



Recorders Attachment 2 – Data from 2012 Ford Mustang ACM

Baltimore, MD

HWY17MH007

(24 pages)

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	1ZVBP8AM4C5 [REDACTED]
User	Det. Timothy Hamilton
Case Number	8-161100095
EDR Data Imaging Date	11/03/2016
Crash Date	11/01/2016
Filename	1ZVBP8AM4C5 [REDACTED] ACM BENDER FATAL.CDRX
Saved on	Thursday, November 3 2016 at 18:29:26
Collected with CDR version	Crash Data Retrieval Tool 16.0.1
Reported with CDR version	Crash Data Retrieval Tool 16.0.1
EDR Device Type	Airbag Control Module
ACM Adapter Detected During Download	Yes
Event(s) recovered	unlocked events

Comments

2012 Ford Mustang rear drivers side collision, drivers seat side bag deployment.

Data Limitations

Restraints Control Module Recorded Crash Events:

Deployment Events cannot be overwritten or cleared from the Restraints Control Module (RCM). Once the RCM has deployed any airbag device, the RCM must be replaced. The data from events which did not qualify as deployable events can be overwritten by subsequent events. The RCM can store up to two deployment events.

Airbag Module Data Limitations:

- Restraints Control Module Recorded Vehicle Forward Velocity Change reflects the change in forward velocity that the sensing system experienced from the point of algorithm wake up. It is not the speed the vehicle was traveling before the event. Note that the vehicle speed is recorded separately five seconds prior to algorithm wake up. This data should be examined in conjunction with other available physical evidence from the vehicle and scene when assessing occupant or vehicle forward velocity change.
- Event Recording Complete will indicate if data from the recorded event has been fully written to the RCM memory or if it has been interrupted and not fully written.
- If power to the Airbag Module is lost during a crash event, all or part of the crash record may not be recorded.
- For 2011 Ford Mustangs, the Steering Wheel Angle parameter indicates the change in steering wheel angle from the previously recorded sample value and does not represent the actual steering wheel position.

Airbag Module Data Sources:

- Event recorded data are collected either INTERNALLY or EXTERNALLY to the RCM.
 - INTERNAL DATA is measured, calculated, and stored internally, sensors external to the RCM include the following:
 - > The Driver and Passenger Belt Switch Circuits are wired directly to the RCM.
 - > The Driver's Seat Track Position Switch Circuit is wired directly to the RCM.
 - > The Side Impact Sensors (if equipped) are located on the side of vehicle and are wired directly to the RCM.
 - > The Occupant Classification Sensor is located in the front passenger seat and transmits data directly to the RCM on high-speed CAN bus.
 - > Front Impact Sensors (right and left) are located at the front of vehicle and are wire directly to the RCM.
 - EXTERNAL DATA recorded by the RCM are data collected from the vehicle communication network from various sources such as Powertrain Control Module, Brake Module, etc.

02007_RCM-RC6_r002

System Status at Time of Retrieval

VIN as programmed into RCM at factory	1ZVBP8AM4C5 [REDACTED]
Current VIN from PCM	1ZVBP8AM4C5 [REDACTED]
Ignition cycle, download (first record)	6,403
Ignition cycle, download (second record)	6,403
Restraints Control Module Part Number	BR33-14B321-AF
Restraints Control Module Serial Number	3133911400000000
Restraints Control Module Software Part Number (Version)	BL84-14C028-AB
Left/Center Frontal Restraints Sensor Serial Number	14FEB6ED
Left Side Restraint Sensor 1 Serial Number	150E5B28
Left Side Restraint Sensor 2 Serial Number	00000000
Right Frontal Restraints Sensor Serial Number	00000000
Right Side Restraint Sensor 1 Serial Number	1500186C
Right Side Restraints Sensor 2 Serial Number	00000000

System Status at Event (First Record)

