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**Special Crash Investigations:
On-Site Child Restraint System
Crash Investigation;
Vehicle: 2018 Honda Civic;
Location: California;
Crash Date: November 2021**

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16. Abstract This on-site investigation documents a fatal nighttime crash in California involving a 2018 Honda Civic and the injuries of two occupants using child restraint systems. An unbelted 29-year-old female was driving and an unbelted 29-year-old male was the passenger. A belted 4-year-old male using a booster seat, a belted 9-year-old female, and a belted 5-year-old male using a booster seat were passengers in the second row. A 2018 Jeep Wrangler traveling westbound in the eastbound lanes driven by a belted 32-year-old male driving under the influence of alcohol entered the eastbound lanes via an eastbound off-ramp. A 2004 GMC Sierra 1500 driven by a belted 60-year-old male was traveling eastbound behind the Honda. The Honda struck the Jeep head-on, then the GMC's front plane struck the Honda's right plane. Four of the Honda's occupants sustained fatal injuries. The surviving 4-year-old male was transported and hospitalized with police-reported "A" (incapacitating) injuries. The Jeep driver sustained police-reported "A" injuries; he was transported and arrested for driving under the influence of alcohol.			
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Special Crash Investigations
On-Site Child Restraint System Crash Investigation
Case No. DS22002
Vehicle: 2018 Honda Civic
Location: California
Crash Date: November 2021

Background

This report documents the on-site investigation of a fatal crash involving a 2018 Honda Civic and the injuries of the two occupants using child restraint systems. The crash was selected by the Special Crash Investigations (SCI) group of the National Highway Traffic Safety Administration in November 2021. After obtaining a copy of the preliminary police crash report (PCR), Dynamic Science, Inc., learned that the 2018 Honda Civic hatchback had two child restraint systems (CRSs) used by its occupants. The Honda, 2018 Jeep Wrangler, and 2004 GMC Sierra 1500 were located at a police impound lot. The vehicles and CRSs were on police evidence holds and the SCI team gained cooperation through the investigating police department and assistant district attorney. The SCI field inspections were completed in January 2022 with a police officer in attendance. SCI obtained on-scene police photos in January 2022 and the final version of the PCR in August 2022. The three vehicles had air bag control modules supported by the Bosch Crash Data Retrieval (CDR) system. Police gave the SCI team event data recorder (EDR) reports for two of the three involved vehicles. The Honda's EDR could not be imaged due to damage.

The crash occurred at night in November 2021 in the eastbound travel lanes of a two-lane divided interstate highway in California. Conditions were clear, dark, and dry. The 2018 Honda Civic was traveling eastbound in the right lane. An unbelted 29-year-old female was the driver and an unbelted 29-year-old male was the front passenger. Second-row occupants included a belted 4-year-old male using a booster seat, belted 9-year-old female, and belted 5-year-old male using a booster seat. The second vehicle was a 2018 Jeep Wrangler traveling westbound in the eastbound lanes by a belted 32-year-old male who police said was under the influence of alcohol. The evidence suggests the Jeep was initially traveling in the left lane before changing lanes to the right just prior to impact with the Honda. The third vehicle, a 2004 GMC Sierra 1500 driven by a belted 60-year-old male, was traveling eastbound in the right lane behind the Honda. The Honda struck the Jeep head-on. The GMC's front plane then struck the Honda's right plane, and the Honda's back plane then struck a concrete traffic barrier. Four occupants of the Honda sustained police-reported "K" (fatal) injuries. The surviving 4-year-old male occupant of the Honda was transported and hospitalized with police-reported "A" (incapacitating) injuries. The Jeep driver sustained police-reported "A" injuries and was transported. He was later arrested. The GMC driver was not injured or transported. All three vehicles were towed due to disabling damage and placed into evidence.

Summary

Crash Site

The crash occurred in the eastbound lanes of a divided interstate highway in California. Satellite images and police data sources were used to obtain roadway measurements discussed in this report. In the area of the crash the section of roadway was straight, followed by a right curve and slight uphill slope. The roadway had two eastbound lanes each measuring 3.8 m (12.0 ft) wide. They were separated by a dashed white painted stripe and bordered by a solid yellow painted fog line on the left and a solid white painted fog line on the right. The concrete roadway had grooved concrete shoulders each measuring 3.0 m (10.0 ft) wide with milled-in rumble strips. Bordering the left shoulder was a concrete jersey type barrier. Bordering the right shoulder was a raised asphalt curb, and dirt and rock ascending embankment. The pavement and lane lines were in good condition. The right curve had a radius measuring 774.0 m (304.7 ft) at the right fog line and the slope was approximately 2.0 percent (Figure 1). Super-elevation was -5.2 percent in the left lane and -4.5 in the right lane. The posted speed limit was 105 km/h (65 mph). Conditions at the time of the crash were dark without artificial lighting, clear, and dry. A crash diagram is included at the end of this report.



Figure 1. Approach to crash site, looking east

Pre-Crash

The Honda was traveling eastbound at an unknown speed in the right eastbound lane and the driver was negotiating the right curve. The GMC was traveling eastbound in the right eastbound lane behind the Honda at an EDR-reported speed of 103 km/h (64 mph) at T-2 seconds to algorithm enable (AE) with the brake switch circuit state “Off.” The GMC driver later told police the Honda had passed him prior to the crash. Police determined the Jeep entered the eastbound lanes via an eastbound off-ramp approximately 3 km (2 mi) east of the crash site. At least one eastbound witness called 911 to report the Jeep’s wrong-way orientation before the crash was reported. The Jeep was traveling westbound in the eastbound lanes at an EDR-reported speed of 109 km/h (68 mph) with the service brake “Off” at T-2.0 seconds to AE. The evidence suggests the Jeep was initially traveling in the left lane before changing lanes to the right just prior to impact with the Honda. The Jeep driver was negotiating the left curve with an EDR-reported steering input of 9° left. At T-1.4 seconds, the Jeep’s service brake was “On,” and the steering input was 16° left. At T-0.1 seconds, its speed was 89 km/h (55 mph), the service brake was “On,” steering input was 79° left, and stability control was “On.” At T-1.0 second to AE, the GMC’s vehicle speed was 93 km/h (58 mph), and the brake switch circuit state was “On.”

Crash

The crash had five events. The Honda struck the Jeep head-on in the right eastbound lane (Event 1). The impact caused the Honda to rotate clockwise, and briefly came to rest before its right plane (forward of the right A-pillar) was struck by the GMC's front plane (Event 2). The Honda's engine became detached and came to rest on the shoulder approximately 30 m (100 ft) east of the area of impact. Impact forces in Event 2 caused the Honda to rotate counterclockwise and travel northbound until its back plane struck the concrete barrier (Event 3), where it came to rest facing south on the left shoulder (Figure 2). The GMC traveled forward, and its front plane struck the Jeep's right plane (Event 4), and then its right plane struck the Jeep's right plane (Event 5). The Jeep came to rest facing east on the right eastbound shoulder (Figure 3) and the GMC came to rest facing south on the right eastbound shoulder.

For the Honda in Event 1, the standard algorithm of WinSMASH calculated a total delta V of 70 km/h (43 mph), a longitudinal delta V of -69 km/h (-43 mph) a lateral delta V of 12 km/h (8 mph) and a barrier equivalent speed (BES) of 85 km/h (53 mph). For the Jeep in Event 1, WinSMASH calculated a total delta V of 61 km/h (38 mph), a longitudinal delta V of -60 km/h (-37 mph) a lateral delta V of -11 km/h (-7 mph) and a BES of 41 km/h (26 mph). The results fit the collision model and appear low. The Jeep's EDR reported a maximum longitudinal delta V of -92 km/h (-57.2 mph).

For the Honda in Event 2, the barrier algorithm of WinSMASH calculated a BES of 50 km/h (31 mph) for the Honda.¹ The results appear reasonable. For the GMC in Event 2, the barrier algorithm of WinSMASH calculated a BES of 30 km/h (19 mph). The results fit the collision model and appear reasonable. The maximum longitudinal delta V captured by the GMC's EDR was -32.75 km/h (-20.35 mph).

Event 3 was a minor impact involving the Honda only. Events 4 and 5 were minor impacts involving the GMC and Jeep. Crush measurements were not taken for those events.



Figure 2. Honda at final rest looking north (police photo)



Figure 3. Jeep at final rest looking east (police photo)

¹ Overlapping damage to the Honda's right plane placed the vehicle out of scope for WinSMASH.

Post-Crash

Evidence suggests that, following the crash, all the Honda's doors were jammed shut. A passerby removed the Honda's 4-year-old male occupant through a left side window and remained with him until emergency medical services (EMS) arrived. The child was then transported by ground ambulance to a hospital located 82 km (51 mi) from the crash site where he was hospitalized for 4 days. A mid-size dog traveling in the Honda was found deceased in the vehicle. Emergency responders forced open the left side doors, removed the right-side doors, and cut off the roof to access the four other occupants who were pronounced deceased at the scene. The Jeep driver was transported and hospitalized for an unknown duration with incapacitating injuries. He was arrested for driving under the influence of alcohol, among other charges, police said. The GMC driver was not injured or transported.

2018 Honda Civic

Description

The 2018 Honda Civic hatchback was identified by police using Vehicle Identification Number (VIN) SHHFK7H55JUxxxxxx. The manufacture date was November 2017 and the most recent odometer reading taken from a vehicle history report in April 2020 was 61,076 km (37,951 mi). The Honda was a 5-door hatchback intermediate class passenger vehicle. It had two rows of seats for five occupants. The front row had bucket seats with adjustable head restraints and the second row had a bench seat with adjustable head restraints and folding backs. Standard features were a 4-cylinder, 1.5-liter, gasoline engine, front-wheel drive and automatic transmission. The vehicle manufacturer recommended size P215/50R17 tires. The Honda had Ironman iMove Gen2 tires of the recommended size with 6 mm (7/32 in) or greater tread depth at all four positions.

Exterior Damage

The Honda had direct damage to the front, right, and back planes, and induced damage to the front, left, right, back, and top planes. Post-crash damage included removal of the roof and right side doors, and forcible opening of the left side doors. The roof and hood were buckled. The front tires were flat, the left front tire was restricted, and the right front wheel was fractured. The left wheelbase was lengthened by 5 cm (2.0 in) and the right wheelbase was reduced by 40 cm (15.7 in). The engine, radiator, grille, bumper fascia, and bumper reinforcement bar were detached from the vehicle.

The bumper reinforcement bar was not available for inspection. Two crush measurements were taken at the left and right frame rails using a Nikon total station and the AutoCrush program calculated six crush measurements as follows: C1 = 48 cm (18.9 in), C2 = 60 cm (23.6 in), C3 = 72 cm (28.3 in), C4 = 80 cm (31.5 in), C5 = 82 cm (32.3 in), and C6 = 84 cm (33.1 in). Maximum crush was located at the front right bumper corner and the collision deformation classification (CDC) for the Honda in Event 1 was 12FDEW04 (Figures 4 and 5).

For the Honda in Event 2, the damage was overlapping, and the estimated CDC was 04RFEW99. For Event 3 the CDC was 06BREE01.



Figure 4. 2018 Honda Civic front plane damage

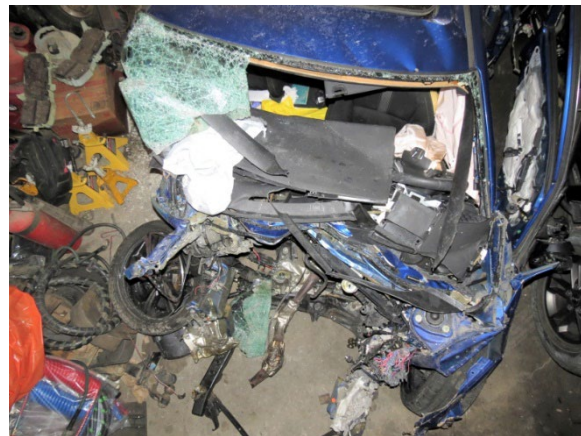


Figure 5. 2018 Honda Civic front plane damage overhead view

Child Restraint Systems

Goodbaby International Evenflo Big Kid Sport

A Goodbaby International Evenflo Big Kid Sport booster seat (Figures 6 and 7) was used by the 4-year-old male seated in the second-row-left position. The Evenflo was manufactured on January 7, 2019 and the model number was 36511910. It had a molded plastic shell, removable high back and headrest, armrests with dual cup holders, and removable padding that was gray and white in color. The Evenflo did not have Low Anchors and Tethers for CHildren (LATCH) features. It was placed in the seat in a forward-facing orientation at the time of the crash.

According to labeling on the Evenflo, it was intended for use by occupants who meet the following parameters:

- Must be at least 4 years old.
- Must weigh between 18.0 and 43.5 kg (40 and 100 lbs).
- Must be between 112 and 145 cm (44 and 57 in).
- Ears must be below the top of the headrest (when the backrest is used).

The occupant using this booster seat met the age and weight requirements. It is unknown if he met the height and headrest requirements.

The Evenflo was damaged in the crash. It had damage to the shell on the seating area, high-back and left armrest. The back right corner of the seating area had a vertical fracture measuring 8 cm (3.1 in) long and the padding was torn. The right armrest had a lateral fracture measuring 8 cm (3.1 in) long at the cup holder. The left aspect of the high-back was fractured in a pattern measuring 10 x 27 cm (3.9 x 10.6 in) and a piece from the left aspect was missing. The head restraint was not damaged.



Figure 6. Evenflo Big Kid Sport booster seat



Figure 7. Evenflo Big Kid Sport booster seat

Graco TurboBooster NB

A Graco TurboBooster backless booster seat (Figures 8 and 9) was used by the 5-year-old male seated in the second-row-right position. The Graco was manufactured on November 26, 2020 and the model number was 1874739JJ. It had a molded plastic shell, adjustable-height armrests, retractable cup holders, and removable padding that was light and dark gray in color. The Graco did not have LATCH features. It was placed in the seat in a forward-facing orientation at the time of the crash.

According to labeling on the Graco, it was intended for use by occupants who meet the following parameters:

- Must be between 4 and 10 years old.
- Must weigh between 18.1 and 45.0 kg (40 and 100 lbs).
- Must be between 110.1 and 145.0 cm (43 and 57 in).

The occupant using this booster seat met the age, weight, and height requirements. The Graco had damage to the left and right armrests. The armrests were adjusted to the lowest position and the left armrest was broken off above the shell insertion point. The right armrest revealed a scuff mark at its upper aspect measuring 17 cm (6.7 in) long. The seating area was undamaged.



Figure 8. Graco TurboBooster booster seat



Figure 9. Graco TurboBooster booster seat

Interior Damage

The Honda sustained interior damage caused by impact forces, occupant contacts, deployed air bags, and post-crash activities. The windshield was fractured and missing, and the side glass and backlight were disintegrated. The moon roof was the only glazing that remained intact. The roof and right side doors were removed, and the left side doors were forced open by responders. The left instrument panel was fractured (Figure 10). The steering wheel column was collapsed, and the right half of the steering wheel rim was bent forward. All the vehicle's air bags deployed. The front-row left floor was buckled. The front passenger seat cushion was shifted rearward, and the seat back was shifted to the right. Front-row longitudinal intrusion was documented at the left, center, and right instrument panels, and the left and right toe pans. Second-row longitudinal intrusion was documented at the second-row-right position where the front-right seat and back cushions moved rearward (Figure 11).

Manual Restraint Systems

The Honda had lap and shoulder seat belts for all seat positions. The front-row seat belts had sliding latch plates and retractor pretensioners. The evidence suggested both front-row occupants were unbelted. The retractor pretensioners appeared not to have actuated and the seat belts were not locked. The driver's belt webbing was bunched and caught in the D-ring while still in the stowed position. The driver's kinematics and injuries suggested she was unbelted and the autopsy report did not include abrasion or contusion patterns commonly associated with seat belt loading. The front-right occupant's seat belt and D-ring were contacted by the occupant's head restraint during the crash. The metal latch plate was smooth and revealed no evidence of historical usage while in this 4-year-old vehicle. The occupant's kinematics and injuries suggested he was unbelted and the autopsy report did not include abrasion or contusion patterns commonly associated with seat belt usage. Both front-row belts had scuff marks that appeared to be caused during the crash and post-crash activities.



Figure 10. Front-row damage, 2018 Honda Civic



Figure 11. Second-row damage, 2018 Honda Civic

The three second-row seat belts had switchable emergency locking retractors and automatic locking retractors and sliding latch plates. The seat belts were used to restrain the three child occupants. The left position belt was used by the 4-year-old male in combination with a high-back booster seat. The latch plate had evidence of historical usage and occupant loading (Figure 12). The center position belt was used by the 9-year-old female. It was cut by emergency responders and the latch plate had evidence of historical usage and occupant loading (Figure 13). Due to her age, this occupant met the minimum requirements for child restraint in California.² The right position belt was used by the 5-year-old male in combination with a backless booster seat. The seat belt was cut by emergency responders and the latch plate had evidence of occupant loading and historical usage (Figure 13). All three second-row occupants sustained seat-belt-related injuries discussed in the Occupant Kinematics sections of this report.

² “Children who are 8 years of age OR have reached 4’9” in height may be secured by a booster seat, but at a minimum must be secured by a safety belt. (California Vehicle Code Section 27363.)”

Supplemental Restraint Systems

The Honda's supplemental restraint systems included driver's and passenger's frontal air bags and outboard seat-mounted side impact air bags, and front and second-row inflatable curtain (IC) air bags. According to a vehicle history report, the air bags were original and had not been serviced or replaced. All six air bags deployed during the crash, probably at impact with the Jeep. The Honda owner's manual stated the IC air bags may deploy in a frontal crash. The frontal air bags had blood deposits from driver and front passenger contact. All the air bags appeared to have deployed normally. The front-row seat belts had retractor pretensioners that were not locked and did not appear to have actuated.

NHTSA Recalls and Investigations

A VIN-based NHTSA recall search in January 2022 revealed no unrepaired recalls for this vehicle. A search in June 2024 revealed one unrepaired recall. The recall (December 18, 2023; NHTSA Recall Number 23V-858; Manufacturer Recall Number MGJ) involved a fuel pump impeller that was improperly molded and could potentially affect engine performance.



