine Throttle, % Full - This indicates the actual position of the Engine Throttle blade. This data element is not supported by vehicles with diesel engines. Thus a value of “SNA” will be displayed if the vehicle has a diesel engine.
- ETC Lamp - Lamp “ON “indicates there is an active Electronic Throttle DTC.
- ETC Lamp Flashing - “Yes” indicates that the ETC is in the limp-in mode.
- Forward Collision Warning (FCW) (if equip.):
  - Object of Interest Distance - This indicates the actual forward distance to the main object being tracked by the FCW system. “FCW present but not tracking” indicates that the FCW system is not currently tracking an object. If the value is SNA for all time stamps, then the vehicle is not equipped with FCW.
  - FCW System Status - “Off” indicates that the FCW system is off and the FCW Warning Lamp will be “On”. “On-braking” indicates that the FCW system is on with active braking enabled but there will no FCW audible or visual warnings in an FCW event. “On-warning” indicates that the FCW system is on but active braking is disabled. In an FCW event, the driver will only receive FCW audible and visual warnings. “On-full” indicates that the FCW system is fully on with active braking as well as the audible and visual warnings enabled. SNA indicates that the vehicle is not equipped with FCW.
- Gear Position - This indicates the current transmission gear.
- Master Cylinder Pressure - This indicates the brake pressure applied to the brakes by the driver.
- PCM MIL - This indicates the PCM fault indicator lamp status. It will only be “On” when there is a fault in the PCM. The Powertrain Control Module DTC’s should be read and recorded for final system interpretation.
- Pre-Crash Recorder Complete - Due to the interruption of data recording in one section, this data element may display “Interrupted” for all sections when some data sections are actually complete.
  - For the 2014 MY Jeep Grand Cherokee and Dodge Durango, if recording of angular rate data is interrupted, the entire EDR record will display “Interrupted” even though the rest of the data may be complete.
- PRND/PRNDL/PRNDS Status - This indicates the status of the Shifter Position.
- Raw Manifold Pressure - This indicates engine load in kPa.
- Reverse Gear - For manual transmission vehicles only, “Yes” indicates the transmission is in the reverse gear.
- Service Brake - “On” indicates that the brake pedal is depressed.
- Speed, Vehicle Indicated - This indicates the average of the drive wheels. The accuracy of the recorded Speed, Vehicle Indicated will be affected if the vehicle had the tire size or the final drive axle ratio changed from the factory build specifications. On some vehicles capable of speeds in excess of 255km/h (about 158mph), the actual vehicle speed may have exceeded the reporting range. It is always prudent to check the reported wheel speeds and other parameters to confirm the Speed, Vehicle Indicated value(s).
- Tire Information:
  - XX where LF = Left Front Tire, RF = Right Front Tire, LR = Left Rear Tire, and RR = Right Rear Tire.
  - Tire X Location - This indicates the location of the tire pressure sensor data being displayed for that time stamp. Default is used to indicate that the location of the tire pressure sensor is unknown or there is no tire pressure sensor in that wheel. Vehicles with Base Tire Pressure Monitoring systems will display SNA for both Tire Locations as these vehicles do not send actual pressure values across the communication bus.
  - Tire X Pressure/Tire Pressure Status, XX -This indicates the actual pressure status of the Tire Location defined in the previous column (Tire X Location) or by the values for XX. Possible values are LOW, NORMAL, HIGH, or SNA for this parameter. Vehicles with Base Tire Pressure Monitoring systems may display NORMAL even though these vehicles do not send actual pressure values across the communication bus.
  - Tire X Pressure/Tire Pressure Value, XX (psi) - This indicates the actual tire pressure value of the Tire Location defined in the previous column (Tire X Location) or by the values for XX. Vehicles with Base Tire Pressure Monitoring systems will display N/A for this parameter as these vehicles do not send actual pressure values across the communication bus.
    - For the following vehicles, the tire location, if displayed, may not be accurate if the tires have been rotated:
      - 2013 MY Ram
      - 2013-2017 MY Jeep Patriot
      - 2013-2014 MY Chrysler 200
      - 2013-2017 MY Jeep Compass
      - 2013-2016 MY Dodge Dart
      - For the 2013 MY Ram, if the values for tire pressure status and the tire pressure are SNA, the EDR does not store tire pressure monitoring data.
    - Tire pressure is not stored in the EDR for the following vehicles:
      - 2014-2018 MY RAM 1500
      - 2014+ MY RAM (all but 1500)
      - 2013+ MY Jeep Wrangler
      - 2013 MY Jeep Grand Cherokee
      - 2013 MY Dodge Durango
      - 2013-2014 MY Dodge Challenger
      - 2013-2016 MY Chrysler Town and Country
      - 2013+ MY Dodge Grand Caravan
      - 2015+ MY Fiat 500
  - Wheel Speed, XX - This indicates the speed value (in revolutions per minute) of a particular tire as denoted by XX.
- Tire Pressure Monitor Indicator Lamp/Faults - “On” indicates a fault in the tire pressure monitoring system. The TPM module DTC’s should be read and recorded for final system interpretation.
- "T0" ("Time zero" where ‘0’ is seen as subscript) is defined as "beginning of the crash event". T0 is the time at which the ACM algorithm is activated, a specific Delta-V is exceeded, or a non-reversible restraint device is deployed. T0 may be defined differently for front, side, rear and roll-over events.
  - If multiple algorithm decisions (i.e.: frontal, side, rear and/or rollover) are made before the first recorded event ends, all of those events are part of the same event record and "T0" is defined as the "T0" from the first recorded event.

- In the Pre-Crash data tables, the relative time marker "-0.1s" or “-0.25s” respectively represents the last set of data captured in the buffer prior to "T0."

- Torque Information:
  - Axle Torque - This indicates the E-Motor Torque multiplied by the gear ratio for battery electric vehicles only.
  - E-Motor Torque - This indicates the calculated torque from the output shaft of the electric motor in battery electric vehicles only.
- Traction Control Intervention Active - “Active” indicates wheel slippage was occurring during vehicle acceleration.

APPLICATION INFORMATION:

- Jeep Renegade and Alfa Romeo Giulia are only CDR supported in the NAFTA market.

03002_Chrysler_ r035

System Status at Retrieval

Original VIN	1C6RR7NT5ES******
Ignition Cycle, Download	1573
ACM Part Number	68085881AH
ECU Serial Number	T52MD236402496
ACM Supplier	Bosch
ECU Supply Voltage at Time of Retrieval	11.9

System Configuration at Retrieval

Configured for Driver Frontal Airbag	Yes
Configured for Passenger Airbag	Yes
Configured for Driver Retractor Pretensioner	Yes
Configured for Passenger Retractor Pretensioner	Yes
Configured for Left Side Curtain Airbag	Yes
Configured for Right Side Curtain Airbag	Yes
Configured for Front Left Seat Airbags	Yes
Configured for Front Right Seat Airbag	Yes
Configured for Safety Belt Status, Driver	Yes
Configured for Safety Belt Status, Outboard Front Passenger	Yes
Configured for Seat Track Position Switch, Foremost, Status, Driver	No
Configured for Seat Track Position Switch, Foremost, Status, Outboard Front Passenger	No

System Configuration at Event (Most Recent Event)

Configured for Driver Frontal Airbag	Yes
Configured for Passenger Airbag	Yes
Configured for Driver Retractor Pretensioner	Yes
Configured for Passenger Retractor Pretensioner	Yes
Configured for Left Side Curtain Airbag	Yes
Configured for Right Side Curtain Airbag	Yes
Configured for Front Left Seat Airbags	Yes
Configured for Front Right Seat Airbag	Yes
Configured for Safety Belt Status, Driver	Yes
Configured for Safety Belt Status, Outboard Front Passenger	Yes
Configured for Seat Track Position Switch, Foremost, Status, Driver	No
Configured for Seat Track Position Switch, Foremost, Status, Outboard Front Passenger	No

System Status at Event (Most Recent Event)

Event Number	2
Multi-Event, Number of Events (1,2)	2
Total number of events	2
Time from Event 1 to 2 (Time since last event)(sec)	0.31
Complete File Recorded (Yes, No)	Yes
Maximum Delta-V Longitudinal (MPH [km/h])	-23.0 [-37]
Time, Maximum Delta-V, Longitudinal (msec)	260
Maximum Delta-V Lateral (MPH [km/h])	3.7 [6]
Time, Maximum Delta-V, Lateral (msec)	64
Ignition Cycle, Crash	1571
Safety Belt Status, Driver	Not Buckled
Safety Belt Status, Outboard Front Passenger	Not Buckled
Airbag Warning Lamp, On/Off	Off
Operation System Time (sec)	1255978
Airbag Warning Lamp On Time Before Event (min)	10794
Supply Voltage at Event, ACM (V)	14.2
Operation via Energy Reserve	No
VIN at Event (last 8 digits)	ES******
Odometer at Event (km [miles])	17793 [11055.7]

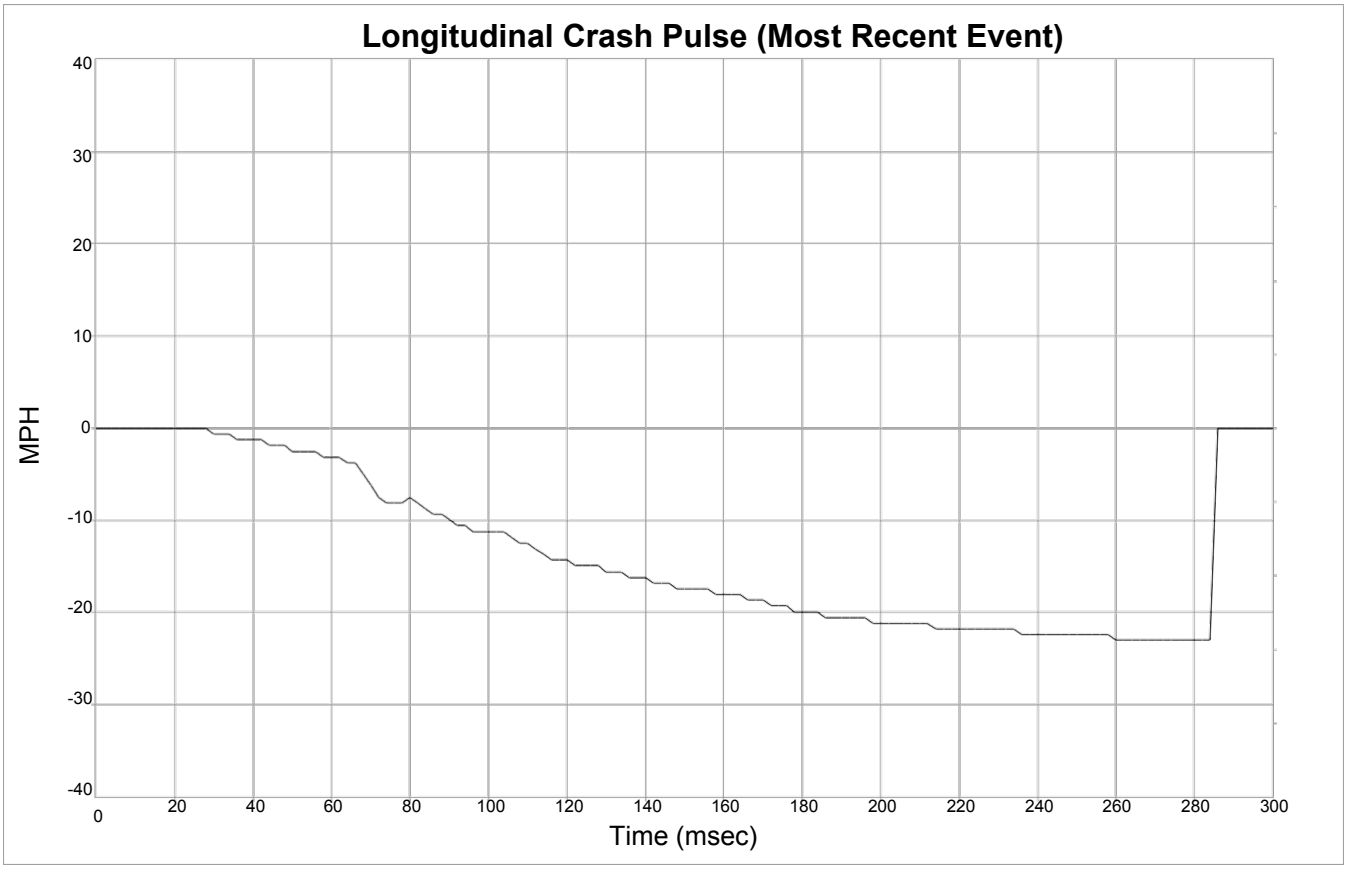
Deployment Command Data (Most Recent Event)