Recording Status	Unlocked Record
Complete file recorded (yes,no)	Yes
Multi-event, number of events (1,2)	1
Time from event 1 to 2 (msec)	N/A
Lifetime Operating Timer at event time zero (seconds)	8,905.335
Key-on Timer at event time zero (seconds)	1,620
Vehicle voltage at time zero (Volts)	14.094
Energy Reserve Mode entered during event (Y/N)	No

Faults Present at Start of Event (First Record)

No Faults Recorded

Deployment Data (First Record)

Maximum delta-V, longitudinal (MPH [km/h])	28.01 [45.07]
Time, maximum delta-V longitudinal (msec)	300
Maximum delta-V, lateral (MPH [km/h])	-3.20 [-5.15]
Time, maximum delta-V lateral (msec)	146
Longitudinal Delta-V Time Zero Offset	3.5 ms
Lateral Delta-V Time Zero Offset	3.5 ms

Pre-Crash Data -1 sec (First Record)

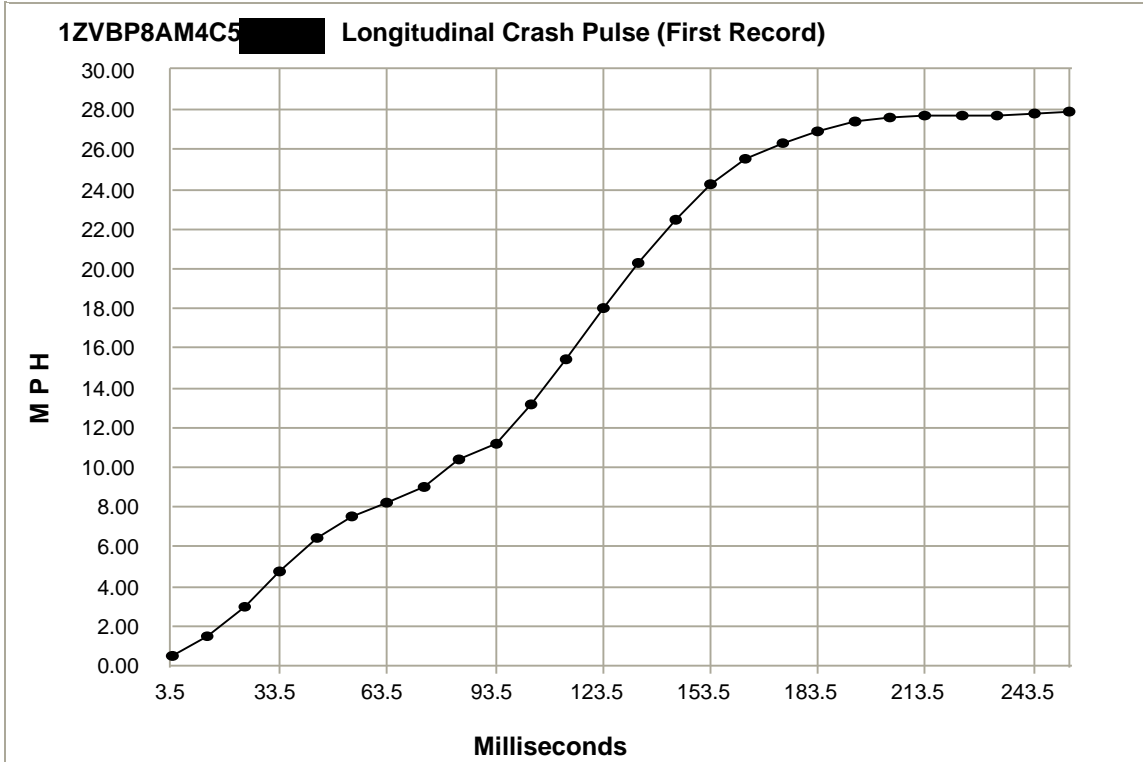
Ignition cycle, crash	6.400
Frontal air bag warning lamp, on/off	Off
Occupant size classification, front passenger (Child size Yes/No [Hex value])	Yes [\$02]
Safety belt status, driver	Driver Buckled
Seat track position switch, foremost, status, driver	Not Forward
Safety belt status, front passenger	Passenger Not Buckled
Seat track position switch, foremost, status, passenger	Not Forward
Brake Telltale	Off
ABS Telltale	Off
Stability Control Telltale	Off
Speed Control Telltale	Off
Powertrain Wrench Telltale	Off
Powertrain Malfunction Indicator Lamp (MIL) Telltale	Off

