COLLISION WITH CRASH ATTENUATOR – MARCH 12, 2018
FACTUAL REPORT

Mountain View, CA

HWY18FH011

(27 pages)

NATIONAL TRANSPORTATION SAFETY BOARD
OFFICE OF HIGHWAY SAFETY
WASHINGTON, D.C.

COLLISION WITH CRASH ATTENUATOR – MARCH 12, 2018
FACTUAL REPORT

A. CRASH INFORMATION

Location:	Southbound US Highway 101 (US-101) south of North Shoreline Boulevard at the exit ramp transition to State Route 85 (SR-85), milepost 48.38, Santa Clara County, Mountain View, California.
Vehicle 1:	2017 Tesla Model X P100D
Vehicle 2:	2010 Mazda 3
Vehicle 3:	2017 Audi A4
Date:	March 23, 2018
Time:	Approximately 9:27 a.m. PDST
NTSB #:	**HWY18FH011**

B. CRASH SUMMARY

For a summary of the crash, refer to the *Crash Summary Report* in the docket for this investigation.

C. DETAILS OF THE MARCH 12TH COLLISION WITH CRASH ATTENUATOR REPORT

- Section 1 of the report provides background information regarding the collision and follow-up investigation.
- Section 2 of the report provides a summary of the imaging of EDR data from the Toyota Prius involved in the prior collision.

1. Background of the March 12th Collision with Crash Attenuator

The SCI SmartCushion® SCI100GM crash cushion was in a damaged and collapsed condition prior to the March 23, 2018 fatal crash. The crash cushion was damaged on March 12, 2018, at 10:30 p.m., during a solo vehicle traffic collision.[1] A 2010 Toyota Prius operated by a 31-year-old male driver on US-101 was traveling southbound south of North Shoreline Boulevard, entered the gore area, and collided with the crash attenuator. The solo occupant was wearing his lap/shoulder belt restraint and the driver's side airbag / knee bolster airbag deployed. The driver suffered a fracture/lacerated finger on his left hand and small tear of the intimal aorta. Figures 1 and 2 below depict the damaged Toyota Prius at the crash scene.

Figure 1. Photo showing front end damage to Toyota Prius at scene of collision with crash attenuator on March 12, 2018 – eleven days prior to fatal March 23rd crash at same location.

[1] See Highway Attachment 10 – Copies of Traffic Collision Reports (TC Report #9330-2018-00724)

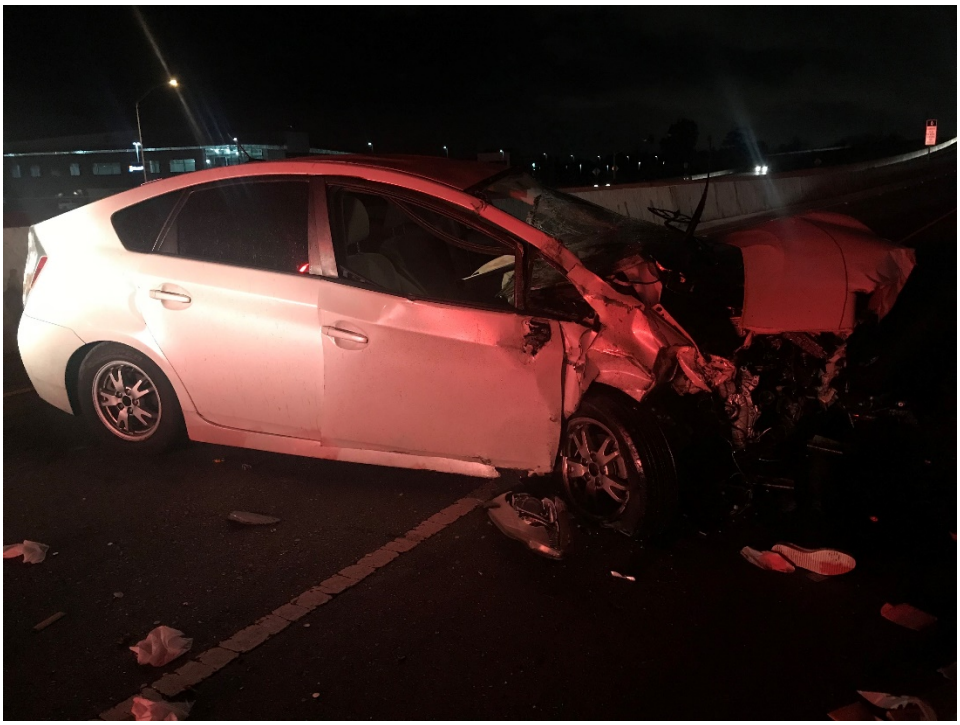

Figure 2. Photo showing right front-end damage to Toyota Prius at scene of collision with crash attenuator on March 12, 2018 – eleven days prior to fatal March 23rd crash at same location.

