

**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                                  | WBA3A5C36DK*****                        |
| User  |   |
| Case Number                                       |   |
| EDR Data Imaging Date                             | 12/12/2012                              |
| Crash Date  |   |
| Filename  | SAMPLE_BMW.CDRX                         |
| Saved on  | Wednesday, December 12 2012 at 16:59:32 |
| Imaged with CDR version                           | Crash Data Retrieval Tool 10.0          |
| Reported with CDR version                         | Crash Data Retrieval Tool 17.6          |
| Reported with Software Licensed to (Company Name) | VCRASH France                           |
| EDR Device Type                                   | Airbag Control Module                   |
| Event(s) recovered                                | Record 1,<br>Record 2                   |

## Comments

Vehicle: 2013 BMW 328i Sedan  
Cable used: F00K108796 & F00K108387 Adapter

## Data Limitations

### BMW AIRBAG CONTROL MODULE (ACSM) DATA LIMITATIONS:

#### General Information:

These limitations are intended to assist you in reading the event data that has been imaged from the vehicle's ACSM. They are not intended to provide specific information regarding the interpretation of this data. Event data should be considered in conjunction with other available physical evidence from the vehicle and scene.

BMW and Rolls Royce passenger vehicles designated as 2013 or later model year are designed to fulfill the "NHTSA 49 CFR 563 - Event Data Recorders" and to be compatible with the Bosch CDR tool.

The Recorded Crash Events can be read by the CDR over the vehicle's OBD connector which is the preferred procedure. Imaging data by connecting directly to the ACSM should only be attempted if the vehicle's electrical system is damaged. In this case proceed with CAUTION. When imaging by directly connecting to the ACSM, make sure the ACSM is not moved, tilted or turned over while connected to and powered by the CDR Interface Module. Also, after a CDR imaging process, wait at least one minute after power is removed from the ACSM before attempting to move the module. Not following these general ACSM guidelines for bench top imaging could cause new events to be recorded in the ACSM.

The ACSM current fault status will be altered if the ACSM is powered-up without having all of the other vehicle inputs connected. This situation will occur when imaging data while connected directly to the ACSM. This will not affect the stored fault data information in any of the Event Records.

To ensure the integrity of the data during imaging, the transmitted data will be first signed by the ACSM before being read by the CDR tool. This can take up to 60 seconds for each recorded event.

In case the signature build takes longer, a gateway timeout can occur. In this case the retrieving procedure should be retried under the same ignition cycle and could be successful, if not then a download directly from ECU is necessary.

#### Recorded Crash Events:

Data for front, side, rear and rollover events can be recorded as either non-deployment or deployment events. Both types of events can contain pre-crash and crash data. The ACSM can store up to five events such as Non-Deployment Events (NDE) and Deployment Events (DE):

- a Non-Deployment Event is recorded if the change in longitudinal or lateral velocity equals or exceeds 8km/h over a 150ms timeframe.
- a Deployment Event is recorded if any type of non-reversible deployable restraint device (e.g. front airbag(s), side airbag(s), side curtain airbag(s), ...) are commanded to deploy.
- Deployment Events are locked into memory and cannot be over-written.
- Non-Deployment Events are not locked into memory and (the oldest) can be over-written by subsequent Non-Deployment or Deployment Events.
- Recorded events will be imaged by the CDR tool in chronological order (the first event is the most recent one).
- If power to the ACSM is lost during an event, all the data of this event will be stored (see information "Complete file recorded"). For following events all or part of the event data record may not be recorded. Such events cannot be retrieved by the CDR tool.

The "event begin" t0 is:

- the change in longitudinal velocity equals or exceeds 0.8km/h over a 20ms timeframe (front threshold)
- the change in lateral velocity equals or exceeds 0.8km/h over a 5ms timeframe (side threshold)
- wake-up of the front, side or rear algorithm
- deployment of a restraint by the rollover algorithm.

The event recording will always be 300ms even if:

- the change in longitudinal and lateral velocity equals or falls below 0.8km/h over a 20ms timeframe OR,
- each algorithm is inactive.

**Multiple Events:**

Data recorded by the ACSM and imaged by the CDR tool is displayed relative to t0, not the time at which the vehicle made contact with another vehicle or object.

In case of multiple algorithm activities during an event (e.g. angular impact where algorithm start to algorithm reset for each individual algorithm) overlap in time (< 300ms) this is considered a "parallel event". The first algorithm started (front, side or rear) or the first threshold reached or the deployment command of the rollover algorithm classifies the event type as "initial event". The triggering times of the subsequent event(s) are in reference to t0 of the initial event and are reported.

If an accident consists of multiple events, during which the algorithm activities (algorithm start to algorithm reset for each individual algorithm) do not overlap in time and whose start times t0 are set apart less than 5 s, this is considered a multiple event.

A multiple event can consist of more than two events, provided their start times t0 are all within the 5 s following the initial event.

The chronological sequence within a multiple event is marked by the data element "multi-event, number of events." The time period between this event and the preceding event is marked in the data element "time from event n to n+1."

**Data Element Sign Convention:**

The sign convention is according to "NHTSA 49 CFR 563 - Event Data Recorders".

| Data Element Name             | Positive Sign Notation Indicates                     |
|-------------------------------|--|
| Longitudinal Acceleration     | Forward  |
| Delta-V, Longitudinal         | Forward  |
| Maximum Delta-V, Longitudinal | Forward  |
| Lateral Acceleration          | Left to Right  |
| Delta-V, Lateral              | Left to Right  |
| Maximum Delta-V, Lateral      | Left to Right  |
| Normal Acceleration           | Downward   |
| Vehicle Roll Angle            | Clockwise Rotation around vehicles longitudinal axis |
| Steering Input                | Right Turn   |

**Data Elements:**

Pre-Crash Data:

- Pre-Crash Data is recorded at 2 samples per second starting 5 seconds before t0.
- Pre-Crash Data is recorded asynchronously.
- Recorded Pre-Crash Data have a time resolution of 500ms. This can cause a possible delay of the collected data up to 500ms.
- Pre-Crash Data indicates "Data Invalid" if a message with an "invalid" flag from the module sending the pre-crash data is sent.
- Pre-Crash Data indicates "Data Not Available" if data is not received from the module sending the pre-crash data.
- Speed, vehicle indicated data is reported as an average of all wheels.
- Speed, vehicle indicated data accuracy can be affected by various factors, such as significant changes in tire size from the factory setting, wheel lockup or slip.
- Accelerator Pedal Position, percent full is the ratio of accelerator pedal position compared to the fully depressed position.
- Steering Input Angle is recorded in 5 degree increments and limited to -250 and 250 degrees.
- Service Brake Status only indicates driver initiated braking. An automatic braking (e.g. brake intervention by Adaptive Cruise Control) will not be recorded.
- ABS Activity Status indicates an ABS Control Intervention during driver initiated braking.
- Stability Control Status indicates a Stability Control Intervention. If the Stability Control is switched off by the driver, the recorded value is "Data Not Available".
- The EDR of all vehicles manufactured from July 2012 up to March 2013 cannot record an engagement of Stability Control (DSC) and is therefore not affected by the Table II requirements for data element "Stability control". The recorded value will be "Non-engaged" even if Stability Control (DSC) actually engaged prior to the event.

Crash data:

- Acceleration data is recorded at 100Hz from t0 to 300ms.
- Delta-V data is recorded at 100Hz from t0 to 300ms.
- Delta-V, longitudinal reflects the change in velocity that the ACSM experienced in the longitudinal direction during the recorded portion of the event and is not the speed the vehicle was traveling before the event.
- Depending on the severity of the event and the accelerometer characteristics, saturation of the ACSM longitudinal or lateral accelerometers may occur. If the saturation exceeds duration of 10ms, the integration of Delta-V is stopped. The reported Delta-V values are displayed as "Data Not Available".
- Restraint Deployment Time (e.g. airbag(s)) is reported as deployment request of this device.
- Restraint Disposal (e.g. 2nd stage of the frontal airbag(s)) is reported if a disposal request of this device occurs.
- Seat Track Position Switch Status is only reported as "foremost" or "not foremost".
- Occupant size classification, right front passenger airbag suppressed data is recorded as "yes" (suppressed) if the front passenger seat sensor system determined the passenger seat was empty or occupied by a child-seat.