Pre-Crash Data -5 to 0 sec [2 samples/sec] (First Record)

Times (sec)	Speed vehicle indicated MPH [km/h]	Accelerator pedal, % full	Service brake, on/off	Engine RPM	ABS activity (engaged, non-engaged)	Stability control (engaged, non-engaged)	Traction Control via Brakes (engaged, non-engaged)	Traction Control via Engine (engaged, non-engaged)
- 5.0	16.2 [26.0]	16	Off	1,700	non-engaged	non-engaged	non-engaged	non-engaged
- 4.5	17.4 [28.0]	16	Off	1,700	non-engaged	non-engaged	non-engaged	non-engaged
- 4.0	19.3 [31.0]	16	Off	1,800	non-engaged	non-engaged	non-engaged	non-engaged
- 3.5	20.5 [33.0]	14	Off	1,800	non-engaged	non-engaged	non-engaged	non-engaged
- 3.0	21.7 [35.0]	10	Off	1,700	non-engaged	non-engaged	non-engaged	non-engaged
- 2.5	21.7 [35.0]	3	Off	1,200	non-engaged	non-engaged	non-engaged	non-engaged
- 2.0	21.7 [35.0]	0	Off	1,200	non-engaged	non-engaged	non-engaged	non-engaged
- 1.5	22.4 [36.0]	0	Off	1,200	non-engaged	non-engaged	non-engaged	non-engaged
- 1.0	21.7 [35.0]	0	Off	1,100	non-engaged	non-engaged	non-engaged	non-engaged
- 0.5	21.7 [35.0]	0	Off	1,100	non-engaged	non-engaged	non-engaged	non-engaged
0.0	21.7 [35.0]	0	Off	1,200	non-engaged	non-engaged	non-engaged	non-engaged

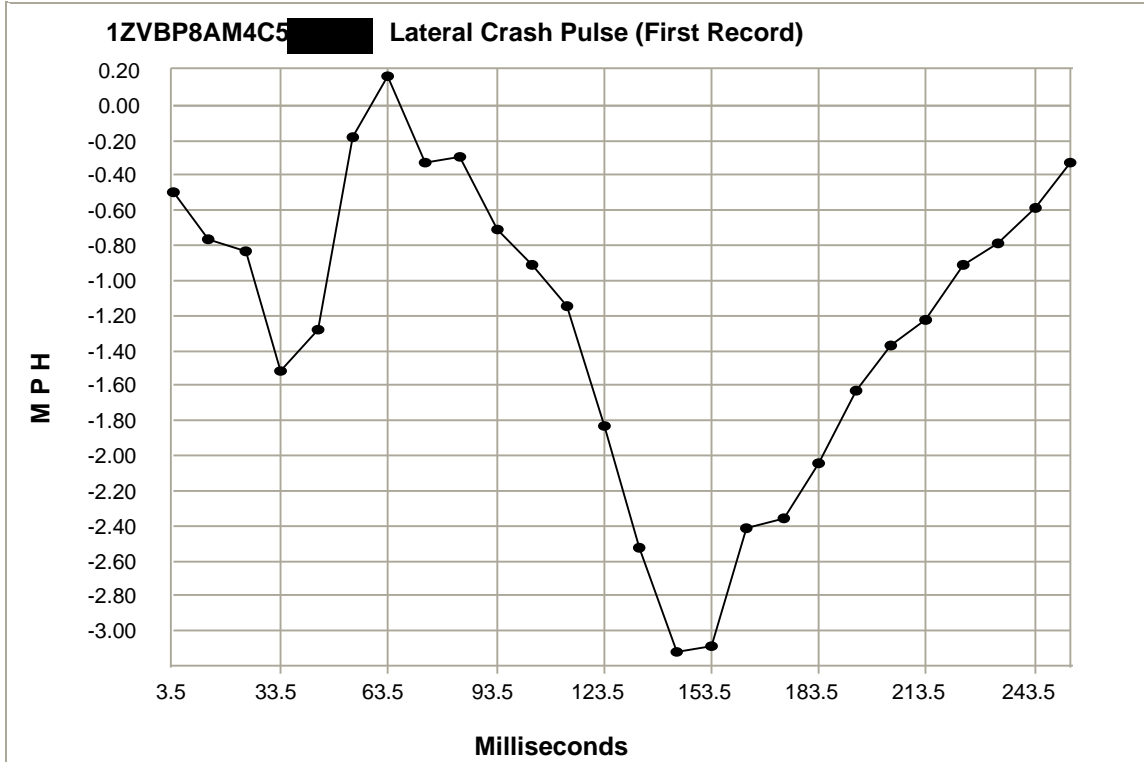
Pre-Crash Data -5 to 0 sec [10 samples/sec] (First Record)