Figure 12. Second-row left latch plate and webbing



Figure 13. Second-row center and right latch plates and buckles

2018 Honda Civic Occupants

Driver Demographics

Age/sex: 29 years/female
 Height: 165 cm (64 in)
 Weight: 124 kg (273 lb)
 Eyewear: Unknown
 Seat type: Bucket with adjustable head restraint
 Seat track position: Unknown
 Manual restraint usage: Lap and shoulder belt not used
 Usage source: Vehicle inspection, medical records, police report
 Air bags: Frontal, seat-mounted side impact and IC air bags available; all deployed
 Alcohol/drug data: None detected
 Egress from vehicle: Removed by emergency responders
 Transport from scene: Not transported
 Type of medical treatment: Pronounced deceased on-scene

Driver Injuries

Injury No.	Injury	Injury Severity AIS 2015	Involved Physical Component (IPC)	IPC Confidence Level
1	Laceration (transection), brain stem	140218.6	Tandem frontal air bag, steering wheel, steering column	Probable
2	Laceration, heart (perforation through right atrium wall)	441012.5	Tandem frontal air bag, steering wheel, steering column	Probable
3	Laceration (transection), bronchus	440110.5	Tandem frontal air bag, steering wheel, steering column	Probable
4	Laceration (transection), right pulmonary artery	421008.5	Tandem frontal air bag, steering wheel, steering column	Probable
5	Laceration (transection), distal thoracic aortic	420210.5	Tandem frontal air bag, steering wheel, steering column	Probable
6	Laceration, left occipital lobe, cerebrum	140686.4	Tandem frontal air bag, left IP	Probable
7	Fractures (hinge), basilar skull	150206.4	Tandem frontal air bag, left IP	Probable
8	Laceration, inf. vena cava	521206.4	Tandem frontal air bag, steering wheel, steering column	Probable

Injury No.	Injury	Injury Severity AIS 2015	Involved Physical Component (IPC)	IPC Confidence Level
9	Laceration, upper left lung	441432.4	Tandem frontal air bag, steering wheel, steering column	Probable
10	Lacerations, fragmentation of right lobe, liver	541826.4	Tandem frontal air bag, steering wheel, steering column	Probable
11	Subdural hemorrhage, cerebrum	140651.3	Tandem frontal air bag, left IP	Probable
12	Fractures NFS, anterior and lateral, bilateral ribs	450203.3	Tandem frontal air bag, steering wheel, steering column	Probable
13 14	Hemothoraces, 150 mL left and 50 mL right	442200.3 442200.3	Tandem frontal air bag, steering wheel, steering column	Probable
15	Fracture, open, right distal tibia	854332.3	Left floor, foot controls	Probable
16 17	Fracture, displaced, T4-T5, thoracic spine	650416.2 650416.2	Steering wheel rim, spokes and hub	Probable
18 19	Contusions, minor, bilateral lungs	441407.2 441407.2	Steering wheel rim, spokes and hub	Probable
20	Laceration, pericardium	441602.2	Steering wheel rim, spokes and hub	Probable
21	Fracture, sternum	450804.2	Steering wheel rim, spokes and hub	Probable
22	Lacerations, superficial, spleen	544222.2	Steering wheel rim, spokes and hub	Probable
23	Fracture, pelvic ring	856151.2	Steering wheel rim, spokes and hub	Probable
24 25	Fracture, closed, left mid-shaft radius and ulna	752251.2 752253.2	Left IP	Probable
26	Laceration, right thigh to below right knee, exposing muscle and bone	810604.2	Lower left IP	Probable
27	Fracture, open, right patella	854501.2	Lower left IP	Probable
28	Laceration, major, left knee to left lower leg near ankle, exposing muscle	810604.2	Foot controls	Probable
29	Laceration, major (20 cm, subcutaneous), right lower leg	810604.2	Foot controls	Probable
30	Abrasion and contusion, face (lip, chin)	210202.1	Frontal air bag	Probable

Injury No.	Injury	Injury Severity AIS 2015	Involved Physical Component (IPC)	IPC Confidence Level
31	Contusions, chest	410402.1	Steering wheel rim, spokes and hub	Probable
32	Laceration, minor (8.5 cm long, subcutaneous), right lower abdomen	510602.1	Steering wheel rim, spokes and hub	Probable
33	Abrasions and contusions, lower abdomen	510202.1	Steering wheel rim, spokes and hub	Probable
34	Lacerations, minor, right and left fingers	710602.1	Left IP	Possible
35	Contusion, dorsal left hand	710402.1	Left door panel	Probable
36	Lacerations, minor, left hip	810602.1	Left door panel	Probable
37	Laceration, minor (10 cm) upper right thigh	810602.1	Left IP	Probable
38	Abrasions and contusions, left thigh	810202.1	Left IP	Probable
39	Abrasions and contusions, left lower leg	810202.1	Foot controls	Probable

Source: Autopsy report

Driver Kinematics

The unbelted Honda driver was negotiating a right turn while traveling at an unknown speed. At impact with the Jeep, the driver's frontal air bag deployed, and she was displaced forward with her head, chest, and abdomen loading the air bag, steering wheel, and steering column. The steering wheel rim deformed forward, and the column compressed into the instrument panel. The driver's chest and abdomen continued moving forward from the air bag and steering wheel to the left instrument panel, causing severe level injuries including lacerations to the inferior vena cava, left lung and liver. The driver's head and neck likely extended forward contacting the left instrument panel and possibly the windshield, causing a maximal severity transection of the brain stem and critical severity transections of the heart, bronchus, pulmonary artery, and thoracic aorta. Severe level head injuries included a laceration to the cerebrum and basilar skull fractures. Her thighs likely contacted the steering wheel rim and left instrument panel, and her lower legs and feet contacted the floor and foot controls. She had fractures to the thoracic spine, bilateral ribs, pelvis, right tibia, right patella, and left radius and ulna. The Honda initiated a post-impact clockwise rotation, and its right plane was struck by the GMC. In response to impact forces, the driver was likely displaced to the right. She reportedly was removed from the driver's seat by emergency responders and was pronounced deceased on-scene.

Front Passenger Demographics

Age/sex: 29 years/male
 Height: 173 cm (68 in)
 Weight: 110 kg (242 lb)
 Eyewear: Unknown
 Seat type: Bucket with adjustable head restraint
 Seat track position: Unknown
 Manual restraint usage: Lap and shoulder belt not used
 Usage source: Vehicle inspection, medical records, police report
 Air bags: Frontal, seat-mounted side impact and IC air bags available; all deployed
 Egress from vehicle: Removed by emergency responders
 Transport from scene: Not transported
 Type of medical treatment: Pronounced deceased on-scene

Front Passenger Injuries

Injury No.	Injury	Injury Severity AIS 2015	Involved Physical Component (IPC)	IPC Confidence Level
1	Transection, brain stem	140218.6	Tandem frontal air bag, right IP	Probable
2	Laceration (transection), basilar artery	120402.5	Tandem frontal air bag, right IP	Probable
3	Laceration with hemorrhage in mediastinum, thoracic aorta	420208.4	Tandem frontal air bag, right IP	Probable
4	Subdural hemorrhage NFS, cerebrum	140650.3	Tandem frontal air bag, right IP	Probable
5	Hemothoraces, 800 mL left	442200.3	Tandem frontal air bag, right IP	Probable
6	and 450 mL right	442200.3	frontal air bag, right IP	Probable
7	Fractures NFS, anterior and posterior, bilateral ribs, more extensive on left side	450203.3	Tandem frontal air bag, right IP	Probable
8	Fracture, closed, distal right femur	853331.3	Floor	Probable
9	Subarachnoid hemorrhage, cerebellum	140466.2	Right IP	Probable
10	Subarachnoid hemorrhage, bilateral cerebrum	140693.2	Right IP	Probable
11	Fracture, sternum	450804.2	Right IP	Probable
12	Lacerations, superficial (longest 12 cm), liver	541822.2	Right IP	Probable
13	Lacerations, superficial, spleen	544222.2	Right IP	Probable
14	Fracture, pelvic ring	856151.2	Right IP	Probable

Injury No.	Injury	Injury Severity AIS 2015	Involved Physical Component (IPC)	IPC Confidence Level
15	Fracture, open, with dislocation, right patella	854501.2	Right IP	Probable
16		874030.2		
17	Dislocation, left knee joint	874030.2	Floor	Probable
18	Contusion, parietal scalp	110402.1	Right IP	Probable
19	Abrasions and lacerations (superficial) face (forehead, nose, cheeks, lips, chin)	210202.1	Windshield	Probable
20	Abrasions and lacerations (superficial), chest, predominately left side	410202.1	Windshield	Probable
21	Abrasions and lacerations (superficial), right abdomen	510202.1	Right IP	
22	Contusions, bilateral forearms and upper arms	710402.1	Frontal air bag	Probable
23	Lacerations (superficial), left fingers	710602.1	Windshield	Probable
24	Laceration, subcutaneous right thigh (8 x 4 cm), near groin	810602.1	Right IP	Probable
25	Contusions, left thigh	810402.1	Right IP	Probable
26	Abrasions and contusions, distal right thigh	810202.1	Right IP	Probable
27	Abrasions, left knee and lower leg	810202.1	Floor	Probable
28	Laceration, minor, right lower leg (shin)	810602.1	Floor	Probable
29	Abrasions, right lower leg	810202.1	Floor	Probable
30	Contusions, left foot	810402.1	Floor	Probable

Source: Autopsy report

Front Passenger Kinematics

The unbelted front passenger was seated in an unknown posture. At impact with the Jeep, his frontal air bag deployed and displaced him forward with his head, chest, and abdomen loading the air bag and instrument panel. Blood deposits were present on the deployed air bag. His head likely extended forward and possibly struck the right instrument panel causing head injuries of maximal, critical, and serious severity including transection of the brain stem, transection of the basil artery, and subdural hemorrhage of the cerebrum. The occupant's chest and abdomen contacted the air bag and right instrument panel causing severe and serious severity injuries including a laceration to the thoracic aorta, bilateral hemothoraces, and bilateral rib fractures. His lower extremities likely contacted the instrument panel and floor, causing fractures to the pelvis, right femur, and right patella. The Honda initiated a post-impact clockwise rotation, and its right plane was struck by the GMC. The occupant was displaced to the right in response to the

direction of force and likely contacted the deployed right IC air bag and right door panel. He was in an unknown posture when the vehicle came to rest. Emergency responders removed him from the vehicle, and he was pronounced deceased on-scene.

Second-Row-Left Occupant Demographics

Age/sex: 4 years/male
 Height: Unknown
 Weight: 18 kg (40 lb)
 Eyewear: None
 Seat type: Bench with folding backs
 Seat track position: Not adjustable
 Manual restraint usage: Lap and shoulder belt used with a booster seat
 Usage source: Vehicle inspection, medical records, police report
 Air bags: IC air bag available; deployed
 Egress from vehicle: Removed due to perceived serious injuries
 Transport from scene: Ground ambulance to hospital
 Type of medical treatment: Hospitalized for 4 days

Second-Row-Left Occupant Injuries

Injury No.	Injury	Injury Severity AIS 2015	Involved Physical Component (IPC)	IPC Confidence Level
1	Fracture, basilar skull (mastoid), closed	150200.3	This occupant's knee Other seating position seat back (alternate IPC)	Possible Possible
2	Contusions, bilateral lungs, minor	441411.3	Shoulder seat belt	Probable
3	Laceration, liver, Grade 3	541824.3	Lap seat belt	Probable
4	Fracture, right distal femur, closed, supracondylar	853351.3	Front-row seat back	Probable
5	Subarachnoid hemorrhage without LOC, left cerebrum	140693.2	This occupant's knee Other seating position seat back (alternate IPC)	Possible Possible
6	Fractures, left 4th and 5th distal metatarsals	858121.2 858121.2	Front-row seat back	Probable
8	Contusions, nose and right eye	210402.1	This occupant's knee	Possible
9	Abrasion and contusion, left chest	410202.1	Shoulder seat belt	Probable
10	Fracture, posterior left rib L1	450201.1	Shoulder seat belt	Probable
11	Contusion, right hand	710402.1	Second-row center seat occupant	Possible

Injury No.	Injury	Injury Severity AIS 2015	Involved Physical Component (IPC)	IPC Confidence Level
12	Contusion, left foot	810402.1	Front-row seat back	Probable

Source: EMS and hospital medical records

Second-Row-Left Occupant Kinematics

The 4-year old male occupant was using the lap and shoulder seat belt in combination with a forward-facing high-back booster seat. At impact with the Jeep, he was displaced forward with his chest and abdomen loading and stretching the lap and shoulder belt. Belt interaction caused bilateral lung contusions, a Grade 3 liver laceration, a fracture to rib L1, and abrasions to the left chest. The occupant experienced a hyperflexion of the neck until his face possibly contacted a knee or thigh, causing a basilar skull fracture, subarachnoid hemorrhage, and contusions to the nose and right eye. His lower extremities likely contacted the driver's seat back causing fractures to the right distal femur and two left toes. The Honda initiated a post-impact clockwise rotation, and its right plane was struck by the GMC. The occupant was displaced to the right in response to the direction of force. His right hand possibly contacted the occupant seated to his right causing contusions. He remained in his CRS until the vehicle came to rest. Due to his age and perceived serious injuries, the occupant was removed from the vehicle through a left side window by an unknown male passerby prior to the arrival of emergency responders. He was transported by ground ambulance to a hospital in Nevada where he was hospitalized for 4 days and discharged to family. His hospital medical records showed that follow-up treatment was advisable, due to the nature and severity of his injuries.

Second-Row-Center Occupant Demographics

Age/sex:	9 years/female
Height:	127 cm (50 in)
Weight:	28 kg (61 lb)
Eyewear:	None
Seat type:	Bench with folding backs
Seat track position:	Not adjustable
Manual restraint usage:	Lap and shoulder belt used
Usage source:	Vehicle inspection, medical records, police crash report
Air bags:	None available
Egress from vehicle:	Removed by emergency responders
Transport from scene:	Not transported
Type of medical treatment:	Pronounced deceased on-scene

Second-Row-Center Occupant Injuries

Injury No.	Injury	Injury Severity AIS 2015	Involved Physical Component (IPC)	IPC Confidence Level
1	Subarachnoid hemorrhage, brain stem	140210.5	Shoulder seat belt	Probable
2	Transection, distal abdominal aorta	520208.5	Lap seat belt	Probable
3	Transection, spinal cord, with fracture and dislocation L1, lumbar spine	610628.5	Lap seat belt	Probable
4	Avulsion, mesentery	542026.4	Lap seat belt	Probable
5	Transection, inferior vena cava	421806.4	Shoulder seat belt	Probable
6	Transections, small bowel	541426.4	Lap seat belt	Probable
7	Dislocation, atlanto-occipital, cervical spine	650208.3	Shoulder seat belt	Probable
8	Hemothoraces, <25 mL left and <25 mL right	442200.3	Shoulder seat belt	Probable
9		442200.3		
10	Laceration and contusion, left lung	441430.3	Shoulder seat belt	Probable
11		441406.2		
12	Subarachnoid hemorrhage, cerebrum, dorsal and lateral hemispheres	140693.2	Shoulder seat belt	Probable
13	Fractures, left ribs left ribs 6-7	450202.2	Shoulder seat belt	Probable
14	Lacerations, spleen	544222.2	Lap seat belt	Probable
15	Laceration, major (16 long gaping to 7 cm wide) right hip and pelvis	810604.2	Lap seat belt	Probable
16	Fracture, mid-shaft right tibia	854000.2	Front-row seat back	Probable
17	Subgaleal hematoma, frontal scalp	110402.1	This occupant's knee	Possible
18	Laceration (minor) with contusion, right forehead	110602.1	This occupant's knee	Possible
19	Abrasions and contusions, face	210202.1	This occupant's knee	Possible
20	Abrasion, left neck	310202.1	Shoulder seat belt	Probable
21	Abrasion, left shoulder to right chest	410202.1	Shoulder seat belt	Probable
22	Contusion, abdomen extending to left and right hips	510402.1	Lap seat belt	Probable
23	Abrasions, right hand	710202.1	Flying glass	Possible

Injury No.	Injury	Injury Severity AIS 2015	Involved Physical Component (IPC)	IPC Confidence Level
24	Abrasion, left forearm	710202.1	Flying glass	Possible
25	Abrasions, contusions bilateral thighs, knees and lower legs	810202.1	Front-row seat back	Probable

Source: Autopsy report

Second-Row-Center Occupant Kinematics

The belted 9-year old female occupant was seated in a forward-facing posture. At impact with the Jeep, she was displaced forward, loading the seat belt. According to the occupant's autopsy report, the seatbelt webbing appeared to be fused to the cloth of the sweatshirt from the force of the impact, extending from the left shoulder to the right hip. Due to the high severity of the collision, the occupant experienced a hyperflexion of the neck in response to impact forces, causing atlanto-occipital dislocation of the cervical spine. She sustained critical severity injuries related to seat belt interaction, including a subarachnoid hemorrhage to the brain stem, transection to the distal abdominal aorta, transection to the spinal cord at L1, as well as multiple serious severity injuries to the lungs. She sustained severe level injuries related to lap belt interaction including avulsion to the mesentery, and transection to the inferior vena cava and small bowel. The occupant's legs contacted a front-row seat back or center console, causing a fracture to the right tibia, as well as integumentary injuries to the thighs, knees, and lower legs. The Honda initiated a post-impact clockwise rotation, and its right plane was struck by the GMC. The occupant was displaced to the right in response to the direction of force and possibly contacted the right seat occupant. She was in an unknown posture when the vehicle came to rest. Emergency responders removed her from the vehicle, and she was pronounced deceased on-scene.