Driver Frontal Airbag Commanded	Yes
Driver Front Airbag, Time to 1st stage (msec)	209
Driver Front Airbag, Time to 2nd Stage from T0 (msec)	269
Passenger Frontal Airbag Commanded	Yes
Passenger Front Airbag, Time to 1st stage (msec)	209
Passenger Front Airbag, Time to 2nd Stage from T0 (msec)	239
Commanded Driver Retractor Pretensioner Deployment	Yes
Commanded Passenger Retractor Pretensioner Deployment	Yes
Commanded Left Side Curtain Airbag Deployment	Yes
Commanded Left Seat Airbag Deployment	Yes
Commanded Right Side Curtain Airbag Deployment	No
Commanded Front Right Side Seat Airbag Deployment	No

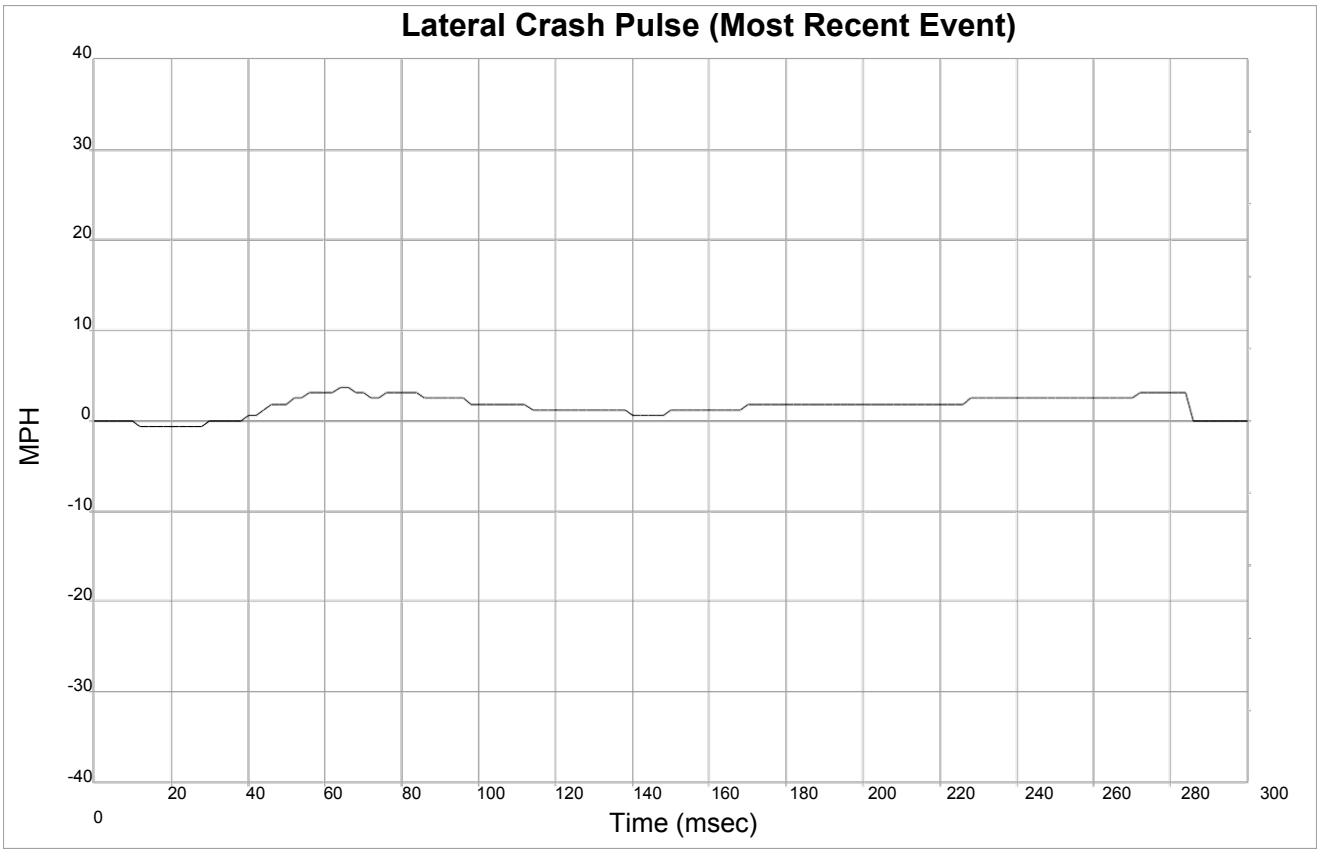
DTCs Present at Start of Event (Most Recent Event)

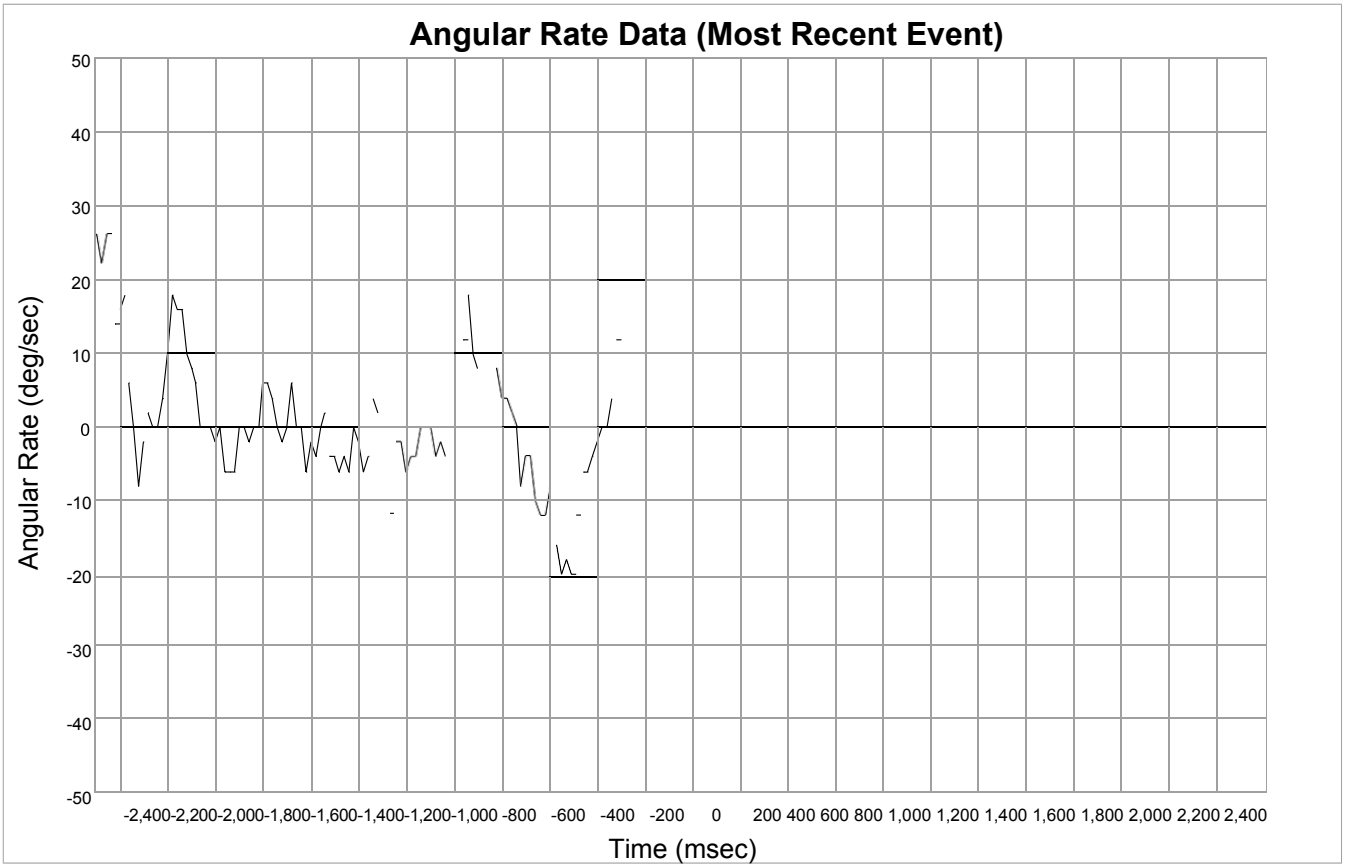
No DTCs Present

Longitudinal Crash Pulse (Most Recent Event)



Lateral Crash Pulse (Most Recent Event)




Angular Rate Data (Most Recent Event)
Angular Rate (deg/sec)
50
40
30
20
10
0
-10
-20
-30
-40
-50
-2,400 -2,200 -2,000 -1,800 -1,600 -1,400 -1,200 -1,000 -800 -600 -400 -200 0 200 400 600 800 1,000 1,200 1,400 1,600 1,800 2,000 2,200 2,400
Time (msec)

Longitudinal Crash Pulse (Most Recent Event)

Time (msec)	Delta-V, Longitudinal (MPH [km/h])
0	0.0 [0]
2	0.0 [0]
4	0.0 [0]
6	0.0 [0]
8	0.0 [0]
10	0.0 [0]
12	0.0 [0]
14	0.0 [0]
16	0.0 [0]
18	0.0 [0]
20	0.0 [0]
22	0.0 [0]
24	0.0 [0]
26	0.0 [0]
28	0.0 [0]
30	-0.6 [-1]
32	-0.6 [-1]
34	-0.6 [-1]
36	-1.2 [-2]
38	-1.2 [-2]
40	-1.2 [-2]
42	-1.2 [-2]
44	-1.9 [-3]
46	-1.9 [-3]
48	-1.9 [-3]
50	-2.5 [-4]
52	-2.5 [-4]
54	-2.5 [-4]
56	-2.5 [-4]
58	-3.1 [-5]
60	-3.1 [-5]
62	-3.1 [-5]
64	-3.7 [-6]
66	-3.7 [-6]
68	-5.0 [-8]
70	-6.2 [-10]
72	-7.5 [-12]
74	-8.1 [-13]
76	-8.1 [-13]
78	-8.1 [-13]
80	-7.5 [-12]
82	-8.1 [-13]
84	-8.7 [-14]
86	-9.3 [-15]
88	-9.3 [-15]
90	-9.9 [-16]
92	-10.6 [-17]
94	-10.6 [-17]
96	-11.2 [-18]
98	-11.2 [-18]

Time (msec)	Delta-V, Longitudinal (MPH [km/h])
100	-11.2 [-18]
102	-11.2 [-18]
104	-11.2 [-18]
106	-11.8 [-19]
108	-12.4 [-20]
110	-12.4 [-20]
112	-13.0 [-21]
114	-13.7 [-22]
116	-14.3 [-23]
118	-14.3 [-23]
120	-14.3 [-23]
122	-14.9 [-24]
124	-14.9 [-24]
126	-14.9 [-24]
128	-14.9 [-24]
130	-15.5 [-25]
132	-15.5 [-25]
134	-15.5 [-25]
136	-16.2 [-26]
138	-16.2 [-26]
140	-16.2 [-26]
142	-16.8 [-27]
144	-16.8 [-27]
146	-16.8 [-27]
148	-17.4 [-28]
150	-17.4 [-28]
152	-17.4 [-28]
154	-17.4 [-28]
156	-17.4 [-28]
158	-18.0 [-29]
160	-18.0 [-29]
162	-18.0 [-29]
164	-18.0 [-29]
166	-18.6 [-30]
168	-18.6 [-30]
170	-18.6 [-30]
172	-19.3 [-31]
174	-19.3 [-31]
176	-19.3 [-31]
178	-19.9 [-32]
180	-19.9 [-32]
182	-19.9 [-32]
184	-19.9 [-32]
186	-20.5 [-33]
188	-20.5 [-33]
190	-20.5 [-33]
192	-20.5 [-33]
194	-20.5 [-33]
196	-20.5 [-33]
198	-21.1 [-34]

Time (msec)	Delta-V, Longitudinal (MPH [km/h])
200	-21.1 [-34]
202	-21.1 [-34]
204	-21.1 [-34]
206	-21.1 [-34]
208	-21.1 [-34]
210	-21.1 [-34]
212	-21.1 [-34]
214	-21.7 [-35]
216	-21.7 [-35]
218	-21.7 [-35]
220	-21.7 [-35]
222	-21.7 [-35]
224	-21.7 [-35]
226	-21.7 [-35]
228	-21.7 [-35]
230	-21.7 [-35]
232	-21.7 [-35]
234	-21.7 [-35]
236	-22.4 [-36]
238	-22.4 [-36]
240	-22.4 [-36]
242	-22.4 [-36]
244	-22.4 [-36]
246	-22.4 [-36]
248	-22.4 [-36]
250	-22.4 [-36]
252	-22.4 [-36]
254	-22.4 [-36]
256	-22.4 [-36]
258	-22.4 [-36]
260	-23.0 [-37]
262	-23.0 [-37]
264	-23.0 [-37]
266	-23.0 [-37]
268	-23.0 [-37]
270	-23.0 [-37]
272	-23.0 [-37]
274	-23.0 [-37]
276	-23.0 [-37]
278	-23.0 [-37]
280	-23.0 [-37]
282	-23.0 [-37]
284	-23.0 [-37]
286	0.0 [0]
288	0.0 [0]
290	0.0 [0]
292	0.0 [0]
294	0.0 [0]
296	0.0 [0]
298	0.0 [0]
300	0.0 [0]

