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Special Crash Investigations: On-Site Alleged Unintended Acceleration Crash Investigation; Vehicle: 2009 Toyota Camry; Location: Maryland; Crash Date: October 2017

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15. Supplementary Note

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

16. Abstract

The interest in this on-site investigation was the alleged unintended acceleration of a 2009 Toyota Camry that departed a roadway and then penetrated a restaurant, resulting in the fatality of a 73-year-old male in the building, in Maryland in October 2017. The Toyota's 55-year-old female driver initially claimed a brake malfunction as a causal factor for the crash. After the police brake-inspection ruled out a malfunction as a causal factor, the driver then alleged that an unintended acceleration caused the crash. The driver was operating the vehicle at a high speed and attempted a right turn at a three-leg intersection. As she initiated the turn, the Toyota overrode the raised curbs of two gore areas and departed the road, entering the parking lot of the restaurant. The front plane of the Toyota struck three protective bollards, a heat pump, and the east wall of the building constructed of concrete block. The driver's frontal air bag deployed at impact with the wall. The Toyota penetrated the block wall and struck the restaurant's furniture and occupants. The Toyota came to rest approximately one vehicle length into the building with the engine running. In all, 15 occupants of the building sustained police-reported possible injuries. Five people sustained minor severity injuries requiring medical transport. A 73-year-old male expired at a local hospital. The driver was not injured.

Based on the results and observations of the SCI inspection, the mechanical elements of the Toyota's brake and throttle system were functioning as intended at the time of the SCI inspection. No malfunction in either system was identified. The data recorded in the vehicle's EDR did not indicate the presence of a sudden unintended acceleration event.

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Background

The interest in this on-site investigation was the alleged unintended acceleration (UA) of a 2009 Toyota Camry that departed a roadway and then penetrated a restaurant (Figure 1), resulting in the fatality of a 73-year-old male patron. The 55-year-old female driver of the Toyota initially claimed a brake malfunction as a causal factor for the crash. After the police brake-inspection ruled out a malfunction as a causal factor, the driver then alleged that an unintended acceleration caused the crash.

Figure 1. East-facing view of the Toyota at final rest in the commercial building. (Image obtained from an internet news source)

Notification of the crash was provided to the National Highway Traffic Safety Administration by the police, and further research was requested through the Special Crash Investigations (SCI) program. The notification was forwarded to the investigative team at Crash Research & Analysis, Inc. (CRA), in November 2017. This investigation was conducted in concert with technical representatives of the vehicle manufacturer. SCI contacted the Toyota representative to conduct the joint investigation in December 2017. The on-site investigation involved the inspection and documentation of the vehicle's accelerator pedal, throttle system, and floor mats; the documentation of the exterior damage to the Toyota; and the assessment of the interior for evidence of occupant contact, manual and supplemental restraint interaction, and occupant compartment intrusion. The Toyota was equipped with an Event Data Recorder (EDR) that was imaged using the Bosch Crash Data (CDR) retrieval tool and software version 17.5.1. Additionally, the crash site and physical plant of the roadway were inspected and documented for evidence associated with the vehicle's trajectory and any attempted avoidance actions by the unbelted female driver.

The crash occurred off-road by a two-lane street during daylight. The female driver of the Toyota was driving at a high speed and attempted a right turn at a three-leg intersection to travel west.

As she initiated the turn, the Toyota struck and overrode the raised curbs of two gore areas and departed the road, entering the parking lot of a restaurant. The front plane of the Toyota struck three protective bollards, a heat pump, and the east wall of the building, which was constructed of concrete block. The driver's frontal air bag deployed at impact with the wall. The Toyota penetrated the block wall and contacted the restaurant's furniture and occupants. The Toyota came to rest approximately one vehicle length inside the building with the engine running. In all, 15 occupants of the building sustained police-reported possible injuries. Five people sustained minor injuries requiring medical transport. A 73-year-old male sustained an occult-type liver injury and expired at a local hospital. The Toyota driver was not injured. The Toyota was towed from the scene and transported to a police impound facility, where it was inspected for this investigation.

Based on the results and observations of the SCI inspection, the mechanical elements of the Toyota's brake and throttle system were functioning at the time of the SCI inspection. No malfunction in either system was identified. The data recorded in the vehicle's EDR did not indicate the presence of a sudden unintended acceleration event.

Crash Summary

Crash Site

The crash occurred on the roadside adjacent to a three-leg Y-intersection in a suburban area during daylight (Figure 2). At the time of the crash, the National Weather Service reported clear conditions with a temperature of 21.4 ºC (70.5 ºF), 58 % humidity, and winds out of the south-southwest at 24 km/h (15 mph). The driver approached the crash site traveling south on a two-lane road that was posted with a 64 km/h (40 mph) speed limit. She attempted a right turn onto the intersecting road that also was composed of two lanes. A designated right turn lane transitioned southbound traffic onto the intersecting roadway. The curved turn lane was 4.3 m (14 ft) in width. A yield sign was posted at the end of the turn lane to regulate traffic flow with any northbound left-turning traffic that would proceed westbound on the roadway. A curbed concrete gore separated the westbound lane of the intersection from the southbound right turn lane. A second curbed gore separated the eastbound lane of the intersecting roadway from a designated right turn lane onto the southbound travel lanes. Located beyond the intersecting street at the south roadside was a large asphalt-surfaced parking lot that serviced two commercial buildings. The grade of the parking lot immediately south of the intersecting roadway was +7% percent. This physical plant is depicted on the Crash Diagram included at the end of this report.

Figure 2. Southwest trajectory view of the Toyota's approach to the crash site

The building struck by the Toyota was located 52 m (170.6 ft) west of the intersection and 11.8 m (38.7 ft) south of the intersecting roadway. The single-story building was constructed of concrete block and dimensionally measured 11.3 m x 11.3 m (37 ft x 37 ft). A heat pump was mounted on a concrete pad adjacent to the east wall and was protected by three concrete-filled bollards. Inside the building at the time of the crash, opposite the east wall, were restaurant tables and chairs occupied by patrons and staff.

Pre-Crash

The 55-year-old female driver of the Toyota was initially traveling south on the two-lane road at an unknown speed that exceeded the EDR's maximum recorded value of 122 km/h (75.8 mph) at the 4.5-second interval prior to algorithm enable (AE). As she approached the three-leg

Y-intersection, the driver removed pressure from the accelerator pedal and applied the service brakes. The EDR recorded the accelerator pedal as static (in the closed position) for the entire 4.5-second pre-crash recording. As a result of the pedal application, the engine rpms and the vehicle speed continued to decrease during the pre-crash recording intervals. She intermittently applied the brakes as she attempted to turn right onto the designated right turn lane to proceed westbound. The Toyota drifted wide in the early phase of the right turn maneuver and departed the confines of the turn lane. Based on a time/distance calculation using the EDR-recorded values, the speed of the Toyota was approximately 100 km/h (62 mph).

Crash

The left front tire of the Toyota entered the curb cutout at the concrete gore located at the southwest corner of the intersection. As the Toyota continued on a southwesterly trajectory, the front center undercarriage contacted the concrete surface of the gore (Event 1). The right front tire and alloy wheel subsequently struck and overrode the 15 cm (6 in) curb of the gore, causing a probable air-out of the tire (Event 2). The rear tires tracked over the front tires as the Toyota traversed the gore and crossed the west and eastbound lanes of the intersecting roadway.

Figure 3. Southwesterly view of the intersection and the initial gore impacts, Events 1 and 2

The left front tire then struck and overrode the 15 cm (6 in) curb of the gore that separated the eastbound lane (Event 3) and the eastbound right turn lane of the intersecting roadway. The right front tire struck the curb (Event 4) as the Toyota continued onto and across the second gore. Immediately following, the left rear tire and wheel struck the curb, causing damage to the wheel rim (Event 5). The right rear tire overrode the curbed gore without damage.

Traveling on three deflated tires, the Toyota continued southwest across the eastbound right turn lane and into the asphalt-surfaced parking lot of the restaurant. Rotating (deflated) tire marks evidenced the vehicle's trajectory. The investigating police agency painted these tire marks for documentation purposes. Due to the passage of time between the police investigation and the SCI investigation, the tire marks had eroded from the asphalt surfaces; however, the paint remained visible and was used by SCI to plot the trajectory of the Toyota.

The Toyota traveled approximately 27 m (88.6 ft) across the parking lots on a trajectory toward the east wall of the restaurant (Figure 4). The front plane of the Toyota struck and displaced three concrete-filled pipe bollards (Events 6, 7, and 8) that protected a pad-mounted heat pump. These impacts did not alter the trajectory of the vehicle. As the Toyota continued forward, the front plane struck the heat pump (Event 9). These fixed-object impacts were closely spaced and within 1 to 1.5 m (3 to 4 ft) of the building. The full front plane of the Toyota struck and penetrated the block wall of the building (Event 10). The EDR-recorded speed of the Toyota at impact with the building was 82 km/h (51 mph).

Figure 4. West-facing view of the Toyota's rotating tire marks (paint highlights) en route to impact with the bollards and the building

The Toyota penetrated the wall and struck several tables, chairs, and occupants of the building. Video cameras in the restaurant captured the vehicle's penetration. At the time of the SCI investigation, the restaurant was closed and under repair. SCI did not have access to the interior of the locked and unoccupied building during the on-site investigation. The frontal impact events with the bollards, heat pump, and wall commanded the actuation of the retractor pretensioners and the deployment of the driver's frontal and knee air bags. The unbelted driver was not injured in the crash.

