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Special Crash Investigations: On-Site Reported Unintended Acceleration Crash Investigation; Vehicle: 2006 Chrysler 300; Location: Michigan; Crash Date: May 2018

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Each crash represents a unique sequence of events, and generalized conclusions cannot be made concerning the crashworthiness performance of the involved vehicles or their safety systems. This report and associated case data are based on information available to the Special Crash Investigation team on the date this report was published.

16. Abstract

This three-vehicle crash occurred in the afternoon in May 2018 in a four-leg intersection in an urban area in Michigan. A 2006 Chrysler 300 was being driven south by a belted 32-year-old male. The front-right seat was occupied by a belted 42-year-old male. A 2014 Ford Fusion was traveling east as it approached the intersection. A 1999 Ford Expedition was stopped at the intersection facing north. The driver said that as the Chrysler approached the intersection, he depressed the accelerator slightly and that the vehicle accelerated suddenly without any warning. The Chrysler continued through the intersection and was struck on the right plane by the front plane of the Fusion. The Chrysler was displaced slightly in a clockwise rotation. The left-rear plane of the Chrysler struck the left front of the stopped Expedition. There were no air bag deployments in the Chrysler. The Chrysler came to rest in the south leg of the intersection facing south. The driver reported moderate severity neck injuries and was transported to a local hospital by ambulance. The driver also reported that the front-right passenger sustained a head injury and had a post-crash seizure. He was transported by ambulance to a local hospital. All three vehicles were towed from the scene due to damage. There were insufficient data available in this investigation to support the driver's claim of unintended acceleration.

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Special Crash Investigations
On-Site Reported Unintended Acceleration Crash Investigation
Office of Defects Investigation
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Background

This report documents the on-site investigation of the unintended acceleration of a 2006 Chrysler 300 that resulted in a three-vehicle crash (Figure 1). This investigation was initiated by the Office of Defects Investigation in response to a driver notification. The Special Crash Investigations (SCI) group of the National Highway Traffic Safety Administration assigned the case to Dynamic Science, Inc., in May 2018. The driver was contacted, and a police report was obtained. The vehicle inspection occurred in May 2018. The Chrysler was supported by the Bosch Crash Data Retrieval (CDR) system, and the vehicle's Event Data Recorder (EDR) was imaged during the vehicle inspection. There were no event data in the EDR record. The investigator removed the vehicle's occupant restraint controller (ORC) and sent it to SCI/ODI for imaging by the manufacturer. The ORC was imaged by the manufacturer, and it determined that no event data were present.

Figure 1. The 2006 Chrysler 300, right-plane damage

This three-vehicle crash occurred in the afternoon in May 2018 in a four-leg intersection in an urban area in Michigan. The Chrysler was being driven southbound by a belted 32-year-old male. The front-right seat was occupied by a belted 42-year-old male. A 2014 Ford Fusion was traveling eastbound as it approached the intersection. A 1999 Ford Expedition was stopped at the intersection facing north. The driver said that as the Chrysler approached the intersection, he depressed the accelerator slightly and that the vehicle accelerated suddenly without any warning. The Chrysler continued through the intersection and was struck on the right plane by the front plane of the Fusion. The Chrysler was displaced slightly in a clockwise rotation. Its left-rear plane struck the left front of the stopped Expedition. There were no air bag deployments in the

Chrysler. It came to rest in the south leg of the intersection facing south. The driver reported moderate severity neck injuries and was transported to a local hospital by ambulance. The driver also reported that the front-right passenger sustained a head injury and had a post-crash seizure. He was transported by ambulance to a local hospital. All three vehicles were towed from the scene due to damage.

There were insufficient data available in this investigation to support the driver's claim of unintended acceleration.

Summary

Crash Site

The crash site was the intersection of a divided east/westbound roadway and an undivided north/southbound roadway. The southbound approach to the intersection and eastbound travel lanes consisted of a northbound travel lane, a southbound travel lane, and a right-turn lane (Figure 2). The concrete roadway was straight and level. This approach was controlled by a 3-phase traffic signal. The southbound approach through the extended median approaching the intersection with the westbound travel lanes consisted of a northbound travel lane and a southbound travel lane. This approach was controlled by a separate 3-phase traffic signal that was not functioning at the time of the crash due to a power outage. The east/westbound roadway consisted of three eastbound travel lanes, an extended 25.2 m (82.6 ft) grass-covered median, and three westbound travel lanes (Figure 3). The asphalt roadway was straight and level.The speed limit was 40 km/h (25 mph) in all directions. The weather at the nearest reporting station was 23 °C (75 °F), a 35-percent humidity, a 16 km (10 miles) visibility, and the winds were out of the south southwest at 20 km/h (12.7 mph). A crash diagram is included at the end of this report.

Figure 2. Southbound approach

Figure 3. Westbound approach

Pre-Crash

The Chrysler was traveling southbound approaching the intersection. According to the driver, he slowed as traffic to his left allowed him to pass through the westbound roadway. He reported that as he depressed the accelerator pedal, there was a slight pause and that the vehicle suddenly accelerated at a high rate. The vehicle accelerated through the extended median and into the eastbound roadway. The Ford Fusion was traveling eastbound in the right lane approaching the intersection. The Ford Expedition was stopped at the intersection facing north.

Crash

The Chrysler traveled approximately two-thirds of the way into the intersection when it was struck in the right side by the Ford Fusion (Event 1).