The CHP responded to the March 12th crash with two Sergeants and four Officers.[2] Caltrans maintenance personnel did not respond to the scene and there is no record in the dispatch log that Caltrans was notified of the damage to the crash cushion. A review of the CHP traffic collision report 9330-2018-0724 (page 2) states that Caltrans was notified of the buckled/crushed attenuator but there is no record to corroborate this claim.

On March 20, 2018, at about 9:30 a.m., the maintenance supervisor for the Cupertino, CA facility was advised by two workers patrolling the area that the crash cushion at the southbound US-101 to the SR-85 southbound connector had been hit. The maintenance supervisor had no knowledge that the crash cushion had been damaged eight days earlier on March 12, 2018.

[2] See Highway Attachment 12 – CHP Dispatch Log for March 12, 2018 Toyota Prius Crash

2. Imaging of Event Data Recorder of 2010 Toyota Prius

With the cooperation of Mercury Insurance Company (claim # 040105130047402), the NTSB was able to determine the impound facility for the 2010 Toyota Prius. The vehicle was held at Insurance Auto Auction, 6700 Stevenson Blvd., Fremont, CA 94538. On August 1, 2018, NTSB investigators responded to the impound location and inspected the Toyota Prius. Additionally, the NTSB imaged data from the Toyota Prius Airbag Control Module (ACM). Figures 3 to 6 below depict the damaged Toyota Prius at the impound location, the location of the airbag control module, and a photo of the ACM being imaged using the Bosch Crash Data Retrieval tool.

Figure 3. Photo showing front-end damage to Toyota Prius during inspection of vehicle at impound facility on August 1, 2018.

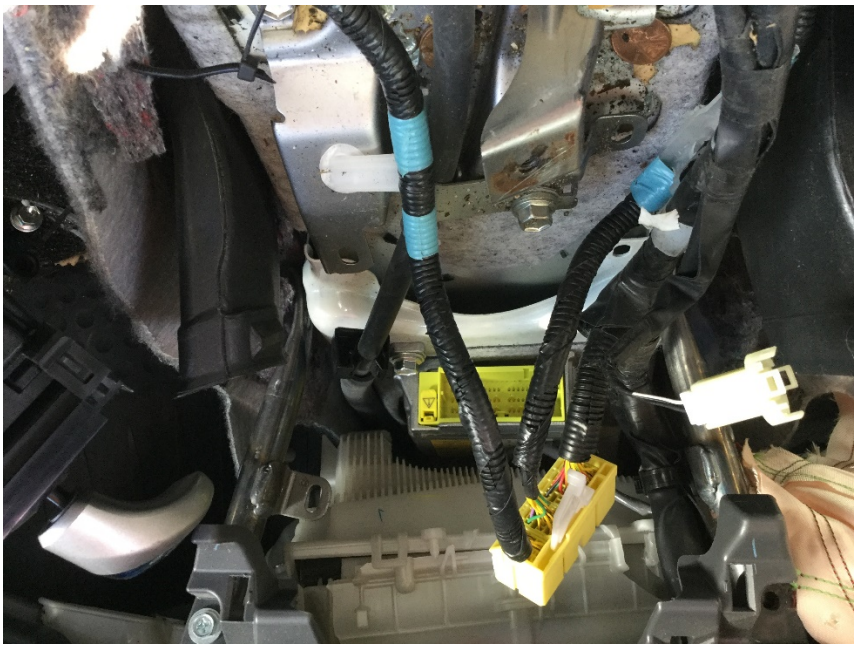

Figure 4. Photo showing the location of the airbag control module in the center console beneath the dash on the Toyota Prius during inspection of vehicle at impound facility on August 1, 2018.

Figure 5. Photo showing the location of the airbag control module after it was removed from the Toyota Prius during inspection of vehicle at impound facility on August 1, 2018.