The specific objects and occupants struck in the building remain unknown. The police reported that there were 23 occupants in the building at the time of the crash. Of the 23 occupants, 15 sustained police-reported possible injuries without medical transport. Five occupants sustained police-reported minor injuries and were transported to local hospitals for medical treatment. One sustained an occult-type liver injury and was transported to a local hospital, where he expired. Two occupants of the building were not injured.

Post-Crash

The Toyota came to rest completely in the confines of the building. The female driver of the Toyota was assisted from the vehicle and escorted outside the building. She denied injury. The injured occupants exited the damaged structure and waited for medical assistance. The police immediately deemed the building unsafe and prevented all occupants from reentering the structure in fear of collapse. Once the building was deemed sound, the Toyota was pulled from the building and towed from the scene to a police impound, where it was inspected for this investigation.

2009 Toyota Camry

Description

The 2009 Toyota Camry SE, manufactured in April 2008, was identified by Vehicle Identification Number 4T1BE46K49Uxxxxxx. It was powered by a 2.4-liter, transverse-mounted, 4-cylinder engine, and the 6-speed automatic transmission transferred power to the front wheels. The 4-door sedan had unibody construction with a 278 cm (109.5 in) wheelbase. The gross vehicle weight rating was 1,996 kg (4,400 lb) with gross axle weight ratings of 1,210 kg (2,668 lb) front and 1,070 kg (2,359 lb) rear. Standard features included traction control, electronic stability control, electronic brakeforce distribution, power-assisted rack-and-pinion steering, a tire pressure monitoring system, and electronic cruise control. The service brakes were power-assisted, 4-wheel disc with ABS. The vehicle manufacturer recommended tire size was P215/55R17 with recommended tire pressures of 221 kPa (32 PSI) at both axle locations. At the time of the crash, the Toyota had Goodyear Assurance all-season tires of the recommended size mounted on OEM 6-spoke alloy wheels. The specific tire data at the time of the SCI inspection were as follows:

	Tire Identification Number	Measured Tread Depth	Restricted	Damage
LF	M63R LF1R 0516	5 mm (6/32 in)	No	Outer sidewall holed, alloy wheel outer bead fractured, inner bead area dented. Tire flat.
LR	PJ3R JBNR 1816	5 mm (6/32 in)	No	None, inner and outer beads of alloy wheel dented. Tire flat.
RR	PJ3R JBNR 1816	6 mm (7/32 in)	No	None
RF	M63R LF1R 0516	5 mm (6/32 in)	No	Outer sidewall cut. Tire flat.

The interior of the Toyota had seating for five occupants with front-row bucket seats and a three-person second-row bench seat with split, forward-folding seat backs. All seating surfaces were cloth. All seat positions had adjustable head restraints adjusted to the full-down positions. Manual restraint systems consisted of 3-point lap and shoulder seat belt with sliding latch plates. Both front-row seat belt systems were equipped with retractor pretensioners that actuated during the crash. Supplemental safety systems included Certified Advanced 208-Compliant (CAC) frontal air bags for the driver and front passenger, a driver knee air bag, and front-seat-mounted side impact and inflatable curtain (IC) air bags. The driver's front and knee air bags deployed during the crash.

Vehicle History

During the SCI inspection of the Toyota, a collection of documents was removed from the glovebox and reviewed for the service history of the vehicle. Key service items were as follows:

- The 2009 Toyota was sold at auction on November 23, 2009, with a recorded mileage of 71,754 km (44,586 mi). Records indicated it was formerly a rental car.
- December 17, 2009 – Vehicle offered for sale.
- April 29, 2014 – Dealer service, floor mats not installed correctly, mileage 217,839 km (135,359 mi).

- December 3, 2015 – Independent body shop completed repairs of sideswipe-type damage that included replacement of the front bumper fascia, right front fender and inner liner, right front door skin, right door handle, and the right outside mirror. Repair cost $1,343.
- March 16, 2016 – Front control arm bushings replaced, mileage 258,216 km (160,448 mi).

NHTSA Recalls and Investigations

There were no active recalls or investigations for this vehicle based on a VIN query of the NHTSA database. Previous recall modifications (NHTSA Campaign 09V388000) were completed on the OEM accelerator pedal prior to this driver's ownership period.

Exterior Damage

The exterior of the Toyota sustained damage to the undercarriage, front, top, and both side planes from this multiple event crash. The most severe damage occurred from impacts with the bollards, heat pump, and the wall of the building, Events 6 to 10. The direct-contact damage across the front plane could not be isolated for each event; therefore, a singular damage profile was documented for the front plane damage (Figure 5). Direct-contact damage was distributed across the full width of the bumper fascia with multiple fractures of the fascia and separation of the left aspect. The bumper beam was crushed, which yielded a combined direct and induced damage length of 114 cm (45 in) extending from corner to corner. Maximum crush was 34 cm (13.5 in) located 29 cm (11.5 in) right of the vehicle's centerline. A crush profile documented at the level of the bumper beam was as follows: C1 = 6 cm (2.3 in), C2 = 13 cm (5.0 in), C3 = 20 cm (8.0) in, C4 = 27 cm (10.8 in), C5 = 29 cm (11.5 in), and C6 = 23 cm (9.0 in). The severity of the combined impact calculated by the WinSMASH program was 31 km/h (19 mph). The longitudinal and lateral components of the delta V were -29 km/h (-18mph) and -10 km/h (-6 mph), respectively. This calculation was considered borderline due to the overlapping damage.

Figure 5. Front left oblique view of the damage to the 2009 Toyota

As the vehicle penetrated the building, the displaced block hit the windshield, producing five fracture sites with induced fracturing across the full height and length of the laminated glazing.

The windshield header was crushed downward. Isolated dents and scratches were present on the left plane involving the left front fender, both doors, the lower C-pillar dogleg, the outside mirror, and the quarter panel. The top surface of the trunk deck was dented from displaced block and building debris. The right front fender was scratched and dented, as were the right front door and right mirror. Both upper A-pillars sustained isolated dents.

Undercarriage damage from the gore (Event 1) was limited to scratches at the frontal area. Additional damage involved the tires and wheels from curb impacts, Events 2 to 5. The left front tire sidewall was cut with an air-out of the tire. The alloy wheel was fractured and dented at the rim beads. This damage occurred at Event 3. The right front tire sidewall was cut resulting in an air-out of the tire. The alloy wheel bead was abraded from Events 2 and 4. The left rear wheel was dented at both beads, causing flattening of the tire. This resulted from Event 5. The estimated Collision Deformation Classifications (CDCs) for these 10 events are detailed in the following table.

Event No.	Object Struck	CDC
1	Curb	00UFCN1
2	Curb	12FRWN3
3	Curb	12FLWN3
4	Curb	12FRWN3
5	Curb	12FLWN9
6	Bollard	12FREN1
7	Bollard	12FCEN1
8	Bollard	12FREN1
9	Heat Pump	12FZEW1
10	Building	01FDEW2

Event Data Recorder

The 2009 Toyota Camry was equipped with an air bag electronic control unit (ECU) that performed the diagnostic, sensing, and deployment command functions for the vehicle's supplemental restraint systems. This ECU had EDR capabilities. The EDR component was imaged during the SCI inspection with the Bosch Crash Data retrieval tool and software version 17.5.1 via a hardware connection to the Diagnostic Link Connector located in the occupant compartment. Electrical power was supplied from the vehicle's 12-volt battery. The imaged data, reported with version 17.7.1, are included at the end of this report as Appendix A.

The data limitations reported that the EDR was capable of recording two event types, namely non-deployment events and deployment events. An event that met the threshold for a recording but did not command the deployment of a supplemental restraint device (pretensioner or air bag) was considered a non-deployment event. Non-deployment events were not locked and could be overwritten by subsequent qualified events. A deployment event met the threshold to command the actuation/deployment of a pretensioner and/or air bag. Deployment events were locked events and could not be overwritten. This EDR recognized longitudinal, lateral, and rollover events and had the capacity to store two records for each event type. Two memory maps (data buffers) were available to record approximately five seconds of pre-crash vehicle performance parameters (vehicle speed, accelerator pedal position, brake status, and engine rpm) and were

linked to the recorded event types. The concept of a trigger counter was used to order the recorded events.

The imaged data indicated that the Toyota's EDR had recognized and recorded four events. These were ordered consecutively as triggers 5 to 8. Trigger 8 was termed the most recent event and was considered a deployment event (pretensioner and air bag). The four triggers were associated with each other and were completely recorded. The air bag warning lamp was off for each recording, and there were no Diagnostic Trouble Codes. The driver's seat belt was recorded as unbuckled at each trigger.

Most Recent Event – Trigger 8:

The data of this event indicated that the pretensioners were commanded to actuate at 21 milliseconds, and a Level 2 air bag deployment was commanded 95 milliseconds after AE. The event trigger was attributed to the impact with the bollards, heat pump, or (subsequently) the building, Events 6 to 10 of the SCI crash reconstruction. It was difficult to identify the specific trigger object in this cluster due to their close proximity and the overlapping vehicle damage pattern. It has been theorized that the impact to the bollards surrounding the heat pump unit was the most likely source of the event trigger. The maximum recorded longitudinal delta V was -35.3 km/h (-22.3 mph) at 200 milliseconds. A review of the crash pulse revealed that the entire duration of the crash had not been recorded. The crash pulse was still active with an increasing negative magnitude.