Lateral Crash Pulse (Most Recent Event)

Time (msec)	Delta-V, Lateral (MPH [km/h])
0	0.0 [0]
2	0.0 [0]
4	0.0 [0]
6	0.0 [0]
8	0.0 [0]
10	0.0 [0]
12	-0.6 [-1]
14	-0.6 [-1]
16	-0.6 [-1]
18	-0.6 [-1]
20	-0.6 [-1]
22	-0.6 [-1]
24	-0.6 [-1]
26	-0.6 [-1]
28	-0.6 [-1]
30	0.0 [0]
32	0.0 [0]
34	0.0 [0]
36	0.0 [0]
38	0.0 [0]
40	0.6 [1]
42	0.6 [1]
44	1.2 [2]
46	1.9 [3]
48	1.9 [3]
50	1.9 [3]
52	2.5 [4]
54	2.5 [4]
56	3.1 [5]
58	3.1 [5]
60	3.1 [5]
62	3.1 [5]
64	3.7 [6]
66	3.7 [6]
68	3.1 [5]
70	3.1 [5]
72	2.5 [4]
74	2.5 [4]
76	3.1 [5]
78	3.1 [5]
80	3.1 [5]
82	3.1 [5]
84	3.1 [5]
86	2.5 [4]
88	2.5 [4]
90	2.5 [4]
92	2.5 [4]
94	2.5 [4]
96	2.5 [4]
98	1.9 [3]

Time (msec)	Delta-V, Lateral (MPH [km/h])
100	1.9 [3]
102	1.9 [3]
104	1.9 [3]
106	1.9 [3]
108	1.9 [3]
110	1.9 [3]
112	1.9 [3]
114	1.2 [2]
116	1.2 [2]
118	1.2 [2]
120	1.2 [2]
122	1.2 [2]
124	1.2 [2]
126	1.2 [2]
128	1.2 [2]
130	1.2 [2]
132	1.2 [2]
134	1.2 [2]
136	1.2 [2]
138	1.2 [2]
140	0.6 [1]
142	0.6 [1]
144	0.6 [1]
146	0.6 [1]
148	0.6 [1]
150	1.2 [2]
152	1.2 [2]
154	1.2 [2]
156	1.2 [2]
158	1.2 [2]
160	1.2 [2]
162	1.2 [2]
164	1.2 [2]
166	1.2 [2]
168	1.2 [2]
170	1.9 [3]
172	1.9 [3]
174	1.9 [3]
176	1.9 [3]
178	1.9 [3]
180	1.9 [3]
182	1.9 [3]
184	1.9 [3]
186	1.9 [3]
188	1.9 [3]
190	1.9 [3]
192	1.9 [3]
194	1.9 [3]
196	1.9 [3]
198	1.9 [3]

Time (msec)	Delta-V, Lateral (MPH [km/h])
200	1.9 [3]
202	1.9 [3]
204	1.9 [3]
206	1.9 [3]
208	1.9 [3]
210	1.9 [3]
212	1.9 [3]
214	1.9 [3]
216	1.9 [3]
218	1.9 [3]
220	1.9 [3]
222	1.9 [3]
224	1.9 [3]
226	1.9 [3]
228	2.5 [4]
230	2.5 [4]
232	2.5 [4]
234	2.5 [4]
236	2.5 [4]
238	2.5 [4]
240	2.5 [4]
242	2.5 [4]
244	2.5 [4]
246	2.5 [4]
248	2.5 [4]
250	2.5 [4]
252	2.5 [4]
254	2.5 [4]
256	2.5 [4]
258	2.5 [4]
260	2.5 [4]
262	2.5 [4]
264	2.5 [4]
266	2.5 [4]
268	2.5 [4]
270	2.5 [4]
272	3.1 [5]
274	3.1 [5]
276	3.1 [5]
278	3.1 [5]
280	3.1 [5]
282	3.1 [5]
284	3.1 [5]
286	0.0 [0]
288	0.0 [0]
290	0.0 [0]
292	0.0 [0]
294	0.0 [0]
296	0.0 [0]
298	0.0 [0]
300	0.0 [0]

Angular Rate Data (Most Recent Event)

Time (msec)	Angular Rate (deg/sec)
-2500	26.00
-2480	22.00
-2460	26.00
-2440	26.00
-2420	14.00
-2400	16.00
-2380	18.00
-2360	6.00
-2340	0.00
-2320	-8.00
-2300	-2.00
-2280	2.00
-2260	0.00
-2240	0.00
-2220	4.00
-2200	10.00
-2180	18.00
-2160	16.00
-2140	16.00
-2120	10.00
-2100	8.00
-2080	6.00
-2060	0.00
-2040	0.00
-2020	0.00
-2000	-2.00
-1980	0.00
-1960	-6.00
-1940	-6.00
-1920	-6.00
-1900	0.00
-1880	0.00
-1860	-2.00
-1840	0.00
-1820	0.00
-1800	6.00
-1780	6.00
-1760	4.00
-1740	0.00
-1720	-2.00
-1700	0.00
-1680	6.00
-1660	0.00
-1640	0.00
-1620	-6.00
-1600	-2.00
-1580	-4.00
-1560	0.00
-1540	2.00
-1520	-4.00

Time (msec)	Angular Rate (deg/sec)
-1500	-4.00
-1480	-6.00
-1460	-4.00
-1440	-6.00
-1420	0.00
-1400	-2.00
-1380	-6.00
-1360	-4.00
-1340	4.00
-1320	2.00
-1300	-2.00
-1280	-12.00
-1260	-12.00
-1240	-2.00
-1220	-2.00
-1200	-6.00
-1180	-4.00
-1160	-4.00
-1140	0.00
-1120	0.00
-1100	0.00
-1080	-4.00
-1060	-2.00
-1040	-4.00
-1020	-12.00
-1000	-8.00
-980	2.00
-960	12.00
-940	18.00
-920	10.00
-900	8.00
-880	24.00
-860	36.00
-840	22.00
-820	8.00
-800	4.00
-780	4.00
-760	2.00
-740	0.00
-720	-8.00
-700	-4.00
-680	-4.00
-660	-10.00
-640	-12.00
-620	-12.00
-600	-8.00
-580	-16.00
-560	-20.00
-540	-18.00
-520	-20.00

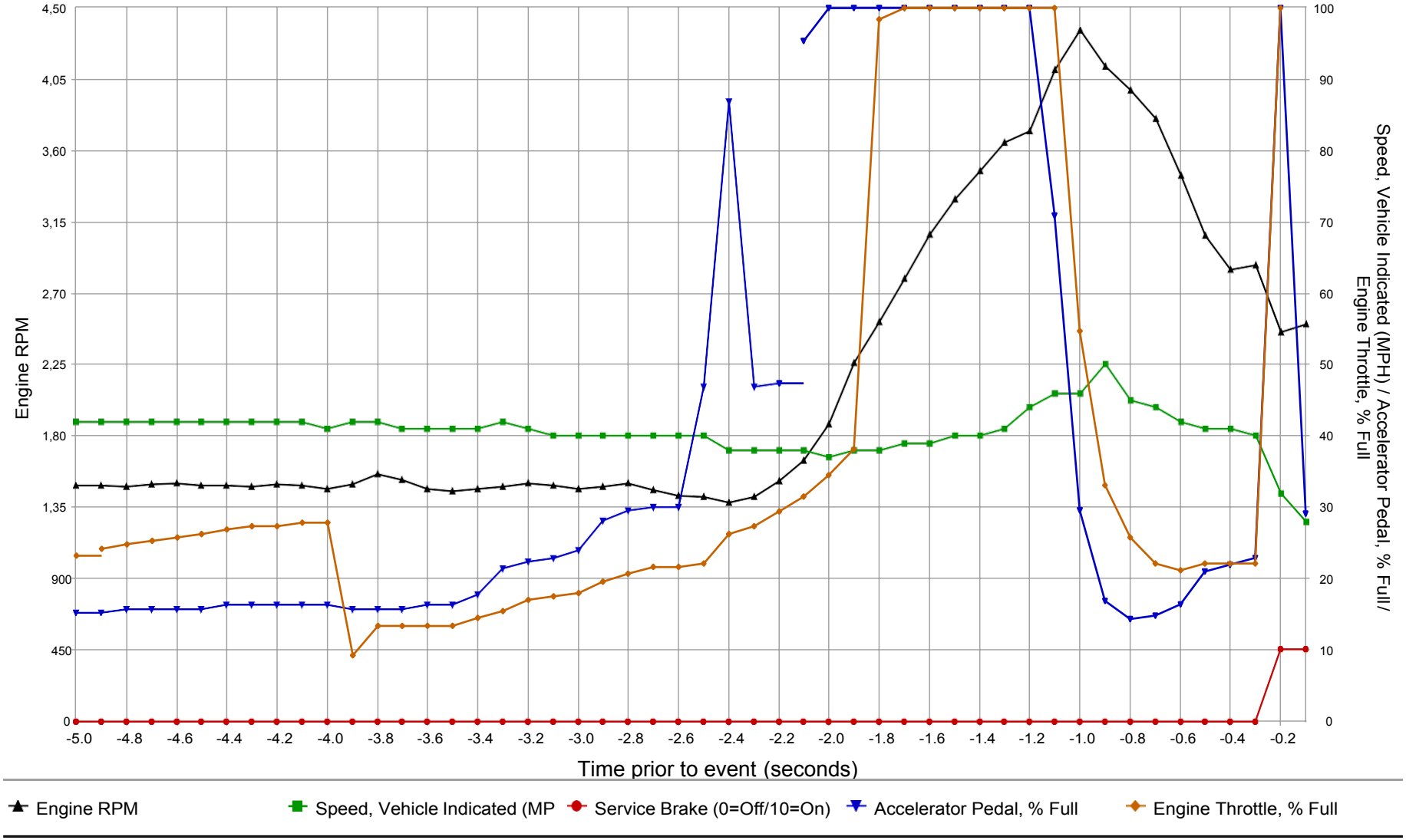
Time (msec)	Angular Rate (deg/sec)
-500	-12.00
-480	-12.00
-460	-6.00
-440	-6.00
-420	-4.00
-400	-2.00
-380	0.00
-360	0.00
-340	4.00
-320	12.00
-300	20.00
-280	0.00
-260	0.00
-240	0.00
-220	0.00
-200	0.00
-180	0.00
-160	0.00
-140	0.00
-120	0.00
-100	0.00
-80	0.00
-60	0.00
-40	0.00
-20	0.00
0	0.00
20	0.00
40	0.00
60	0.00
80	0.00
100	0.00
120	0.00
140	0.00
160	0.00
180	0.00
200	0.00
220	0.00
240	0.00
260	0.00
280	0.00
300	0.00
320	0.00
340	0.00
360	0.00
380	0.00
400	0.00
420	0.00
440	0.00
460	0.00
480	0.00

Angular Rate Data (Most Recent Event)

Time (msec)	Angular Rate (deg/sec)
500	0.00
520	0.00
540	0.00
560	0.00
580	0.00
600	0.00
620	0.00
640	0.00
660	0.00
680	0.00
700	0.00
720	0.00
740	0.00
760	0.00
780	0.00
800	0.00
820	0.00
840	0.00
860	0.00
880	0.00
900	0.00
920	0.00
940	0.00
960	0.00
980	0.00
1000	0.00
1020	0.00
1040	0.00
1060	0.00
1080	0.00
1100	0.00
1120	0.00
1140	0.00
1160	0.00
1180	0.00
1200	0.00
1220	0.00
1240	0.00
1260	0.00
1280	0.00
1300	0.00
1320	0.00
1340	0.00
1360	0.00
1380	0.00
1400	0.00
1420	0.00
1440	0.00
1460	0.00
1480	0.00

Time (msec)	Angular Rate (deg/sec)
1500	0.00
1520	0.00
1540	0.00
1560	0.00
1580	0.00
1600	0.00
1620	0.00
1640	0.00
1660	0.00
1680	0.00
1700	0.00
1720	0.00
1740	0.00
1760	0.00
1780	0.00
1800	0.00
1820	0.00
1840	0.00
1860	0.00
1880	0.00
1900	0.00
1920	0.00
1940	0.00
1960	0.00
1980	0.00
2000	0.00
2020	0.00
2040	0.00
2060	0.00
2080	0.00
2100	0.00
2120	0.00
2140	0.00
2160	0.00
2180	0.00
2200	0.00
2220	0.00
2240	0.00
2260	0.00
2280	0.00
2300	0.00
2320	0.00
2340	0.00
2360	0.00
2380	0.00
2400	0.00
2420	0.00

Pre-Crash Data (Most Recent Event)



SNA values will not be plotted on the graph

Pre-Crash Data (Most Recent Event - table 1 of 3)

(the most recent sampled values are recorded prior to the event)

