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

NHTSA

DOT HS 813 508

September 2023

Special Crash Investigations: On-Site Crash Avoidance Investigation; Vehicle: 2019 Volkswagen Tiguan; Location: Florida; Crash Date: October 2020

DISCLAIMER

This publication is distributed by the U.S. Department of Transportation, National Highway Traffic Safety Administration, in the interest of information exchange. The opinions, findings, and conclusions expressed in this publication are those of the authors and not necessarily those of the Department of Transportation or the National Highway Traffic Safety Administration. The United States Government assumes no liability for its contents or use thereof. If trade or manufacturers' names are mentioned, it is only because they are considered essential to the object of the publication and should not be construed as an endorsement. The United States Government does not endorse products or manufacturers.

Suggested APA Format Citation:

Crash Research & Analysis, Inc. (2023, September) *Special Crash Investigations: On-site crash avoidance investigation; Vehicle: 2019 Volkswagen Tiguan; Location: Florida; Crash Date: October 2020* (Report No. DOT HS 813 508). National Highway Traffic Safety Administration.

Technical Report Documentation Page

1. Report No.	2. Government Accession No.	3. Recipient's Catalog No.	
DOT HS 813 508			
4. Title and Subtitle Special Crash Investigations: On-Site Crash Avoidance Investigation; Vehicle: 2019 Volkswagen Tiguan; Location: Florida; Crash Date: October 2020		**5. Report Date** September 2023 **6. Performing Organization Code**	
7. Author Crash Research & Analysis, Inc.		**8. Performing Organization Report No.** CR21003	
9. Performing Organization Name and Address Crash Research & Analysis, Inc. PO Box 302 Elma, NY 14059		**10. Work Unit No. (TRAIS)** **11. Contract or Grant No.** 693JJ919C000004	
12. Sponsoring Agency Name and Address National Highway Traffic Safety Administration 1200 New Jersey Avenue SE Washington, DC 20590		**13. Type of Report and Period Covered** Technical Report **14. Sponsoring Agency Code**	

15. Supplementary Notes

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 submitted.

16. Abstract

This on-site investigation documented the front-to-rear plane crash of a 2019 Volkswagen Tiguan and a 2008 Nissan Altima. The Volkswagen had several crash avoidance systems, including front assist, a forward collision mitigation system designed to prevent and/or reduce the severity of front-to-rear collisions. The belted male driver notified the National Highway Traffic Safety Administration and alleged that the crash avoidance system did not provide a warning of the Nissan stopped in his traffic lane. Additionally, the driver reported to local law enforcement that the driver frontal air bag did not deploy. According to local law enforcement, the Volkswagen driver said he was not injured and wasn't transported for treatment. The belted female Nissan driver sustained injuries and was transported by ambulance to a hospital, extent of treatment unknown. The SCI investigation concluded that the front assist/FCW system would not have alerted or applied braking due to the Volkswagen traveling at speeds greater than the threshold for the system to alert for a stationary object.

17. Key Words	18. Distribution Statement
crash avoidance, air bag, non-deployment	This document is available to the public from the USDOT, National Highway Traffic Safety Administration, National Center for Statistical Analysis, crashstats.nhtsa.dot.gov/

19. Security Classif. (of this report)	20. Security Classif. (of this page)	21. No. of Pages	22. Price
Unclassified	Unclassified	94	

Form DOT F 1700.7 (8-72) Reproduction of completed page authorized

Table of Contents

Special Crash Investigations
On-Site Crash Avoidance Investigation
Office of Defects Investigation
Case Number: CR21003
Vehicle: 2019 Volkswagen Tiguan
Location: Florida
Crash Date: October 2020

Background

This on-site investigation documented the front-to-rear plane crash of a 2019 Volkswagen Tiguan (Figure 1) and a 2008 Nissan Altima. The Volkswagen had several crash avoidance (CA) systems, including front assist, a forward collision warning (FCW) system designed to prevent and/or reduce the severity of front-to-rear (rear-end) collisions. The belted male driver (age unknown) notified the National Highway Traffic Safety Administration in December 2020 and alleged that the crash avoidance system did not provide warning of the Nissan stopped in his traffic lane. Additionally, the driver reported to local law enforcement that his frontal air bag did not deploy. According to local law enforcement, the Volkswagen driver stated at the scene that he was not injured and was not transported for treatment. The belted female Nissan driver (unknown age) sustained police-reported C-level (possible) injuries and was transported by ambulance to a hospital. The extent of medical treatment for the Nissan driver is unknown.

Figure 1. Front left oblique view of the 2019 Volkswagen during the SCI investigation

The crash was identified by the Office of Defects Investigations and assigned to the Special Crash Investigations team of Crash Research and Analysis, Inc., in January 2021. A joint inspection with a vehicle manufacturer representative was arranged and completed in February 2021. The on-site investigation included inspections of the Volkswagen to measure exterior deformation, interior damage and intrusion, documentation of interior occupant contact, assessment of the manual and supplemental restraint systems, and verification of the CA systems. The Volkswagen event data recorder (EDR) was imaged during the inspection process with the Bosch Crash Data Retrieval (CDR) tool. Due to safety concerns of the traffic and local police requesting the team to not be on the side of the interstate, the crash site was not measured by total station. The scene was documented by drive-through images then reconstructed using satellite imagery. After several attempts to contact the Volkswagen driver by telephone, he could not be located for interview. The Nissan was sold prior to the crash notification and was not inspected in-person. A photos-only inspection was conducted for the Nissan.

The SCI investigation concluded that the front assist/FCW system would not have alerted or applied braking due to the Volkswagen traveling at a speed greater than the designed threshold for the system to alert for a stationary object. Additional details about this can be found in the EDR section of this report.

Summary

Crash Site

This crash occurred on a multi-lane northbound interstate (Figure 2) at night. The reported weather conditions in the locale included clear skies, a temperature of 10 ºC (50 ºF), 63-percent relative humidity, and northeast wind speeds of 16 km/h (10 mph). The interstate traversed in a general northeast, southwest direction. The northbound roadway had four lanes, curved slightly to the right, and was divided by the southbound lanes by a concrete traffic barrier. The northbound roadway markings consisted of dashed white lane lines and solid white edge lines. The lanes were each approximately 3.7 m (12.0 ft) wide. The roadway had a slight right curve leading into a straightaway. The speed limit for both vehicles was 105 km/h (65 mph). A crash diagram is included at the end of this report.

Figure 2. Northbound view of the Volkswagen's approach to the crash site

Pre-Crash

The Volkswagen was traveling north in the right lane at an EDR-reported speed of 112 km/h (70 mph) at 4.5 seconds prior to algorithm enable (AE). According to the police crash report (PCR), the Nissan was stopped in the northbound right lane with no lights on. Due to the dark conditions and lack of overhead lighting, the Volkswagen driver likely could not see the Nissan in the roadway.

Crash

The front plane, right/center aspect of the Volkswagen struck the back plane, left/center aspect of the Nissan (Event 1). Directions of force were in the 12 o'clock sector for the Volkswagen and 6 o'clock sector for the Nissan. No air bags deployed in the Volkswagen. The impact displaced the Nissan forward and to the right, off the roadway, where it struck a traffic sign (Event 2) indicated by the yellow line in Figure 3. The Volkswagen continued forward after impact and traveled left across all travel lanes coming to final rest on the left shoulder of the northbound travel lanes.

Figure 3. Scene image showing the area of impact as indicated by the yellow arrow

Post-Crash

Local emergency medical services and law enforcement personnel were dispatched to the crash scene. The Volkswagen driver stated, at the scene, that he was uninjured and refused treatment or transport to a local hospital. The driver of the Nissan was transported by ambulance to a hospital with C-level injuries. The extent of medical treatment for the driver of the Nissan is unknown. The PCR indicated the driver of the Nissan was cited for driving while impaired.

2019 Volkswagen Tiguan

Description

The 2019 Volkswagen Tiguan (Figure 4) was manufactured with the Vehicle Identification Number (VIN) 3VV2B7AX6KMxxxxxx. The Volkswagen was an all-wheel-drive SUV powered by a 2.0-liter, 4-cylinder, gasoline engine linked to a continuous variable transmission. Its service brakes were power-assisted 4-wheel disc with antilock (ABS). The gross vehicle weight rating was 2,350 kg (5,180 lb). The vehicle manufacturer's recommended tire size was 215/65R17. All four wheels of the Volkswagen had GitiComfort XR1 tires of the recommended size. All tires had 6 mm (7/32) of tread, remained inflated, and were not restricted or damaged in the crash.

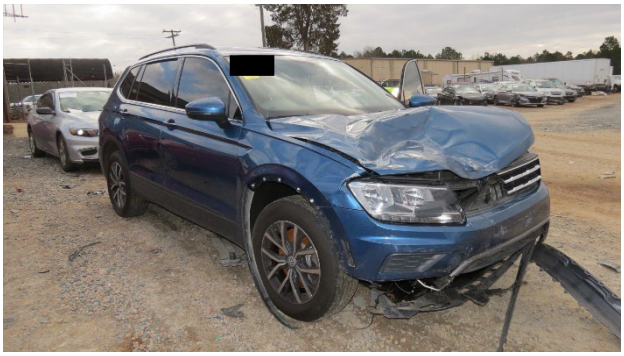


Figure 4. Front right oblique view of the 2019 Volkswagen Tiguan during the SCI vehicle inspection

The Volkswagen had several CA systems including front assist/forward collision warning, blind spot detection, pedestrian monitoring, and a backup camera with rear traffic alert.

The Volkswagen interior had seating for five occupants (2/3), with front-row bucket seats and a second-row bench seat with split folding seatbacks. All seating positions had adjustable head restraints. Manual restraint systems consisted of 3-point lap and shoulder seat belts for all seat positions. The front-row seating positions had retractor pretensioners. Supplemental restraint systems included driver and passenger frontal air bags, front-row seat-mounted side impact air bags, and inflatable curtain (IC) air bags.

Exterior Damage

The damage pattern of the front plane was indicative of a right offset frontal impact (Figure 5). The front of the Volkswagen overrode the rear of the Nissan, resulting in direct damage to the front bumper, grill, and hood of the Volkswagen. The contact damage to the hood of the Volkswagen was consistent with the trunk of the Nissan. A crush profile was documented to the front bumper beam and radiator bar. The corresponding direct damage was 84 cm (33.0 in) wide beginning at 22 cm (8.6 in) left of the front center point extending right. The field-L was 173 cm (68.1 in). The residual crush profile from the bumper level was zero. There was crush above the bumper level, however, it was not the 13 cm (5.1 in) in difference required to average. The collision deformation classification (CDC) for this damage was 12FZEW1.

Figure 5. Front right oblique view of the 2019 Volkswagen Tiguan during the SCI vehicle inspection

Event Data Recorder

The Volkswagen had an air bag control module (ACM) that performed the diagnostics, sensing, and deployment command functions for the supplemental restraint systems. The ACM had event data recorder capabilities, which were supported by the Bosch Crash Data Retrieval tool. During the vehicle inspection communication between the CDR tool and the module was established through the vehicle's diagnostic link connector and the application of supplemental 12-volt electrical power. The EDR component was imaged with software version 21.0 and the EDR data is reported with version 23.1 at the end of this report as an Appendix A.

The EDR could record two different event types, termed non-deployment and deployment. Non-deployment events were vehicle conditions that met the recording threshold but did not deploy a passive safety system (non-reversible) device. The minimum speed change required for deployment was 8 km/h (5 mph) within 150 milliseconds. Subsequent events for greater magnitude could overwrite a non-deployment event. Deployment events by definition deployed/actuated pretensioners and air bags and could not be overwritten. The EDR had the capacity to store six event records and recorded events in all three directions, as well as rollovers. The EDR used the concept of event counters to track and correlate the total number, order, and relationship of several event crashes. Additionally, event records were tracked by a vehicle clock (date and time), as well as an ignition cycle counter.

A 5.0-second pre-crash buffer that described various vehicle performance parameters including vehicle speed, accelerator pedal position, brake status, engine rpm, and steering wheel angle was recorded for each crash event. These performance parameters were recorded asynchronously in 0.5-second intervals.

The imaged data reported that the EDR had recorded a total of 30 events over the vehicle's history. The stored events were numbered 25 to 30. Sequence of events 29 and 30 were related to the crash under SCI investigation and were recorded on ignition cycle 3,360. The ignition cycle at the time of the data imaging was 3,369. The difference of 9 ignition cycles was attributed to post-crash movement of the vehicle through the insurance process to salvage. The ignition cycle counter fields for the event records 25 to 28 were all less than 2,581 and these events were considered historical non-deployment events.

Record 2 – Event Counter 29
Chronologically, this record was the first event in the two-record sequence and was a deployment event attributed to event 1 of the SCI crash reconstruction. The deployment command consisted of the actuation of the seat belt pretensioners 168 milliseconds after AE. The driver frontal air bag was not commanded to deploy. At the time of recording, the driver's seat belt was buckled and the driver's seat was in a rear position. The air bag warning indicator in the instrument cluster was off. The maximum longitudinal delta V was -30 km/h (-18.6 mph) at 257.5 milliseconds after AE. The maximum lateral delta V was -1 km/h (-0.6 mph) at 190.05 milliseconds after AE.

Record 1 – Event Counter 30
This record was the second record in the crash sequence and was a non-deployment event which occurred 767 milliseconds after the initial impact. At the time of the recording the air bag warning indicator was on. The maximum longitudinal and lateral delta V was -2 km/h (-1.2 mph) and 2 km/h (1.2 mph). The record was consistent with the Volkswagen engaging the Nissan a second time in the rear-end crash.

The recorded pre-crash data of the two events overlapped by 1 second and are shown in Table 1 below.

Table 1. EDR Pre-Crash Data

Time (sec) Event 29	Time (sec) Event 30	Speed km/h (mph)	Accelerator Pedal, % full	Engine rpm	Service Brake (On, Off)	Steering Input (deg.)
-5.0	**------**	111 (69)	14	1,856	Off	-4
-4.5	**------**	112 (70)	4	1,856	Off	-4
-4.0	**-5.0**	112 (70)	4	1,856	Off	-2
-3.5	**-4.5**	112 (70)	6	1,856	Off	-2
-3.0	**-4.0**	112 (70)	8	1,856	Off	-2
-2.5	**-3.5**	112 (70)	9	1,856	Off	-2
-2.0	**-3.0**	112 (70)	9	1,856	Off	-2
-1.5	**-2.5**	112 (70)	9	1,856	Off	-4
-1.0	**-2.0**	112 (70)	9	1,856	Off	-6
-0.5	**-1.5**	113 (70)	9	1,856	Off	-4
0.0	**-1.0**	111 (69)	0	1,856	Off	-2
AE Event 29						
	-0.05	82 (51)	0	1,280	On, ABS, ESC	-80
	0.0	41 (25)	0	768	On, ABS, ESC	48
AE Event 30						

The data trends indicated that the driver was traveling with constant control input at a speed of 112 km/h (70 mph) leading up to the crash. The change status for the accelerator and brake pedals indicate that the driver probably recognized the impending crash late in the pre-crash phase. His brake pedal application activated the ABS and ESC systems, suggesting a hard brake application occurred as the initial impact occurred. The brake application after the initial

application was also recorded in the diagnostic data, which confirmed the Volkswagen's post-crash brake mitigation was overridden by the driver's brake application. The post-impact changes in the steering wheel angle are likely induced by the impact forces and were not attributed to driver input.

Air Bag Non-Deployment Discussion

The driver frontal air bag did not deploy during the impact with the Nissan. A review of the data recorded in the EDR indicated that the crash pulse had a long duration with a relatively low magnitude. The pulse stretched over approximately 250 milliseconds with a maximum acceleration of approximately -7g. The nature of the crash pulse and physical damage to the Volkswagen were consistent with the underride crash type. The slope of the velocity change was shallow, and the driver's use of the seat belt coupled with the pretensioner actuation was likely sufficient to restrain the occupant.

Crash Avoidance Discussion

The Volkswagen had several CA systems designed to assist/support the driver in both avoiding a potential crash and/or reducing the severity of a crash event should a collision be imminent. These CA systems included front assist/forward collision warning, blind spot detection, pedestrian monitoring, and a backup camera with rear traffic alert. The driver was able to turn these systems on or off through the assist systems menu in the instrument cluster or in the system settings located in the infotainment system.

According to the owner's manual, the front assist/FCW can detect vehicles up to 80 m (262 ft) in front of it. The system uses escalating measures at certain critical points to help the driver avoid an accident. When the system determines that a collision is likely, it will issue an optical and auditory alert. If the driver does not react the system will apply a small braking action to serve as a "haptic" warning. At the same time the brakes are prepared so that if the driver does apply the brakes, front assist will apply the additional braking force needed to reduce the severity or mitigate a collision. Front assist applies full braking up to 30 km/h (19 mph) and can detect moving or stationary objects. Between 30 km/h (19 mph) and 80 km/h (50 mph), front assist will not apply braking, but the system will warn the driver if it detects a stationary object. Between 30 km/h (19 mph) and 200 km/h (124 mph), in moving traffic, front assist applies its full capacity of driver warnings with partial braking.

In this crash sequence the front assist/FCW system would not have alerted or applied braking due to the Volkswagen traveling at approximately 113 km/h (70 mph), which is greater than the 30 km/h (19 mph) designed threshold for the system to alert for a stationary object. It should also be noted that the driver did not apply the brakes until after the first impact and no frontal collision assistance was applied to the braking.

Interior Damage

At inspection, the interior of the Volkswagen had no signs of intrusion or contacts.

Manual Restraint Systems

The Volkswagen had manual 3-point lap and shoulder seat belt systems for all five seating positions. All the 3-point lap and shoulder belt systems consisted of continuous loop webbing

with sliding latch plates. The driver and front passenger seat belt systems used retractor pretensioners and retracted onto an emergency locking retractor (ELR). The second-row seat belt systems used switchable ELR/automatic locking retractors. The seat belt for the driver was found in an extended position lying loosely in the driver's seat with the retractor locked, indicating the pretensioner had actuated during the crash sequence.

Supplemental Restraint Systems

The Volkswagen had several supplemental restraints for its occupants. These included dual-stage driver and passenger frontal air bag, front outboard seat-mounted side impact air bags, and combination rollover/side impact IC air bags. None of the air bags deployed during the crash sequence.

2019 Volkswagen Tiguan Occupant Data

Driver Demographics

Age/sex:	Unknown years/male
Height:	Unknown
Weight:	Unknown
Eyewear:	Unknown
Seat type:	Forward-facing bucket seat with adjustable head restraint
Seat track position:	Rearmost track position
Manual restraint usage:	3-point lap and shoulder seat belt with retractor and pretensioners (actuated)
Usage source:	Vehicle inspection, EDR data
Air bags:	Frontal, outboard seat-mounted side impact, and IC air bags; none deployed
Alcohol/drug involvement:	None (No test given)
Egress from vehicle:	Unknown
Transport from scene:	Not transported
Type of medical treatment:	None

Driver Injuries

Injury No.	Injury	Injury Severity AIS 2015	Involved Physical Component (IPC)	IPC Confidence Level
1	N/A	N/A	N/A	N/A

Driver Kinematics

The driver was seated with the track position adjusted to the rearmost position. The driver was restrained by the available 3-point lap and shoulder seat belt. Upon striking the Nissan, the pretensioner actuated. The driver responded in a forward trajectory and loaded the restraint. The driver remained in his seat secured by the seat belt and came to rest. The driver did not report any injuries at the scene and was not transported.

2008 Nissan Altima

Description

The 2008 Nissan Altima (Figure 6) was manufactured in January of 2008 with the VIN 1N4AL21E18Cxxxxxx. The Nissan was a front-wheel-drive sedan powered by a 2.5-liter, 4-cylinder, gasoline engine linked to a 6-speed continuous variable transmission. The gross vehicle weight rating was 1,941 kg (4,279 lb).

Figure 6. Front right oblique view of the 2008 Nissan Altima. Image obtained from insurance salvage facility

Supplemental restraint systems included front seat belt pretensioners, driver and passenger frontal, front-row outboard seat-mounted side impact, and IC air bags.

Exterior Damage

The Nissan was sold by its insurer prior to the SCI investigation and was not inspected. However, insurance salvage images of the Nissan were obtained from online sources. The damage pattern of the rear plane was indicative of a left offset rear impact (Figure 7). The rear of the Nissan was overridden by the front end of the Volkswagen resulting in direct damage to the rear bumper and trunk of the Nissan. This damage resulted in an estimated CDC of 06BYEW99.

Figure 7. Back left oblique view of the 2008 Nissan Altima. Image obtained from insurance salvage facility

The right side damage to the Nissan was the result of the impact to a traffic sign (Figure 8, Event 2). This damage started after the A-pillar and extended rearward along the right side. The street sign pole dug into the right rear door panel separating the sheet metal from the door frame during this impact. The right front window was shattered from the impact but was still in place.

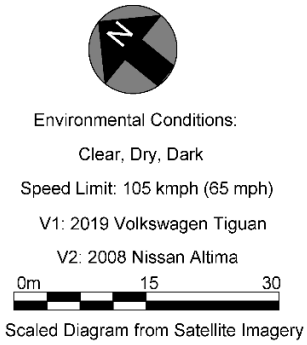
Figure 8. Front right oblique view of the 2008 Nissan Altima. Image obtained from insurance salvage facility.

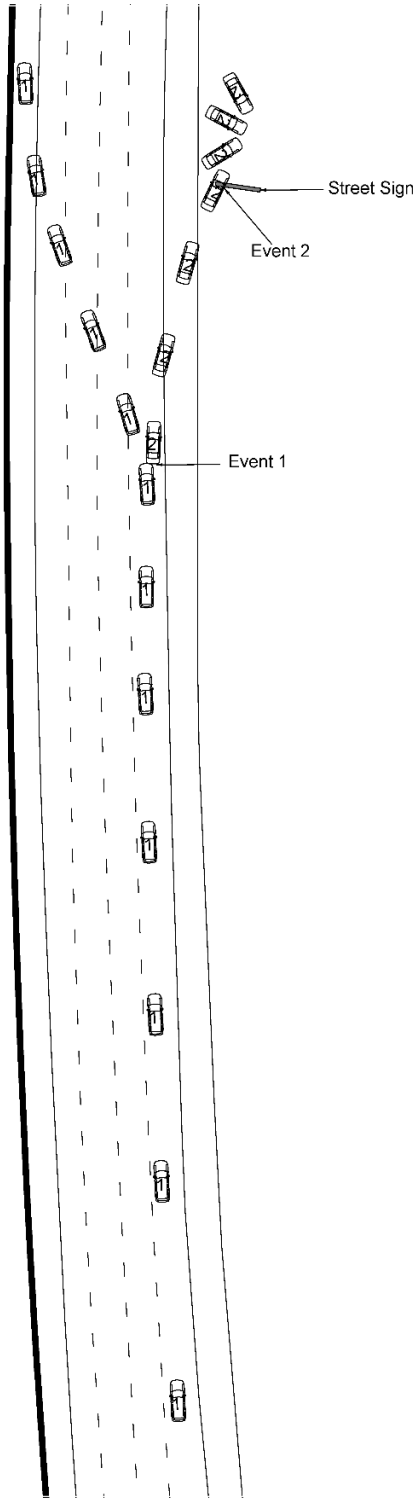
This impact occurred after the Nissan was projected off the right side of the roadway. This damage resulted in surface scratching on the right front door and the right rear door sheet metal peeling rearward from the traffic signpost getting caught in it at the B-pillar. This damage resulted in an estimated CDC of 12RZEW99.

Occupant Data

According to the PCR, the Nissan was driven by a belted female. The driver sustained C-level injuries. The driver was transported by ambulance to a local hospital for treatment. The details of the drivers' injuries are unknown.

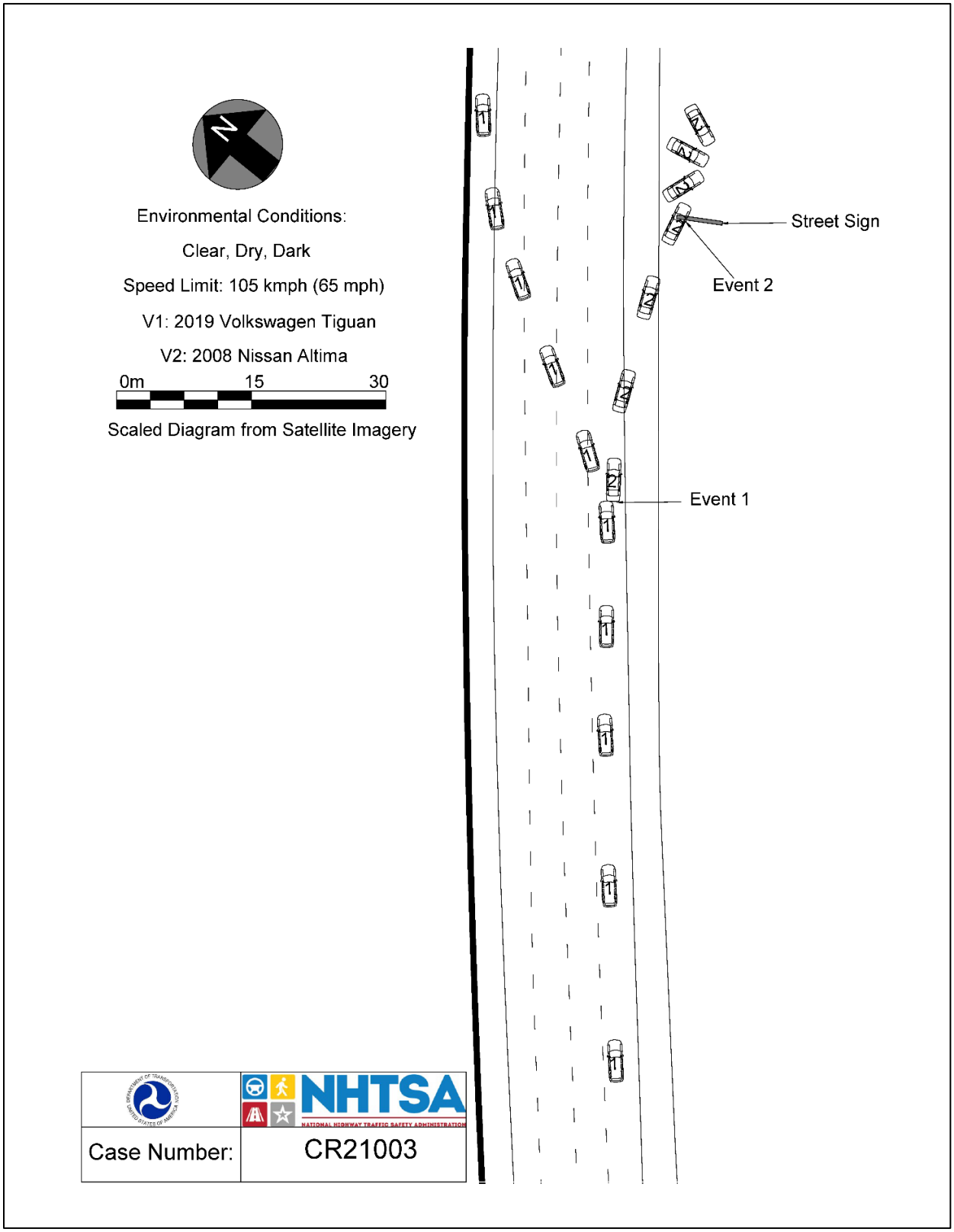
Crash Diagram





	NHTSA
Case Number:	CR21003

Crash Diagram – A Detailed View



Appendix: 2019 Volkswagen Tiguan Event Data Recorder Report[1]

[1]The EDR report contained in this technical report was imaged using the current version of the Bosch CDR software at the time of the vehicle inspection. The CDR report contained in the associated Crash Viewer application may differ relative to this report. The Bosch CDR report uploaded to CISSWeb contains only the PDF file due to the personal identifiable information contained in the CDRx.

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	3VV2B7AX6KM******
User	
Case Number	
EDR Data Imaging Date	
Crash Date	
Filename	CR21003_V1.CDRX
Saved on	
Imaged with CDR version	Crash Data Retrieval Tool 21.0
Imaged with Software Licensed to (Company Name)	Company Name information was removed when this file was saved without VIN sequence number
Reported with CDR version	Crash Data Retrieval Tool 23.1
Reported with Software Licensed to (Company Name)	NHTSA
EDR Device Type	Airbag Control Module
Event(s) recovered	Record 1 (CRC Check Failed - Saved Without VIN Sequence Number), Record 2 (CRC Check Failed - Saved Without VIN Sequence Number), Record 3 (CRC Check Failed - Saved Without VIN Sequence Number), Record 4 (CRC Check Failed - Saved Without VIN Sequence Number), Record 5 (CRC Check Failed - Saved Without VIN Sequence Number), Record 6 (CRC Check Failed - Saved Without VIN Sequence Number)

Comments

No comments entered.

Data Limitations

AIRBAG CONTROL MODULE (ACM) DATA LIMITATIONS:

General Information:
These limitations are intended to assist you in reading the event data that has been imaged from the vehicle's Airbag Control Module (ACM). They are not intended to provide specific information regarding the interpretation of this data. Event data should be examined in conjunction with other available physical evidence from the vehicle and scene.

> **Note**: The ACM's current DTC status will be altered if the ACM is powered-up without the vehicle periphery connected. This situation might occur when the CDR tool is connected directly to the ACM (e.g. for bench top imaging). It will not affect the stored EDR data, but may result in additional DTCs within the ACM.
>
> **Note**: During bench top imaging, make sure the ACM is not moved, tilted or turned over while connected to and powered by the CDR Interface Module. Also, after a CDR imaging process, wait one minute after power is removed from the ACM before attempting to move the module. Not following these general ACM guidelines for bench top imaging could cause new events to be recorded in the ACM.

Recorded Crash Events:
This ACM is capable of recording up to 6 events of front, side, rear or rollover within its memory. Each record contains 5 seconds of pre-crash data and at least 300ms of post-crash data. Deployment events are locked into memory and cannot be overwritten. Non-deployment events can be overwritten by subsequent deployment or non-deployment events. The oldest non-deployment event will be overwritten first. Some ACMs stop over-writing of older non-deployment events by more recent non-deployment events after a certain number of events (more than 1000). Under these conditions, the storage of deployment events is still available. The event counter is incremented for each event and stored within the data record.