**Data Source:**

All recorded data is measured and calculated within the ACSM except for the following parameters (if applicable) which are transmitted via the vehicle's communication network to the ACSM:

- Speed, vehicle indicated

- Accelerator pedal position, percent full
- Service brake
- ABS activity
- Stability control
- Steering input angle
- Engine RPM

The Belt Switch Circuit is wired directly to the ACSM.

**Hexadecimal Data:**

All data that has been specified for imaging is shown in the hexadecimal data section of this report. However, not all of this data is translated by the CDR tool. The imaged ACSM may contain additional data that is not retrievable by the CDR tool.

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## System Status at Retrieval

|                                  |       |
|----------------------------------|-------|
| Ignition Cycle, Download (cycle) | 8,145 |
|----------------------------------|-------|

## System Status at Event (Record 1, Most Recent)

|   |               |
|---|---------------|
| Event Type  | Frontal       |
| Ignition ON Timer, at Event (msec)  | 2,704,767,809 |
| Time From Time Zero to Frontal Threshold (Beginning of Impact) (msec)         | Not Recorded  |
| Time From Time Zero to Side Threshold (Beginning of Impact) (msec)            | Not Recorded  |
| Time From Time Zero to Algorithm Wake-Up Start (Front) (msec)                 | 0             |
| Time From Time Zero to Algorithm Wake-Up Start (Side) (msec)                  | 4             |
| Time From Time Zero to Algorithm Wake-Up Start (Rear) (msec)                  | 15            |
| Time From Time Zero to Deployment (Rollover) (msec)                           | Not Recorded  |
| Time From Time Zero to Deployment (Pitchover) (msec)                          | Not Recorded  |
| Time From Time Zero to Algorithm Wake-Up Start (Pedestrian Protection) (msec) | Not Recorded  |
| Event Counter (counts)  | 2             |
| Complete File Recorded (Yes, No)  | Yes           |
| Multi-Event, Number of Events   | 1             |
| Time From Previous Event to Current Event (msec)                              | 0             |
| Maximum Delta-V, Longitudinal (MPH [km/h])                                    | -39.8 [-64.0] |
| Maximum Delta-V, Lateral (MPH [km/h])   | -0.6 [-1.0]   |
| Time, Maximum Delta-V, Longitudinal (msec)                                    | 104           |
| Time, Maximum Delta-V, Lateral (msec)   | 90            |
| Time, Maximum Delta-V, Resultant (msec)                                       | 104           |

## Deployment Command Data (Record 1, Most Recent)

|  |             |
|--|-------------|
| Frontal Air Bag, Time to First Stage Deployment, Driver (msec)                 | 8           |
| Frontal Air Bag, Time to Second Stage Deployment, Driver (msec)                | 13          |
| Frontal Air Bag, Time to Third Stage Deployment (Vent), Driver (msec)          | Unknown     |
| Frontal Air Bag, Second Stage Disposal, Driver                                 | No Disposal |
| Frontal Air Bag, Third Stage Disposal (Vent), Driver                           | No Disposal |
| Frontal Air Bag, Time to First Stage Deployment, Front Passenger (msec)        | 8           |
| Frontal Air Bag, Time to Second Stage Deployment, Front Passenger (msec)       | 13          |
| Frontal Air Bag, Time to Third Stage Deployment (Vent), Front Passenger (msec) | Unknown     |
| Frontal Air Bag, Second Stage Disposal, Front Passenger                        | No Disposal |
| Frontal Air Bag, Third Stage Disposal (Vent), Front Passenger                  | No Disposal |
| Side Air Bag, Time to Deployment First Stage, Driver (msec)                    | Unknown     |
| Side Curtain/Tube Air Bag, Time to Deployment, Driver Side (msec)              | Unknown     |
| Pretensioner, Time to Deploy, Driver (msec)                                    | Unknown     |
| Knee Bag, Time to Deploy, Driver (msec)  | 8           |
| Side Air Bag, Time to Deployment First Stage, Front Passenger (msec)           | Unknown     |
| Side Curtain/Tube Air Bag, Time to Deployment, Passenger Side (msec)           | Unknown     |
| Pretensioner, Time to Deploy, Front Passenger (msec)                           | Unknown     |
| Knee Bag, Time to Deploy, Front Passenger (msec)                               | Unknown     |

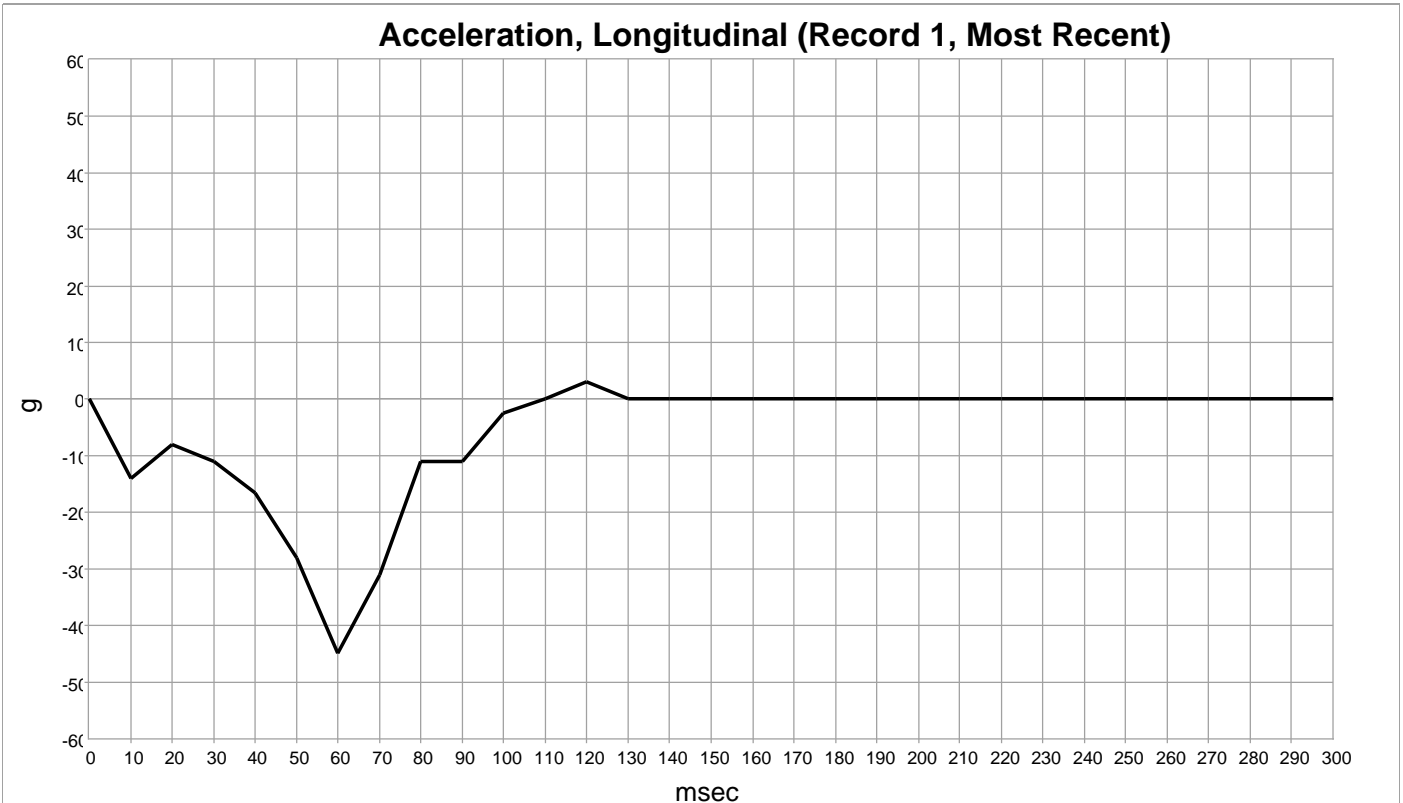
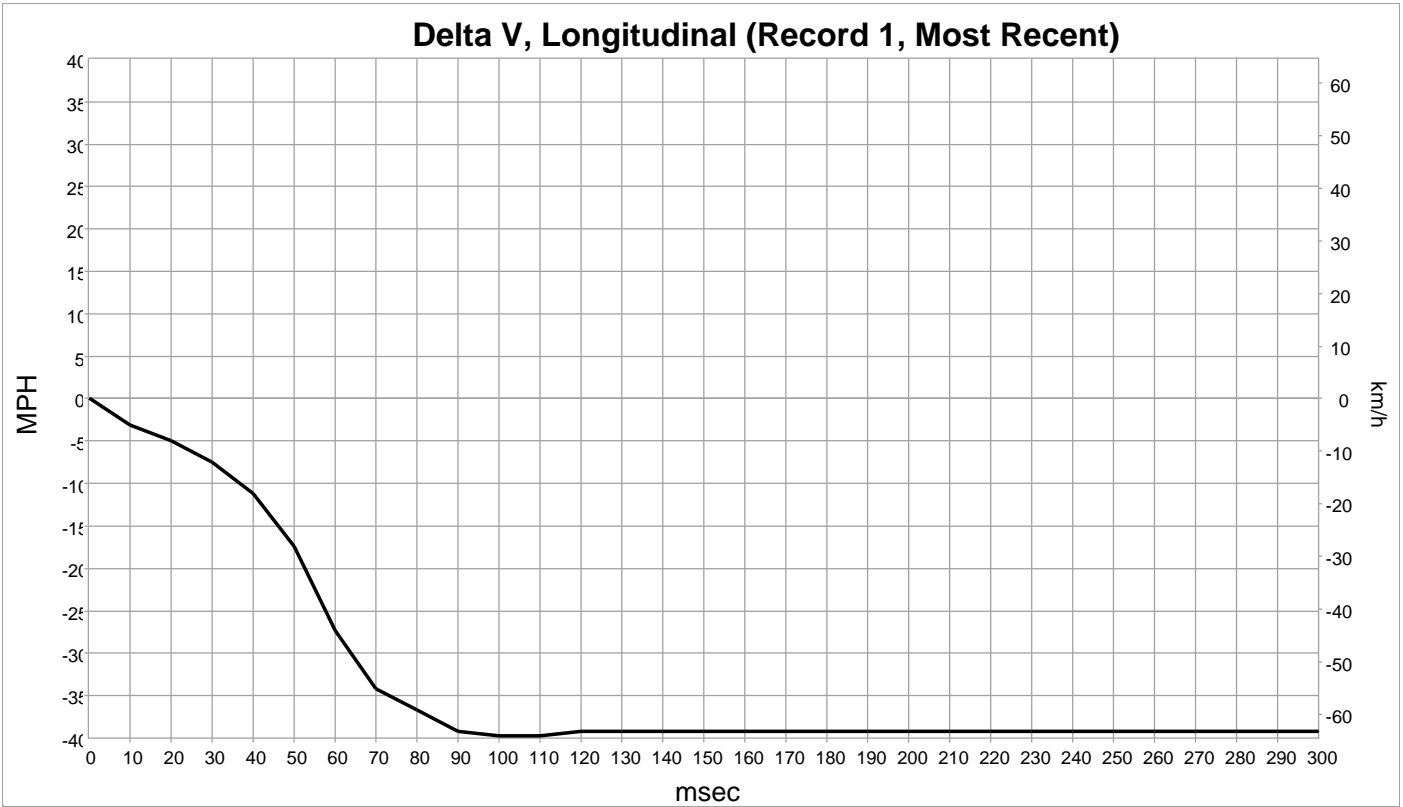
### Pre-Crash Data -1 Sec (Record 1, Most Recent)