Second-Row-Right Occupant Demographics

Age/sex:	5 years/male
Height:	114 cm (44 in)
Weight:	23 kg (50 lb)
Eyewear:	None
Seat type:	Bench with folding backs
Seat track position:	Not adjustable
Manual restraint usage:	Lap and shoulder belt used with a booster seat
Usage source:	Vehicle inspection, medical records, police report
Air bags:	IC air bag available; deployed
Egress from vehicle:	Removed by emergency responders
Transport from scene:	Not transported
Type of medical treatment:	Pronounced deceased on-scene

Second-Row-Right Occupant Injuries

Injury No.	Injury	Injury Severity AIS 2015	Involved Physical Component (IPC)	IPC Confidence Level
1	Transection, brain stem	140218.6	Shoulder seat belt	Probable
2	Transection with fracture and dislocation at T12, thoracic spinal cord	610428.5	Shoulder seat belt	Probable
3	Transection, descending aorta	520208.5	Lap seat belt	Probable
4	Avulsion, left diaphragm	440610.4	Shoulder seat belt	Probable
5	Lacerations, left kidney with transection of renal artery	541626.4	Lap seat belt	Probable
6	Transection, pancreas	542828.4	Lap seat belt	Probable
7	Transection, inferior vena cava	421806.4	Lap seat belt	Probable
8	Transections, small bowel	541426.4	Lap seat belt	Probable
9	Subdural hemorrhage, cerebellum	140438.3	Shoulder seat belt	Probable
10	Dislocation, atlanto-occipital, cervical spine	650208.3	Shoulder seat belt	Probable
11	Hemothoraces, bilateral, 150 mL left and 30 mL right	442200.3	Shoulder seat belt	Probable
12		442200.3		
13	Fractures, posterior left ribs 8-11	450203.3	Shoulder seat belt	Probable
14	Transection, proximal duodenum	541023.3	Lap seat belt	Probable
15	Subarachnoid hemorrhage, cerebellum	140466.2	Shoulder seat belt	Probable
16	Retroperitoneum hematoma (hemorrhage)	543800.2	Lap seat belt	Probable
17	Lacerations, liver	541822.2	Lap seat belt	Probable
18	Lacerations, gallbladder	541222.2	Lap seat belt	Probable
19	Lacerations, bilateral adrenal glands	540224.2	Lap seat belt	Probable
20		540224.2		
21	Fracture, closed, mid-shaft right humerus	751251.2	Right door panel	Probable
22	Abrasions and contusions, face (right cheek, right ear, left eyebrow, left eye, chin)	210202.1	This occupant's knee	Possible
23	Abrasions, upper back, left scapula, left flank	410202.1	Right door panel	Probable

Injury No.	Injury	Injury Severity AIS 2015	Involved Physical Component (IPC)	IPC Confidence Level
24	Abrasions, chest to left flank	410202.1	Shoulder seat belt	Probable
25	Abrasions and contusions, abdomen, left and right hip	510202.1	Lap seat belt	Probable
26	Abrasions, right forearm and upper arm	710202.1	Right door panel	Probable

Source: Autopsy report

Second-Row-Right Occupant Kinematics

The 5-year old male occupant was using the lap and shoulder seat belt in combination with a forward-facing backless booster seat. At impact with the Jeep, he was displaced forward loading, the seat belt. Due to the high severity of the collision, the occupant experienced a hyperflexion of the neck in response to impact forces, causing a maximal severity transection to the brain stem, subdural hemorrhage to the cerebellum, and atlanto-occipital dislocation to the cervical spine. Interaction with the shoulder seat belt caused a transection to the spinal cord at T12, avulsion to the left diaphragm, bilateral hemothoraces and left rib fractures. Interaction with the lap seat belt caused transections to the descending aorta, pancreas, inferior vena cava, proximal duodenum and small bowel, and lacerations to the liver, gallbladder, and adrenal glands. The Honda initiated a post-impact clockwise rotation, and its right plane was struck by the GMC. The occupant was displaced to the right in response to the direction of force and his right arm likely contacted the right door panel causing a fracture to the humerus and abrasions to the forearm and upper arm. He remained in his seated position until emergency responders removed him from the vehicle. The occupant was pronounced deceased on-scene.

2018 Jeep Wrangler

Description

The 2018 Jeep Wrangler was identified by police using VIN 1C4BJWDG9JLxxxxxx. The manufacture date was January 2018. The Jeep was a 4-door compact SUV with 4-wheel drive, manual transmission, and a 6-cylinder, 3.6-liter, gasoline engine. The vehicle manufacturer recommended size P245/75R17 tires. The Jeep had Goodyear Wrangler tires of the recommended size with a minimum of 7 mm (9/32 in) tread depth.

Exterior Damage

The Jeep was involved in Event 1 with the Honda and Events 4 and 5 with the GMC. The Jeep sustained severe damage to the front plane in the impact with the Honda (Figure 14). The front bumper backing bar was broken into two separate pieces, the fascia and grille were missing. The hood, roof, left fender, right fender, and front right door were buckled. The front tires were flat and restricted, the right front wheel was fractured. The left and right wheelbases were reduced by 13 cm (5.1 in) and 47 cm (18.5 in), respectively. Sixteen crush measurements were taken at bumper level using a Nikon total station and the AutoCrush program calculated 6 crush measurements as follows: C1 = 0 cm, C2 = 10 cm (3.9 in), C3 = 28 cm (11.0 in), C4 = 18 cm (7.1 in), C5 = 42 cm (16.5 in), and C6 = 47 cm (18.5 in). Maximum crush was located at the front right bumper corner and the CDC for the Jeep in Event 1 was 12FDEW02.

Events 4 and 5 were minor impacts. For Event 4, the Jeep had damage to the right plane rearward of the rear axle. The estimated CDC for the Jeep in Event 4 was 01RBAE2. For Event 5, the vehicle had minor damage to the right plane forward of the front axle. This damage overlapped damage sustained in Event 1. The estimated CDC for the Jeep in Event 5 was 12RFEW1.



Figure 14. Front plane damage, 2018 Jeep Wrangler

Event Data Recorder

The Jeep had an air bag control module with EDR capability. Police imaged the crash data using the direct-to-module method and furnished a copy of the CDRX file to the SCI. The data was imaged using CDR version 21.3 and reported using version 24.0.1. The EDR captured one deployment level frontal event which was the Event 1 impact with the Honda. For Event 1, the

Jeep's EDR reported a maximum longitudinal delta V of -92 km/h (-57.2 mph). The complete EDR report is included in Appendix A of this report.

NHTSA Recalls and Investigations

VIN-based NHTSA recall searches in January 2022 and June 2024 revealed no unrepaired recalls for this vehicle.

Occupant Data

The 32-year-old male driver of the Jeep sustained police-reported "A" (incapacitating) injuries and was transported to a hospital for treatment of an unknown duration. Field sobriety tests revealed his blood alcohol concentration was .154 g/dL.

2004 GMC Sierra 1500

Description

The 2004 GMC Sierra 1500 was identified by police using VIN 1GTEK19T04Exxxxxx. The manufacture date was May 2004. The GMC was a 4-door pickup with extended cab, 4-wheel drive, and an 8-cylinder, 5.3-liter, gasoline engine. The vehicle manufacturer recommended size P265/75R16 tires. The GMC had Goodyear Wrangler LT275/70R18 tires with a minimum of 7 mm (9/32 in) tread depth.

Exterior Damage

The GMC was involved in Event 2 with the Honda and Events 4 and 5 with the Jeep. The GMC sustained moderate damage to the front plane in the impact with the Honda (Figure 15). The front bumper was bent, the fascia was fractured and displaced, and the grille and headlamps were missing. The hood, and left and right fender were buckled. The front tires were flat and restricted, and the front wheels were fractured. The left and right wheelbases were reduced by 6 cm (2.4 in) and 10 cm (3.9 in), respectively. Twenty crush measurements were taken at bumper level using a Nikon total station and the AutoCrush program calculated 6 crush measurements as follows: C1 = 32 cm (12.6 in), C2 = 28 cm (11.0 in), C3 = 23 cm (11.8 in), C4 = 9 cm (3.5 in), C5 = 3 cm (1.2 in), and C6 = 9 cm (3.5 in). Maximum crush measured 32 cm (12.6 in) and was located at the front left bumper corner. The CDC for the GMC in Event 2 was 12FDEW02.



Figure 15. Front plane damage 2004 GMC Sierra

Events 4 and 5 were minor impacts. For Event 4, the GMC had damage to the front plane beginning near the front right bumper corner and extending down the right plane. The estimated CDC for the GMC in Event 4 was 12FREE2. For Event 5, the vehicle had minor damage to the right plane rearward of the rear axle. The estimated CDC for the GMC in Event 5 was 01RBEW1.

Event Data Recorder

The GMC had an air bag control module with EDR capability. Police imaged the crash data using the direct-to-module method and furnished a copy of the CDRX file to the SCI. The data was imaged using CDR version 21.3 and reported using version 24.0.1. The EDR captured one deployment level frontal event which was the Event 2 impact with the Honda. For Event 2, the maximum longitudinal delta V captured by the GMC's EDR was -32.75 km/h (-20.35 mph). The complete EDR report is included in Appendix B of this report.

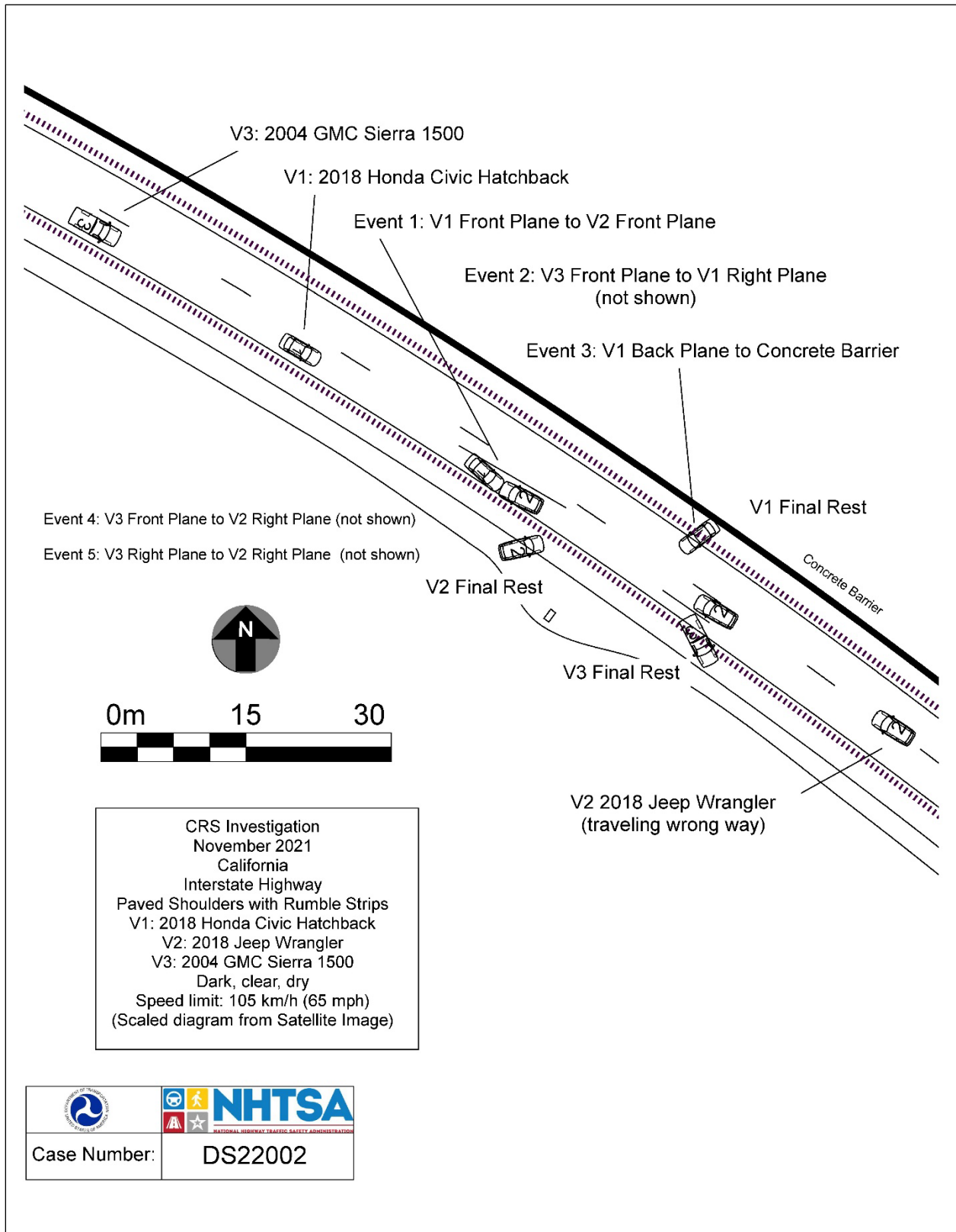
NHTSA Recalls and Investigations

VIN-based NHTSA recall searches in January 2022 and June 2024 revealed no unrepaired recalls for this vehicle.

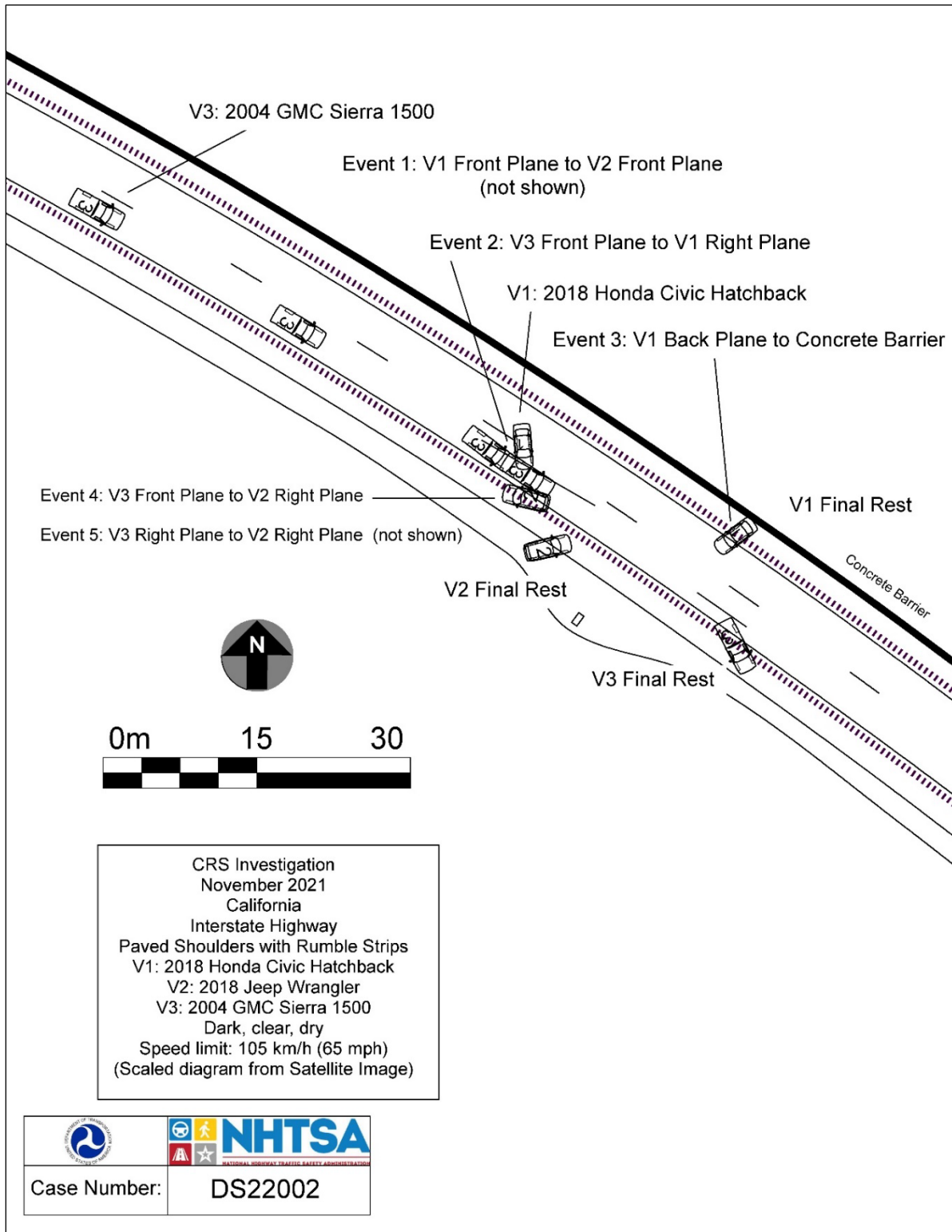
Occupant Data

The belted 60-year-old male driver of the GMC was identified in the police crash report. According to police, he was not injured or transported.

Crash Diagram 1



Crash Diagram 2



Appendix A: Jeep Wrangler EDR Report

³ The EDR Report contained in this 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 Viewer application may differ relative to this report.

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

CDR File Information

User Entered VIN	1C4BJWDG9JL*****
User	
Case Number	
EDR Data Imaging Date	
Crash Date	
Filename	DS22002_V2_ACM.CDRX
Saved on	
Imaged with CDR version	Crash Data Retrieval Tool 21.3
Imaged with Software Licensed to (Company Name)	California Highway Patrol
Reported with CDR version	Crash Data Retrieval Tool 24.0.1
Reported with Software Licensed to (Company Name)	NHTSA
EDR Device Type	Airbag Control Module
Event(s) recovered	Most Recent Event

Comments

No comments entered.

Data Limitations

AIRBAG CONTROL MODULE (ACM) DATA LIMITATIONS:

GENERAL INFORMATION:

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

- For additional definitions, please refer to the CDR Help File Glossary.
- As the VIN may be used to determine the configuration of the restraint system, it is imperative that the correct VIN be entered into the CDR Tool during the imaging process.
- If a DLC adapter has to be used with the CDR Tool, the 'Read VIN from Vehicle' feature in the CDR Tool will not work. The VIN will have to be manually entered.
- If a 2021 or later MY Dodge Durango was imaged with a CDR Tool version 19.4 or older, the ACM will need to be reimaged as not all the peripheral sensor data will have been retrieved.
- If a 2023 MY Jeep Grand Cherokee or Jeep Grand Cherokee L was imaged with a CDR Tool version 23.0.2 or older, the ACM will need to be reimaged as not all the data will have been retrieved.
- The 2019 MY RAM 1500 may take up to 30 minutes to retrieve the EDR data. The ignition will time out within 20 minutes so the vehicle flashers must be turned on within 20 minutes to keep the ignition and communication bus active.
- Lateral Delta V will not be displayed for the 2013 MY Jeep Compass and Patriot.
- Ignition Cycle, download/crash
 - For RAMs and Dodge Vipers, there are 2 internal ignition counters in the ACM. It is possible for the ignition cycles at download to be different than the ignition cycles at event due to the 2 different counters.
 - Note that the ignition cycle count in an ACM may differ from the ignition cycle count in a Pedestrian Protection Module (PPM) in the same vehicle due to the fact that the ACM has an energy reserve while the PPM does not.
- The following table provides an explanation of the sign notation for data elements that may be included in this CDR report. All directional references to sign notation are from the perspective of the driver when seated in the vehicle facing the direction of forward vehicle travel.