The recorded pre-crash vehicle parameters were as follows:

Time Seconds	Speed km/h (mph)	Accelerator Rate Voltage	Brake Switch	Engine rpm
-4.5	122 (75.8)	0.78	On	2,000
-3.5	116 (72.1)	0.78	On	2,000
2.5	100 (62.1)	0.78	On	1,600
-1.5	98 (60.9)	0.78	Off	1,200
-0.5	80 (49.7)	0.78	On	1,200
0	82 (51.0)	0.78	On	800

Examination of the data trends revealed that the driver was intermittently applying the brake with a corresponding reduction in the vehicle's speed. The accelerator was in the closed (released or off) position based on the voltage value. The reduction in the engine rpms was consistent with a closed throttle. It should be noted that the recorded speed of the Toyota at the -4.5 second interval was 122 km/h (75.8 mph). The data limitations indicated that this value was considered an upper limit, such that the actual center-of-mass speed of the Toyota was of an unknown magnitude greater than this maximum value during the crash sequence.

The driver's allegations of a brake malfunction or the occurrence of an unintended acceleration were inconsistent with the EDR data.

Interior Damage

Interior damage was limited to the deployment of the driver's frontal and knee bolster air bags and the intrusion of the windshield header. There were no specific occupant contacts in the interior of the Toyota. The left mid and lower instrument panels were separated from the deployment of the knee bolster air bag. The driver's frontal air bag separated at the horizontal tear seam of the steering wheel-mounted module. The header intruded several centimeters into the front-row occupant space due to the impact(s) of the falling concrete.

Brake Inspection

The driver of the Toyota initially claimed a brake malfunction as the cause of the crash. The investigating police agency called for an independent inspection of the vehicle's brake system by an outside police agency. This inspection deemed the Toyota's brakes to be fully operational with no malfunctions.

During the joint SCI and Toyota inspection conducted in December 2017, the braking system was again thoroughly examined and documented. Figure 6 is a view of the right front brake assembly. The brake fluid reservoir of the master cylinder was full to the full level line. Pumping of the brake pedal without vacuum assist yielded firm pedal pressure. Three of the four tires and wheels were removed from the Toyota. A lug nut at the right rear position was rounded off; therefore, it could not be removed without destructive efforts. A thorough inspection of the brake calipers, slides, brake pads, and lines was conducted at each wheel position. There were no fluid leaks in the system. All calipers moved freely on the slides. The rotors were free of scoring. The front axle brake pads measured 10 mm (0.4 in) in thickness. The pads at the left rear position measured 5 mm (0.2 in). The outer pad at the right rear position measured 4 mm (0.15 in).

Foot Controls

The Toyota was equipped with a Denso electronic accelerator pedal and a conventional brake pedal that was connected to a linkage arm direct to the vacuum booster unit of the power-assisted brake system. The Denso pedal in this 2009 Toyota was subjected to an earlier NHTSA/Toyota recall and had been serviced. The lower aspect of the accelerator pedal was cut off and rounded to prevent interference and capturing by floor mats. The overall length of the pedal was 9 cm (3.4 in) with a width of 4 cm (1.6 in). The pedal was fully depressed during the inspection, and it did not engage the carpeted floor mat or OEM carpeting (Figure 7).

The brake pedal in its static position was 110 mm (4.3 in) above the OEM carpet. The pedal was depressed by a Toyota representative with a force of 490 nm (newton meters). While depressed, the gap between the back of the pedal and the OEM carpet measured 55 mm (2.2 in). This was within normal specifications.

Floor Mats

The driver of the Toyota operated the vehicle with three loosely installed aftermarket floor mats in the front left position (Figure 8). The vehicle was equipped with pins in the OEM carpet to secure OEM-type floor mats. These pins were not used as the aftermarket mats did not contain holes for the pins.

Installed over the OEM carpet was a stick-down plastic film that was installed to protect the OEM carpet prior to sale. It was suspected that this plastic film was installed prior to the auction sale of November 23, 2009. The three aftermarket mats consisted of a carpeted bottom mat that measured 64 cm (25 in) in length x 42 cm (16.5 in) at the widest point and 35 cm (13.8 in) at the opposite end. The wide portion of this mat was positioned forward at the toe pan. This mat was on top of the plastic temporary protectant film. The middle aftermarket mat was a sister mat to the bottom mat but reversed in orientation with the narrow portion at the toe pan. The third mat measured 44 cm (17.25 in) square and was positioned with two-thirds of the mat on the floor pan and the forward third on the toe pan. These mats did not interfere with the operation of the recalled and modified accelerator pedal.

Figure 6. Right front brake assembly of the Toyota

Figure 7. Recall-modified Denso accelerator pedal fully depressed against the carpeted floor mat

Figure 8. Driver floor mats of the Toyota

Figure 9. Throttle plate of the Toyota fully open during the check-out

Throttle Body

The air box was removed from the engine compartment to view the position and observe the status of the throttle body. The initial observation of the throttle plate was in the fully closed position. Toyota representatives tested the status of the throttle. With the ignition key turned to the run-position, the system does a self-diagnostic check and rapidly opens (Figure 9) and closes the throttle plate. The system operated properly during this check-out.

Manual Restraint Systems

The SCI vehicle inspection determined that the female driver of the Toyota was not restrained by the manual seat belt at the time of the crash. The belt was stowed and taut against the left B-pillar due to the actuation of the retractor pretensioner. The EDR data was in agreement with this determination.

Supplemental Restraint Systems

The driver's frontal and knee air bags deployed at impact with the building. The EDR report listed deployment as Level 2. There was no identified occupant contact evidence to the deployed air bags. The side impact seat-mounted and IC air bags did not deploy.

2009 Toyota Occupant

Driver Demographics

Age/sex:	55 years/female
Height:	Unknown
Weight:	Unknown
Eyewear:	Unknown
Seat type:	Forward-facing bucket seat with adjustable head restraint
Seat track position:	Mid-to-rear track
Manual restraint usage:	None, 3-point lap and shoulder seat belt was available
Usage source:	Vehicle inspection/EDR
Air bags:	Frontal, knee, seat-mounted side impact and IC air bags available; frontal and knee air bags deployed.
Alcohol/drug data:	Not tested
Egress from vehicle:	Assisted from vehicle prior to first responders
Transport from scene:	Police transport to her residence
Medical treatment:	None, not injured

Driver Injuries

Injury No.	Injury	Injury Severity AIS 2015	Involved Physical Component (IPC)	IPC Confidence Level
1	Not injured	N/A	N/A	N/A

Source: PAR.

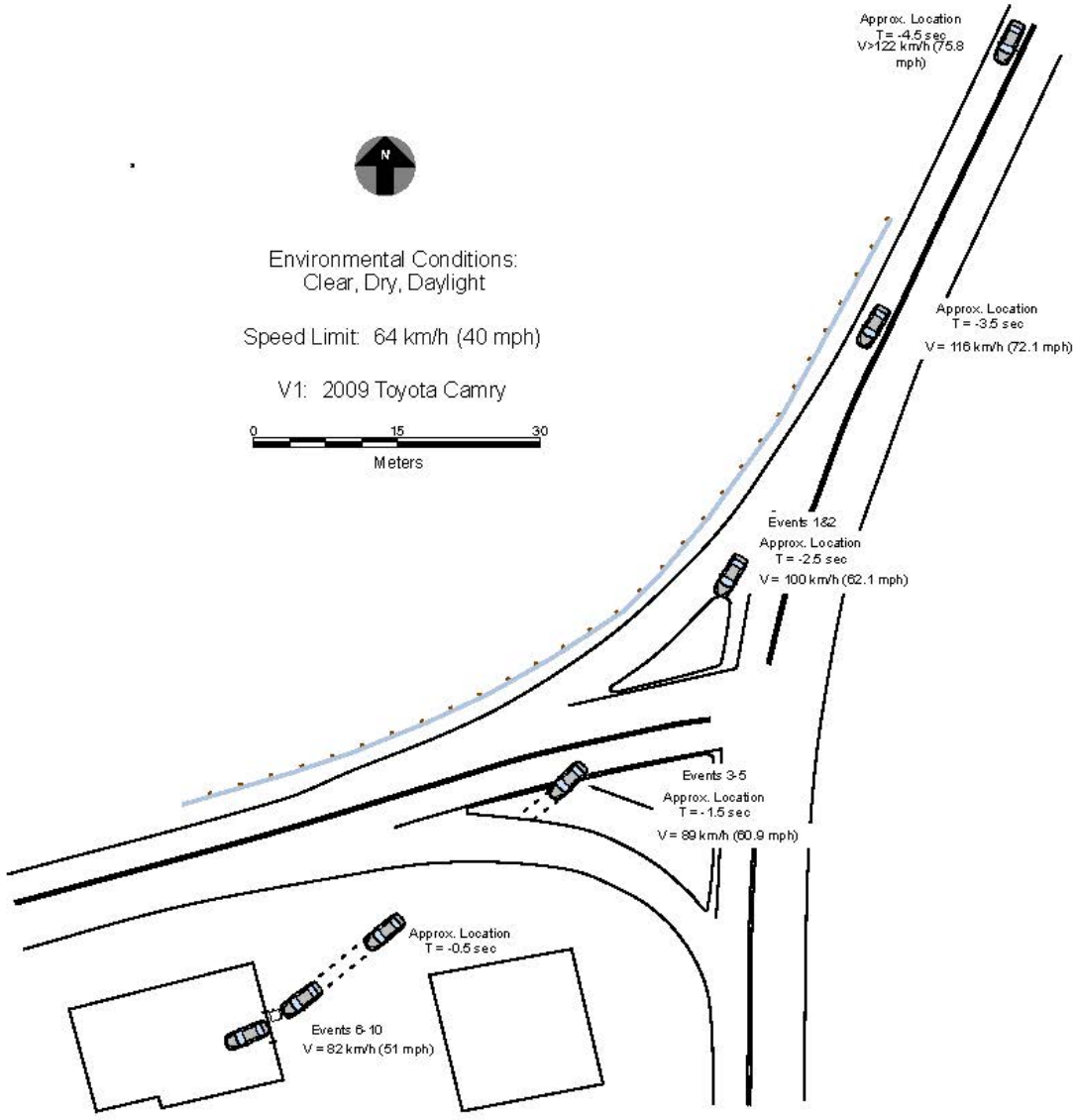
Driver Kinematics

The 55-year-old female driver of the Toyota was seated in a mid-to-rear track position with the adjustable head restraint in the full-down position. She did not use the manual seat belt system as the pretensioner actuated and cinched the belt webbing taut in its stowed position against the left B-pillar.

