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# Special Crash Investigations: Child Restraint System Crash Investigation; Vehicle: 2003 Ford Escape; Location: Utah; Crash Date: April 2018

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**15. Supplementary Notes**

Each crash represents a unique sequence of events, and generalized conclusions cannot be made concerning the crashworthiness performance of the involved vehicle(s) 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 report documents the investigation of the child restraint systems (CRSs) used by two occupants of a 2003 Ford Escape involved in a multiple-vehicle crash and the disparate injuries sustained by the occupants of the vehicle. A 2-year-old female occupant restrained in a CRS in the second-row right position sustained severe injuries and was pronounced deceased on-scene. A 7-month-old female occupant restrained in a CRS in the second-row left position sustained serious injuries and was hospitalized for 11 days. The 31-year-old male driver and 30-year-old female front right occupant sustained moderate and serious injuries, respectively, and were transported and treated for unknown durations. The investigation focused on what role CRS usage played in the occupants' kinematics and injury mitigation. The other involved vehicles were a 1999 Dodge RAM driven by a 37-year-old male and occupied by an 8-year-old male and a 38-year-old female, a 2011 Mercedes-Benz E63 AMG driven by a 63-year-old male and occupied by a 63-year-old female, and a 2015 Toyota Sienna driven by a 32-year-old male. All four vehicles were traveling southbound. The Ford, Mercedes, and Toyota were stopped in the left turn lane at the intersection. The Dodge was traveling in a southbound through lane when the driver became distracted. The Dodge crossed into the left turn lane and the front plane struck the back plane of the Ford. A chain reaction occurred when the Ford was displaced forward striking the Mercedes, and the Mercedes was displaced forward, striking the Toyota. The Toyota came to a controlled stop and the other vehicles came to rest engaged in front-to-back configurations.


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# Table of Contents

**Special Crash Investigations**
**Child Restraint System Crash Investigation**
**Case Number: DS18009**
**Vehicle: 2003 Ford Escape**
**Location: Utah**
**Crash Date: April 2018**

## BACKGROUND

**Figure 1**. The 2003 Ford Escape.

This report documents the investigation of the child restraint systems (CRSs) used by two occupants of a 2003 Ford Escape (**Figure 1**) involved in a multiple-vehicle crash and the disparate injuries sustained by the occupants of the vehicle. A 2-year-old female occupant restrained in a CRS in the second-row right position sustained severe injuries and was pronounced deceased on-scene. A 7-month-old female occupant restrained in a CRS in the second-row left position sustained serious injuries and was hospitalized for 11 days. The 31-year-old male driver and the 30-year-old female front right occupant sustained moderate and serious injuries, respectively, and were transported and treated for unknown durations. The investigation focused on what role CRS usage played in the occupants' kinematics and injury mitigation. The investigation was initiated by the Special Crash Investigations (SCI) group of the National Highway Traffic Safety Administration in May 2018 in response to a notification by Dynamic Science, Inc., identifying the incident in an online news article. SCI obtained the police report, on-scene photos and permission to inspect the Ford and CRSs. The inspections were completed in May 2018. The Ford was supported by the Bosch Crash Data Retrieval (CDR) system and the vehicle's event data recorder (EDR) was imaged during the inspection.

The crash involved four vehicles and occurred during an afternoon in April 2018. The crash site was a four-leg intersection in a suburban mixed use area in Utah. All four vehicles were traveling in the southbound lanes where the posted speed limit was 80 km/h (50 mph). The other vehicles included a 1999 Dodge RAM driven by a 37-year-old male and occupied by an 8-year-old male and a 38-year-old female, a 2011 Mercedes-Benz E63 AMG driven by a 63-year-old male and occupied by a 63-year-old female, and a 2015 Toyota Sienna driven by a 32-year-old male. The Ford, Mercedes, and Toyota were stopped in the left turn lane at the intersection. The Dodge was traveling in a southbound through lane when the driver became distracted, the vehicle crossed into the left turn lane and the front plane of the Dodge struck the back plane of the Ford. A chain reaction of events occurred when the Ford was displaced forward striking the Mercedes, and the Mercedes was displaced forward striking the Toyota. The Toyota proceeded through the intersection and came to a controlled stop and the other vehicles came to rest engaged in front-to-back configurations.

The 2-year-old female occupant of the Ford restrained in a CRS was pronounced deceased on-scene, the 31-year-old male driver and 30-year-old female were transported by ambulance, and the 7-month-old female restrained in a CRS was transported by helicopter. The driver of the Dodge was transported by ambulance and the other occupants were transported by private vehicle. The occupants of the Mercedes were transported by ambulance and the driver of the Toyota was not transported. All four vehicles were towed due to damage.

## SUMMARY

### *Crash Site*

The crash site was a four-leg intersection including a two-way, non-divided north/south roadway and a two-way, non-divided east/west roadway (**Figure 2**). The intersection was configured with three-phase overhead traffic signals for all directions of travel. The southbound approach to the intersection was configured with a shared right turn lane/bike lane, two through lanes, and a left turn lane. This roadway was straight and level. The through lanes were separated by a dashed white painted stripe and the turn lanes were bordered by solid white painted stripes. Lane markings including a solid white painted stripe and white painted arrows began 41 m (135 ft) north of the stop line. The asphalt surface and painted stripes for all roadways were in good condition. The posted speed limit was 80 km/h (50 mph) and conditions at the time of the crash were daylight, clear, and dry. A crash diagram is included at the end of this report.

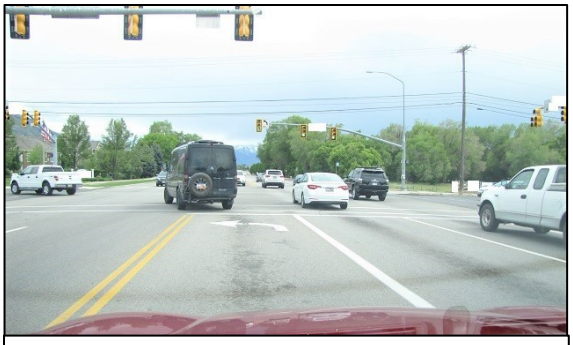


**Figure 2**. Crash site looking south.

### *Pre-Crash*

The Toyota was lead vehicle facing south and stopped at the stop line of the intersection, followed by the Mercedes and the Ford. The Dodge approached the intersection traveling southbound in the third lane from the right at a witness-estimated speed at or near the speed limit of 80 km/h (50 mph). According to the police report, the driver of the Dodge became distracted when the female occupant placed her hand on his shoulder and he turned his head in response. The vehicle traveled into the left turn lane on a trajectory approaching the Ford. The evidence suggested the driver of the Dodge took no evasive action. In a police interview he indicated his next recollection was the deployment of his frontal air bag.

### *Crash*

The crash included three events. The front plane of the Dodge struck the back plane of the Ford (Event 1), the Ford was displaced in a forward trajectory where its front plane struck the back plane of the Mercedes (Event 2), and the Mercedes was displaced in a forward trajectory where its front plane struck the back plane of the Toyota (Event 3). Police-reported evidence indicated the Ford traveled 20 m (66 ft) from point of impact to final rest, the Dodge traveled 21 m (69 ft) from point of impact to final rest, the Mercedes traveled 16 m (52 ft) from point of impact to final rest, and the Toyota traveled an unknown distance from point of impact to final rest as it was driven through the intersection and came to a controlled stop. The Dodge, Ford, and

Mercedes came to rest in a linear configuration with the Mercedes having been displaced slightly right and the Ford and Dodge having rotated slightly clockwise. The Ford's back plane remained engaged with the Dodge's front plane and its front plane remained engaged with the Mercedes' back plane (**Figure 3**).