Time Stamp (sec)	Pre-Crash Recorder Status	Speed, Vehicle Indicated (MPH [km/h])	Accelerator Pedal, % Full	Engine Throttle, % Full	Service Brake	Engine RPM	ABS Activity	Stability Control	Steering Input (deg)
-5.0	Complete	42 [68]	15	23	Off	1,488	No	On	-3
-4.9	Complete	42 [68]	15	24	Off	1,490	No	On	-2
-4.8	Complete	42 [68]	16	25	Off	1,480	No	On	-1
-4.7	Complete	42 [67]	16	25	Off	1,498	No	On	-1
-4.6	Complete	42 [67]	16	26	Off	1,500	No	On	-3
-4.5	Complete	42 [68]	16	26	Off	1,488	No	On	-4
-4.4	Complete	42 [68]	16	27	Off	1,490	No	On	-3
-4.3	Complete	42 [68]	16	27	Off	1,482	No	On	-2
-4.2	Complete	42 [67]	16	27	Off	1,496	No	On	0
-4.1	Complete	42 [67]	16	28	Off	1,490	No	On	4
-4.0	Complete	41 [67]	16	28	Off	1,469	No	On	7
-3.9	Complete	42 [67]	16	9	Off	1,496	No	On	8
-3.8	Complete	42 [67]	16	13	Off	1,558	No	On	5
-3.7	Complete	41 [66]	16	13	Off	1,527	No	On	2
-3.6	Complete	41 [66]	16	13	Off	1,466	No	On	1
-3.5	Complete	41 [66]	16	13	Off	1,454	No	On	3
-3.4	Complete	41 [66]	18	14	Off	1,467	No	On	4
-3.3	Complete	42 [67]	21	15	Off	1,481	No	On	2
-3.2	Complete	41 [66]	22	17	Off	1,500	No	On	-2
-3.1	Complete	40 [65]	23	18	Off	1,487	No	On	-5
-3.0	Complete	40 [64]	24	18	Off	1,467	No	On	-6
-2.9	Complete	40 [64]	28	20	Off	1,481	No	On	-3
-2.8	Complete	40 [65]	30	21	Off	1,499	No	On	-2
-2.7	Complete	40 [64]	30	22	Off	1,456	No	On	-4
-2.6	Complete	40 [64]	30	22	Off	1,426	No	On	-5
-2.5	Complete	40 [64]	47	22	Off	1,415	No	On	1
-2.4	Complete	38 [61]	87	26	Off	1,381	No	On	16
-2.3	Complete	38 [62]	47	27	Off	1,418	No	Engaged	36
-2.2	Complete	38 [61]	47	29	Off	1,515	No	On	44
-2.1	Complete	38 [61]	95	31	Off	1,649	No	On	25
-2.0	Complete	37 [60]	100	35	Off	1,876	No	On	7
-1.9	Complete	38 [61]	100	38	Off	2,259	No	On	0
-1.8	Complete	38 [61]	100	98	Off	2,518	No	On	-5
-1.7	Complete	39 [63]	100	100	Off	2,791	No	On	-5
-1.6	Complete	39 [63]	100	100	Off	3,069	No	On	-2
-1.5	Complete	40 [65]	100	100	Off	3,289	No	On	-1
-1.4	Complete	40 [64]	100	100	Off	3,467	No	On	-4
-1.3	Complete	41 [66]	100	100	Off	3,649	No	On	-7
-1.2	Complete	44 [71]	100	100	Off	3,720	No	On	-7
-1.1	Complete	46 [75]	71	100	Off	4,108	No	On	-8
-1.0	Complete	46 [74]	30	55	Off	4,357	No	On	-12
-0.9	Complete	50 [81]	17	33	Off	4,131	No	On	-17
-0.8	Complete	45 [72]	14	26	Off	3,980	No	On	-23
-0.7	Complete	44 [70]	15	22	Off	3,796	No	On	-22
-0.6	Complete	42 [67]	16	21	Off	3,439	No	On	-18
-0.5	Complete	41 [66]	21	22	Off	3,064	No	On	-18
-0.4	Complete	41 [66]	22	22	Off	2,844	No	On	-18
-0.3	Complete	40 [65]	23	22	Off	2,877	No	On	-15
-0.2	Complete	32 [51]	100	100	On	2,453	Yes	Off	-23
-0.1	Complete	28 [44]	29	SNA	On	2,504	Yes	Off	-24

Pre-Crash Data (Most Recent Event - table 2 of 3)

(the most recent sampled values are recorded prior to the event)

Time Stamp (sec)	Raw Manifold Pressure (kPa)	PCM MIL	Yaw Rate (deg/sec)	Wheel Speed LF (RPM)	Wheel Speed RF (RPM)	Wheel Speed LR (RPM)	Wheel Speed RR (RPM)	ETC Lamp
-5.0	96.80	Off	-1	441	436	440	437	Off
-4.9	96.80	Off	-1	439	437	441	448	Off
-4.8	97.60	Off	0	437	434	441	440	Off
-4.7	97.60	Off	0	438	430	436	436	Off
-4.6	97.60	Off	0	436	430	436	433	Off
-4.5	97.60	Off	-1	438	439	441	440	Off
-4.4	97.60	Off	0	439	437	440	439	Off
-4.3	97.60	Off	0	434	435	440	443	Off
-4.2	97.60	Off	-1	428	431	433	433	Off
-4.1	97.60	Off	-2	425	429	434	436	Off
-4.0	95.20	Off	0	430	425	431	429	Off
-3.9	76.00	Off	0	424	417	432	434	Off
-3.8	65.60	Off	-1	426	418	431	435	Off
-3.7	62.40	Off	0	424	416	431	433	Off
-3.6	60.00	Off	1	416	410	428	428	Off
-3.5	59.20	Off	1	419	408	427	425	Off
-3.4	59.20	Off	4	428	415	432	427	Off
-3.3	60.80	Off	2	421	412	439	432	Off
-3.2	64.80	Off	1	420	406	442	413	Off
-3.1	68.00	Off	1	412	408	419	424	Off
-3.0	71.20	Off	-1	407	401	416	410	Off
-2.9	76.00	Off	-2	415	399	417	414	Off
-2.8	80.00	Off	0	410	402	415	421	Off
-2.7	83.20	Off	-1	399	399	419	411	Off
-2.6	84.80	Off	0	401	396	419	411	Off
-2.5	85.60	Off	5	379	386	430	410	Off
-2.4	90.40	Off	4	387	387	394	389	Off
-2.3	92.00	Off	6	381	373	396	403	Off
-2.2	92.80	Off	9	385	381	386	399	Off
-2.1	93.60	Off	8	376	381	394	401	Off
-2.0	94.40	Off	7	373	386	384	389	Off
-1.9	94.40	Off	6	379	381	389	393	Off
-1.8	99.20	Off	3	382	380	397	394	Off
-1.7	98.40	Off	3	376	380	406	408	Off
-1.6	99.20	Off	2	375	379	401	418	Off
-1.5	97.60	Off	1	381	384	400	436	Off
-1.4	99.20	Off	1	379	376	414	420	Off
-1.3	99.20	Off	0	378	385	435	412	Off
-1.2	98.40	Off	-1	382	388	496	451	Off
-1.1	95.20	Off	-3	392	384	527	460	Off
-1.0	92.00	Off	-4	393	395	470	554	Off
-0.9	68.00	Off	-5	384	392	527	518	Off
-0.8	51.20	Off	-6	403	391	430	507	Off
-0.7	42.40	Off	-3	410	399	442	464	Off
-0.6	42.40	Off	-2	399	398	419	457	Off
-0.5	48.00	Off	-2	402	399	428	442	Off
-0.4	56.80	Off	-2	404	395	421	436	Off
-0.3	61.60	Off	-4	430	381	422	413	Off
-0.2	72.00	On	-27	258	75	330	427	On
-0.1	75.20	On	SNA	281	101	276	470	On

Pre-Crash Data (Most Recent Event - table 3 of 3)

(the most recent sampled values are recorded prior to the event)

Time Stamp (sec)	ETC Flashing	Engine Torque Applied	PRNDL Status (if equip.)	Reverse Gear (Manual Only)	Cruise Control Engaged (if equip.)	Cruise Control Status (if equip.)
-5.0	No	Yes	Drive	No	Not Engaged	On
-4.9	No	Yes	Drive	No	Not Engaged	On
-4.8	No	Yes	Drive	No	Not Engaged	On
-4.7	No	Yes	Drive	No	Not Engaged	On
-4.6	No	Yes	Drive	No	Not Engaged	On
-4.5	No	Yes	Drive	No	Not Engaged	On
-4.4	No	Yes	Drive	No	Not Engaged	On
-4.3	No	Yes	Drive	No	Not Engaged	On
-4.2	No	Yes	Drive	No	Not Engaged	On
-4.1	No	Yes	Drive	No	Not Engaged	On
-4.0	No	Yes	Drive	No	Not Engaged	On
-3.9	No	Yes	Drive	No	Not Engaged	On
-3.8	No	Yes	Drive	No	Not Engaged	On
-3.7	No	Yes	Drive	No	Not Engaged	On
-3.6	No	Yes	Drive	No	Not Engaged	On
-3.5	No	Yes	Drive	No	Not Engaged	On
-3.4	No	Yes	Drive	No	Not Engaged	On
-3.3	No	Yes	Drive	No	Not Engaged	On
-3.2	No	Yes	Drive	No	Not Engaged	On
-3.1	No	Yes	Drive	No	Not Engaged	On
-3.0	No	Yes	Drive	No	Not Engaged	On
-2.9	No	Yes	Drive	No	Not Engaged	On
-2.8	No	Yes	Drive	No	Not Engaged	On
-2.7	No	Yes	Drive	No	Not Engaged	On
-2.6	No	Yes	Drive	No	Not Engaged	On
-2.5	No	Yes	Drive	No	Not Engaged	On
-2.4	No	Yes	Drive	No	Not Engaged	On
-2.3	No	Yes	Drive	No	Not Engaged	On
-2.2	No	Yes	Drive	No	Not Engaged	On
-2.1	No	Yes	Drive	No	Not Engaged	On
-2.0	No	Yes	Drive	No	Not Engaged	On
-1.9	No	Yes	Drive	No	Not Engaged	On
-1.8	No	Yes	Drive	No	Not Engaged	On
-1.7	No	Yes	Drive	No	Not Engaged	On
-1.6	No	Yes	Drive	No	Not Engaged	On
-1.5	No	Yes	Drive	No	Not Engaged	On
-1.4	No	Yes	Drive	No	Not Engaged	On
-1.3	No	Yes	Drive	No	Not Engaged	On
-1.2	No	Yes	Drive	No	Not Engaged	On
-1.1	No	Yes	Drive	No	Not Engaged	On
-1.0	No	Yes	Drive	No	Not Engaged	On
-0.9	No	Yes	Drive	No	Not Engaged	Off
-0.8	No	Yes	Drive	No	Not Engaged	Off
-0.7	No	Yes	Drive	No	Not Engaged	Off
-0.6	No	Yes	Drive	No	Not Engaged	Off
-0.5	No	Yes	Drive	No	Not Engaged	Off
-0.4	No	Yes	Drive	No	Not Engaged	Off
-0.3	No	Yes	Drive	No	Not Engaged	Off
-0.2	No	Yes	Drive	No	Not Engaged	Off
-0.1	No	Yes	Drive	No	Not Engaged	Off

System Configuration at Event (1st Prior Event)

Configured for Driver Frontal Airbag	Yes
Configured for Passenger Airbag	Yes
Configured for Driver Retractor Pretensioner	Yes
Configured for Passenger Retractor Pretensioner	Yes
Configured for Left Side Curtain Airbag	Yes
Configured for Right Side Curtain Airbag	Yes
Configured for Front Left Seat Airbags	Yes
Configured for Front Right Seat Airbag	Yes
Configured for Safety Belt Status, Driver	Yes
Configured for Safety Belt Status, Outboard Front Passenger	Yes
Configured for Seat Track Position Switch, Foremost, Status, Driver	No
Configured for Seat Track Position Switch, Foremost, Status, Outboard Front Passenger	No

System Status at Event (1st Prior Event)

Event Number	1
Multi-Event, Number of Events (1,2)	1
Total number of events	2
Time from Event 1 to 2 (Time since last event)(sec)	>5
Complete File Recorded (Yes, No)	Yes
Maximum Delta-V Longitudinal (MPH [km/h])	-13.0 [-21]
Time, Maximum Delta-V, Longitudinal (msec)	88
Maximum Delta-V Lateral (MPH [km/h])	1.9 [3]
Time, Maximum Delta-V, Lateral (msec)	52
Ignition Cycle, Crash	1571
Safety Belt Status, Driver	Not Buckled
Safety Belt Status, Outboard Front Passenger	Not Buckled
Airbag Warning Lamp, On/Off	Off
Operation System Time (sec)	1258789
Airbag Warning Lamp On Time Before Event (min)	0
Supply Voltage at Event, ACM (V)	14.2
Operation via Energy Reserve	No
VIN at Event (last 8 digits)	ES******
Odometer at Event (km [miles])	17793 [11055.7]