|  |              |
|--|--------------|
| Ignition Cycle, Crash (cycle)                                | 7,822        |
| Safety Belt Status, Driver                                   | Belted       |
| Safety Belt Status, Front Passenger                          | Belted       |
| Air Bag Warning Lamp (On,Off)                                | On           |
| Air Bag Suppression Switch Status, Front Passenger           | Unknown      |
| Seat Track Position Switch Status, Driver                    | Not Foremost |
| Seat Track Position Switch Status, Foremost, Front Passenger | Not Foremost |
| Occupant Size Classification, Front Passenger (Child)        | Unknown      |

### Pre-Crash Data -5 to 0 sec (Record 1, Most Recent)

| Time (sec) | Speed, Vehicle Indicated (MPH [km/h]) | Accelerator Pedal, % Full (%) | Engine RPM | Steering Input (deg) | Service Brake, On/Off | ABS Activity (Engaged, Non-engaged) | Stability Control (On Engaged, Non-engaged) |
|------------|---------------------------------------|-------------------------------|------------|----------------------|-----------------------|-------------------------------------|---|
| -5.0       | 35 [56]                               | 82                            | 10200      | -205                 | Unknown               | Unknown                             | Unknown                                     |
| -4.5       | 35 [56]                               | 92                            | 11500      | -250                 | Unknown               | Unknown                             | Unknown                                     |
| -4.0       | 35 [56]                               | 2                             | 200        | -115                 | On                    | ABS Activity                        | Non-engaged                                 |
| -3.5       | 35 [56]                               | 12                            | 1500       | 250                  | On                    | ABS Activity                        | Non-engaged                                 |
| -3.0       | 35 [56]                               | 22                            | 2700       | 235                  | On                    | ABS Activity                        | Non-engaged                                 |
| -2.5       | 35 [56]                               | 32                            | 4000       | 145                  | On                    | ABS Activity                        | Non-engaged                                 |
| -2.0       | 65 [105]                              | 42                            | 5200       | 85                   | Off                   | No ABS Activity                     | Non-engaged                                 |
| -1.5       | 81 [130]                              | 52                            | 6500       | 0                    | Off                   | No ABS Activity                     | Non-engaged                                 |
| -1.0       | 96 [155]                              | 62                            | 7700       | -55                  | Off                   | No ABS Activity                     | Non-engaged                                 |
| -0.5       | 112 [180]                             | 72                            | 9000       | -145                 | Off                   | No ABS Activity                     | Non-engaged                                 |
| 0.0        | 35 [56]                               | 82                            | 10200      | -205                 | Unknown               | Unknown                             | Unknown                                     |