Data Element Name	Positive Sign Notation Indicates
Delta-V, Longitudinal	Forward
Maximum Delta-V, Longitudinal	Forward
Delta-V, Lateral	Left to Right
Maximum Delta-V, Lateral	Left to Right
Angular Rate	Clockwise rotation around the longitudinal axis
Peripheral Sensors, X and Y	Outside to Inside
Pressure Sensors	Compression of air

Internal Y Acceleration	Left to Right
Low-g Z Acceleration	Downward
Steering Input	Steering wheel turned counter clockwise
Yaw Rate	Counter clockwise rotation

CDR FILE INFORMATION:

- An event will be stored when the delta V is approximately 5 mph (8 km/h) or greater within a 150 ms interval and non-reversible occupant restraint system activated. For non-NAFTA ACMs that control pedestrian protection devices, a non-deployment event will be stored when the pedestrian protection devices are activated.
- A non-deployment event may be stored with activation of the Active Head Restraints. See AHR explanation under System Configuration at Retrieval/Event section.
- A deployment event may be stored in a 2019 MY+ Ram 3500 as the result of a rear impact, even though the Ram 3500 does not deploy any restraint system devices in a rear impact.

Event(s) Recovered definitions:

- None - There are no stored events in the ACM
- Not Retrievable - Event Data may be stored in the ACM but is not retrievable by the CDR Tool.
- Most Recent Event - Data of the most recent event is displayed in the report
- 1st Prior Event - Two events are stored in the ACM, Data displayed is of the first prior event.
- 2nd Prior Event - Three events are stored in the ACM, Data displayed is of the second prior event.
- For 2013 and 2014 MY Dodge Journey and Fiat Freemont:
 - Event Record 1 - Data from an event is stored in the ACM (not necessarily in chronological order)
 - Event Record 2 - Data from another event is stored in the ACM (not necessarily in chronological order)
- For TRW modules:
 - If there is a side impact, two EDR events may be stored for the one side impact event. The second event may be recorded due to the Lateral Delta V exceeding 5 mph (8 km/h) within a 150 ms interval after the side deployment occurred.
- For some Fiat vehicles:
 - Two EDR events may be stored for one impact event. The second event may be recorded due to the deployment of the frontal airbag, 3rd stage passenger.
- During an event, if power to the ACM is lost, all or part of the event data record may not be recorded. An indication may be observed in the recorded data under this condition: The restraint data is recorded first and then the vehicle data.
 - 'None' may be displayed in the 'Event(s) Recovered' section of the report indicating no pre-crash vehicle data.
 - An event may be displayed in the 'Event(s) Recovered' section of the report and 'Interrupted' will be displayed for Pre-Crash Recorder Status.
- For the 2021MY Jeep Grand Cherokee L, an event may be displayed in the 'Event(s) Recovered' section of the report as 'End of Line Test event - See Data Limitations'. This event is an End of Line test event from the module manufacturing process which will be included in the count for the total number of events, but no data will be displayed in the CDR Report.

SYSTEM STATUS AT RETRIEVAL:

- Original VIN - The VIN is captured by the ACM when the vehicle was first manufactured. Once it has been recorded, this number cannot be changed.
- VIN, Current - reflects the Vehicle Identification Number of the vehicle on which the ACM is currently installed.
- Original TVV Data identifier Number - captured by the ACM when the vehicle was first manufactured.
- Effective TVV Data Identifier Number - captured by the ACM if the vehicle has been modified by a multistage manufacturer

SYSTEM CONFIGURATION AT RETRIEVAL/EVENT:

- The System Configuration data tables indicate the components that the ACM for a particular vehicle monitors and/or controls.
- Active Head Restraint (AHR) - This refers to some active head restraint systems that are electronically controlled by the ACM. AHRs may activate but not store an EDR Record if the delta V does not exceed the minimum delta V threshold. 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 Configuration at Retrieval" table will not be displayed for 2024 MY Alfa Romeo Giulia and Stelvio.

SYSTEM STATUS AT EVENT:

- Accident Emergency Call System (AECS) Status - 'Faulted' indicates a fault / failure in the AECS. 'On but emergency call not automatically triggered' indicates that the system is functional, but the emergency call was not triggered by the ACM. 'On - Emergency call automatically triggered' indicates that the emergency call was triggered by the ACM.
- Frontal Airbag Warning Lamp / Airbag Warning Lamp - In Veoneer modules, the airbag warning lamp may indicate ON at the time of a most recent event without any DTCs present if a deployment event has already occurred in the same ignition cycle. The ABWL will come on due to the deployment but, as there are still algorithms processing data, the actual faults will not be qualified yet and will not show up as DTCs.
- Number, Total Events / Total Number of Events - Cumulative number of events that the ACM has recorded, including those non-deployment events that have been overwritten by a subsequent event.
 - For the 2021MY Jeep Grand Cherokee L, the module will contain one, two, or three End of Line test events from the module

manufacturing process which will be included in the count for the total number of events. However, the data from these End of Line test events will not be displayed in the CDR Report.

- Occupant Size Classification, Outboard Front Passenger - 'Child' status may be used to indicate anything weighing less than a 5th percentile female adult crash dummy, including an empty seat; 'Not Child' indicates anything weighing the same as or more than a 5th percentile female adult crash dummy. 'SNA' indicates undetermined;
 - For some non-North American applications, 'Empty' indicates an empty seat;
- Odometer at Event - Vehicle odometer at the time of the event
 - For 2014-2016 MY Fiat 500L, the odometer value in miles may be shown in the brackets, labeled as kilometers. If this is the case, the non-bracketed value is not valid.
- Operation via Energy Reserve Only / Operation via Energy Reserve - 'Yes' indicates that the ACM had lost power at or before T0 and was only operating on energy reserve at T0.
- Safety Belt Status, Outboard Front Passenger - For pre-2024 MY vehicles sold outside of North America, which do not contain a buckle switch for the outboard front passenger, the safety belt status, outboard front passenger will default to 'not buckled/unbuckled'.
- System Voltage at Event, ACM / Supply Voltage at Event ACM (V) - Voltage at the ACM as measured by the ACM. This voltage may be approximately 0.7V (one diode drop) below the bused voltage.
- System Voltage at Event, Bused - Voltage of the vehicle system, communicated on the communication bus to other electronic modules in the vehicle.
- Temperature, Outside - Ambient Air Temperature.
- Time, Airbag Warning Lamp On - This is a cumulative time. It indicates the total amount of time that the ACM has requested the Airbag Warning Lamp be turned on.
 - This time does not include the warning lamp bulb check time, which occurs at every ignition cycle
 - For 2013 MY Minivans and new 2017+ MY Jeep Compass, this time is only cumulative for the past 10 ignition cycles.
- Time from event 1 to 2 -
 - If only one event is stored, either a value of 0 or >5 may be displayed for this data element.
 - For the 2018+ MY Promaster and 2019+ MY RAM 1500, a value of 0 may be displayed for the first event or for events > 5 seconds apart.
 - If multiple events exist in the EDR, the time from event 1 to event 2 is defined as:
 - For Bosch and TRW modules, the time from the prior recorded event (even if it has been overwritten) to the current recorded event.
 - For Continental modules, the time from the prior existing recorded event (as long as it is still displayed in the CDR report) to the current recorded event. If the prior event in a multi-event condition is overwritten by a subsequent event, the multi-event status will no longer be displayed.
 - For the 2019+ MY RAM 1500, the time from event 1 to 2 may utilize a non-stored event as event 1. In this case, the total number of events and multi-event data elements will not include the non-stored event in the number of events. However, the time from event 1 to 2 will be shown as time from that non-stored event.
- Time, Operation System Time / 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.
 - For 2019 and later MY RAMs, this time is only cumulative for the current ignition cycle.
- Tire Pressure Indicator Lamp at Event / Tire Pressure Monitor Indicator Lamp / Tyre Pressure Monitoring System Warning Lamp Status - 'On' indicates a tire with low pressure or a fault in the tire pressure monitoring system at the time of the event. The TPM module DTC # should be read and recorded for final system interpretation. 'Flashing' indicates a recent fault in the tire pressure monitoring system. Note that if the TPMS is disabled, the Lamp is set to 'OFF'.
- Tire Pressure at Event / Tire Pressure Status, LF, LR, RF, RR - See 'Tire Information' under Pre-Crash Data section for details.
- VIN at Event, Last 8 Digits- Last 8 digits of the VIN of the vehicle at the time the ACM records the event.

DEPLOYMENT COMMAND DATA:

- A 'Yes' for a particular item indicates that the ACM commanded the deployment /activation of the associated device.
 - The phrase 'Exceeded Storage Range' for a particular time to deploy indicates that the deployment time is equal to or greater than the 255 milliseconds that can be stored.
 - For the 2023-2024 MY Alfa Romeo Tonale and Dodge Hornet and for the 2024MY Alfa Romeo Giulia and Stelvio '255' will be displayed for a particular time to deploy whenever the deployment time is equal to or greater than the 255 milliseconds that can be stored.
 - If a device is not deployed, the 'time to deploy' for that device will N/A.
 - A time to deploy value of 0 is valid and indicates that the deployment of the device triggered the EDR t0.
 - In vehicles with Bosch and Veoneer ACMs, once a device has been deployed in an ignition cycle, it is possible that the ACM will not attempt to re-deploy any already deployed device during subsequent events in that same ignition cycle.
- For 2024 MY 500e, data associated to Delta-V Longitudinal and Delta-V Lateral return 'Unobtainable value' from 30 ms after crash is ended.

DTCs PRESENT AT START OF EVENT:

- If any DTCs (diagnostic trouble codes) are present in the ACM at the start of the event, these will be listed in this section. A dealership service manual can be used to decode the DTCs.
 - DTCs Present at Start of Event are not present in the 2017-2023 MY Alfa Romeo Giulia, Fiat 500X, Fiat 2024 MY 500e and the Jeep Renegade.
- For the 2021 MY+ Jeep Grand Cherokee L, the DTCs will not be updated for the subsequent events within the same ignition cycle.

FITTED ACTIVE SAFETY AND ACCIDENT AVOIDANCE: (if displayed)

- 'Fitted' indicates that the vehicle is equipped with the listed system.

SENSOR DATA:

- The design range for the angular rate data is:
 - +/- 240 deg/sec for Bosch ACMs unless specifically called out below
 - +/- 299.48 deg/sec for the 2023-2024 MY Alfa Romeo Tonale and Dodge Hornet and for 2024 MY Alfa Romeo Giulia and Stelvio
 - +/- 300 deg/sec for TRW ACMs, the 2019 MY RAM 1500, and the 2018+ MY Dodge Journey
 - +/- 290 deg/sec for 2008+ MY minivans and 2009-2017 MY Dodge Journey
 - +/- 340 deg/sec for 2017+ MY Chrysler Pacifica and new 2017+ MY Jeep Compass
 - - 416.67 deg/sec to +413.41 deg/sec for 2014+ MY Jeep Cherokee
- +/- 300 deg/sec for vehicles with Veoneer ACMs
- For 2024 MY 500e, the design range for the vehicle roll angle data is
 - +/- 1080 deg
- For 2024 MY RAM Promaster BEV Amazon, the Right Side Door Pressure Sensor is not present (as reported in System Configuration at Retrieval) and the default value 14.94140625 is displayed
- For vehicles that store peripheral sensor data:
 - The data is from remote or satellite impact sensors which are located at various locations in the vehicle
 - t0 for the peripheral sensors is the same as the t0 for the delta V.
- Internal y acceleration is stored prior to t0 so the internal y acceleration data will usually be zero unless the rollover sensing algorithm has triggered storage of the EDR event.
- The words 'Sensor Design Range Exceeded' and a vertical line will be displayed on the Longitudinal and Lateral Delta-V graphs the first time the applicable sensor range is exceeded.
- For the 2010-2012 MY Chrysler Town and Country, Dodge Caravan, Dodge Grand Caravan, and Dodge Journey and the 2010-2011 MY Grand Voyager, the angular rate will only be displayed if it is non-zero.

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.
- In the Pre-Crash Data graph, data transmitted at a rate other than 0.1 seconds will be shown as dots for each available data point. Only data transmitted at a rate of 0.1 seconds will have the dots connected by a line.
- (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 (DTCs) in the various electronic modules (ACM, PCM, ABS, TCM, etc., where applicable) for use in interpretation of some vehicle specific recorded data.
- ABS Activity / Anti-lock braking system Activity - 'Yes' / 'Engaged' 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 DTCs should be read and recorded for final system interpretation.
- Accelerator Pedal, % Full - This indicates the actual position of the accelerator pedal. It will be 'SNA' if the vehicle is in the power free mode which limits acceleration.
- Accelerator Pedal (Derived), % Full - This indicates the calculated value of the accelerator pedal for battery electric vehicles only (if equip.).
- Accelerator Pedal/Engine Throttle, % Full - This indicates the actual position of the accelerator pedal unless the cruise control is engaged. If the cruise control is engaged, this indicates the actual position of the engine throttle blade.
- AEB (Autonomous Emergency Braking) System Status - 'On' / 'On but Non-Engaged' indicates the AEB system is functional but not providing any warning or braking intervention. 'Off' / 'Deactivated' indicates the AEB system was either turned off by the driver or due to a fault/failure. 'Warning, but non-engaged' indicates the AEB system is providing pre-intervention warning, but no braking. 'Engaged' indicates that AEB system is actively providing the braking.
- AEB Type - This indicates the type of braking intervention in which the vehicle is engaged.
 - AEB-P standard / CMS Braking - The limited autonomous brake request at low vehicle speeds
 - AEB-P extended / CMS Extended Braking - The limited autonomous brake request at extended vehicle speeds
 - ABA/EBA Braking - The advanced brake assist to provide additional braking during an emergency braking event
 - AEB-L Braking - The full autonomous brake request at low vehicle speeds
 - PEB Braking - The brake request by the Pedestrian Emergency Brake system
 - ICA-L / R Braking - The brake request by the Intersection Collision Assist system
- AEBS Limit Fail - This indicates the AEB is operating with limited functionality as camera is unavailable or is in an irregular operation state due to a fault and service is required.
- AEBS Limited - This indicates the AEB is operating with limited functionality as camera is blind / blocked OR video image is reported as degraded by the camera.
- AEB Blind - This indicates the AEB is unavailable due to blocked radar sensor.
- AEB Fault Status - This indicates the AEB is unavailable due to fault / failure and service is required.
- Automatically Commanded Steering Function Category A Status - This indicates the status of park assist system. 'Active' indicates the system is actively controlling the steering to provide park assist. 'Stand-by' indicates the system is available but not actively controlling the steering. 'Off' indicates the system is turned off by the customer. 'Faulted' indicates a fault / failure in the park assist system.
- Automatically Commanded Steering Function Category B1 Status - This indicates the status of Highway Assist System (HAS) / Lane C entering

System (LCS). ³Active indicates the system is actively controlling the steering to provide highway assist / lane centering. ³Stand-by indicates the system is available but not actively controlling the steering. ³Off indicates the system is turned off by the customer. ³Faulted indicates a fault/ failure in the HAS/ LCS.