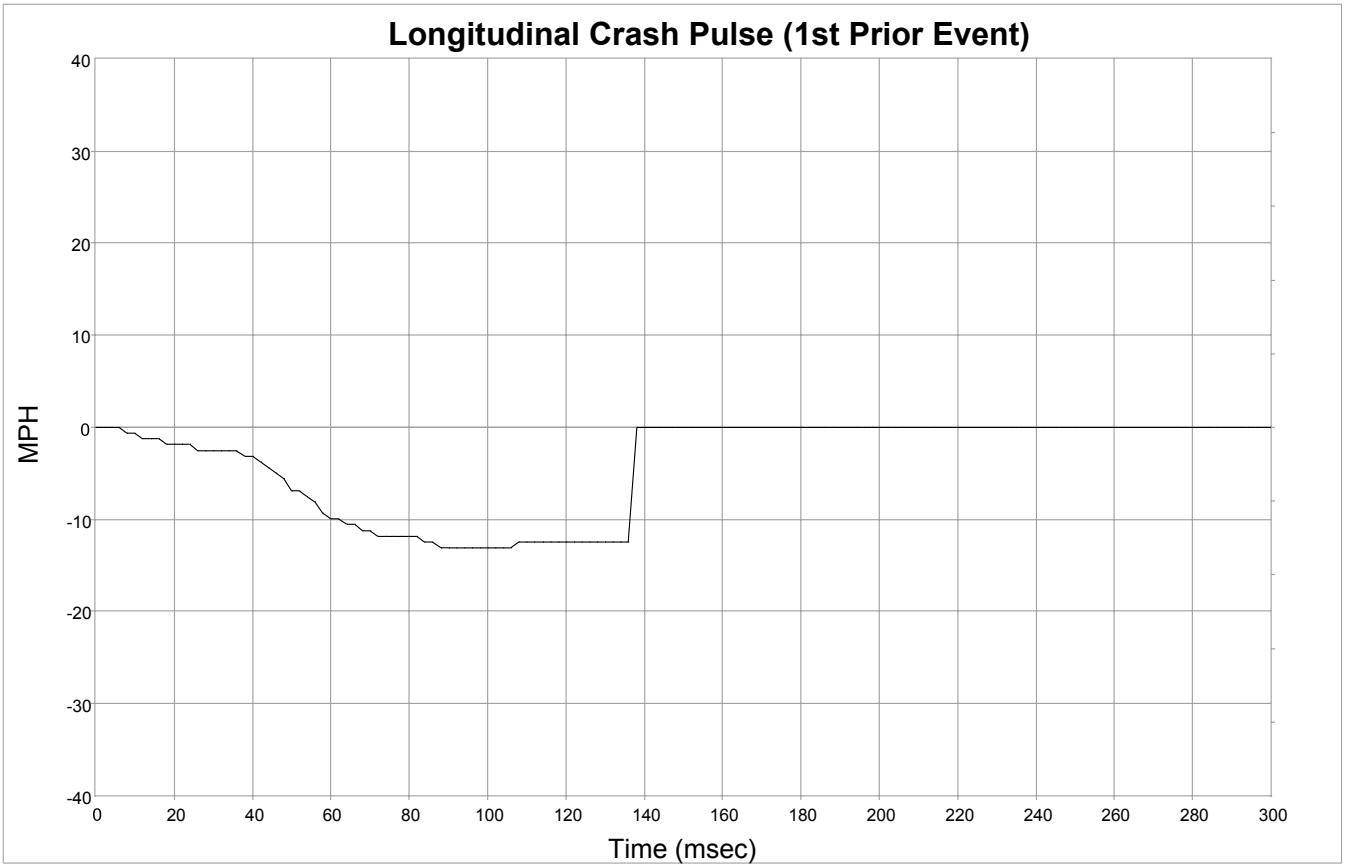
Deployment Command Data (1st Prior Event)

Driver Frontal Airbag Commanded	Yes
Driver Front Airbag, Time to 1st stage (msec)	41
Driver Front Airbag, Time to 2nd Stage from T0 (msec)	51
Passenger Frontal Airbag Commanded	Yes
Passenger Front Airbag, Time to 1st stage (msec)	41
Passenger Front Airbag, Time to 2nd Stage from T0 (msec)	51
Commanded Driver Retractor Pretensioner Deployment	Yes
Commanded Passenger Retractor Pretensioner Deployment	Yes
Commanded Left Side Curtain Airbag Deployment	No
Commanded Left Seat Airbag Deployment	No
Commanded Right Side Curtain Airbag Deployment	No
Commanded Front Right Side Seat Airbag Deployment	No

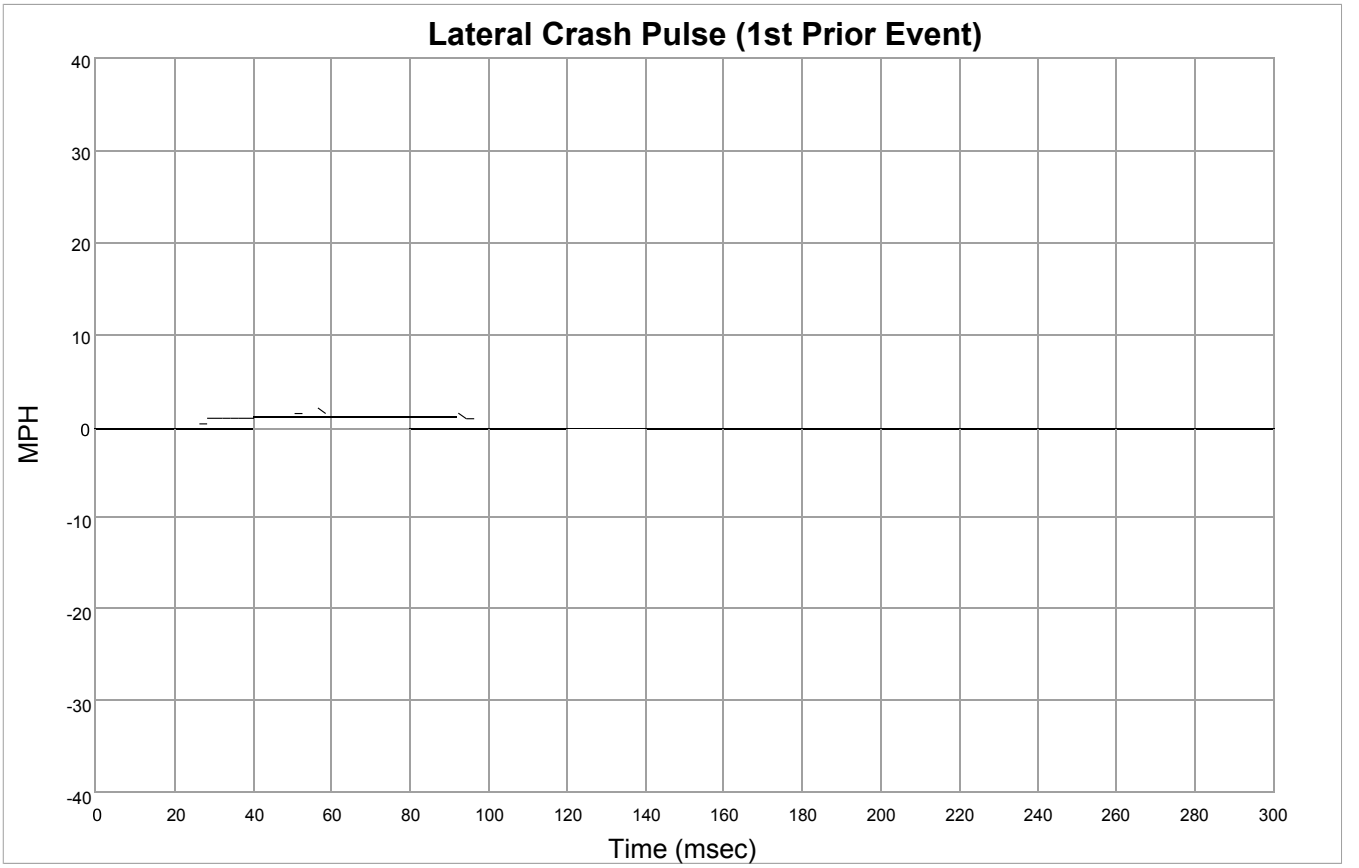
DTCs Present at Start of Event (1st Prior Event)

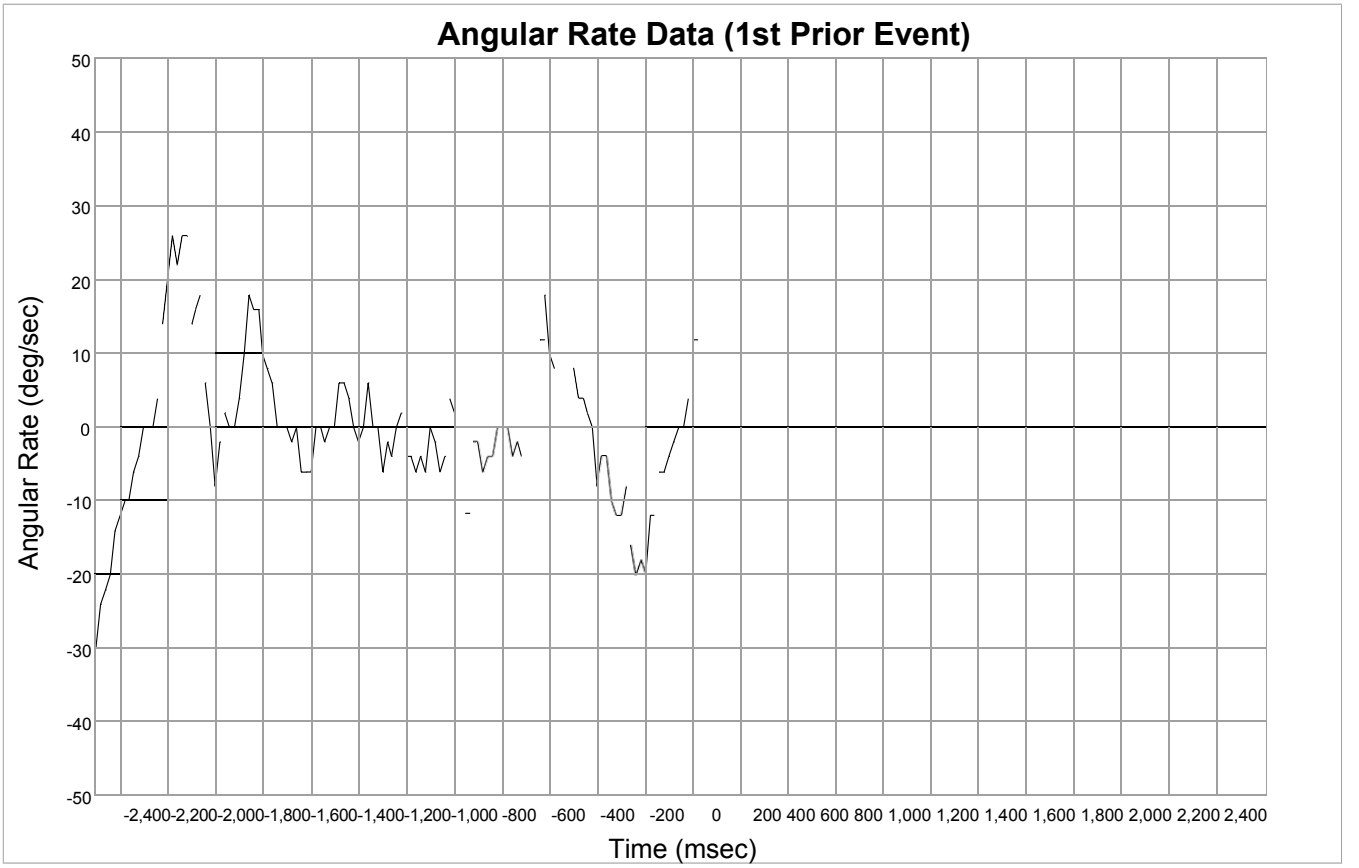
No DTCs Present

Longitudinal Crash Pulse (1st Prior Event)



Lateral Crash Pulse (1st Prior Event)




Angular Rate Data (1st Prior Event)
Angular Rate (deg/sec)
50
40
30
20
10
0
-10
-20
-30
-40
-50
-2,400 -2,200 -2,000 -1,800 -1,600 -1,400 -1,200 -1,000 -800 -600 -400 -200 0 200 400 600 800 1,000 1,200 1,400 1,600 1,800 2,000 2,200 2,400
Time (msec)

Longitudinal Crash Pulse (1st Prior Event)