The curb impacts minimally displaced the driver. She would have responded forward and downward into the seat cushion as the vehicle was decelerated in the longitudinal direction with a vertical component. As the Toyota struck the bollards and the building, the unbelted driver initiated a forward trajectory. The driver's frontal air bag deployed (Stages 1 and 2) along with the knee air bag. As she translated forward, the driver loaded the deployed air bags which prevented her from contact with hard interior surfaces and produced a ride down of the crash forces. She was not injured in the crash.

Following the crash, the driver was assisted from the vehicle due to its position in the building and the amount of debris surrounding the Toyota. The police subsequently transported the driver to her residence. She declined to be interviewed for this SCI investigation.

Crash Diagram



	NHTSA www.nhtsa.gov
Case Number:	CR17035

Appendix A: Event Data Report for 2009 Toyota Camry[1]

[1] The Event Data Recorder report published as part of this technical report is the latest software version of the Bosch CDR tool at the time of the vehicle inspection. The CDR report contained in the associated CISSWEB application may be of an earlier software version of the Bosch CDR tool and may differ relative to this report.

BOSCH

CDR CRASH DATA RETRIEVAL

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/Frame Number	4T1BE46K49U******
User	
Case Number	
EDR Data Imaging Date	
Crash Date	
Filename	201750S1CR17035_V1_ACM.CDRX
Saved on	
Imaged with CDR version	Crash Data Retrieval Tool 17.5.1
Imaged with Software Licensed to (Company Name)	NHTSA
Reported with CDR version	Crash Data Retrieval Tool 17.7.1
Reported with Software Licensed to (Company Name)	NHTSA
EDR Device Type	Airbag Control Module
Event(s) recovered	Front/Rear (2), Side (2)

Comments

No comments entered.

Data Limitations

CDR Record Information:

- Due to limitations of the data recorded by the airbag ECU, such as the resolution, data range, sampling interval, time period of the recording, and the items recorded, the information provided by this data may not be sufficient to capture the entire crash.
- Pre-Crash data is recorded in discrete intervals. Due to different refresh rates within the vehicle's electronics, the data recorded may not be synchronous to each other.
- Airbag ECU data should be used in conjunction with other physical evidence obtained from the vehicle and the surrounding circumstances.
- If the airbags did not deploy or the pretensioners did not operate during an event that meets a specified recording threshold, it is called a Non-Deployment Event. Data from a Non-Deployment Event can be overwritten by a succeeding event that meets the specified recording threshold. If the airbag(s) deploy or the pretensioners are operated, it is called a Deployment Event. Deployment Event data cannot be overwritten or deleted by the airbag ECU following that event.
- If power supply to the airbag ECU is lost during an event, all or part of the data may not be recorded.
- "Diagnostic Trouble Codes" are information about faults when a recording trigger is established. Various diagnostic trouble codes could be set and recorded due to component or system damage during an accident.
- The airbag ECU records only diagnostic information related to the airbag system. It does not record diagnostic information related to other vehicle systems.
- The TaSCAN, Global Tech Stream, or Intelligent Tester II devices (or any other Toyota genuine diagnostic tool) can be used to obtain detailed information on the diagnostic trouble codes from the airbag system, as well as diagnostic information from other systems. However, in some cases, the diagnostic trouble codes of the airbag system recorded by the airbag ECU when the event occurred may not match the diagnostic trouble codes read out when the diagnostic tool is used.

General Information:

- The data recording specifications of Toyota's airbag ECUs are divided into the following categories. The specifications for 12EDR or later are designed to be compatible with NHTSA's 49CFR Part 563 rule.
  - 00EDR / 02EDR / 04EDR / 06EDR / 10EDR / 12EDR / 13EDR / 15EDR / 17EDR
- The airbag ECU records data for all or some of the following accident types: frontal crash, rear crash , side crash, and rollover events. Depending on the installed airbag ECU, data for side crash and/or rollover events may not be recorded.
- This airbag ECU records post-crash data, and depending on the airbag ECU, may record pre-crash data.
  - If a single event occurs independently, the data for that event is recorded on a one-to-one basis.
  - If multiple events occur successively (within a period of approximately 500ms), the establishment of the recording trigger for the first event is defined as the "pre-crash recording trigger". Pre-crash data for the first event and post-crash data for each successive event is then recorded.
- The airbag ECU has two recording pages (memory maps) to store pre-crash data. Additionally, to store post-crash data, the airbag ECU has two recording pages for each accident type: two pages for frontal and rear crash, two pages for a side crash, and two pages for rollover event.

- The data recorded by the airbag ECU includes correlating information between each previously occurring event (i.e., information that clarifies the collision event sequence. This correlation information consists of the following items.
  - Time from Previous Pre-Crash TRG
  - Linked Pre-Crash Page
  - Time from Pre-Crash TRG
  - TRG Count
  - Previous Crash Type
- The point in time at which the recording trigger is established is regarded as time zero for the recorded data.
- The recording trigger judgment threshold value differs depending on the collision type (i.e., frontal crash, rear crash, side crash, or rollover event).
- Time series data for side crash may have 24 or 25 sampling points.
- Some of the data recorded by the airbag ECU is transmitted to the airbag ECU from various vehicle control modules by the vehicle's Controller Area Network (CAN).
- In some cases, the airbag ECU part number printed on the ECU label may not match the airbag ECU part number that the CDR tool reports. The part number retrieved by the CDR tool should be considered as the official ECU part number.

Data Element Sign Convention:
The following table provides an explanation of the sign notation for data elements that may be included in this CDR report.

Data Element Name	Positive Sign Notation Indicates
Max. Longitudinal Delta-V	Forward
Longitudinal Delta-V	Forward
Max. Lateral Delta-V , B-Pillar Sensor	Outside to Inside
Max. Lateral Delta-V , C-Pillar Sensor	Outside to Inside
Max. Lateral Delta-V , Slide Door Sensor	Outside to Inside
Lateral Delta-V , B-Pillar Sensor	Outside to Inside
Lateral Delta-V , C-Pillar Sensor	Outside to Inside
Lateral Delta-V , Slide Door Sensor	Outside to Inside
Lateral Delta-V , Airbag ECU Sensor	Left to Right
Roll Angle Peak	Clockwise Rotation
Roll Angle	Clockwise Rotation
Lateral Acceleration , Airbag ECU Sensor *	Right to Left

* For sensing a rollover

Data Definitions:
1)

- The "ON" setting for the "Freeze Signal" indicates a state in which the non-volatile memory can not be overwritten or deleted by the airbag ECU. After "Freeze Signal" has been turned ON, subsequent events will not be recorded.
- "Recording Status" indicates a state in which all recorded event data has been written into the non-volatile memory, or a state in which this process was interrupted and not fully written into the non-volatile memory. If "Recording Status" is "Incomplete", recorded event data may not be valid.
- "Time to Deployment Command" indicates the time between recording trigger establishment and the determination of airbag deployment. This value may differ from the actual time it takes for the airbag to fully deploy.
- Even if an airbag/pretensioner did not deploy due to the "front passenger airbag disable switch and/or "RSCA Disable Switch" in the ON position or other disabling criteria are met, the "Time to deployment command" data element for that airbag/pretensioner may still be recorded.
- "Engine RPM" indicates the number of engine revolutions, not the number of motor revolutions. The recorded value has an upper limit of 5,200 rpm. Resolution is 400 rpm and the value is rounded down and recorded. For example, if the actual engine speed is 799 rpm, the recorded value will be 400 rpm.
- The upper limit for the recorded "Vehicle Speed" value is 122 km/h (75.8mph). Resolution is 2km/h (1.2mph) and the value is rounded down and recorded. The accuracy of the "Vehicle Speed" value can be affected by various factors. These include, but not limited, to the following.
  - Significant changes in the tire's rolling radius
  - Wheel lock and wheel slip
- "Accelerator Rate" value is recorded as a voltage. The voltage increases as the driver depresses the accelerator.
- The "Drive" setting for the "Shift Position" value indicates the shift position state is other than "R,"(Reverse), "N" (Neutral), or "P" (Park). If sequential shift had been used, "Invalid" may be displayed.
- Depending on the type of occupant sensor installed in the vehicle, one of the following three recording formats for "Occupancy Status, Passenger" will be utilized.
  - Occupied / Not Occupied
  - Adult / Child / Not Occupied
  - AM50 / AF05 / Child / Not Occupied
- Resolution of the "Air Bag Warning Lamp ON Time Since DTC was Set" is 15 minutes, and the value is rounded down and recorded.
- "Longitudinal Delta-V" indicates the change in forward speed after establishment of the recording trigger. This does not refer to vehicle speed, and it does not include the change in speed during the period from the start of the actual collision to establishment of the recording trigger.
- Depending on the specifications, "Roll Angle peak" can be recorded as absolute value.
- "Roll Angle peak" may not always match the peak value within the "Roll Angle" sampling points due to differences in data calculation method.