The missing vehicle algorithm of the WinSMASH program calculated a total delta V of 8 km/h (5 mph) for the Chrysler. The longitudinal and lateral components were -7 km/h (-4 mph) and -4 km/h (-2 mph), respectively. The WinSMASH program calculated a total delta V of 11 km/h (7 mph) for the Ford Fusion. The longitudinal and lateral components were -5 km/h (-3 mph) and 9 km/h (5 mph), respectively. The WinSMASH results were considered borderline.

The Chrysler was displaced slightly in a clockwise rotation and entered the northbound travel lane. The left-rear plane of the Chrysler struck the left front of the stopped Expedition (Event 2). The missing vehicle algorithm of the WinSMASH program calculated a total delta V of 12 km/h (7 mph) for the Chrysler. The longitudinal and lateral components were -6 km/h (-4 mph) and 10 km/h (6 mph), respectively. The WinSMASH program calculated a total delta V of 11 km/h (7 mph) for the Ford Expedition. The longitudinal and lateral components were -9 km/h (-6 mph) and 7 km/h (4 mph), respectively. The WinSMASH results were considered borderline.

There were no air bag deployments in the Chrysler.

Post-Crash

The Chrysler came to rest in the south leg of the intersection facing south.

The driver reported moderate severity neck injuries and was transported to a local hospital by ambulance, where he was treated and released.

During the SCI interview, the driver reported that the front-right occupant was nonresponsive after the impact and began to have a seizure. He was extricated by fire personnel and transported by ambulance to a local hospital. After initial treatment, medical personnel said he should stay overnight for observation. At some point, the occupant released himself from the hospital.

All three vehicles were towed from the scene due to damage.

2006 Chrysler 300

Description

The Chrysler 300 was a 4-door sedan identified by the Vehicle Identification Number (VIN) 2C3LA73W56Hxxxxxx. The vehicle had a 5.7-liter, 8-cylinder gasoline engine; an automatic transmission; and rear-wheel drive. The vehicle manufacturer's recommended tire size was P245/45R20 with a cold pressure of 221 kPa (32 psi). The vehicle had Pirelli P-Zero tires of the recommended size for the front and Falken Ziex SI tires of the recommended size for the rear. The specific tire information was as follows:

Position	Measured Pressure	Tire Depth	Restricted	Damage
LF	241 kPa (35 psi)	5 mm (6/32 in)	No	None
LR	Tire flat	7 mm (9/32 in)	No	None
RR	268 kPa (39 psi)	7 mm (9/32 in)	No	None
RF	275 kPa (40 psi)	5 mm (6/32 in)	No	None

The Chrysler had seating for five occupants. The front row had bucket seats with adjustable head restraints. The second row had a 60/40 split bench with folding backs.

Vehicle History

This vehicle was initially purchased in 2006 in Colorado. According to a Carfax report, the vehicle was sold in July 2008 in New Mexico. A new owner was reported in October 2009 in Michigan. A new owner was reported in October 2013 and in January 2016 in Michigan. The owner at the time of the crash purchased the vehicle in September 2017.

According to the most recent owner, one of the previous owners added several aftermarket electrical components, including a remote starting system and an iSimple IS77 universal iPhone audio input cable for the FM radio. The current owner took the vehicle to a local stereo installation shop, which indicated that the electrical components were installed correctly.

According to the Carfax report, prior to the current owner's purchase in March 2016, the driver's frontal air bag was replaced, and the throttle body cleaned and serviced. The reason for the air bag replacement is unknown.

The left door had been replaced by a used left door at some point, presumably due to an unreported crash. The VIN data on the door were different than the VIN data located on the B-pillar label and the registration data on the police report.

After purchasing the vehicle, the driver reported a number of vehicle issues and took the vehicle into various dealerships and repair shops for service/inspection. A summary of these issues is included below.

October 2017: Maintenance inspection completed, engine electrical system checked.

December 2017: Several visits. Reported vehicle not shifting properly. Reported that under hard acceleration from idle or any speed, the vehicle will stall out intermittently. Will also stall from any gear, forward or reverse.

March 2018: Several visits. Engine electrical concerns. Vehicle stalls. Wouldn't accelerate past 40 km/h (25 mph). Vehicle towed.

April 2018: Reported vehicle stalling when coming to a stop.

Exterior Damage

The Chrysler sustained moderate damage to the right and left planes during the impacts with the Fusion and Expedition.

The direct damage from the impact with the Fusion began 8 cm (3.1 in) forward of the right rear axle and extended 230 cm (90.5 in) forward (Figure 4). Twenty-one measurements were taken at the mid-door level by the Nikon Total Station and the Faro Blitz program computed crush measurements in six increments as follows: C1 = 6 cm (2.3 in), C2 = 10 cm (3.9 in), C3 = 15 cm (5.9 in), C4 = 0 cm, C5 = 0 cm, and C6 = 0 cm. The collision deformation classification (CDC) was 01RPEW2. Both right plane doors were jammed shut post-crash and required opening and removal by the fire department. The right-rear door was removed and was not located.

The direct damage from the impact with the Expedition began 31 cm (12.2 in) forward of the left-rear axle and extended 134 cm (52.7 in) rearward (Figure 5). Thirteen measurements were taken at the mid-door level by the Nikon Total Station and the Faro Blitz program computed crush measurements in six increments as follows: C1 = 30 cm (11.8 in), C2 = 25 cm (9.8 in), C3 = 17 cm (6.6 in), C4 = 4 cm (1.5 in), C5 =2 cm (0.8 in), and C6 = 6 cm (2.3 in). The CDC was 10LZAW3.

The battery and fuse block located in the trunk were displaced and were found in the center of the trunk during the inspection.