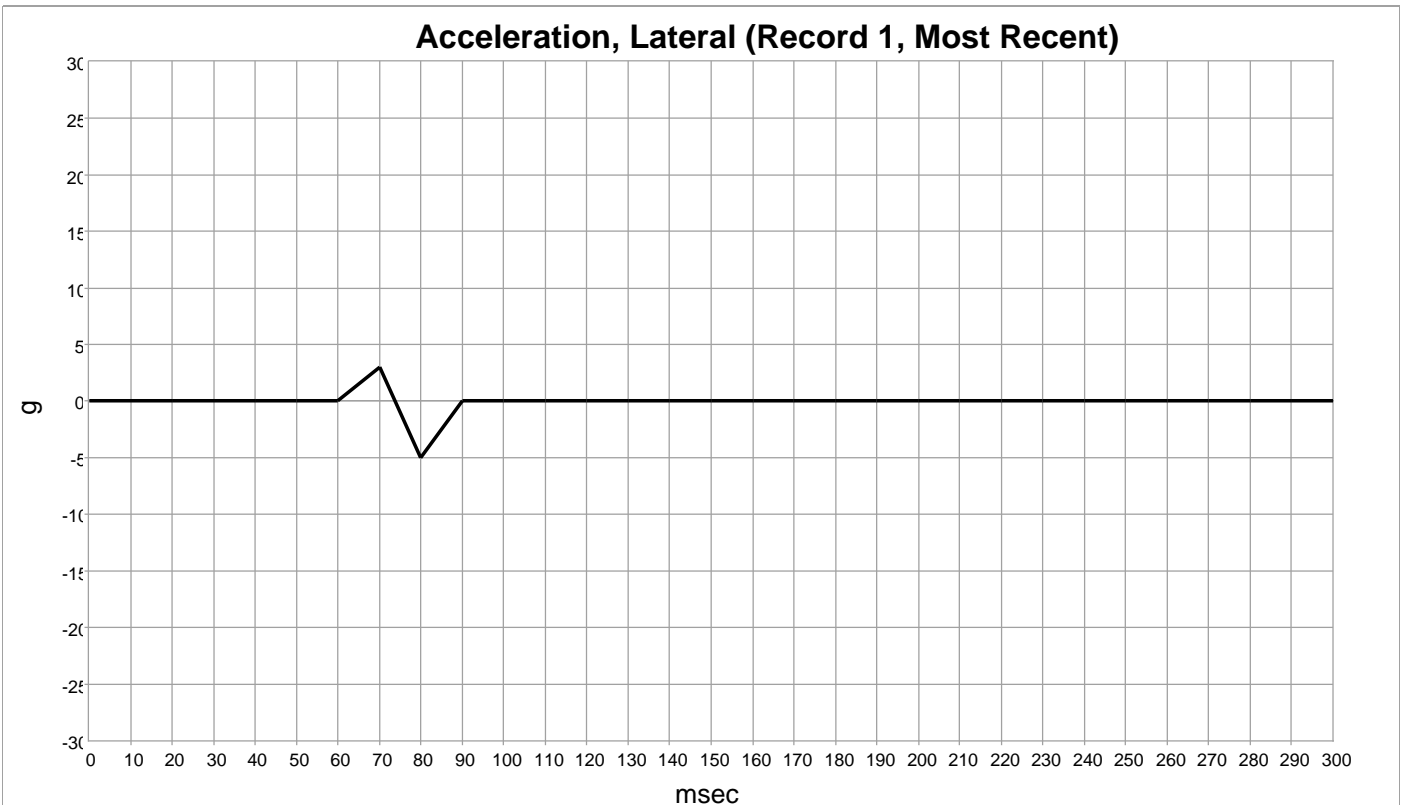
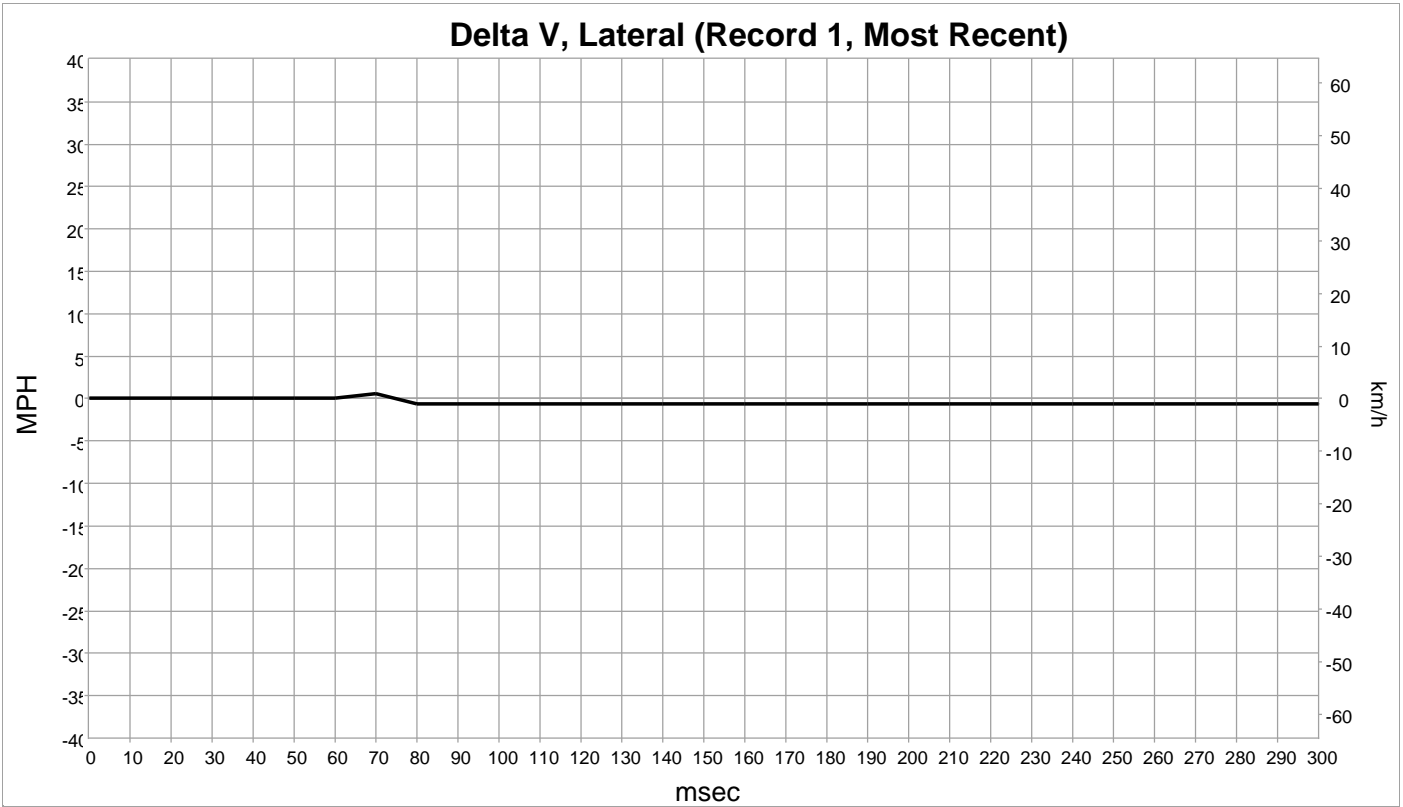
### Longitudinal Crash Pulse (Record 1, Most Recent)



### Longitudinal Crash Pulse (Record 1, Most Recent)

| Time (msec) | Delta-V, Longitudinal<br>(MPH [km/h]) | Longitudinal<br>Acceleration<br>(g) |
|-------------|---------------------------------------|-------------------------------------|
| 0           | 0.0 [0.0]                             | 0                                   |
| 10          | -3.1 [-5.0]                           | -14                                 |
| 20          | -5.0 [-8.0]                           | -8                                  |
| 30          | -7.5 [-12.0]                          | -11                                 |
| 40          | -11.2 [-18.0]                         | -17                                 |
| 50          | -17.4 [-28.0]                         | -28                                 |
| 60          | -27.3 [-44.0]                         | -45                                 |
| 70          | -34.2 [-55.0]                         | -31                                 |
| 80          | -36.7 [-59.0]                         | -11                                 |
| 90          | -39.1 [-63.0]                         | -11                                 |
| 100         | -39.8 [-64.0]                         | -3                                  |
| 110         | -39.8 [-64.0]                         | 0                                   |
| 120         | -39.1 [-63.0]                         | 3                                   |
| 130         | -39.1 [-63.0]                         | 0                                   |
| 140         | -39.1 [-63.0]                         | 0                                   |
| 150         | -39.1 [-63.0]                         | 0                                   |
| 160         | -39.1 [-63.0]                         | 0                                   |
| 170         | -39.1 [-63.0]                         | 0                                   |
| 180         | -39.1 [-63.0]                         | 0                                   |
| 190         | -39.1 [-63.0]                         | 0                                   |
| 200         | -39.1 [-63.0]                         | 0                                   |
| 210         | -39.1 [-63.0]                         | 0                                   |
| 220         | -39.1 [-63.0]                         | 0                                   |
| 230         | -39.1 [-63.0]                         | 0                                   |
| 240         | -39.1 [-63.0]                         | 0                                   |
| 250         | -39.1 [-63.0]                         | 0                                   |
| 260         | -39.1 [-63.0]                         | 0                                   |
| 270         | -39.1 [-63.0]                         | 0                                   |
| 280         | -39.1 [-63.0]                         | 0                                   |
| 290         | -39.1 [-63.0]                         | 0                                   |
| 300         | -39.1 [-63.0]                         | 0                                   |