Times (sec)	Stability Control Lateral Acceleration (g)	Stability Control Longitudinal Acceleration (g)	Stability Control Yaw Rate (deg/sec)
- 5.0	-0.065	0.141	-7.0
- 4.9	-0.08	0.135	-6.62
- 4.8	-0.001	0.116	-6.0
- 4.7	-0.004	0.112	-5.25
- 4.6	-0.006	0.102	-4.12
- 4.5	-0.012	0.129	-3.75
- 4.4	0.004	0.099	-2.87
- 4.3	-0.014	0.109	-3.87
- 4.2	-0.019	0.118	-3.25
- 4.1	-0.004	0.078	-3.0
- 4.0	0.018	0.095	-2.75
- 3.9	0.017	0.089	-0.87
- 3.8	-0.02	0.086	-1.62
- 3.7	0.053	0.059	-1.5
- 3.6	-0.004	0.056	-1.5
- 3.5	0.014	0.076	-1.0
- 3.4	0.042	0.085	-0.12
- 3.3	0.032	0.07	-0.62
- 3.2	0.032	0.056	-0.37
- 3.1	0.017	0.02	-0.62
- 3.0	0.046	-0.01	0.0
- 2.9	0.034	-0.017	-0.87
- 2.8	0.014	-0.006	-0.5
- 2.7	0.028	0.003	-0.12
- 2.6	0.036	-0.015	-0.25
- 2.5	0.034	-0.003	0.12
- 2.4	0.055	-0.02	0.25
- 2.3	0.04	-0.016	0.75
- 2.2	0.057	-0.02	1.0
- 2.1	0.074	-0.025	0.62
- 2.0	0.077	-0.02	1.0
- 1.9	0.052	-0.03	1.0
- 1.8	0.074	-0.022	1.25
- 1.7	0.052	-0.02	0.87
- 1.6	0.048	-0.032	0.62
- 1.5	0.053	-0.01	1.0
- 1.4	0.045	-0.02	0.12
- 1.3	0.02	-0.018	0.12
- 1.2	0.022	-0.02	-0.25
- 1.1	0.038	-0.026	0.12
- 1.0	0.045	-0.032	0.0
- 0.9	-0.055	-0.029	-1.62
- 0.8	-0.055	-0.036	-6.37
- 0.7	-0.083	-0.02	-5.37
- 0.6	-0.062	-0.02	-4.37
- 0.5	0.056	-0.032	-5.5
- 0.4	0.093	-0.034	3.0
- 0.3	0.101	-0.02	3.37
- 0.2	-0.1	0.026	-8.0
- 0.1	-0.365	-0.001	-15.37
0.0	-0.466	-0.02	-21.5



Longitudinal Crash Pulse (First Record)