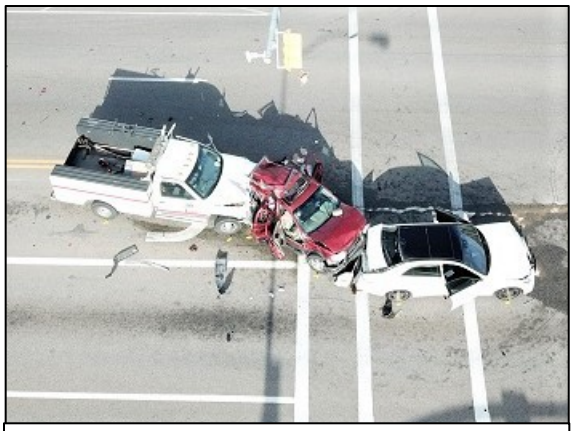


**Figure 3**. Final rest overhead view looking east (police photo).

For the Ford in Event 1, the "Missing" algorithm of the WinSMASH program calculated a total delta V of 137 km/h (85 mph), longitudinal delta V of 137 km/h (85 mph), lateral delta V of 0 km/h and a barrier equivalent speed (BES) of 104 km/h (65 mph). The collision fits the model but the results appear high. The vehicle's EDR report did not include delta V data for this event.

For the Dodge in Event 1, WinSMASH calculated a total delta V of 58 km/h (36 mph), longitudinal delta V of -58 km/h (-36 mph), lateral delta V of 0 km/h and a BES of 82 km/h (51 mph). The results for the Dodge fit the model and appear reasonable.

For the Ford in Event 2, the "Missing" algorithm of the WinSMASH program calculated a total delta V of 23 km/h (14 mph), longitudinal delta V of -23 km/h (-14 mph), lateral delta V of 0 km/h and a BES of 20 km/h (12 mph). According to the vehicle's EDR, this was a deployment level event. The collision fits the model and the results appear reasonable.

The Ford's EDR report included a maximum longitudinal delta V of 2.40 km/h (1.49 mph) at 75 ms. Since the EDR was not configured for rear impacts it is presumed the velocity change data was related to the frontal impact for Event 2. The delta V data appears inconsistent with the crash dynamics given the severity of the crash. It should be noted the crash pulse data timed out at 116 and the air bags deployed at 174.25 ms. This suggests the velocity change was under- reported because the maximum velocity change occurred after the crash pulse data timed out. For the Mercedes in Event 2, WinSMASH calculated a total delta V of 21 km/h (13 mph), longitudinal delta V of 21 km/h (13 mph), lateral delta V of 0 and a BES of 24 km/h (15 mph). The results fit the model and appear reasonable.

***Post-Crash***

Following the crash, the driver of the Ford exited the vehicle through the left front door and was assisted to the roadside by a passerby. He sustained moderate injuries, was transported by ambulance to a local hospital, and was treated for an unknown duration. The front right occupant was removed from the vehicle while unconscious through her side door after emergency responders cut her seat belt. She sustained serious injuries, was transported by ambulance to a local hospital, and admitted for an unknown duration. The second row left occupant was removed while unconscious through her side door after responders cut the shoulder straps of her CRS harness. She sustained serious injuries, was transported by helicopter to a hospital, and admitted for 11 days. The second-row right occupant was pronounced deceased prior to being

removed from the vehicle. She was transported by ambulance to a local hospital and an autopsy was performed.

The driver of the Dodge was transported by ambulance and the other occupants were transported by private vehicles. The occupants of the Mercedes were transported by ambulance and the driver of the Toyota was not transported. All four vehicles were towed due to damage.

## 2003 FORD ESCAPE

### *Description*

The 2003 Ford Escape was a 4-door sport utility vehicle (SUV) identified by the Vehicle Identification Number (VIN) 1FMCU93113Kxxxxxx. It was manufactured in December 2002 and the odometer reading was 245,465 km (152,525 mi). The vehicle was equipped with a 3.0-liter, 6-cylinder gasoline engine, 4-wheel drive and antilock brakes. The vehicle manufacturer recommended P235/70R16 tires with a recommended pressure of 205 kPa (30 psi) for the front and rear. The Ford was equipped with Michelin LTX M/S2 tires of the recommended size manufactured in 2015 (rear) and 2016 (front).

The vehicle was configured with two rows of seating for five occupants. The front row was equipped with bucket seats and adjustable head restraints. The driver's seat cushion was in the middle track position and the seat back was reclined following the crash. The head restraint had been removed. The front right passenger's seat cushion was in the middle track position. The seat back was deformed forward and rotated slightly clockwise, and revealed evidence of loading from the second-row right occupant. The head restraint was present and unremarkable. The second row was configured with a 60/40 split bench seat with folding and adjustable head restraints for the outboard seat positions. The left and center seat backs were displaced and deformed forward by intrusion of the cargo area. The left position head restraint was unevenly inserted into the seat back in a slanted configuration. Attached to the head restraint was an Eddie Bauer First Adventure dual-facing mirror. The right seat back was displaced forward to a fully upright position and the head restraint was in contact with the intruding roof header. The left and right seat positions were equipped with Lower Anchors and Tethers for Children (LATCH) anchorage systems to be used for installing LATCH-equipped CRSs. The lower anchors were located in the seat bight and the tether anchors were positioned behind the seating position on the backlight headliner of the cargo area. Both LATCH systems in the second row were used to secured CRSs at the time of the crash. This is discussed further in the Manual Restraint Systems and CRS discussions in this report.

**Figure 4**. Right side view, the 2003 Ford Escape.

### *Exterior Damage*

The Ford sustained severe damage to the back plane damage caused by the impact with the Dodge in Event 1. Direct damage was distributed laterally from bumper corner to bumper corner and

vertically from frame to above the belt line. Both rear tires were displaced forward in restricted positions shortening the wheelbase. The rear hatch was jammed shut. Induced damage extended to the left, right, top and bottom planes. The back bumper fascia was displaced and the backing bar was used to measure crush. Ten measurements were taken at bumper level by the Nikon Total Station and the Faro Blitz program computed crush measurements in six increments as follows: $C_1$ = 63 cm (24.8 in), $C_2$ = 89 cm (35.0 in), $C_3$ = 101 cm (39.8 in), $C_4$ = 107 cm (42.1 in), $C_5$ = 108 cm (42.5 in), and $C_6$ = 110 cm (43.3 in). Maximum crush located at the back right bumper corner and the Collision Deformation Classification (CDC) for the Ford in Event 2 was 06BDAW6 (**Figure 4**).

The Ford sustained minor damage to the front plane damage caused by the impact with the Mercedes in Event 2. Direct damage was distributed laterally from bumper corner to bumper corner and vertically from frame to above the belt line. The front bumper fascia was displaced and the backing bar was used to measure crush. Thirteen measurements were taken at bumper level by the Nikon Total Station and the Faro Blitz program computed crush measurements in six increments as follows: $C_1$ = 0 cm, $C_2$ = 2 cm (0.8 in), $C_3$ = 14 cm (5.5 in), $C_4$ = 11 cm (4.3 in), $C_5$ = 7 cm (2.8 in), and $C_6$ = 5 cm (2.0 in). Maximum crush located 15 cm (5.9 in) left of the longitudinal centerline and the CDC for the Ford in Event 2 was 12FDEW1 (**Figure 5**).

**Figure 5**. Front view, the 2003 Ford Escape.

**Figure 6**. Baby Trend Flex-Loc ISS.

***Event Data Recorder***

The Ford's EDR was imaged during the vehicle inspection using the Data Link Connector (DLC) method and CDR software version 17.7.1. and reported using version 19.3. The EDR report included limited data common among pre-1999 General Motors restraint control modules (RMCs). The module recorded longitudinal deceleration data for the purpose of understanding the input data the RCM used to determine whether or not to deploy restraint devices. The EDR recovered one deployment event in which the frontal air bags and seat belt pretensioners deployed at 174.25 milliseconds (ms). No Diagnostic Trouble Codes (DTCs) were active when the event occurred. The complete EDR report is included in this report as **Appendix A**.