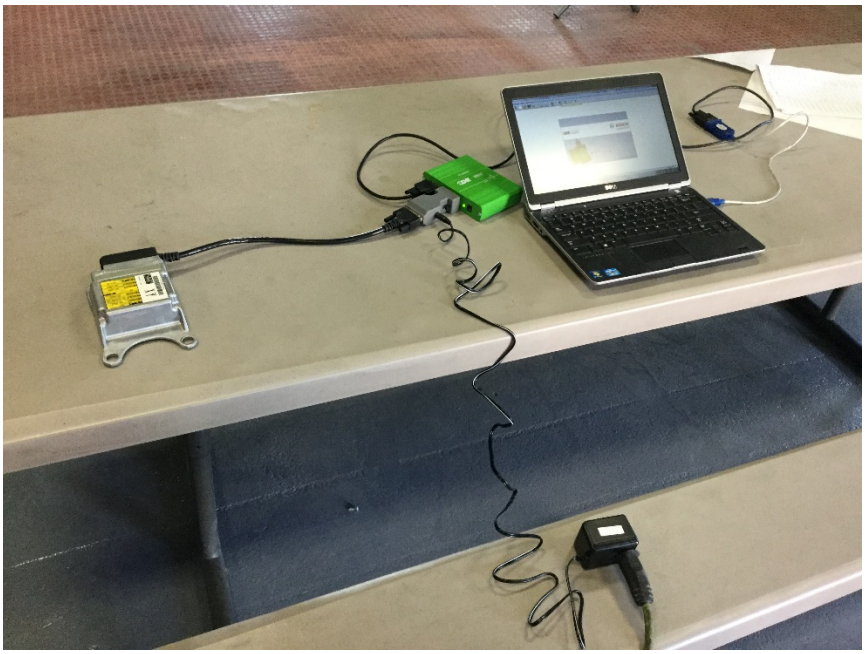

Figure 6. Photo showing the imaging of the airbag control module at the impound facility on August 1, 2018.

As a result of the imaging of airbag control module, a crash data retrieval report was obtained depicting the recorded data from the March 12, 2018 crash. The following pages contain the 19-page 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	[redacted]
User	
Case Number	HWY18FH011
EDR Data Imaging Date	08/01/2018
Crash Date	03/12/2018
Filename	JTDKN3DU[redacted]ACM_PRIUS_MOUNTAINVIEW_HWY18FH011.CDRX
Saved on	Wednesday, August 1 2018 at 14:50:26
Imaged with CDR version	Crash Data Retrieval Tool 17.8
Imaged with Software Licensed to (Company Name)	NTSB
Reported with CDR version	Crash Data Retrieval Tool 17.8
Reported with Software Licensed to (Company Name)	NTSB
EDR Device Type	Airbag Control Module
Event(s) recovered	Front/Rear (2), Side (1)

Comments

Imaging done with Mecury Insurance Represenatative, Steven Silveira

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 , Front Door 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 , 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" has two recording specifications. Both the recorded value increases as the driver depresses the accelerator.
  - Percentage of accelerator pedal depressed (recorded as 0-100(%)).
  - Output voltage of accelerator pedal module (recorded as 0-5(V)).
- 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 four recording formats for "Occupancy Status, Passenger" will be utilized.
  - Occupied / Not Occupied
  - Adult / Child / Not Occupied
  - AM50 / AF05 / Child / Not Occupied
  - AM50 / AF05 / Child or 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.
- "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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CDR CRASH DATA RETRIEVAL

System Status at Time of Retrieval

ECU Part Number	89170-47080
ECU Generation	06EDR
Recording Status, All Pages	Complete
Freeze Signal	ON
Freeze Signal Factor	Front Airbag Deployment Front Pretensioner Deployment
Diagnostic Trouble Codes Exist	No
Time from Previous Pre Crash TRG (msec)	16381 or greater
Latest Pre-Crash Page	1
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	3	Front/Rear Crash	0	Complete (Page 1)	Complete (Front/Rear Page 1)
1st Prior Event	2	Side Crash	0	Complete (Page 1)	Complete (Side Page 0)
2nd Prior Event	1	Front/Rear Crash	-16381 or greater	Complete (Page 0)	Complete (Front/Rear Page 0)

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CDR CRASH DATA RETRIEVAL

System Status at Event (Most Recent Event, TRG 3)

Recording Status, Front/Rear Crash Info.	Complete
Crash Type	Front/Rear Crash
TRG Count (times)	3
Previous Crash Type	Side
Time from Pre-Crash TRG (msec)	0
Linked Pre-Crash Page	1
Time to Deployment Command, Front Airbag, Driver (msec)	1
Time to Deployment Command, Front Airbag, Passenger (msec)	1
Event Severity Status, Driver	Level 3
Event Severity Status, Passenger	N/A
Time to Deployment Command, Pretensioner (msec)	1