Deployment events are recorded, when a non-reversible restraint system was commanded to deploy. Recording of non-deployment events requires a minimum delta-V of 8km/h within a 150ms period in either longitudinal or lateral direction. Reversible restraint systems (e.g. active headrests) that have been commanded to deploy also trigger recording of a non-deployment event. Time Zero of an event is determined by the ACM's algorithms based on the acceleration and/or pressure sensors or a deployment command. Post-crash data (e.g. deployment time of restraint systems) is reported relative to Time Zero.

The ACM supports recording of multiple events. In case of a rapid sequence of events (e.g. a combined frontal and side event), the ACM will record the data within a common EDR entry (a so-called parallel event). In this case, the post-crash data is reported relative to Time Zero of the initial event. If the initial event has already ended and another event happens within a time period of 5s from Time Zero of the initial event, the ACM will record a multi-event consisting of two or more separate EDR entries.

If power to the ACM was lost during an event, all or part of the event data record may not have been recorded.

Data:
The reported data elements may vary by vehicle model, model year or vehicle configuration. Part of the pre-crash data has been transmitted to the ACM by various vehicle control modules via the vehicle's communication network.

Time-continuous pre-crash data is recorded at two samples per second for 5 seconds before Time Zero. The main data elements are:

- Speed Vehicle Indicated: is reported as displayed by the vehicle's instrument cluster. The vehicle speed is evaluated as an average of wheel speeds and transmitted via the vehicle communication network to the ACM. Its data accuracy may be affected by various factors, such as significant changes in tire size from the factory settings, wheel lock-up or slip.
- Accelerator Pedal: is the ratio of the accelerator pedal's position compared to the fully depressed position (in percent). The pedal position sensor is wired to the Engine Control Module.
- Service Brake Activation: is the status of the brake pedal switch. The switch is wired to the Engine Control Module.
- Engine RPM (Combustion Engine): as reported by the Engine Control Module.
- Steering Input: as reported by the wheel angle sensor.
- ABS Activity: as reported by the Electronic Stability Control Module.
- Stability Control: as reported by the Electronic Stability Control Module.

The pre-crash status is recorded 1 second before Time Zero. The main data elements are:

- Safety Belt Status: as evaluated by the belt-switches that are wired to the ACM.
- Seat Track Position Switch: as evaluated by the seat track position sensors that are wired to the ACM.
- Airbag Warning Lamp, Status: as commanded by the ACM.
- Occupant Size Classification, Front Passenger: as reported by the occupant classification system.
- Frontal Airbag Disable Indicator Status: as commanded by the ACM.

Pre-crash and post-crash data are recorded asynchronously. The data element "Time from Last Speed Data Sample (Precrash) to Time Zero" indicates the time delay between the most recent pre-crash data sample and Time Zero (0 to 500ms).

Post-crash data is recorded after Time Zero up to 300ms. The Vehicle Roll Angle may be recorded for 5 seconds post-crash. The main data elements are:

- Event Type: indicates the event type depending on the algorithm that triggered the recording criteria first (deployment or Delta-V threshold).
- Multi-Event, Number of Events: determines the chronological order of records being part of a multi-event.
- Time from Previous / Initial Event to Current Event: indicates the time difference between records of multi-events.
- Delta-V Longitudinal / Lateral: are recorded every 10ms from Time Zero to 250ms. Delta-V reflects the change in velocity that the ACM experienced during the recorded time period. It does not necessarily correlate with vehicle traveling speed.
- Longitudinal / Lateral / Normal Acceleration: are recorded every 10ms from Time Zero to 250ms (if supported by the ACM). The reported range of acceleration may vary between ACM models.
- Clipping Time, Longitudinal / Lateral Acceleration Sensor: depending on the severity of the event, the measuring range of the longitudinal or lateral accelerometers may be exceeded. The data elements "Clipping Time, Longitudinal / Lateral Acceleration Sensor" indicate the time within an event when the measurement first exceeded the design range of the sensor. As a result, subsequent Delta-V values may be underestimated.
- Vehicle Roll Angle: is recorded every 100ms from 1 second before and up to 5 seconds after Time Zero. Due to mechanical limitations of the roll rate sensor, high accelerations, which can occur during front, side or rear crashes, can disturb the oscillating angular rate sensing element. This results in the roll rate data being temporarily invalid for a short period of time (at or shortly after Time Zero).
- Time to Deployment: indicates the time at which the ACM commanded the deployment of the associated restraint system.
- Disposal: indicates whether the ACM commanded the disposal of the propellant from the associated restraint system. "No Disposal" indicates that the restraint system was commanded to deploy for occupant restraint purposes.
- Date and Time at Event: is reported as the date and time of the vehicle's clock at the time of an event. Since the vehicle clock may be adjusted manually, the reported values may not reflect the actual date and time of a given event. As with the other data elements reported herein, these parameters should be examined in conjunction with other available physical evidence from the vehicle and scene.
- Complete File Recorded: indicates if the event data has been completely recorded to the ACM's memory or if the recording process has been interrupted before completion.

The status "Data not Available" is reported if the ACM was unable to store the data element (e.g. due to missing communication). "Invalid Data" is reported if the ACM was unable to store valid data for the data element (e.g. range exceeded, communication failure, sensor failure).

Data Sign Convention:

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	Left to Right Rotation
Steering Input	Left Turn

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.

12001_VWGDefault_r002

System Status at Event (Record 1, Most Recent)

Event Counter at Event	30
Event Type	Data Not Available
Multi-Event, Number of Events	2, Event
Time from Initial Event to Current Event (msec)	767.0
Time from Previous Event to Current Event (msec)	767.0
Vehicle Clock, Date and Time at Event (YYYY-MM-DD, HH:MM:SS)	[redacted]
Vehicle Mileage (km)	61,150
Operating Time (min)	64,847
Ignition Cycle at Event (Cycles)	3,360
Ignition Cycle at Download (Cycles)	3,369
Maximum Delta-V, Longitudinal (MPH [km/h])	-1.2 [-2]
Time, Maximum Delta-V, Longitudinal (msec)	300.0
Clipping Time, Longitudinal Acceleration Sensor (msec)	Clipping Not Reached
Maximum Delta-V, Lateral (MPH [km/h])	1.2 [2]
Time, Maximum Delta-V, Lateral (msec)	102.5
Clipping Time, Lateral Acceleration Sensor (msec)	Clipping Not Reached
Time, Maximum Delta-V, Resultant (msec)	300.0
Time from Last Speed Data Sample (Precrash) to Time Zero (msec)	366
Time from Time Zero to Algorithm Start (Front) (msec)	Algorithm Not Started
Time from Time Zero to Algorithm Reset (Front) (msec)	Algorithm Not Reset
Time from Time Zero to Algorithm Start (Side) (msec)	Algorithm Not Started
Time from Time Zero to Algorithm Reset (Side) (msec)	Algorithm Not Reset
Time from Time Zero to Algorithm Start (Rear) (msec)	Algorithm Not Started
Time from Time Zero to Algorithm Reset (Rear) (msec)	Algorithm Not Reset
Time from Time Zero to Deployment (Rollover) (msec)	Algorithm Not Started
Time from Time Zero to Algorithm Reset (Rollover) (msec)	Algorithm Not Reset
Vehicle Identification Number (VIN)	3VV2B7AX6KM******
Supplier ID, ACM	YNF
Production Date, ACM	190215
Supply Voltage (Before Event) (V)	12.9
Complete File Recorded	Completed Successfully

Deployment Command Data (Record 1, Most Recent)

Pretensioner, Time to 1st Stage Deployment, Driver (msec)	Not Deployed
Belt-Load Limiter, Time to Deployment, Driver (msec)	Not Deployed
Sill-End Pretensioner, Time to Deployment, Driver (msec)	Not Deployed
Frontal Airbag, Time to 1st Stage Deployment, Driver (msec)	Not Deployed
Side Airbag, Time to 1st Stage Deployment, Driver (msec)	Not Deployed
Side Curtain/Tube Airbag, Time to Deployment, Driver Side (msec)	Not Deployed
Pretensioner, Time to 1st Stage Deployment, Front Passenger (msec)	Not Deployed
Belt-Load Limiter, Time to Deployment, Front Passenger (msec)	Not Deployed
Sill-End Pretensioner, Time to Deployment, Front Passenger (msec)	Not Deployed
Frontal Airbag, Time to 1st Stage Deployment, Front Passenger (msec)	Not Deployed
Frontal Airbag, Time to 2nd Stage Deployment, Front Passenger (msec)	Not Deployed
Frontal Airbag, 2nd Stage Disposal, Front Passenger	Not Deployed
Side Airbag, Time to 1st Stage Deployment, Front Passenger (msec)	Not Deployed
Side Curtain/Tube Airbag, Time to Deployment, Passenger Side (msec)	Not Deployed

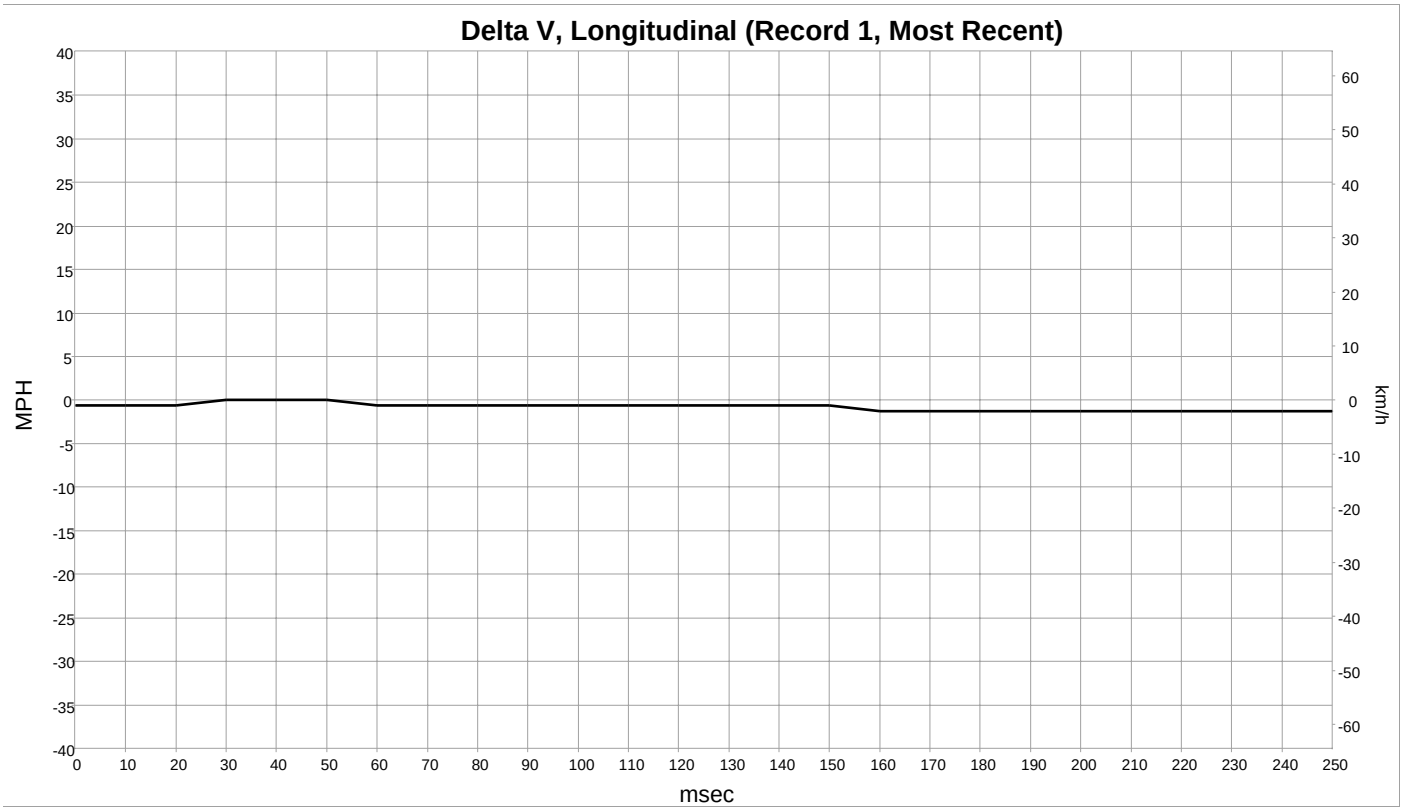
Pre-Crash Data -1 Sec (Record 1, Most Recent)

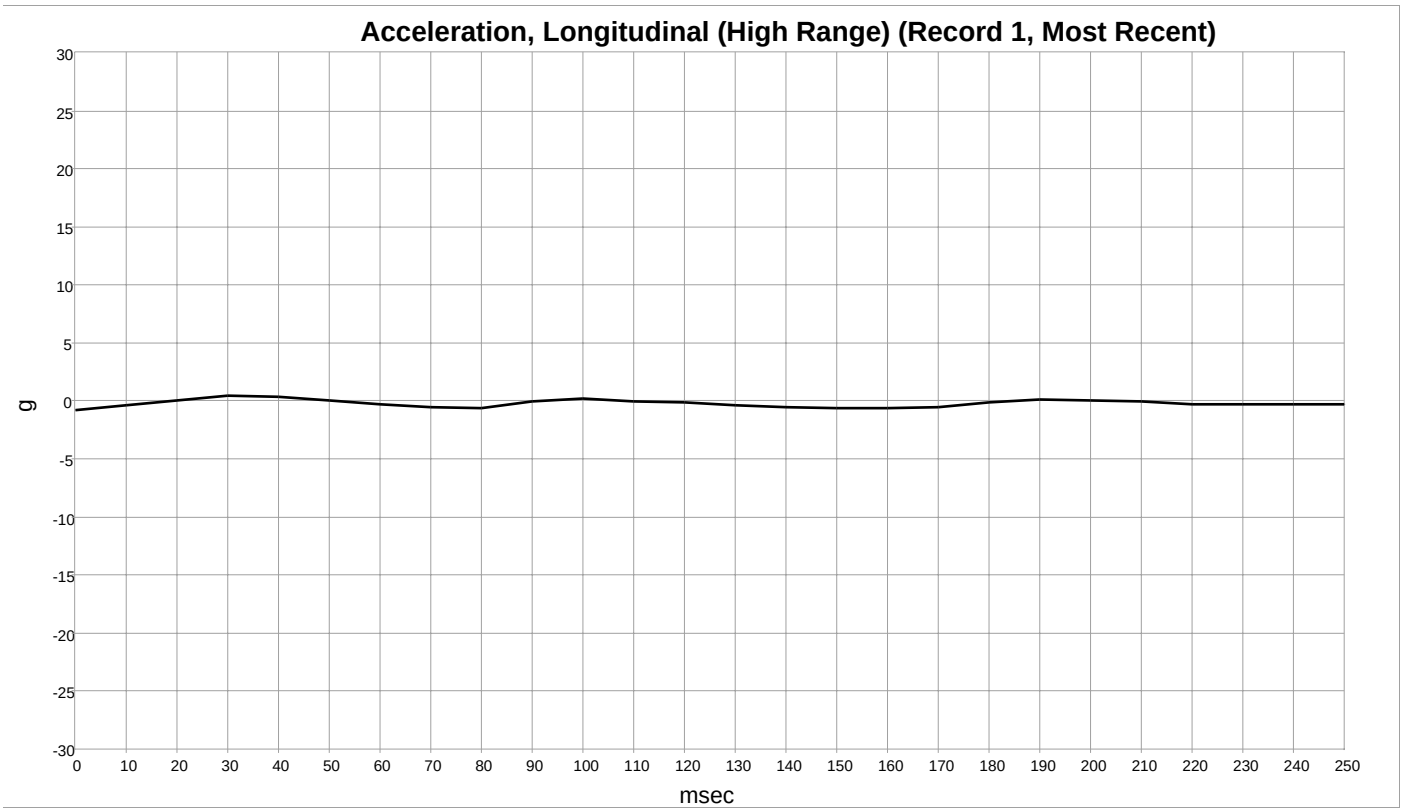
Safety Belt Status, Driver	Fastened
Seat Track Position Switch Status, Driver	Rear
Safety Belt Status, Front Passenger	Not fastened
Seat Track Position Switch Status, Front Passenger	Rear
Occupant Size Classification, Front Passenger	Empty
Frontal Airbag Disable Indicator Status, Passenger	On
Airbag Warning Lamp, Status	On

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

Time (sec)	Engine RPM (Combustion Engine) (RPM)	ABS Activity	Stability Control	Steering Input (deg)	Speed, Vehicle Indicated (MPH [km/h])	Accelerator Pedal (%)	Service Brake Activation
-5.0	1,856	Non-Engaged	On	-2	70 [112]	4	Off
-4.5	1,856	Non-Engaged	On	-2	70 [112]	6	Off
-4.0	1,856	Non-Engaged	On	-2	70 [112]	8	Off
-3.5	1,856	Non-Engaged	On	-2	70 [112]	9	Off
-3.0	1,856	Non-Engaged	On	-2	70 [112]	9	Off
-2.5	1,856	Non-Engaged	On	-4	70 [112]	9	Off
-2.0	1,856	Non-Engaged	On	-6	70 [112]	9	Off
-1.5	1,856	Non-Engaged	On	-4	70 [113]	9	Off
-1.0	1,856	Non-Engaged	On	-2	69 [111]	0	Off
-0.5	1,280	Engaged	Engaged	-80	51 [82]	0	On
0.0	768	Engaged	Engaged	48	25 [41]	0	On

Longitudinal Crash Pulse (Record 1, Most Recent)

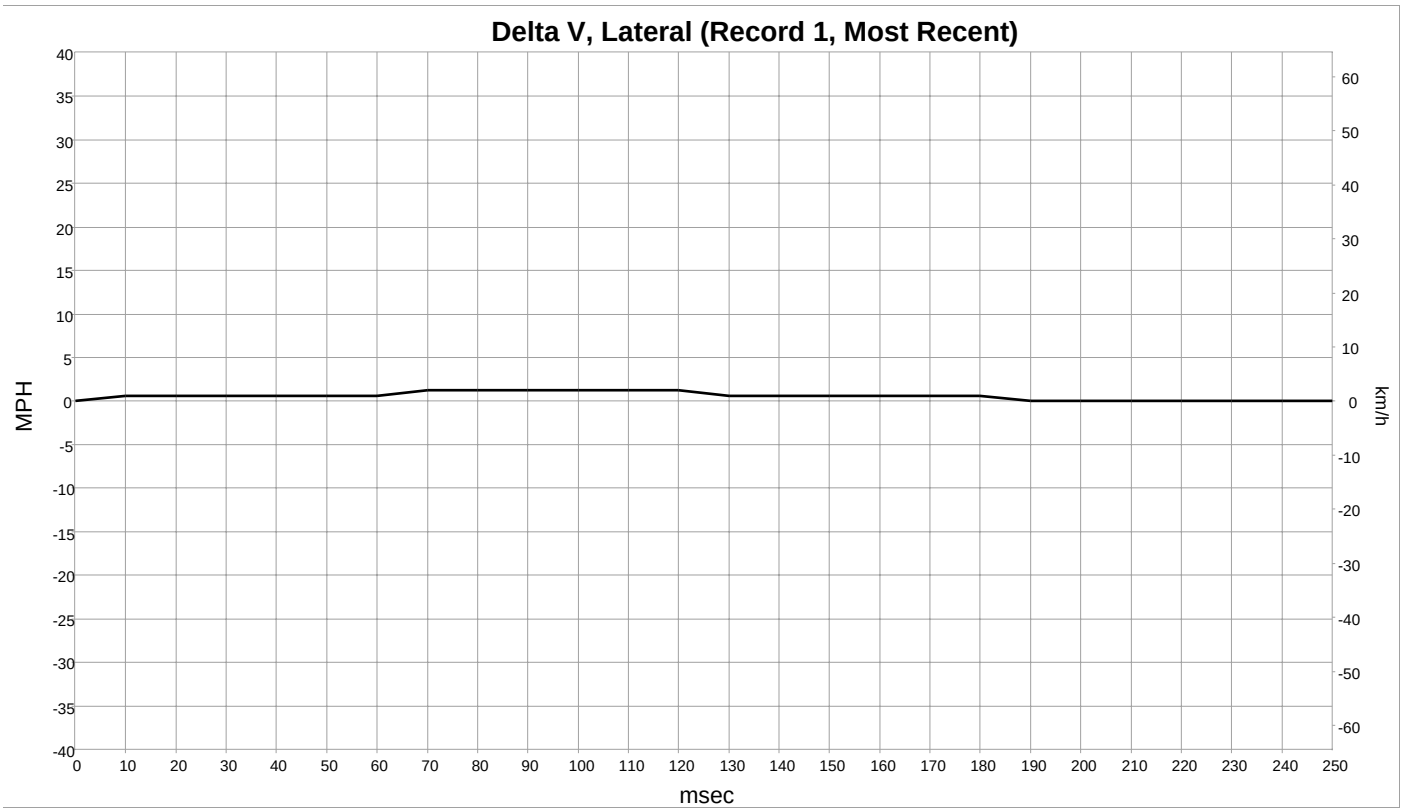


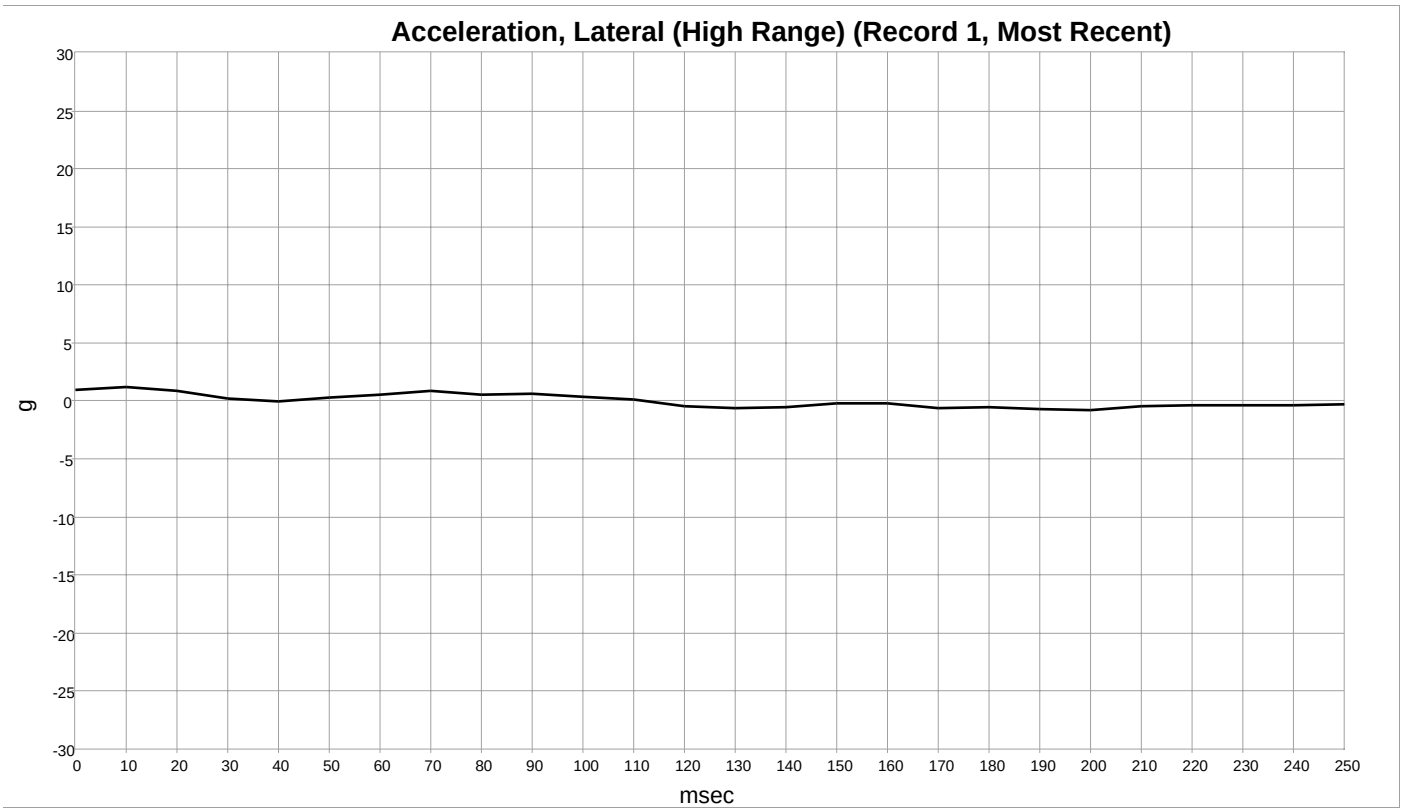


Longitudinal Crash Pulse (Record 1, Most Recent)

Time (msec)	Delta-V, Longitudinal (MPH [km/h])	Longitudinal Acceleration High Range (g)
0	-0.6 [-1]	-0.78
10	-0.6 [-1]	-0.41
20	-0.6 [-1]	0.04
30	0.0 [0]	0.43
40	0.0 [0]	0.40
50	0.0 [0]	0.08
60	-0.6 [-1]	-0.33
70	-0.6 [-1]	-0.52
80	-0.6 [-1]	-0.59
90	-0.6 [-1]	-0.06
100	-0.6 [-1]	0.23
110	-0.6 [-1]	-0.04
120	-0.6 [-1]	-0.16
130	-0.6 [-1]	-0.38
140	-0.6 [-1]	-0.57
150	-0.6 [-1]	-0.59
160	-1.2 [-2]	-0.60
170	-1.2 [-2]	-0.50
180	-1.2 [-2]	-0.11
190	-1.2 [-2]	0.09
200	-1.2 [-2]	0.08
210	-1.2 [-2]	-0.06
220	-1.2 [-2]	-0.27
230	-1.2 [-2]	-0.30
240	-1.2 [-2]	-0.30
250	-1.2 [-2]	-0.30

Lateral Crash Pulse (Record 1, Most Recent)

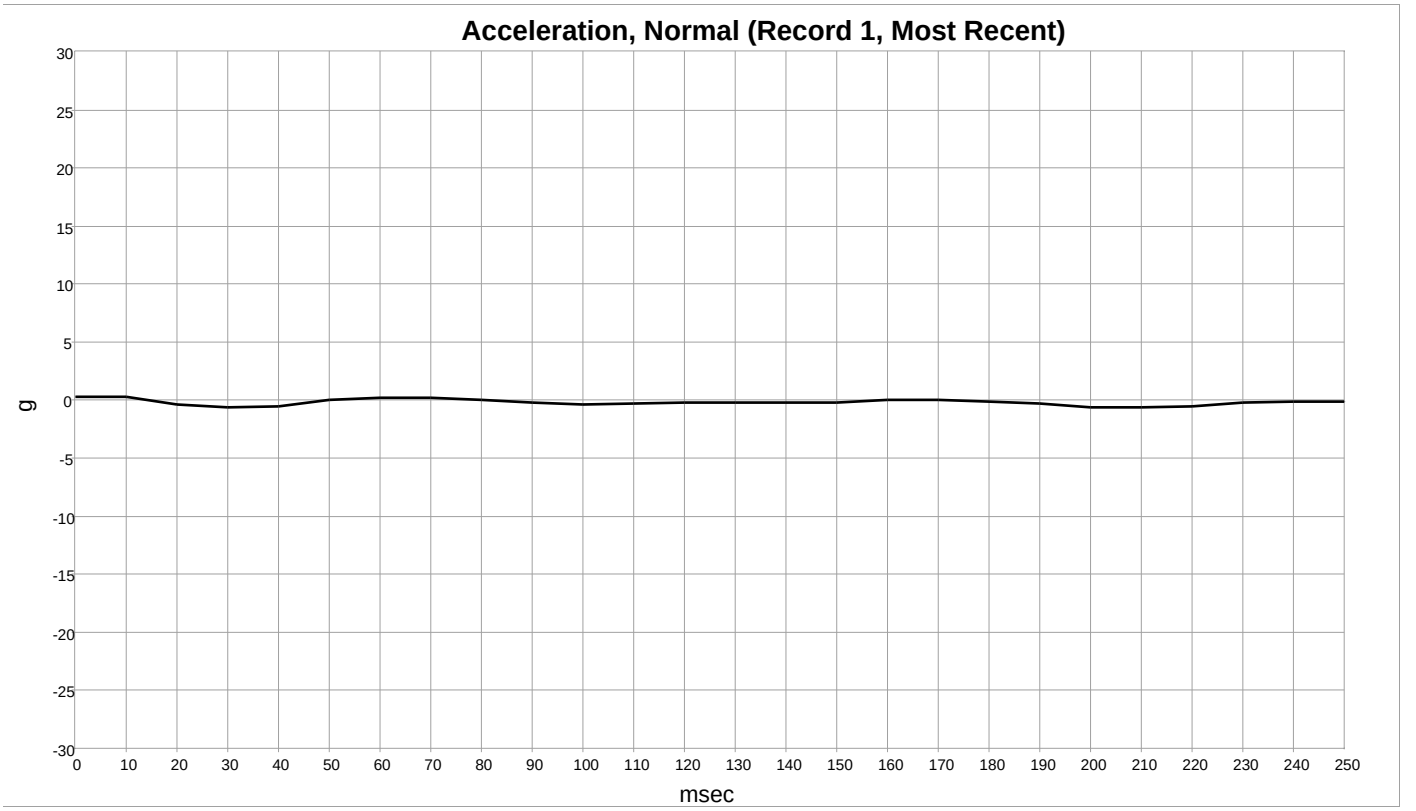




Lateral Crash Pulse (Record 1, Most Recent)