***Child Restraint Systems***

*Baby Trend Flex-Loc Infant Safety Seat (ISS)*

The 7-month-old female was seated in a Baby Trend Flex-Loc ISS (**Figure 6**) identified by the model number TJ98017 with a manufacture date of August 15, 2012. This ISS was configured as a rear-facing-only seat with a removable stay-in-vehicle base, adjustable 5-point harness system, removable seat pad, canopy, adjustable carry handle, height-adjustable back, one set of adjustable harness slots, seat angle indicator and LATCH (lower anchors only, no tether). The ISS was intended to be installed using either LATCH or the vehicle's seat belt and with or without the base. In this case the CRS was installed using the base and LATCH on the second row left seat cushion. The LATCH connectors were attached to the left and right LATCH anchors, spaced 24 cm (15 in) apart.

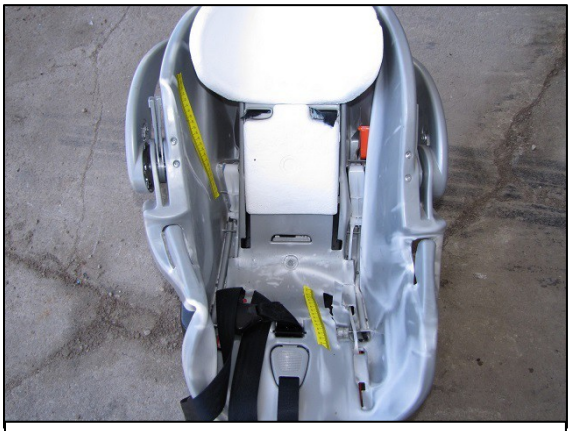


**Figure 7**. Baby Trend Flex-Loc ISS shell with damage.

The Baby Trend was found installed in the second row left seat position of the Ford at the time of the SCI vehicle inspection. Both lower latch attachments were in place on the anchors. It appeared to have been installed with no slack in the LATCH straps. The harness shoulder straps were positioned through the available set of slots and the seat back was set to 2/3 of maximum height. Both harness shoulder straps were cut during post-crash activities. The buckle and retainer clip were in place. They were examined for functionality and exhibited no damage. At impact with the Dodge in Event 1, the ISS was displaced forward and compressed between the second row left seat cushion and back, and the front row left seat back. The compression caused damage to the ISS as follows: The carry handle was bent and discolored beginning at the upper aspect and extending 7 cm (2.8 inches to the left. The handle was discolored in an area measuring 6 x 6 cm (2.4 x 2.4 in) located at the left release button. The shell sustained a linear fracture measuring 17 cm (6.7 in) located on the right aspect lateral to the adjustable back and just below the headrest. The shell sustained a multi-directional fracture measuring 17 cm (6.7 in) total located around the slot where the right harness strap fed through the bottom. The right aspect of the shell lateral to the seat area was bent 8 cm (3.1 in) to the left. The left side, right side, and seating area of the shell revealed multiple areas of discolored plastic caused by stress deformation and occupant loading (**Figure 7**).

Labeling on the CRS indicated the seat was intended for use by children meeting the following parameters:

- 5 - 30 lbs (2.2 - 13.6 kg)
- 30 inches (76.2 cm) or less

The 7-month-old female occupant met the weight and height parameters. The occupant's injuries were consistent with the crash severity and reduction of space in the second row caused by intrusion. The investigation revealed no evidence that this safety seat's functionality or usage contributed to the occupant's injuries.

*Safety 1st Everfit 3-In-1 CRS*

The Safety 1st Everfit CRS (**Figure 8**) was identified by the model number CC150-EHZ with a manufacture date of 3/7/2017. The Everfit was a combination type CRS intended to be used rear-facing, forward-facing or as a belt-positioning booster safety seat. It was configured with an adjustable 5-point-harness system, adjustable headrest, recline adjustment handle, removable seat pad, cup holders, one set of adjustable harness slots, seat angle indicator and LATCH. The CRS was designed to be installed using either LATCH or the vehicle's seat belt. In this case the CRS was installed forward-facing on the second-row right seat cushion using LATCH and the 5-point harness system. The LATCH connectors were attached to the left and right LATCH anchors spaced 24 cm (15 in) apart. The lower connectors appeared to have been installed with no slack in the LATCH straps. The tether strap was used incorrectly. Instead of being attached to the available tether anchor located at the backlight headliner it was routed behind the vehicle seat back and attached to seat hardware. The vehicle's head restraint was in place and the tether passed between the head restraint and seat back. According to the vehicle owner's manual, the head restraint should be removed and stowed when the tether is used. Labeling on the CRS indicated the seat was intended for use by children meeting the following parameters:

**Figure 8**. Safety 1st Everfit CRS.

- 22 - 40 lbs (10.1 - 18.0 kg)
- 29 - 43 inches (73.6 - 110.1 cm)
- At least 1 year old

The 2-year-old female occupant met the weight, height, and age parameters.

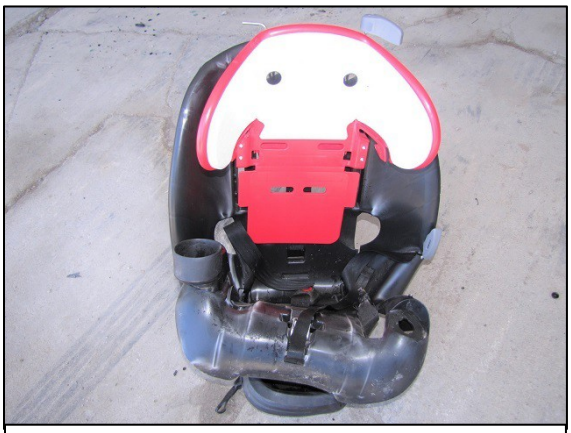


**Figure 9**. Safety 1st Everfit CRS shell with damage.

The CRS inspection revealed evidence of damage to the harness system and shell. The left shoulder strap had been cut during post-crash activities. The shell had been compressed between the intruding second row seat back and the front row right seat back, and the seat cushion and intruding roof header causing fracturing and deformation particularly in the seating area of the shell. The seating area of the shell was bent up and back relative to the back rest (**Figure 9**). A linear fracture measuring 12 cm (4.7 in) in length began at the left slot for the forward-facing belt path and extended downward to the seating area. The shell exhibited areas of discoloration in the plastic. The upper aspect of the headrest revealed scuff marks and fabric transfers caused by contact with the vehicle roof header. The occupant's injuries were consistent with the crash severity and reduction of space in the second row caused by intrusion. The investigation revealed no evidence that this safety seat's functionality or usage contributed to the occupant's injuries.

***Interior Damage***

The Ford sustained interior damage resulting from impact forces, air bag deployments and occupant contacts. The windshield was fractured, the second-row rear windows, backlight and right side windows were disintegrated. The front row seat belts revealed evidence of pretensioner actuation and occupant loading, the frontal air bags deployed, all five seat backs were deformed by impact forces or occupant loading and the front row right seat back revealed occupant contact from the second-row right occupant (**Figure 10**). The roof header was buckled by impact forces. The left side doors were sprung and would not close or latch. The right front door hinges were separated during post-crash activities and the right rear door was jammed shut. The front row was reduced by vertical intrusion of the roof header and lateral intrusion of the right roof side rail. The second row was reduced by longitudinal intrusion of the seat backs and seat cushions, lateral intrusion of the right B-pillar and right roof side rail and vertical intrusion of the roof. The cargo area was reduced by longitudinal intrusion of the backlight header and rear hatch.