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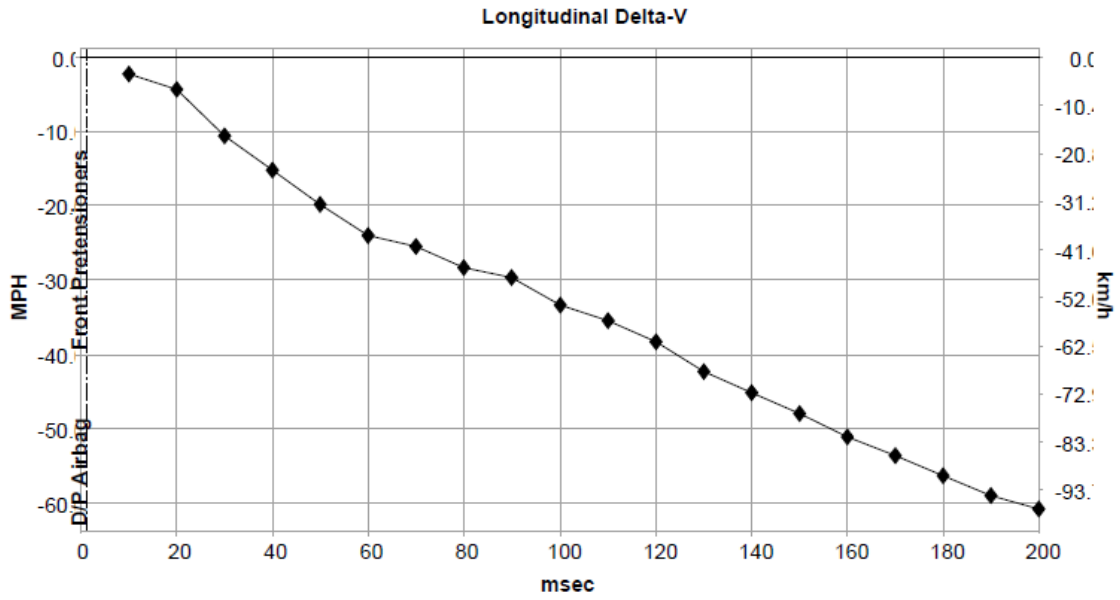
CDR CRASH DATA RETRIEVAL

Longitudinal Crash Pulse (Most Recent Event, TRG 3 - table 1 of 2)

Recording Status, Time Series Data	Complete
Max Longitudinal Delta-V (MPH [km/h])	-60.8 [-97.8]



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CDR CRASH DATA RETRIEVAL

Longitudinal Crash Pulse (Most Recent Event, TRG 3 - table 2 of 2)

Time (msec)	Longitudinal Delta-V (MPH [km/h])
10	-2.2 [-3.6]
20	-4.4 [-7.0]
30	-10.5 [-17.0]
40	-15.2 [-24.4]
50	-19.9 [-32.0]
60	-24.0 [-38.6]
70	-25.5 [-41.1]
80	-28.4 [-45.6]
90	-29.6 [-47.6]
100	-33.3 [-53.6]
110	-35.4 [-57.0]
120	-38.3 [-61.6]
130	-42.2 [-68.0]
140	-45.1 [-72.5]
150	-48.0 [-77.2]
160	-51.1 [-82.2]
170	-53.6 [-86.2]
180	-56.3 [-90.6]
190	-58.9 [-94.7]
200	-60.8 [-97.8]

DTCs Present at Time of Event (Most Recent Event, TRG 3)

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 3)

Recording Status, Pre-Crash/Occupant	Complete
Time from Pre-Crash to TRG (msec)	200
Buckle Switch, Left Seat	Buckled
Buckle Switch, Right Seat	Unbuckled
Occupancy Status, Passenger	Not Occupied
Seat Position, Driver	Rearward
Shift Position	Drive

Pre-Crash Data, -5 to 0 seconds (Most Recent Event, TRG 3)

Time (sec)	-4.2	-3.2	-2.2	-1.2	-0.2	0 (TRG)
Vehicle Speed (MPH [km/h])	75.8 [122]	75.8 [122]	75.8 [122]	75.8 [122]	75.8 [122]	75.8 [122]
Brake Switch	OFF	OFF	OFF	OFF	OFF	ON
Accelerator Rate (V)	1.76	1.68	1.64	1.60	0.78	0.78
Engine RPM (RPM)	4,400	4,400	4,000	4,000	3,600	3,200

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CDR CRASH DATA RETRIEVAL

System Status at Event (1st Prior Event, TRG 2)