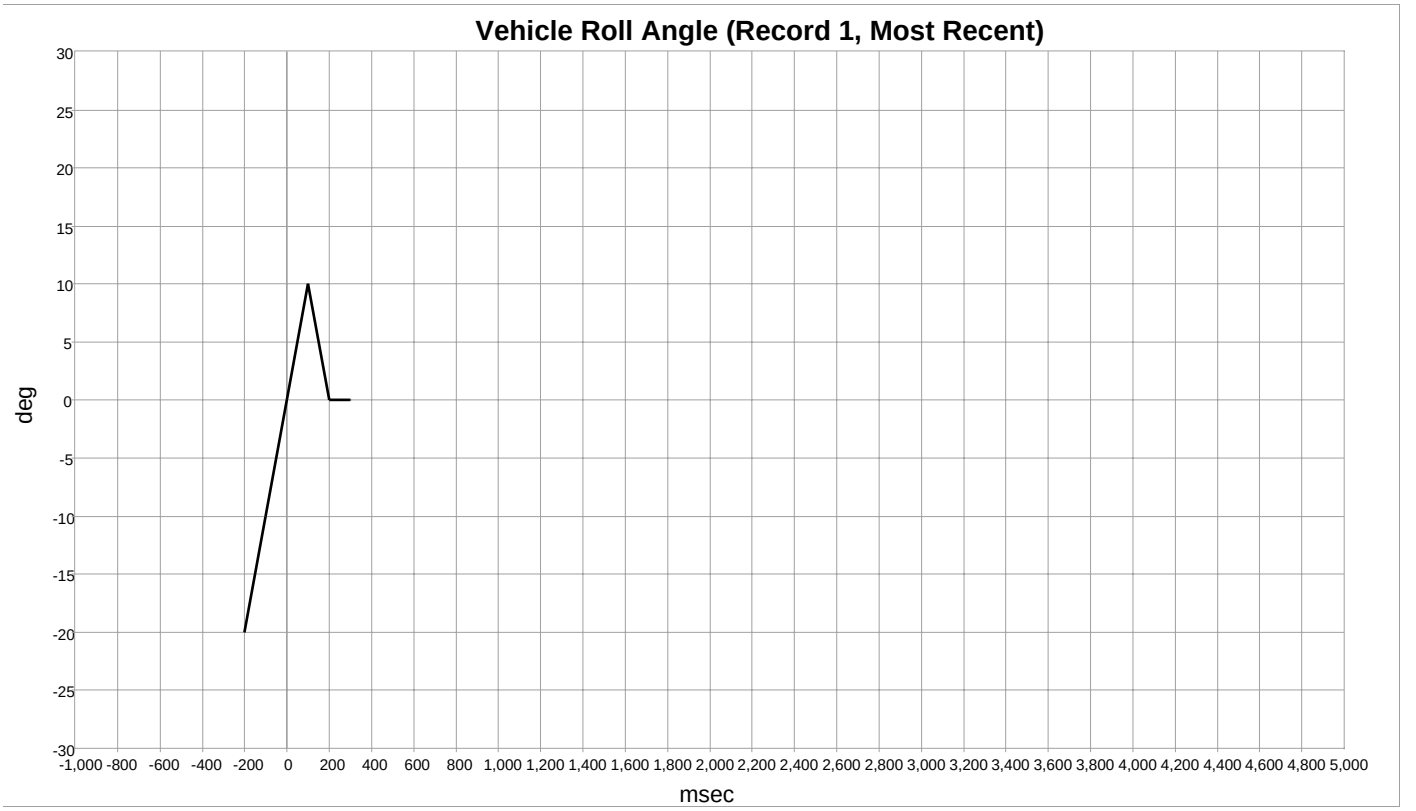
Time (msec)	Delta-V, Lateral (MPH [km/h])	Lateral Acceleration High Range (g)
0	0.0 [0]	0.96
10	0.6 [1]	1.21
20	0.6 [1]	0.90
30	0.6 [1]	0.17
40	0.6 [1]	-0.06
50	0.6 [1]	0.33
60	0.6 [1]	0.55
70	1.2 [2]	0.84
80	1.2 [2]	0.57
90	1.2 [2]	0.60
100	1.2 [2]	0.41
110	1.2 [2]	0.12
120	1.2 [2]	-0.44
130	0.6 [1]	-0.66
140	0.6 [1]	-0.56
150	0.6 [1]	-0.24
160	0.6 [1]	-0.24
170	0.6 [1]	-0.62
180	0.6 [1]	-0.55
190	0.0 [0]	-0.68
200	0.0 [0]	-0.77
210	0.0 [0]	-0.49
220	0.0 [0]	-0.40
230	0.0 [0]	-0.36
240	0.0 [0]	-0.41
250	0.0 [0]	-0.33

Normal Acceleration (Record 1, Most Recent)



Time (msec)	Normal Acceleration (g)
0	0.3
10	0.3
20	-0.4
30	-0.6
40	-0.5
50	0.0
60	0.2
70	0.2
80	0.0
90	-0.2
100	-0.4
110	-0.3
120	-0.2
130	-0.2
140	-0.2
150	-0.2
160	0.0
170	0.0
180	-0.1
190	-0.3
200	-0.6
210	-0.6
220	-0.5
230	-0.2
240	-0.1
250	-0.1

Vehicle Roll Angle (Record 1, Most Recent)



Time (msec)	Vehicle Roll Angle (deg)
-1000	Data Not Available
-900	Data Not Available
-800	Data Not Available
-700	Data Not Available
-600	Data Not Available
-500	Data Not Available
-400	Data Not Available
-300	Data Not Available
-200	-20
-100	-10
0	0
100	10
200	0
300	0
400	Data Not Available
500	Data Not Available
600	Data Not Available
700	Data Not Available
800	Data Not Available
900	Data Not Available
1000	Data Not Available
1100	Data Not Available
1200	Data Not Available
1300	Data Not Available
1400	Data Not Available
1500	Data Not Available
1600	Data Not Available

Time (msec)	Vehicle Roll Angle (deg)
1700	Data Not Available
1800	Data Not Available
1900	Data Not Available
2000	Data Not Available
2100	Data Not Available
2200	Data Not Available
2300	Data Not Available
2400	Data Not Available
2500	Data Not Available
2600	Data Not Available
2700	Data Not Available
2800	Data Not Available
2900	Data Not Available
3000	Data Not Available
3100	Data Not Available
3200	Data Not Available
3300	Data Not Available
3400	Data Not Available
3500	Data Not Available
3600	Data Not Available
3700	Data Not Available
3800	Data Not Available
3900	Data Not Available
4000	Data Not Available
4100	Data Not Available
4200	Data Not Available
4300	Data Not Available
4400	Data Not Available
4500	Data Not Available
4600	Data Not Available
4700	Data Not Available
4800	Data Not Available
4900	Data Not Available
5000	Data Not Available

System Status at Event (Record 2)

Event Counter at Event	29
Event Type	Frontal
Multi-Event, Number of Events	1, Event
Time from Initial Event to Current Event (msec)	0.0
Time from Previous Event to Current Event (msec)	0.0
Vehicle Clock, Date and Time at Event (YYYY-MM-DD, HH:MM:SS)	[redacted]
Vehicle Mileage (km)	61,150
Operating Time (min)	64,847
Ignition Cycle at Event (Cycles)	3,360
Ignition Cycle at Download (Cycles)	3,369
Maximum Delta-V, Longitudinal (MPH [km/h])	-18.6 [-30]
Time, Maximum Delta-V, Longitudinal (msec)	257.5
Clipping Time, Longitudinal Acceleration Sensor (msec)	Clipping Not Reached
Maximum Delta-V, Lateral (MPH [km/h])	-0.6 [-1]
Time, Maximum Delta-V, Lateral (msec)	190.0
Clipping Time, Lateral Acceleration Sensor (msec)	Clipping Not Reached
Time, Maximum Delta-V, Resultant (msec)	300.0
Time from Last Speed Data Sample (Precrash) to Time Zero (msec)	133
Time from Time Zero to Algorithm Start (Front) (msec)	Algorithm Started at Time Zero
Time from Time Zero to Algorithm Reset (Front) (msec)	193
Time from Time Zero to Algorithm Start (Side) (msec)	Algorithm Not Started
Time from Time Zero to Algorithm Reset (Side) (msec)	Algorithm Not Reset
Time from Time Zero to Algorithm Start (Rear) (msec)	4
Time from Time Zero to Algorithm Reset (Rear) (msec)	189
Time from Time Zero to Deployment (Rollover) (msec)	Algorithm Not Started
Time from Time Zero to Algorithm Reset (Rollover) (msec)	Algorithm Not Reset
Vehicle Identification Number (VIN)	3VV2B7AX6KM******
Supplier ID, ACM	YNF
Production Date, ACM	190215
Supply Voltage (Before Event) (V)	13.9
Complete File Recorded	Completed Successfully

Deployment Command Data (Record 2)

Pretensioner, Time to 1st Stage Deployment, Driver (msec)	168
Belt-Load Limiter, Time to Deployment, Driver (msec)	Not Deployed
Sill-End Pretensioner, Time to Deployment, Driver (msec)	168
Frontal Airbag, Time to 1st Stage Deployment, Driver (msec)	Not Deployed
Side Airbag, Time to 1st Stage Deployment, Driver (msec)	Not Deployed
Side Curtain/Tube Airbag, Time to Deployment, Driver Side (msec)	Not Deployed
Pretensioner, Time to 1st Stage Deployment, Front Passenger (msec)	168
Belt-Load Limiter, Time to Deployment, Front Passenger (msec)	Not Deployed
Sill-End Pretensioner, Time to Deployment, Front Passenger (msec)	168
Frontal Airbag, Time to 1st Stage Deployment, Front Passenger (msec)	Not Deployed
Frontal Airbag, Time to 2nd Stage Deployment, Front Passenger (msec)	Not Deployed
Frontal Airbag, 2nd Stage Disposal, Front Passenger	Not Deployed
Side Airbag, Time to 1st Stage Deployment, Front Passenger (msec)	Not Deployed
Side Curtain/Tube Airbag, Time to Deployment, Passenger Side (msec)	Not Deployed

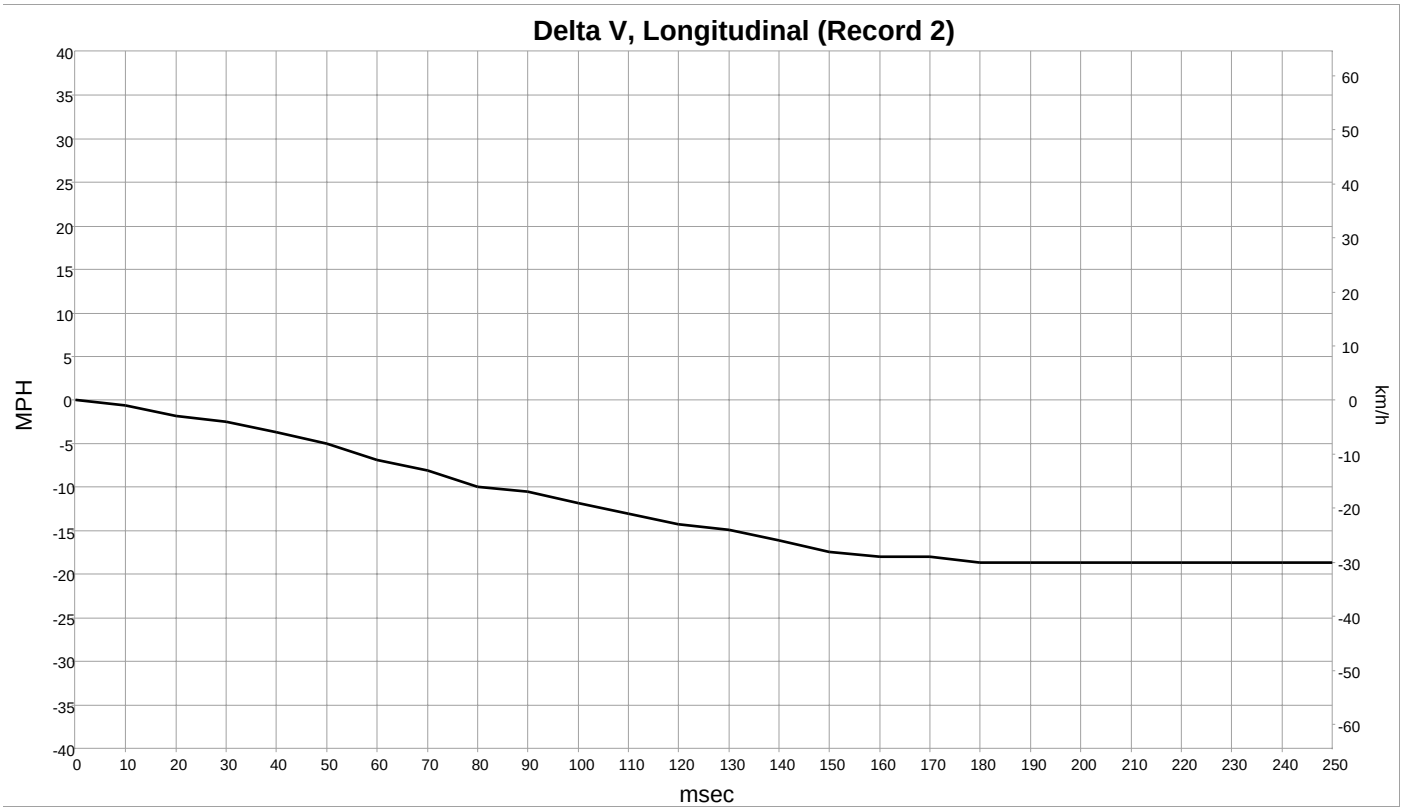
Pre-Crash Data -1 Sec (Record 2)

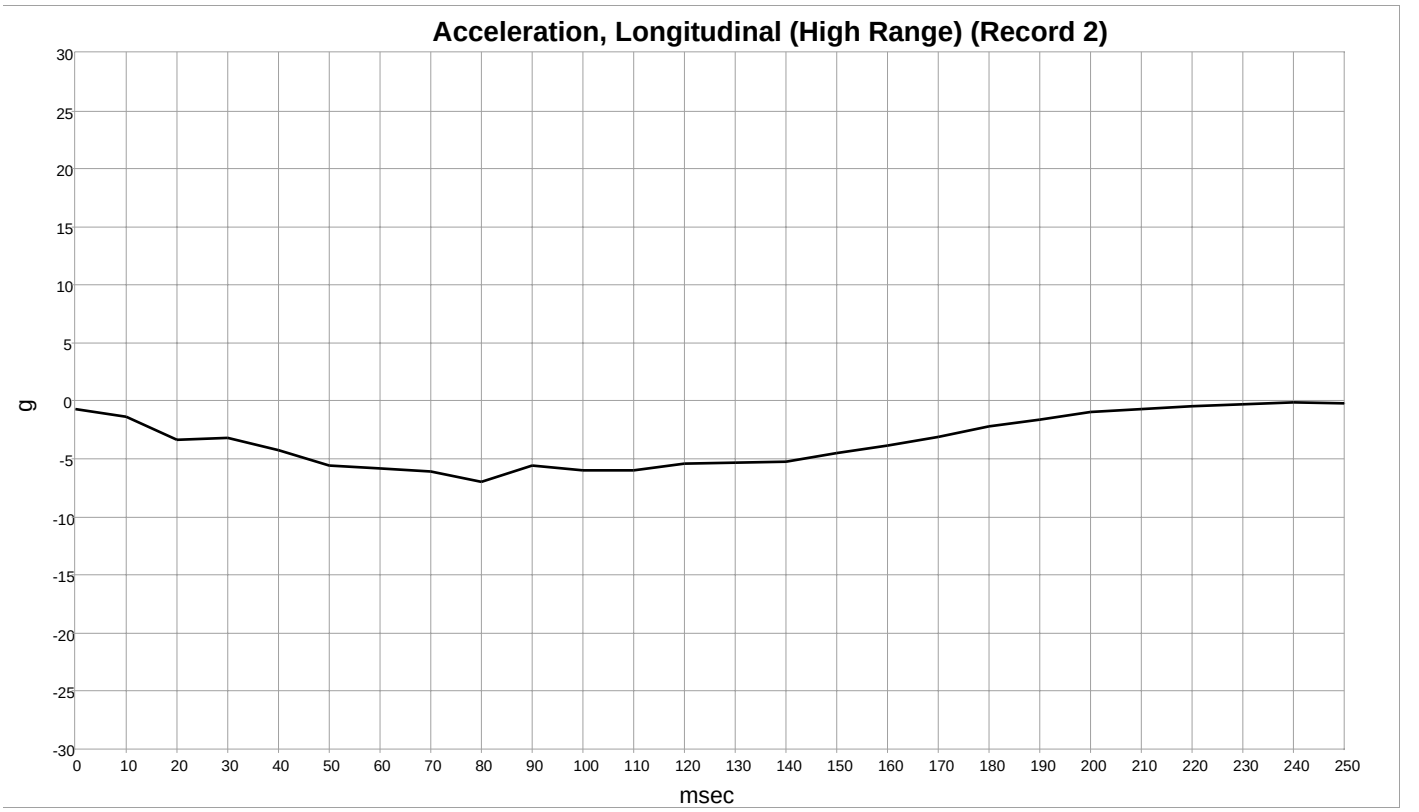
Safety Belt Status, Driver	Fastened
Seat Track Position Switch Status, Driver	Rear
Safety Belt Status, Front Passenger	Not fastened
Seat Track Position Switch Status, Front Passenger	Rear
Occupant Size Classification, Front Passenger	Empty
Frontal Airbag Disable Indicator Status, Passenger	On
Airbag Warning Lamp, Status	Off

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

Time (sec)	Engine RPM (Combustion Engine) (RPM)	ABS Activity	Stability Control	Steering Input (deg)	Speed, Vehicle Indicated (MPH [km/h])	Accelerator Pedal (%)	Service Brake Activation
-5.0	1,856	Non-Engaged	On	-4	69 [111]	14	Off
-4.5	1,856	Non-Engaged	On	-4	70 [112]	4	Off
-4.0	1,856	Non-Engaged	On	-2	70 [112]	4	Off
-3.5	1,856	Non-Engaged	On	-2	70 [112]	6	Off
-3.0	1,856	Non-Engaged	On	-2	70 [112]	8	Off
-2.5	1,856	Non-Engaged	On	-2	70 [112]	9	Off
-2.0	1,856	Non-Engaged	On	-2	70 [112]	9	Off
-1.5	1,856	Non-Engaged	On	-4	70 [112]	9	Off
-1.0	1,856	Non-Engaged	On	-6	70 [112]	9	Off
-0.5	1,856	Non-Engaged	On	-4	70 [113]	9	Off
0.0	1,856	Non-Engaged	On	-2	69 [111]	0	Off

Longitudinal Crash Pulse (Record 2)

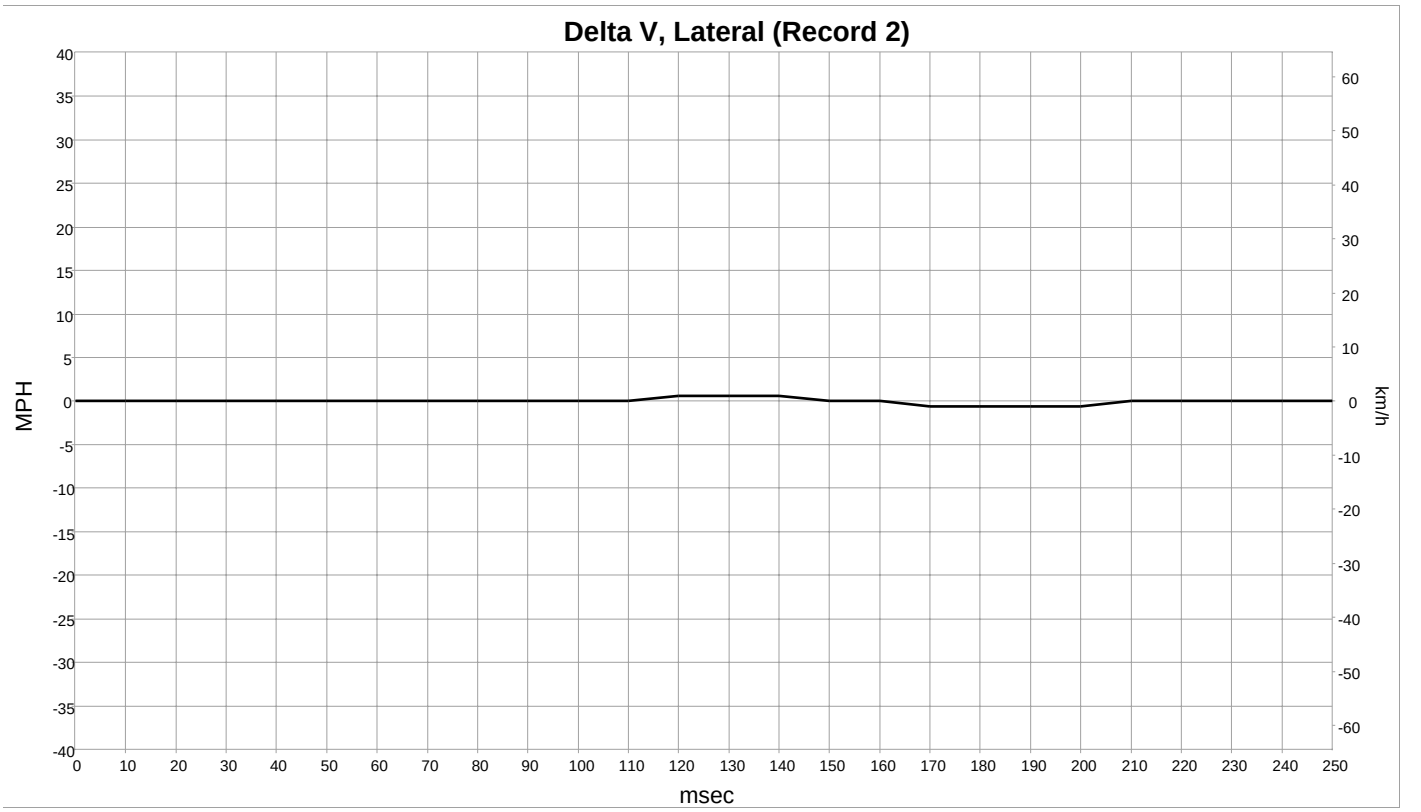


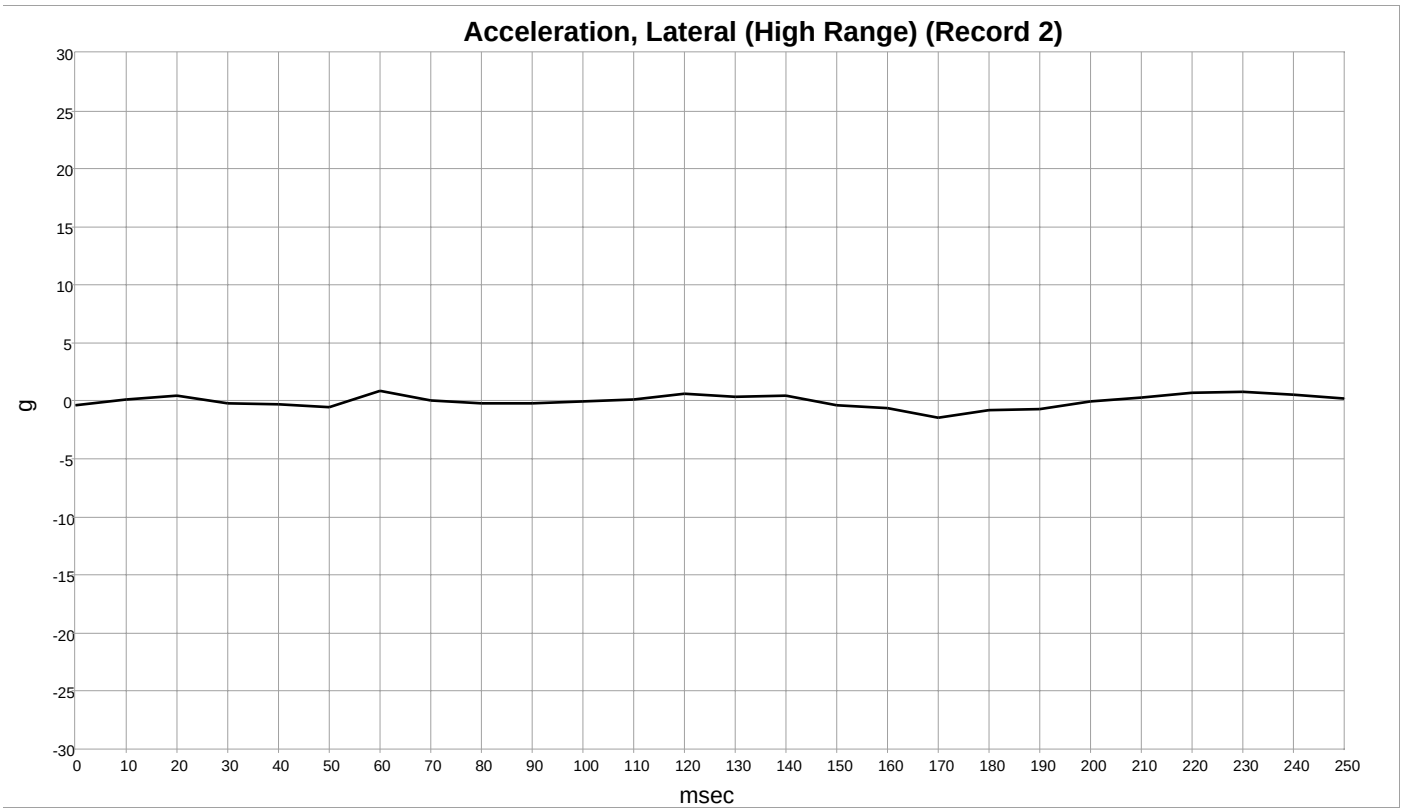


Longitudinal Crash Pulse (Record 2)

Time (msec)	Delta-V, Longitudinal (MPH [km/h])	Longitudinal Acceleration High Range (g)
0	0.0 [0]	-0.73
10	-0.6 [-1]	-1.36
20	-1.9 [-3]	-3.37
30	-2.5 [-4]	-3.14
40	-3.7 [-6]	-4.25
50	-5.0 [-8]	-5.60
60	-6.8 [-11]	-5.83
70	-8.1 [-13]	-6.09
80	-9.9 [-16]	-6.98
90	-10.6 [-17]	-5.59
100	-11.8 [-19]	-5.95
110	-13.0 [-21]	-5.95
120	-14.3 [-23]	-5.41
130	-14.9 [-24]	-5.36
140	-16.2 [-26]	-5.23
150	-17.4 [-28]	-4.53
160	-18.0 [-29]	-3.84
170	-18.0 [-29]	-3.13
180	-18.6 [-30]	-2.16
190	-18.6 [-30]	-1.63
200	-18.6 [-30]	-0.99
210	-18.6 [-30]	-0.74
220	-18.6 [-30]	-0.49
230	-18.6 [-30]	-0.31
240	-18.6 [-30]	-0.16
250	-18.6 [-30]	-0.18

Lateral Crash Pulse (Record 2)

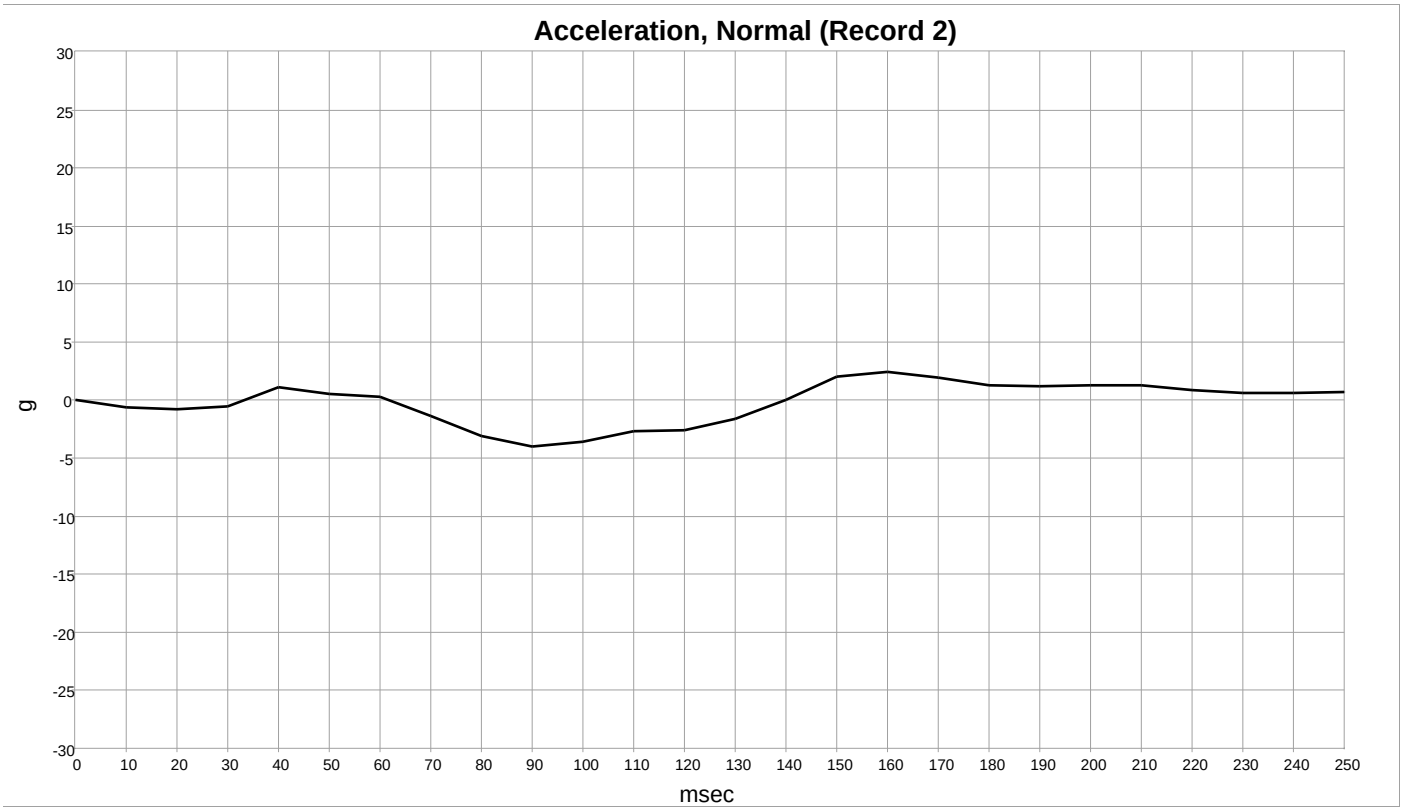




Lateral Crash Pulse (Record 2)