- Brake Pedal Position - This indicates the percentage of brake pedal depression by the driver.
- Brake Torque - This indicates the calculated amount of brake torque the system is producing at the wheels.
- Brake Torque Driver - This indicates the calculated amount of brake torque that the driver is requesting.
- Braking System, Maximum Braking -- ³Yes indicates that ABS is active on all 4 wheels at the same time.
 - For the 2023-2024 MY Alfa Romeo Tonale and Dodge Hornet and for 2024 MY Alfa Romeo Giulia and Stelvio, ³Braking System, Maximum Braking indicates the status (active/not active) of the Hydraulic Brake Assist (HBA).
- Cruise Control:
 - Note that the following two Cruise Control data elements are only valid for vehicles not equipped with Adaptive Cruise Control (ACC). For vehicles equipped with ACC, the ACC data elements are used for both regular Cruise Control and ACC.
 - Cruise Control System/Lamp Status - ³On indicates that the Cruise Control system is turned on.
 - Cruise Control Status - ³Off indicates that all cruise control functionality is disabled; ³NCC_On indicates that the Normal Cruise Control system is turned on; ³NCC_Engaged indicates the Normal Cruise Control is actively controlling vehicle speed; ³ACC_On indicates that ACC is turned on; ³ACC_Engaged indicates that the ACC is actively controlling vehicle speed.
 - For the 2023-2024 MY Alfa Romeo Tonale and Dodge Hornet and 2024 MY Alfa Romeo Giulia and Stelvio ³Fail Present is set if the CC-related steering wheel commands "Speed Rocker", "Resume" and "Resume/Cancel" fail the plausibility check; otherwise, the signal is set to "Fail Not Present".
 - Cruise Control Engaged Status/Active / Cruise Control Engaged - ³Engaged / ³Yes / ³Active indicates the Cruise Control system is actively controlling vehicle speed. ³Not Engaged / ³No / ³Not Active indicates the system is NOT controlling vehicle speed.
 - Cruise Control Override - ³Active indicates that the driver has overridden the set speed. ³Not Active indicates that the cruise control is either not turned on or is not being overridden.
 - Adaptive Cruise Control (ACC) Status / System Status (if equip.) - ³Off indicates that all cruise control functionality is disabled. ³NCC_On indicates that the Normal Cruise Control system is turned on. ³NCC_Set indicates the Normal Cruise Control is actively controlling vehicle speed. ³ACC_On indicates that ACC is turned on. ³ACC_Set indicates that the ACC is actively controlling vehicle speed. If the value is SNA for all time stamps, then the vehicle is not equipped with ACC.
 - For the 2023-2024 MY Alfa Romeo Tonale and Dodge Hornet, for 2024MY 500e and for 2024 MY Alfa Romeo Giulia and Stelvio, ³Off indicates that system has been disabled by the user; ³Enabled indicates that the system has been enabled by the user, but is not engaged; ³Engaged indicates that the system is actively controlling and regulating the cruise speed; ³Engaged Brake Only indicates that the system is actively controlling only the braking portion; ³Override indicates that the system engagement is suspended to allow the driver manual takeover; ³Cancel indicates that the system has been disengaged by the driver or due to other reasons.
 - For 2024 MY Alfa Romeo Giulia and Stelvio, ³Suggestion Engaged indicates that the iACC (³Intelligent Adaptive Cruise Control) system is regulating the cruise speed according to Traffic Sign Recognition (TSR); ³Suggestion Override indicates that the iACC system engagement is suspended to allow the driver manual takeover.
 - Set Speed / Adaptive Cruise Control Set Speed (if equip.)- This indicates the desired speed in mph that was input by the driver for the cruise control system.
 - ACC Faulted / Adaptive Cruise Control System Fail Status - ³Yes / ³Fail Present indicates that the ACC system will not function and the ACC warning lamp is lit; ³No / ³Fail Not Present indicates that the ACC system is functional and the ACC warning lamp is off;
 - For new 2017+MY Jeep Compass, cruise control data elements are only available for vehicles NOT equipped with ACC.
 - Corrective Steering Function (LKA) Status / Emergency Steering Function Status - This indicates the status of Lane Keep Assist system. ³Engaged indicates the system is actively controlling the steering. ³On but not engaged indicates the system is available but not actively controlling the steering. ³Off indicates the system is turned off by the customer. ³Faulted indicates a fault/ failure in the lane keep assist system.
- Corrective Steering Function (DST) Status - This indicates the status of Dynamic Steering Torque system. ³Engaged indicates the system is actively controlling the steering. ³On but not engaged indicates the system is available but not actively controlling the steering. ³Off indicates the system is turned off by the customer. ³Faulted indicates a fault/ failure in the DST system.
- Drive Mode - This indicates the driver selected mode of operation (e.g. normal, sport, track, «)
- EBD (Electronic Brake Distribution) failure status - This indicates a fault/ failure in the Electronic Brake Distribution system.
- Electric Steering failure status - This indicates a fault/ failure in the electric steering system
- Electronic Brake/Stability Control information:
 - Stability Control - This is the status of the ESC symbol - ³car with squiggly lines indicator lamp. ³On indicates that the ESC system is functional. ³Off indicates that the ESC system was turned off either by the driver or due to a fault or thermal mode shutdown. ³Engaged indicates an active ESC/TCS event. ³Partial Off indicates that engine management has been turned off but brake traction control is still functional.
 - For the Jeep Renegade, if the Stability Control is ³Off, the ESC Button Status is ³Disabled, and the vehicle speed exceeds 40 mph, the stability control system will operate in a reduced functionality mode with traction control turned off (³partial off mode) even though the user disabled it. For all other conditions, when the Stability Control is ³Off, the stability control system will be off.
 - For the 2023-2024 MY Alfa Romeo Tonale and Dodge Hornet stability control will not be displayed.
 - ESC Button Status - This indicates the driver selected mode for the ESC system. ³Disabled / ³Not Active indicates that the driver pressed the ESC Button to disable engine management. ³Enabled / ³Active is the default state for the ESC system.
 - SRT and some Fiat products have the ability to fully disable the ESC system if the ESC button has been pressed and held for a specific amount of time. Additional system analysis is required.
 - ESP Feature is Completely Disabled - This indicates that the stability control system has turned off engine management, traction control, and stability control.
 - ESC/ESP MIL - This indicates the ESC/ESP fault indication lamp status. It will only be ³On when there is a fault or thermal mode shutdown in the ESC/ESP system. The ESC/ESP module DTC # should be read and recorded for final system interpretation.
 - Brake Intervention by ESP - ³Yes indicates that the stability control system has engaged the brakes.
 - Engine Torque Applied - ³No indicates no engine torque output was applied (as in Park/Neutral for Automatic transmissions or clutch

- depressed on manual or during an ESP/Traction Control event). If 'Yes', then engine torque output was applied.
- Traction Control Active - 'Yes' indicates that the traction control system is actively controlling the vehicle's wheels.
- Electronic Park Brake (EPB): Park Brake Engaged - 'Yes' indicates that the park brake is applied.
- EPB MIL - 'On' indicates that there is a fault in the Electronic Park Brake System.
- Engine RPM - For the RAM ProMaster City, the minimum resolution for Engine RPM is 32 rpm. Engine Throttle, % Full - This indicates the actual position of the Engine Throttle blade. This data element is not supported by vehicles with diesel engines. Thus a value of 'SNA' will be displayed if the vehicle has a diesel engine.
- ETC Lamp - Lamp 'ON / On, Fail' indicates there is an active Electronic Throttle DTC.
- ETC Lamp Flashing - 'Yes / Flashing, Fail' indicates that the ETC is in the limp-in mode.
- ETC Lamp: Flash on service -- indicates that service is necessary on the ETC module.
- Forward Collision Warning (FCW) (if equip.):
 - Object of Interest Distance - If the FCW system is acting on the object, this indicates the actual forward distance to the main object being tracked by the FCW system. 'No Object' indicates that the FCW system is not currently acting on an object. If the value is SNA for all time stamps, then the vehicle is not equipped with FCW.
 - FCW System Operating State - 'Off' indicates that the FCW system is off and the FCW Warning Lamp will be 'On'; 'On' indicates that the FCW system is on with the audible and visual warnings enabled.
 - FCW System Status - 'Off' indicates that the FCW system is off and the FCW Warning Lamp will be 'On'. 'On-warning' / 'On, only Warning' indicates that the FCW system is on but active braking is disabled. In an FCW event, the driver will only receive FCW audible and visual warnings. 'On-full' / 'On, Full' indicates that the FCW system is fully on with active braking enabled as well as the audible and visual warnings enabled. SNA indicates that the vehicle is not equipped with FCW.
 - For the 2023-2024 MY Alfa Romeo Tonale and Dodge Hornet, 2024 MY Alfa Romeo Giulia and Stelvio and 2024 MY 500e 'On-braking' / 'On, only Braking' indicates that the system is engaged and ready to brake autonomously without providing a collision warning before braking occurs.
 - FCW Braking Enabled - 'Yes' indicates that the FCW system has active braking enabled; 'No' indicates that the FCW system does not have active braking enabled.
 - Fused Vehicle - 'Yes' indicates that the FCW system has detected a vehicle of interest, but it does not indicate if the FCW system is acting on the object.
- Gear Position/Current Gear - For all vehicles except the RAM ProMaster City and the 2023-2024 MY Alfa Romeo Tonale and Dodge Hornet, this indicates the current transmission gear.
 - For the RAM ProMaster City, the 2023-2024 MY Alfa Romeo Tonale and Dodge Hornet and the 2024 MY Alfa Romeo Giulia and Stelvio, this indicates the status of the gear shift lever.
- Gear Status - This indicates what gear the Gearbox (TCM) has currently engaged.
- Estimate Regenerative Braking Axle Torque - (HEV only) This indicates the calculated braking torque applied by the HEV system to the drive axles in Nm.
- Driver Intended Axle Torque - (HEV only) This indicates the calculated value of torque in Nm being applied to the drive axles based on accelerator pedal position.
- Trans torque request - (HEV only) 'Yes' indicates that the transmission controller has requested a torque reduction when shifting from one gear to another.
- Static Axle Torque - (HEV only) This indicates the torque in Nm at the axle when the speed of the axle is constant.
- HEV Battery Pack Contactor State - (HEV only) 'Closed' indicates that the HEV battery pack is connected to the vehicle's electrical system. 'Open' indicates that the HEV battery pack is disconnected from the vehicle's electrical system. 'Pre-Charging' indicates that the inverter internal capacitor is charging. 'Pre-Charge Failed' indicates that the attempt to charge an internal capacitor failed. 'Pre-Charge Inhibited' indicates that an attempt to charge an internal capacitor was not made.
- HEV Lamp Request - (HEV only) This indicates the HEV indicator lamp status. It will only be 'On' when there is a fault in the HEV system. The vehicle DTC should be read and recorded for final system interpretation.
- Lane Departure Warning System (LDWS) Status - 'Faulted' indicates a fault / failure in the LDWS. 'Off' indicates the system is turned off by the customer. 'On but not warning' indicates the LDWS is functional but not providing any warnings. 'On - Warning Left' indicates the system is warning the driver when the vehicle is approaching or crossing the left lane marking without the turn signal active. 'On - Warning Right' indicates the system is warning the driver when the vehicle is approaching or crossing the right lane marking without the turn signal active.
- Lateral acceleration (pre - crash): This stores the lateral acceleration data used by the ESC system.
- Longitudinal acceleration (pre - crash): This stores the longitudinal acceleration data used by the ESC system.
- Master Cylinder Pressure - This indicates the brake pressure applied to the brakes through the brake pedal.
- Motor X RPM - This indicates the Revolutions Per Minute (RPM) of applicable electrical motor.
- OCM (Occupant Classification Module) status / occupant size classification, passenger - This indicates the occupant size classification, outboard front passenger. 'EMPTY_RFIS' indicates either a rear facing infant seat or an empty seat. 'OC_5TH_UP' indicates anything weighing the same as or more than a 5th percentile female adult crash dummy. 'OC_UNDETERMINED' indicates undetermined. 'Child' indicates a 6 year old III US ATD or Q6 ATD or smaller. 'Not Child' indicates larger than a 6 year old III US ATD or Q6 ATD.
- OCM (Occupant Classification Module) Fault Status - This indicates if there is a fault in the OCM.
- PCM MIL - This indicates the PCM fault indicator lamp status. It will only be 'On' / 'Fail, Fix Light Indication' when there is a fault in the PCM. 'Flashing' / 'Fail, Flash Light Indication' indicates misfire detection. The Powertrain Control Module DTC should be read and recorded for final system interpretation.
 - For the 2023-2024 MY Alfa Romeo Tonale and Dodge Hornet and for the 2024 MY Alfa Romeo Giulia and Stelvio and, 2024 MY 500e with ETC (Electric Throttle Control), 'Fail, Flash for service' indicates that service is necessary on the ETC module or the ECM (Engine Control Module); while for the versions without ETC service is necessary on the diesel or gasoline ECM system.
 - For 2024 MY 500e, 'Fail Not Present' indicates that the lamp is Off and there are no faults on PCM.
- Pre-Crash Recorder Complete / Pre -Crash Recorder Status - Due to the interruption of data recording in one section, this data element may display 'Interrupted' for all sections when some data sections are actually complete.
 - For the 2014 MY Jeep Grand Cherokee and Dodge Durango, if recording of angular rate data is interrupted, the entire EDR record will display 'Interrupted' even though the rest of the data may be complete.
- PRND/PRNDL/PRNDS Status - This indicates the status of the Shifter Position.
- Raw Manifold Pressure - This indicates engine load in kPa.
- Reverse Gear - For manual transmission vehicles only, 'Yes' indicates the transmission is in the reverse gear.

- For 2024 MY500e, the status for the reverse gear are:
 - 'Not Inserted', indicates position R (Reverse) is not pressed.
 - 'Inserted' indicates position R is pressed and the position N (neutral) is not pressed.
 - 'Not used' is when position R and N are pressed.
- Service Brake - 'On' / 'Active' indicates that the brake pedal is physically depressed. Braking feedback from the ABS or FCW systems will not be reported in this data element.
- Shift Selector Position - This indicates the status of the gear shift selector.
- Speed, Vehicle Indicated - This indicates the average of the wheel speeds of the drive wheels.
 - The reporting resolution for Speed, Vehicle Indicated 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 N/A or 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 Significantly Under Inflated (TPM lamp will be on), LOW/Under/Under Inflated, NORMAL, HIGH/Over/Over Inflated, or SNA for this parameter. Vehicles with Base Tire Pressure Monitoring systems may display NORMAL even though these vehicles do not send actual pressure values across the communication bus.
 - Tire X Pressure/Tire Pressure Value, XX (psi) - This indicates the actual tire pressure value of the Tire Location defined in the previous column (Tire X Location) or by the values for XX. Vehicles with Base Tire Pressure Monitoring systems will display N/A for this parameter as these vehicles do not send actual pressure values across the communication bus.
 - For the following vehicles, the tire location, if displayed, may not be accurate if the tires have been rotated:
 - -2013 MY Ram
 - -2013-2017 MY Jeep Patriot
 - -2013-2014 MY Chrysler 200
 - -2013-2017 MY Jeep Compass
 - -2013-2016 MY Dodge Dart
 - For the 2013 MY Ram, if the values for tire pressure status and the tire pressure are SNA, the EDR does not store tire pressure monitoring data.
 - Tire pressure is not stored in the EDR for the following vehicles:
 - -2014-2018 MY RAM 1500
 - -2014+ MY RAM (all but 1500)
 - -2013+ MY Jeep Wrangler
 - -2013 MY Jeep Grand Cherokee
 - -2013 MY Dodge Durango
 - -2013-2014 MY Dodge Challenger
 - -2013-2016 MY Chrysler Town and Country
 - -2013+ MY Dodge Grand Caravan
 - -2015+ MY Fiat 500
 - Wheel Speed, XX - This indicates the speed value of a particular tire as denoted by XX.
- Tire Pressure Monitor Indicator Lamp/Faults - 'On' indicates a tire with low pressure or a fault in the tire pressure monitoring system. The TPM module DTC should be read and recorded for final system interpretation. 'Flashing' indicates a recent fault in the tire pressure monitoring system.
- "T0" ("Time zero" where μ is seen as subscript) is defined as "beginning of the crash event". T0 is the time at which the ACM algorithm is activated, a specific Delta-V is exceeded, or a non-reversible restraint device is deployed. T0 may be defined differently for front, side, rear and roll-over events.
 - If multiple algorithm decisions (i.e.: frontal, side, rear and/or rollover) are made before the first recorded event ends, all of those events are part of the same event record and "T0" is defined as the "T0" from the first recorded event.
 - In the Pre-Crash data tables, the relative time marker "-0.1s" or "-0.25s" respectively represents the last set of data captured in the buffer prior to "T0."
- Torque Information:
 - Axle Torque - This indicates the E-Motor Torque multiplied by the gear ratio for battery electric vehicles only.
 - E-Motor Torque - This indicates the calculated torque from the output shaft of the electric motor in battery electric vehicles only.
- Traction Control Status - 'Engaged' indicates the system is actively controlling the vehicle through either engine torque management or brake pressure modulation. 'On' indicates that the TCS system is functional but not actively controlling the engine torque or brake pressure. 'Off' indicates that the TCS system was turned off by the driver. 'Faulted' indicates a fault / failure in the TCS system.
- Traction Control Intervention Active - 'Active' indicates wheel slippage was occurring during vehicle acceleration.

APPLICATION INFORMATION:

- Alfa Romeo Giulia, Alfa Romeo Stelvio, Fiat 500L, Fiat 500X, and Jeep Renegade are only CDR supported in the United States, Canada, and Saudi Arabia markets.

- Alfa Romeo Tonale is only CDR supported in the United States, Canada, Mexico and Saudi Arabia markets.
- Dodge Hornet is only CDR supported in the United States and Canada markets.
- Fiat 500/500e is only CDR supported in the United States, Canada, Mexico, and Brazil markets.

03002_Chrysler_r051

System Status at Retrieval

Original VIN	1C4BJWDG9JL*****
Airbag Control Module Part Number	68185855AB
Airbag Control Module Serial Number	TJVMF003800433
Airbag Control Module Supplier	TRW
Ignition Cycle, Download	6134

System Configuration at Retrieval

Configured for Driver Frontal Airbag	Yes
Configured for Passenger Frontal Airbag	Yes
Configured for Left Curtain Airbag	No
Configured for Left Seat Airbag	No
Configured for Right Curtain Airbag	No
Configured for Right Seat Airbag	No
Configured for Driver Buckle Pretensioner	No
Configured for Driver Retractor Pretensioner	Yes
Configured for Front Passenger Buckle Pretensioner	Yes
Configured for Front Passenger Retractor Pretensioner	Yes
Configured for Driver Active Head Restraint	No
Configured for Front Passenger Active Head Restraint	No
Configured for Front Passenger Occupant Classification System	No
Configured for Driver Seat Track Position Sensor	Yes
Configured for Front Passenger Seat Track Position Sensor	No

System Status at Event (Most Recent Event)