- For "Lateral Delta-V", the sensor location (B-pillar, front door, C-pillar, and slide door) shows the outline of a typical sensor position. Sensory location can be confirmed using the repair manual.
- "Time from Previous Pre-Crash TRG" indicates the time between the establishment of an event's pre-crash recording trigger to the establishment of a more recent event's pre-crash recording trigger. The upper limit for the recorded value is 16,381 milliseconds. In the event of establishment of the first pre-crash recording trigger after the ignition is switched ON, the upper limit value(max value) is recorded.
- "TRG Count" indicates a calculated value of the number of times recording triggers have been established for all crash types. The sequence in which each event occurred can be verified from the "TRG Count". The smaller the "TRG Count" value, the older the data. The upper limit for the recorded value is 65,533 times. When more than one event reaches the upper limit, the actual "TRG Count" may be greater than what is displayed for that event.
- "Linked Pre-Crash Page" is used to link 'paged" pre-crash data with 'paged" post-crash data. When old pre-crash data is overwritten by new pre-crash data, the "Linked Pre-Crash Page" value may record a page number that is not actually linked.
- Resolution of the "Time from Pre-Crash to TRG" is 100 [ms], and the value is rounded down and recorded.

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System Status at Time of Retrieval

ECU Part Number	89170-33490
ECU Generation	04EDR
Recording Status, All Pages	Complete
Freeze Signal	ON
Freeze Signal Factor	Front Pretensioner Deployment
Diagnostic Trouble Codes Exist	No
Time from Previous Pre Crash TRG (msec)	1501
Latest Pre-Crash Page	0
Contains Unlinked Pre-Crash Data	No

Event Record Summary at Retrieval

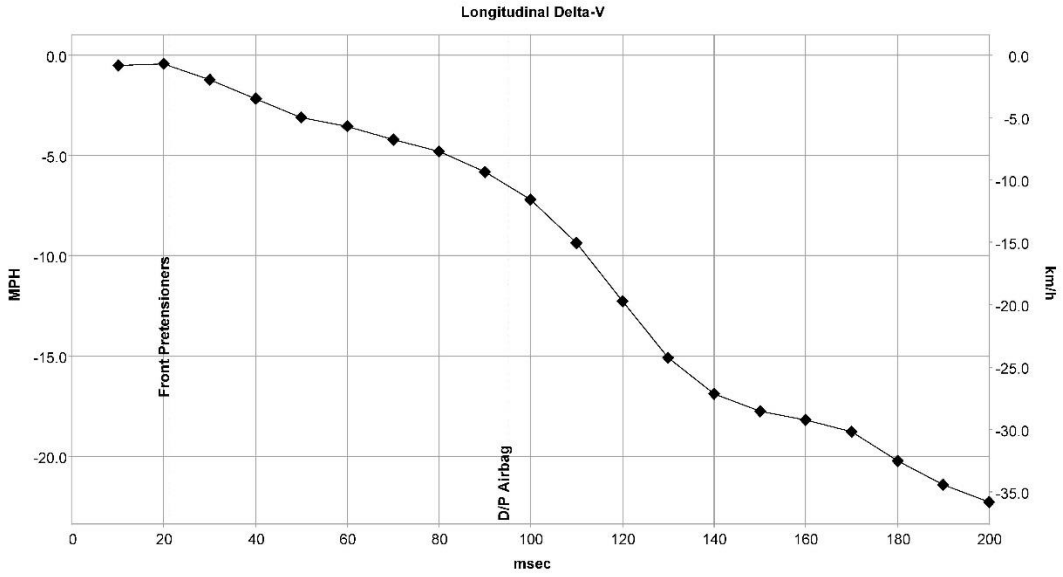
Events Recorded	TRG Count	Crash Type	Time (msec)	Pre-Crash and/or DTC Data Recording Status	Event & Crash Pulse Data Recording Status
Most Recent Event	8	Front/Rear Crash	0	Complete (Page 0)	Complete (Front/Rear Page 1)
1st Prior Event	7	Side Crash	-9	Complete (Page 0)	Complete (Side Page 1)
2nd Prior Event	6	Front/Rear Crash	-1111	Complete (Page 1)	Complete (Front/Rear Page 0)
3rd Prior Event	5	Side Crash	-1405	Complete (Page 1)	Complete (Side Page 0)

System Status at Event (Most Recent Event, TRG 8)

Recording Status, Front/Rear Crash Info.	Complete
Crash Type	Front/Rear Crash
TRG Count (times)	8
Previous Crash Type	Side
Time from Pre-Crash TRG (msec)	9
Linked Pre-Crash Page	0
Time to Deployment Command, Front Airbag, Driver (msec)	95
Time to Deployment Command, Front Airbag, Passenger (msec)	95
Event Severity Status, Driver	Level 2
Event Severity Status, Passenger	N/A
Time to Deployment Command, Pretensioner (msec)	21

Longitudinal Crash Pulse (Most Recent Event, TRG 8 - table 1 of 2)

Recording Status, Time Series Data	Complete
Max Longitudinal Delta-V (MPH [km/h])	-22.3 [-35.9]



Longitudinal Crash Pulse (Most Recent Event, TRG 8 - table 2 of 2)

Time (msec)	Longitudinal Delta-V (MPH [km/h])
10	-0.5 [-0.8]
20	-0.4 [-0.7]
30	-1.2 [-1.9]
40	-2.1 [-3.4]
50	-3.1 [-5.0]
60	-3.5 [-5.7]
70	-4.2 [-6.8]
80	-4.8 [-7.7]
90	-5.8 [-9.4]
100	-7.2 [-11.6]
110	-9.3 [-15.0]
120	-12.3 [-19.7]
130	-15.1 [-24.3]
140	-16.9 [-27.2]
150	-17.7 [-28.5]
160	-18.2 [-29.2]
170	-18.8 [-30.2]
180	-20.2 [-32.5]
190	-21.4 [-34.5]
200	-22.3 [-35.9]

DTCs Present at Time of Event (Most Recent Event, TRG 8)

Recording Status, Diagnostic	Complete
Ignition Cycle Since DTC was Set (times)	0
Airbag Warning Lamp ON Time Since DTC was Set (min)	0
Diagnostic Trouble Codes	None

Pre-Crash Data, 1 Sample (Most Recent Event, TRG 8)

Recording Status, Pre-Crash/Occupant	Complete
Time from Pre-Crash to TRG (msec)	500
Buckle Switch, Driver	Unbuckled
Buckle Switch, Passenger	Unbuckled
Occupancy Status, Passenger	Not Occupied
Seat Position, Driver	Rearward
Shift Position	Drive

Pre-Crash Data, -5 to 0 seconds (Most Recent Event, TRG 8)

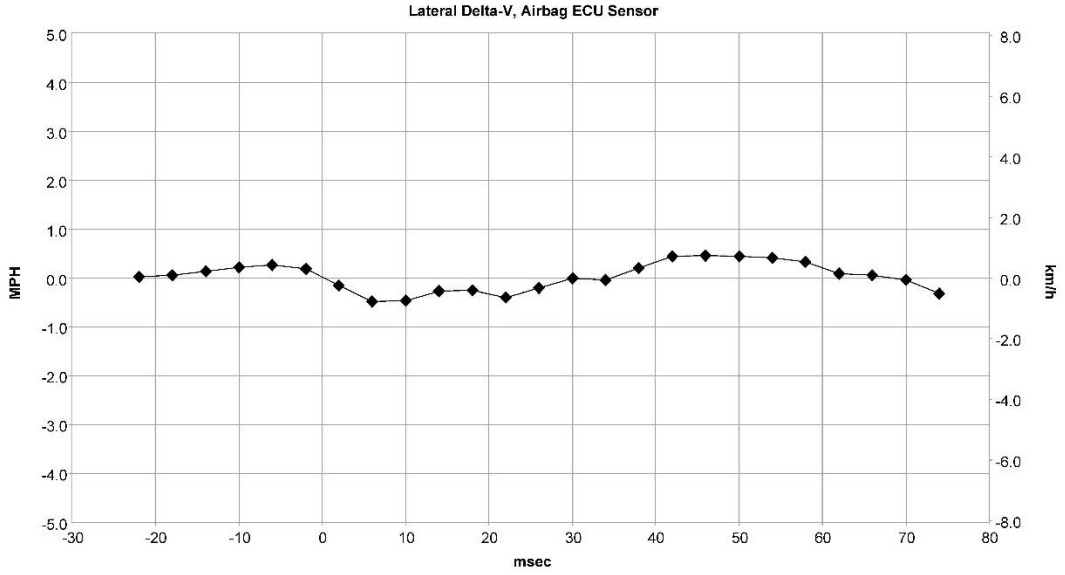
Time (sec)	-4.5	-3.5	-2.5	-1.5	-0.5	0 (TRG)
Vehicle Speed (MPH [km/h])	75.8 [122]	72.1 [116]	62.1 [100]	60.9 [98]	49.7 [80]	51 [82]
Brake Switch	ON	ON	ON	OFF	ON	ON
Accelerator Rate (V)	0.78	0.78	0.78	0.78	0.78	0.78
Engine RPM (RPM)	2,000	2,000	1,600	1,200	1,200	800