Recording Status, Side Crash Info.	Complete
Crash Type	Side Crash
TRG Count (times)	2
Recorded Side	Driver's Side
Previous Crash Type	No Event
Time from Pre-Crash TRG (msec)	0
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

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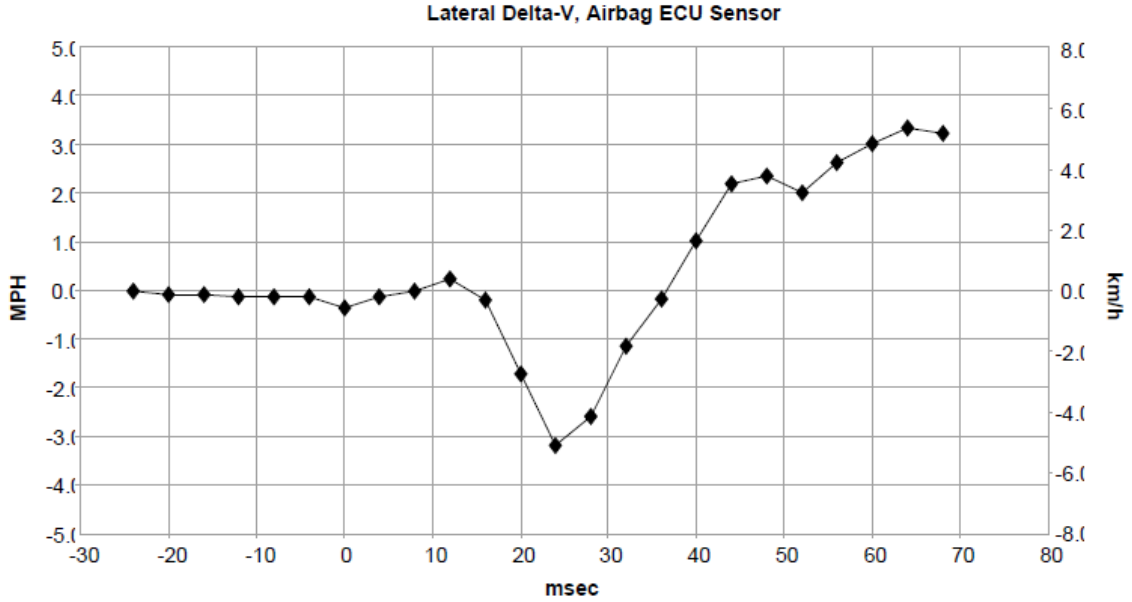
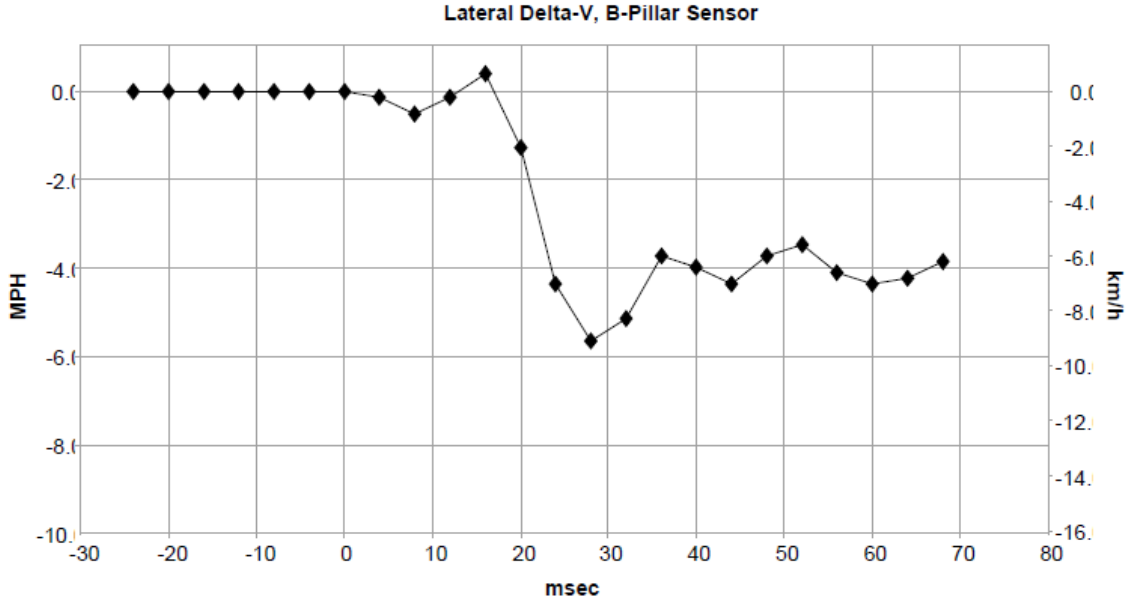
CDR CRASH DATA RETRIEVAL