Time (msec)	Delta-V, Longitudinal (MPH [km/h])
0	0.0 [0]
2	0.0 [0]
4	0.0 [0]
6	0.0 [0]
8	-0.6 [-1]
10	-0.6 [-1]
12	-1.2 [-2]
14	-1.2 [-2]
16	-1.2 [-2]
18	-1.9 [-3]
20	-1.9 [-3]
22	-1.9 [-3]
24	-1.9 [-3]
26	-2.5 [-4]
28	-2.5 [-4]
30	-2.5 [-4]
32	-2.5 [-4]
34	-2.5 [-4]
36	-2.5 [-4]
38	-3.1 [-5]
40	-3.1 [-5]
42	-3.7 [-6]
44	-4.3 [-7]
46	-5.0 [-8]
48	-5.6 [-9]
50	-6.8 [-11]
52	-6.8 [-11]
54	-7.5 [-12]
56	-8.1 [-13]
58	-9.3 [-15]
60	-9.9 [-16]
62	-9.9 [-16]
64	-10.6 [-17]
66	-10.6 [-17]
68	-11.2 [-18]
70	-11.2 [-18]
72	-11.8 [-19]
74	-11.8 [-19]
76	-11.8 [-19]
78	-11.8 [-19]
80	-11.8 [-19]
82	-11.8 [-19]
84	-12.4 [-20]
86	-12.4 [-20]
88	-13.0 [-21]
90	-13.0 [-21]
92	-13.0 [-21]
94	-13.0 [-21]
96	-13.0 [-21]
98	-13.0 [-21]

Time (msec)	Delta-V, Longitudinal (MPH [km/h])
100	-13.0 [-21]
102	-13.0 [-21]
104	-13.0 [-21]
106	-13.0 [-21]
108	-12.4 [-20]
110	-12.4 [-20]
112	-12.4 [-20]
114	-12.4 [-20]
116	-12.4 [-20]
118	-12.4 [-20]
120	-12.4 [-20]
122	-12.4 [-20]
124	-12.4 [-20]
126	-12.4 [-20]
128	-12.4 [-20]
130	-12.4 [-20]
132	-12.4 [-20]
134	-12.4 [-20]
136	-12.4 [-20]
138	0.0 [0]
140	0.0 [0]
142	0.0 [0]
144	0.0 [0]
146	0.0 [0]
148	0.0 [0]
150	0.0 [0]
152	0.0 [0]
154	0.0 [0]
156	0.0 [0]
158	0.0 [0]
160	0.0 [0]
162	0.0 [0]
164	0.0 [0]
166	0.0 [0]
168	0.0 [0]
170	0.0 [0]
172	0.0 [0]
174	0.0 [0]
176	0.0 [0]
178	0.0 [0]
180	0.0 [0]
182	0.0 [0]
184	0.0 [0]
186	0.0 [0]
188	0.0 [0]
190	0.0 [0]
192	0.0 [0]
194	0.0 [0]
196	0.0 [0]
198	0.0 [0]

Time (msec)	Delta-V, Longitudinal (MPH [km/h])
200	0.0 [0]
202	0.0 [0]
204	0.0 [0]
206	0.0 [0]
208	0.0 [0]
210	0.0 [0]
212	0.0 [0]
214	0.0 [0]
216	0.0 [0]
218	0.0 [0]
220	0.0 [0]
222	0.0 [0]
224	0.0 [0]
226	0.0 [0]
228	0.0 [0]
230	0.0 [0]
232	0.0 [0]
234	0.0 [0]
236	0.0 [0]
238	0.0 [0]
240	0.0 [0]
242	0.0 [0]
244	0.0 [0]
246	0.0 [0]
248	0.0 [0]
250	0.0 [0]
252	0.0 [0]
254	0.0 [0]
256	0.0 [0]
258	0.0 [0]
260	0.0 [0]
262	0.0 [0]
264	0.0 [0]
266	0.0 [0]
268	0.0 [0]
270	0.0 [0]
272	0.0 [0]
274	0.0 [0]
276	0.0 [0]
278	0.0 [0]
280	0.0 [0]
282	0.0 [0]
284	0.0 [0]
286	0.0 [0]
288	0.0 [0]
290	0.0 [0]
292	0.0 [0]
294	0.0 [0]
296	0.0 [0]
298	0.0 [0]
300	0.0 [0]

Lateral Crash Pulse (1st Prior Event)

Time (msec)	Delta-V, Lateral (MPH [km/h])
0	0.0 [0]
2	0.0 [0]
4	0.0 [0]
6	0.0 [0]
8	0.0 [0]
10	0.0 [0]
12	0.0 [0]
14	0.0 [0]
16	0.0 [0]
18	0.0 [0]
20	0.0 [0]
22	0.0 [0]
24	0.0 [0]
26	0.0 [0]
28	0.6 [1]
30	0.6 [1]
32	0.6 [1]
34	0.6 [1]
36	0.6 [1]
38	0.6 [1]
40	1.2 [2]
42	1.2 [2]
44	1.2 [2]
46	1.2 [2]
48	1.2 [2]
50	1.2 [2]
52	1.9 [3]
54	1.9 [3]
56	1.9 [3]
58	1.2 [2]
60	1.2 [2]
62	1.2 [2]
64	1.2 [2]
66	1.2 [2]
68	1.2 [2]
70	1.2 [2]
72	1.2 [2]
74	1.2 [2]
76	1.2 [2]
78	1.2 [2]
80	1.2 [2]
82	1.2 [2]
84	1.2 [2]
86	1.2 [2]
88	1.2 [2]
90	1.2 [2]
92	1.2 [2]
94	0.6 [1]
96	1.2 [2]
98	1.2 [2]

Time (msec)	Delta-V, Lateral (MPH [km/h])
100	1.2 [2]
102	1.2 [2]
104	1.2 [2]
106	1.2 [2]
108	1.2 [2]
110	1.2 [2]
112	1.2 [2]
114	0.6 [1]
116	0.6 [1]
118	0.6 [1]
120	0.6 [1]
122	0.6 [1]
124	0.6 [1]
126	0.6 [1]
128	0.6 [1]
130	0.6 [1]
132	0.6 [1]
134	0.6 [1]
136	0.6 [1]
138	0.0 [0]
140	0.0 [0]
142	0.0 [0]
144	0.0 [0]
146	0.0 [0]
148	0.0 [0]
150	0.0 [0]
152	0.0 [0]
154	0.0 [0]
156	0.0 [0]
158	0.0 [0]
160	0.0 [0]
162	0.0 [0]
164	0.0 [0]
166	0.0 [0]
168	0.0 [0]
170	0.0 [0]
172	0.0 [0]
174	0.0 [0]
176	0.0 [0]
178	0.0 [0]
180	0.0 [0]
182	0.0 [0]
184	0.0 [0]
186	0.0 [0]
188	0.0 [0]
190	0.0 [0]
192	0.0 [0]
194	0.0 [0]
196	0.0 [0]
198	0.0 [0]

Time (msec)	Delta-V, Lateral (MPH [km/h])
200	0.0 [0]
202	0.0 [0]
204	0.0 [0]
206	0.0 [0]
208	0.0 [0]
210	0.0 [0]
212	0.0 [0]
214	0.0 [0]
216	0.0 [0]
218	0.0 [0]
220	0.0 [0]
222	0.0 [0]
224	0.0 [0]
226	0.0 [0]
228	0.0 [0]
230	0.0 [0]
232	0.0 [0]
234	0.0 [0]
236	0.0 [0]
238	0.0 [0]
240	0.0 [0]
242	0.0 [0]
244	0.0 [0]
246	0.0 [0]
248	0.0 [0]
250	0.0 [0]
252	0.0 [0]
254	0.0 [0]
256	0.0 [0]
258	0.0 [0]
260	0.0 [0]
262	0.0 [0]
264	0.0 [0]
266	0.0 [0]
268	0.0 [0]
270	0.0 [0]
272	0.0 [0]
274	0.0 [0]
276	0.0 [0]
278	0.0 [0]
280	0.0 [0]
282	0.0 [0]
284	0.0 [0]
286	0.0 [0]
288	0.0 [0]
290	0.0 [0]
292	0.0 [0]
294	0.0 [0]
296	0.0 [0]
298	0.0 [0]
300	0.0 [0]

Angular Rate Data (1st Prior Event)

Time (msec)	Angular Rate (deg/sec)
-2500	-30.00
-2480	-24.00
-2460	-22.00
-2440	-20.00
-2420	-14.00
-2400	-12.00
-2380	-10.00
-2360	-10.00
-2340	-6.00
-2320	-4.00
-2300	0.00
-2280	0.00
-2260	0.00
-2240	4.00
-2220	14.00
-2200	20.00
-2180	26.00
-2160	22.00
-2140	26.00
-2120	26.00
-2100	14.00
-2080	16.00
-2060	18.00
-2040	6.00
-2020	0.00
-2000	-8.00
-1980	-2.00
-1960	2.00
-1940	0.00
-1920	0.00
-1900	4.00
-1880	10.00
-1860	18.00
-1840	16.00
-1820	16.00
-1800	10.00
-1780	8.00
-1760	6.00
-1740	0.00
-1720	0.00
-1700	0.00
-1680	-2.00
-1660	0.00
-1640	-6.00
-1620	-6.00
-1600	-6.00
-1580	0.00
-1560	0.00
-1540	-2.00
-1520	0.00

Time (msec)	Angular Rate (deg/sec)
-1500	0.00
-1480	6.00
-1460	6.00
-1440	4.00
-1420	0.00
-1400	-2.00
-1380	0.00
-1360	6.00
-1340	0.00
-1320	0.00
-1300	-6.00
-1280	-2.00
-1260	-4.00
-1240	0.00
-1220	2.00
-1200	-4.00
-1180	-4.00
-1160	-6.00
-1140	-4.00
-1120	-6.00
-1100	0.00
-1080	-2.00
-1060	-6.00
-1040	-4.00
-1020	4.00
-1000	2.00
-980	-2.00
-960	-12.00
-940	-12.00
-920	-2.00
-900	-2.00
-880	-6.00
-860	-4.00
-840	-4.00
-820	0.00
-800	0.00
-780	0.00
-760	-4.00
-740	-2.00
-720	-4.00
-700	-12.00
-680	-8.00
-660	2.00
-640	12.00
-620	18.00
-600	10.00
-580	8.00
-560	24.00
-540	36.00
-520	22.00

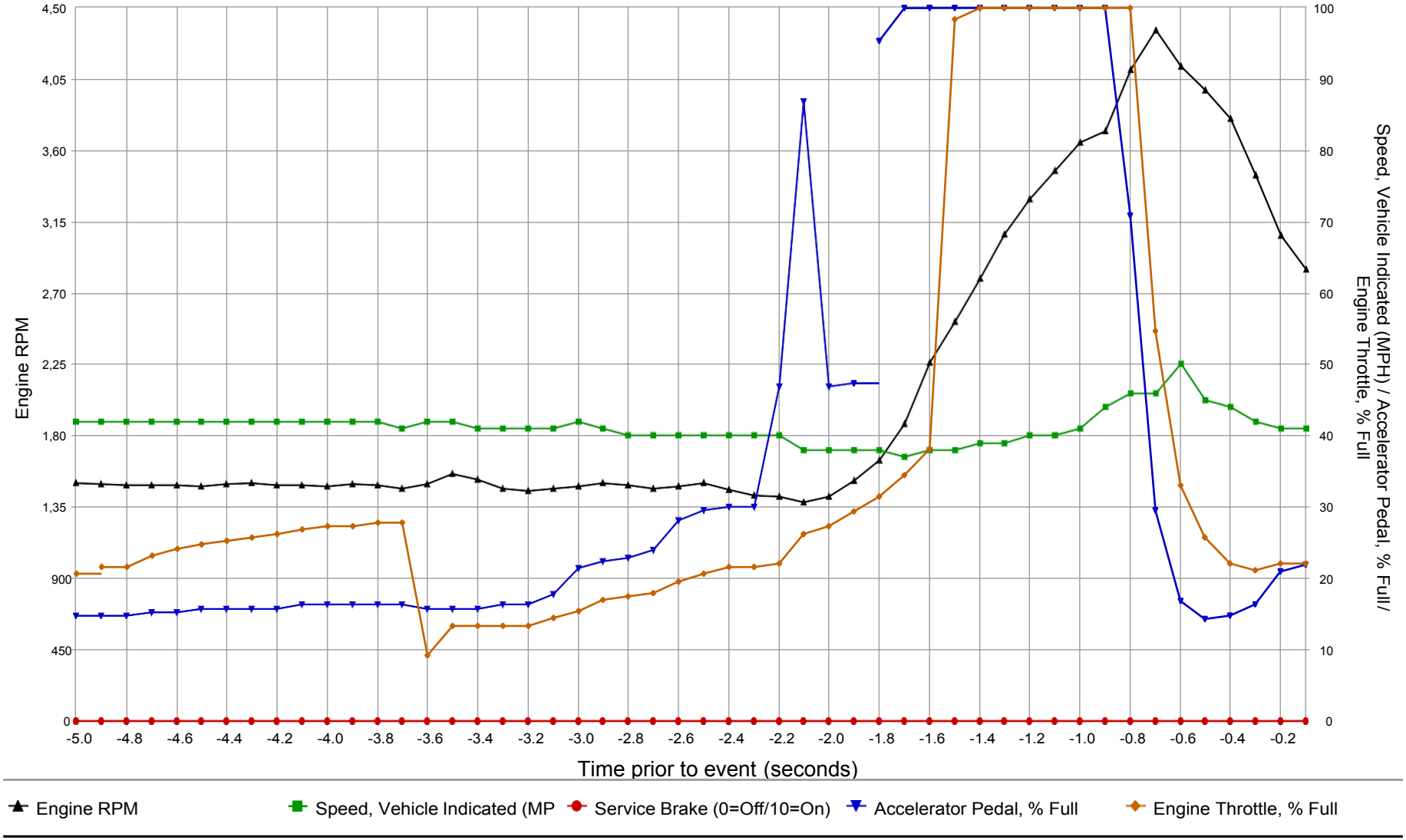
Time (msec)	Angular Rate (deg/sec)
-500	8.00
-480	4.00
-460	4.00
-440	2.00
-420	0.00
-400	-8.00
-380	-4.00
-360	-4.00
-340	-10.00
-320	-12.00
-300	-12.00
-280	-8.00
-260	-16.00
-240	-20.00
-220	-18.00
-200	-20.00
-180	-12.00
-160	-12.00
-140	-6.00
-120	-6.00
-100	-4.00
-80	-2.00
-60	0.00
-40	0.00
-20	4.00
0	12.00
20	20.00
40	0.00
60	0.00
80	0.00
100	0.00
120	0.00
140	0.00
160	0.00
180	0.00
200	0.00
220	0.00
240	0.00
260	0.00
280	0.00
300	0.00
320	0.00
340	0.00
360	0.00
380	0.00
400	0.00
420	0.00
440	0.00
460	0.00
480	0.00