**Figure 10**. Interior second-row view from the driver's side.

***Manual Restraint Systems***

The front row was equipped with driver and front right passenger lap and shoulder seat belts. The driver's belt was equipped with continuous loop belt webbing, a sliding latch plate, emergency locking retractor (ELR), and an adjustable D-ring in the full-up position. The front right occupant's seat belt was configured similar to the driver's with the addition of a switchable automatic locking retractor/ELR retractor and an adjustable D-ring in the full-down position. The front row belts were configured with retractor-mounted seat belt pretensioners which, according to the EDR report, actuated at 174.25 ms of the Event 2 frontal impact with the Mercedes (the EDR was not configured for rear impacts). Examination of the belt assemblies confirmed both front row occupants were belted at impact. The driver's belt assembly revealed scuff marks caused by loading at the D-ring, latch plate and webbing. The front right occupant's belt was cut during post-crash activities and the webbing, latch plate and D-ring trim were missing at the time of the inspection. The D-ring revealed evidence of occupant loading.

The second row was configured with lap and shoulder seat belts for all three seat positions. These belts were not used by the occupants in the second row at the time of the crash. Both CRSs were installed using LATCH.

***Supplemental Restraint Systems***

The Ford's supplemental restraint systems (SRSs) included driver's and passenger's frontal and seat-mounted side impact air bags. The frontal air bags deployed at impact with the Mercedes at 174.25 ms of Event 2. The driver's frontal air bag deployed from the steering wheel hub. It was configured with two vent ports and two tethers, and was unremarkable. The passenger's frontal air bag deployed from the top right instrument panel. It was configured with two vent ports and

exhibited dried blood deposits on the lower aspect of the front panel. The seat-mounted side impact air bags did not deploy.

***NHTSA Recalls and Investigations***
A query using the Ford's VIN revealed no open recalls as of January 2020.

**2003 FORD ESCAPE OCCUPANTS**

***Driver Demographics***

| | |
|---|---|
| Age/sex: | 31 years/male |
| Height: | Unknown |
| Weight: | Unknown |
| Eyewear: | Unknown |
| Seat type: | Bucket |
| Seat track position: | Middle |
| Manual restraint usage: | Lap and shoulder seat belt used |
| Usage source: | Vehicle inspection |
| Air bags: | Frontal air bag deployed, seat-mounted side air bag not deployed |
| Alcohol/drug data: | None |
| Egress from vehicle: | Exited under own power |
| Transport from scene: | Ambulance to hospital |
| Type of medical treatment: | Treated, duration unknown |

***Driver Injuries***

| Injury No. | Injury | Injury Severity AIS 2015 | Involved Physical Components (IPC) | IPC Confidence Level |
|---|---|---|---|---|
| 1 | Fracture NFS, thoracic spine | 650416.2 | Seat back | Probable |
| 2 | Fractures NFS, ribs | 450210.2 | Seat back | Probable |
| 3 | Abrasion, right face | 210202.1 | Frontal air bag | Probable |
| 4 | Abrasion, right wrist | 710202.1 | Frontal air bag | Possible |
| 5 | Minor lacerations and abrasions, left upper arm and elbow | 710602.1 | Door panel, unknown quadrant | Probable |
| 6 | Abrasion, left shoulder | 710202.1 | Shoulder portion seat belt | Certain |

*Source: police report.*

***Driver Kinematics***

The belted 31-year-old male driver was seated in an unknown posture while braking the stopped vehicle at a red traffic signal. At impact with the Dodge, the driver was displaced rearward in response to the direction of force. He loaded the seat back and the seat back was contacted by the CRS in the second row left position. The driver sustained unspecified fractures to the spine and ribs. The Ford was displaced forward striking the vehicle stopped ahead and the driver was displaced forward in response to the direction of force. His frontal air bag deployed and seat belt pretensioner actuated. He loaded the belt with his chest and loaded the deployed air bag with his chest, face and head. He sustained abrasions to the face and left shoulder. The driver remained held in place in his seated position by the pretensioned belt until the vehicle came to rest. He exited the vehicle and was assisted out of the street and to the curb by a passerby. The driver was transported by ambulance to a local hospital where he was treated for an unknown duration.

***Front Row Right Occupant Demographics***

| | |
|---|---|
| Age/sex: | 30 years/female |
| Height: | Unknown |
| Weight: | 59 kg (130 lb) |
| Eyewear: | Unknown |
| Seat type: | Bucket |
| Seat track position: | Middle |
| Manual restraint usage: | Lap and shoulder seat belt used |
| Usage source: | Vehicle inspection |
| Air bags: | Frontal air bag deployed, seat-mounted side air bag not deployed |
| Alcohol/drug data: | None |
| Egress from vehicle: | Removed while unconscious |
| Transport from scene: | Ambulance to hospital |
| Type of medical treatment: | Hospitalized, duration unknown |

***Front Row Right Occupant Injuries***

| Injury No. | Injury | Injury Severity AIS 2015 | Involved Physical Components (IPC) | IPC Confidence Level |
|---|---|---|---|---|
| 1 | Cerebral concussion with coma lasting greater than 6 hours | 161009.3 | Head restraint | Probable |
| 2<br>3 | Abrasions, bilateral hands | 710202.1 | Instrument panel | Possible |
| 4<br>5 | Abrasions and contusions, bilateral hips | 810202.1 | Lap portion seat belt | Certain |

*Source: EMS, police report.*

***Front Row Right Occupant Kinematics***

The belted 30-year-old female occupant was seated in an unknown posture in the stopped vehicle. At impact with the Dodge, the occupant was displaced rearward in response to the direction of force. She loaded the seat back and head restraint and the seat back was contacted by the occupant and the CRS in the second-row right position. She sustained a cerebral concussion with loss of consciousness. The Ford was displaced forward striking the vehicle stopped ahead and the occupant was displaced forward in response to the direction of force. Her frontal air bag deployed and seat belt pretensioner actuated. She loaded the belt with her chest and loaded the deployed air bag with her chest, face and head depositing blood deposits on the front panel. She sustained abrasions and contusions to her hips. The occupant remained held in place in her seated position by the pretensioned belt until the vehicle came to rest. She was removed from the vehicle while unconscious by emergency responders through the right-side door and transported by ambulance to a local hospital where she was admitted for treatment of an unknown duration.

***Second Row Left Occupant Demographics***

| | |
|---|---|
| Age/sex: | 7 Months/female |
| Height: | 69 cm (27 in) |
| Weight: | 8 kg (18 lb) |
| Eyewear: | None |
| Seat type: | Split bench with folding backs |
| Seat track position: | Not adjustable |
| Manual restraint usage: | LATCH with rear-facing CRS and 5-point harness |
| Usage source: | Vehicle inspection |
| Air bags: | None available |
| Egress from vehicle: | Removed from vehicle due to age |
| Transport from scene: | Helicopter to hospital |
| Type of medical treatment: | Hospitalized for 11 days |

***Second Row Left Occupant Injuries***

| Injury No. | Injury | Injury Severity AIS 2015 | Involved Physical Components (IPC) | IPC Confidence Level |
|---|---|---|---|---|
| 1 | Complex fractures, basilar skull, extending from left orbital roof to left squamosal suture, displaced | 150200.3 | Seat back | Probable |
| 2 | Intraparenchymal hemorrhage, cerebrum, left frontal lobe | 140638.3 | Seat back | Probable |
| 3 | Subdural hemorrhage, left front | 140650.3 | Seat back | Probable |
| 4 | Cephalhematoma NFS | 140630.3 | Seat back | Probable |

| Injury No. | Injury | Injury Severity AIS 2015 | Involved Physical Components (IPC) | IPC Confidence Level |
|---|---|---|---|---|
| 5 | Fractures, vault skull, calvarial sagittal suture extending to posterior left parietal and left lambdoid suture | 150402.2 | Seat back | Probable |
| 6 | Subgaleal hematoma, cerebrum | 110402.1 | Seat back | Probable |
| 7 | Hematoma, left periorbital, upper eyelid | 210402.1 | Seat back | Probable |