Figure 4. Right-plane damage, the 2006 Chrysler 300

Figure 5. Left-plane impact, the 2006 Chrysler 300

Event Data Recorder

The Chrysler had an air bag supplemental restraint system with EDR capability to store deployment and non-deployment events. The data from the Chrysler's EDR were imaged using the Bosch Crash Data Retrieval Tool version 17.7.1 by going directly to the ORC and reported using version 21.4.1. After applying power, the investigator waited one minute before attempting to collect data. No events were recovered. The report indicated "Not Retrievable by CDR tool." The data limitations file indicated that event data may be stored in the ACM (ORC) but are not retrievable by the CDR tool. The Bosch CDR report is in Appendix A. The investigator removed the vehicle's ORC and sent it to SCI/ODI for imaging by the manufacturer. The ORC was imaged, with no events recovered. The ECU Data Reader Report is in Appendix B.

It should be noted that the EDR was imaged using the VIN from the left door. As stated earlier in this report, the door had been replaced, and the VIN data on the door were different than the actual VIN. The EDR report has the VIN from the door as initially imaged.

NHTSA Recalls and Investigations

A search queried in April 2022 using the Chrysler's VIN indicated that there were no unrepaired recalls.

Interior Damage

The Chrysler sustained minor damage from intrusions and occupant contacts. The vehicle sustained lateral intrusion of the sill in the second row and a longitudinal intrusion of the left seat back in the second row. Both right side doors were jammed shut and were opened by the responding fire department during the occupant extrication. The front-row right side glass and the backlight window were disintegrated. There was a possible scuff contact to the front-row right door.

Reported Unintended Acceleration

The driver reported that the vehicle experienced an unintended acceleration incident. According to the driver, he slowed as traffic to his left allowed him to pass through the westbound roadway. He reported that as he depressed the accelerator pedal, there was a slight pause and that the

vehicle suddenly accelerated at a high rate. The vehicle accelerated through the extended median and into the eastbound roadway. During the on-scene vehicle inspection, the accelerator pedal and floor mat were examined (Figure 6). The accelerator pedal assembly (manufacturer part number 04861681AA) moved smoothly without any impingement. The travel distance was 9.5 cm (3.7 in) to 1.0 cm (0.4 in) above the floor. The vehicle had an OEM SRT8 floor mat (Figure 7). The mat was properly attached at the aft end by the attachment hook. At the time of the vehicle inspection, the mat was flat on the floor and not restricting the movement of the accelerator or brake pedal.

There were insufficient data available in this investigation to support the driver's claim of unintended acceleration.

Figure 6. Foot controls and toe pan, the 2006 Chrysler 300

Figure 7. Floor mat, the 2006 Chrysler 300

Manual Restraint Systems

The front row had driver and front-right passenger lap and shoulder seat belts. The driver’s belt had continuous loop belt webbing, a sliding latch plate, an emergency locking retractor (ELR), and an adjustable upper anchor that was in the full-up position. The front passenger’s seat belt had a continuous loop belt webbing, a sliding latch plate, a switchable ELR/automatic locking retractor (ALR), and an adjustable upper anchor that was in the full-up position. There was evidence of historical usage on both belts. The belts were in use according to the driver interview. There were no retractor pretensioner actuations in this crash.

Supplemental Restraints System

The Chrysler had dual-stage driver's and passenger's frontal air bags and side impact inflatable curtain (IC) air bags for the front and second-row seats. There were no air bag deployments. The driver's frontal air bag was replaced in March 2016 for unknown reasons.

2006 Chrysler 300 Occupants

Driver Demographics

Age/sex:	32 years/male
Height:	168 cm (66 in)
Weight:	84 kg (185 lbs)
Eyewear:	Unknown
Seat type:	Bucket
Seat track position:	Middle
Manual restraint usage:	Lap and shoulder belt available, used
Usage source:	Vehicle inspection, interview
Air bags:	Frontal and IC air bags not deployed
Alcohol/drug data:	None detected
Egress from vehicle:	Under own power
Transport from scene:	Ambulance
Type of medical treatment:	Treated and released after 4 hours

Driver Injuries

Injury No.	Injury	Injury Severity AIS 2015	Involved Physical Component (IPC)	IPC Confidence Level
1	Contusion, right head	110402.1	Occupant 2	Certain
2	Neck strain	640278.1	Seat belt	Probable
3	Laceration, left abdomen	510600.1	Seat belt	Probable
4	Contusion, left hip	810402.1	Door	Probable

Source: interview.

Driver Kinematics

The belted 32-year-old driver was seated in an upright posture. The seat was adjusted to the mid-track position, and the seat back was slightly reclined. Both hands were on the steering wheel and his right foot was alternately on the brake and accelerator. At impact with the Ford Fusion, he was displaced to the right and contacted the head of the right seat occupant. At impact with the Ford Expedition, he was displaced to the left and contacted the door side panel. He spoke to the passenger after the vehicle came to rest and reported that the passenger was initially unresponsive and having a seizure. The driver was able to exit the vehicle under his own power and was then transported by ambulance to a local hospital, where he was treated and released.

Front-Row Right Occupant Demographics

Age/sex:	42 years/male
Height:	180 cm (71 in)
Weight:	127 kg (280 lbs)
Eyewear:	None
Seat type:	Bucket
Seat track position:	Rear most
Manual restraint usage:	Lap and shoulder belt available, used
Usage source:	Vehicle inspection, interview
Air bags:	Frontal and IC air bags not deployed
Alcohol/drug data:	None detected
Egress from vehicle:	Extricated by EMS
Transport from scene:	Ambulance
Type of medical treatment:	Treated, self-released

Front-Row Right Occupant Injuries

Injury No.	Injury	Injury Severity AIS 2015	Involved Physical Component (IPC)	IPC Confidence Level
1	Head injury, seizure	100099.9	Driver	Probable
2	Contusion, left hip	810402.1	Center console	Probable

Source: interview.