Angular Rate Data (1st Prior Event)

Time (msec)	Angular Rate (deg/sec)
500	0.00
520	0.00
540	0.00
560	0.00
580	0.00
600	0.00
620	0.00
640	0.00
660	0.00
680	0.00
700	0.00
720	0.00
740	0.00
760	0.00
780	0.00
800	0.00
820	0.00
840	0.00
860	0.00
880	0.00
900	0.00
920	0.00
940	0.00
960	0.00
980	0.00
1000	0.00
1020	0.00
1040	0.00
1060	0.00
1080	0.00
1100	0.00
1120	0.00
1140	0.00
1160	0.00
1180	0.00
1200	0.00
1220	0.00
1240	0.00
1260	0.00
1280	0.00
1300	0.00
1320	0.00
1340	0.00
1360	0.00
1380	0.00
1400	0.00
1420	0.00
1440	0.00
1460	0.00
1480	0.00

Time (msec)	Angular Rate (deg/sec)
1500	0.00
1520	0.00
1540	0.00
1560	0.00
1580	0.00
1600	0.00
1620	0.00
1640	0.00
1660	0.00
1680	0.00
1700	0.00
1720	0.00
1740	0.00
1760	0.00
1780	0.00
1800	0.00
1820	0.00
1840	0.00
1860	0.00
1880	0.00
1900	0.00
1920	0.00
1940	0.00
1960	0.00
1980	0.00
2000	0.00
2020	0.00
2040	0.00
2060	0.00
2080	0.00
2100	0.00
2120	0.00
2140	0.00
2160	0.00
2180	0.00
2200	0.00
2220	0.00
2240	0.00
2260	0.00
2280	0.00
2300	0.00
2320	0.00
2340	0.00
2360	0.00
2380	0.00
2400	0.00
2420	0.00

Pre-Crash Data (1st Prior Event)



SNA values will not be plotted on the graph

Pre-Crash Data (1st Prior Event - table 1 of 3)

(the most recent sampled values are recorded prior to the event)

Time Stamp (sec)	Pre-Crash Recorder Status	Speed, Vehicle Indicated (MPH [km/h])	Accelerator Pedal, % Full	Engine Throttle, % Full	Service Brake	Engine RPM	ABS Activity	Stability Control	Steering Input (deg)
-5.0	Interrupted	42 [68]	15	21	Off	1,500	No	On	-7
-4.9	Interrupted	42 [68]	15	22	Off	1,493	No	On	-5
-4.8	Interrupted	42 [68]	15	22	Off	1,488	No	On	-4
-4.7	Interrupted	42 [68]	15	23	Off	1,488	No	On	-3
-4.6	Interrupted	42 [68]	15	24	Off	1,490	No	On	-2
-4.5	Interrupted	42 [68]	16	25	Off	1,480	No	On	-1
-4.4	Interrupted	42 [67]	16	25	Off	1,498	No	On	-1
-4.3	Interrupted	42 [67]	16	26	Off	1,500	No	On	-3
-4.2	Interrupted	42 [68]	16	26	Off	1,488	No	On	-4
-4.1	Interrupted	42 [68]	16	27	Off	1,490	No	On	-3
-4.0	Interrupted	42 [68]	16	27	Off	1,482	No	On	-2
-3.9	Interrupted	42 [67]	16	27	Off	1,496	No	On	0
-3.8	Interrupted	42 [67]	16	28	Off	1,490	No	On	4
-3.7	Interrupted	41 [67]	16	28	Off	1,469	No	On	7
-3.6	Interrupted	42 [67]	16	9	Off	1,496	No	On	8
-3.5	Interrupted	42 [67]	16	13	Off	1,558	No	On	5
-3.4	Interrupted	41 [66]	16	13	Off	1,527	No	On	2
-3.3	Interrupted	41 [66]	16	13	Off	1,466	No	On	1
-3.2	Interrupted	41 [66]	16	13	Off	1,454	No	On	3
-3.1	Interrupted	41 [66]	18	14	Off	1,467	No	On	4
-3.0	Interrupted	42 [67]	21	15	Off	1,481	No	On	2
-2.9	Interrupted	41 [66]	22	17	Off	1,500	No	On	-2
-2.8	Interrupted	40 [65]	23	18	Off	1,487	No	On	-5
-2.7	Interrupted	40 [64]	24	18	Off	1,467	No	On	-6
-2.6	Interrupted	40 [64]	28	20	Off	1,481	No	On	-3
-2.5	Interrupted	40 [65]	30	21	Off	1,499	No	On	-2
-2.4	Interrupted	40 [64]	30	22	Off	1,456	No	On	-4
-2.3	Interrupted	40 [64]	30	22	Off	1,426	No	On	-5
-2.2	Interrupted	40 [64]	47	22	Off	1,415	No	On	1
-2.1	Interrupted	38 [61]	87	26	Off	1,381	No	On	16
-2.0	Interrupted	38 [62]	47	27	Off	1,418	No	Engaged	36
-1.9	Interrupted	38 [61]	47	29	Off	1,515	No	On	44
-1.8	Interrupted	38 [61]	95	31	Off	1,649	No	On	25
-1.7	Interrupted	37 [60]	100	35	Off	1,876	No	On	7
-1.6	Interrupted	38 [61]	100	38	Off	2,259	No	On	0
-1.5	Interrupted	38 [61]	100	98	Off	2,518	No	On	-5
-1.4	Interrupted	39 [63]	100	100	Off	2,791	No	On	-5
-1.3	Interrupted	39 [63]	100	100	Off	3,069	No	On	-2
-1.2	Interrupted	40 [65]	100	100	Off	3,289	No	On	-1
-1.1	Interrupted	40 [64]	100	100	Off	3,467	No	On	-4
-1.0	Interrupted	41 [66]	100	100	Off	3,649	No	On	-7
-0.9	Interrupted	44 [71]	100	100	Off	3,720	No	On	-7
-0.8	Interrupted	46 [75]	71	100	Off	4,108	No	On	-8
-0.7	Interrupted	46 [74]	30	55	Off	4,357	No	On	-12
-0.6	Interrupted	50 [81]	17	33	Off	4,131	No	On	-17
-0.5	Interrupted	45 [72]	14	26	Off	3,980	No	On	-23
-0.4	Interrupted	44 [70]	15	22	Off	3,796	No	On	-22
-0.3	Interrupted	42 [67]	16	21	Off	3,439	No	On	-18
-0.2	Interrupted	41 [66]	21	22	Off	3,064	No	On	-18
-0.1	Interrupted	41 [66]	22	22	Off	2,844	No	On	-18

Pre-Crash Data (1st Prior Event - table 2 of 3)

(the most recent sampled values are recorded prior to the event)

Time Stamp (sec)	Raw Manifold Pressure (kPa)	PCM MIL	Yaw Rate (deg/sec)	Wheel Speed LF (RPM)	Wheel Speed RF (RPM)	Wheel Speed LR (RPM)	Wheel Speed RR (RPM)	ETC Lamp
-5.0	96.00	Off	-1	442	434	442	439	Off
-4.9	96.00	Off	-1	441	435	441	442	Off
-4.8	96.80	Off	0	440	442	442	439	Off
-4.7	96.80	Off	-1	441	436	440	437	Off
-4.6	96.80	Off	-1	439	437	441	448	Off
-4.5	97.60	Off	0	437	434	441	440	Off
-4.4	97.60	Off	0	438	430	436	436	Off
-4.3	97.60	Off	0	436	430	436	433	Off
-4.2	97.60	Off	-1	438	439	441	440	Off
-4.1	97.60	Off	0	439	437	440	439	Off
-4.0	97.60	Off	0	434	435	440	443	Off
-3.9	97.60	Off	-1	428	431	433	433	Off
-3.8	97.60	Off	-2	425	429	434	436	Off
-3.7	95.20	Off	0	430	425	431	429	Off
-3.6	76.00	Off	0	424	417	432	434	Off
-3.5	65.60	Off	-1	426	418	431	435	Off
-3.4	62.40	Off	0	424	416	431	433	Off
-3.3	60.00	Off	1	416	410	428	428	Off
-3.2	59.20	Off	1	419	408	427	425	Off
-3.1	59.20	Off	4	428	415	432	427	Off
-3.0	60.80	Off	2	421	412	439	432	Off
-2.9	64.80	Off	1	420	406	442	413	Off
-2.8	68.00	Off	1	412	408	419	424	Off
-2.7	71.20	Off	-1	407	401	416	410	Off
-2.6	76.00	Off	-2	415	399	417	414	Off
-2.5	80.00	Off	0	410	402	415	421	Off
-2.4	83.20	Off	-1	399	399	419	411	Off
-2.3	84.80	Off	0	401	396	419	411	Off
-2.2	85.60	Off	5	379	386	430	410	Off
-2.1	90.40	Off	4	387	387	394	389	Off
-2.0	92.00	Off	6	381	373	396	403	Off
-1.9	92.80	Off	9	385	381	386	399	Off
-1.8	93.60	Off	8	376	381	394	401	Off
-1.7	94.40	Off	7	373	386	384	389	Off
-1.6	94.40	Off	6	379	381	389	393	Off
-1.5	99.20	Off	3	382	380	397	394	Off
-1.4	98.40	Off	3	376	380	406	408	Off
-1.3	99.20	Off	2	375	379	401	418	Off
-1.2	97.60	Off	1	381	384	400	436	Off
-1.1	99.20	Off	1	379	376	414	420	Off
-1.0	99.20	Off	0	378	385	435	412	Off
-0.9	98.40	Off	-1	382	388	496	451	Off
-0.8	95.20	Off	-3	392	384	527	460	Off
-0.7	92.00	Off	-4	393	395	470	554	Off
-0.6	68.00	Off	-5	384	392	527	518	Off
-0.5	51.20	Off	-6	403	391	430	507	Off
-0.4	42.40	Off	-3	410	399	442	464	Off
-0.3	42.40	Off	-2	399	398	419	457	Off
-0.2	48.00	Off	-2	402	399	428	442	Off
-0.1	56.80	Off	-2	404	395	421	436	Off

Pre-Crash Data (1st Prior Event - table 3 of 3)

(the most recent sampled values are recorded prior to the event)