*Source: medical records.*

***Second Row Left Occupant Kinematics***

The occupant was restrained in a rear-facing CRS with a 5-point harness system. At impact with the other vehicle, the occupant and CRS were displaced toward the rear of the vehicle in response to the direction of force loading the CRS shell, harness and the vehicle's seat back. The second-row seat back intruded longitudinally in a forward direction reducing the occupant space and compressing the occupant and CRS shell. She sustained complex fractures of the basilar and vault skull, as well as multiple cerebral hemorrhages and hematomas. The Ford was displaced forward striking the stopped vehicle ahead and the occupant and CRS were displaced forward in response to the direction of force contacting the front row seat back and further loading the CRS shell. The occupant remained held in place by the CRS harness until the vehicle came to rest. She was removed by emergency responders due to her age and perceived serious injuries and transported by helicopter to a hospital where she was admitted for treatment for eleven days.

***Second Row Right Occupant Demographics***

| | |
|---|---|
| Age/sex: | 2 Years/female |
| Height: | 93 cm (36 in) |
| Weight: | 15 kg (33 lb) |
| Eyewear: | None |
| Seat type: | Split bench with folding backs |
| Seat track position: | Not adjustable |
| Manual restraint usage: | LATCH with forward-facing CRS and 5-point harness |
| Usage source: | Vehicle inspection |
| Air bags: | None available |
| Egress from vehicle: | Removed from vehicle after being declared deceased |
| Transport from scene: | Ambulance to hospital |
| Type of medical treatment: | None, declared deceased on-scene |

***Second Row Right Occupant Injuries***

| Injury No. | Injury | Injury Severity AIS 2015 | Involved Physical Components (IPC) | IPC Confidence Level |
|---|---|---|---|---|
| 1 | Fractures, comminuted and linear, basilar involving all cranial fossae | 150206.4 | Critical IPC 2-point Second row seat back, front row seat back | Probable Probable |
| 2 | Laceration, basilar portions of the frontal lobes, brain | 140688.3 | Critical IPC 2-point Second row seat back, front row seat back | Probable Probable |
| 3 | Fracture, depressed, left frontal skull, with linear fracture to left posterior parietal skull | 150404.3 | Critical IPC 2-point Second row seat back, front row seat back | Probable |
| 4 | Subarachnoid hemorrhage, right inferior temporal lobe, cerebrum | 140693.2 | Critical IPC 2-point Second row seat back, front row seat back | Probable Probable |
| 5 | Fracture, displaced, maxilla with laceration | 250800.2 | Critical IPC 2-point Second row seat back, front row seat back | Probable Probable |
| 6 | Subscapular and subgaleal hemorrhage of the left frontal, left parietal and central occipital regions, scalp | 110402.1 | CRS shell | Probable |
| 7 | Fracture, nasal bone | 251000.1 | Front seat back | Probable |
| 8 | Abrasions, contusions and lacerations, face | 210202.1 | Front seat back | Certain |
| 9 | Abrasions and contusions, left neck | 310202.1 | CRS harness | Certain |
| 10 | Abrasions and contusions, abdomen | 510202.1 | CRS harness | Certain |

| Injury No. | Injury | Injury Severity AIS 2015 | Involved Physical Components (IPC) | IPC Confidence Level |
|---|---|---|---|---|
| 11 | Abrasions and contusions, bilateral shoulders | 710402.1 | CRS harness | Certain |
| 12 | Contusion, right posterior forearm | 710402.1 | CRS shell | Probable |
| 13 | Laceration, minor, right anterior wrist | 710602.1 | Fractured glass | Possible |
| 14 | Contusions, left thigh | 810402.1 | Front row seat back | Probable |
| 15 | Contusions, left lower leg | 810402.1 | Front row seat back | Probable |

*Source: autopsy report.*

***Second Row Right Occupant Kinematics***

**Figure 11**. The 1999 Dodge Ram 3500 (police photo).

The occupant was restrained in a forward-facing CRS with a 5-point harness system. At impact with the other vehicle, the occupant and CRS were displaced rearward in response to the direction of force loading the CRS shell, harness and vehicle seat back. The front and second row seat backs intruded longitudinally and the roof intruded vertically reducing the occupant space and compressing the CRS shell. The Ford was displaced forward striking the vehicle stopped ahead and the occupant and CRS were displaced forward in response to the direction of force further loading the CRS shell. The occupant's head and face contacted the front row right seat back causing injuries including complex fractures to the basilar and vault skull, fractures to the face, lacerations and hemorrhages to the brain, and multiple abrasions, contusions and lacerations to the face, torso and extremities. She loaded the CRS harness causing abrasions and contusions to the neck, shoulders and chest. The occupant remained held in place by the CRS harness until the vehicle came to rest. She was declared deceased on-scene prior to her being removed by emergency responders and transported by ambulance to a local hospital.

**1999 DODGE RAM 3500**

***Description***

The 1999 Dodge RAM 3500 (**Figure 11**) was a full-size pickup identified in the police report by the VIN 3B6MF366XXMxxxxxx. The Dodge was manufactured as an incomplete cab/chassis vehicle and equipped with aftermarket tool boxes and cargo bed for use as a city utility service vehicle. It was configured with a 6-cylinder, 5.9-liter diesel engine and hydraulic brakes. The police verified a vehicle weight of 4,082 kg (9,000 lb).

***Exterior Damage***
The Dodge sustained moderate front plane damage caused at impact with the Ford in Event 1. Damage at front bumper level was distributed laterally from corner to corner and the estimated CDC was 12FDEW2.

***Occupant Data***
According to the police report, the occupants of the GMC included an unbelted 37-year-old male driver, a belted 8-year-old male and a belted 38-year-old female occupant. All three occupants sustained police-reported non-incapacitating injuries. The driver was transported by ambulance and the other occupants were transported by private vehicle to a local hospital. Their level and duration of treatment was unknown.

**2011 MERCEDES-BENZ E63 AMG**

***Description***
The 2011 Mercedes-Benz E63 AMG was a full-size sedan identified in the police report by the VIN WDDHF7HB0BAxxxxxx. The vehicle was configured with an 8-cylinder, 6.2-liter gas engine and rear-wheel drive.

***Exterior Damage***
The Mercedes sustained minor back plane damage caused at impact with the Ford and minor front plane damage caused at impact with the Toyota (**Figure 12**). The estimated CDC for the Mercedes in Event 2 was 06BDEW1 and the CDC in Event 3 was 12FDEW1.

***Occupant Data***
According to the police report, the occupants of the Mercedes included a belted 63-year-old male driver and belted 63-year-old female passenger who sustained police-reported incapacitating injuries and were transported by ambulance to a local hospital. Their level and duration of treatment was unknown.