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

Recording Status, Time Series Data	Complete
Time from TRG to Next Sample (msec)	0
Max Lateral Delta-V, B-Pillar Sensor (MPH [km/h])	-5.7 [-9.1]
Max Lateral Delta-V, C-Pillar Sensor (MPH [km/h])	-10.9 [-17.5]





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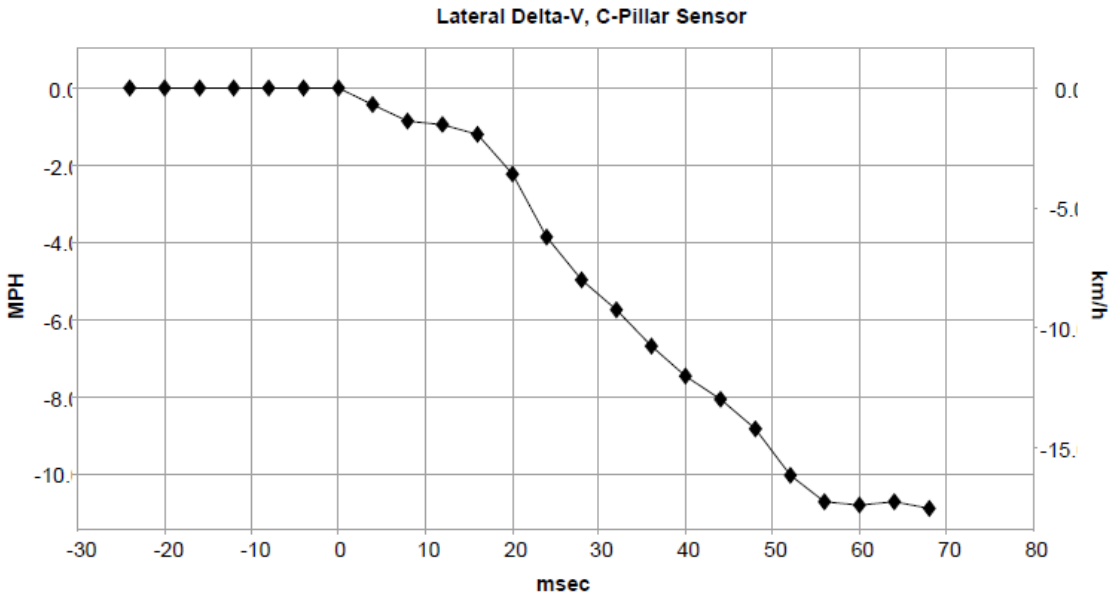
Lateral Delta-V, C-Pillar Sensor
MPH
km/h
msec
0.0
-2.0
-4.0
-6.0
-8.0
-10.0
0.0
-5.0
-10.0
-15.0
-30
-20
-10
0
10
20
30
40
50
60
70
80

Lateral Crash Pulse (1st Prior Event, TRG 2 - 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])
-24	0.0 [0.0]	0.0 [0.0]	0.0 [0.0]
-20	-0.1 [-0.1]	0.0 [0.0]	0.0 [0.0]
-16	-0.1 [-0.1]	0.0 [0.0]	0.0 [0.0]
-12	-0.1 [-0.2]	0.0 [0.0]	0.0 [0.0]
-8	-0.1 [-0.2]	0.0 [0.0]	0.0 [0.0]
-4	-0.1 [-0.2]	0.0 [0.0]	0.0 [0.0]
0	-0.4 [-0.6]	0.0 [0.0]	0.0 [0.0]
4	-0.1 [-0.2]	-0.1 [-0.2]	-0.4 [-0.7]
8	0.0 [0.0]	-0.5 [-0.8]	-0.9 [-1.4]
12	0.2 [0.4]	-0.1 [-0.2]	-0.9 [-1.5]
16	-0.2 [-0.3]	0.4 [0.6]	-1.2 [-1.9]
20	-1.7 [-2.8]	-1.3 [-2.1]	-2.2 [-3.6]
24	-3.2 [-5.1]	-4.4 [-7.0]	-3.9 [-6.2]
28	-2.6 [-4.2]	-5.7 [-9.1]	-5.0 [-8.0]
32	-1.1 [-1.8]	-5.1 [-8.3]	-5.7 [-9.2]
36	-0.2 [-0.3]	-3.7 [-6.0]	-6.7 [-10.8]
40	1.0 [1.7]	-4.0 [-6.4]	-7.5 [-12.0]
44	2.2 [3.5]	-4.4 [-7.0]	-8.1 [-13.0]
48	2.3 [3.8]	-3.7 [-6.0]	-8.8 [-14.2]
52	2.0 [3.2]	-3.5 [-5.6]	-10.0 [-16.1]
56	2.6 [4.2]	-4.1 [-6.6]	-10.7 [-17.2]
60	3.0 [4.9]	-4.4 [-7.0]	-10.8 [-17.4]
64	3.3 [5.4]	-4.2 [-6.8]	-10.7 [-17.2]
68	3.2 [5.2]	-3.9 [-6.2]	-10.9 [-17.5]