Front-Row Right Occupant Kinematics

The belted 42-year-old male, front-right passenger was seated in an upright posture. The seat was adjusted to the rearmost position, and the seat back was slightly reclined. According to the driver, this passenger was epileptic but had not had any episodes for over a year. At impact with the Ford Fusion, he was displaced to the right and probably contacted the right door. He possibly contacted the driver as he rebounded to the left. At impact with the Ford Expedition, he was displaced to the left and contacted the center console. The driver reported that this occupant was non-responsive after the impact and began to have a seizure. He was extricated by fire personnel and transported by ambulance to a local hospital. After initial treatment, medical personnel indicated that he should stay overnight for observation. At some point, he released himself from the hospital.

2014 Ford Fusion

Description

The 2014 Ford Fusion was a 4-door sedan. The vehicle was identified by the VIN 3FA6P0H77ERxxxxxx. The vehicle had a 4-cylinder, 2.5-liter gasoline engine, and front-wheel drive.

Exterior Damage

The Fusion sustained police-reported disabling damage to the front plane. The vehicle was towed from the scene due to damage but was not available for inspection.

Occupant Data

According to the police report, the 68-year-old female driver was belted and sustained “B” non-incapacitating injuries. She was transported by ambulance to a local hospital for treatment. A belted 83-year-old female was seated in the front-right seat position. She sustained “B” non-incapacitating injuries and was transported by ambulance to a local hospital for treatment.

1999 Ford Expedition

Description

The 1999 Ford Expedition was an SUV identified by the VIN 1FMPU18LXXLxxxxxx. The vehicle had a 5.4-liter, 8-cylinder gasoline engine, and four-wheel drive.

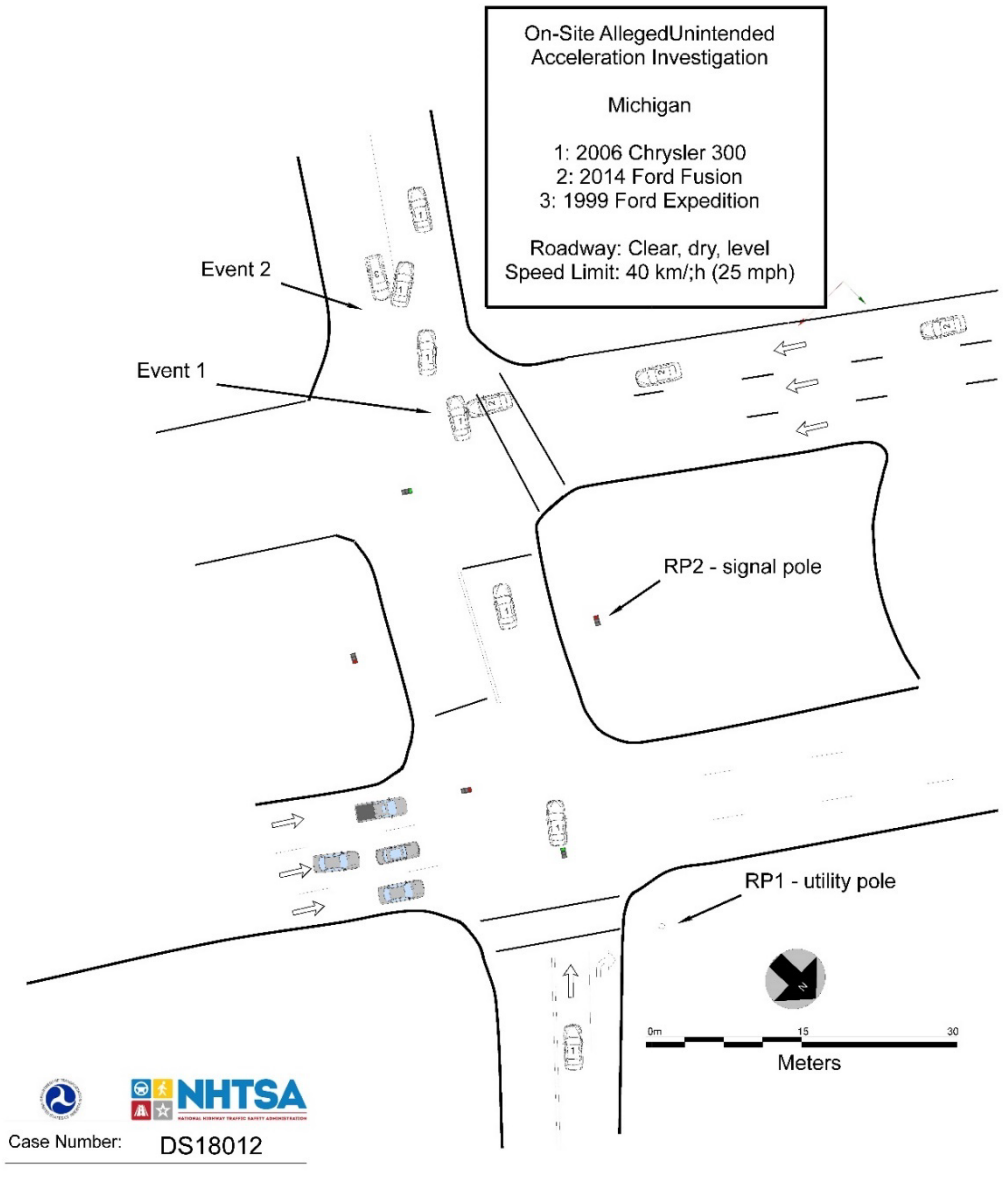
Exterior Damage

The Expedition sustained police-reported disabling damage to the front plane. The vehicle was towed from the scene due to damage but was not available for inspection.