Time Stamp (sec)	ETC Flashing	Engine Torque Applied	PRNDL Status (if equip.)	Reverse Gear (Manual Only)	Cruise Control Engaged (if equip.)	Cruise Control Status (if equip.)
-5.0	No	Yes	Drive	No	Not Engaged	On
-4.9	No	Yes	Drive	No	Not Engaged	On
-4.8	No	Yes	Drive	No	Not Engaged	On
-4.7	No	Yes	Drive	No	Not Engaged	On
-4.6	No	Yes	Drive	No	Not Engaged	On
-4.5	No	Yes	Drive	No	Not Engaged	On
-4.4	No	Yes	Drive	No	Not Engaged	On
-4.3	No	Yes	Drive	No	Not Engaged	On
-4.2	No	Yes	Drive	No	Not Engaged	On
-4.1	No	Yes	Drive	No	Not Engaged	On
-4.0	No	Yes	Drive	No	Not Engaged	On
-3.9	No	Yes	Drive	No	Not Engaged	On
-3.8	No	Yes	Drive	No	Not Engaged	On
-3.7	No	Yes	Drive	No	Not Engaged	On
-3.6	No	Yes	Drive	No	Not Engaged	On
-3.5	No	Yes	Drive	No	Not Engaged	On
-3.4	No	Yes	Drive	No	Not Engaged	On
-3.3	No	Yes	Drive	No	Not Engaged	On
-3.2	No	Yes	Drive	No	Not Engaged	On
-3.1	No	Yes	Drive	No	Not Engaged	On
-3.0	No	Yes	Drive	No	Not Engaged	On
-2.9	No	Yes	Drive	No	Not Engaged	On
-2.8	No	Yes	Drive	No	Not Engaged	On
-2.7	No	Yes	Drive	No	Not Engaged	On
-2.6	No	Yes	Drive	No	Not Engaged	On
-2.5	No	Yes	Drive	No	Not Engaged	On
-2.4	No	Yes	Drive	No	Not Engaged	On
-2.3	No	Yes	Drive	No	Not Engaged	On
-2.2	No	Yes	Drive	No	Not Engaged	On
-2.1	No	Yes	Drive	No	Not Engaged	On
-2.0	No	Yes	Drive	No	Not Engaged	On
-1.9	No	Yes	Drive	No	Not Engaged	On
-1.8	No	Yes	Drive	No	Not Engaged	On
-1.7	No	Yes	Drive	No	Not Engaged	On
-1.6	No	Yes	Drive	No	Not Engaged	On
-1.5	No	Yes	Drive	No	Not Engaged	On
-1.4	No	Yes	Drive	No	Not Engaged	On
-1.3	No	Yes	Drive	No	Not Engaged	On
-1.2	No	Yes	Drive	No	Not Engaged	On
-1.1	No	Yes	Drive	No	Not Engaged	On
-1.0	No	Yes	Drive	No	Not Engaged	On
-0.9	No	Yes	Drive	No	Not Engaged	On
-0.8	No	Yes	Drive	No	Not Engaged	On
-0.7	No	Yes	Drive	No	Not Engaged	On
-0.6	No	Yes	Drive	No	Not Engaged	Off
-0.5	No	Yes	Drive	No	Not Engaged	Off
-0.4	No	Yes	Drive	No	Not Engaged	Off
-0.3	No	Yes	Drive	No	Not Engaged	Off
-0.2	No	Yes	Drive	No	Not Engaged	Off
-0.1	No	Yes	Drive	No	Not Engaged	Off

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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62 F1 00 00 42 01 03

62 F1 32 36 38 30 38 35 38 38 31 41 48

62 F1 50 0C 05 00

62 F1 51 0D 1C 00 0E 18 00

62 02 20 07 00 00 00 00 00 FF FF FF 00 00 00 00 00 00 00 00 00 00 00 00 3F 30 30 30 30 30
30 30 30 30 30 30 30 30 30 30 30 30 7E 0F 00 00 00 00

62 F1 8C 54 35 32 4D 44 32 33 36 34 30 32 34 39 36

62 F1 54 00 03

62 F1 90 31 43 36 52 52 37 4E 54 35 45 53 2A 2A 2A 2A 2A 2A

62 02 B1 01 CC 02 02 11 FF 0F 0F 19 00 13 2A 2A 2A 2A 2A 2A 06 23 02 B7 05 1D 02 07 F8 04 F0 00
00 00 00 00 00 33 11 0F 00 00 00 00 33 43 04 00 80 80 3C 1E D1 D1 10 0E 18 00 8E 00 00 00 00 00
00 00 00 00 00 00 00 00 00 00 00 00 00 00 00 00 00 00 00 00 00 00 00 00 00 00 00 00 00 00 00 00
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00 00 00 00 00 00 00 00 00 00 00 00 00 00 00 00 00 00 00 00 00 00 00 00 00 00 00 00 00 00 00 45
53 2A 2A 2A 2A 2A 2A 01 3A FF FF FF 00 00 00 03 8E F5 00 00 00 00 00 00 00 00 00 00 00 00 00 00
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00 00 00 00 00 00 00 00 00 00 00 00 00 00 00 00 00 00 00 00 00 00 00 00 00 00 00 00 00 00 00 00
00 00 00

62 02 B2 02 66 01 02 11 FF 0F 0F 19 00 13 35 25 00 00 00 B0 06 23 02 B7 05 1D 02 07 F8 04 F0 00
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00 00 00 00 00 00 00 00 00 00 00 00 00 00 00 00 00 00 00 00 00 00 00 00 00 00 00 00 00 00 00 00
00 00 00 00 00 00 00 00 00 00 00 00 00 00 00 00 00 00 00 00 00 00 00 00 00 00 00 00 00 00 00 00
00 00 00 00 00 00 00 00 00 00 00 00 00 00 00 00 00 00 00 00 00 00 00 00 00 00 00 00 00 00 00 45
53 2A 2A 2A 2A 2A 2A FF FE FF FF FF 00 00 00 03 8E F5 00 00 00 00 00 00 00 00 00 00 00 00 00 00
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00 00 00 00 00 00 00 00 00 00 00 00 00 00 00 00 00 00 00 00 00 00 00 00 00 00 00 00 00 00 00 00
00 00 00

62 02 B3 FF FF FF FF FF FF FF FF FF FF FF FF FF FF FF FF FF FF FF FF FF FF FF FF FF FF FF FF FF
FF FF FF FF FF FF FF FF FF FF FF FF FF FF FF FF FF FF FF FF FF FF FF FF FF FF FF FF FF FF FF FF
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FF FF FF FF FF FF FF FF FF FF FF FF FF FF FF FF FF FF FF FF FF FF FF FF FF FF FF FF FF FF FF FF
FF 2A 2A 2A 2A 2A 2A FF FF FF FF FF FF FF FF FF FF FF FF FF FF FF FF FF FF FF FF FF FF FF FF FF
FF FF FF FF FF FF FF FF FF FF FF FF FF FF FF FF FF FF FF FF FF FF FF FF FF FF FF FF FF FF FF FF
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FF FF FF

62 02 C1 02 7F 00 01 1F 00 00 00 00

62 02 10 FF FF FF FF FF FF FF FF 03 40 01 97 01 95 65 9A 00 00 00 00 00 00

62 02 50 06 25 00 13 38 B0 02 00 00 00 00 00 00 00 00 00 00 00 00 00 00 00 00 00 00 00 00 00 00
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71 01 03 01 01 00 CC 00 09 C8 00 03 AC 02 28 02 32 00 CA FF FF 02 00 00 01 00 FF 00 17 0B 5E FF
39 90 01 00 00 07 00 FF 00 00 00 00 00 0F D1 00 0F 1F FF 00 FF 60 03 FF FF 78 FF FF FF FF FF 16
3A 08 00 04 20 00 03 24 25 26 24 FF 54 FF FF FF FF FF 5B 00 00 00 0A B1 10 C8 00 00 00 00 00 00
00 00 00 00 00 00 00 00 00 00 FF FF

71 01 03 01 01 01 CC 00 09 95 00 03 56 02 94 02 04 00 96 75 3C 02 00 00 01 00 F7 00 E9 74 5A DD
C4 D0 00 00 00 07 00 FF 00 00 00 00 00 0F D3 00 0F 1F FF 00 FF 60 03 FF FF 78 FF FF FF FF FF 19
6F 08 00 04 20 00 03 24 25 26 24 FF 54 7F FF FF 4F 83 5F 00 00 00 08 4C 0E 70 00 00 00 00 00 00
00 00 00 00 00 00 00 00 00 00 FF FF

71 01 03 01 01 02 CC 00 0B 3D 00 03 3A 03 4B 03 5B 02 FA 7E 49 00 00 00 00 00 46 5C 84 00 4D 2B
2D C0 00 00 00 07 00 FF 00 00 00 00 00 0F E2 00 0F 1F FF 00 FF 60 03 FF FF 78 FF FF FF FF FF 20
8A 00 00 04 20 00 03 24 25 26 24 FF 22 7F 75 87 63 83 61 00 00 00 06 91 11 2C 00 00 00 00 00 00
00 00 00 00 00 00 00 00 00 00 FF FF

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8E 00 00 04 20 00 03 24 25 26 24 FF 22 7F 75 79 92 83 6D 00 00 00 0B FC 0F 9C 00 00 00 00 00 00
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71 01 03 01 02 0F 66 00 08 D3 00 03 12 03 09 02 F5 02 FA 82 5F 00 00 00 00 00 72 8D E9 74 76 4A
C4 C2 00 00 00 07 00 FF 00 00 00 00 00 10 00 00 0F 1F FF 00 FF 60 03 FF FF 78 FF FF FF FF FF 1E
4E 00 00 04 20 00 03 24 25 26 24 FF 22 7F 75 7A 93 83 6D 00 00 00 0B 9C 0F 9C 00 00 00 00 00 00
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71 01 03 01 02 10 66 00 07 54 00 03 0A 02 FF 02 E9 03 04 83 07 00 00 00 00 00 61 9F E9 00 76 43
C4 C2 00 00 00 07 00 FF 00 00 00 00 00 10 0E 00 0F 1F FF 00 FF 60 03 FF FF 78 FF FF FF FF FF 1D
CA 00 00 04 20 00 03 24 25 26 24 FF 22 7F 75 75 91 83 6C 00 00 00 0B 16 0F 38 00 00 00 00 00 00
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71 01 03 01 02 11 66 00 06 71 00 03 21 03 14 02 EF 02 F9 83 7F 00 00 00 00 00 58 A8 E9 74 75 3D
BB C2 00 00 00 07 00 FF 00 00 00 00 00 10 32 00 0F 1F FF 00 FF 60 03 FF FF 78 FF FF FF FF FF 1E
8E 00 00 04 20 00 03 24 25 26 24 FF 22 7F 75 7C 8E 83 6C 00 00 00 0A EF 0E 0C 00 00 00 00 00 00
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71 01 03 01 02 12 66 00 05 EB 00 03 1D 03 04 03 01 02 FA 83 87 00 00 00 00 00 53 AD 86 43 74 39
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5C 00 00 04 20 00 03 24 25 26 24 FF 22 7F 75 7D 81 83 6D 00 00 00 0B 27 10 00 00 00 00 00 00 00
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71 01 03 01 02 13 66 00 05 8A 00 03 26 03 17 02 F9 02 EA 82 7F 00 00 00 00 00 50 B0 7C 3E 73 35
5C C2 00 00 00 07 00 FF 00 00 00 00 00 10 47 00 0F 1F FF 00 FF 60 03 FF FF 78 FF FF FF FF FF 1E
E3 00 00 04 20 00 03 24 25 26 24 FF 23 7F 75 80 73 83 6C 00 00 00 0A EE 10 C8 00 00 00 00 00 00
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71 01 03 01 02 14 66 00 05 65 00 03 09 03 14 03 05 03 05 81 BF 00 00 00 00 00 4E B2 AD 56 71 33
AA C2 00 00 00 07 00 FF 00 00 00 00 00 10 20 00 0F 1F FF 00 FF 60 03 FF FF 78 FF FF FF FF FF 1E
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71 01 03 01 02 15 66 00 05 87 00 03 33 03 5B 02 F6 03 04 82 4F 00 00 00 00 00 46 BA D1 69 6B 2B
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71 01 03 01 02 16 66 00 05 92 00 03 36 03 45 03 22 03 17 7F D9 00 00 00 00 00 44 BC 5B 2E 6A 2A
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71 01 03 01 02 17 66 00 05 B0 00 03 35 03 46 03 1D 03 1E 7F 51 00 00 00 00 00 43 BC 5B 2D 68 2A
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37 C2 00 00 00 07 00 FF 00 00 00 00 00 0F FA 00 0F 1F FF 00 FF 60 03 FF FF 78 FF FF FF FF FF 20
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2F C2 00 00 00 07 00 FF 00 00 00 00 00 0F F5 00 0F 1F FF 00 FF 60 03 FF FF 78 FF FF FF FF FF 1F
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71 01 03 01 02 1F 66 00 05 AE 00 03 51 03 55 03 46 03 2F 80 BF 00 00 00 00 00 33 CC 42 21 4A 1A
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71 01 03 01 02 21 66 00 05 F7 00 03 61 03 5D 03 4F 03 3F 80 5F 00 00 00 00 00 34 CC 3F 00 4E 1A
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71 01 03 01 02 23 66 00 05 D8 00 03 63 03 60 03 4F 03 42 7F E1 00 00 00 00 00 30 CF 3F 20 5F 12
1F C2 00 00 00 07 00 FF 00 00 00 00 00 10 10 00 0F 1F FF 00 FF 60 03 FF FF 78 FF FF FF FF FF 21
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20 C2 00 00 00 07 00 FF 00 00 00 00 00 0F FD 00 0F 1F FF 00 FF 60 03 FF FF 78 FF FF FF FF FF 21
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71 01 03 01 02 28 66 00 05 D2 00 03 6D 03 70 03 6D 03 69 7F B9 00 00 00 00 00 4E B2 40 20 7A 34
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FC 00 00 04 20 00 03 24 25 26 24 FF 22 7F 75 7E 80 83 67 00 00 00 0B 1C 10 00 00 00 00 00 00 00
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1F C2 00 00 00 07 00 FF 00 00 00 00 00 0F F9 00 0F 1F FF 00 FF 60 03 FF FF 78 FF FF FF FF FF 22
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DOT HS 812 565
July 2018

U.S. Department
of Transportation

**National Highway
Traffic Safety
Administration**

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