Time (msec)	Delta-V, longitudinal (MPH)	Delta-V, longitudinal (km/h)
3.5	0.46	0.74
13.5	1.53	2.46
23.5	2.96	4.76
33.5	4.80	7.73
43.5	6.42	10.33
53.5	7.50	12.07
63.5	8.25	13.28
73.5	9.05	14.56
83.5	10.39	16.73
93.5	11.17	17.97
103.5	13.17	21.20
113.5	15.47	24.89
123.5	18.05	29.06
133.5	20.29	32.65
143.5	22.51	36.23
153.5	24.22	38.97
163.5	25.55	41.13
173.5	26.35	42.41
183.5	26.95	43.37
193.5	27.38	44.07
203.5	27.62	44.44
213.5	27.74	44.64
223.5	27.71	44.60
233.5	27.75	44.65
243.5	27.82	44.77
253.5	27.88	44.87



Lateral Crash Pulse (First Record)

Time (msec)	Delta-V, lateral (MPH)	Delta-V, lateral (km/h)
3.5	-0.49	-0.79
13.5	-0.76	-1.22
23.5	-0.84	-1.34
33.5	-1.52	-2.45
43.5	-1.28	-2.07
53.5	-0.19	-0.30
63.5	0.17	0.27
73.5	-0.32	-0.52
83.5	-0.29	-0.46
93.5	-0.71	-1.14
103.5	-0.91	-1.47
113.5	-1.14	-1.84
123.5	-1.83	-2.94
133.5	-2.52	-4.06
143.5	-3.12	-5.02
153.5	-3.09	-4.97
163.5	-2.41	-3.89
173.5	-2.36	-3.80
183.5	-2.05	-3.30
193.5	-1.63	-2.62
203.5	-1.37	-2.20
213.5	-1.23	-1.98
223.5	-0.91	-1.47
233.5	-0.79	-1.27
243.5	-0.58	-0.94
253.5	-0.32	-0.52

System Status at Event (Second Record)

Recording Status	Unlocked Record
Complete file recorded (yes,no)	Yes
Multi-event, number of events (1,2)	2
Time from event 1 to 2 (msec)	100
Lifetime Operating Timer at event time zero (seconds)	8,905,335
Key-on Timer at event time zero (seconds)	1,620
Vehicle voltage at time zero (Volts)	14.013
Energy Reserve Mode entered during event (Y/N)	No

Faults Present at Start of Event (Second Record)

No Faults Recorded

Deployment Data (Second Record)

Maximum delta-V, longitudinal (MPH [km/h])	4.30 [6.92]
Time, maximum delta-V longitudinal (msec)	61
Maximum delta-V, lateral (MPH [km/h])	4.64 [7.47]
Time, maximum delta-V lateral (msec)	294
Longitudinal Delta-V Time Zero Offset	9.5 ms
Lateral Delta-V Time Zero Offset	9.5 ms

Pre-Crash Data -1 sec (Second Record)