Occupant Data

According to the police report, the 68-year-old male driver was belted during the crash and did not sustain any injuries.

Crash Diagram



Appendix A: Event Data Recorder Report for 2006 Chrysler 300[1]

[1]The EDR report contained in this technical report was imaged using the current version of the Bosch CDR software at the time of the vehicle inspection. The CDR report contained in the associated Crash View application may differ relative to this report.

IMPORTANT NOTICE: Robert Bosch LLC and the manufacturers whose vehicles are accessible using the CDR System urge end users to use the latest production release of the Crash Data Retrieval system software when viewing, printing or exporting any retrieved data from within the CDR program. Using the latest version of the CDR software is the best way to ensure that retrieved data has been translated using the most current information provided by the manufacturers of the vehicles supported by this product.

CDR File Information

User Entered VIN	2C3KA63H16H******
User	
Case Number	
EDR Data Imaging Date	
Crash Date	
Filename	DS18012_V1_ACM .CDRX
Saved on	
Imaged with CDR version	Crash Data Retrieval Tool 17.7.1
Imaged with Software Licensed to (Company Name)	Company Name information was removed when this file was saved without VIN sequence number
Reported with CDR version	Crash Data Retrieval Tool 21.4.1
Reported with Software Licensed to (Company Name)	NHTSA
EDR Device Type	Airbag Control Module
Event(s) recovered	Not retrievable by CDR tool

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 direct-to-module imaging could 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.
- Delta-V is first available starting with some 2010 MY vehicles.
    - On vehicles not equipped with side impact sensing, Lateral acceleration and Delta-V will not be available.
    - Lateral acceleration may not be available for the 2008-2009 MY Chrysler Town and Country/ Dodge Grand Caravan/Lancia Voyager and 2010 MY Dodge Journey and Fiat Freemont even when equipped with side impact sensing.
    - Longitudinal and Lateral Delta-V are not available for the 2010-2012 MY Chrysler Town and Country/ Dodge Grand Caravan/Lancia Voyager.
- If a vehicle has rollover sensing but there is no angular rate recorded during the event, the Rollover Crash Pulse may not be displayed.
- 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**
Longitudinal Acceleration	Forward
Delta-V, Longitudinal	Forward
Maximum Delta-V, Longitudinal	Forward
Lateral Acceleration	Left to Right
Delta-V, Lateral	Left to Right
Maximum Delta-V, Lateral	Left to Right
Steering Input*	Steering wheel turned counter clockwise
Angular Rate	Left to Right RotationClockwise rotation around the longitudinal axis
Yaw Rate**	Counter clockwise rotation

* The Steering Input for the following vehicles has a positive sign notation for the steering wheel turned clockwise:
    - o 2006 - 2007 Grand Cherokee

- o 2006 - 2007 Commander
- o 2005 - 2010 300, Magnum, and Charger
- o 2008 - 2010 Challenger

**The Yaw Rate for the 2011-2012 MY RAM has a positive sign notation for clockwise rotation.

CDR FILE INFORMATION:

- For ACMs that store non-deployment events, 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.

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.
- For Continental ACMs:
  - 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)
  - Event Record 3 - Data from another event is stored in the ACM (not necessarily in chronological order) (for modules with 3 stored events)
- For all other ACMs:
  - 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.
  - Etc., (for modules with 3 to 5 stored events)
- 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:
  - "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 Vehicle Event /Pre-Crash Recorder Status.
- For 2010-2012 MY Dodge Journey and 2010-2012 MY Chrysler Town and Country/Dodge Grand Caravan/Lancia Voyager, a non-deployment event will also display "Interrupted" for the Vehicle Event/Pre-Crash Recorder Status. This non-deployment event can be distinguished from a power loss by:
  - In the System Status at Event and Deployment Command Data section, Event/Deployment Recorder Status will display "Interrupted".
  - In the Deployment Command Data section, a value of "No" will be displayed for each deployment data element.

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:

- 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 the 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. It is possible that the AHRs may activate after the EDR record has been stored and written, based on achieving the minimum delta V. This condition will result in an EDR but no record of the AHR activation in the CDR report. Activation of only the AHRs, if stored, will be a non-deployment event.

SYSTEM STATUS AT EVENT (if applicable):

- Event Number -
  - Indicates the event number per vehicle ignition cycle for 2010-2012 Sebring, Avenger, Caliber, Nitro, Compass, Liberty, Patriot, Wrangler, and Ram
  - Indicates the overall order of the events for all other applicable vehicles.
- Event Signal Transmission, Complete - "Yes" indicates that the ACM has sent the automatic collision notification (ACN) message.
- 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.
- Side Fuel Cutoff, Activated - Applicable to the Fiat 500, "Yes" indicates that the ACM has sent the automatic collision notification (ACN) message.
- System Voltage at Event, ECU - 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
- 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.
    - 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.
- 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.
- Total Number of Events -
    - Stops incrementing when each event record is recorded by the ACM for 2010 - 2012 Sebring, Avenger, Caliber, Nitro, Compass, Liberty, Patriot, Wrangler, and Ram
    - Indicates the total number of events that the ACM has recorded, including those non-deployment events that have been overwritten by a subsequent event, for all other applicable vehicles.
- VIN at Event, Last 8 Digits- Last 8 digits of the VIN of the vehicle at the time the ACM records the event.