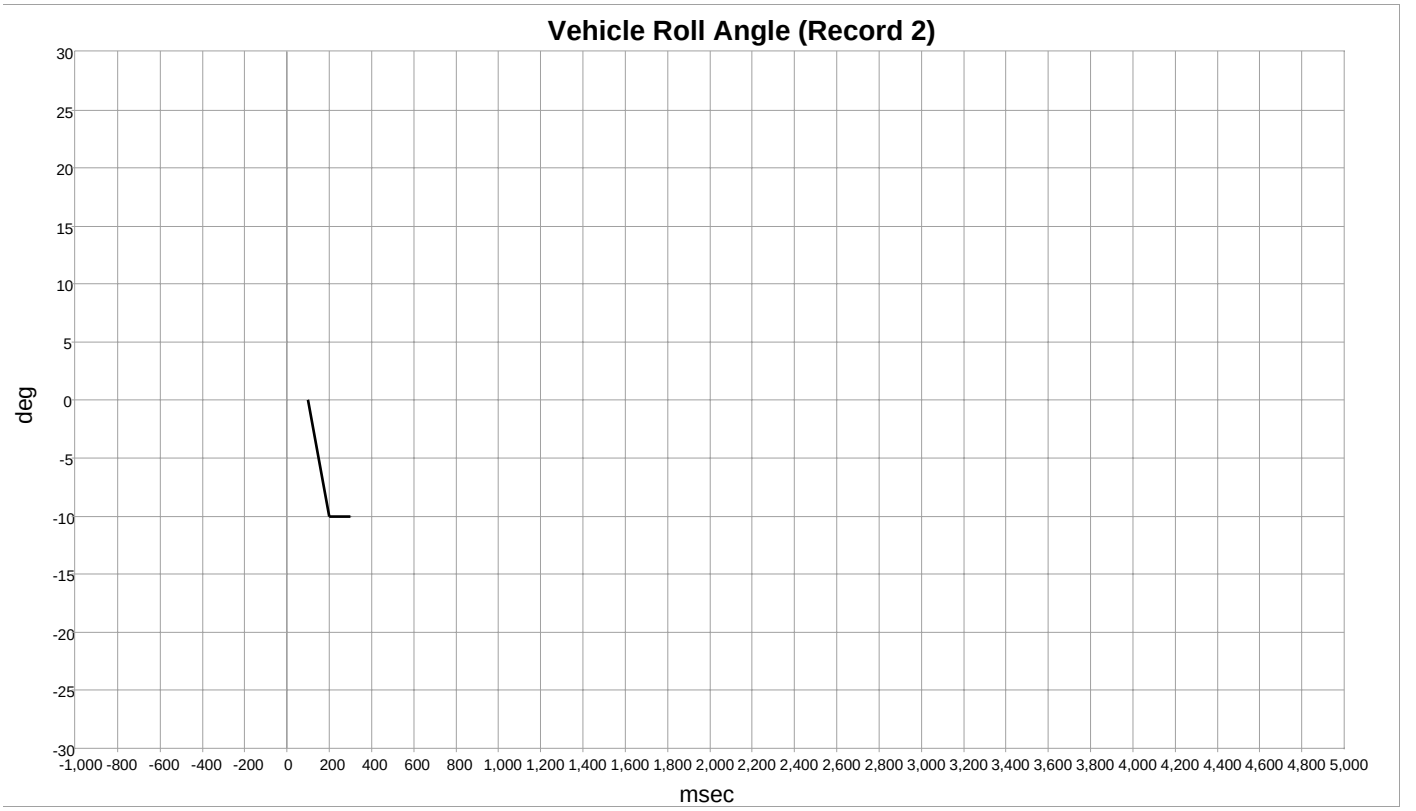
Time (msec)	Delta-V, Lateral (MPH [km/h])	Lateral Acceleration High Range (g)
0	0.0 [0]	-0.41
10	0.0 [0]	0.10
20	0.0 [0]	0.45
30	0.0 [0]	-0.21
40	0.0 [0]	-0.27
50	0.0 [0]	-0.57
60	0.0 [0]	0.88
70	0.0 [0]	0.05
80	0.0 [0]	-0.20
90	0.0 [0]	-0.23
100	0.0 [0]	-0.02
110	0.0 [0]	0.09
120	0.6 [1]	0.60
130	0.6 [1]	0.41
140	0.6 [1]	0.45
150	0.0 [0]	-0.38
160	0.0 [0]	-0.59
170	-0.6 [-1]	-1.42
180	-0.6 [-1]	-0.79
190	-0.6 [-1]	-0.73
200	-0.6 [-1]	-0.07
210	0.0 [0]	0.33
220	0.0 [0]	0.68
230	0.0 [0]	0.77
240	0.0 [0]	0.55
250	0.0 [0]	0.20

Normal Acceleration (Record 2)



Time (msec)	Normal Acceleration (g)
0	0.0
10	-0.6
20	-0.8
30	-0.5
40	1.1
50	0.5
60	0.3
70	-1.4
80	-3.1
90	-4.0
100	-3.6
110	-2.7
120	-2.6
130	-1.6
140	0.0
150	2.0
160	2.4
170	1.9
180	1.3
190	1.2
200	1.3
210	1.3
220	0.9
230	0.6
240	0.6
250	0.7

Vehicle Roll Angle (Record 2)



Time (msec)	Vehicle Roll Angle (deg)
-1000	Data Not Available
-900	Data Not Available
-800	Data Not Available
-700	Data Not Available
-600	Data Not Available
-500	Data Not Available
-400	Data Not Available
-300	Data Not Available
-200	Data Not Available
-100	Data Not Available
0	Data Not Available
100	0
200	-10
300	-10
400	Data Not Available
500	Data Not Available
600	Data Not Available
700	Data Not Available
800	Data Not Available
900	Data Not Available
1000	Data Not Available
1100	Data Not Available
1200	Data Not Available
1300	Data Not Available
1400	Data Not Available
1500	Data Not Available
1600	Data Not Available

Time (msec)	Vehicle Roll Angle (deg)
1700	Data Not Available
1800	Data Not Available
1900	Data Not Available
2000	Data Not Available
2100	Data Not Available
2200	Data Not Available
2300	Data Not Available
2400	Data Not Available
2500	Data Not Available
2600	Data Not Available
2700	Data Not Available
2800	Data Not Available
2900	Data Not Available
3000	Data Not Available
3100	Data Not Available
3200	Data Not Available
3300	Data Not Available
3400	Data Not Available
3500	Data Not Available
3600	Data Not Available
3700	Data Not Available
3800	Data Not Available
3900	Data Not Available
4000	Data Not Available
4100	Data Not Available
4200	Data Not Available
4300	Data Not Available
4400	Data Not Available
4500	Data Not Available
4600	Data Not Available
4700	Data Not Available
4800	Data Not Available
4900	Data Not Available
5000	Data Not Available

System Status at Event (Record 3)

Event Counter at Event	28
Event Type	Rear
Multi-Event, Number of Events	2. Event
Time from Initial Event to Current Event (msec)	1,082.0
Time from Previous Event to Current Event (msec)	1,082.0
Vehicle Clock, Date and Time at Event (YYYY-MM-DD, HH:MM:SS)	[redacted]
Vehicle Mileage (km)	52,060
Operating Time (min)	55,341
Ignition Cycle at Event (Cycles)	2,850
Ignition Cycle at Download (Cycles)	3,369
Maximum Delta-V, Longitudinal (MPH [km/h])	6.2 [10]
Time, Maximum Delta-V, Longitudinal (msec)	265.0
Clipping Time, Longitudinal Acceleration Sensor (msec)	Clipping Not Reached
Maximum Delta-V, Lateral (MPH [km/h])	-0.6 [-1]
Time, Maximum Delta-V, Lateral (msec)	90.0
Clipping Time, Lateral Acceleration Sensor (msec)	Clipping Not Reached
Time, Maximum Delta-V, Resultant (msec)	300.0
Time from Last Speed Data Sample (Precrash) to Time Zero (msec)	155
Time from Time Zero to Algorithm Start (Front) (msec)	Algorithm Not Started
Time from Time Zero to Algorithm Reset (Front) (msec)	Algorithm Not Reset
Time from Time Zero to Algorithm Start (Side) (msec)	4
Time from Time Zero to Algorithm Reset (Side) (msec)	34
Time from Time Zero to Algorithm Start (Rear) (msec)	Algorithm Started at Time Zero
Time from Time Zero to Algorithm Reset (Rear) (msec)	72
Time from Time Zero to Deployment (Rollover) (msec)	Algorithm Not Started
Time from Time Zero to Algorithm Reset (Rollover) (msec)	Algorithm Not Reset
Vehicle Identification Number (VIN)	3VV2B7AX6KM******
Supplier ID, ACM	YNF
Production Date, ACM	190215
Supply Voltage (Before Event) (V)	14.1
Complete File Recorded	Completed Successfully

Deployment Command Data (Record 3)

Pretensioner, Time to 1st Stage Deployment, Driver (msec)	Not Deployed
Belt-Load Limiter, Time to Deployment, Driver (msec)	Not Deployed
Sill-End Pretensioner, Time to Deployment, Driver (msec)	Not Deployed
Frontal Airbag, Time to 1st Stage Deployment, Driver (msec)	Not Deployed
Side Airbag, Time to 1st Stage Deployment, Driver (msec)	Not Deployed
Side Curtain/Tube Airbag, Time to Deployment, Driver Side (msec)	Not Deployed
Pretensioner, Time to 1st Stage Deployment, Front Passenger (msec)	Not Deployed
Belt-Load Limiter, Time to Deployment, Front Passenger (msec)	Not Deployed
Sill-End Pretensioner, Time to Deployment, Front Passenger (msec)	Not Deployed
Frontal Airbag, Time to 1st Stage Deployment, Front Passenger (msec)	Not Deployed
Frontal Airbag, Time to 2nd Stage Deployment, Front Passenger (msec)	Not Deployed
Frontal Airbag, 2nd Stage Disposal, Front Passenger	Not Deployed
Side Airbag, Time to 1st Stage Deployment, Front Passenger (msec)	Not Deployed
Side Curtain/Tube Airbag, Time to Deployment, Passenger Side (msec)	Not Deployed

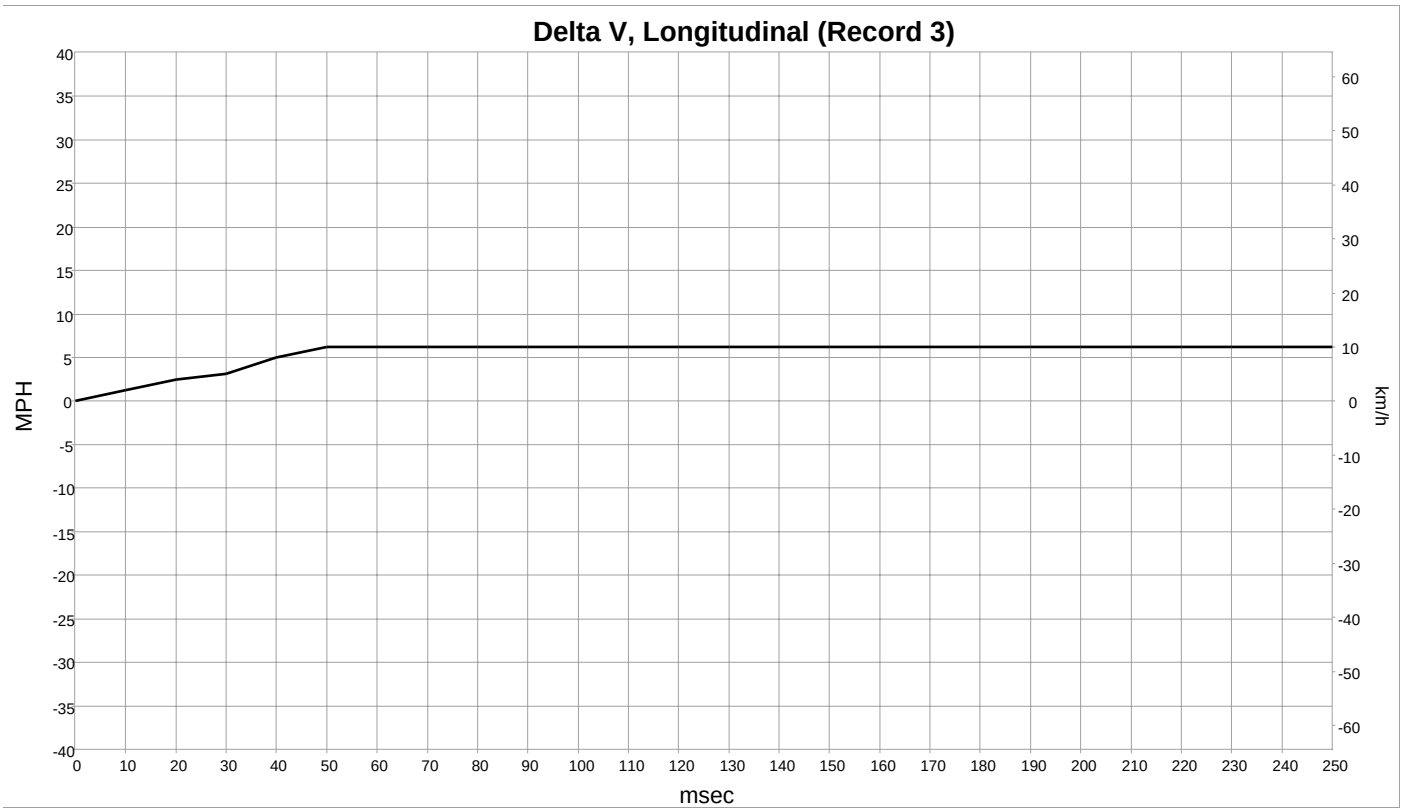
Pre-Crash Data -1 Sec (Record 3)

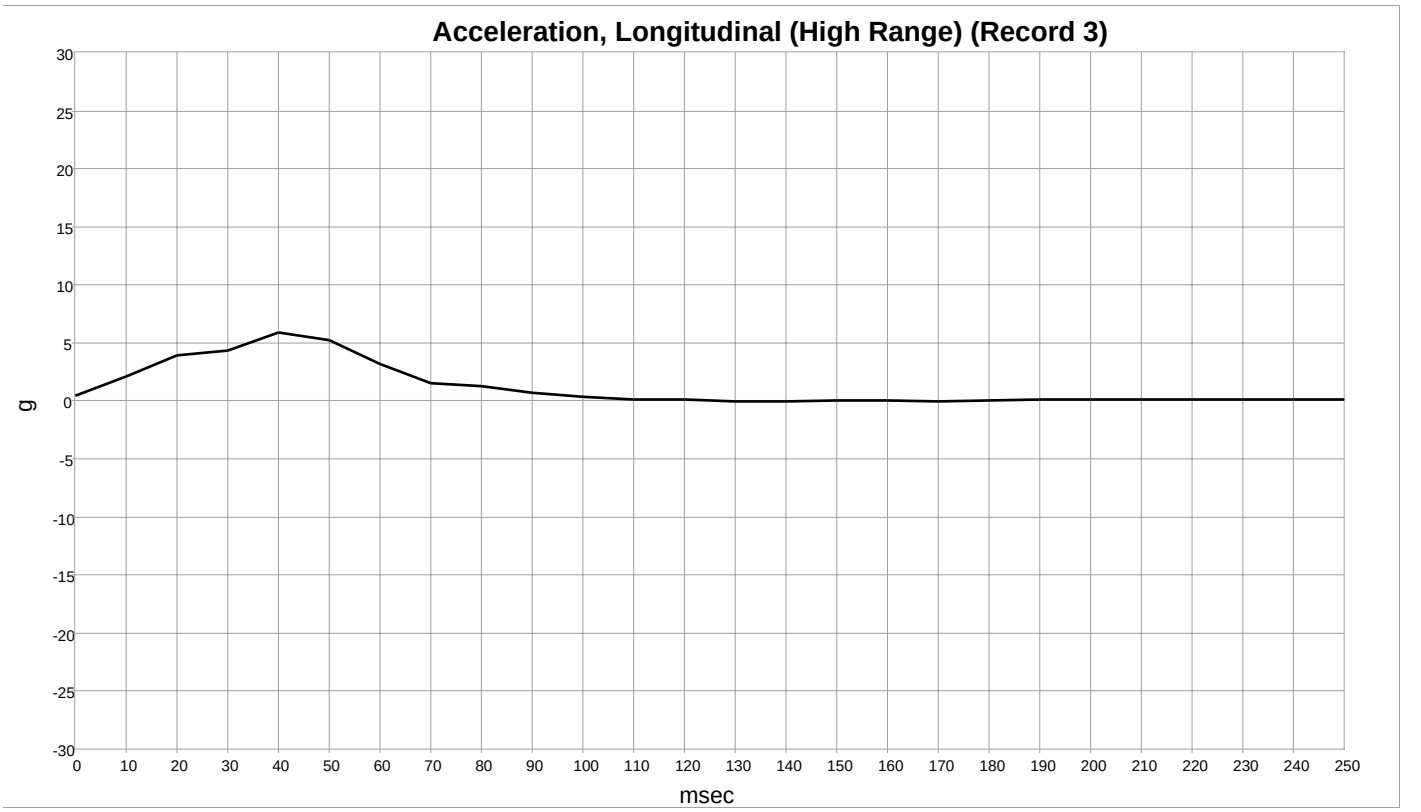
Safety Belt Status, Driver	Fastened
Seat Track Position Switch Status, Driver	Rear
Safety Belt Status, Front Passenger	Not fastened
Seat Track Position Switch Status, Front Passenger	Rear
Occupant Size Classification, Front Passenger	Empty
Frontal Airbag Disable Indicator Status, Passenger	On
Airbag Warning Lamp, Status	Off

Pre-Crash Data -5 to 0 sec (Record 3)

Time (sec)	Engine RPM (Combustion Engine) (RPM)	ABS Activity	Stability Control	Steering Input (deg)	Speed, Vehicle Indicated (MPH [km/h])	Accelerator Pedal (%)	Service Brake Activation
-5.0	2,880	Non-Engaged	On	0	23 [37]	28	Off
-4.5	2,176	Non-Engaged	On	-2	25 [40]	28	Off
-4.0	2,304	Non-Engaged	On	0	26 [42]	22	Off
-3.5	2,368	Non-Engaged	On	0	27 [44]	18	Off
-3.0	2,432	Non-Engaged	On	-2	29 [46]	18	Off
-2.5	1,920	Non-Engaged	On	-2	29 [47]	0	Off
-2.0	1,344	Non-Engaged	On	-8	24 [38]	0	On
-1.5	896	Engaged	On	-10	14 [22]	0	On
-1.0	768	Non-Engaged	On	-6	8 [13]	0	On
-0.5	896	Non-Engaged	On	0	5 [8]	0	On
0.0	832	Non-Engaged	On	0	2 [4]	0	On

Longitudinal Crash Pulse (Record 3)

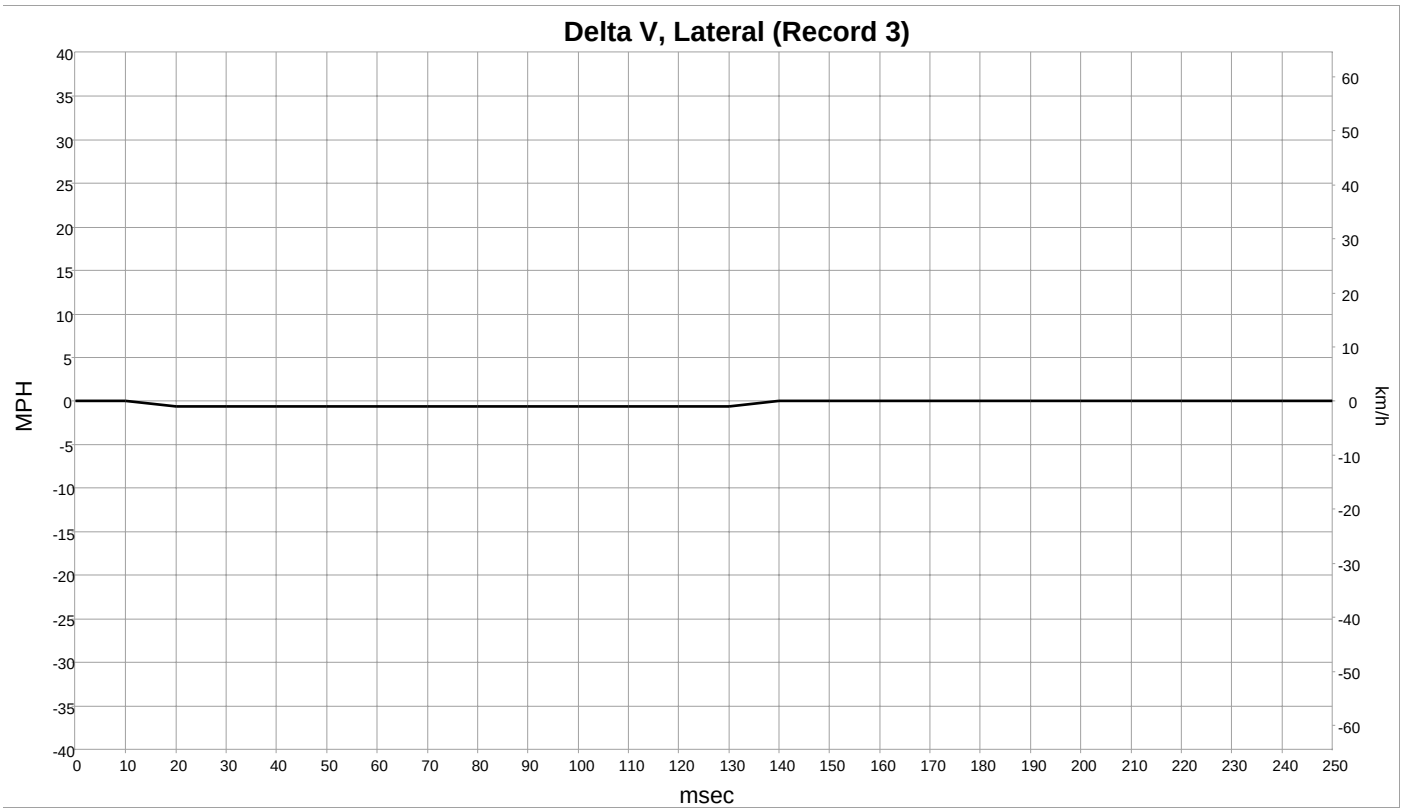


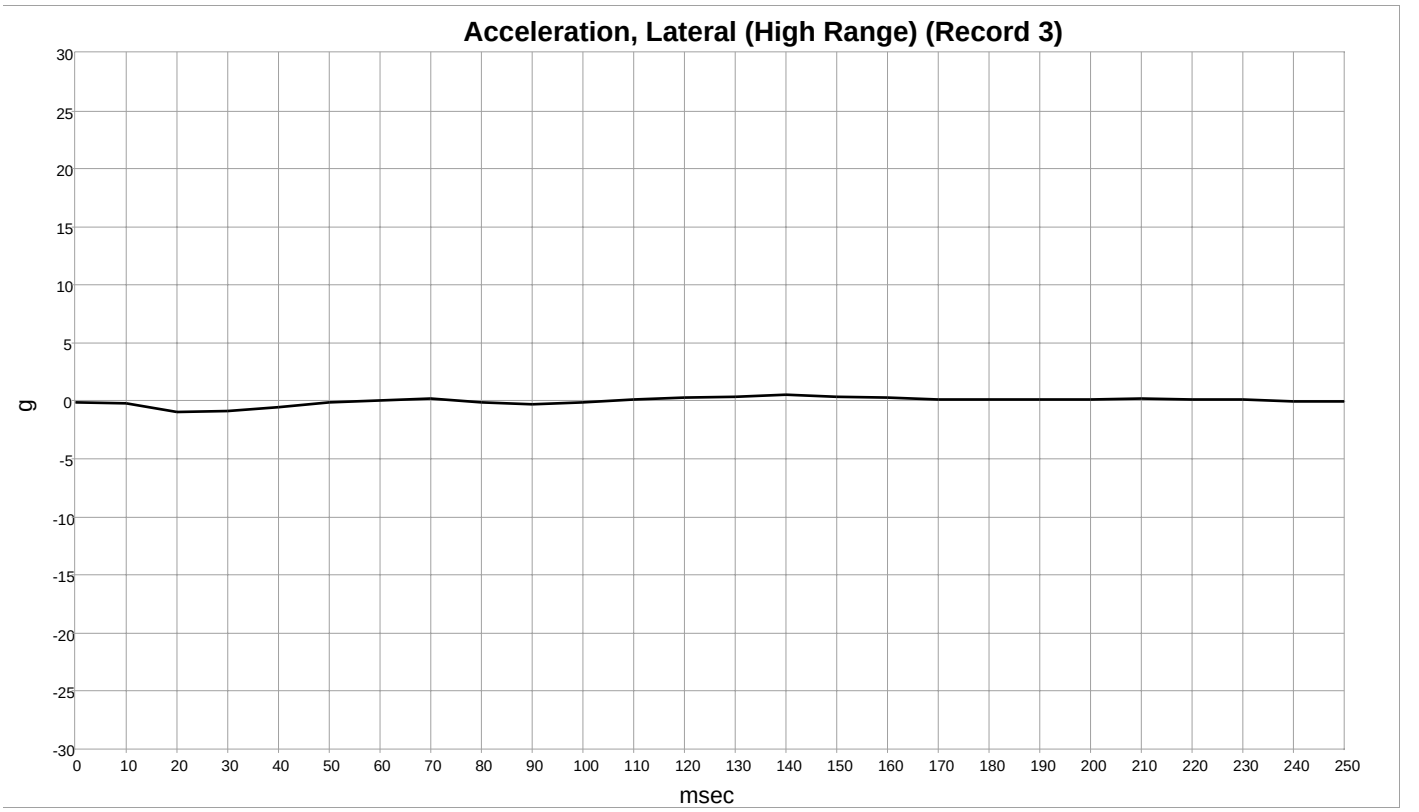


Longitudinal Crash Pulse (Record 3)

Time (msec)	Delta-V, Longitudinal (MPH [km/h])	Longitudinal Acceleration High Range (g)
0	0.0 [0]	0.43
10	1.2 [2]	2.10
20	2.5 [4]	3.94
30	3.1 [5]	4.37
40	5.0 [8]	5.88
50	6.2 [10]	5.28
60	6.2 [10]	3.20
70	6.2 [10]	1.55
80	6.2 [10]	1.31
90	6.2 [10]	0.73
100	6.2 [10]	0.37
110	6.2 [10]	0.16
120	6.2 [10]	0.16
130	6.2 [10]	-0.02
140	6.2 [10]	-0.07
150	6.2 [10]	0.06
160	6.2 [10]	0.07
170	6.2 [10]	-0.05
180	6.2 [10]	0.06
190	6.2 [10]	0.13
200	6.2 [10]	0.13
210	6.2 [10]	0.13
220	6.2 [10]	0.13
230	6.2 [10]	0.12
240	6.2 [10]	0.09
250	6.2 [10]	0.12

Lateral Crash Pulse (Record 3)

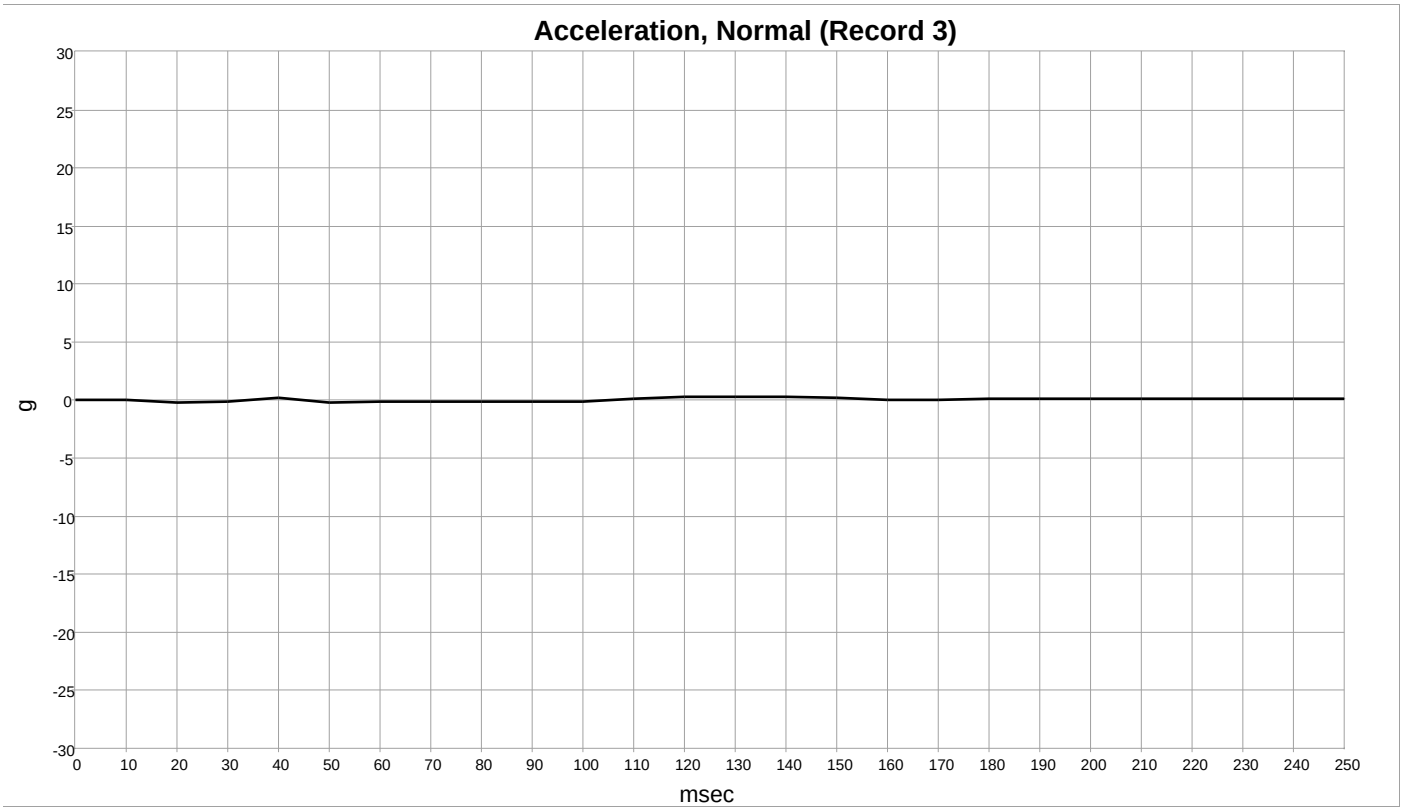




Lateral Crash Pulse (Record 3)