**Figure 12**. The 2011 Mercedes-Benz E63 AMG (police photo).

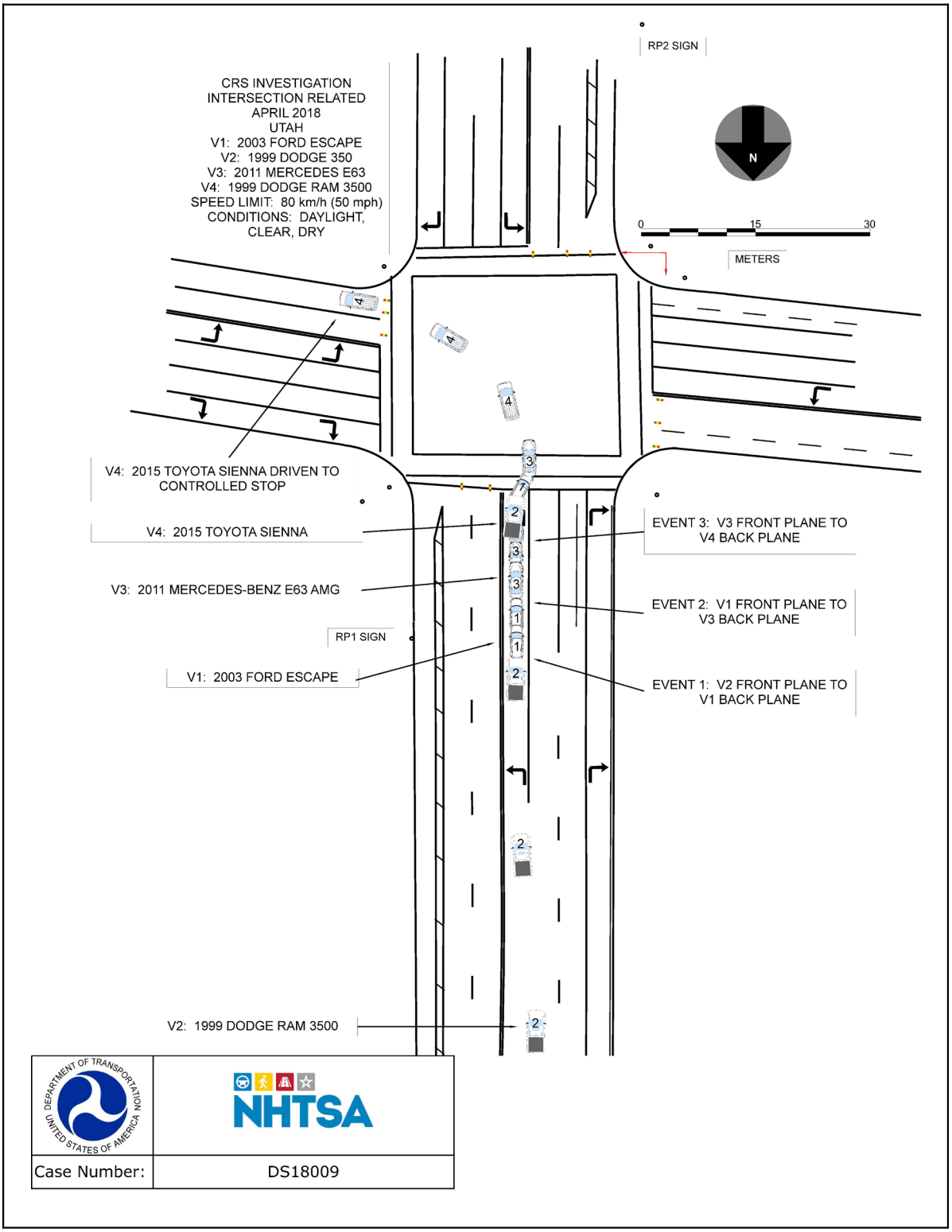
**2015 TOYOTA SIENNA**

***Description***
The 2015 Toyota Sienna was a passenger van identified in the police report by the VIN 5TDKK3DC5FSxxxxxx. The vehicle was configured with a 6-cylinder, 3.5-liter gas engine and front-wheel drive.

***Exterior Damage***
The Toyota sustained unspecified damage to the back plane caused at impact with the Mercedes in Event 3.

***Occupant Data***
According to the police report, the driver of the Toyota was a belted 32-year-old male who was not injured or transported.

# CRASH DIAGRAM



## APPENDIX: 2003 Ford Escape Event Data Recorder (EDR) Report [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 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 | 1FMCU93113K****** |
| User | |
| Case Number | |
| EDR Data Imaging Date | |
| Crash Date | |
| Filename | DS18009_V1_ACM.CDRX |
| Saved on | |
| Imaged with CDR version | Crash Data Retrieval Tool 17.7.1 |
| Imaged with Software Licensed to (Company Name) | NHTSA |
| Reported with CDR version | Crash Data Retrieval Tool 19.3 |
| Reported with Software Licensed to (Company Name) | NHTSA |
| EDR Device Type | Airbag Control Module |
| Event(s) recovered | Deployment |

## Comments

No comments entered.

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

## Data Limitations

**Important Limitations on Bosch Crash Data Retrieval (CDR) Tool Capabilities.**

Disclaimer: This Restraint Control Module (RCM) records longitudinal deceleration data for the purpose of understanding the input data the Restraint Control Module used to determine whether or not to deploy restraint devices. This module does not record vehicle speed, throttle position, brake on-off, and other data, which may be recorded in some 1999 model year and later General Motors modules. The deceleration data recorded by Ford's module during a crash can subsequently be mathematically integrated into a longitudinal Delta-V. Delta-V is the change in velocity during the recording time and is NOT the speed the vehicle was traveling before the accident, and is also not the Barrier Equivalent Velocity. The Bosch CDR Tool will read and interpret both acceleration in G's and Delta-V in mph. RCM's in Ford vehicles that can be read by the Bosch CDR tool are listed in the Bosch Help Files.

**Important**

If there is any question that the restraint system did not perform as it was designed to perform, please read the system only through the diagnostic link connector. The Bosch CDR kit provides an RCM interface cable to plug directly into the restraint control module. The Bosch CDR RCM Interface Cable connects only power, ground, and memory read pins to the relevant vehicle restraint control module. The other RCM pins normally connect to inputs, such as sensors, and outputs, such as airbags, are not connected when you use the RCM Interface Cable to plug directly into the module. Since the vehicle restraint control module is constantly monitoring airbag system readiness (when powered), it will detect that the sensors and airbags are not connected. The restraint control module may record a new diagnostic trouble code into memory for each device that is not connected. These new diagnostic trouble codes may record over previously written diagnostic trouble codes present prior to the accident and spoil evidence necessary to determine if the restraint system performed in the accident as it was designed to perform. Not only could this prevent Ford from being able to determine if the system performed as it was designed to perform, but, regardless of innocent inadvertence, you could raise issues of evidence spoliation in any litigation that may arise out of the accident. If you cannot read the module via the diagnostic link connector, and if you suspect improper system performance, contact Ford Motor Company and request their assistance to read the module with a proper vehicle simulator attached.

While data stored in RCM's is accurate, accident reconstructionists must be aware of the limitations of the data recorded in Ford's control modules and should compare the recorded data with the physical evidence at the accident scene using professional accident reconstruction techniques (i.e. vehicle crush characteristics, skid marks, etc) before making any assumptions about the import and validity of the data recorded in the module with respect to the crash event being analyzed. The following describes specific limitations that must be considered when analyzing recorded data. Investigators should obtain permission of the vehicle owner or have sufficient legal authority prior to reading any data.

1. There may be no deceleration data recorded in the module.
Loss of power (cut wires, damaged battery, crushed fuse box) to the module during or immediately after the crash may prevent the crash data from being recorded. A backup power supply within the module has sufficient power to continue to analyze the deceleration data and deploy restraint devices if needed, but there is no backup power for recording.

If the deceleration input does not create a vehicle longitudinal Delta-V above 4 mph within 100 milliseconds, there may not be any data recorded.