STATUS OF THE DATA IN THE MOST RECENT EVENT (if applicable):

Definitions for Data Blocks 1 - 7 and Overall Data Record Complete:

1. Crash Record (system status and DTCs)
2. NHTSA Table #1 Vehicle System data
3. NHTSA Table #1 Longitudinal delta-V
4. NHTSA Table #2 Vehicle System Data
5. NHTSA Table #2 Lateral delta-V - will be a NO if vehicle is not equipped with side sensing
6. ACM angular rate data - will be a NO if vehicle is not equipped with roll-over sensing
7. Other Vehicle System Data - Chrysler Specific Data

Overall Data Record Complete - Yes, No is defined based on the specific vehicle configuration. For example, a NO may be present for a non-applicable data block but a YES may be present for overall data record complete as all of the applicable data is complete.

DEPLOYMENT COMMAND DATA (if applicable):

- A "Yes" for a particular item in the Deployment Command Data section of the report indicates that the ACM commanded the deployment /activation of the associated device.
- Deployment of Seatbelt Pretensioners is not stored in the EDR for the 2010 MY vehicles that utilize a TRW ACM. Assessment of the seatbelt pretensioners' deployment status in these vehicles must be made by physical inspection in the vehicle.

DTCs PRESENT AT START OF EVENT (if applicable):

- 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.

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 a recorded event has Engine RPM equal to SNA and Speed, Vehicle Indicated equals SNA for each time stamp, then the data is default data and the event stored in the ACM is not valid.
- (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.
- Brakes:
    - Brake Lamps On - "On" indicates that the brake lamps/CHMSL are illuminated.
    - Brake Switch #2 Status - "On" indicates that the brake pedal is depressed.
    - Braking System, Intervention by ESP - "Yes" indicates that the stability control system has engaged the brakes.
    - Braking System, Intervention Enabled "Yes" indicates that the ESC system is functional.
    - Braking System, Emergency Braking - "Yes" indicates that panic brake assist is active.
    - Braking System, Maximum Braking -- "Yes" indicates that ABS is active on all 4 wheels.

- Panic Brake Assist Active - "Yes" indicates that all four of the brake circuits are undergoing ABS control.
- Service Brake - "On" indicates that the brake pedal is depressed.

- Cruise Control:
  - Cruise Control System/Status -"On" indicates that the Cruise Control system is turned on.
  - Cruise Control Engaged/Active - "Engaged"/"Yes" indicates the Cruise Control system is actively controlling vehicle speed. "Not Engaged"/"No" indicates the system is NOT controlling vehicle speed.
- Electronic Brake/Stability Control information:
  - 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.
  - ESP Lamp - This is the status of the ESP symbol - "car with squiggly lines" indicator lamp. "On" indicates ESP has been turned off by the driver or has reduced performance and is not an indication of a fault in the system.
  - ESP Lamp Flashing Requested - If "Yes", then an ESP, Traction Control or Trailer Sway Control (if equipped) event was active at the time of data capture.
  - ESP Disabled - "Yes" indicates that ABS & ESP have been disabled by the driver or due to system performance.
  - ESP/ESC Functional/Active - "YES" indicates that the ESP system is functional and has no faults.
  - ESC System Status - "OK' indicates no faults in the ABS or ESC system that affect the system functionality; "ABS Fault" indicates a fault in the ABS system and "ESC Fault" indicates a fault in the ESC system.
  - 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.
  - 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.
  - Traction Control Intervention Active - "Yes" indicates that the traction control system is actively controlling the vehicle's wheels.
- Engine RPM - On 2006-2009 Ram 2500/3500, the Engine RPM recorded is limited to a maximum of 4080 RPM. On the 2008 - 2010 Dodge Grand Caravan, 2008-2010 Chrysler Town and Country and 2009-2010 Dodge Journey, the engine RPM resolution is 256 rpm. On all other vehicles, the resolution is 32 rpm.
- Engine Throttle, % Full - This indicates the actual position of the Engine Throttle blade.
- ETC -
  - On vehicles equipped with ETC, "Accelerator Pedal, % Full" and "Engine Throttle, % Full" are relative values - relative pedal position and relative engine throttle. These parameters may record values of less than 100% when the pedal/throttle is actually at its maximum. (Max. ~ 77%)
  - 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.
- 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.
- Raw Manifold Pressure - This indicates engine load in kPa.
- Speed, Vehicle Indicated - This indicates the average of the wheel speeds of the drive wheels.
  - On the 2008 - 2009 Dodge Grand Caravan, 2008-2009 Chrysler Town and Country and 2009 Dodge Journey, the reporting resolution is 2 km/h. On all other vehicles, the reporting resolution is 1 km/h.
  - To display this data element in mph, the CDR Tool converts the km/h to mph and reports a rounded value in mph.
  - The accuracy of the recorded Speed, Vehicle Indicated may be affected by a significant change of the tire size for the drive wheels or the final drive axle ratio of the transmission from the factory build specifications, wheel lockup, wheel slip, or wheel spin.
  - 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, 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.
  - Wheel Speed, XX - This indicates the speed value (in revolutions per minute) of a particular tire as denoted by XX.
  - For the following vehicles, the tire location, if displayed, may not be accurate if the tires have been rotated:
    - 2011-2012 MY Jeep Wrangler
    - 2010-2012 MY Jeep Patriot
    - 2010-2012 MY Chrysler 200
    - 2010-2012 MY Jeep Compass
  - Tire pressure is not stored in the EDR for the following vehicles. If a value is displayed, it may not be accurate:
    - 2011-2012 MY Jeep Grand Cherokee
    - 2011-2012 MY Dodge Durango
    - 2010-2012 MY Dodge Challenger
    - 2011-2012 MY Chrysler Town and Country
    - 2011-2012 MY Dodge Grand Caravan
    - 2010-2012 MY Ram
- Tire Pressure Monitor Indicator Lamp - "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" represents the last set of data captured in the buffer prior to "T0."
- Transmission/Shifter Position -
    - Gear Status - This indicates the current transmission gear.
    - PRND/PRNDL Status - This indicates the status of the Shifter Position.
    - Reverse Gear - For manual transmission vehicles only, "Yes" indicates the transmission is in the reverse gear.
    - Shift Gear Position - This indicates the current transmission gear/Shifter Position.
- Vehicle Data 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.