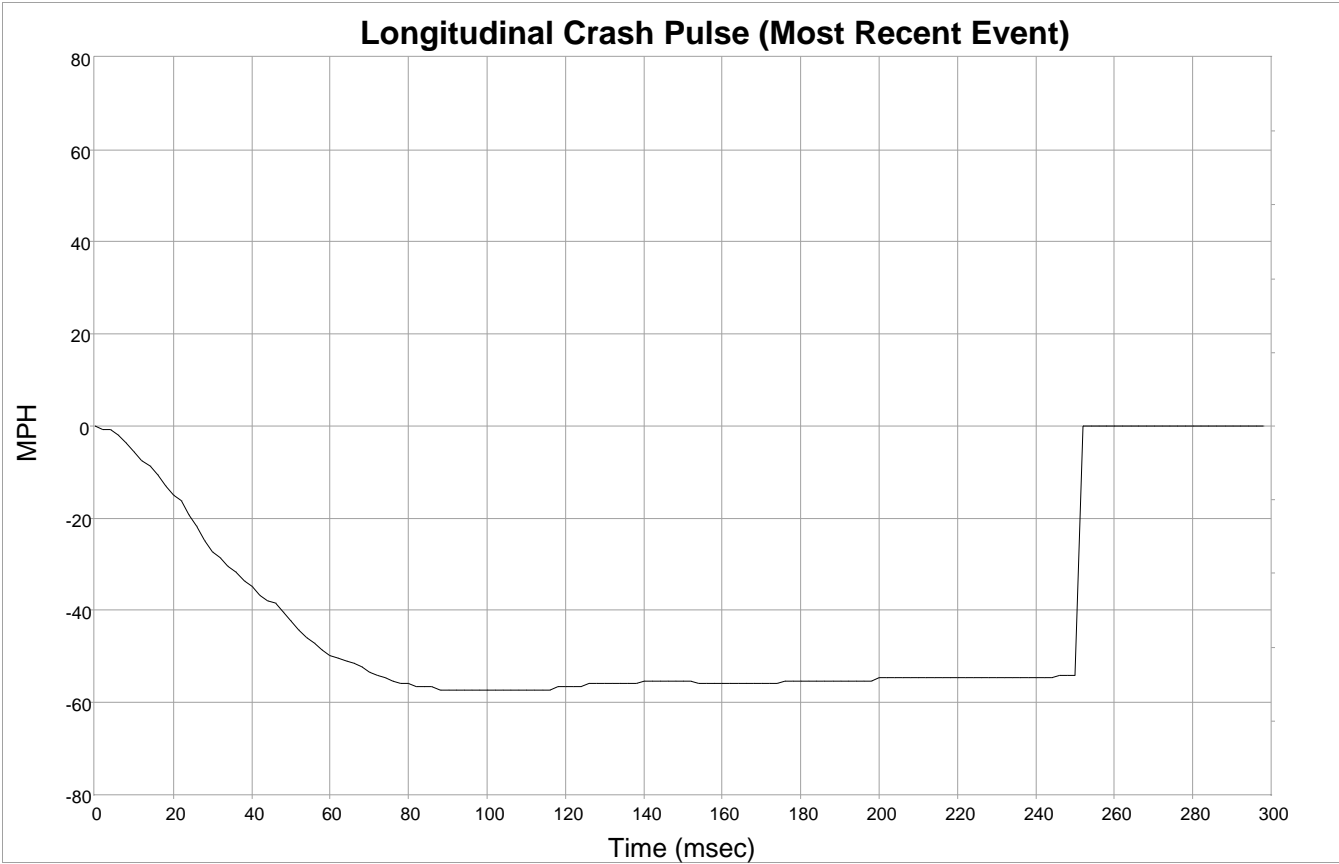
Event Number	1
Event Type	Deployment Event
Complete File Recorded	Yes
Time from Event 1 to 2 (sec)	0.0
Multi-Event, Number of Events (1,2)	1
Maximum Delta-V Longitudinal (MPH [km/h])	-57.2 [-92]
Time, Maximum Delta-V, Longitudinal (msec)	88
Safety Belt Status, Driver	Buckled
Safety Belt Status, Outboard Front Passenger	Not Buckled
Seat Track Position Switch, Foremost, Status, Driver	No
Airbag Warning Lamp, On/Off	Off
Ignition Cycle, Crash	6133
Odometer Recorded at Event (miles[km])	39092.9 [62914.0]
VIN at event, Last 8 Digits	JL*****
Vehicle System Voltage Recorded at Event (V)	14.6

Deployment Command Data (Most Recent Event)

Driver Front Airbag Commanded	Yes
Driver Front Airbag, Time to 1st Stage (msec)	6
Driver Front Airbag, Time to 2nd Stage (msec)	11
Passenger Frontal Airbag Commanded	Yes
Passenger Front Airbag, Time to 1st Stage (msec)	6
Passenger Front Airbag, Time to 2nd Stage (msec)	16
Commanded Driver Pretensioner(s) Deployment	Yes
Commanded Passenger Pretensioner(s) Deployment	Yes
Commanded Left Side Airbag(s) Deployment	No
Commanded Right Side Airbag(s) Deployment	No
Commanded Driver Active Head Restraint	No
Commanded Passenger Active Head Restraint	No

DTCs Present at Start of Event (Most Recent Event)

No DTCs Present



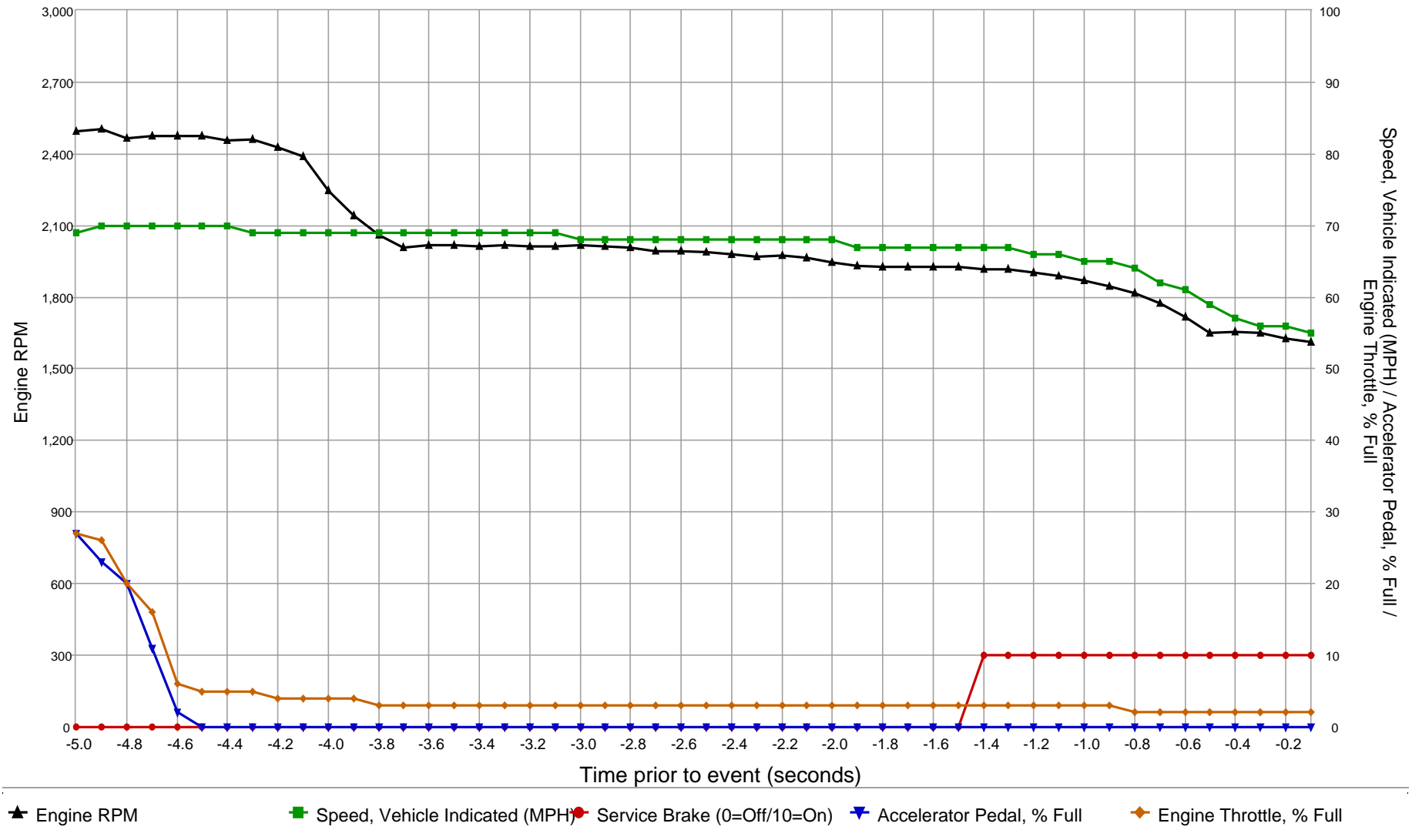
Longitudinal Crash Pulse (Most Recent Event)

Time (msec)	Delta-V, Longitudinal (MPH [km/h])
0	0.0 [0]
2	-0.6 [-1]
4	-0.6 [-1]
6	-1.9 [-3]
8	-3.7 [-6]
10	-5.6 [-9]
12	-7.5 [-12]
14	-8.7 [-14]
16	-10.6 [-17]
18	-13.0 [-21]
20	-14.9 [-24]
22	-16.2 [-26]
24	-19.3 [-31]
26	-21.7 [-35]
28	-24.9 [-40]
30	-27.3 [-44]
32	-28.6 [-46]
34	-30.4 [-49]
36	-31.7 [-51]
38	-33.6 [-54]
40	-34.8 [-56]
42	-36.7 [-59]
44	-37.9 [-61]
46	-38.5 [-62]
48	-40.4 [-65]
50	-42.3 [-68]
52	-44.1 [-71]
54	-46.0 [-74]
56	-47.2 [-76]
58	-48.5 [-78]
60	-49.7 [-80]
62	-50.3 [-81]
64	-51.0 [-82]
66	-51.6 [-83]
68	-52.2 [-84]
70	-53.4 [-86]
72	-54.1 [-87]
74	-54.7 [-88]
76	-55.3 [-89]
78	-55.9 [-90]
80	-55.9 [-90]
82	-56.5 [-91]
84	-56.5 [-91]
86	-56.5 [-91]
88	-57.2 [-92]
90	-57.2 [-92]
92	-57.2 [-92]
94	-57.2 [-92]
96	-57.2 [-92]
98	-57.2 [-92]

Time (msec)	Delta-V, Longitudinal (MPH [km/h])
100	-57.2 [-92]
102	-57.2 [-92]
104	-57.2 [-92]
106	-57.2 [-92]
108	-57.2 [-92]
110	-57.2 [-92]
112	-57.2 [-92]
114	-57.2 [-92]
116	-57.2 [-92]
118	-56.5 [-91]
120	-56.5 [-91]
122	-56.5 [-91]
124	-56.5 [-91]
126	-55.9 [-90]
128	-55.9 [-90]
130	-55.9 [-90]
132	-55.9 [-90]
134	-55.9 [-90]
136	-55.9 [-90]
138	-55.9 [-90]
140	-55.3 [-89]
142	-55.3 [-89]
144	-55.3 [-89]
146	-55.3 [-89]
148	-55.3 [-89]
150	-55.3 [-89]
152	-55.3 [-89]
154	-55.9 [-90]
156	-55.9 [-90]
158	-55.9 [-90]
160	-55.9 [-90]
162	-55.9 [-90]
164	-55.9 [-90]
166	-55.9 [-90]
168	-55.9 [-90]
170	-55.9 [-90]
172	-55.9 [-90]
174	-55.9 [-90]
176	-55.3 [-89]
178	-55.3 [-89]
180	-55.3 [-89]
182	-55.3 [-89]
184	-55.3 [-89]
186	-55.3 [-89]
188	-55.3 [-89]
190	-55.3 [-89]
192	-55.3 [-89]
194	-55.3 [-89]
196	-55.3 [-89]
198	-55.3 [-89]

Time (msec)	Delta-V, Longitudinal (MPH [km/h])
200	-54.7 [-88]
202	-54.7 [-88]
204	-54.7 [-88]
206	-54.7 [-88]
208	-54.7 [-88]
210	-54.7 [-88]
212	-54.7 [-88]
214	-54.7 [-88]
216	-54.7 [-88]
218	-54.7 [-88]
220	-54.7 [-88]
222	-54.7 [-88]
224	-54.7 [-88]
226	-54.7 [-88]
228	-54.7 [-88]
230	-54.7 [-88]
232	-54.7 [-88]
234	-54.7 [-88]
236	-54.7 [-88]
238	-54.7 [-88]
240	-54.7 [-88]
242	-54.7 [-88]
244	-54.7 [-88]
246	-54.1 [-87]
248	-54.1 [-87]
250	-54.1 [-87]
252	0.0 [0]
254	0.0 [0]
256	0.0 [0]
258	0.0 [0]
260	0.0 [0]
262	0.0 [0]
264	0.0 [0]
266	0.0 [0]
268	0.0 [0]
270	0.0 [0]
272	0.0 [0]
274	0.0 [0]
276	0.0 [0]
278	0.0 [0]
280	0.0 [0]
282	0.0 [0]
284	0.0 [0]
286	0.0 [0]
288	0.0 [0]
290	0.0 [0]
292	0.0 [0]
294	0.0 [0]
296	0.0 [0]
298	0.0 [0]

Pre-Crash Data (Most Recent Event)



SNA values will not be plotted on the graph

Pre-Crash Data (Most Recent Event - table 1 of 3)
 (the most recent sampled values are recorded prior to the event)

Time Stamp (sec)	Pre-Crash Recorder Status	Speed, Vehicle Indicated (MPH [km/h])	Accelerator Pedal, % Full	Engine Throttle, % Full	Service Brake	Engine RPM	Stability Control	Steering Input (deg)	Raw Manifold Pressure (kPa)
-5.0	Complete	69 [112]	27	27	Off	2,495	On	14	76
-4.9	Complete	70 [112]	23	26	Off	2,503	On	13	75
-4.8	Complete	70 [112]	20	20	Off	2,465	On	13	70
-4.7	Complete	70 [112]	11	16	Off	2,473	On	13	60
-4.6	Complete	70 [112]	2	6	Off	2,474	On	13	46
-4.5	Complete	70 [112]	0	5	Off	2,473	On	13	34
-4.4	Complete	70 [112]	0	5	Off	2,456	On	13	26
-4.3	Complete	69 [112]	0	5	Off	2,462	On	11	22
-4.2	Complete	69 [112]	0	4	Off	2,429	On	11	19
-4.1	Complete	69 [112]	0	4	Off	2,388	On	11	18
-4.0	Complete	69 [111]	0	4	Off	2,247	On	11	17
-3.9	Complete	69 [111]	0	4	Off	2,143	On	11	17
-3.8	Complete	69 [111]	0	3	Off	2,059	On	10	17
-3.7	Complete	69 [111]	0	3	Off	2,009	On	9	17
-3.6	Complete	69 [111]	0	3	Off	2,018	On	6	17
-3.5	Complete	69 [111]	0	3	Off	2,018	On	6	17
-3.4	Complete	69 [111]	0	3	Off	2,011	On	6	17
-3.3	Complete	69 [111]	0	3	Off	2,016	On	6	17
-3.2	Complete	69 [110]	0	3	Off	2,015	On	6	17
-3.1	Complete	69 [110]	0	3	Off	2,015	On	6	17
-3.0	Complete	68 [110]	0	3	Off	2,019	On	6	17
-2.9	Complete	68 [110]	0	3	Off	2,013	On	6	17
-2.8	Complete	68 [110]	0	3	Off	2,009	On	6	17
-2.7	Complete	68 [110]	0	3	Off	1,995	On	6	17
-2.6	Complete	68 [110]	0	3	Off	1,994	On	6	17
-2.5	Complete	68 [109]	0	3	Off	1,987	On	6	17
-2.4	Complete	68 [109]	0	3	Off	1,979	On	6	17
-2.3	Complete	68 [109]	0	3	Off	1,971	On	6	17
-2.2	Complete	68 [109]	0	3	Off	1,974	On	6	17
-2.1	Complete	68 [109]	0	3	Off	1,967	On	7	17
-2.0	Complete	68 [109]	0	3	Off	1,946	On	9	17
-1.9	Complete	67 [109]	0	3	Off	1,931	On	10	17
-1.8	Complete	67 [108]	0	3	Off	1,926	On	13	18
-1.7	Complete	67 [108]	0	3	Off	1,929	On	13	18
-1.6	Complete	67 [108]	0	3	Off	1,926	On	13	17
-1.5	Complete	67 [108]	0	3	Off	1,925	On	14	17
-1.4	Complete	67 [108]	0	3	On	1,919	On	16	17
-1.3	Complete	67 [107]	0	3	On	1,916	On	20	17
-1.2	Complete	66 [107]	0	3	On	1,902	On	25	18
-1.1	Complete	66 [106]	0	3	On	1,887	On	27	17
-1.0	Complete	65 [105]	0	3	On	1,871	On	27	17
-0.9	Complete	65 [104]	0	3	On	1,848	On	31	17
-0.8	Complete	64 [102]	0	2	On	1,816	On	41	17
-0.7	Complete	62 [100]	0	2	On	1,776	On	52	17
-0.6	Complete	61 [98]	0	2	On	1,717	On	63	17
-0.5	Complete	59 [95]	0	2	On	1,651	On	75	17
-0.4	Complete	57 [92]	0	2	On	1,656	On	75	16
-0.3	Complete	56 [91]	0	2	On	1,649	On	75	16
-0.2	Complete	56 [90]	0	2	On	1,628	On	79	15
-0.1	Complete	55 [89]	0	2	On	1,610	Engaged	73	15

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

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

Time Stamp (sec)	PCM MIL	ESC MIL	Yaw Rate (deg/sec)	Wheel Speed LF (RPM)	Wheel Speed RF (RPM)	Wheel Speed LR (RPM)	Wheel Speed RR (RPM)	ETC Lamp
-5.0	Off	Off	2.55	767	770	768	770	Off
-4.9	Off	Off	2.80	769	770	768	771	Off
-4.8	Off	Off	2.88	766	771	770	771	Off
-4.7	Off	Off	2.46	767	772	769	773	Off
-4.6	Off	Off	2.50	770	771	769	771	Off
-4.5	Off	Off	3.27	769	770	768	770	Off
-4.4	Off	Off	2.51	766	771	768	770	Off
-4.3	Off	Off	2.48	767	771	767	769	Off
-4.2	Off	Off	2.60	769	768	764	768	Off
-4.1	Off	Off	2.76	766	768	765	768	Off
-4.0	Off	Off	2.60	764	767	765	768	Off
-3.9	Off	Off	2.29	766	766	764	766	Off
-3.8	Off	Off	2.35	761	766	763	766	Off
-3.7	Off	Off	2.31	762	766	762	765	Off
-3.6	Off	Off	2.19	763	763	762	764	Off
-3.5	Off	Off	1.89	762	762	760	762	Off
-3.4	Off	Off	1.61	759	762	758	761	Off
-3.3	Off	Off	1.72	759	761	758	760	Off
-3.2	Off	Off	1.62	759	759	757	759	Off
-3.1	Off	Off	1.69	756	758	756	758	Off
-3.0	Off	Off	2.05	755	759	755	757	Off
-2.9	Off	Off	1.96	756	757	755	757	Off
-2.8	Off	Off	1.80	755	755	755	757	Off
-2.7	Off	Off	1.75	754	755	751	753	Off
-2.6	Off	Off	1.68	752	755	752	754	Off
-2.5	Off	Off	1.51	750	754	750	752	Off
-2.4	Off	Off	1.38	753	752	751	752	Off
-2.3	Off	Off	1.54	749	751	747	749	Off
-2.2	Off	Off	1.97	748	751	747	749	Off
-2.1	Off	Off	1.90	748	748	746	748	Off
-2.0	Off	Off	1.57	747	746	744	746	Off
-1.9	Off	Off	1.95	745	747	744	746	Off
-1.8	Off	Off	2.41	743	746	744	745	Off
-1.7	Off	Off	2.79	744	746	742	744	Off
-1.6	Off	Off	2.87	743	743	740	743	Off
-1.5	Off	Off	3.08	738	742	739	742	Off
-1.4	Off	Off	3.00	735	739	737	740	Off
-1.3	Off	Off	3.14	733	737	734	737	Off
-1.2	Off	Off	4.08	729	730	730	733	Off
-1.1	Off	Off	5.54	721	725	720	726	Off
-1.0	Off	Off	6.31	712	719	712	719	Off
-0.9	Off	Off	6.15	700	709	700	710	Off
-0.8	Off	Off	6.28	681	696	685	697	Off
-0.7	Off	Off	8.34	664	683	658	682	Off
-0.6	Off	Off	12.44	647	670	630	668	Off
-0.5	Off	Off	16.34	623	653	612	656	Off
-0.4	Off	Off	18.56	623	643	596	649	Off
-0.3	Off	Off	19.17	605	626	594	639	Off
-0.2	Off	Off	16.36	599	590	597	624	Off
-0.1	Off	Off	11.27	580	579	595	609	Off