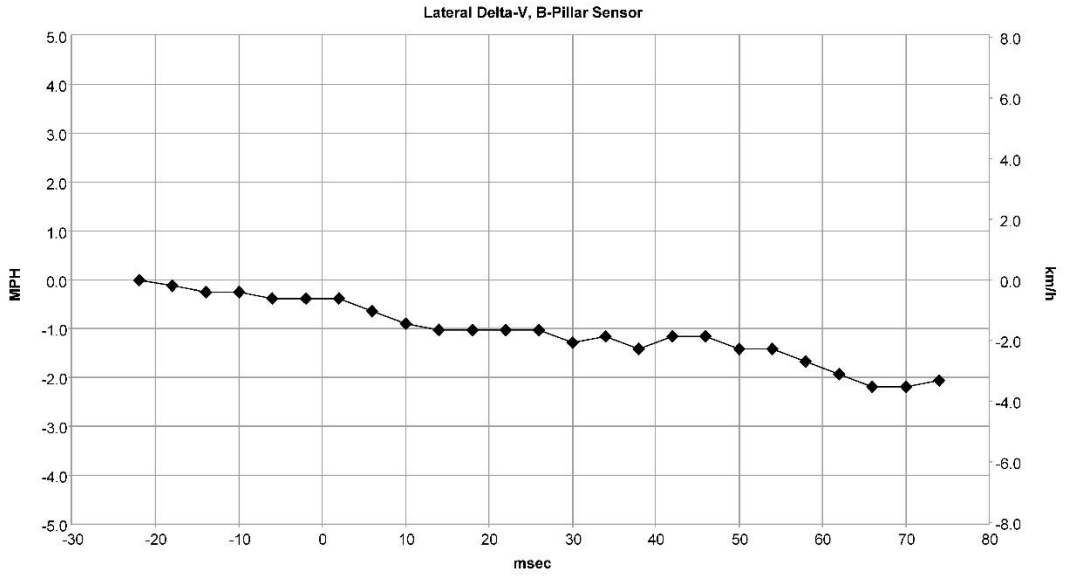
System Status at Event (1st Prior Event, TRG 7)

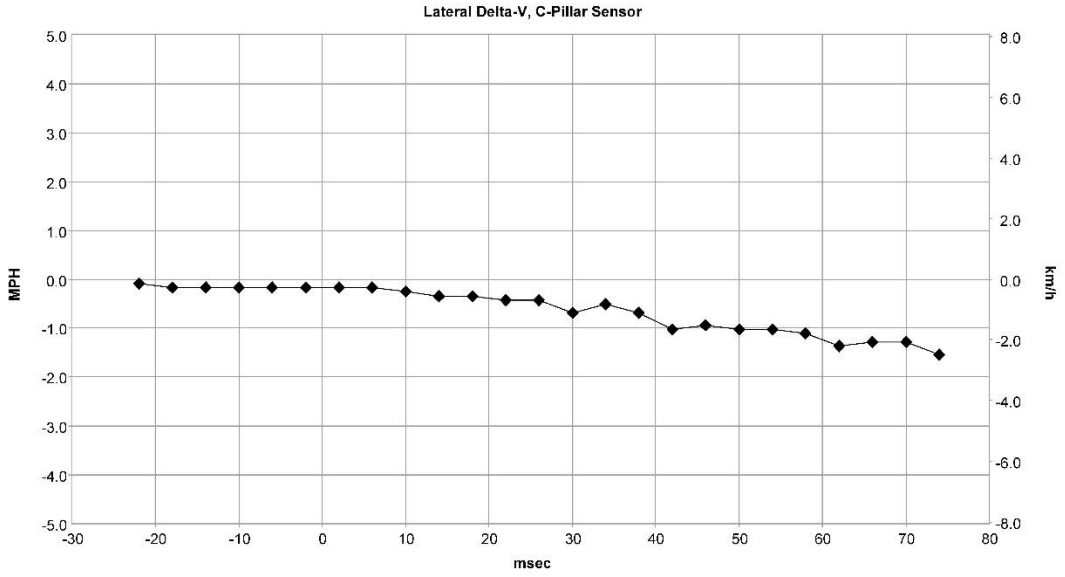
Recording Status, Side Crash Info.	Complete
Crash Type	Side Crash
TRG Count (times)	7
Recorded Side	Driver's Side
Previous Crash Type	Frontal/Rear
Time from Pre-Crash TRG (msec)	0
Linked Pre-Crash Page	0
Time to Deployment Command, B-Pillar Sensor (msec)	Not Commanded
Time to Deployment Command, C-Pillar Sensor (msec)	Not Commanded

Lateral Crash Pulse (1st Prior Event, TRG 7 - table 1 of 2)

Recording Status, Time Series Data	Complete
Time from TRG to Next Sample (msec)	2
Max Lateral Delta-V, B-Pillar Sensor (MPH [km/h])	-2.2 [-3.5]
Max Lateral Delta-V, C-Pillar Sensor (MPH [km/h])	-1.5 [-2.5]






Lateral Delta-V, C-Pillar Sensor
MPH
km/h
msec
5.0
4.0
3.0
2.0
1.0
0.0
-1.0
-2.0
-3.0
-4.0
-5.0
8.0
6.0
4.0
2.0
0.0
-2.0
-4.0
-6.0
-8.0
-30
-20
-10
0
10
20
30
40
50
60
70
80

Lateral Crash Pulse (1st Prior Event, TRG 7 - table 2 of 2)

Time (msec)	Lateral Delta-V, Airbag ECU Sensor (MPH [km/h])	Lateral Delta-V, B-Pillar Sensor (MPH [km/h])	Lateral Delta-V, C-Pillar Sensor (MPH [km/h])
-22	0.0 [0.0]	0.0 [0.0]	-0.1 [-0.1]
-18	0.1 [0.1]	-0.1 [-0.2]	-0.2 [-0.3]
-14	0.1 [0.2]	-0.3 [-0.4]	-0.2 [-0.3]
-10	0.2 [0.4]	-0.3 [-0.4]	-0.2 [-0.3]
-6	0.3 [0.4]	-0.4 [-0.6]	-0.2 [-0.3]
-2	0.2 [0.3]	-0.4 [-0.6]	-0.2 [-0.3]
2	-0.2 [-0.2]	-0.4 [-0.6]	-0.2 [-0.3]
6	-0.5 [-0.8]	-0.6 [-1.0]	-0.2 [-0.3]
10	-0.5 [-0.7]	-0.9 [-1.4]	-0.3 [-0.4]
14	-0.3 [-0.4]	-1.0 [-1.7]	-0.3 [-0.6]
18	-0.3 [-0.4]	-1.0 [-1.7]	-0.3 [-0.6]
22	-0.4 [-0.6]	-1.0 [-1.7]	-0.4 [-0.7]
26	-0.2 [-0.3]	-1.0 [-1.7]	-0.4 [-0.7]
30	0.0 [0.0]	-1.3 [-2.1]	-0.7 [-1.1]
34	0.0 [-0.1]	-1.2 [-1.9]	-0.5 [-0.8]
38	0.2 [0.3]	-1.4 [-2.3]	-0.7 [-1.1]
42	0.4 [0.7]	-1.2 [-1.9]	-1.0 [-1.7]
46	0.5 [0.7]	-1.2 [-1.9]	-0.9 [-1.5]
50	0.4 [0.7]	-1.4 [-2.3]	-1.0 [-1.7]
54	0.4 [0.7]	-1.4 [-2.3]	-1.0 [-1.7]
58	0.3 [0.5]	-1.7 [-2.7]	-1.1 [-1.8]
62	0.1 [0.1]	-1.9 [-3.1]	-1.4 [-2.2]
66	0.1 [0.1]	-2.2 [-3.5]	-1.3 [-2.1]
70	0.0 [-0.1]	-2.2 [-3.5]	-1.3 [-2.1]
74	-0.3 [-0.5]	-2.1 [-3.3]	-1.5 [-2.5]

DTCs Present at Time of Event (1st Prior Event, TRG 7)

Recording Status, Diagnostic	Complete
Ignition Cycle Since DTC was Set (times)	0
Airbag Warning Lamp ON Time Since DTC was Set (min)	0
Diagnostic Trouble Codes	None

Pre-Crash Data, 1 Sample (1st Prior Event, TRG 7)

Recording Status, Pre-Crash/Occupant	Complete
Time from Pre-Crash to TRG (msec)	500
Buckle Switch, Driver	Unbuckled
Buckle Switch, Passenger	Unbuckled
Occupancy Status, Passenger	Not Occupied
Seat Position, Driver	Rearward
Shift Position	Drive

Pre-Crash Data, -5 to 0 seconds (1st Prior Event, TRG 7)