DTCs Present at Time of Event (1st Prior Event, TRG 2)

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 2)

Recording Status, Pre-Crash/Occupant	Complete
Time from Pre-Crash to TRG (msec)	200
Buckle Switch, Left Seat	Buckled
Buckle Switch, Right Seat	Unbuckled
Occupancy Status, Passenger	Not Occupied
Seat Position, Driver	Rearward
Shift Position	Drive

Pre-Crash Data, -5 to 0 seconds (1st Prior Event, TRG 2)

Time (sec)	-4.2	-3.2	-2.2	-1.2	-0.2	0 (TRG)
Vehicle Speed (MPH [km/h])	75.8 [122]	75.8 [122]	75.8 [122]	75.8 [122]	75.8 [122]	75.8 [122]
Brake Switch	OFF	OFF	OFF	OFF	OFF	ON
Accelerator Rate (V)	1.76	1.68	1.64	1.60	0.78	0.78
Engine RPM (RPM)	4,400	4,400	4,000	4,000	3,600	3,200

System Status at Event (2nd Prior Event, TRG 1)

Recording Status, Front/Rear Crash Info.	Complete
Crash Type	Front/Rear Crash
TRG Count (times)	1
Previous Crash Type	No Event
Time from Pre-Crash TRG (msec)	0
Linked Pre-Crash Page	0
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

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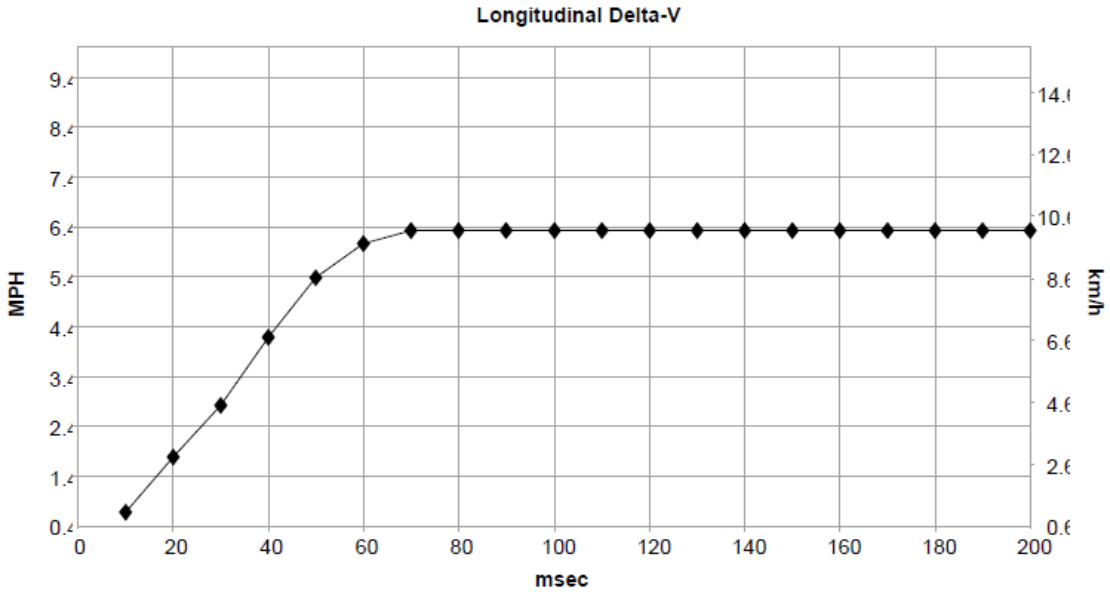
CDR CRASH DATA RETRIEVAL

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

Recording Status, Time Series Data	Complete
Max Longitudinal Delta-V (MPH [km/h])	6.3 [10.2]