### Lateral Crash Pulse (Record 1, Most Recent)





### Lateral Crash Pulse (Record 1, Most Recent)

| Time (msec) | Delta-V, Lateral<br>(MPH [km/h]) | Lateral Acceleration<br>(Lateral G High Range)<br>(g) |
|-------------|----------------------------------|---|
| 0           | 0.0 [0.0]                        | 0   |
| 10          | 0.0 [0.0]                        | 0   |
| 20          | 0.0 [0.0]                        | 0   |
| 30          | 0.0 [0.0]                        | 0   |
| 40          | 0.0 [0.0]                        | 0   |
| 50          | 0.0 [0.0]                        | 0   |
| 60          | 0.0 [0.0]                        | 0   |
| 70          | 0.6 [1.0]                        | 3   |
| 80          | -0.6 [-1.0]                      | -5  |
| 90          | -0.6 [-1.0]                      | 0   |
| 100         | -0.6 [-1.0]                      | 0   |
| 110         | -0.6 [-1.0]                      | 0   |
| 120         | -0.6 [-1.0]                      | 0   |
| 130         | -0.6 [-1.0]                      | 0   |
| 140         | -0.6 [-1.0]                      | 0   |
| 150         | -0.6 [-1.0]                      | 0   |
| 160         | -0.6 [-1.0]                      | 0   |
| 170         | -0.6 [-1.0]                      | 0   |
| 180         | -0.6 [-1.0]                      | 0   |
| 190         | -0.6 [-1.0]                      | 0   |
| 200         | -0.6 [-1.0]                      | 0   |
| 210         | -0.6 [-1.0]                      | 0   |
| 220         | -0.6 [-1.0]                      | 0   |
| 230         | -0.6 [-1.0]                      | 0   |
| 240         | -0.6 [-1.0]                      | 0   |
| 250         | -0.6 [-1.0]                      | 0   |
| 260         | -0.6 [-1.0]                      | 0   |
| 270         | -0.6 [-1.0]                      | 0   |
| 280         | -0.6 [-1.0]                      | 0   |
| 290         | -0.6 [-1.0]                      | 0   |
| 300         | -0.6 [-1.0]                      | 0   |

## System Status at Event (Record 2)

|   |               |
|---|---------------|
| Event Type  | Frontal       |
| Ignition ON Timer, at Event (msec)  | 2,704,759,379 |
| Time From Time Zero to Frontal Threshold (Beginning of Impact) (msec)         | Not Recorded  |
| Time From Time Zero to Side Threshold (Beginning of Impact) (msec)            | Not Recorded  |
| Time From Time Zero to Algorithm Wake-Up Start (Front) (msec)                 | 0             |
| Time From Time Zero to Algorithm Wake-Up Start (Side) (msec)                  | 4             |
| Time From Time Zero to Algorithm Wake-Up Start (Rear) (msec)                  | 15            |
| Time From Time Zero to Deployment (Rollover) (msec)                           | Not Recorded  |
| Time From Time Zero to Deployment (Pitchover) (msec)                          | Not Recorded  |
| Time From Time Zero to Algorithm Wake-Up Start (Pedestrian Protection) (msec) | Not Recorded  |
| Event Counter (counts)  | 1             |
| Complete File Recorded (Yes, No)  | Yes           |
| Multi-Event, Number of Events   | 1             |
| Time From Previous Event to Current Event (msec)                              | 0             |
| Maximum Delta-V, Longitudinal (MPH [km/h])                                    | -39.8 [-64.0] |
| Maximum Delta-V, Lateral (MPH [km/h])   | -0.6 [-1.0]   |
| Time, Maximum Delta-V, Longitudinal (msec)                                    | 104           |
| Time, Maximum Delta-V, Lateral (msec)   | 90            |
| Time, Maximum Delta-V, Resultant (msec)                                       | 104           |

## Deployment Command Data (Record 2)

|  |             |
|--|-------------|
| Frontal Air Bag, Time to First Stage Deployment, Driver (msec)                 | 8           |
| Frontal Air Bag, Time to Second Stage Deployment, Driver (msec)                | 13          |
| Frontal Air Bag, Time to Third Stage Deployment (Vent), Driver (msec)          | Unknown     |
| Frontal Air Bag, Second Stage Disposal, Driver                                 | No Disposal |
| Frontal Air Bag, Third Stage Disposal (Vent), Driver                           | No Disposal |
| Frontal Air Bag, Time to First Stage Deployment, Front Passenger (msec)        | 8           |
| Frontal Air Bag, Time to Second Stage Deployment, Front Passenger (msec)       | 13          |
| Frontal Air Bag, Time to Third Stage Deployment (Vent), Front Passenger (msec) | Unknown     |
| Frontal Air Bag, Second Stage Disposal, Front Passenger                        | No Disposal |
| Frontal Air Bag, Third Stage Disposal (Vent), Front Passenger                  | No Disposal |
| Side Air Bag, Time to Deployment First Stage, Driver (msec)                    | Unknown     |
| Side Curtain/Tube Air Bag, Time to Deployment, Driver Side (msec)              | Unknown     |
| Pretensioner, Time to Deploy, Driver (msec)                                    | Unknown     |
| Knee Bag, Time to Deploy, Driver (msec)  | 8           |
| Side Air Bag, Time to Deployment First Stage, Front Passenger (msec)           | Unknown     |
| Side Curtain/Tube Air Bag, Time to Deployment, Passenger Side (msec)           | Unknown     |
| Pretensioner, Time to Deploy, Front Passenger (msec)                           | Unknown     |
| Knee Bag, Time to Deploy, Front Passenger (msec)                               | Unknown     |