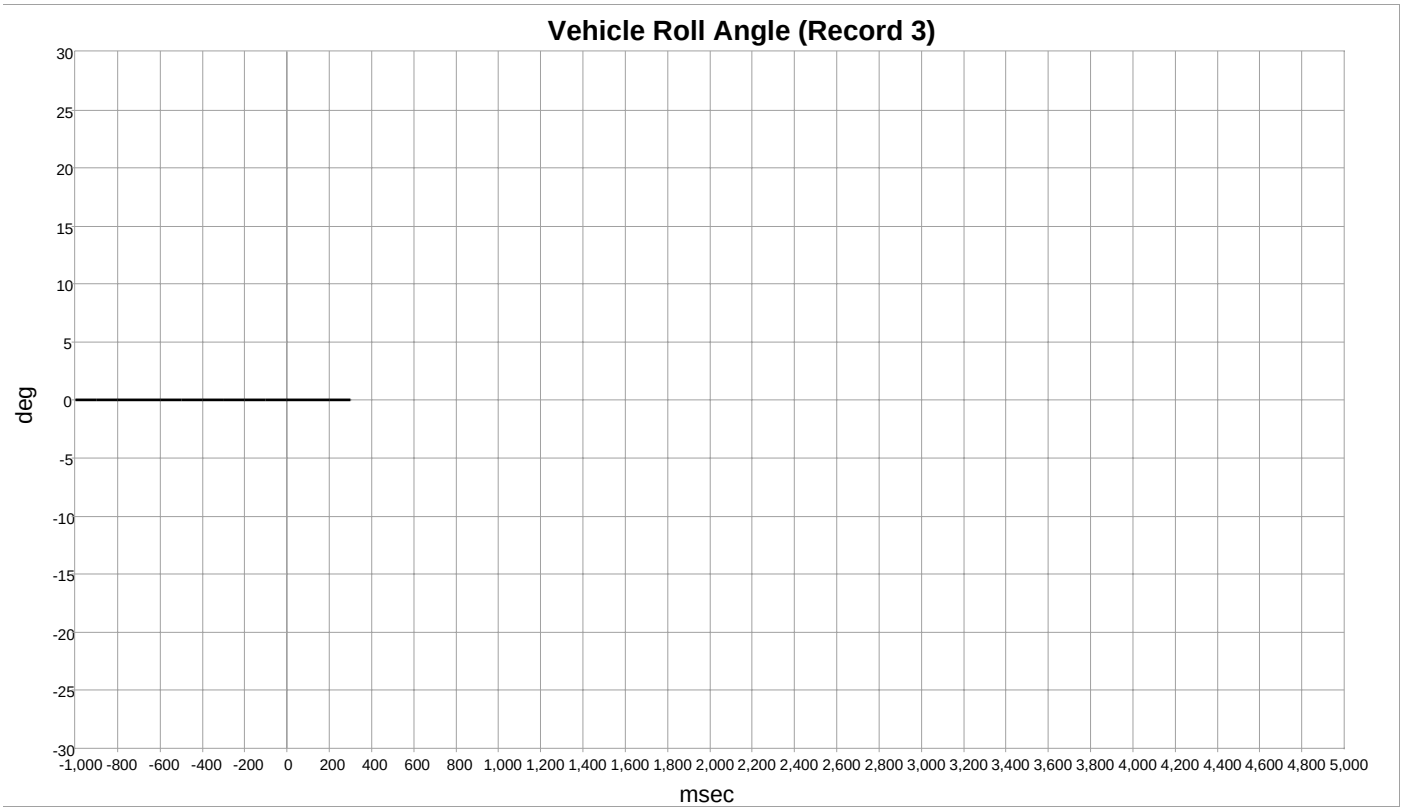
Time (msec)	Delta-V, Lateral (MPH [km/h])	Lateral Acceleration High Range (g)
0	0.0 [0]	-0.09
10	0.0 [0]	-0.18
20	-0.6 [-1]	-0.93
30	-0.6 [-1]	-0.85
40	-0.6 [-1]	-0.50
50	-0.6 [-1]	-0.10
60	-0.6 [-1]	0.06
70	-0.6 [-1]	0.17
80	-0.6 [-1]	-0.13
90	-0.6 [-1]	-0.29
100	-0.6 [-1]	-0.16
110	-0.6 [-1]	0.13
120	-0.6 [-1]	0.28
130	-0.6 [-1]	0.40
140	0.0 [0]	0.54
150	0.0 [0]	0.41
160	0.0 [0]	0.26
170	0.0 [0]	0.15
180	0.0 [0]	0.11
190	0.0 [0]	0.16
200	0.0 [0]	0.16
210	0.0 [0]	0.17
220	0.0 [0]	0.15
230	0.0 [0]	0.11
240	0.0 [0]	-0.01
250	0.0 [0]	-0.08

Normal Acceleration (Record 3)



Time (msec)	Normal Acceleration (g)
0	0.0
10	0.0
20	-0.2
30	-0.1
40	0.2
50	-0.2
60	-0.1
70	-0.1
80	-0.1
90	-0.1
100	-0.1
110	0.1
120	0.3
130	0.3
140	0.3
150	0.2
160	0.0
170	0.0
180	0.1
190	0.1
200	0.1
210	0.1
220	0.1
230	0.1
240	0.1
250	0.1

Vehicle Roll Angle (Record 3)



Time (msec)	Vehicle Roll Angle (deg)
-1000	0
-900	0
-800	0
-700	0
-600	0
-500	0
-400	0
-300	0
-200	0
-100	0
0	0
100	0
200	0
300	0
400	Data Not Available
500	Data Not Available
600	Data Not Available
700	Data Not Available
800	Data Not Available
900	Data Not Available
1000	Data Not Available
1100	Data Not Available
1200	Data Not Available
1300	Data Not Available
1400	Data Not Available
1500	Data Not Available
1600	Data Not Available

Time (msec)	Vehicle Roll Angle (deg)
1700	Data Not Available
1800	Data Not Available
1900	Data Not Available
2000	Data Not Available
2100	Data Not Available
2200	Data Not Available
2300	Data Not Available
2400	Data Not Available
2500	Data Not Available
2600	Data Not Available
2700	Data Not Available
2800	Data Not Available
2900	Data Not Available
3000	Data Not Available
3100	Data Not Available
3200	Data Not Available
3300	Data Not Available
3400	Data Not Available
3500	Data Not Available
3600	Data Not Available
3700	Data Not Available
3800	Data Not Available
3900	Data Not Available
4000	Data Not Available
4100	Data Not Available
4200	Data Not Available
4300	Data Not Available
4400	Data Not Available
4500	Data Not Available
4600	Data Not Available
4700	Data Not Available
4800	Data Not Available
4900	Data Not Available
5000	Data Not Available

System Status at Event (Record 4)

Event Counter at Event	27
Event Type	External Trigger
Multi-Event, Number of Events	1, Event
Time from Initial Event to Current Event (msec)	0.0
Time from Previous Event to Current Event (msec)	0.0
Vehicle Clock, Date and Time at Event (YYYY-MM-DD, HH:MM:SS)	[redacted]
Vehicle Mileage (km)	52,060
Operating Time (min)	55,341
Ignition Cycle at Event (Cycles)	2,850
Ignition Cycle at Download (Cycles)	3,369
Maximum Delta-V, Longitudinal (MPH [km/h])	-1.2 [-2]
Time, Maximum Delta-V, Longitudinal (msec)	297.5
Clipping Time, Longitudinal Acceleration Sensor (msec)	Clipping Not Reached
Maximum Delta-V, Lateral (MPH [km/h])	0.0 [0]
Time, Maximum Delta-V, Lateral (msec)	0.0
Clipping Time, Lateral Acceleration Sensor (msec)	Clipping Not Reached
Time, Maximum Delta-V, Resultant (msec)	297.5
Time from Last Speed Data Sample (Precrash) to Time Zero (msec)	237
Time from Time Zero to Algorithm Start (Front) (msec)	Algorithm Not Started
Time from Time Zero to Algorithm Reset (Front) (msec)	Algorithm Not Reset
Time from Time Zero to Algorithm Start (Side) (msec)	Algorithm Not Started
Time from Time Zero to Algorithm Reset (Side) (msec)	Algorithm Not Reset
Time from Time Zero to Algorithm Start (Rear) (msec)	Algorithm Not Started
Time from Time Zero to Algorithm Reset (Rear) (msec)	Algorithm Not Reset
Time from Time Zero to Deployment (Rollover) (msec)	Algorithm Not Started
Time from Time Zero to Algorithm Reset (Rollover) (msec)	Algorithm Not Reset
Vehicle Identification Number (VIN)	3VV2B7AX6KM******
Supplier ID, ACM	YNF
Production Date, ACM	190215
Supply Voltage (Before Event) (V)	14.1
Complete File Recorded	Completed Successfully

Deployment Command Data (Record 4)

Pretensioner, Time to 1st Stage Deployment, Driver (msec)	Not Deployed
Belt-Load Limiter, Time to Deployment, Driver (msec)	Not Deployed
Sill-End Pretensioner, Time to Deployment, Driver (msec)	Not Deployed
Frontal Airbag, Time to 1st Stage Deployment, Driver (msec)	Not Deployed
Side Airbag, Time to 1st Stage Deployment, Driver (msec)	Not Deployed
Side Curtain/Tube Airbag, Time to Deployment, Driver Side (msec)	Not Deployed
Pretensioner, Time to 1st Stage Deployment, Front Passenger (msec)	Not Deployed
Belt-Load Limiter, Time to Deployment, Front Passenger (msec)	Not Deployed
Sill-End Pretensioner, Time to Deployment, Front Passenger (msec)	Not Deployed
Frontal Airbag, Time to 1st Stage Deployment, Front Passenger (msec)	Not Deployed
Frontal Airbag, Time to 2nd Stage Deployment, Front Passenger (msec)	Not Deployed
Frontal Airbag, 2nd Stage Disposal, Front Passenger	Not Deployed
Side Airbag, Time to 1st Stage Deployment, Front Passenger (msec)	Not Deployed
Side Curtain/Tube Airbag, Time to Deployment, Passenger Side (msec)	Not Deployed

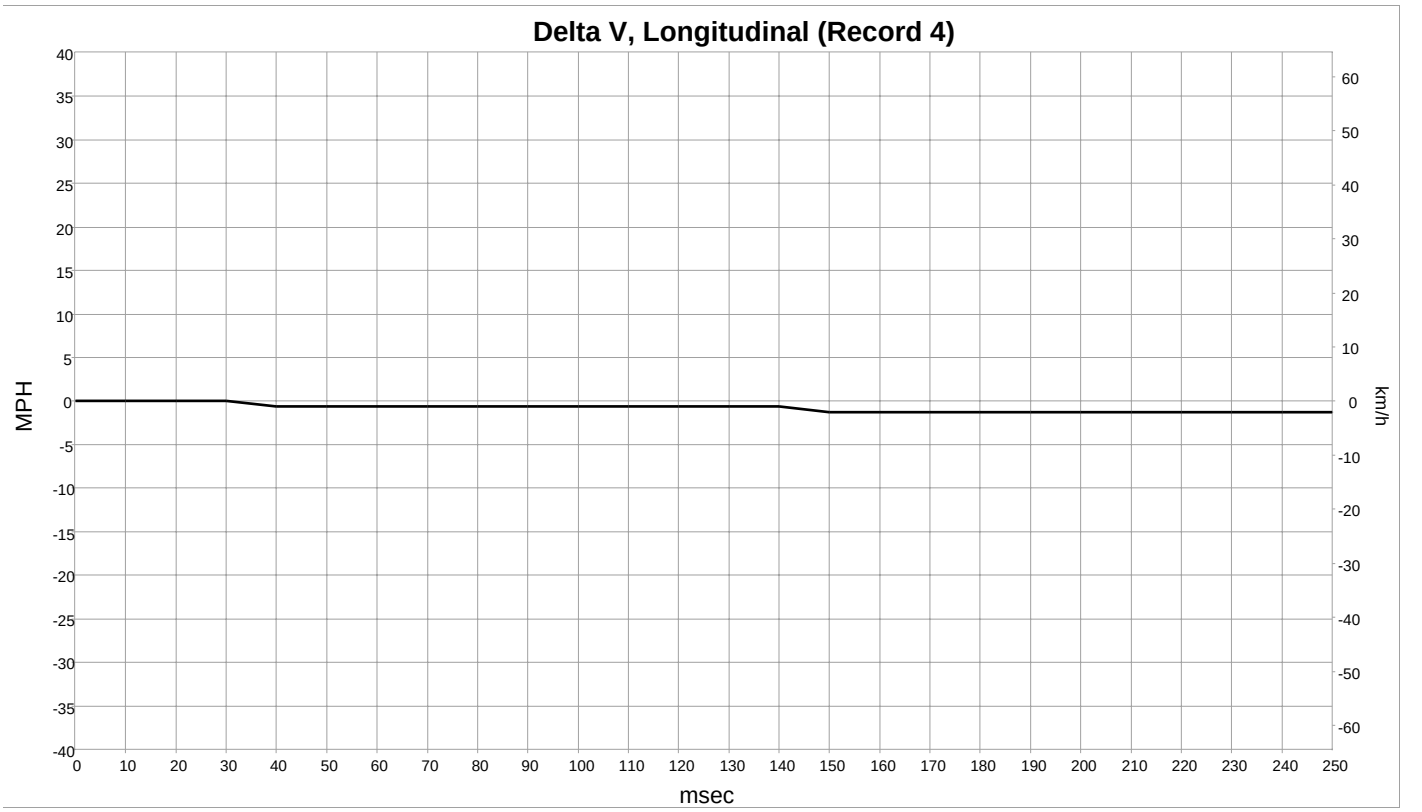
Pre-Crash Data -1 Sec (Record 4)

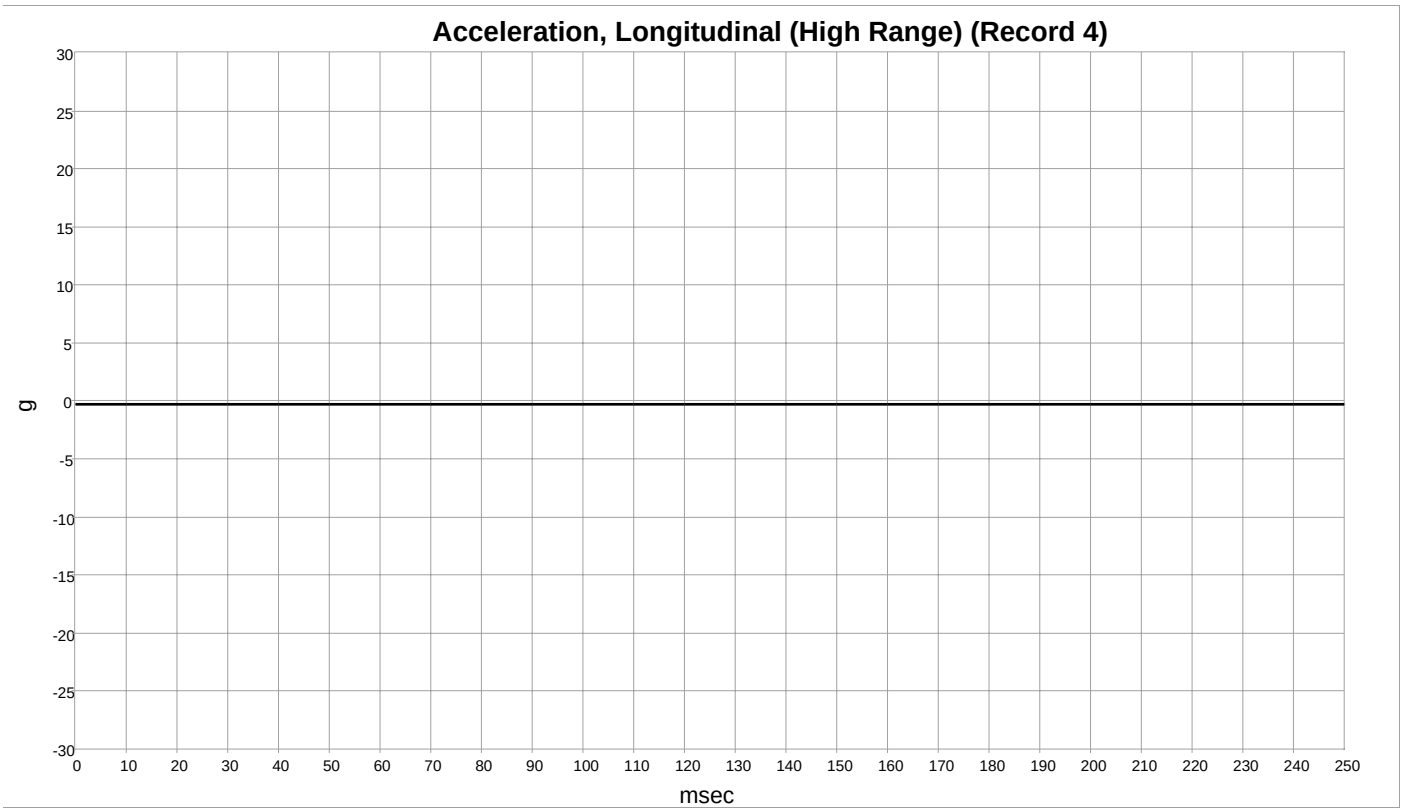
Safety Belt Status, Driver	Fastened
Seat Track Position Switch Status, Driver	Rear
Safety Belt Status, Front Passenger	Not fastened
Seat Track Position Switch Status, Front Passenger	Rear
Occupant Size Classification, Front Passenger	Empty
Frontal Airbag Disable Indicator Status, Passenger	On
Airbag Warning Lamp, Status	Off

Pre-Crash Data -5 to 0 sec (Record 4)

Time (sec)	Engine RPM (Combustion Engine) (RPM)	ABS Activity	Stability Control	Steering Input (deg)	Speed, Vehicle Indicated (MPH [km/h])	Accelerator Pedal (%)	Service Brake Activation
-5.0	2,688	Non-Engaged	On	0	19 [31]	30	Off
-4.5	2,944	Non-Engaged	On	0	22 [35]	28	Off
-4.0	2,880	Non-Engaged	On	0	23 [37]	28	Off
-3.5	2,176	Non-Engaged	On	-2	25 [40]	28	Off
-3.0	2,304	Non-Engaged	On	0	26 [42]	22	Off
-2.5	2,368	Non-Engaged	On	0	27 [44]	18	Off
-2.0	2,432	Non-Engaged	On	-2	29 [46]	18	Off
-1.5	1,920	Non-Engaged	On	-2	29 [47]	0	Off
-1.0	1,344	Non-Engaged	On	-8	24 [38]	0	On
-0.5	896	Engaged	On	-10	14 [22]	0	On
0.0	768	Non-Engaged	On	-6	8 [13]	0	On

Longitudinal Crash Pulse (Record 4)

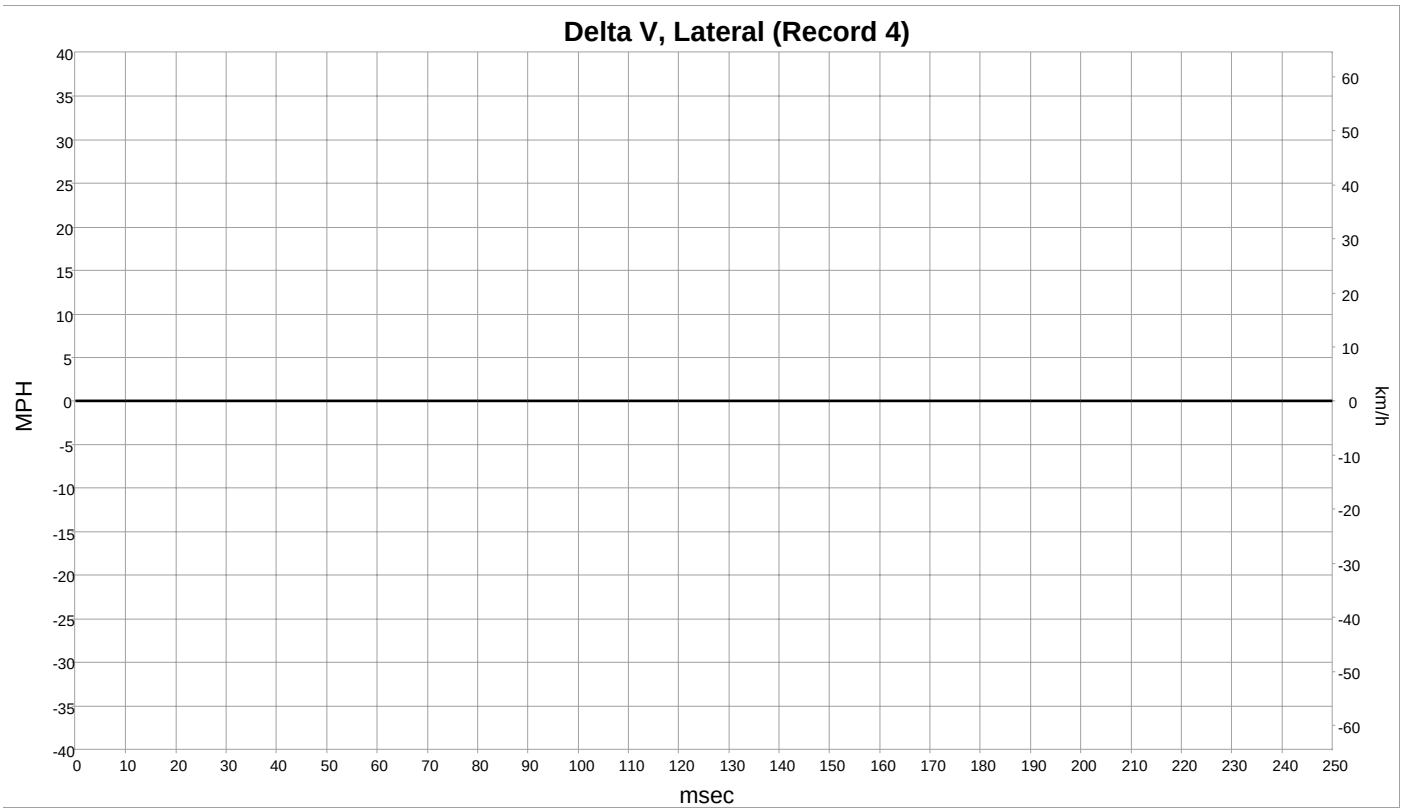


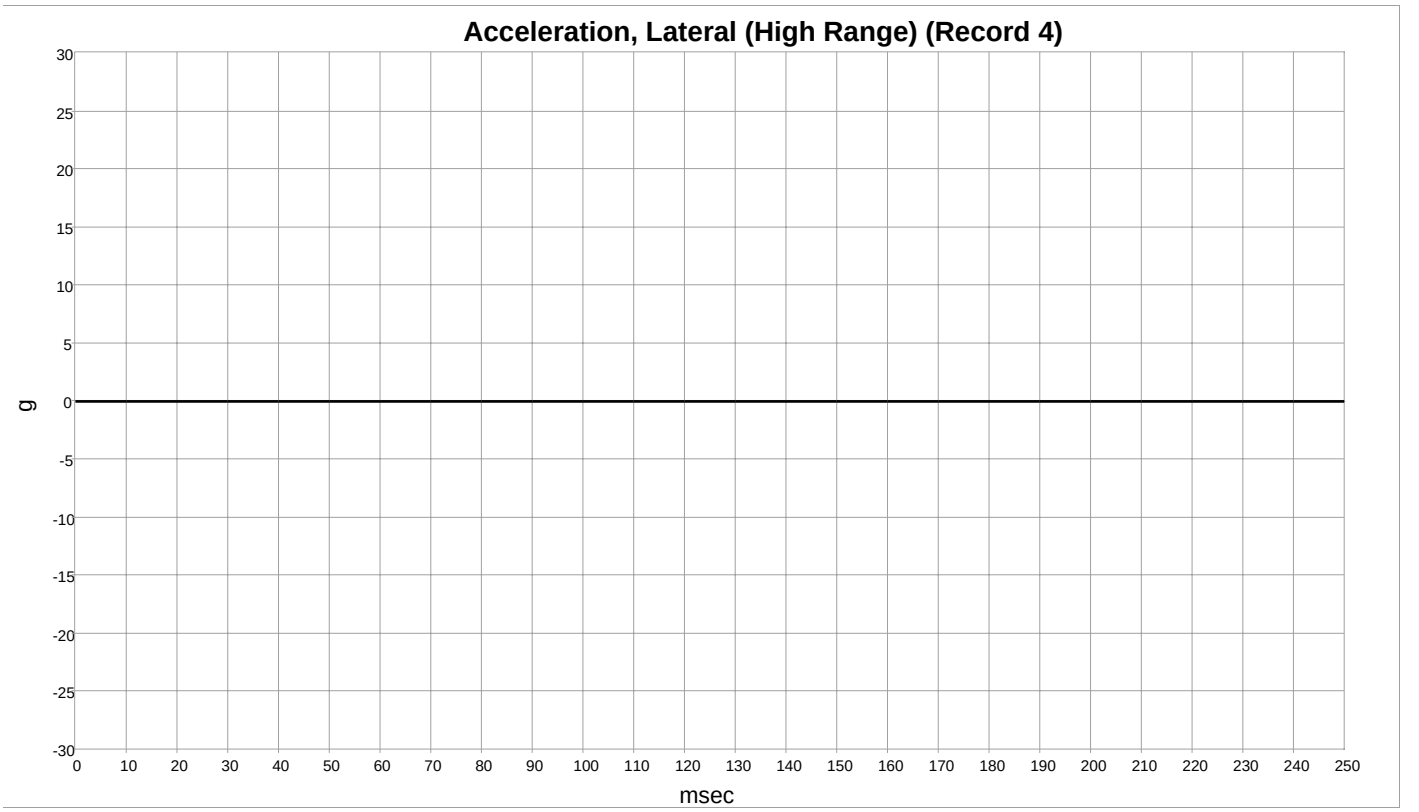


Longitudinal Crash Pulse (Record 4)

Time (msec)	Delta-V, Longitudinal (MPH [km/h])	Longitudinal Acceleration High Range (g)
0	0.0 [0]	-0.27
10	0.0 [0]	-0.27
20	0.0 [0]	-0.27
30	0.0 [0]	-0.27
40	-0.6 [-1]	-0.27
50	-0.6 [-1]	-0.27
60	-0.6 [-1]	-0.27
70	-0.6 [-1]	-0.27
80	-0.6 [-1]	-0.27
90	-0.6 [-1]	-0.27
100	-0.6 [-1]	-0.27
110	-0.6 [-1]	-0.27
120	-0.6 [-1]	-0.27
130	-0.6 [-1]	-0.27
140	-0.6 [-1]	-0.27
150	-1.2 [-2]	-0.27
160	-1.2 [-2]	-0.27
170	-1.2 [-2]	-0.27
180	-1.2 [-2]	-0.27
190	-1.2 [-2]	-0.27
200	-1.2 [-2]	-0.27
210	-1.2 [-2]	-0.27
220	-1.2 [-2]	-0.27
230	-1.2 [-2]	-0.27
240	-1.2 [-2]	-0.27
250	-1.2 [-2]	-0.27

Lateral Crash Pulse (Record 4)

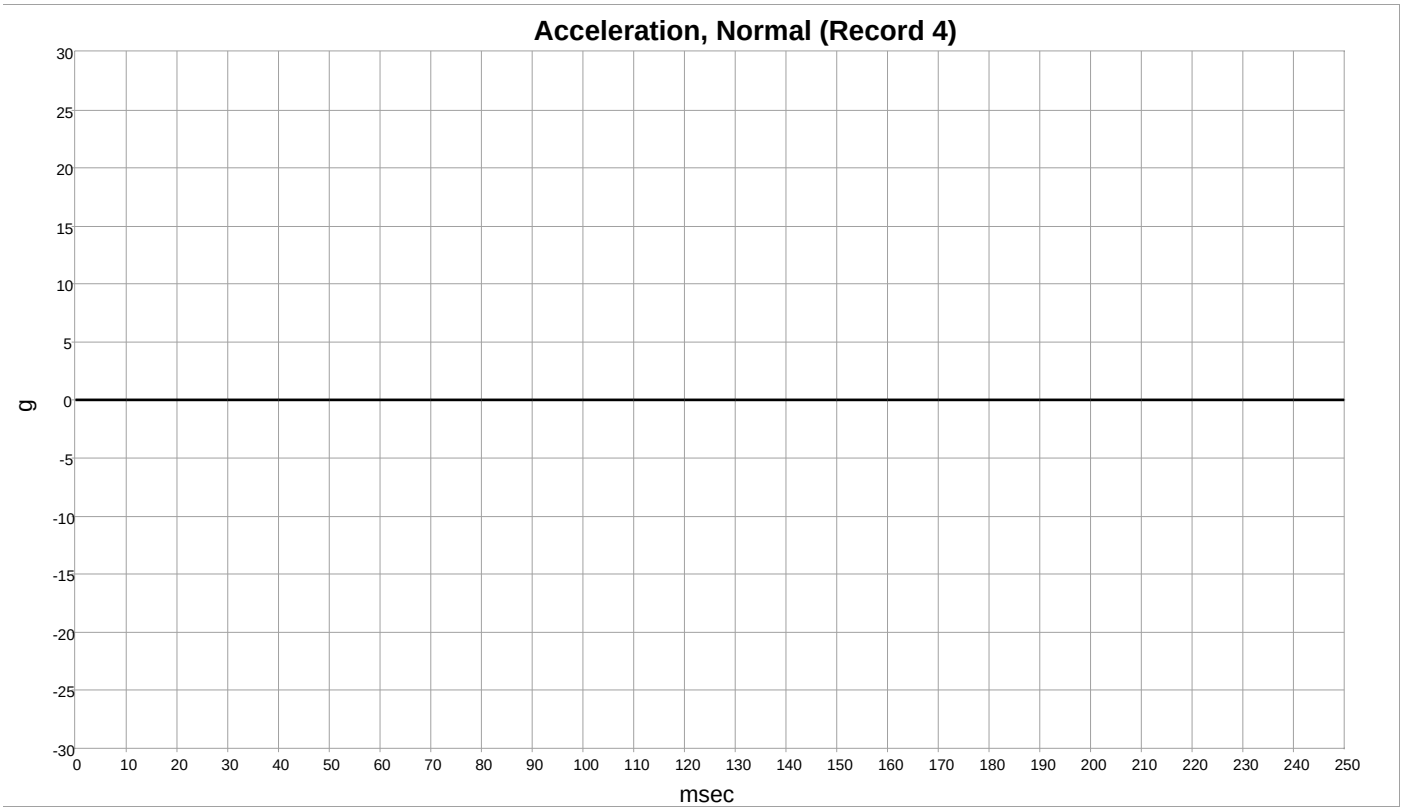




Lateral Crash Pulse (Record 4)