2. In unusual circumstances, deceleration data stored in the module may be from a crash other than the one you are currently analyzing.
The module will record data from some non-deploy events. If, after the module has recorded data from a non-deploy event, and there is a subsequent event in which there is a loss of power and no new recording is made for that subsequent event, the deceleration data in the module's memory may be from the prior event. If the new, subsequent event is a deploy event and recording has occurred, the deployment times should be recorded. If there are no deployment times recorded, but airbags or other restraint devices are observed to have deployed, the recorded data that you read are most likely from a prior event.

Once an airbag or other restraint device has been commanded to deploy, the data recorded in connection with that deployment are "locked", and subsequent crashes cannot be recorded.

If a vehicle is being repaired, the RCM should be replaced after any crash in which restraint devices deploy. Early printed shop manuals refer to re-using modules by clearing the "crash data memory full" code, but this is no longer true and the latest on-line electronic shop manual directs that modules be replaced.

Crashes that involve multiple impacts will record only one of the impacts. If there is a deployment, the deployment event will be recorded and locked. If no restraint device is commanded to deploy, the recorded data are not "locked", and subsequent impacts may record over any previous recorded data. Further analysis will be required to determine which of the events was actually recorded.

3. The computed longitudinal Delta-V may understate the total Delta-V

Many real-world crashes can last longer than the memory has the capacity to record. Therefore, the actual Delta-V of the event may be higher than the Delta-V calculated and displayed by the Bosch CDR System output. Review the end of the longitudinal acceleration/deceleration pulse - if it has not settled to zero G's by the end of the recording, the vehicle longitudinal Delta-V is most likely understated. If there is a clear decaying trend line you may choose, at your own risk, to estimate the total Delta-V by extrapolating the decay trend to zero and to calculate the additional Delta-V not captured.

Under some circumstances where power is interrupted, during the recording of data, or the module re-sets during the recording of data, a partial recording may occur. This will be shown as "no data" in the data table and will not be plotted on the graph of acceleration. When some portion of the acceleration data is not recorded, the Delta-V during that time cannot be calculated. A Delta-V will be calculated for the points that are valid, but the user must be aware that the partial Delta-V calculated will further underestimate the actual event total Delta-V.

4. This module records only longitudinal acceleration/deceleration of the vehicle. You must compute lateral or resultant total acceleration based on your estimated Principal Direction of Force (PDOF).

5. Vertical acceleration/decelerations are not recorded. Vehicle spin about a point not centered on the Restraints Control Module sensor may add or subtract from bulk vehicle motion.

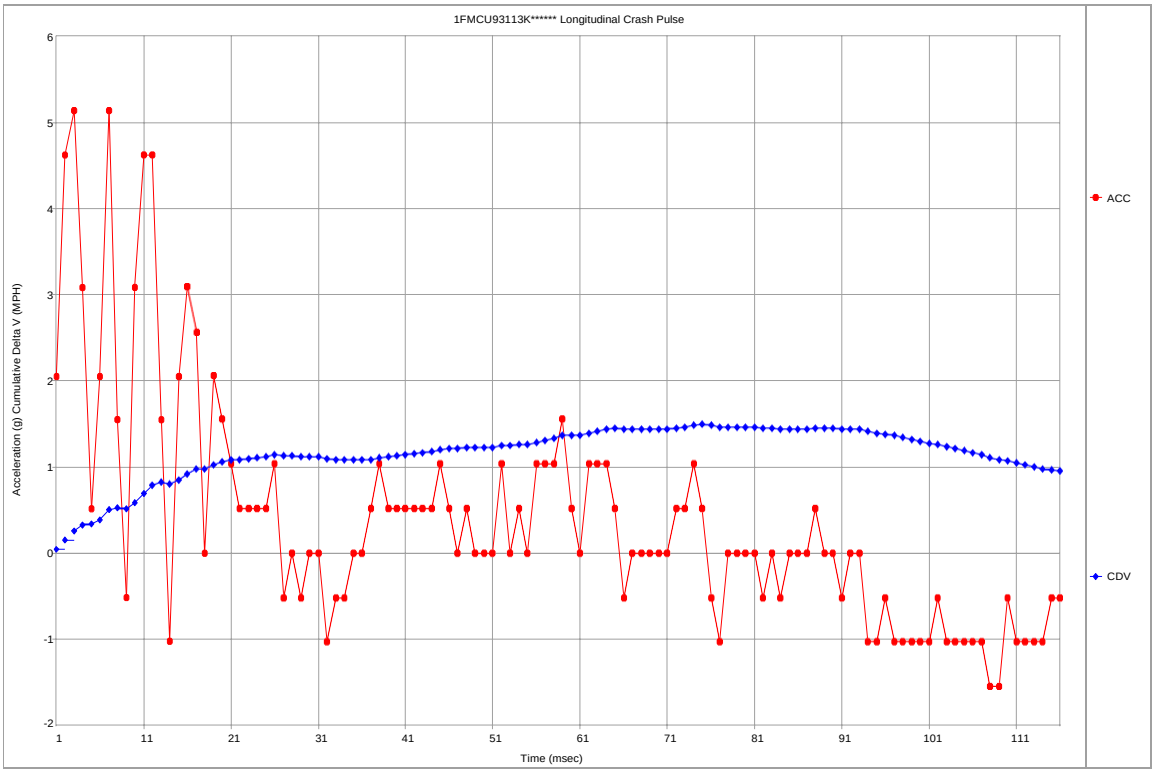
6. This module is not intended to record acceleration/deceleration in a side-impact event. If the side impact generates a longitudinal deceleration component sufficient to wake up the frontal deployment algorithm, there may be a recording of longitudinal deceleration in a side impact event.

Any Longitudinal Delta-V determined by using data read from the air bag module should be verified with physical evidence from the crash (such as vehicle crush, skid marks) and assumed accident sequence. Multiple impacts, angular collisions, side impacts, vehicle spin, etc should be considered in addition to the data read from the air bag module.

02001_RCM-1_r002

## System Status At Deployment

| | |
|---|---|
| Diagnostic codes active when event occurred | 0 |
| Passenger Airbag Switch Position During Event | Activated |
| Time From Side Safing Decision to Left (Driver) Side Bag Deployment (msec) | Not Deployed |
| Frontal and Pretensioner Fire time (ms) | 174.25 |


1FMCU93113K****** Longitudinal Crash Pulse
Acceleration (g) Cumulative Delta V (MPH)
Time (msec)
ACC
CDV

# Crash Pulse Data

| Milliseconds | Long. Acceleration (Gs) | Long. Cumulative Delta V (MPH) |
|---|---|---|
| 1 | 2.06 | 0.05 |
| 2 | 4.63 | 0.15 |
| 3 | 5.14 | 0.26 |
| 4 | 3.08 | 0.33 |
| 5 | 0.51 | 0.34 |
| 6 | 2.06 | 0.38 |
| 7 | 5.14 | 0.50 |
| 8 | 1.54 | 0.53 |
| 9 | -0.51 | 0.52 |
| 10 | 3.08 | 0.59 |
| 11 | 4.63 | 0.69 |
| 12 | 4.63 | 0.79 |
| 13 | 1.54 | 0.82 |
| 14 | -1.03 | 0.80 |
| 15 | 2.06 | 0.85 |
| 16 | 3.08 | 0.91 |
| 17 | 2.57 | 0.97 |
| 18 | 0.00 | 0.97 |
| 19 | 2.06 | 1.02 |
| 20 | 1.54 | 1.05 |
| 21 | 1.03 | 1.07 |
| 22 | 0.51 | 1.08 |
| 23 | 0.51 | 1.09 |
| 24 | 0.51 | 1.11 |
| 25 | 0.51 | 1.12 |
| 26 | 1.03 | 1.14 |
| 27 | -0.51 | 1.13 |
| 28 | 0.00 | 1.13 |
| 29 | -0.51 | 1.12 |
| 30 | 0.00 | 1.12 |
| 31 | 0.00 | 1.12 |
| 32 | -1.03 | 1.09 |
| 33 | -0.51 | 1.08 |
| 34 | -0.51 | 1.07 |
| 35 | 0.00 | 1.07 |
| 36 | 0.00 | 1.07 |
| 37 | 0.51 | 1.08 |
| 38 | 1.03 | 1.11 |
| 39 | 0.51 | 1.12 |
| 40 | 0.51 | 1.13 |
| 41 | 0.51 | 1.14 |
| 42 | 0.51 | 1.15 |
| 43 | 0.51 | 1.16 |
| 44 | 0.51 | 1.17 |
| 45 | 1.03 | 1.20 |
| 46 | 0.51 | 1.21 |
| 47 | 0.00 | 1.21 |
| 48 | 0.51 | 1.22 |
| 49 | 0.00 | 1.22 |
| 50 | 0.00 | 1.22 |
| 51 | 0.00 | 1.22 |
| 52 | 1.03 | 1.24 |