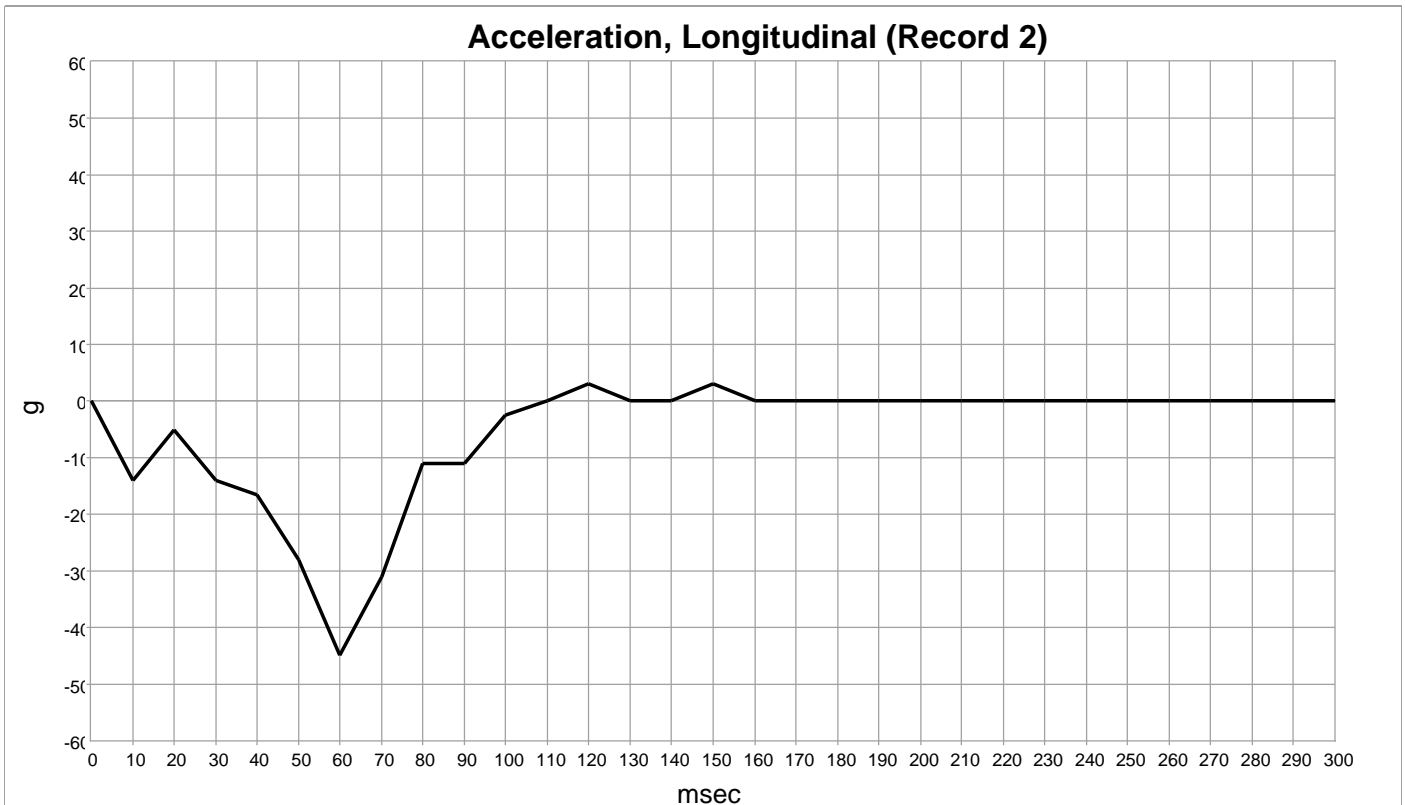
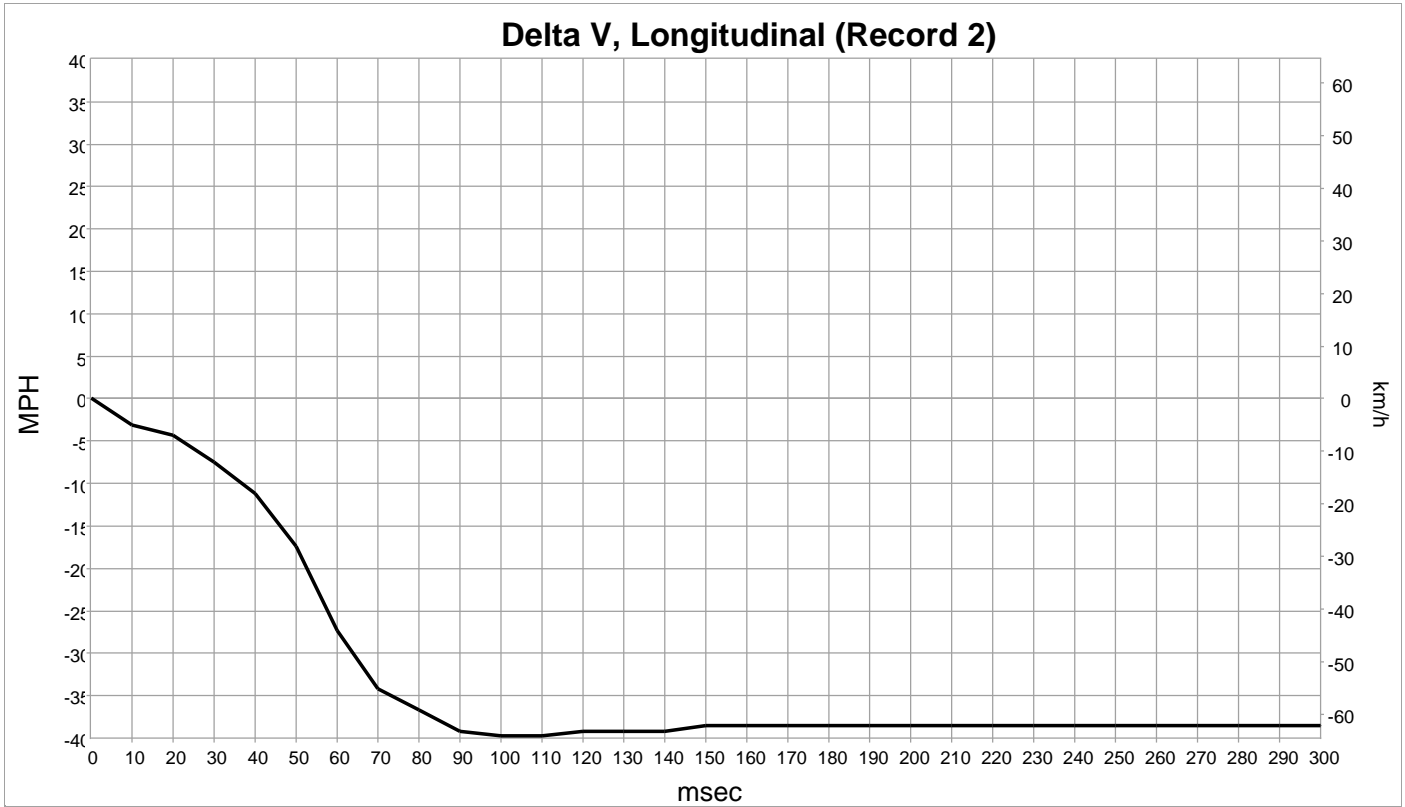
### Pre-Crash Data -1 Sec (Record 2)

|  |              |
|--|--------------|
| Ignition Cycle, Crash (cycle)                                | 7,822        |
| Safety Belt Status, Driver                                   | Belted       |
| Safety Belt Status, Front Passenger                          | Belted       |
| Air Bag Warning Lamp (On,Off)                                | Off          |
| Air Bag Suppression Switch Status, Front Passenger           | Unknown      |
| Seat Track Position Switch Status, Driver                    | Not Foremost |
| Seat Track Position Switch Status, Foremost, Front Passenger | Not Foremost |
| Occupant Size Classification, Front Passenger (Child)        | Unknown      |

### Pre-Crash -5 to 0 sec (Record 2)

| Time (sec) | Speed, Vehicle Indicated (MPH [km/h]) | Accelerator Pedal, % Full (%) | Engine RPM | Steering Input (deg) | Service Brake, On/Off | ABS Activity (Engaged, Non-engaged) | Stability Control (On Engaged, Non-engaged) |
|------------|---------------------------------------|-------------------------------|------------|----------------------|-----------------------|-------------------------------------|---|
| -5.0       | 19 [30]                               | 12                            | 1500       | 250                  | On                    | ABS Activity                        | Non-engaged                                 |
| -4.5       | 34 [55]                               | 22                            | 2700       | 235                  | On                    | ABS Activity                        | Non-engaged                                 |
| -4.0       | 50 [80]                               | 32                            | 4000       | 145                  | On                    | ABS Activity                        | Non-engaged                                 |
| -3.5       | 65 [105]                              | 42                            | 5200       | 85                   | Off                   | No ABS Activity                     | Non-engaged                                 |
| -3.0       | 80 [129]                              | 52                            | 6500       | 0                    | Off                   | No ABS Activity                     | Non-engaged                                 |
| -2.5       | 96 [155]                              | 62                            | 7700       | -55                  | Off                   | No ABS Activity                     | Non-engaged                                 |
| -2.0       | 111 [179]                             | 72                            | 9000       | -145                 | Off                   | No ABS Activity                     | Non-engaged                                 |
| -1.5       | 127 [205]                             | 82                            | 10200      | -205                 | Unknown               | Unknown                             | Unknown                                     |
| -1.0       | 143 [230]                             | 92                            | 11500      | -250                 | Unknown               | Unknown                             | Unknown                                     |
| -0.5       | 3 [5]                                 | 2                             | 200        | -115                 | On                    | ABS Activity                        | Non-engaged                                 |
| 0.0        | 35 [56]                               | 12                            | 1500       | 250                  | On                    | ABS Activity                        | Non-engaged                                 |