APPLICATION INFORMATION:

- 2005 - 2009 Durango's equipped with side airbags have EDR data that can be imaged by the CDR tool. Durango's not equipped with side airbags have EDR Data that might be imaged by the CDR tool and may be imaged by the supplier.
- For 2005 & 2006 MY, some Chrysler 300, Dodge Magnum, Dodge Charger, Jeep Grand Cherokee, and Jeep Commander models may contain EDR data that cannot be imaged by the CDR tool, but may be imaged by the supplier.
- For 2006 & 2007 MY, some PT Cruiser models may contain EDR data that cannot be imaged by the CDR tool, but may be imaged by the supplier
- EDR Data is only recorded for frontal deployments in the following vehicles:
    - 2005-2007 Durango
    - 2006-2007 Ram 1500
    - 2006-2009 Ram 2500/3500 Heavy Duty
    - 2007 Aspen, Caliber, Compass, Patriot, Nitro, Sebring, Wrangler

03001_Chrysler_r026

System Status at Retrieval

Original VIN	2C3LA73W56H******
Airbag Control Module Part Number	05081042AG
Airbag Control Module Serial Number	T52MD293531112a
Airbag Control Module Supplier	Bosch

System Configuration at Retrieval

Configured for Driver Seatbelt Switch	No
Configured for Front Center Seatbelt Switch	No
Configured for Front Passenger Seatbelt Switch	No
Configured for 2nd Row Left Seatbelt Switch	No
Configured for 2nd Row Center Seatbelt Switch	No
Configured for 2nd Row Right Seatbelt Switch	No
Configured for 3rd Row Left Seatbelt Switch	No
Configured for 3rd Row Center Seatbelt Switch	No
Configured for 3rd Row Right Seatbelt Switch	No
Configured for Driver Knee Airbag	No
Configured for Left Curtain #1	Yes
Configured for Right Curtain #1	Yes
Configured for Front Driver Seatbelt Pretensioner	Yes
Configured for Front Center Seatbelt Pretensioner	No
Configured for Front Passenger Seatbelt Pretensioner	Yes
Configured for 2nd Row Left Seatbelt Pretensioner	No
Configured for 2nd Row Center Seatbelt Pretensioner	No
Configured for 2nd Row Right Seatbelt Pretensioner	No
Configured for 3rd Row Left Seatbelt Pretensioner	No
Configured for 3rd Row Center Seatbelt Pretensioner	No
Configured for 3rd Row Right Seatbelt Pretensioner	No
Configured for Left Side Sensor #1	Yes
Configured for Left Side Sensor #2	Yes
Configured for Left Side Sensor #3	No
Configured for Right Side Sensor #1	Yes
Configured for Right Side Sensor #2	Yes
Configured for Right Side Sensor #3	No
Configured for Left Up Front Sensor	Yes
Configured for Right Up Front Sensor	Yes
Configured for Front Driver Digressive Load Limiter	No
Configured for Front Passenger Digressive Load Limiter	No
Configured for Driver Seat Track Position Sensor	Yes
Configured for Front Passenger Seat Track Position Sensor	Yes
Configured for Passenger Airbag Disable Switch	No
Configured for Front Passenger Occupant Classification System	Yes

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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5A 88 32 43 33 4C 41 37 33 57 35 36 48 2A 2A 2A 2A 2A 2A

5A 90 00 00 00 00 00 37 33 57 35 36 48 2A 2A 2A 2A 2A 2A

61 E1 54 35 32 4D 44 32 39 33 35 33 31 31 31 32

61 EA 00 98 02 DB EC 01

73 E2 30 81 2C 92 04 FF FF 92 06 FF FF D4 15 FF FF D4 14 FF FF C0 19 FF FF 9B 1A FF FF 9B 22 FF FF 9B A6 FF FF

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Disclaimer of Liability

Appendix B: ECU Data Reader Report

***** Airbag ECU Data Reader Reports *****

Reports generated: 2018/11/20 15:17:43(GMT) Computer Name: PLY97A3B6

***** Software Settings *****

Application: Airbag ECU Data Reader 2.20a Connection Status: Connected: AB 8.7+ | CAN | COM 4

Config File: Config:C:\Program Files (x86)\Airbag ECU Data Reader 3\DDT_8906D4_CAN.cfg

***** End of Software Settings *****

***** Module Build Information *****

Original VIN: 2C3LA73W56Hxxxxx Part Number: 05081042AG

Part Change Level: 412020

Serial Number: TMD293xxxxxx Software Version: 8906D650 Hardware Version: 0000 Calibration ID: 9D00060D