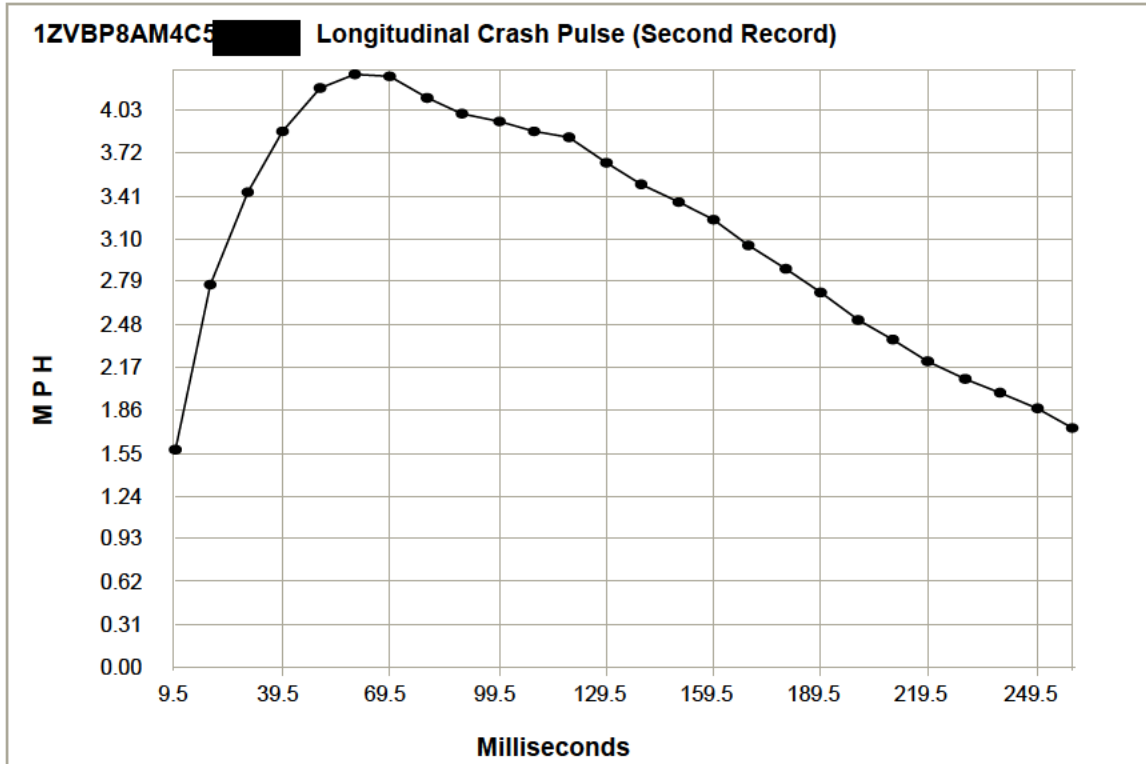
Ignition cycle, crash	6.400
Frontal air bag warning lamp, on/off	Off
Occupant size classification, front passenger (Child size Yes/No [Hex value])	Yes [\$02]
Safety belt status, driver	Driver Buckled
Seat track position switch, foremost, status, driver	Not Forward
Safety belt status, front passenger	Passenger Not Buckled
Seat track position switch, foremost, status, passenger	Not Forward
Brake Telltale	Off
ABS Telltale	Off
Stability Control Telltale	Off
Speed Control Telltale	Off
Powertrain Wrench Telltale	Off
Powertrain Malfunction Indicator Lamp (MIL) Telltale	Off

Pre-Crash Data -5 to 0 sec [2 samples/sec] (Second Record)

Times (sec)	Speed vehicle indicated MPH [km/h]	Accelerator pedal, % full	Service brake, on/off	Engine RPM	ABS activity (engaged, non-engaged)	Stability control (engaged, non-engaged)	Traction Control via Brakes (engaged, non-engaged)	Traction Control via Engine (engaged, non-engaged)
- 5.0	17.4 [28.0]	16	Off	1,700	non-engaged	non-engaged	non-engaged	non-engaged
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- 3.5	21.7 [35.0]	10	Off	1,700	non-engaged	non-engaged	non-engaged	non-engaged
- 3.0	21.7 [35.0]	3	Off	1,200	non-engaged	non-engaged	non-engaged	non-engaged
- 2.5	21.7 [35.0]	0	Off	1,200	non-engaged	non-engaged	non-engaged	non-engaged
- 2.0	22.4 [36.0]	0	Off	1,200	non-engaged	non-engaged	non-engaged	non-engaged
- 1.5	21.7 [35.0]	0	Off	1,100	non-engaged	non-engaged	non-engaged	non-engaged
- 1.0	21.7 [35.0]	0	Off	1,100	non-engaged	non-engaged	non-engaged	non-engaged
- 0.5	21.7 [35.0]	0	Off	1,200	non-engaged	non-engaged	non-engaged	non-engaged
0.0	22.4 [36.0]	100	Off	2,200	non-engaged	non-engaged	non-engaged	non-engaged