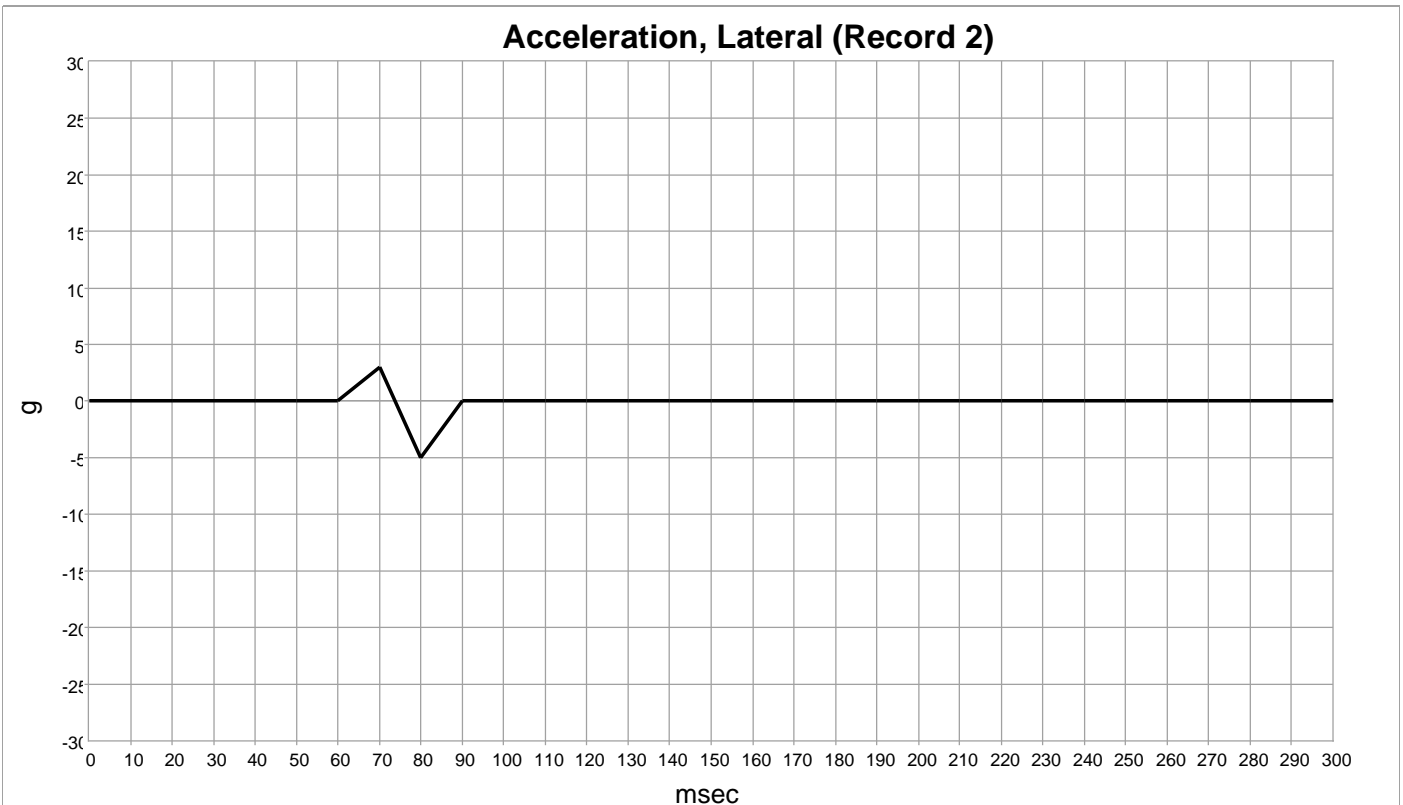
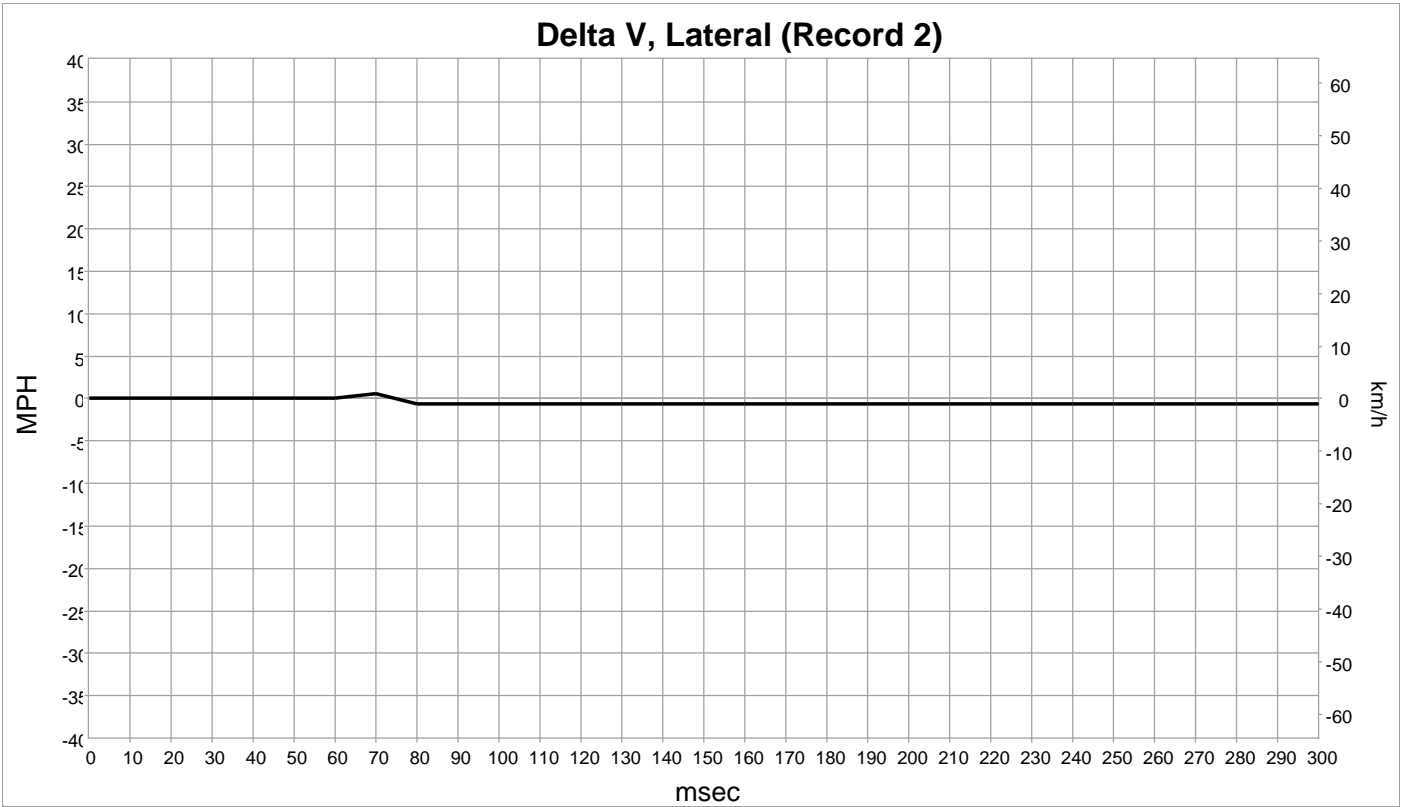
### Longitudinal Crash Pulse (Record 2)



## Longitudinal Crash Pulse (Record 2)

| Time (msec) | Delta-V, Longitudinal<br>(MPH [km/h]) | Longitudinal<br>Acceleration<br>(g) |
|-------------|---------------------------------------|-------------------------------------|
| 0           | 0.0 [0.0]                             | 0                                   |
| 10          | -3.1 [-5.0]                           | -14                                 |
| 20          | -4.3 [-7.0]                           | -5                                  |
| 30          | -7.5 [-12.0]                          | -14                                 |
| 40          | -11.2 [-18.0]                         | -17                                 |
| 50          | -17.4 [-28.0]                         | -28                                 |
| 60          | -27.3 [-44.0]                         | -45                                 |
| 70          | -34.2 [-55.0]                         | -31                                 |
| 80          | -36.7 [-59.0]                         | -11                                 |
| 90          | -39.1 [-63.0]                         | -11                                 |
| 100         | -39.8 [-64.0]                         | -3                                  |
| 110         | -39.8 [-64.0]                         | 0                                   |
| 120         | -39.1 [-63.0]                         | 3                                   |
| 130         | -39.1 [-63.0]                         | 0                                   |
| 140         | -39.1 [-63.0]                         | 0                                   |
| 150         | -38.5 [-62.0]                         | 3                                   |
| 160         | -38.5 [-62.0]                         | 0                                   |
| 170         | -38.5 [-62.0]                         | 0                                   |
| 180         | -38.5 [-62.0]                         | 0                                   |
| 190         | -38.5 [-62.0]                         | 0                                   |
| 200         | -38.5 [-62.0]                         | 0                                   |
| 210         | -38.5 [-62.0]                         | 0                                   |
| 220         | -38.5 [-62.0]                         | 0                                   |
| 230         | -38.5 [-62.0]                         | 0                                   |
| 240         | -38.5 [-62.0]                         | 0                                   |
| 250         | -38.5 [-62.0]                         | 0                                   |
| 260         | -38.5 [-62.0]                         | 0                                   |
| 270         | -38.5 [-62.0]                         | 0                                   |
| 280         | -38.5 [-62.0]                         | 0                                   |
| 290         | -38.5 [-62.0]                         | 0                                   |
| 300         | -38.5 [-62.0]                         | 0                                   |