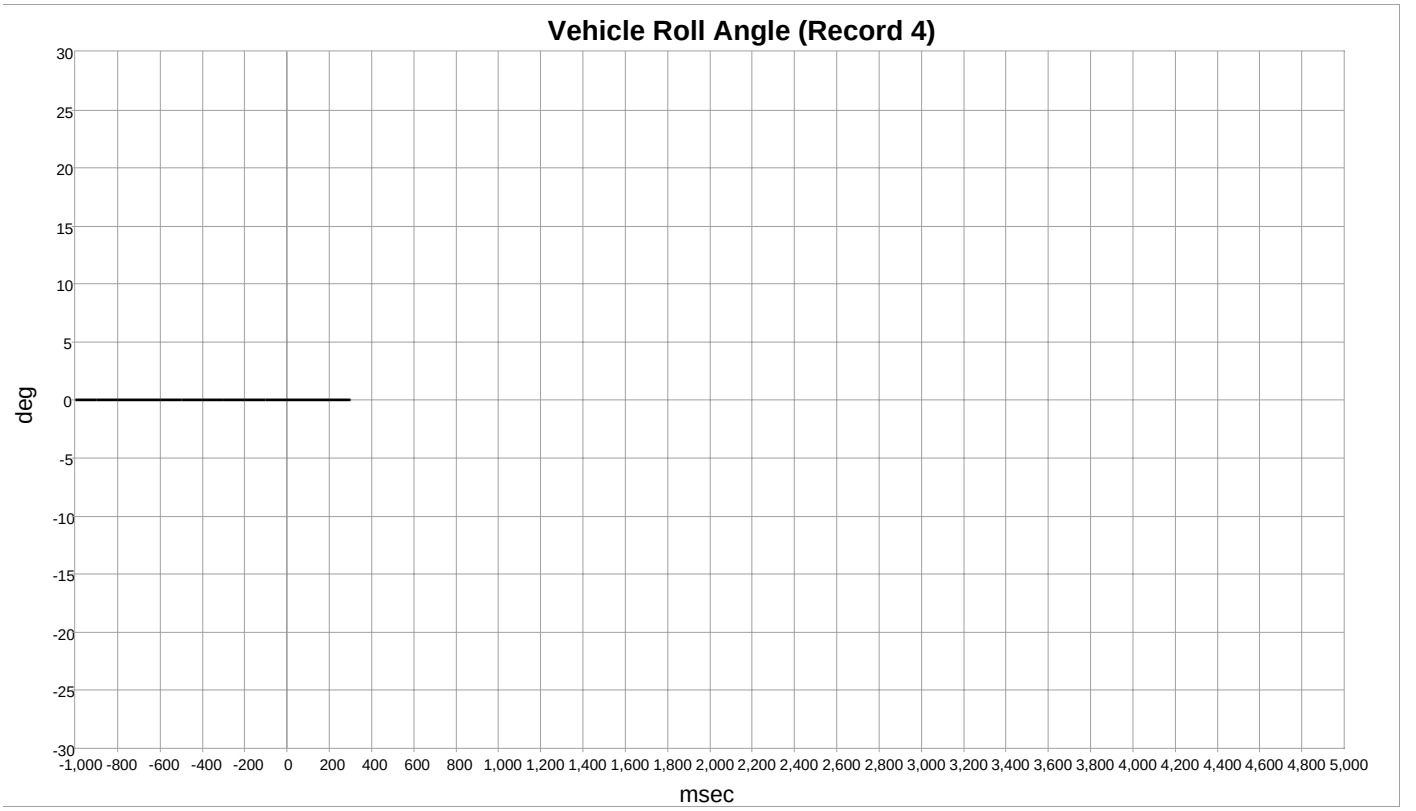
Time (msec)	Delta-V, Lateral (MPH [km/h])	Lateral Acceleration High Range (g)
0	0.0 [0]	-0.01
10	0.0 [0]	-0.01
20	0.0 [0]	-0.01
30	0.0 [0]	-0.01
40	0.0 [0]	-0.01
50	0.0 [0]	-0.01
60	0.0 [0]	-0.01
70	0.0 [0]	-0.01
80	0.0 [0]	-0.01
90	0.0 [0]	-0.01
100	0.0 [0]	-0.01
110	0.0 [0]	-0.01
120	0.0 [0]	-0.01
130	0.0 [0]	-0.01
140	0.0 [0]	-0.01
150	0.0 [0]	-0.01
160	0.0 [0]	-0.01
170	0.0 [0]	-0.01
180	0.0 [0]	-0.01
190	0.0 [0]	-0.01
200	0.0 [0]	-0.01
210	0.0 [0]	-0.01
220	0.0 [0]	-0.01
230	0.0 [0]	-0.01
240	0.0 [0]	-0.01
250	0.0 [0]	-0.01

Normal Acceleration (Record 4)



Time (msec)	Normal Acceleration (g)
0	0.0
10	0.0
20	0.0
30	0.0
40	0.0
50	0.0
60	0.0
70	0.0
80	0.0
90	0.0
100	0.0
110	0.0
120	0.0
130	0.0
140	0.0
150	0.0
160	0.0
170	0.0
180	0.0
190	0.0
200	0.0
210	0.0
220	0.0
230	0.0
240	0.0
250	0.0

Vehicle Roll Angle (Record 4)



Time (msec)	Vehicle Roll Angle (deg)
-1000	0
-900	0
-800	0
-700	0
-600	0
-500	0
-400	0
-300	0
-200	0
-100	0
0	0
100	0
200	0
300	0
400	Data Not Available
500	Data Not Available
600	Data Not Available
700	Data Not Available
800	Data Not Available
900	Data Not Available
1000	Data Not Available
1100	Data Not Available
1200	Data Not Available
1300	Data Not Available
1400	Data Not Available
1500	Data Not Available
1600	Data Not Available

Time (msec)	Vehicle Roll Angle (deg)
1700	Data Not Available
1800	Data Not Available
1900	Data Not Available
2000	Data Not Available
2100	Data Not Available
2200	Data Not Available
2300	Data Not Available
2400	Data Not Available
2500	Data Not Available
2600	Data Not Available
2700	Data Not Available
2800	Data Not Available
2900	Data Not Available
3000	Data Not Available
3100	Data Not Available
3200	Data Not Available
3300	Data Not Available
3400	Data Not Available
3500	Data Not Available
3600	Data Not Available
3700	Data Not Available
3800	Data Not Available
3900	Data Not Available
4000	Data Not Available
4100	Data Not Available
4200	Data Not Available
4300	Data Not Available
4400	Data Not Available
4500	Data Not Available
4600	Data Not Available
4700	Data Not Available
4800	Data Not Available
4900	Data Not Available
5000	Data Not Available

System Status at Event (Record 5)

Event Counter at Event	26
Event Type	External Trigger
Multi-Event, Number of Events	1, Event
Time from Initial Event to Current Event (msec)	0.0
Time from Previous Event to Current Event (msec)	0.0
Vehicle Clock, Date and Time at Event (YYYY-MM-DD, HH:MM:SS)	[redacted]
Vehicle Mileage (km)	48,930
Operating Time (min)	52,076
Ignition Cycle at Event (Cycles)	2,668
Ignition Cycle at Download (Cycles)	3,369
Maximum Delta-V, Longitudinal (MPH [km/h])	-3.7 [-6]
Time, Maximum Delta-V, Longitudinal (msec)	300.0
Clipping Time, Longitudinal Acceleration Sensor (msec)	Clipping Not Reached
Maximum Delta-V, Lateral (MPH [km/h])	0.0 [0]
Time, Maximum Delta-V, Lateral (msec)	0.0
Clipping Time, Lateral Acceleration Sensor (msec)	Clipping Not Reached
Time, Maximum Delta-V, Resultant (msec)	300.0
Time from Last Speed Data Sample (Precrash) to Time Zero (msec)	397
Time from Time Zero to Algorithm Start (Front) (msec)	Algorithm Not Started
Time from Time Zero to Algorithm Reset (Front) (msec)	Algorithm Not Reset
Time from Time Zero to Algorithm Start (Side) (msec)	Algorithm Not Started
Time from Time Zero to Algorithm Reset (Side) (msec)	Algorithm Not Reset
Time from Time Zero to Algorithm Start (Rear) (msec)	Algorithm Not Started
Time from Time Zero to Algorithm Reset (Rear) (msec)	Algorithm Not Reset
Time from Time Zero to Deployment (Rollover) (msec)	Algorithm Not Started
Time from Time Zero to Algorithm Reset (Rollover) (msec)	Algorithm Not Reset
Vehicle Identification Number (VIN)	3VV2B7AX6KM******
Supplier ID, ACM	YNF
Production Date, ACM	190215
Supply Voltage (Before Event) (V)	14.0
Complete File Recorded	Completed Successfully

Deployment Command Data (Record 5)

Pretensioner, Time to 1st Stage Deployment, Driver (msec)	Not Deployed
Belt-Load Limiter, Time to Deployment, Driver (msec)	Not Deployed
Sill-End Pretensioner, Time to Deployment, Driver (msec)	Not Deployed
Frontal Airbag, Time to 1st Stage Deployment, Driver (msec)	Not Deployed
Side Airbag, Time to 1st Stage Deployment, Driver (msec)	Not Deployed
Side Curtain/Tube Airbag, Time to Deployment, Driver Side (msec)	Not Deployed
Pretensioner, Time to 1st Stage Deployment, Front Passenger (msec)	Not Deployed
Belt-Load Limiter, Time to Deployment, Front Passenger (msec)	Not Deployed
Sill-End Pretensioner, Time to Deployment, Front Passenger (msec)	Not Deployed
Frontal Airbag, Time to 1st Stage Deployment, Front Passenger (msec)	Not Deployed
Frontal Airbag, Time to 2nd Stage Deployment, Front Passenger (msec)	Not Deployed
Frontal Airbag, 2nd Stage Disposal, Front Passenger	Not Deployed
Side Airbag, Time to 1st Stage Deployment, Front Passenger (msec)	Not Deployed
Side Curtain/Tube Airbag, Time to Deployment, Passenger Side (msec)	Not Deployed

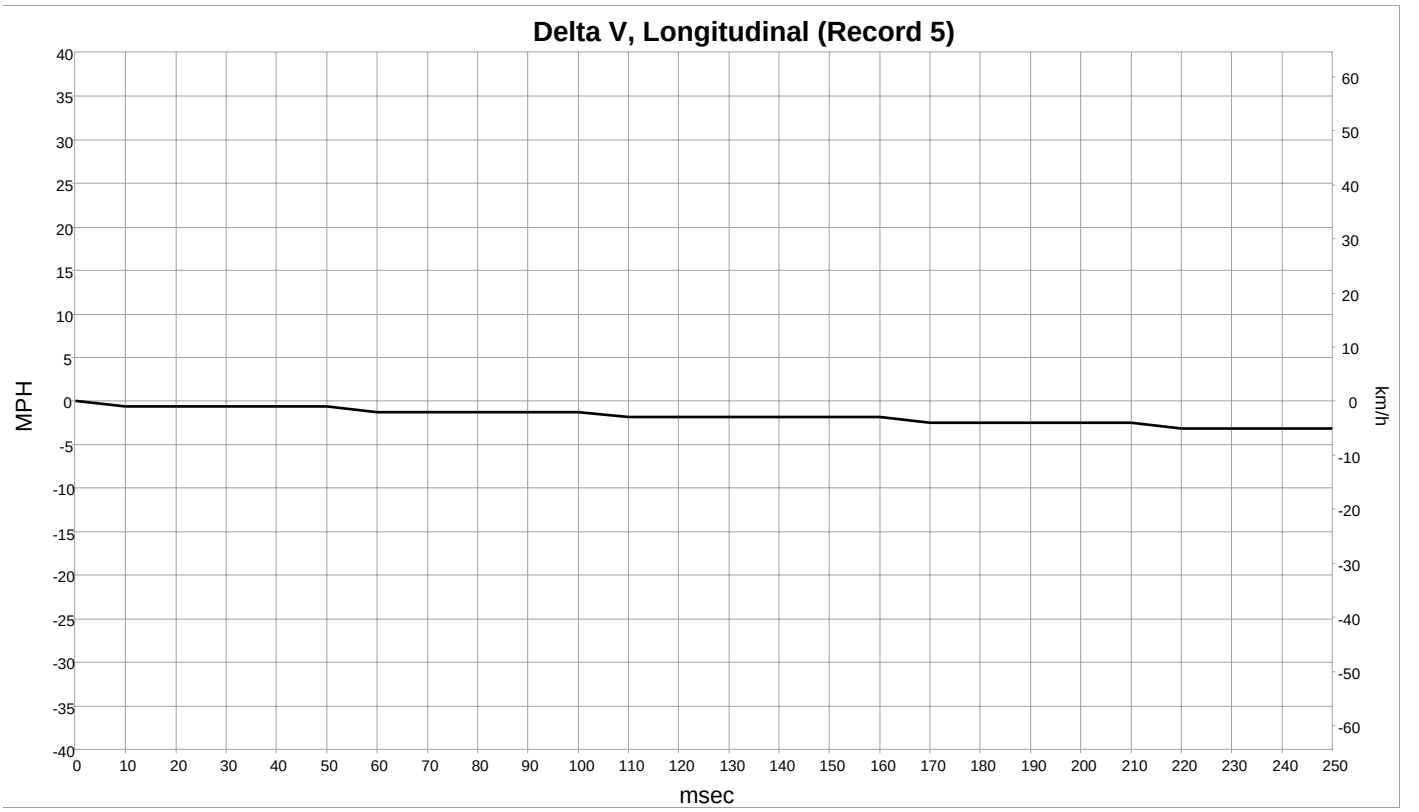
Pre-Crash Data -1 Sec (Record 5)

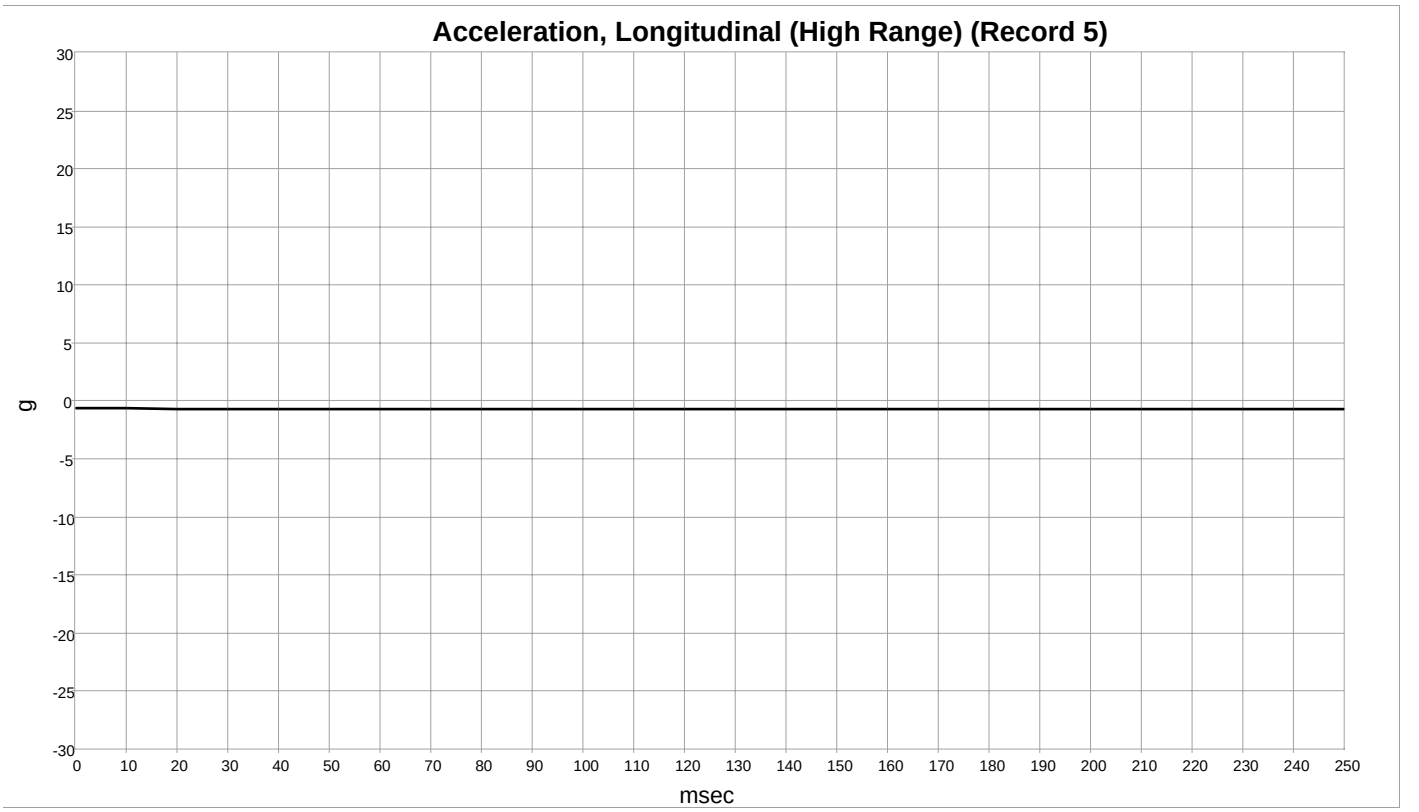
Safety Belt Status, Driver	Fastened
Seat Track Position Switch Status, Driver	Rear
Safety Belt Status, Front Passenger	Not fastened
Seat Track Position Switch Status, Front Passenger	Rear
Occupant Size Classification, Front Passenger	Empty
Frontal Airbag Disable Indicator Status, Passenger	On
Airbag Warning Lamp, Status	Off

Pre-Crash Data -5 to 0 sec (Record 5)

Time (sec)	Engine RPM (Combustion Engine) (RPM)	ABS Activity	Stability Control	Steering Input (deg)	Speed, Vehicle Indicated (MPH [km/h])	Accelerator Pedal (%)	Service Brake Activation
-5.0	1,408	Non-Engaged	On	0	53 [85]	0	On
-4.5	1,408	Non-Engaged	On	0	52 [84]	0	On
-4.0	1,344	Non-Engaged	On	-2	52 [83]	0	On
-3.5	1,344	Non-Engaged	On	-2	51 [82]	0	On
-3.0	1,344	Non-Engaged	On	-2	50 [81]	0	On
-2.5	1,344	Non-Engaged	On	-2	50 [80]	0	On
-2.0	1,280	Non-Engaged	On	-2	50 [80]	0	On
-1.5	1,280	Non-Engaged	On	0	49 [79]	0	On
-1.0	1,280	Non-Engaged	On	-4	48 [77]	0	On
-0.5	1,216	Non-Engaged	On	-2	45 [72]	0	On
0.0	1,216	Non-Engaged	On	-2	38 [61]	0	On

Longitudinal Crash Pulse (Record 5)

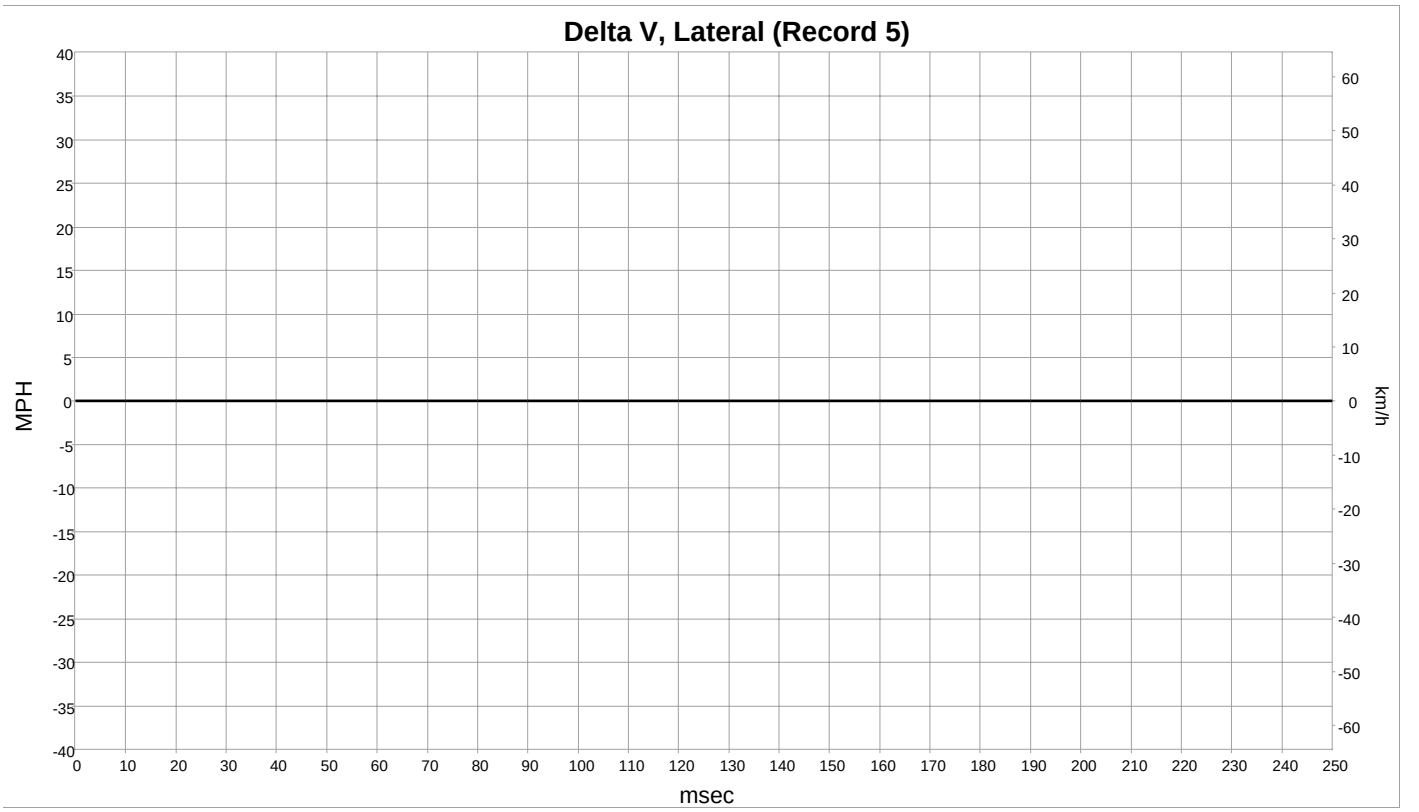


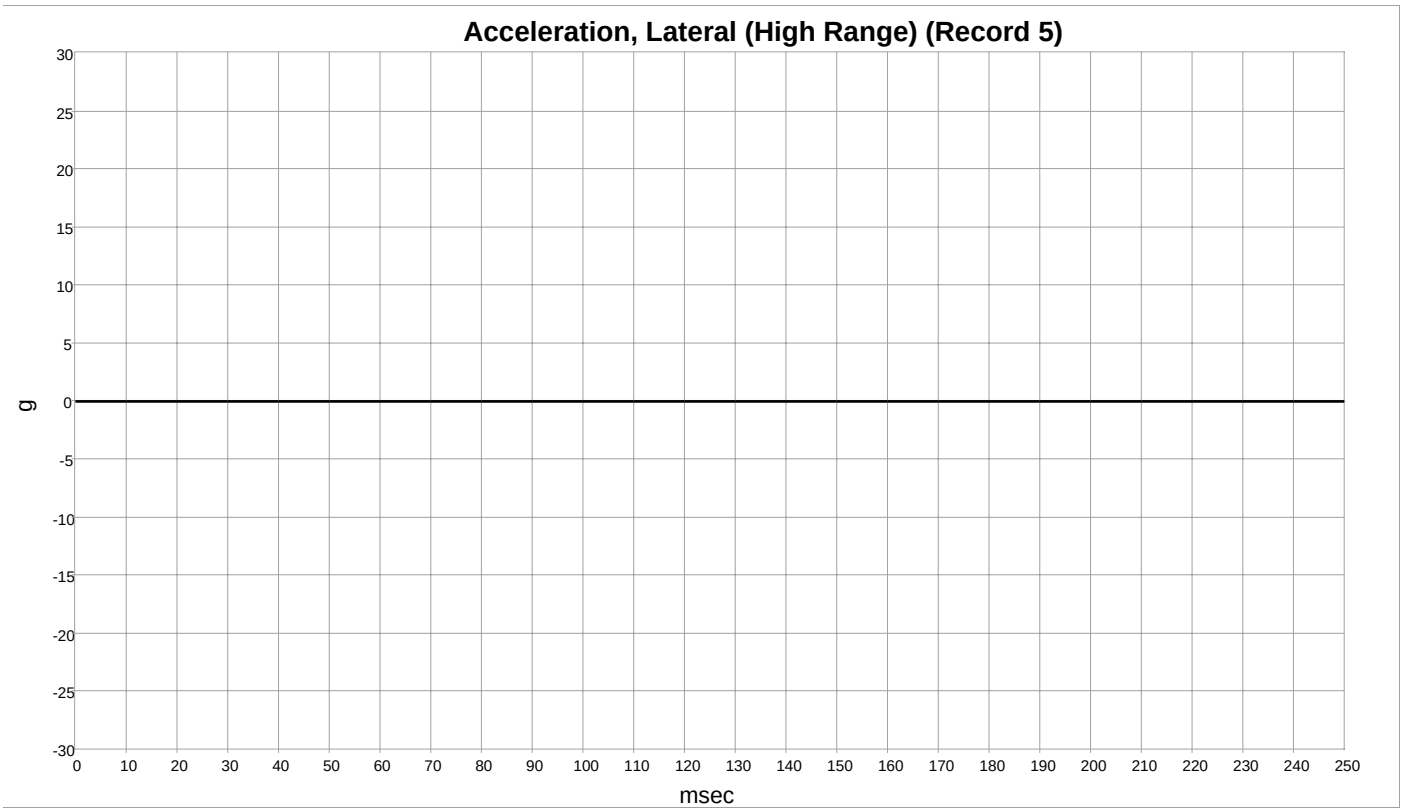


Longitudinal Crash Pulse (Record 5)

Time (msec)	Delta-V, Longitudinal (MPH [km/h])	Longitudinal Acceleration High Range (g)
0	0.0 [0]	-0.66
10	-0.6 [-1]	-0.66
20	-0.6 [-1]	-0.69
30	-0.6 [-1]	-0.69
40	-0.6 [-1]	-0.69
50	-0.6 [-1]	-0.69
60	-1.2 [-2]	-0.69
70	-1.2 [-2]	-0.69
80	-1.2 [-2]	-0.69
90	-1.2 [-2]	-0.69
100	-1.2 [-2]	-0.69
110	-1.9 [-3]	-0.69
120	-1.9 [-3]	-0.69
130	-1.9 [-3]	-0.69
140	-1.9 [-3]	-0.69
150	-1.9 [-3]	-0.69
160	-1.9 [-3]	-0.69
170	-2.5 [-4]	-0.69
180	-2.5 [-4]	-0.69
190	-2.5 [-4]	-0.69
200	-2.5 [-4]	-0.69
210	-2.5 [-4]	-0.69
220	-3.1 [-5]	-0.69
230	-3.1 [-5]	-0.69
240	-3.1 [-5]	-0.69
250	-3.1 [-5]	-0.69

Lateral Crash Pulse (Record 5)

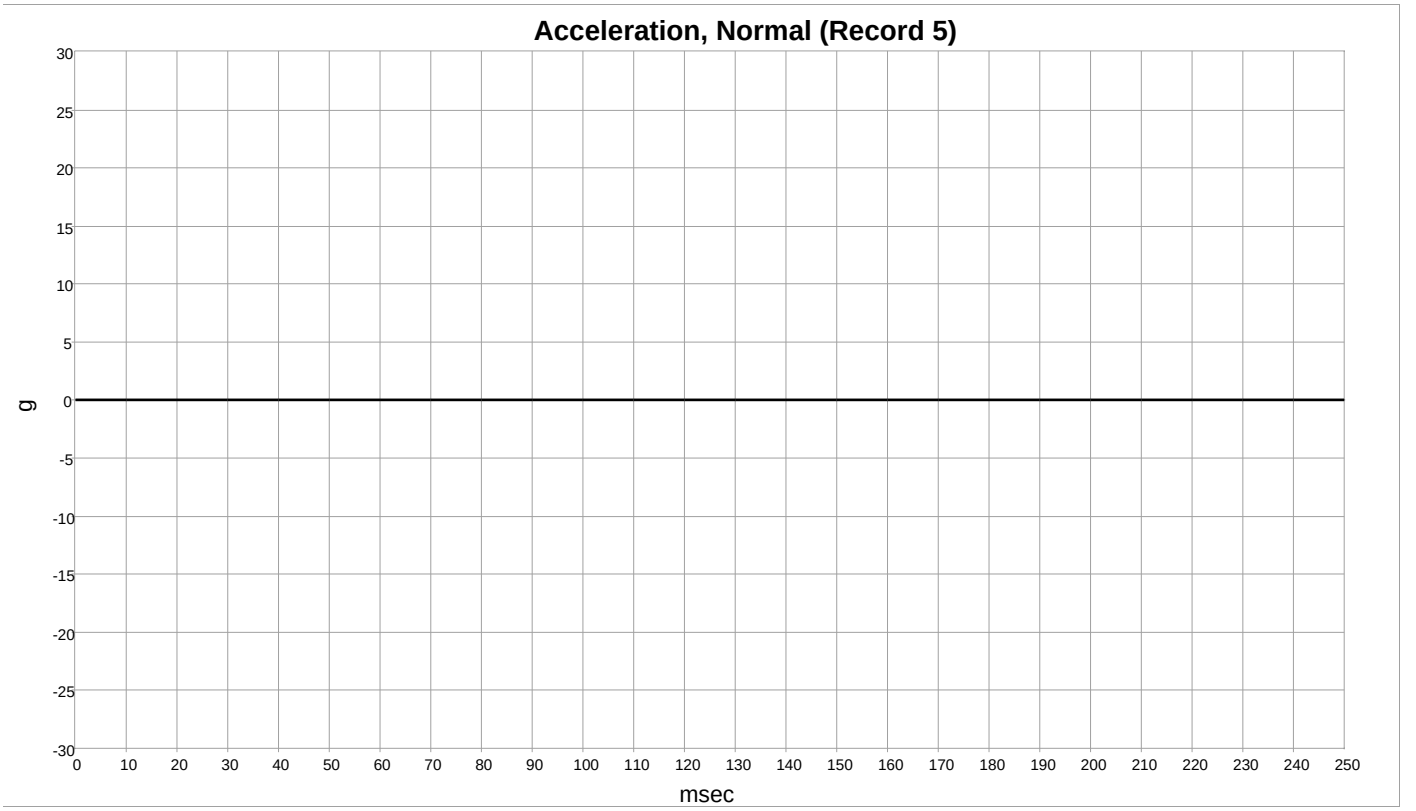




Lateral Crash Pulse (Record 5)