| Milliseconds | Long. Acceleration (Gs) | Long. Cumulative Delta V (MPH) |
|---|---|---|
| 53 | 0.00 | 1.24 |
| 54 | 0.51 | 1.25 |
| 55 | 0.00 | 1.25 |
| 56 | 1.03 | 1.28 |
| 57 | 1.03 | 1.30 |
| 58 | 1.03 | 1.32 |
| 59 | 1.54 | 1.35 |
| 60 | 0.51 | 1.37 |
| 61 | 0.00 | 1.37 |
| 62 | 1.03 | 1.39 |
| 63 | 1.03 | 1.41 |
| 64 | 1.03 | 1.43 |
| 65 | 0.51 | 1.44 |
| 66 | -0.51 | 1.43 |
| 67 | 0.00 | 1.43 |
| 68 | 0.00 | 1.43 |
| 69 | 0.00 | 1.43 |
| 70 | 0.00 | 1.43 |
| 71 | 0.00 | 1.43 |
| 72 | 0.51 | 1.44 |
| 73 | 0.51 | 1.46 |
| 74 | 1.03 | 1.48 |
| 75 | 0.51 | 1.49 |
| 76 | -0.51 | 1.48 |
| 77 | -1.03 | 1.46 |
| 78 | 0.00 | 1.46 |
| 79 | 0.00 | 1.46 |
| 80 | 0.00 | 1.46 |
| 81 | 0.00 | 1.46 |
| 82 | -0.51 | 1.44 |
| 83 | 0.00 | 1.44 |
| 84 | -0.51 | 1.43 |
| 85 | 0.00 | 1.43 |
| 86 | 0.00 | 1.43 |
| 87 | 0.00 | 1.43 |
| 88 | 0.51 | 1.44 |
| 89 | 0.00 | 1.44 |
| 90 | 0.00 | 1.44 |
| 91 | -0.51 | 1.43 |
| 92 | 0.00 | 1.43 |
| 93 | 0.00 | 1.43 |
| 94 | -1.03 | 1.41 |
| 95 | -1.03 | 1.39 |
| 96 | -0.51 | 1.38 |
| 97 | -1.03 | 1.35 |
| 98 | -1.03 | 1.33 |
| 99 | -1.03 | 1.31 |
| 100 | -1.03 | 1.29 |
| 101 | -1.03 | 1.26 |
| 102 | -0.51 | 1.25 |
| 103 | -1.03 | 1.23 |
| 104 | -1.03 | 1.21 |
| 105 | -1.03 | 1.18 |
| 106 | -1.03 | 1.16 |
| 107 | -1.03 | 1.14 |

| Milliseconds | Long. Acceleration (Gs) | Long. Cumulative Delta V (MPH) |
|---|---|---|
| 108 | -1.54 | 1.11 |
| 109 | -1.54 | 1.07 |
| 110 | -0.51 | 1.06 |
| 111 | -1.03 | 1.04 |
| 112 | -1.03 | 1.02 |
| 113 | -1.03 | 0.99 |
| 114 | -1.03 | 0.97 |
| 115 | -0.51 | 0.96 |
| 116 | -0.51 | 0.95 |

## 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.

```
0800:  AA 42 40 5F 14 A2 58 2D 0D 23 0F 2D 38 57 C8 FF
0810:  10 FF 2C 12 3C 78 F1 9E 08 A2 F9 EF 19 99 52 49
0820:  2D 03 B3 43 1E 0A F5 0A A1 5E 03 0E 1D 1E 00 25
0830:  3C 3C 80 28 05 28 01 09 A0 0C 0A 18 03 84 B7 03
0840:  03 01 01 01 E4 67 11 01 F4 00 55 00 C0 12 5C 01
0850:  40 01 5E 02 6C 00 A5 00 A5 19 64 00 15 01 2C 06
0860:  A4 27 10 03 84 00 00 00 00 00 00 00 C6 04 7E 7D
0870:  00 00 82 00 2C 00 BB 11 94 03 E8 01 2C 04 28 01
0880:  DC 01 EA 00 53 00 96 00 C8 1E 00 08 4A 08 E6 02
0890:  14 96 0A E1 03 96 27 14 67 32 02 18 45 01 0D D0
08A0:  14 FF 50 C3 60 CC 40 FF FF FF FF FF FF FF FF 8A
08B0:  45 02 05 F8 0F 9F 84 45 02 05 F8 09 B7 0F 00 FF
08C0:  04 FF FF FF FF FF 72 04 64 59 4C 38 46 04 05 10
08D0:  32 FF 80 03 FF 80 04 FF 80 2F FF 80 16 FF 80 FF
08E0:  02 FD 80 09 FE 80 0A FE 80 21 FE 80 23 FE 80 FF
08F0:  1D 06 C0 01 0A 80 04 FF FF FF FF FF FF FF 00 00
0900:  02 FF 81 34 01 6C 11 FF FF FF FF FF 33 03 42 80
0910:  FF 13 01 42 80 54 01 42 80 18 31 23 66 63 FF FD
0920:  A2 A7 A8 A4 9F A2 A8 A1 9D A4 A7 A7 A1 9C A2 A4
0930:  A3 9E A2 A1 A0 9F 9F 9F 9F A0 9D 9E 9D 9E 9E 9C
0940:  9D 9D 9E 9E 9F A0 9F 9F 9F 9F 9F 9F A0 9F 9E 9F
0950:  9E 9E 9E A0 9E 9F 9E A0 A0 A0 A1 9F 9E A0 A0 A0
0960:  9F 9D 9E 9E 9E 9E 9E 9F 9F A0 9F 9D 9C 9E 9E 9E
0970:  9E 9D 9E 9D 9E 9E 9E 9F 9E 9E 9D 9E 9E 9C 9C 9D
0980:  9C 9C 9C 9C 9C 9D 9C 9C 9C 9C 9C 9B 9B 9D 9C 9C
0990:  9C 9C 9D 9D 9E BD 7E 65 CA 99 02 CD 00 00 00 00
09A0:  03 13 03 51 02 A7 02 B9 02 B9 02 AD 00 00 00 81
09B0:  02 AA 00 00 02 B9 00 00 03 E9 00 00 00 00 00 00
09C0:  00 02 B9 FF 01 FF FF 07 BB 00 FF FF FF FF FF FF
09D0:  FF FF FF FF FF FF FF FF FF FF FF FF FF FF FF FF
09E0:  FF FF FF FF FF FF FF FF FF FF FF FF FF FF FF FF
09F0:  FF FF FF FF FF FF FF FF FF FF FF FF FF FF FF FF
```

## Disclaimer of Liability

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

DOT HS 812 933
May 2020

U.S. Department
of Transportation

**National Highway
Traffic Safety
Administration**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