Bootloader ID: 8906D6

***** End of Module Build Information *****

***** Faults Status Report ***** Number of faults = 23.

1. PAS_UPFRONT_LEFT_COMM: Stored

SubFaults Below L_UPFRONT_PAS_OPEN: Stored

IGNITION CYCLES: 1

FAULT MINUTES: 67

2. PAS_UPFRONT_RIGHT_COMM: Stored

SubFaults Below R_UPFRONT_PAS_OPEN: Stored

IGNITION CYCLES: 1

FAULT MINUTES: 67

3. PAS_SIDE1_LEFT_COMM: Stored

SubFaults Below L_SIDE1_PAS_OPEN: Stored

IGNITION CYCLES: 1

FAULT MINUTES: 67

4. PAS_SIDE2_LEFT_COMM: Stored

SubFaults Below L_SIDE2_PAS_OPEN: Stored

IGNITION CYCLES: 1

FAULT MINUTES: 67

5. PAS_SIDE1_RIGHT_COMM: Stored

SubFaults Below R_SIDE1_PAS_OPEN: Stored

IGNITION CYCLES: 1

FAULT MINUTES: 67

6. PAS_SIDE2_RIGHT_COMM: Stored

SubFaults Below R_SIDE2_PAS_OPEN: Stored

IGNITION CYCLES: 1

FAULT MINUTES: 68

7. CALIBRATION_MISMATCH: Active

SubFaults Below CAL_MISMATCH: Active

IGNITION CYCLES: 0

FAULT MINUTES: 2

8. OCCUPANT_CLASS_UNDETERMINED: Active

SubFaults Below

OCCUPANT_CLASS_UNDETERMINED: Active

IGNITION CYCLES: 0

FAULT MINUTES: 69

9. CAN_BUS_CIRCUIT: Stored

SubFaults Below CAN_BUS_OFF: Stored

IGNITION CYCLES: 1

FAULT MINUTES: 2

10. PASSENGER_AIRBAG_LAMP_LOW: Stored

SubFaults Below PA_DISABLE_LAMP_OPEN_SHORT_GND: Stored

IGNITION CYCLES: 1

FAULT MINUTES: 67

11. PASSENGER_AIRBAG_LAMP_OPEN: Stored

SubFaults Below PA_DISABLE_LAMP_OPEN: Stored

IGNITION CYCLES: 1

FAULT MINUTES: 67

12. SQUIB_DRIVER1_OPEN: Stored

SubFaults Below D_FRONTAL1_OPEN: Stored

IGNITION CYCLES: 1

FAULT MINUTES: 67

13. SQUIB_DRIVER2_OPEN: Stored

SubFaults Below D_FRONTAL2_OPEN: Stored

IGNITION CYCLES: 1

FAULT MINUTES: 67

14. SQUIB_DRIVER_PRETENS_OPEN: Stored

SubFaults Below D_PRETEN_OPEN: Stored

IGNITION CYCLES: 1

FAULT MINUTES: 67

15. SQUIB_PASSENGER_PRETENS_OPEN: Stored

SubFaults Below P_PRETEN_OPEN: Stored

IGNITION CYCLES: 1

FAULT MINUTES: 67

16. SQUIB_PASSENGER1_OPEN: Stored

SubFaults Below P_FRONTAL1_OPEN: Stored

IGNITION CYCLES: 1

FAULT MINUTES: 67

17. SQUIB_PASSENGER2_OPEN: Stored

SubFaults Below P_FRONTAL2_OPEN: Stored

IGNITION CYCLES: 1

FAULT MINUTES: 67

18. SQUIB_L_CURTAIN1_OPEN: Stored

SubFaults Below L_CURTAIN1_OPEN: Stored

IGNITION CYCLES: 1

FAULT MINUTES: 67

19. SQUIB_R_CURTAIN1_OPEN: Stored

SubFaults Below R_CURTAIN1_OPEN: Stored

IGNITION CYCLES: 1

FAULT MINUTES: 67

20. IMPLAUSIBLE_ECU_NW_CONFIG_DATA: Stored

SubFaults Below IMPLAUSIBLE_ECU_NW_CONFIG_DATA: Stored

IGNITION CYCLES: 1
FAULT MINUTES: 65
21. IMPLAUSIBLE_VEH_CONFIG_DATA: Stored
SubFaults Below IMPLAUSIBLE_VEH_CONFIG_DATA: Stored
IGNITION CYCLES: 1
FAULT MINUTES: 66
22. LOST_COMM_WITH_RADIO: Stored
SubFaults Below LOST_COMM_WITH_RADIO: Stored
IGNITION CYCLES: 5
FAULT MINUTES: 231
23. LOST_COMM_WITH_LRSM: Stored
SubFaults Below
IGNITION CYCLES: 0
FAULT MINUTES: 0
***** End of Faults Status Report *****

***** EDR Reports *****

---- The Most Recent Event ----
Event Record Status: Empty/No event data
---- The 2nd Most Recent Event ----
Event Record Status: Empty/No event data
---- The 3rd Most Recent Event ----
Event Record Status: Empty/No event data
Event Record Status: Empty/No event data
---- The 5th Most Recent Event ----
Event Record Status: Empty/No event data
***** End of EDR Reports *****

***** Vehicle EDR Reports *****
---- The Most Recent Event ----
Event Record Status: Empty/No event data

---- The 2nd Most Recent Event ----

Event Record Status: Empty/No event data

---- The 3rd Most Recent Event ----

Event Record Status: Empty/No event data

---- The 4th Most Recent Event ----

Event Record Status: Empty/No event data

---- The 5th Most Recent Event ----

Event Record Status: Empty/No event data

DOT HS 813 308
June 2022

U.S. Department
of Transportation

**National Highway
Traffic Safety
Administration**

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