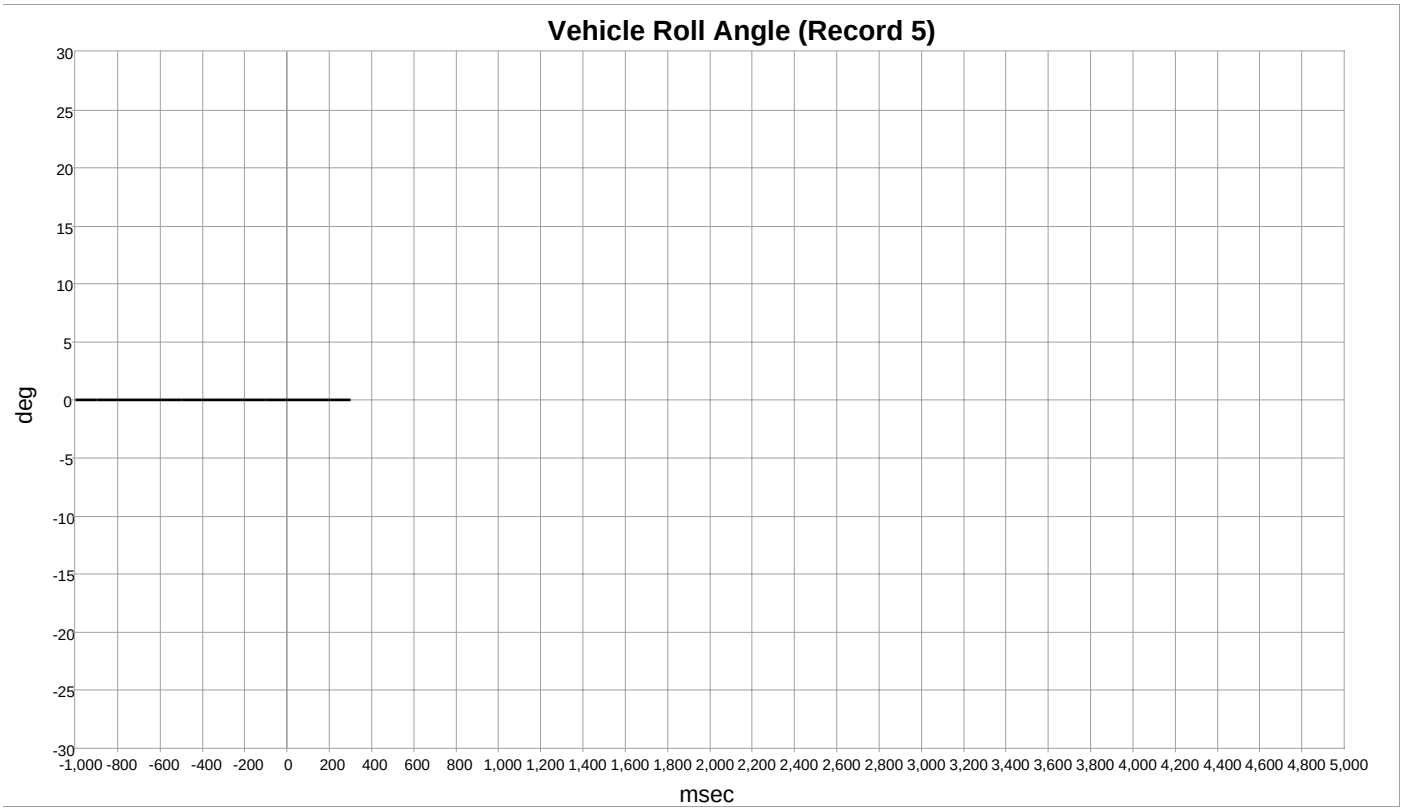
Time (msec)	Delta-V, Lateral (MPH [km/h])	Lateral Acceleration High Range (g)
0	0.0 [0]	-0.01
10	0.0 [0]	-0.01
20	0.0 [0]	-0.01
30	0.0 [0]	-0.01
40	0.0 [0]	-0.01
50	0.0 [0]	-0.01
60	0.0 [0]	-0.01
70	0.0 [0]	-0.01
80	0.0 [0]	-0.01
90	0.0 [0]	-0.01
100	0.0 [0]	-0.01
110	0.0 [0]	-0.01
120	0.0 [0]	-0.01
130	0.0 [0]	-0.01
140	0.0 [0]	-0.01
150	0.0 [0]	-0.01
160	0.0 [0]	-0.01
170	0.0 [0]	-0.01
180	0.0 [0]	-0.01
190	0.0 [0]	-0.01
200	0.0 [0]	-0.01
210	0.0 [0]	-0.01
220	0.0 [0]	-0.01
230	0.0 [0]	-0.01
240	0.0 [0]	-0.01
250	0.0 [0]	-0.01

Normal Acceleration (Record 5)



Time (msec)	Normal Acceleration (g)
0	0.0
10	0.0
20	0.0
30	0.0
40	0.0
50	0.0
60	0.0
70	0.0
80	0.0
90	0.0
100	0.0
110	0.0
120	0.0
130	0.0
140	0.0
150	0.0
160	0.0
170	0.0
180	0.0
190	0.0
200	0.0
210	0.0
220	0.0
230	0.0
240	0.0
250	0.0

Vehicle Roll Angle (Record 5)



Time (msec)	Vehicle Roll Angle (deg)
-1000	0
-900	0
-800	0
-700	0
-600	0
-500	0
-400	0
-300	0
-200	0
-100	0
0	0
100	0
200	0
300	0
400	Data Not Available
500	Data Not Available
600	Data Not Available
700	Data Not Available
800	Data Not Available
900	Data Not Available
1000	Data Not Available
1100	Data Not Available
1200	Data Not Available
1300	Data Not Available
1400	Data Not Available
1500	Data Not Available
1600	Data Not Available

Time (msec)	Vehicle Roll Angle (deg)
1700	Data Not Available
1800	Data Not Available
1900	Data Not Available
2000	Data Not Available
2100	Data Not Available
2200	Data Not Available
2300	Data Not Available
2400	Data Not Available
2500	Data Not Available
2600	Data Not Available
2700	Data Not Available
2800	Data Not Available
2900	Data Not Available
3000	Data Not Available
3100	Data Not Available
3200	Data Not Available
3300	Data Not Available
3400	Data Not Available
3500	Data Not Available
3600	Data Not Available
3700	Data Not Available
3800	Data Not Available
3900	Data Not Available
4000	Data Not Available
4100	Data Not Available
4200	Data Not Available
4300	Data Not Available
4400	Data Not Available
4500	Data Not Available
4600	Data Not Available
4700	Data Not Available
4800	Data Not Available
4900	Data Not Available
5000	Data Not Available

System Status at Event (Record 6)

Event Counter at Event	25
Event Type	External Trigger
Multi-Event, Number of Events	1. Event
Time from Initial Event to Current Event (msec)	0.0
Time from Previous Event to Current Event (msec)	0.0
Vehicle Clock, Date and Time at Event (YYYY-MM-DD, HH:MM:SS)	[redacted]
Vehicle Mileage (km)	47,770
Operating Time (min)	50,751
Ignition Cycle at Event (Cycles)	2,593
Ignition Cycle at Download (Cycles)	3,369
Maximum Delta-V, Longitudinal (MPH [km/h])	0.0 [0]
Time, Maximum Delta-V, Longitudinal (msec)	0.0
Clipping Time, Longitudinal Acceleration Sensor (msec)	Clipping Not Reached
Maximum Delta-V, Lateral (MPH [km/h])	0.0 [0]
Time, Maximum Delta-V, Lateral (msec)	0.0
Clipping Time, Lateral Acceleration Sensor (msec)	Clipping Not Reached
Time, Maximum Delta-V, Resultant (msec)	0.0
Time from Last Speed Data Sample (Precrash) to Time Zero (msec)	297
Time from Time Zero to Algorithm Start (Front) (msec)	Algorithm Not Started
Time from Time Zero to Algorithm Reset (Front) (msec)	Algorithm Not Reset
Time from Time Zero to Algorithm Start (Side) (msec)	Algorithm Not Started
Time from Time Zero to Algorithm Reset (Side) (msec)	Algorithm Not Reset
Time from Time Zero to Algorithm Start (Rear) (msec)	Algorithm Not Started
Time from Time Zero to Algorithm Reset (Rear) (msec)	Algorithm Not Reset
Time from Time Zero to Deployment (Rollover) (msec)	Algorithm Not Started
Time from Time Zero to Algorithm Reset (Rollover) (msec)	Algorithm Not Reset
Vehicle Identification Number (VIN)	3VV2B7AX6KM******
Supplier ID, ACM	YNF
Production Date, ACM	190215
Supply Voltage (Before Event) (V)	12.2
Complete File Recorded	Completed Successfully

Deployment Command Data (Record 6)

Pretensioner, Time to 1st Stage Deployment, Driver (msec)	Not Deployed
Belt-Load Limiter, Time to Deployment, Driver (msec)	Not Deployed
Sill-End Pretensioner, Time to Deployment, Driver (msec)	Not Deployed
Frontal Airbag, Time to 1st Stage Deployment, Driver (msec)	Not Deployed
Side Airbag, Time to 1st Stage Deployment, Driver (msec)	Not Deployed
Side Curtain/Tube Airbag, Time to Deployment, Driver Side (msec)	Not Deployed
Pretensioner, Time to 1st Stage Deployment, Front Passenger (msec)	Not Deployed
Belt-Load Limiter, Time to Deployment, Front Passenger (msec)	Not Deployed
Sill-End Pretensioner, Time to Deployment, Front Passenger (msec)	Not Deployed
Frontal Airbag, Time to 1st Stage Deployment, Front Passenger (msec)	Not Deployed
Frontal Airbag, Time to 2nd Stage Deployment, Front Passenger (msec)	Not Deployed
Frontal Airbag, 2nd Stage Disposal, Front Passenger	Not Deployed
Side Airbag, Time to 1st Stage Deployment, Front Passenger (msec)	Not Deployed
Side Curtain/Tube Airbag, Time to Deployment, Passenger Side (msec)	Not Deployed

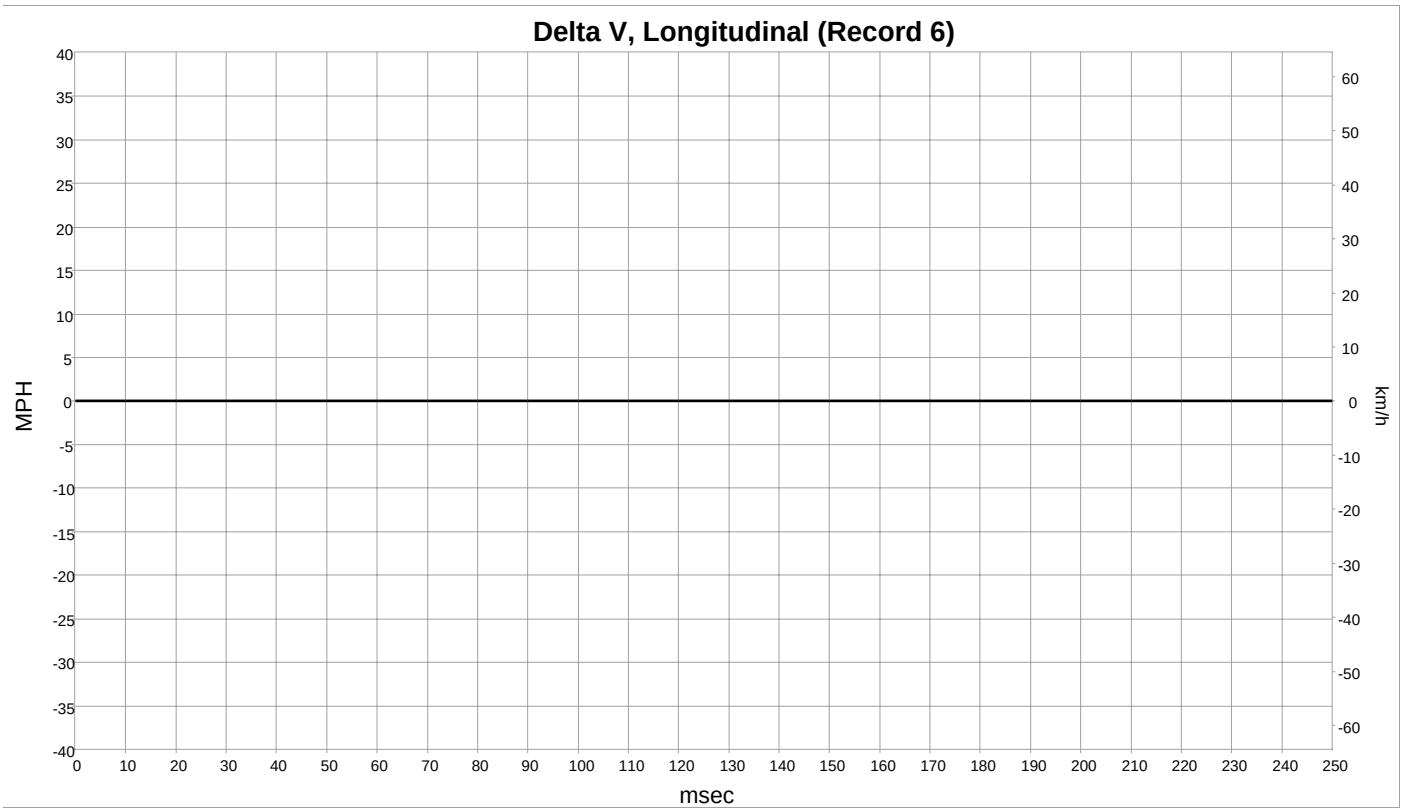
Pre-Crash Data -1 Sec (Record 6)

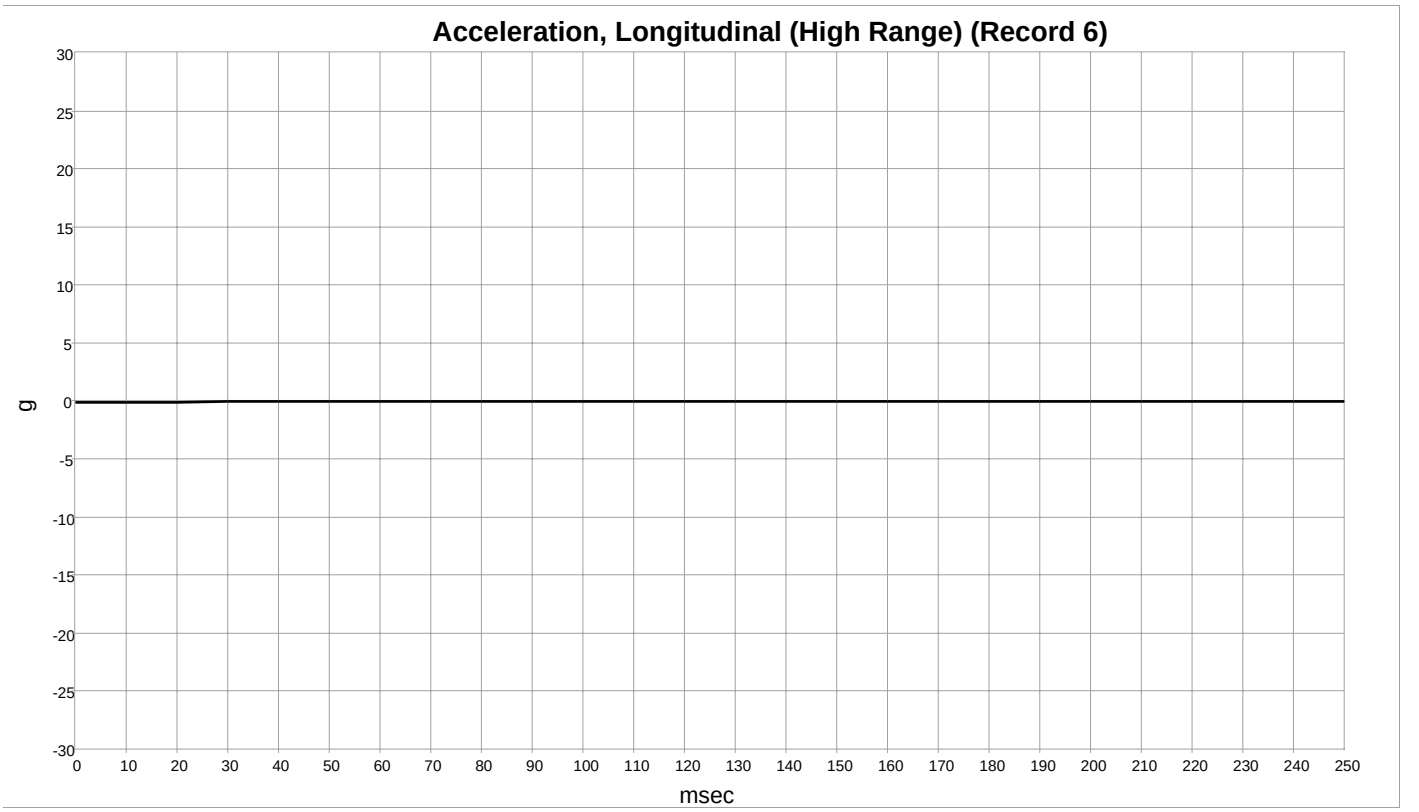
Safety Belt Status, Driver	Fastened
Seat Track Position Switch Status, Driver	Rear
Safety Belt Status, Front Passenger	Not fastened
Seat Track Position Switch Status, Front Passenger	Rear
Occupant Size Classification, Front Passenger	Empty
Frontal Airbag Disable Indicator Status, Passenger	On
Airbag Warning Lamp, Status	Off

Pre-Crash Data -5 to 0 sec (Record 6)

Time (sec)	Engine RPM (Combustion Engine) (RPM)	ABS Activity	Stability Control	Steering Input (deg)	Speed, Vehicle Indicated (MPH [km/h])	Accelerator Pedal (%)	Service Brake Activation
-5.0	1,984	Non-Engaged	On	-2	26 [42]	0	Off
-4.5	2,048	Non-Engaged	On	0	26 [42]	3	Off
-4.0	2,112	Non-Engaged	On	4	26 [42]	10	Off
-3.5	2,112	Non-Engaged	On	-2	26 [42]	14	Off
-3.0	1,664	Non-Engaged	On	-4	27 [43]	16	Off
-2.5	1,664	Non-Engaged	On	0	27 [44]	20	Off
-2.0	1,600	Non-Engaged	On	0	28 [45]	0	Off
-1.5	1,408	Non-Engaged	On	-2	26 [42]	0	On
-1.0	960	Non-Engaged	On	-2	19 [30]	0	On
-0.5	896	Non-Engaged	On	-2	11 [18]	0	On
0.0	704	Non-Engaged	On	0	8 [13]	0	On

Longitudinal Crash Pulse (Record 6)

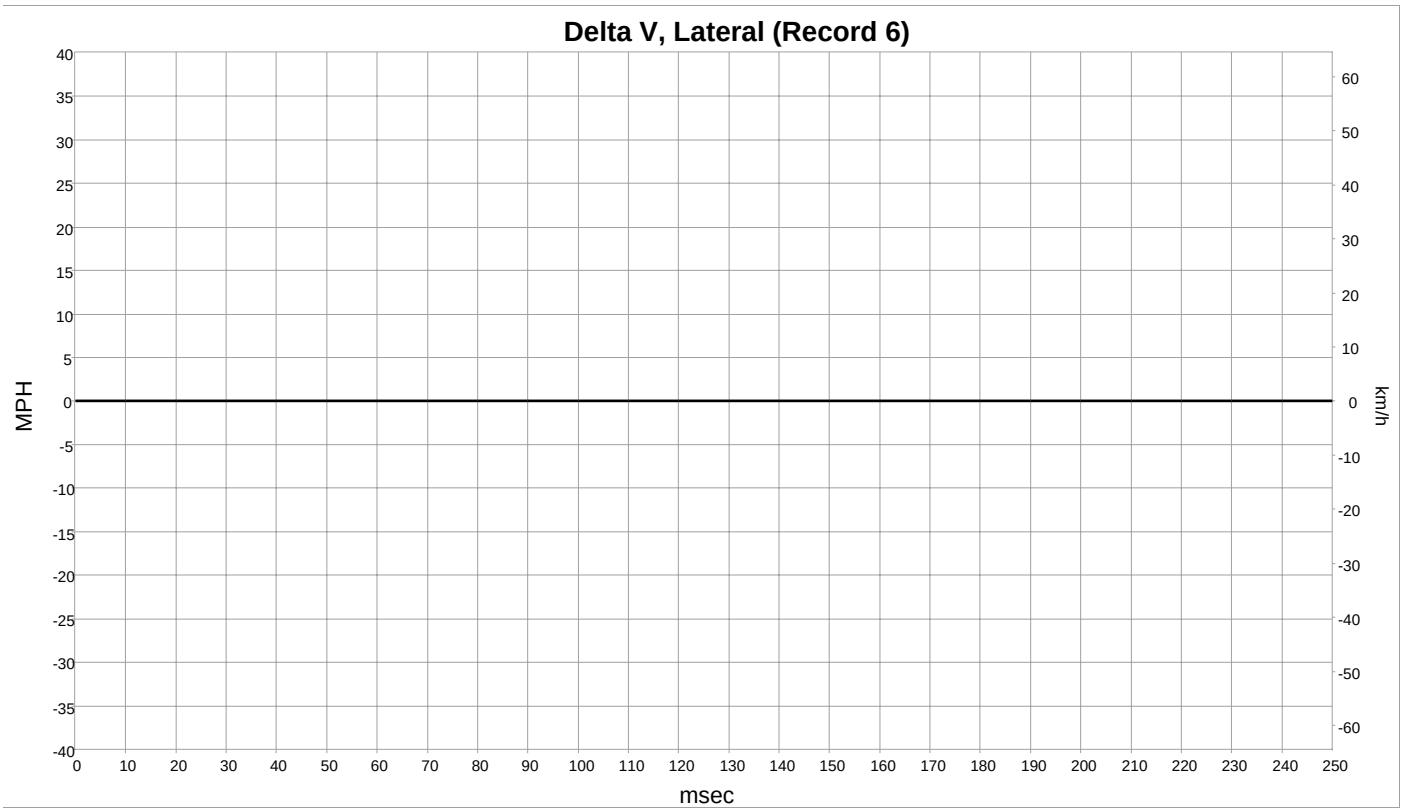


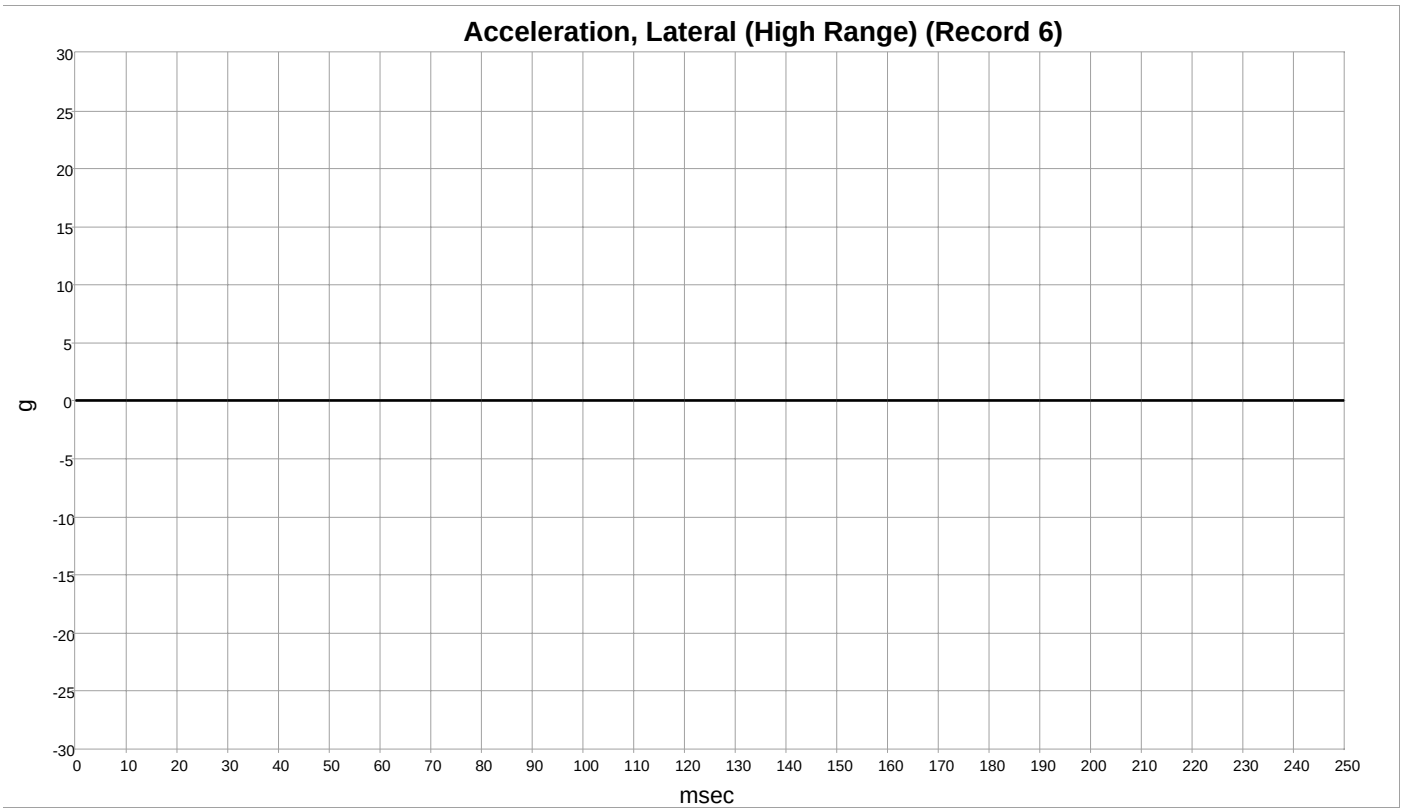


Longitudinal Crash Pulse (Record 6)

Time (msec)	Delta-V, Longitudinal (MPH [km/h])	Longitudinal Acceleration High Range (g)
0	0.0 [0]	-0.09
10	0.0 [0]	-0.09
20	0.0 [0]	-0.09
30	0.0 [0]	-0.08
40	0.0 [0]	-0.06
50	0.0 [0]	-0.06
60	0.0 [0]	-0.06
70	0.0 [0]	-0.05
80	0.0 [0]	-0.05
90	0.0 [0]	-0.05
100	0.0 [0]	-0.05
110	0.0 [0]	-0.05
120	0.0 [0]	-0.05
130	0.0 [0]	-0.05
140	0.0 [0]	-0.05
150	0.0 [0]	-0.05
160	0.0 [0]	-0.05
170	0.0 [0]	-0.05
180	0.0 [0]	-0.05
190	0.0 [0]	-0.05
200	0.0 [0]	-0.05
210	0.0 [0]	-0.05
220	0.0 [0]	-0.05
230	0.0 [0]	-0.05
240	0.0 [0]	-0.05
250	0.0 [0]	-0.05

Lateral Crash Pulse (Record 6)

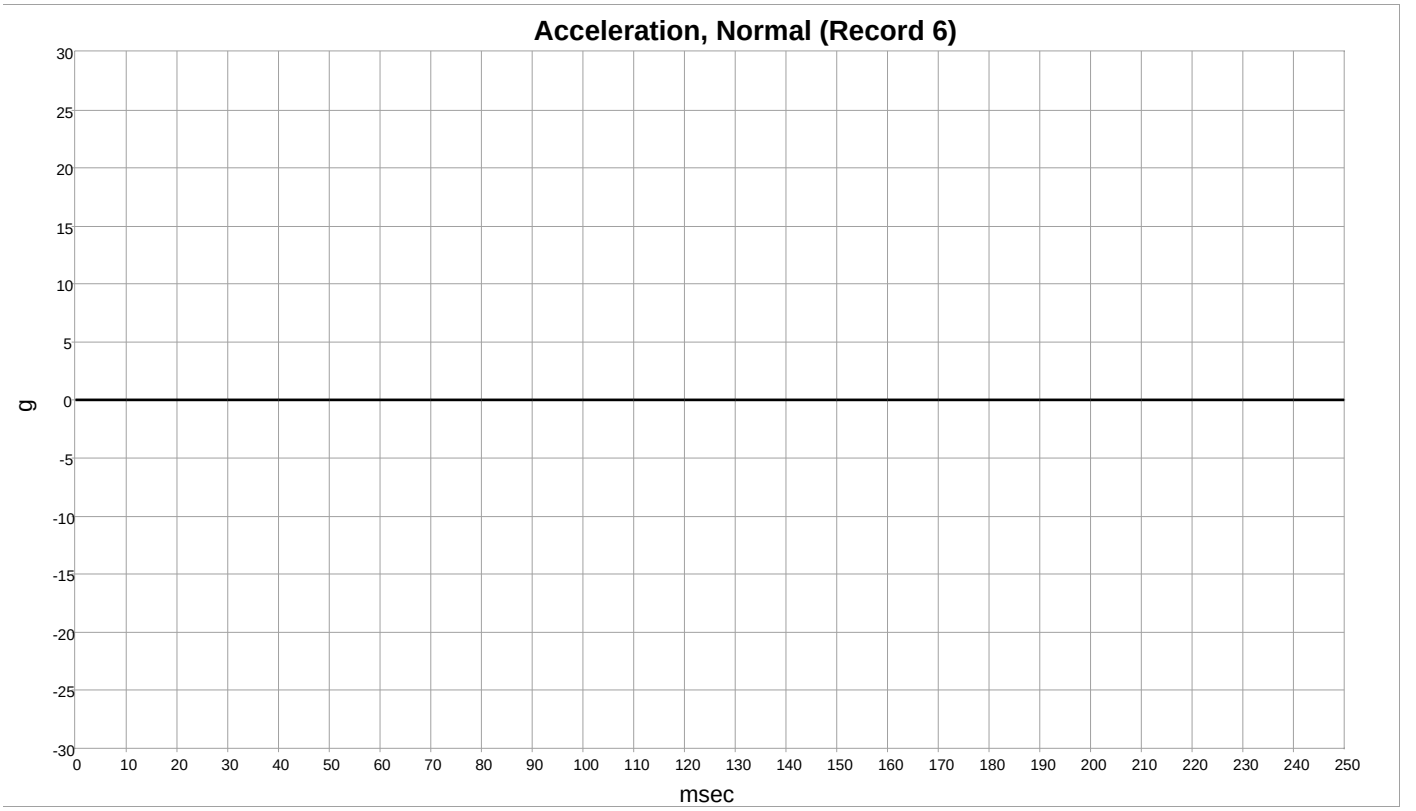




Lateral Crash Pulse (Record 6)