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CDR CRASH DATA RETRIEVAL

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

Time (msec)	Longitudinal Delta-V (MPH [km/h])
10	0.7 [1.1]
20	1.8 [2.9]
30	2.8 [4.6]
40	4.2 [6.8]
50	5.4 [8.7]
60	6.1 [9.8]
70	6.3 [10.2]
80	6.3 [10.2]
90	6.3 [10.2]
100	6.3 [10.2]
110	6.3 [10.2]
120	6.3 [10.2]
130	6.3 [10.2]
140	6.3 [10.2]
150	6.3 [10.2]
160	6.3 [10.2]
170	6.3 [10.2]
180	6.3 [10.2]
190	6.3 [10.2]
200	6.3 [10.2]

DTCs Present at Time of Event (2nd Prior Event, TRG 1)

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 1)

Recording Status, Pre-Crash/Occupant	Complete
Time from Pre-Crash to TRG (msec)	400
Buckle Switch, Left Seat	Buckled
Buckle Switch, Right Seat	Unbuckled
Occupancy Status, Passenger	Not Occupied
Seat Position, Driver	Rearward
Shift Position	Drive

Pre-Crash Data, -5 to 0 seconds (2nd Prior Event, TRG 1)

Time (sec)	-4.4	-3.4	-2.4	-1.4	-0.4	0 (TRG)
Vehicle Speed (MPH [km/h])	9.9 [16]	11.2 [18]	7.5 [12]	2.5 [4]	0 [0]	0 [0]
Brake Switch	OFF	OFF	ON	ON	ON	ON
Accelerator Rate (V)	1.13	0.78	0.78	0.78	0.78	0.78
Engine RPM (RPM)	0	0	0	0	0	0

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    BC 60 00 01
               01    00
               03    34 37 30 38 30 30 30 30 30 30 30 30 30 30 30 30 30 30 30 30 30 30
                     30 30 30 30 30 30 30 30 30 30 30 30 30
               04    FF FF FF FF
               05    01
               06    16
               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    17 17
               E2    00 5B 19 11 00
               EC    FF

EEPROM      Address  Data (-- = data not imaged from ECU)
                          (** = no response from ECU)

                0    -- -- -- -- -- -- -- -- -- -- -- -- -- -- -- --
               10    -- -- -- -- -- -- -- -- -- -- -- -- -- -- -- --
               20    -- -- -- -- -- -- -- -- -- -- -- -- -- -- 00 00
               30    00 00 00 00 7F FD 00 00 A5 03 00 16 00 00 -- --
               40    -- -- -- -- -- -- -- -- -- -- -- -- -- -- -- --
               50    -- -- 10 01 01 01 14 00 01 14 00 09 14 00 19 14
               60    24 14 20 1D 04 00 00 55 00 00 00 00 00 00 00 00
               70    00 00 00 00 00 00 00 00 00 55 10 01 01 F5 14 89
               80    F4 14 AA F4 29 BB F4 2A F4 2B F4 2D 02 00 00 55
               90    00 00 00 00 00 00 00 00 00 00 00 00 00 00 00 00
               A0    00 55 -- -- F8 F3 F4 F0 F2 F8 FD 00 00 00 00 00
               B0    00 00 00 00 00 00 00 00 FE 57 00 55 00 01 E0 00
               C0    FE FE 00 55 1A 19 48 36 37 30 12 21 0E 2C 18 22
               D0    2E 21 22 24 1D 20 1E 16 0A E0 00 55 00 03 14 00
               E0    01 01 30 55 -- -- 00 00 00 00 00 00 00 FF FD 03
               F0    04 F3 E8 F6 04 0B FE FD 05 02 FB FE 01 03 00 00
              100    00 00 00 00 00 FB FB FF FD F4 ED F3 F7 F5 F7 F9
              110    F7 F2 F8 FF 01 FE 01 04 00 02 00 01 0D F3 F9 F1
              120    1A 58 56 DD AC C7 BA BC F7 14 DC E9 ED 07 00 00
              130    00 00 00 55 00 02 E4 00 FE FE 00 55 00 00 00 00
              140    00 00 00 00 00 00 00 00 00 00 00 00 00 00 00 00
              150    00 00 00 00 00 00 00 00 00 00 00 00 00 00 00 00
              160    00 00 00 00 00 00 00 00 00 00 00 00 00 00 00 00
              170    00 00 00 00 00 00 00 00 00 00 00 00 00 00 00 00
              180    00 00 00 00 00 00 00 00 00 00 00 00 00 00 00 00
              190    00 00
```

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END OF REPORT

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