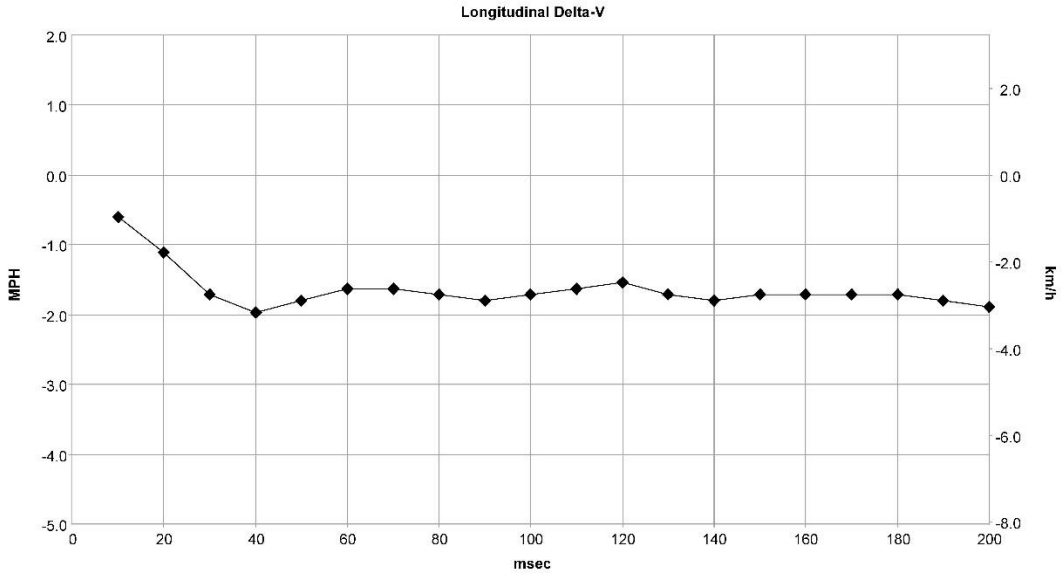
Time (sec)	-4.5	-3.5	-2.5	-1.5	-0.5	0 (TRG)
Vehicle Speed (MPH [km/h])	75.8 [122]	72.1 [116]	62.1 [100]	60.9 [98]	49.7 [80]	51 [82]
Brake Switch	ON	ON	ON	OFF	ON	ON
Accelerator Rate (V)	0.78	0.78	0.78	0.78	0.78	0.78
Engine RPM (RPM)	2,000	2,000	1,600	1,200	1,200	800

System Status at Event (2nd Prior Event, TRG 6)

Recording Status, Front/Rear Crash Info.	Complete
Crash Type	Front/Rear Crash
TRG Count (times)	6
Previous Crash Type	Side
Time from Pre-Crash TRG (msec)	399
Linked Pre-Crash Page	1
Time to Deployment Command, Front Airbag, Driver (msec)	Not Commanded
Time to Deployment Command, Front Airbag, Passenger (msec)	Not Commanded
Event Severity Status, Driver	N/A
Event Severity Status, Passenger	N/A
Time to Deployment Command, Pretensioner (msec)	Not Commanded

Longitudinal Crash Pulse (2nd Prior Event, TRG 6 - table 1 of 2)

Recording Status, Time Series Data	Complete
Max Longitudinal Delta-V (MPH [km/h])	-2.0 [-3.2]



Longitudinal Crash Pulse (2nd Prior Event, TRG 6 - table 2 of 2)

Time (msec)	Longitudinal Delta-V (MPH [km/h])
10	-0.6 [-1.0]
20	-1.1 [-1.8]
30	-1.7 [-2.8]
40	-2.0 [-3.2]
50	-1.8 [-2.9]
60	-1.6 [-2.6]
70	-1.6 [-2.6]
80	-1.7 [-2.8]
90	-1.8 [-2.9]
100	-1.7 [-2.8]
110	-1.6 [-2.6]
120	-1.5 [-2.5]
130	-1.7 [-2.8]
140	-1.8 [-2.9]
150	-1.7 [-2.8]
160	-1.7 [-2.8]
170	-1.7 [-2.8]
180	-1.7 [-2.8]
190	-1.8 [-2.9]
200	-1.9 [-3.0]

DTCs Present at Time of Event (2nd Prior Event, TRG 6)

Recording Status, Diagnostic	Complete
Ignition Cycle Since DTC was Set (times)	0
Airbag Warning Lamp ON Time Since DTC was Set (min)	0
Diagnostic Trouble Codes	None

Pre-Crash Data, 1 Sample (2nd Prior Event, TRG 6)

Recording Status, Pre-Crash/Occupant	Complete
Time from Pre-Crash to TRG (msec)	0
Buckle Switch, Driver	Unbuckled
Buckle Switch, Passenger	Unbuckled
Occupancy Status, Passenger	Not Occupied
Seat Position, Driver	Rearward
Shift Position	Drive

Pre-Crash Data, -5 to 0 seconds (2nd Prior Event, TRG 6)

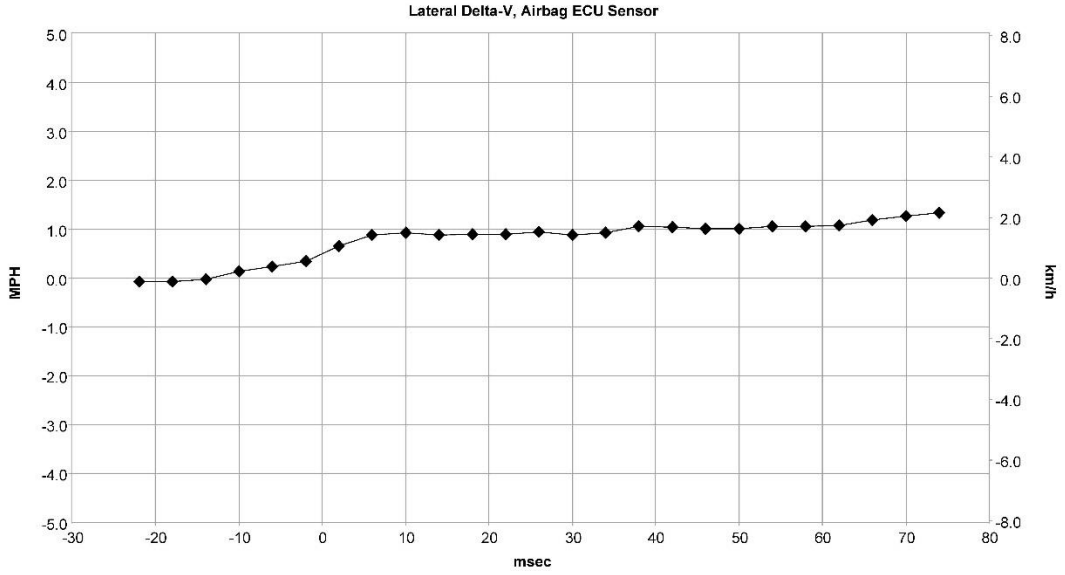
Time (sec)	-4	-3	-2	-1	0	0 (TRG)
Vehicle Speed (MPH [km/h])	75.8 [122]	75.8 [122]	72.1 [116]	62.1 [100]	60.9 [98]	60.9 [98]
Brake Switch	OFF	ON	ON	ON	OFF	OFF
Accelerator Rate (V)	0.78	0.78	0.78	0.78	0.78	0.78
Engine RPM (RPM)	2,000	2,000	2,000	1,600	1,200	1,200

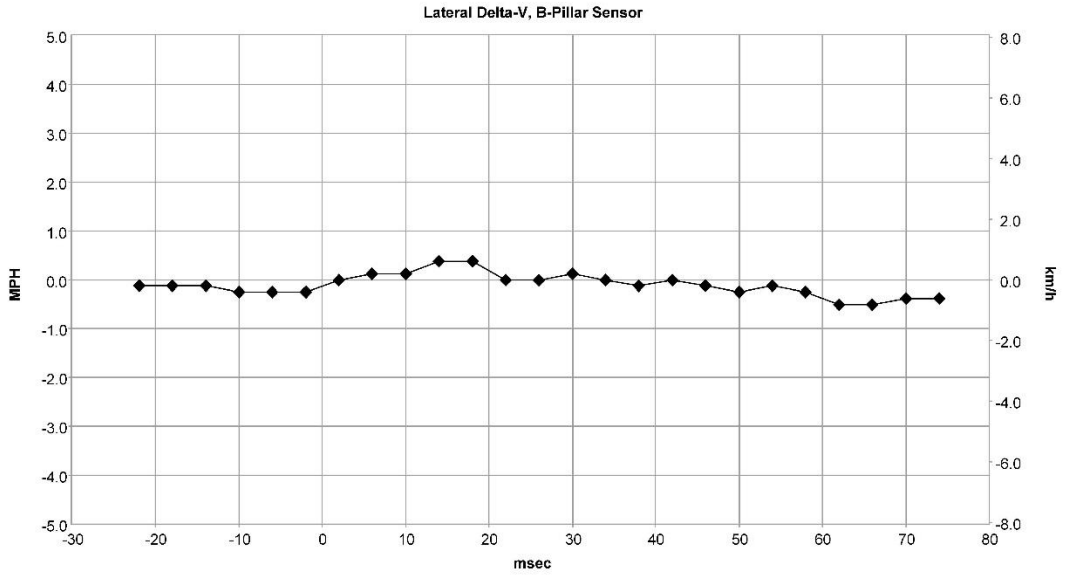
System Status at Event (3rd Prior Event, TRG 5)