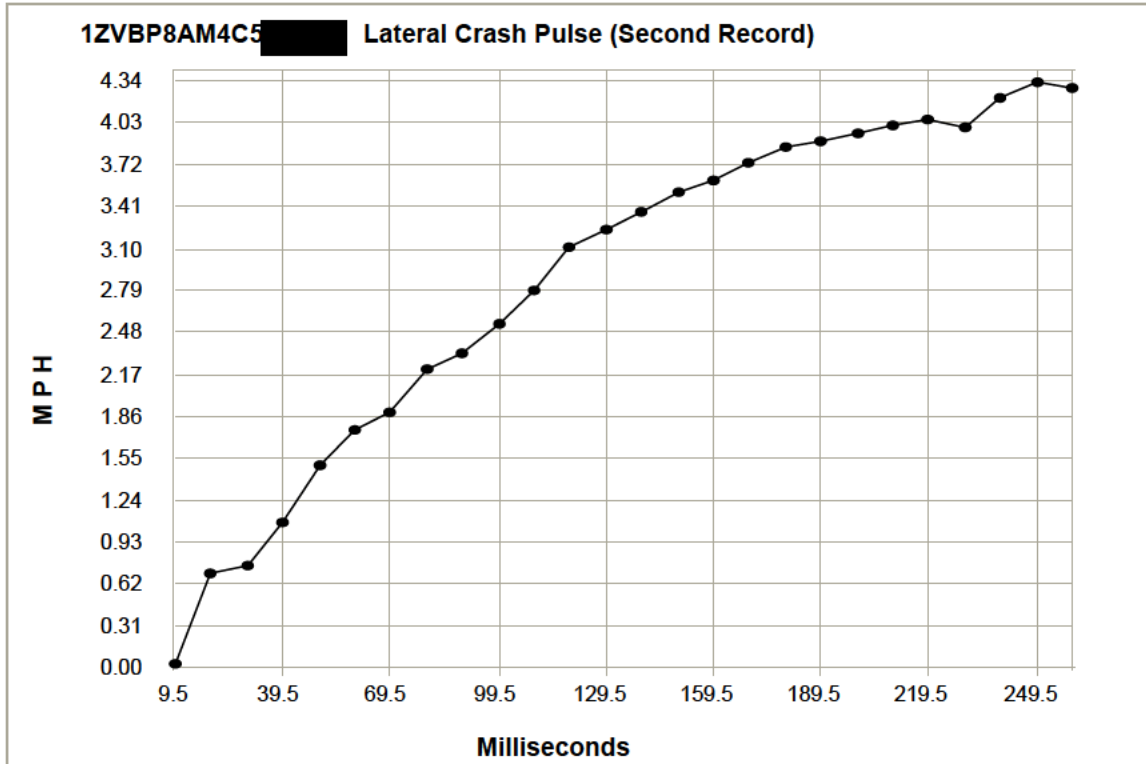
Pre-Crash Data -5 to 0 sec [10 samples/sec] (Second Record)