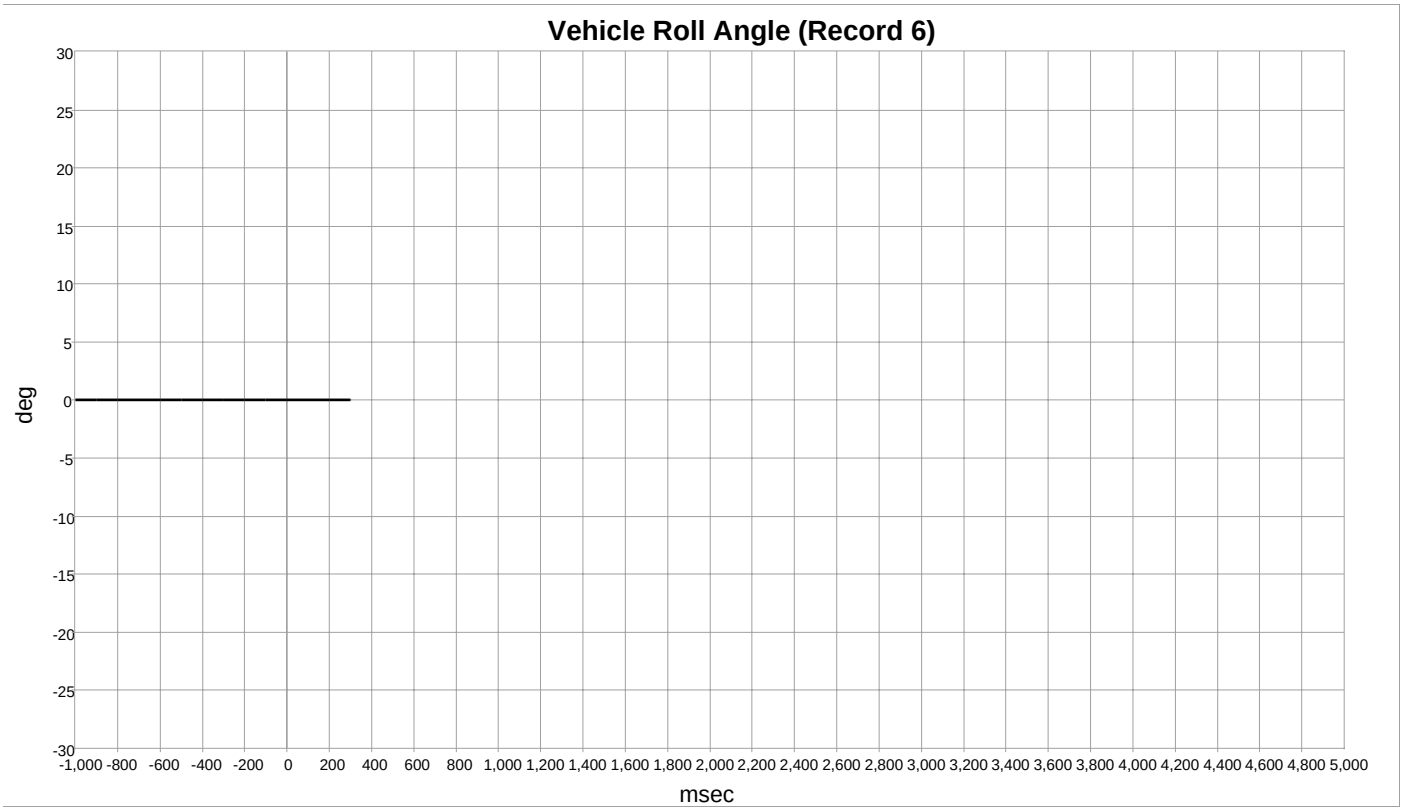
Time (msec)	Delta-V, Lateral (MPH [km/h])	Lateral Acceleration High Range (g)
0	0.0 [0]	0.01
10	0.0 [0]	0.01
20	0.0 [0]	0.01
30	0.0 [0]	0.01
40	0.0 [0]	0.01
50	0.0 [0]	0.01
60	0.0 [0]	0.01
70	0.0 [0]	0.01
80	0.0 [0]	0.01
90	0.0 [0]	0.01
100	0.0 [0]	0.01
110	0.0 [0]	0.01
120	0.0 [0]	0.01
130	0.0 [0]	0.01
140	0.0 [0]	0.01
150	0.0 [0]	0.01
160	0.0 [0]	0.01
170	0.0 [0]	0.01
180	0.0 [0]	0.01
190	0.0 [0]	0.01
200	0.0 [0]	0.01
210	0.0 [0]	0.01
220	0.0 [0]	0.01
230	0.0 [0]	0.01
240	0.0 [0]	0.01
250	0.0 [0]	0.01

Normal Acceleration (Record 6)



Time (msec)	Normal Acceleration (g)
0	0.0
10	0.0
20	0.0
30	0.0
40	0.0
50	0.0
60	0.0
70	0.0
80	0.0
90	0.0
100	0.0
110	0.0
120	0.0
130	0.0
140	0.0
150	0.0
160	0.0
170	0.0
180	0.0
190	0.0
200	0.0
210	0.0
220	0.0
230	0.0
240	0.0
250	0.0

Vehicle Roll Angle (Record 6)



Time (msec)	Vehicle Roll Angle (deg)
-1000	0
-900	0
-800	0
-700	0
-600	0
-500	0
-400	0
-300	0
-200	0
-100	0
0	0
100	0
200	0
300	0
400	Data Not Available
500	Data Not Available
600	Data Not Available
700	Data Not Available
800	Data Not Available
900	Data Not Available
1000	Data Not Available
1100	Data Not Available
1200	Data Not Available
1300	Data Not Available
1400	Data Not Available
1500	Data Not Available
1600	Data Not Available

Time (msec)	Vehicle Roll Angle (deg)
1700	Data Not Available
1800	Data Not Available
1900	Data Not Available
2000	Data Not Available
2100	Data Not Available
2200	Data Not Available
2300	Data Not Available
2400	Data Not Available
2500	Data Not Available
2600	Data Not Available
2700	Data Not Available
2800	Data Not Available
2900	Data Not Available
3000	Data Not Available
3100	Data Not Available
3200	Data Not Available
3300	Data Not Available
3400	Data Not Available
3500	Data Not Available
3600	Data Not Available
3700	Data Not Available
3800	Data Not Available
3900	Data Not Available
4000	Data Not Available
4100	Data Not Available
4200	Data Not Available
4300	Data Not Available
4400	Data Not Available
4500	Data Not Available
4600	Data Not Available
4700	Data Not Available
4800	Data Not Available
4900	Data Not Available
5000	Data Not Available

Hexadecimal Data

```
FA10   01

FA12   01 00 00 07 F1 00 00 07 F9

FA11   02 00 05

FA13   00 1E 00 01 FF 00 04 FF FF 00 05 FF FF 00 06 FF
       FF 00 07 FF FF 00 09 FF FF 00 0C FF FF 00 0D FF
       FF 00 0E FF FF 00 0F FF FF 00 11 FF FF 00 16 64
       00 00 19 80 5F 80 78 80 59 80 10 7F F9 80 20 80
       36 80 53 80 38 80 3B 80 28 80 0B 7F D3 7F BD 7F
       C7 7F E7 7F E7 7F C1 7F C8 7F BB 7F B2 7F CE 7F
       D7 7F DB 7F D6 7F DE 00 17 64 00 00 19 7F B1 7F
       D6 80 03 80 2A 80 27 80 07 7F DE 7F CB 7F C4 7F
       F9 80 16 7F FB 7F EF 7F D9 7F C6 7F C4 7F C3 7F
       CD 7F F4 80 08 80 07 7F F9 7F E4 7F E1 7F E1 7F
       E1 00 19 64 00 00 19 82 82 7B 79 7A 7F 81 81 7F
       7D 7B 7C 7D 7D 7D 7D 7F 7F 7E 7C 79 79 7A 7D 7E
       7E 00 1B 64 00 0A 32 FF FF FF FF FF FF FF FF 7D
       7E 7F 80 7F 7F FF FF FF FF FF FF FF FF FF FF FF
       FF FF FF FF FF FF FF FF FF FF FF FF FF FF FF FF
       FF FF FF FF FF FF FF FF FF FF FF FF FF FF FF FF
       FF FF FF FF 00 1F 64 00 00 19 7E 7E 7E 7F 7F 7F
       7E 7E 7E 7E 7E 7E 7E 7E 7E 7E 7D 7D 7D 7D 7D 7D
       7D 7D 7D 7D 00 20 64 00 00 19 7F 80 80 80 80 80
       80 81 81 81 81 81 81 80 80 80 80 80 80 7F 7F 7F
       7F 7F 7F 7F 00 21 7D 00 22 81 00 23 78 00 24 29
       00 25 78 00 28 FF 00 29 FF 00 2D 02 00 2E 05 FE
       00 2F 01 6E 00 30 05 FE 00 33 FF FF 00 38 FF FF
       00 39 FF FF 00 3B FF 00 3D FF FF 00 3E FF FF 00
       3F FF FF 00 41 FF FF 00 42 FF FF 00 43 FF FF 00
       47 01 00 48 02 00 4B 01 00 4D 00 00 4E 02 00 4F
       00 00 51 01 00 5B 70 70 70 70 70 70 70 71 6F 52
       29 00 5C 04 06 08 09 09 09 09 09 00 00 00 00 5D
       1D 1D 1D 1D 1D 1D 1D 1D 1D 14 0C 00 5E 7E 7E 7E
       7E 7E 7D 7C 7D 7E 57 97 00 5F 00 00 00 00 00 00
       00 00 00 01 01 00 60 00 00 00 00 00 00 00 00 00
       01 01 00 61 00 00 00 00 00 00 00 00 00 01 01 00
       73 FF FF 00 74 FF FF 03 67 FF FF 03 68 FF FF 03
       CF 00 81 03 DD 59 4E 46 03 DE 19 02 15 03 E8 A5
       03 E9 0D 20 03 EA 0D 29 03 EB 78 03 EC 0A 03 ED
       1E 03 EE 16 03 EF 16 03 F0 0A 03 F1 17 E3 03 F2
       00 FD 4F 03 F3 33 56 56 32 42 37 41 58 36 4B 4D
       2A 2A 2A 2A 2A 2A 03 FB 04 03 FD 00 1E 03 FE FD
       61 41 3D

FA14   00 1E 00 01 00 00 04 00 00 00 05 FF FF 00 06 00
       04 00 07 FF FF 00 09 FF FF 00 0C 00 C1 00 0D FF
       FF 00 0E 00 BD 00 0F FF FF 00 11 FF FF 00 16 64
       2F 04 15 7F D6 80 09 80 2C 7F EA 7F E4 7F C6 80
       57 80 04 7F EB 7F E8 7F FD 80 08 80 3B 80 28 80
       2C 7F D9 7F C4 7F 71 7F B0 7F B6 7F F8 80 20 80
       43 80 4C 80 36 80 13 00 17 64 2F 04 15 7F B6 7F
       77 7E AE 7E C5 7E 56 7D CF 7D B8 7D 9E 7D 45 7D
       D0 7D AC 7D AC 7D E2 7D E7 7D F4 7E 3A 7E 7F 7E
       C6 7F 27 7F 5C 7F 9C 7F B5 7F CE 7F E0 7F EF 7F
       ED 00 19 64 2F 04 15 7F 79 77 7A 8A 84 82 71 60
       57 5B 64 65 6F 7F 93 97 92 8C 8B 8C 8C 88 85 85
       86 00 1B 64 2F 0A 32 FF FF FF FF FF FF FF FF FF
       FF FF 7F 7E 7E FF FF FF FF FF FF FF FF FF FF FF
       FF FF FF FF FF FF FF FF FF FF FF FF FF FF FF FF
       FF FF FF FF FF FF FF FF FF FF FF FF FF FF FF FF
       FF FF FF FF 00 1F 64 2F 04 15 7F 7E 7C 7B 79 77
       74 72 6F 6E 6C 6A 68 67 65 63 62 62 61 61 61 61
       61 61 61 61 00 20 64 2F 04 15 7F 7F 7F 7F 7F 7F
       7F 7F 7F 7F 7F 7F 80 80 80 7F 7F 7E 7E 7E 7E 7F
```

```
        7F 7F 7F 7F 00 21 61 00 22 7E 00 23 67 00 24 4C
        00 25 78 00 28 FF 00 29 FF 00 2D 01 00 2E 00 00
        00 2F 00 85 00 30 00 00 00 33 FF FF 00 38 FF FF
        00 39 FF FF 00 3B FF 00 3D FF FF 00 3E FF FF 00
        3F 00 A8 00 41 FF FF 00 42 FF FF 00 43 00 A8 00
        47 01 00 48 02 00 4B 00 00 4D 00 00 4E 02 00 4F
        00 00 51 01 00 5B 6F 70 70 70 70 70 70 70 70 71
        6F 00 5C 0E 04 04 06 08 09 09 09 09 09 00 00 5D
        1D 1D 1D 1D 1D 1D 1D 1D 1D 1D 00 5E 7D 7D 7E
        7E 7E 7E 7E 7D 7C 7D 7E 00 5F 00 00 00 00 00 00
        00 00 00 00 00 00 60 00 00 00 00 00 00 00 00 00
        00 00 00 61 00 00 00 00 00 00 00 00 00 00 00 00
        73 FF FF 00 74 FF FF 03 67 00 A8 03 68 00 A8 03
        CF 00 8B 03 DD 59 4E 46 03 DE 19 02 15 03 E8 A5
        03 E9 0D 20 03 EA 0D 29 03 EB 78 03 EC 0A 03 ED
        1E 03 EE 16 03 EF 16 03 F0 09 03 F1 17 E3 03 F2
        00 FD 4F 03 F3 33 56 56 32 42 37 41 58 36 4B 4D
        2A 2A 2A 2A 2A 2A 03 FB 04 03 FD 00 1D 03 FE 42
        FB 51 B7

FA15    00 1E 00 01 02 00 04 FF FF 00 05 00 04 00 06 00
        00 00 07 FF FF 00 09 FF FF 00 0C FF FF 00 0D 00
        22 00 0E 00 48 00 0F FF FF 00 11 FF FF 00 16 64
        28 04 15 7F F6 7F ED 7F A2 7F AA 7F CD 7F F5 80
        05 80 10 7F F2 7F E2 7F EF 80 0C 80 1B 80 27 80
        35 80 28 80 19 80 0E 80 0A 80 0F 80 0F 80 10 80
        0E 80 0A 7F FE 7F F7 00 17 64 28 04 15 80 2A 80
        D1 81 89 81 B4 82 4B 82 0F 81 3F 80 9A 80 82 80
        48 80 24 80 0F 80 0F 7F FD 7F F8 80 05 80 06 7F
        FA 80 05 80 0C 80 0C 80 0C 80 0C 80 0B 80 08 80
        0B 00 19 64 28 04 15 7F 7F 7D 7E 81 7D 7E 7E 7E
        7E 7E 80 82 82 82 81 7F 7F 80 80 80 80 80 80 80
        80 00 1B 64 28 0A 32 7F 7F 7F 7F 7F 7F 7F 7F 7F
        7F 7F 7F 7F 7F FF FF FF FF FF FF FF FF FF FF FF
        FF FF FF FF FF FF FF FF FF FF FF FF FF FF FF FF
        FF FF FF FF FF FF FF FF FF FF FF FF FF FF FF FF
        FF FF FF FF 00 1F 64 28 04 15 7F 81 83 84 87 89
        89 89 89 89 89 89 89 89 89 89 89 89 89 89 89 89
        89 89 89 89 00 20 64 28 04 15 7F 7F 7E 7E 7E 7E
        7E 7E 7E 7E 7E 7E 7E 7E 7F 7F 7F 7F 7F 7F 7F 7F
        7F 7F 7F 7F 00 21 89 00 22 7E 00 23 6A 00 24 24
        00 25 78 00 28 FF 00 29 FF 00 2D 02 00 2E 08 74
        00 2F 00 9B 00 30 08 74 00 33 FF FF 00 38 FF FF
        00 39 FF FF 00 3B FF 00 3D FF FF 00 3E FF FF 00
        3F FF FF 00 41 FF FF 00 42 FF FF 00 43 FF FF 00
        47 01 00 48 02 00 4B 00 00 4D 00 00 4E 02 00 4F
        00 00 51 01 00 5B 25 28 2A 2C 2E 2F 26 16 0D 08
        04 00 5C 1C 1C 16 12 12 00 00 00 00 00 00 00 5D
        2D 22 24 25 26 1E 15 0E 0C 0E 0D 00 5E 7F 7E 7F
        7F 7E 7E 7B 7A 7C 7F 7F 00 5F 00 00 00 00 00 00
        01 01 01 01 01 00 60 00 00 00 00 00 00 00 01 00
        00 00 00 61 00 00 00 00 00 00 00 00 00 00 00 00
        73 FF FF 00 74 FF FF 03 67 FF FF 03 68 FF FF 03
        CF 00 8D 03 DD 59 4E 46 03 DE 19 02 15 03 E8 A5
        03 E9 0B 22 03 EA 0D 29 03 EB 78 03 EC 08 03 ED
        06 03 EE 0A 03 EF 2E 03 F0 33 03 F1 14 56 03 F2
        00 D8 2D 03 F3 33 56 56 32 42 37 41 58 36 4B 4D
        2A 2A 2A 2A 2A 2A 03 FB 04 03 FD 00 1C 03 FE CD
        9D 2A 29

FA16    00 1E 00 01 FD 00 04 FF FF 00 05 FF FF 00 06 FF
        FF 00 07 FF FF 00 09 FF FF 00 0C FF FF 00 0D FF
        FF 00 0E FF FF 00 0F FF FF 00 11 FF FF 00 16 64
        FE 19 00 7F FE 7F FE 7F FE 7F FE 7F FE 7F FE 7F
        FE 7F FE 7F FE 7F FE 7F FE 7F FE 7F FE 7F FE 7F
        FE 7F FE 7F FE 7F FE 7F FE 7F FE 7F FE 7F FE 7F
        FE 7F FE 7F FE 7F FE 00 17 64 FE 19 00 7F E4 7F
        E4 7F E4 7F E4 7F E4 7F E4 7F E4 7F E4 7F E4 7F
        E4 7F E4 7F E4 7F E4 7F E4 7F E4 7F E4 7F E4 7F
        E4 7F E4 7F E4 7F E4 7F E4 7F E4 7F E4 7F E4 7F
```

```
        E4 00 19 64 FE 19 00 7F 7F 7F 7F 7F 7F 7F 7F 7F
        7F 7F 7F 7F 7F 7F 7F 7F 7F 7F 7F 7F 7F 7F 7F 7F
        7F 00 1B 64 FE 14 28 7F 7F 7F 7F 7F 7F 7F 7F 7F
        7F 7F 7F 7F 7F FF FF FF FF FF FF FF FF FF FF FF
        FF FF FF FF FF FF FF FF FF FF FF FF FF FF FF FF
        FF FF FF FF FF FF FF FF FF FF FF FF FF FF FF FF
        FF FF FF FF 00 1F 64 FE 19 00 7F 7F 7F 7F 7E 7E
        7E 7E 7E 7E 7E 7E 7E 7E 7D 7D 7D 7D 7D 7D 7D 7D
        7D 7D 7D 7D 00 20 64 FE 19 00 7F 7F 7F 7F 7F 7F
        7F 7F 7F 7F 7F 7F 7F 7F 7F 7F 7F 7F 7F 7F 7F 7F
        7F 7F 7F 7F 00 21 7D 00 22 7F 00 23 77 00 24 00
        00 25 77 00 28 FF 00 29 FF 00 2D 01 00 2E 00 00
        00 2F 00 ED 00 30 00 00 00 33 FF FF 00 38 FF FF
        00 39 FF FF 00 3B FF 00 3D FF FF 00 3E FF FF 00
        3F FF FF 00 41 FF FF 00 42 FF FF 00 43 FF FF 00
        47 01 00 48 02 00 4B 00 00 4D 00 00 4E 02 00 4F
        00 00 51 01 00 5B 1F 23 25 28 2A 2C 2E 2F 26 16
        0D 00 5C 1E 1C 1C 1C 16 12 12 00 00 00 00 00 5D
        2A 2E 2D 22 24 25 26 1E 15 0E 0C 00 5E 7F 7F 7F
        7E 7F 7F 7E 7E 7B 7A 7C 00 5F 00 00 00 00 00 00
        00 00 01 01 01 00 60 00 00 00 00 00 00 00 00 00
        01 00 00 61 00 00 00 00 00 00 00 00 00 00 00 00
        73 FF FF 00 74 FF FF 03 67 FF FF 03 68 FF FF 03
        CF 00 8D 03 DD 59 4E 46 03 DE 19 02 15 03 E8 A5
        03 E9 0B 22 03 EA 0D 29 03 EB 78 03 EC 08 03 ED
        06 03 EE 0A 03 EF 2E 03 F0 32 03 F1 14 56 03 F2
        00 D8 2D 03 F3 33 56 56 32 42 37 41 58 36 4B 4D
        2A 2A 2A 2A 2A 2A 03 FB 04 03 FD 00 1B 03 FE 35
        2F 39 2A

FA17    00 1E 00 01 FD 00 04 FF FF 00 05 FF FF 00 06 FF
        FF 00 07 FF FF 00 09 FF FF 00 0C FF FF 00 0D FF
        FF 00 0E FF FF 00 0F FF FF 00 11 FF FF 00 16 64
        FE 19 00 7F FE 7F FE 7F FE 7F FE 7F FE 7F FE 7F
        FE 7F FE 7F FE 7F FE 7F FE 7F FE 7F FE 7F FE 7F
        FE 7F FE 7F FE 7F FE 7F FE 7F FE 7F FE 7F FE 7F
        FE 7F FE 7F FE 7F FE 00 17 64 FE 19 00 7F BD 7F
        BD 7F BA 7F BA 7F BA 7F BA 7F BA 7F BA 7F BA 7F
        BA 7F BA 7F BA 7F BA 7F BA 7F BA 7F BA 7F BA 7F
        BA 7F BA 7F BA 7F BA 7F BA 7F BA 7F BA 7F BA 7F
        BA 00 19 64 FE 19 00 7F 7F 7F 7F 7F 7F 7F 7F 7F
        7F 7F 7F 7F 7F 7F 7F 7F 7F 7F 7F 7F 7F 7F 7F 7F
        7F 00 1B 64 FE 14 28 7F 7F 7F 7F 7F 7F 7F 7F 7F
        7F 7F 7F 7F 7F FF FF FF FF FF FF FF FF FF FF FF
        FF FF FF FF FF FF FF FF FF FF FF FF FF FF FF FF
        FF FF FF FF FF FF FF FF FF FF FF FF FF FF FF FF
        FF FF FF FF 00 1F 64 FE 19 00 7F 7E 7E 7E 7E 7E
        7D 7D 7D 7D 7D 7C 7C 7C 7C 7C 7C 7B 7B 7B 7B 7B
        7A 7A 7A 7A 00 20 64 FE 19 00 7F 7F 7F 7F 7F 7F
        7F 7F 7F 7F 7F 7F 7F 7F 7F 7F 7F 7F 7F 7F 7F 7F
        7F 7F 7F 7F 00 21 79 00 22 7F 00 23 78 00 24 00
        00 25 78 00 28 FF 00 29 FF 00 2D 01 00 2E 00 00
        00 2F 01 8D 00 30 00 00 00 33 FF FF 00 38 FF FF
        00 39 FF FF 00 3B FF 00 3D FF FF 00 3E FF FF 00
        3F FF FF 00 41 FF FF 00 42 FF FF 00 43 FF FF 00
        47 01 00 48 02 00 4B 00 00 4D 00 00 4E 02 00 4F
        00 00 51 01 00 5B 55 54 53 52 51 50 50 4F 4D 48
        3D 00 5C 00 00 00 00 00 00 00 00 00 00 00 00 5D
        16 16 15 15 15 15 14 14 14 13 13 00 5E 7F 7F 7E
        7E 7E 7E 7E 7F 7D 7E 7E 00 5F 01 01 01 01 01 01
        01 01 01 01 01 00 60 00 00 00 00 00 00 00 00 00
        00 00 00 61 00 00 00 00 00 00 00 00 00 00 00 00
        73 FF FF 00 74 FF FF 03 67 FF FF 03 68 FF FF 03
        CF 00 8C 03 DD 59 4E 46 03 DE 19 02 15 03 E8 A5
        03 E9 0A 6C 03 EA 0D 29 03 EB 78 03 EC 07 03 ED
        08 03 EE 0C 03 EF 23 03 F0 06 03 F1 13 1D 03 F2
        00 CB 6C 03 F3 33 56 56 32 42 37 41 58 36 4B 4D
        2A 2A 2A 2A 2A 2A 03 FB 04 03 FD 00 1A 03 FE DE
        CF 01 96
```

```
FA18    00 1E 00 01 FD 00 04 FF FF 00 05 FF FF 00 06 FF
        FF 00 07 FF FF 00 09 FF FF 00 0C FF FF 00 0D FF
        FF 00 0E FF FF 00 0F FF FF 00 11 FF FF 00 16 64
        FE 19 00 80 00 80 00 80 00 80 00 80 00 80 00 80
        00 80 00 80 00 80 00 80 00 80 00 80 00 80 00 80
        00 80 00 80 00 80 00 80 00 80 00 80 00 80 00 80
        00 80 00 80 00 80 00 00 17 64 FE 19 00 7F F6 7F
        F6 7F F6 7F F7 7F F9 7F F9 7F F9 7F FA 7F FA 7F
        FA 7F FA 7F FA 7F FA 7F FA 7F FA 7F FA 7F FA 7F
        FA 7F FA 7F FA 7F FA 7F FA 7F FA 7F FA 7F FA 7F
        FA 00 19 64 FE 19 00 7F 7F 7F 7F 7F 7F 7F 7F 7F
        7F 7F 7F 7F 7F 7F 7F 7F 7F 7F 7F 7F 7F 7F 7F 7F
        7F 00 1B 64 FE 14 28 7F 7F 7F 7F 7F 7F 7F 7F 7F
        7F 7F 7F 7F 7F FF FF FF FF FF FF FF FF FF FF FF
        FF FF FF FF FF FF FF FF FF FF FF FF FF FF FF FF
        FF FF FF FF FF FF FF FF FF FF FF FF FF FF FF FF
        FF FF FF FF 00 1F 64 FE 19 00 7F 7F 7F 7F 7F 7F
        7F 7F 7F 7F 7F 7F 7F 7F 7F 7F 7F 7F 7F 7F 7F 7F
        7F 7F 7F 7F 00 20 64 FE 19 00 7F 7F 7F 7F 7F 7F
        7F 7F 7F 7F 7F 7F 7F 7F 7F 7F 7F 7F 7F 7F 7F 7F
        7F 7F 7F 7F 00 21 7F 00 22 7F 00 23 00 00 24 00
        00 25 00 00 28 FF 00 29 FF 00 2D 01 00 2E 00 00
        00 2F 01 29 00 30 00 00 00 33 FF FF 00 38 FF FF
        00 39 FF FF 00 3B FF 00 3D FF FF 00 3E FF FF 00
        3F FF FF 00 41 FF FF 00 42 FF FF 00 43 FF FF 00
        47 01 00 48 02 00 4B 00 00 4D 00 00 4E 02 00 4F
        00 00 51 01 00 5B 2A 2A 2A 2A 2B 2C 2D 2A 1E 12
        0D 00 5C 00 03 0A 0E 10 14 00 00 00 00 00 00 5D
        1F 20 21 21 1A 1A 19 16 0F 0E 0B 00 5E 7E 7F 81
        7E 7D 7F 7F 7E 7E 7E 7F 00 5F 00 00 00 00 00 00
        00 01 01 01 01 00 60 00 00 00 00 00 00 00 00 00
        00 00 00 61 00 00 00 00 00 00 00 00 00 00 00 00
        73 FF FF 00 74 FF FF 03 67 FF FF 03 68 FF FF 03
        CF 00 7A 03 DD 59 4E 46 03 DE 19 02 15 03 E8 A5
        03 E9 0A 21 03 EA 0D 29 03 EB 78 03 EC 06 03 ED
        1A 03 EE 08 03 EF 0D 03 F0 28 03 F1 12 A9 03 F2
        00 C6 3F 03 F3 33 56 56 32 42 37 41 58 36 4B 4D
        2A 2A 2A 2A 2A 2A 03 FB 04 03 FD 00 19 03 FE 0B
        D9 0F C9
```

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.

DOT HS 813 508
September 2023

U.S. Department
of Transportation

**National Highway
Traffic Safety
Administration**

16027-082323-v2a