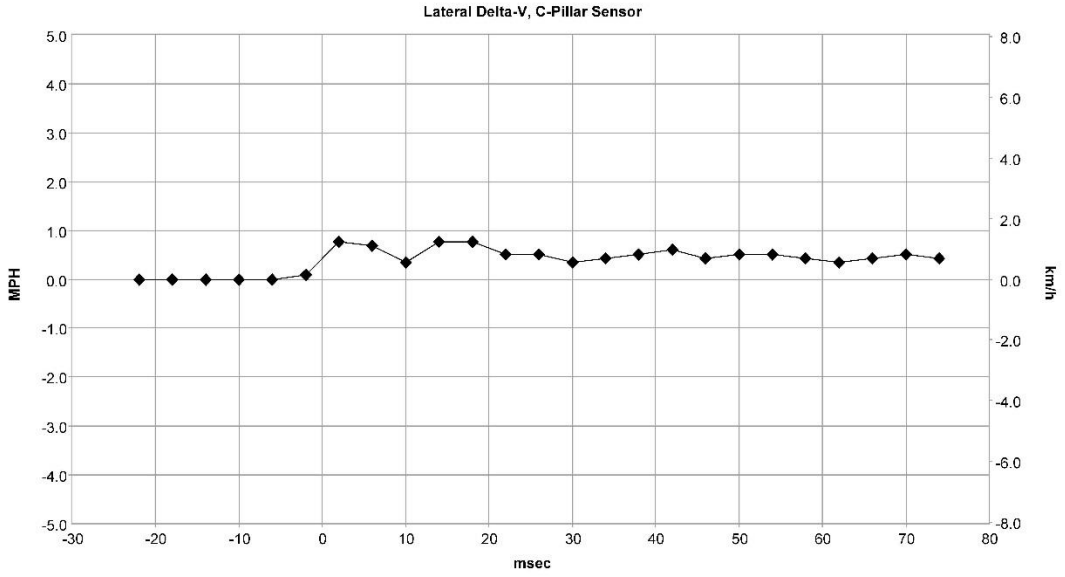
Recording Status, Side Crash Info.	Complete
Crash Type	Side Crash
TRG Count (times)	5
Recorded Side	Driver's Side
Previous Crash Type	Frontal/Rear
Time from Pre-Crash TRG (msec)	105
Linked Pre-Crash Page	1
Time to Deployment Command, B-Pillar Sensor (msec)	Not Commanded
Time to Deployment Command, C-Pillar Sensor (msec)	Not Commanded

Lateral Crash Pulse (3rd Prior Event, TRG 5 - table 1 of 2)

Recording Status, Time Series Data	Complete
Time from TRG to Next Sample (msec)	2
Max Lateral Delta-V, B-Pillar Sensor (MPH [km/h])	-0.5 [-0.8]
Max Lateral Delta-V, C-Pillar Sensor (MPH [km/h])	0.8 [1.2]






Lateral Delta-V, C-Pillar Sensor
MPH
km/h
msec
5.0
4.0
3.0
2.0
1.0
0.0
-1.0
-2.0
-3.0
-4.0
-5.0
8.0
6.0
4.0
2.0
0.0
-2.0
-4.0
-6.0
-8.0
-30
-20
-10
0
10
20
30
40
50
60
70
80

Lateral Crash Pulse (3rd Prior Event, TRG 5 - table 2 of 2)

Time (msec)	Lateral Delta-V, Airbag ECU Sensor (MPH [km/h])	Lateral Delta-V, B-Pillar Sensor (MPH [km/h])	Lateral Delta-V, C-Pillar Sensor (MPH [km/h])
-22	-0.1 [-0.1]	-0.1 [-0.2]	0.0 [0.0]
-18	-0.1 [-0.1]	-0.1 [-0.2]	0.0 [0.0]
-14	0.0 [0.0]	-0.1 [-0.2]	0.0 [0.0]
-10	0.1 [0.2]	-0.3 [-0.4]	0.0 [0.0]
-6	0.2 [0.4]	-0.3 [-0.4]	0.0 [0.0]
-2	0.3 [0.6]	-0.3 [-0.4]	0.1 [0.1]
2	0.7 [1.0]	0.0 [0.0]	0.8 [1.2]
6	0.9 [1.4]	0.1 [0.2]	0.7 [1.1]
10	0.9 [1.5]	0.1 [0.2]	0.3 [0.6]
14	0.9 [1.4]	0.4 [0.6]	0.8 [1.2]
18	0.9 [1.4]	0.4 [0.6]	0.8 [1.2]
22	0.9 [1.4]	0.0 [0.0]	0.5 [0.8]
26	0.9 [1.5]	0.0 [0.0]	0.5 [0.8]
30	0.9 [1.4]	0.1 [0.2]	0.3 [0.6]
34	0.9 [1.5]	0.0 [0.0]	0.4 [0.7]
38	1.1 [1.7]	-0.1 [-0.2]	0.5 [0.8]
42	1.0 [1.7]	0.0 [0.0]	0.6 [1.0]
46	1.0 [1.6]	-0.1 [-0.2]	0.4 [0.7]
50	1.0 [1.6]	-0.3 [-0.4]	0.5 [0.8]
54	1.1 [1.7]	-0.1 [-0.2]	0.5 [0.8]
58	1.1 [1.7]	-0.3 [-0.4]	0.4 [0.7]
62	1.1 [1.7]	-0.5 [-0.8]	0.3 [0.6]
66	1.2 [1.9]	-0.5 [-0.8]	0.4 [0.7]
70	1.3 [2.0]	-0.4 [-0.6]	0.5 [0.8]
74	1.3 [2.2]	-0.4 [-0.6]	0.4 [0.7]

DTCs Present at Time of Event (3rd Prior Event, TRG 5)

Recording Status, Diagnostic	Complete
Ignition Cycle Since DTC was Set (times)	0
Airbag Warning Lamp ON Time Since DTC was Set (min)	0
Diagnostic Trouble Codes	None

Pre-Crash Data, 1 Sample (3rd Prior Event, TRG 5)

Recording Status, Pre-Crash/Occupant	Complete
Time from Pre-Crash to TRG (msec)	0
Buckle Switch, Driver	Unbuckled
Buckle Switch, Passenger	Unbuckled
Occupancy Status, Passenger	Not Occupied
Seat Position, Driver	Rearward
Shift Position	Drive

Pre-Crash Data, -5 to 0 seconds (3rd Prior Event, TRG 5)

Time (sec)	-4	-3	-2	-1	0	0 (TRG)
Vehicle Speed (MPH [km/h])	75.8 [122]	75.8 [122]	72.1 [116]	62.1 [100]	60.9 [98]	60.9 [98]
Brake Switch	OFF	ON	ON	ON	OFF	OFF
Accelerator Rate (V)	0.78	0.78	0.78	0.78	0.78	0.78
Engine RPM (RPM)	2,000	2,000	2,000	1,600	1,200	1,200

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.

PIDs

PID	Data
00	BE E0 00 01
01	00
03	33 33 34 39 30 30 30 30 43 44 30 30 30 43 44 30 30 30 43 42 30 30 30 43 42 30 30 30 44 32 30 30 30 44 32
04	02 02 01 01
05	02
06	12
07	30 30 30 30 30 30 30 30 30 30 30 30 30 30 30 30 30 30 30 30
09	
0A	01
0B	00
20	80 00 00 01
21	00 31
40	00 00 00 01
60	00 00 00 01
80	00 00 00 01
A0	00 00 00 01
C0	00 00 00 01
E0	C0 10 00 00
E1	05 05
E2	00 5B 1F 11 00
EC	FF

EEPROM

Address	Data (-- = data not imaged from ECU) (** = no response from ECU)
0	-- -- -- -- -- -- -- -- -- -- -- -- -- -- -- --
10	-- -- -- -- -- -- -- -- -- -- -- -- -- -- -- --
20	-- -- -- -- -- -- -- -- -- -- -- -- -- -- 00 00
30	00 00 4F 01 05 DD 00 00 A5 02 00 12 FF FF FF FF
40	FF FF FF FF FF FF FF FF FF FF FF FF FF FF -- --
50	-- -- 00 01 01 A5 14 23 A1 14 34 C4 14 55 C9 14
60	E9 14 F5 14 05 00 00 00 00 00 00 00 00 00 00 00
70	00 00 00 00 00 00 00 00 00 00 00 01 01 C4 14 33
80	C4 14 45 C9 14 55 E9 14 F5 14 F4 14 00 00 00 00
90	00 00 00 00 00 00 00 00 00 00 00 00 00 00 00 00
A0	00 00 -- -- 07 06 07 03 FE FE 00 01 01 FF FF FF
B0	02 01 FF 00 00 00 01 01 00 53 00 00 00 06 15 8F
C0	FE FE 00 00 06 FF 09 0B 0B 05 08 07 0C 10 19 22
D0	21 15 0A 05 07 11 0E 0A 03 E5 00 00 00 08 10 09
E0	5F 15 20 00 -- -- FF 00 00 FF 00 00 02 01 00 02
F0	00 FD 00 01 FF FF 01 FF FF 01 FF FE 00 01 00 00
100	00 00 00 00 01 08 FF FC 05 00 FD 00 FE 01 01 01
110	FE 01 00 FF FF 01 01 FF 04 00 FD F7 FA FA EE F3
120	FD 03 FF 00 FD 04 FD F8 01 02 00 FD 00 FF FA FB
130	FC 00 20 00 00 05 04 69 FE FE 00 00 00 FF FF 00
140	FF 00 00 FE FE FF 00 00 00 FE 01 FE 02 00 FE 00
150	FE FE FE 00 01 FF FF 00 00 00 00 00 00 FF FF 00
160	FF 00 FD 02 FE FC 01 FF 00 FF FD 01 00 FD FF FE
170	FB FB FD 05 14 13 FF F5 FF 08 F5 F4 02 F2 F2 FF
180	01 02 05 0E 02 05 10 00 20 00 00 07 00 00 FE FE
190	00 00

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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**National Highway
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