### Lateral Crash Pulse (Record 2)



## Lateral Crash Pulse (Record 2)

| Time (msec) | Delta-V, Lateral<br>(MPH [km/h]) | Lateral Acceleration<br>(Lateral G High Range)<br>(g) |
|-------------|----------------------------------|---|
| 0           | 0.0 [0.0]                        | 0   |
| 10          | 0.0 [0.0]                        | 0   |
| 20          | 0.0 [0.0]                        | 0   |
| 30          | 0.0 [0.0]                        | 0   |
| 40          | 0.0 [0.0]                        | 0   |
| 50          | 0.0 [0.0]                        | 0   |
| 60          | 0.0 [0.0]                        | 0   |
| 70          | 0.6 [1.0]                        | 3   |
| 80          | -0.6 [-1.0]                      | -5  |
| 90          | -0.6 [-1.0]                      | 0   |
| 100         | -0.6 [-1.0]                      | 0   |
| 110         | -0.6 [-1.0]                      | 0   |
| 120         | -0.6 [-1.0]                      | 0   |
| 130         | -0.6 [-1.0]                      | 0   |
| 140         | -0.6 [-1.0]                      | 0   |
| 150         | -0.6 [-1.0]                      | 0   |
| 160         | -0.6 [-1.0]                      | 0   |
| 170         | -0.6 [-1.0]                      | 0   |
| 180         | -0.6 [-1.0]                      | 0   |
| 190         | -0.6 [-1.0]                      | 0   |
| 200         | -0.6 [-1.0]                      | 0   |
| 210         | -0.6 [-1.0]                      | 0   |
| 220         | -0.6 [-1.0]                      | 0   |
| 230         | -0.6 [-1.0]                      | 0   |
| 240         | -0.6 [-1.0]                      | 0   |
| 250         | -0.6 [-1.0]                      | 0   |
| 260         | -0.6 [-1.0]                      | 0   |
| 270         | -0.6 [-1.0]                      | 0   |
| 280         | -0.6 [-1.0]                      | 0   |
| 290         | -0.6 [-1.0]                      | 0   |
| 300         | -0.6 [-1.0]                      | 0   |

## Hexadecimal Data

```
FA10  02

FA12  02 00 00 06 F1 00 00 06 01

FA11  04 00 01

FA13  02 00 01 00 00 02 FF FF 00 03 FF FF 00 04 00 00
      00 05 00 04 00 06 00 0F 00 07 FF FF 00 08 FF FF
      00 09 FF FF 00 0A 00 02 00 15 64 00 1E 80 80 80
      80 80 80 80 86 76 80 80 80 80 80 80 80 80 80 80
      80 80 80 80 80 80 80 80 80 80 80 80 00 17 64 00
      1E 80 64 70 6A 5F 48 26 42 6A 6A 7B 80 86 80 80
      80 80 80 80 80 80 80 80 80 80 80 80 80 80 80 80
      00 1F 64 1F 80 7B 78 74 6E 64 54 49 45 41 40 40
      41 41 41 41 41 41 41 41 41 41 41 41 41 41 41 41
      41 41 41 00 20 64 1F 80 80 80 80 80 80 80 81 7F
      7F 7F 7F 7F 7F 7F 7F 7F 7F 7F 7F 7F 7F 7F 7F
      7F 7F 7F 7F 7F 7F 00 21 40 00 22 7F 00 23 34 00
      24 2D 00 25 34 00 29 00 1E 8E 00 2A 00 1F D1 00
      2B 00 00 2D 01 00 2E 00 00 33 08 00 34 0D 00 35
      FE 00 36 00 00 37 00 00 38 08 00 39 0D 00 3A FE
      00 3B 00 00 3C 00 00 3D FE 00 3E FE 00 3F FE 00
      40 08 00 41 FE 00 42 FE 00 43 FE 00 44 FE 00 47
      01 00 48 00 00 4B 01 00 4C FE 00 4D 01 00 4E 00
      00 4F FE 00 5B 38 38 38 38 38 38 38 69 82 9B B4 38
      00 5C 52 5C 02 0C 16 20 2A 34 3E 48 52 00 5D 66
      73 02 0F 1B 28 34 41 4D 5A 66 00 5E 5B 64 49 00
      03 15 21 32 3D 4F 5B 00 5F FE FE 01 01 01 01 00
      00 00 FE 00 60 FE FE 01 01 01 01 00 00 00 00
      FE 00 61 FE FE 00 00 00 00 00 00 00 00 FE 02 3B
      1B D0 3C 07 00 00 00 02 3C 45 01 00 01 50 00 10
      00 00 00 00 00 00 00 03 E8 00 03 FB 00 00 A1 37
      7B 41 03 FF E1 1F F9 30 F4 A9 92 96 6D 53 DD 14
      A9 6A 20 7D AF 43 D0 01 27 F5 36 D2 6F 0D 0A 0A
      BE 1C 03 81 CE 5F E8 5A 49 51 AA F8 08 2A 88 C8
      B8 CE 63 C6 46 D8 58 2A 2A 10 B3 5F 95 46 68 62
      C9 FF 69 74

FA14  01 00 01 00 00 02 FF FF 00 03 FF FF 00 04 00 00
      00 05 00 04 00 06 00 0F 00 07 FF FF 00 08 FF FF
      00 09 FF FF 00 0A 00 01 00 15 64 00 1E 80 80 80
      80 80 80 80 86 76 80 80 80 80 80 80 80 80 80 80
      80 80 80 80 80 80 80 80 80 80 80 80 00 17 64 00
      1E 80 64 76 64 5F 48 26 42 6A 6A 7B 80 86 80 80
      86 80 80 80 80 80 80 80 80 80 80 80 80 80 80 80
      00 1F 64 1F 80 7B 79 74 6E 64 54 49 45 41 40 40
      41 41 41 42 42 42 42 42 42 42 42 42 42 42 42 42
      42 42 42 00 20 64 1F 80 80 80 80 80 80 80 81 7F
      7F 7F 7F 7F 7F 7F 7F 7F 7F 7F 7F 7F 7F 7F 7F
      7F 7F 7F 7F 7F 7F 00 21 40 00 22 7F 00 23 34 00
      24 2D 00 25 34 00 29 00 1E 8E 00 2A 00 1F D1 00
      2B 00 00 2D 01 00 2E 00 00 33 08 00 34 0D 00 35
      FE 00 36 00 00 37 00 00 38 08 00 39 0D 00 3A FE
      00 3B 00 00 3C 00 00 3D FE 00 3E FE 00 3F FE 00
      40 08 00 41 FE 00 42 FE 00 43 FE 00 44 FE 00 47
      01 00 48 00 00 4B 00 00 4C FE 00 4D 01 00 4E 00
      00 4F FE 00 5B 1E 37 50 69 81 9B B3 CD E6 05 38
      00 5C 0C 16 20 2A 34 3E 48 52 5C 02 0C 00 5D 0F
      1B 28 34 41 4D 5A 66 73 02 0F 00 5E 00 03 15 21
      32 3D 4F 5B 64 49 00 00 5F 01 01 01 00 00 00 00
      FE FE 01 01 00 60 01 01 01 00 00 00 00 FE FE 01
      01 00 61 00 00 00 00 00 00 00 FE FE 00 00 02 3B
      1B D0 3C 07 00 00 00 02 3C 45 01 00 01 50 00 10
      00 00 00 00 00 00 00 03 E8 00 03 FB 00 00 A1 37
      5A 53 03 FF B3 55 59 76 F3 A6 61 1F C8 B8 A5 93
```



```
3A F5 11 80 64 99 FF 9C E6 69 6D 42 E0 B1 0D A7
E5 93 4F 1F 33 99 01 8F D2 E9 CA 94 BE 30 83 9D
34 3F 4B 8E 86 34 D5 E8 62 56 25 68 B3 5C F4 3B
80 5E B5 E4
```

FA15 00

FA16 00

FA17 00

FA18 No data received.

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