Times (sec)	Stability Control Lateral Acceleration (g)	Stability Control Longitudinal Acceleration (g)	Stability Control Yaw Rate (deg/sec)
- 5.0	-0.08	0.135	-6.62
- 4.9	-0.001	0.116	-6.0
- 4.8	-0.004	0.112	-5.25
- 4.7	-0.006	0.102	-4.12
- 4.6	-0.012	0.129	-3.75
- 4.5	0.004	0.099	-2.87
- 4.4	-0.014	0.109	-3.87
- 4.3	-0.019	0.118	-3.25
- 4.2	-0.004	0.078	-3.0
- 4.1	0.018	0.095	-2.75
- 4.0	0.017	0.089	-0.87
- 3.9	-0.02	0.086	-1.62
- 3.8	0.053	0.059	-1.5
- 3.7	-0.004	0.056	-1.5
- 3.6	0.014	0.076	-1.0
- 3.5	0.042	0.085	-0.12
- 3.4	0.032	0.07	-0.62
- 3.3	0.032	0.056	-0.37
- 3.2	0.017	0.02	-0.62
- 3.1	0.046	-0.01	0.0
- 3.0	0.034	-0.017	-0.87
- 2.9	0.014	-0.006	-0.5
- 2.8	0.028	0.003	-0.12
- 2.7	0.036	-0.015	-0.25
- 2.6	0.034	-0.003	0.12
- 2.5	0.055	-0.02	0.25
- 2.4	0.04	-0.016	0.75
- 2.3	0.057	-0.02	1.0
- 2.2	0.074	-0.025	0.62
- 2.1	0.077	-0.02	1.0
- 2.0	0.052	-0.03	1.0
- 1.9	0.074	-0.022	1.25
- 1.8	0.052	-0.02	0.87
- 1.7	0.048	-0.032	0.62
- 1.6	0.053	-0.01	1.0
- 1.5	0.045	-0.02	0.12
- 1.4	0.02	-0.018	0.12
- 1.3	0.022	-0.02	-0.25
- 1.2	0.038	-0.026	0.12
- 1.1	0.045	-0.032	0.0
- 1.0	-0.055	-0.029	-1.62
- 0.9	-0.055	-0.036	-6.37
- 0.8	-0.083	-0.02	-5.37
- 0.7	-0.062	-0.02	-4.37
- 0.6	0.056	-0.032	-5.5
- 0.5	0.093	-0.034	3.0
- 0.4	0.101	-0.02	3.37
- 0.3	-0.1	0.026	-8.0
- 0.2	-0.365	-0.001	-15.37
- 0.1	-0.466	-0.02	-21.5
0.0	-0.546	2.0	-89.37



Longitudinal Crash Pulse (Second Record)

Time (msec)	Delta-V, longitudinal (MPH)	Delta-V, longitudinal (km/h)
9.5	1.57	2.53
19.5	2.77	4.46
29.5	3.44	5.53
39.5	3.88	6.25
49.5	4.18	6.73
59.5	4.28	6.89
69.5	4.27	6.87
79.5	4.11	6.61
89.5	4.01	6.45
99.5	3.94	6.34
109.5	3.87	6.23
119.5	3.83	6.16
129.5	3.65	5.88
139.5	3.49	5.62
149.5	3.37	5.42
159.5	3.24	5.22
169.5	3.06	4.92
179.5	2.89	4.65
189.5	2.71	4.35
199.5	2.52	4.05
209.5	2.37	3.82
219.5	2.21	3.56
229.5	2.08	3.35
239.5	1.99	3.20
249.5	1.88	3.02
259.5	1.73	2.79



Lateral Crash Pulse (Second Record)

Time (msec)	Delta-V, lateral (MPH)	Delta-V, lateral (km/h)
9.5	0.03	0.05
19.5	0.70	1.13
29.5	0.76	1.22
39.5	1.07	1.72
49.5	1.49	2.40
59.5	1.75	2.82
69.5	1.89	3.04
79.5	2.20	3.55
89.5	2.33	3.75
99.5	2.54	4.08
109.5	2.79	4.50
119.5	3.11	5.01
129.5	3.24	5.22
139.5	3.37	5.43
149.5	3.51	5.65
159.5	3.60	5.80
169.5	3.73	6.00
179.5	3.85	6.19
189.5	3.89	6.26
199.5	3.94	6.35
209.5	4.01	6.45
219.5	4.05	6.51
229.5	3.99	6.42
239.5	4.21	6.78
249.5	4.32	6.96
259.5	4.28	6.89

Hexadecimal Data

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

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42 52 33 33 2D 31 34 42 33 32 31 2D 41 46 00 00 00 00 00 00 00 00 00 00

33 31 33 33 39 31 31 34 30 30 30 30 30 30 30

42 4C 38 34 2D 31 34 43 30 32 38 2D 41 42 00 00 00 00 00 00 00 00 00

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31 5A 56 42 50 38 41 4D 34 43 35 32 36 30 31 34 39

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Event Record 1

Table with 32 columns and 400 rows of hexadecimal data (00-FF) representing an event record.

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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.