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

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

Time Stamp (sec)	Engine Torque Applied	PRND Status	Cruise Control Active (if equip.)	Cruise Control System (if equip.)
-5.0	Yes	Drive	No	Off
-4.9	Yes	Drive	No	Off
-4.8	Yes	Drive	No	Off
-4.7	Yes	Drive	No	Off
-4.6	Yes	Drive	No	Off
-4.5	Yes	Drive	No	Off
-4.4	Yes	Drive	No	Off
-4.3	Yes	Drive	No	Off
-4.2	Yes	Drive	No	Off
-4.1	Yes	Drive	No	Off
-4.0	Yes	Drive	No	Off
-3.9	Yes	Drive	No	Off
-3.8	Yes	Drive	No	Off
-3.7	Yes	Drive	No	Off
-3.6	Yes	Drive	No	Off
-3.5	Yes	Drive	No	Off
-3.4	Yes	Drive	No	Off
-3.3	Yes	Drive	No	Off
-3.2	Yes	Drive	No	Off
-3.1	Yes	Drive	No	Off
-3.0	Yes	Drive	No	Off
-2.9	Yes	Drive	No	Off
-2.8	Yes	Drive	No	Off
-2.7	Yes	Drive	No	Off
-2.6	Yes	Drive	No	Off
-2.5	Yes	Drive	No	Off
-2.4	Yes	Drive	No	Off
-2.3	Yes	Drive	No	Off
-2.2	Yes	Drive	No	Off
-2.1	Yes	Drive	No	Off
-2.0	Yes	Drive	No	Off
-1.9	Yes	Drive	No	Off
-1.8	Yes	Drive	No	Off
-1.7	Yes	Drive	No	Off
-1.6	Yes	Drive	No	Off
-1.5	Yes	Drive	No	Off
-1.4	Yes	Drive	No	Off
-1.3	Yes	Drive	No	Off
-1.2	Yes	Drive	No	Off
-1.1	Yes	Drive	No	Off
-1.0	Yes	Drive	No	Off
-0.9	Yes	Drive	No	Off
-0.8	Yes	Drive	No	Off
-0.7	Yes	Drive	No	Off
-0.6	Yes	Drive	No	Off
-0.5	Yes	Drive	No	Off
-0.4	Yes	Drive	No	Off
-0.3	Yes	Drive	No	Off
-0.2	Yes	Drive	No	Off
-0.1	Yes	Drive	No	Off

Hexadecimal Data

Data that the vehicle manufacturer has specified for data retrieval is shown in the hexadecimal data section of the CDR report. The hexadecimal data section of the CDR report may contain data that is not translated by the CDR program. The control module contains additional data that is not retrievable by the CDR system.

5A 87 02 27 03 05 FF 0D 32 0C 10 01 36 38 31 38 35 38 35 35 41 42

5A 88 31 43 34 42 4A 57 44 47 39 4A 4C 2A 2A 2A 2A 2A

61 E1 54 4A 56 4D 46 30 30 33 38 30 30 34 33 33

61 EA 04 00 02 C0 40 91 08 01 20 00 00 00 00 00 00 00 00 00

61 02 21 64 00 00 60 10 00 00 00 00 00 01 00 00 00 00 00 00

61 31 01 CC 01 01 12 00 00 11 39 05 AA 25 A8 00 05 00 00 17 F5 09 99 94 00 A4 2B 00 00 06 06 00
00 00 00 00 00 00 00 00 00 00 00 90 02 2F 00 00 00 05 0A 00 00 0C 10 01 60 00 00 00 00 00 00
00
00
2A 2A 2A 2A 2A 2A

61 32 02 FF
FF
FF
2A 2A 2A 2A 2A 2A

71 02 01 00 CC 00 06 4A 10 04 C2 04 A5 04 87 04 85 84 67 00 01 00 01 00 1E E1 15 0A 13 04 00 CC
00 44 00 00 FF 00 FF 00 FF 00 10 92 00 F8 FF 00 80 FF 07 3F 00 FF FF FF 00 00 00 00 2C 5A 00 00
04 00
00 00 00 00 00

71 02 01 01 CC 00 06 5C 00 04 E0 04 AA 04 AD 04 9C 86 64 00 01 00 01 00 1E E1 15 0B 13 04 00 CC
00 44 00 00 FF 00 FF 00 FF 00 10 9D 00 F8 FF 00 80 FF 07 3F 00 FF FF FF 00 00 00 00 2C EA 00 00
04 00
00 00 00 00 00

71 02 01 02 CC 00 06 71 00 04 FD 04 A3 04 B9 04 E4 87 7D 00 01 00 01 00 1E E2 15 0A 14 04 00 CC
00 44 00 00 FF 00 FF 00 FF 00 10 95 00 F8 FF 00 80 FF 07 3F 00 FF FF FF 00 00 00 00 2D 5C 00 00
04 00
00 00 00 00 00

71 02 01 03 CC 00 06 78 00 05 11 04 A8 04 DE 05 05 87 40 00 01 00 01 00 1E E2 15 0B 14 04 00 CC
00 44 00 00 FF 00 FF 00 FF 00 10 95 00 F8 FF 00 80 FF 07 3F 00 FF FF FF 00 00 00 00 2E 19 00 00
04 00
00 00 00 00 00

71 02 01 04 CC 00 06 73 00 05 20 04 C7 04 DD 05 1A 86 62 00 01 00 01 00 1E E2 15 0A 15 04 00 CC
00 44 00 00 FF 00 FF 00 FF 00 10 95 00 F8 FF 00 80 FF 07 3F 00 FF FF FF 00 00 00 00 2F 6E 00 00
04 00
00 00 00 00 00

71 02 01 05 CC 00 06 B5 00 05 37 04 EB 05 0D 05 3B 84 DC 00 01 00 01 00 1E E1 15 0B 15 04 00 CC
00 44 00 00 FF 00 FF 00 FF 00 10 7E 00 F8 FF 00 80 FF 07 3F 00 FF FF FF 00 00 00 00 30 D4 00 00
04 00
00 00 00 00 00

71 02 01 06 CC 00 06 F0 00 05 54 05 23 05 2F 05 56 83 42 00 01 00 01 00 1E E1 15 0B 15 04 00 CC
00 44 00 00 FF 00 FF 00 FF 00 10 68 00 F8 FF 00 80 FF 07 3F 00 FF FF FF 00 00 00 00 32 28 00 00
04 00
00 00 00 00 00

71 02 01 07 CC 00 07 18 00 05 72 05 5A 05 51 05 70 82 74 00 01 00 01 00 1E E1 15 0A 15 04 00 CC
00 44 00 00 FF 00 FF 00 FF 00 10 51 00 F8 FF 00 80 FF 07 3F 00 FF FF FF 00 00 00 00 33 2B 00 00
04 00
00 00 00 00 00

00 00 00 00 00

71 02 01 08 CC 00 07 38 00 05 8B 05 78 05 78 05 89 82 67 00 01 00 01 00 1E E1 15 0A 15 05 00 CC
00 44 00 00 FF 00 FF 00 FF 00 10 3E 00 F8 FF 00 80 FF 07 3F 00 FF FF FF 00 00 00 00 33 F8 00 00
04 00
00 00 00 00 00

71 02 01 09 CC 00 07 4F 00 05 9E 05 8F 05 90 05 9E 82 77 00 01 00 01 00 1E E1 15 0A 15 05 00 CC
00 44 00 00 FF 00 FF 00 FF 00 10 35 00 F8 FF 00 80 FF 07 3F 00 FF FF FF 00 00 00 00 34 91 00 00
04 00
00 00 00 00 00

71 02 01 0A CC 00 07 5F 00 05 AC 05 A0 05 A1 05 AA 82 2A 00 01 00 01 00 1E E1 15 0B 15 05 00 CC
00 44 00 00 FF 00 FF 00 FF 00 10 35 00 F8 FF 00 80 FF 07 3F 00 FF FF FF 00 00 00 00 35 0E 00 00
04 00
00 00 00 00 00

71 02 01 0B CC 00 07 6E 00 05 B9 05 B4 05 B1 05 B4 81 98 00 01 00 01 00 1E E1 15 0A 16 05 00 CC
00 44 00 00 FF 00 FF 00 FF 00 10 32 00 F8 FF 00 80 FF 07 3F 00 FF FF FF 00 00 00 00 35 63 00 00
04 00
00 00 00 00 00

71 02 01 0C CC 00 07 7C 00 05 C1 05 BC 05 B9 05 C1 81 3A 00 01 00 01 00 1E E1 15 0A 15 05 00 CC
00 44 00 00 FF 00 FF 00 FF 00 10 27 00 F8 FF 00 80 FF 07 3F 00 FF FF FF 00 00 00 00 35 AC 00 00
04 00
00 00 00 00 00

71 02 01 0D CC 00 07 7F 00 05 C7 05 C2 05 BE 05 C6 81 2C 00 01 00 01 00 1E E1 15 0A 15 05 00 CC
00 44 00 00 FF 00 FF 00 FF 00 10 1F 00 F8 FF 00 80 FF 07 3F 00 FF FF FF 00 00 00 00 35 D8 00 00
04 00
00 00 00 00 00

71 02 01 0E CC 00 07 85 00 05 CB 05 C5 05 C4 05 CB 81 34 00 00 00 00 00 1E E1 15 00 15 05 00 C0
00 44 00 00 FF 00 FF 00 FF 00 10 1C 00 F8 FF 00 80 FF 07 3F 00 FF FF FF 00 00 00 00 35 F4 00 00
04 00
00 00 00 00 00

71 02 01 0F CC 00 07 86 00 05 CD 05 C7 05 CE 05 CE 81 1F 00 00 00 00 00 1E E1 15 0A 15 05 00 C0
00 44 00 00 FF 00 FF 00 FF 00 10 19 00 F8 FF 00 80 FF 07 3F 00 FF FF FF 00 00 00 00 36 08 00 00
04 00
00 00 00 00 00

71 02 01 10 CC 00 07 89 00 05 CF 05 CB 05 D0 05 D3 81 17 00 00 00 00 00 1F E1 15 0B 16 05 00 C0
00 44 00 00 FF 00 FF 00 FF 00 10 19 00 F8 FF 00 80 FF 07 3F 00 FF FF FF 00 00 00 00 36 19 00 00
04 00
00 00 00 00 00

71 02 01 11 CC 00 07 86 00 05 D2 05 D0 05 CD 05 D4 80 F1 00 00 00 00 00 1F E1 15 0B 16 05 00 C0
00 44 00 00 FF 00 FF 00 FF 00 10 19 00 F8 FF 00 80 FF 07 3F 00 FF FF FF 00 00 00 00 36 2A 00 00
04 00
00 00 00 00 00

71 02 01 12 CC 00 07 8B 00 05 D3 05 CF 05 D1 05 D6 80 C3 00 00 00 00 00 1F E1 15 0A 15 05 00 C0
00 44 00 00 FF 00 FF 00 FF 00 10 13 00 F8 FF 00 80 FF 07 3F 00 FF FF FF 00 00 00 00 36 40 00 00
04 00
00 00 00 00 00

71 02 01 13 CC 00 07 9A 00 05 D3 05 CF 05 D6 05 D3 80 9D 00 00 00 00 00 1F E0 15 0A 15 05 00 C0
00 44 00 00 FF 00 FF 00 FF 00 10 11 00 F8 FF 00 80 FF 07 3F 00 FF FF FF 00 00 00 00 36 57 00 00
04 00
00 00 00 00 00

71 02 01 14 CC 00 07 AF 00 05 D8 05 D4 05 D7 05 D8 80 BE 00 00 00 00 00 1F E1 17 0C 15 05 00 C0
00 44 00 00 FF 00 FF 00 FF 00 10 0E 00 F8 FF 00 80 FF 07 3F 00 FF FF FF 00 00 00 00 36 6A 00 00
04 00
00 00 00 00 00

71 02 01 15 CC 00 07 B6 00 05 D9 05 D5 05 D7 05 DD 80 C5 00 00 00 00 00 1F E0 17 0C 15 05 00 C0
00 44 00 00 FF 00 FF 00 FF 00 10 0B 00 F8 FF 00 80 FF 07 3F 00 FF FF FF 00 00 00 00 36 79 00 00
04 00
00 00 00 00 00

71 02 01 16 CC 00 07 B3 00 05 DA 05 D6 05 D9 05 DE 80 9A 00 00 00 00 00 1F E0 17 0B 15 05 00 C0
00 44 00 00 FF 00 FF 00 FF 00 10 0B 00 F8 FF 00 80 FF 07 3F 00 FF FF FF 00 00 00 00 36 90 00 00
04 00
00 00 00 00 00

71 02 01 17 CC 00 07 BB 00 05 DF 05 DD 05 E1 05 DF 80 8A 00 00 00 00 00 1F E0 16 0B 15 05 00 C0
00 44 00 00 FF 00 FF 00 FF 00 10 0B 00 F8 FF 00 80 FF 07 3F 00 FF FF FF 00 00 00 00 36 A1 00 00
04 00
00 00 00 00 00

71 02 01 18 CC 00 07 C3 00 05 E0 05 DC 05 DC 05 E3 80 97 00 00 00 00 00 1F E0 16 0B 15 05 00 C0
00 44 00 00 FF 00 FF 00 FF 00 10 0B 00 F8 FF 00 80 FF 07 3F 00 FF FF FF 00 00 00 00 36 B3 00 00
04 00
00 00 00 00 00

71 02 01 19 CC 00 07 CA 00 05 E4 05 DF 05 DF 05 E6 80 A8 00 00 00 00 00 1F E0 15 0B 15 05 00 C0
00 44 00 00 FF 00 FF 00 FF 00 10 0B 00 F8 FF 00 80 FF 07 3F 00 FF FF FF 00 00 00 00 36 C5 00 00
04 00
00 00 00 00 00

71 02 01 1A CC 00 07 CB 00 05 E2 05 DE 05 E3 05 E6 80 AF 00 00 00 00 00 1F E0 15 0B 15 05 00 C0
00 44 00 00 FF 00 FF 00 FF 00 10 0B 00 F8 FF 00 80 FF 07 3F 00 FF FF FF 00 00 00 00 36 DC 00 00
04 00
00 00 00 00 00

71 02 01 1B CC 00 07 D9 00 05 E9 05 E5 05 E6 05 E5 80 B4 00 00 00 00 00 1F E0 15 0B 15 05 00 C0
00 44 00 00 FF 00 FF 00 FF 00 10 0B 00 F8 FF 00 80 FF 07 3F 00 FF FF FF 00 00 00 00 36 F1 00 00
04 00
00 00 00 00 00

71 02 01 1C CC 00 07 DD 00 05 E9 05 E5 05 E8 05 EA 80 C4 00 00 00 00 00 1F E0 15 0B 15 05 00 C0
00 44 00 00 FF 00 FF 00 FF 00 10 0B 00 F8 FF 00 80 FF 07 3F 00 FF FF FF 00 00 00 00 36 FA 00 00
04 00
00 00 00 00 00

71 02 01 1D CC 00 07 E3 00 05 E9 05 E6 05 E6 05 EE 80 CD 00 00 00 00 00 1F E0 15 0A 15 05 00 C0
00 44 00 00 FF 00 FF 00 FF 00 10 0B 00 F8 FF 00 80 FF 07 3F 00 FF FF FF 00 00 00 00 37 0C 00 00
04 00
00 00 00 00 00

71 02 01 1E CC 00 07 DF 00 05 EC 05 E8 05 E8 05 EC 80 A9 00 00 00 00 00 1F E0 15 0A 15 05 00 C0
00 44 00 00 FF 00 FF 00 FF 00 10 0B 00 F8 FF 00 80 FF 07 3F 00 FF FF FF 00 00 00 00 37 21 00 00
04 00
00 00 00 00 00

71 02 01 1F CC 00 07 DF 00 05 ED 05 EA 05 EE 05 EE 80 A2 00 00 00 00 00 1F E0 15 00 15 05 00 C0
00 44 00 00 FF 00 FF 00 FF 00 10 0B 00 F8 FF 00 80 FF 07 3F 00 FF FF FF 00 00 00 00 37 33 00 00
04 00
00 00 00 00 00

71 02 01 20 CC 00 07 E0 00 05 EF 05 EC 05 ED 05 F2 80 AC 00 00 00 00 00 1F E0 15 0A 15 05 00 C0
00 44 00 00 FF 00 FF 00 FF 00 10 0B 00 F8 FF 00 80 FF 07 3F 00 FF FF FF 00 00 00 00 37 43 00 00
04 00
00 00 00 00 00

71 02 01 21 CC 00 07 DB 00 05 F1 05 EC 05 EE 05 F4 80 A1 00 00 00 00 00 1F E0 15 0A 15 05 00 C0
00 44 00 00 FF 00 FF 00 FF 00 10 0B 00 F8 FF 00 80 FF 07 3F 00 FF FF FF 00 00 00 00 37 53 00 00
04 00
00 00 00 00 00

71 02 01 22 CC 00 07 E2 00 05 F4 05 F0 05 F3 05 F4 80 BD 00 00 00 00 00 1F E0 15 0A 15 05 00 C0
00 44 00 00 FF 00 FF 00 FF 00 10 0B 00 F8 FF 00 80 FF 07 3F 00 FF FF FF 00 00 00 00 37 6B 00 00

Appendix B: 2004 GMC Sierra 1500 EDR Report

⁴ The EDR Report contained in this 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 Viewer application may differ relative to this report.

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

CDR File Information

User Entered VIN	1GTEK19T04E*****
User	
Case Number	
EDR Data Imaging Date	
Crash Date	
Filename	DS22002_V3_ACM.CDRX
Saved on	
Imaged with CDR version	Crash Data Retrieval Tool 21.3
Imaged with Software Licensed to (Company Name)	California Highway Patrol
Reported with CDR version	Crash Data Retrieval Tool 24.0.1
Reported with Software Licensed to (Company Name)	NHTSA
EDR Device Type	Airbag Control Module
Event(s) recovered	Deployment Non-Deployment

Comments

No comments entered.

Data Limitations

Recorded Crash Events:

There are two types of Recorded Crash Events. The first is the Non-Deployment Event. A Non-Deployment Event records data but does not deploy the air bag(s). It contains Pre-Crash and Crash data. The SDM can store up to one Non-Deployment Event. This event may be overwritten by another Non-Deployment Event. This event will be cleared by the SDM, after approximately 250 ignition cycles. This event can be overwritten by a second Deployment Event, referred to as a Deployment Level Event, if the Non-Deployment Event is not locked. The data in the Non-Deployment Event file will be locked, if the Non-Deployment Event occurred within five seconds before a Deployment Event. A locked Non Deployment Event cannot be overwritten or cleared by the SDM. The second type of SDM recorded crash event is the Deployment Event. It also contains Pre-Crash and Crash data. The SDM can store up to two different Deployment Events, if they occur within five seconds of one another. If multiple Non-Deployment Events occur within five seconds prior to a Deployment Event, then the most severe Non-Deployment Event will be recorded and locked. If multiple Non-Deployment Events precede a Deployment Event, and occur within five seconds of each other (but not necessarily all within five seconds of the Deployment Event), then the most severe of the Non-Deployment Events (which may have occurred more than five seconds prior to the Deployment Event) will be recorded and locked. If a Deployment Level Event occurs within five seconds after the Deployment Event, the Deployment Level Event will overwrite any non-locked Non-Deployment Event. If multiple Non-Deployment Events occur within five seconds prior to a Deployment Event, and one or more of those events was a Pretensioner Deployment Event, then the most recent Pretensioner Deployment Event will be recorded and locked. Deployment Events cannot be overwritten or cleared by the SDM. Once the SDM has deployed an air bag, the SDM must be replaced.

Data:

-SDM Recorded Vehicle Longitudinal Velocity Change reflects the change in longitudinal velocity that the sensing system experienced during the recorded portion of the event. SDM Recorded Vehicle Longitudinal Velocity Change is the change in velocity during the recording time and is not the speed the vehicle was traveling before the event, and is also not the Barrier Equivalent Velocity. For Deployment Events, the SDM will record 100 milliseconds of data after Deployment criteria is met and up to 50 milliseconds before Deployment criteria is met. For Non-Deployment Events, the SDM can record up to the first 150 milliseconds of data after algorithm enable. Velocity Change data is displayed in SAE sign convention.

-Event Recording Complete will indicate if data from the recorded event has been fully written to the SDM memory or if it has been interrupted and not fully written.

-SDM Recorded Vehicle Speed accuracy can be affected by various factors, including but not limited to the following:

- Significant changes in the tire's rolling radius
- Final drive axle ratio changes
- Wheel lockup and wheel slip

-Brake Switch Circuit Status indicates the open/closed state of the brake switch circuit.

-Pre-Crash data is recorded asynchronously. The 1.0 second Pre-crash data value (most recent recorded data point) is the data point last sampled before AE. That is to say, the last data point may have been captured just before AE but no more than 1.0 second before AE. All subsequent Pre-crash data values are referenced from this data point.

-Pre-Crash Electronic Data Validity Check Status indicates "Data Invalid" if:

- The SDM receives a message with an "invalid" flag from the module sending the pre-crash data

- No data is received from the module sending the pre-crash data
- No module present to send the pre-crash data
- Engine Speed is reported at two times the actual value in the following vehicles, if the vehicle is equipped with a 6.6L Duramax diesel engine (RPO LB7, LBZ, LLY, or LMM):
 - 2001-2006 Chevrolet Silverado
 - 2007 Chevrolet Silverado Classic
 - 2001-2006 GMC Sierra
 - 2007 GMC Sierra Classic
 - 2006-2007 Chevrolet Express
 - 2006-2007 GMC Savana
 - 2003-2009 Chevrolet Kodiak
 - 2003-2009 GMC Topkick
- Driver's and Passenger's Belt Switch Circuit Status indicates the status of the seat belt switch circuit. If the vehicle's electrical system is compromised during a crash, the state of the Driver's Belt Switch Circuit may be reported other than the actual state.
- The Time between Non-Deployment to Deployment Events is displayed in seconds. If the time between the two events is greater than 25.4 seconds, "N/A" is displayed in place of the time.
- If power to the SDM is lost during a crash event, all or part of the crash record may not be recorded.
- Multiple Events will indicate whether one or more associated events preceded the recorded event.
- Multiple Events Not Recorded can be used in the following scenarios:
 - If a single event is recorded, this parameter will indicate whether one or more associated events prior to the recorded event was not recorded due to insufficient record space (because there were more events than there were available event records).
 - If two associated events are recorded, this parameter for the first event will indicate whether one or more associated events prior to the first event was not recorded due to insufficient record space.
 - If two associated events are recorded, this parameter for the second event will indicate whether one or more associated events between the first and second events was not recorded due to insufficient record space.
- All data should be examined in conjunction with other available physical evidence from the vehicle and scene.

Data Source:

All SDM recorded data is measured, calculated, and stored internally, except for the following:

- Vehicle Speed, Engine Speed, and Percent Throttle data are transmitted by the Powertrain Control Module (PCM), via the vehicle's communication network, to the SDM.
- Brake Switch Circuit Status data is transmitted by either the ABS module or the PCM, via the vehicle's communication network, to the SDM.
- The Belt Switch Circuit is wired directly to the SDM.

Hexadecimal Data:

Data that the vehicle manufacturer has specified for data retrieval is shown in the hexadecimal data section of the CDR report. The hexadecimal data section of the CDR report may contain data that is not translated by the CDR program. The control module contains additional data that is not retrievable by the CDR tool.

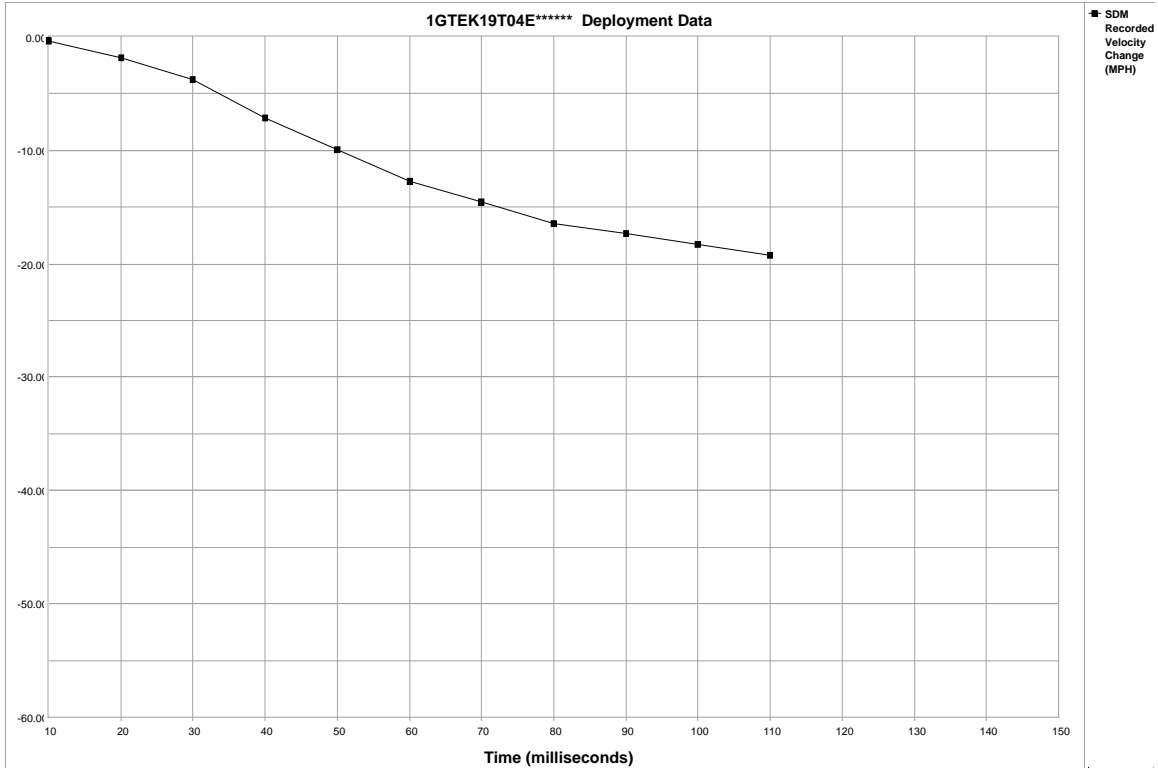
01027_SDMGF_r007

System Status At Deployment

SIR Warning Lamp Status	OFF
Driver's Belt Switch Circuit Status	BUCKLED
Passenger's Belt Switch Circuit Status	UNBUCKLED
Passenger Seat Position Switch Circuit Status	Rearward
Ignition Cycles At Deployment	36899
Ignition Cycles At Investigation	36900
Maximum SDM Recorded Velocity Change (MPH)	-20.35
Algorithm Enable to Maximum SDM Recorded Velocity Change (msec)	137.5
Driver 1st Stage Time From Algorithm Enable to Deployment Command Criteria Met (msec)	15
Driver 2nd Stage Time From Algorithm Enable to Deployment Command Criteria Met (msec)	N/A
Passenger 1st Stage Time From Algorithm Enable to Deployment Command Criteria Met (msec)	Suppressed
Passenger 2nd Stage Time From Algorithm Enable to Deployment Command Criteria Met (msec)	N/A
Time Between Non-Deployment And Deployment Events (sec)	N/A
Frontal Deployment Level Event Counter	1
Event Recording Complete	Yes
Multiple Events	No
Multiple Events Not Recorded	No

Seconds Before AE	Vehicle Speed (MPH)	Engine Speed (RPM)	Percent Throttle
-5	64	1792	0
-4	64	1792	0
-3	64	1792	0
-2	64	1792	0
-1	58	1600	0

Seconds Before AE	Brake Switch Circuit State
-8	OFF
-7	OFF
-6	OFF
-5	OFF
-4	OFF
-3	OFF
-2	OFF
-1	ON



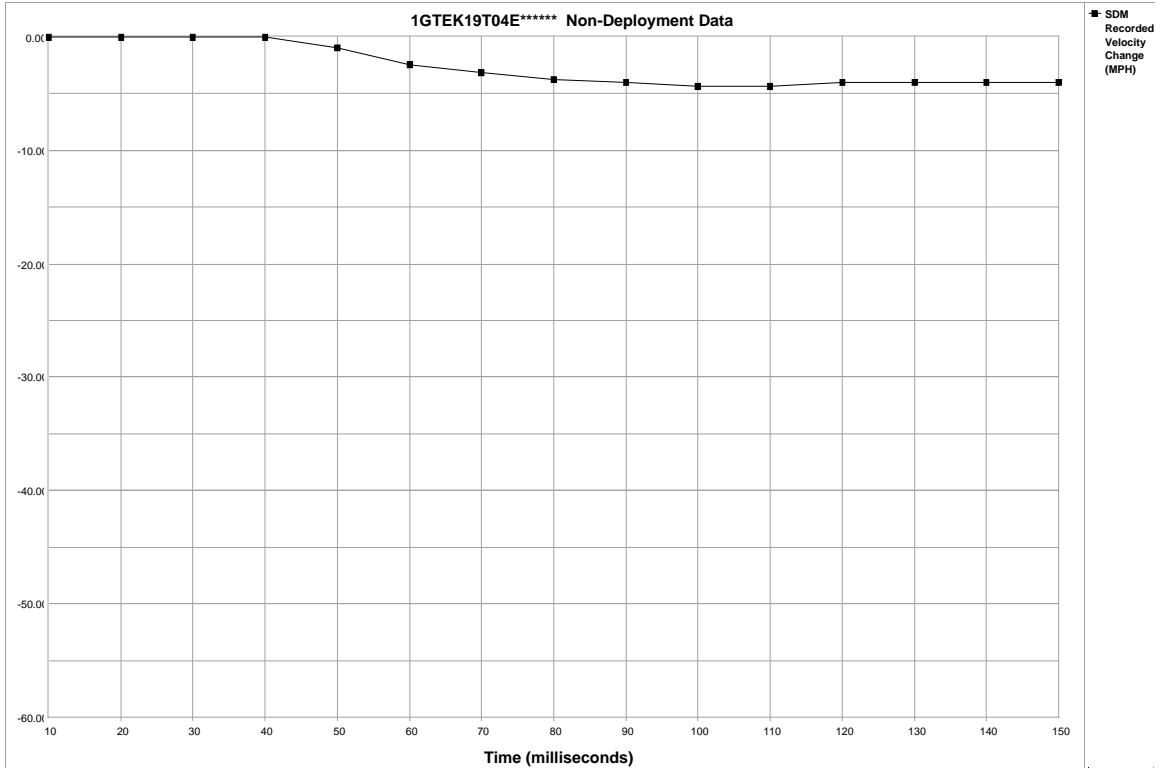
Time (milliseconds)	10	20	30	40	50	60	70	80	90	100	110	120	130	140	150
Recorded Velocity Change (MPH)	-0.31	-1.86	-3.72	-7.13	-9.92	-12.71	-14.57	-16.43	-17.36	-18.29	-19.22	N/A	N/A	N/A	N/A

System Status At Non-Deployment

SIR Warning Lamp Status	ON
Driver's Belt Switch Circuit Status	BUCKLED
Passenger's Belt Switch Circuit Status	UNBUCKLED
Passenger Seat Position Switch Circuit Status	Rearward
Ignition Cycles At Non-Deployment	36899
Ignition Cycles At Investigation	36900
Maximum SDM Recorded Velocity Change (MPH)	-4.62
Algorithm Enable to Maximum SDM Recorded Velocity Change (msec)	102.5
Crash Record Locked	No
Event Recording Complete	Yes
Multiple Events	No
Multiple Events Not Recorded	No

Seconds Before AE	Vehicle Speed (MPH)	Engine Speed (RPM)	Percent Throttle
-5	64	1792	0
-4	64	1792	0
-3	64	1792	0
-2	64	1792	0
-1	58	1600	0

Seconds Before AE	Brake Switch Circuit State
-8	OFF
-7	OFF
-6	OFF
-5	OFF
-4	OFF
-3	OFF
-2	OFF
-1	ON



Time (milliseconds)	10	20	30	40	50	60	70	80	90	100	110	120	130	140	150
Recorded Velocity Change (MPH)	0.00	0.00	0.00	0.00	-0.93	-2.48	-3.10	-3.72	-4.03	-4.34	-4.34	-4.03	-4.03	-4.03	-4.03

Hexadecimal Data

```
$01 F0 39 33 A9 AE C6
$02 F1 F1 00 00 B8 00
$03 41 53 34 31 31 38
$04 4B 58 57 39 50 33
$05 00 00 00 00 00 00
$06 15 13 06 08 00 00
$07 00 00 00 00 00 00
$08 00 00 00 00 00 00
$09 00 00 00 00 00 00
$0A 00 00 00 00 00 00
$0B 00 00 00 00 00 00
$0C 00 00 00 00 00 00
$0D 00 00 00 00 00 00
$0E 00 00 00 00 00 00
$0F 00 00 00 00 00 00
$10 ED FB F0 00 00 00
$11 81 80 81 7E 7D 7E
$12 9A 87 88 21 21 11
$13 FF 02 00 00 00 00
$14 03 03 00 00 6C 00
$15 FA FA FA FA FA FA
$16 FA FA FA FA FA FA
$17 FA FA 00 00 00 00
$18 00 0F 05 EC F5 00
$19 09 00 0A 00 00 64
$1A 00 00 00 00 00 00
$1B 00 00 00 00 00 00
$1C 00 0C 00 00 00 00
$1D 00 00 00 00 00 00
$1F FE 00 00 00 00 00
$20 52 FD 00 00 FF FF
$21 FF F7 FF FF FF FF
$22 FF FF FF FF FF FF
$23 FF FF FF FF FF F7
$24 00 00 EE 11 29 1F
$25 1F 00 00 03 FF FF
$26 00 00 00 00 03 08
$27 0A 0C 0D 0E 0E 0D
$28 0D 0D 0D 00 ED FB
$29 F8 A5 FF FF FF FF
$2A FF FF FF FF FF FF
$2B FF FF FF FF FF FF
$2C FF FF FF FF FF FF
$2D FF FF 00 00 00 00
$30 B2 FE 00 00 FF FF
$31 FF FF FF FF FF FF
$32 FF FF FF FF FF FF
$33 FF FF FF FF FF FF
$34 00 00 33 0C 06 03
$35 00 00 00 00 00 00
$36 00 00 00 00 00 00
$37 00 00 00 04 19 4D
$38 37 07 5D 2F 00 00
$39 01 00 00 03 FF FF
$3A 01 06 0C 17 20 29
$3B 2F 35 38 3B 3E 00
$3C 00 00 00 0B ED FB
$3D F8 A5 00 00 00 00
$40 5D 67 67 67 67 00
$41 80 00 00 00 00 00
$42 00 00 19 1C 1C 1C
$43 1C 00 01 FC 00 00
$44 5D 67 67 67 67 00
```

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$45 80 00 00 00 00 00  
$46 00 00 19 1C 1C 1C  
$47 1C 00 80 FE 00 00  
$48 5D 67 67 67 67 00  
$49 80 00 00 00 00 00  
$4A 00 00 19 1C 1C 1C  
$4B 1C 00 80 FE 00 00  
$4C FF FF FF FF FF FF  
$4D FF FF FF FF FF FF  
$4E FF FF FF FF FF FF  
$4F FF FF FF FF 00 00  
$50 FF FF FF FF FF FF  
$51 FF FF FF FF FF FF  
$52 FF FF FF FF FF FF  
$53 FF FF FF FF FF FF  
$54 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.

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October 2024



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



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