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

NHTSA

DOT HS 813 001

September 2020

Special Crash Investigations: Air Bag Non-Deployment Crash Investigation; Vehicle: 2016 Honda HR-V; Location: Texas; Crash Date: June 2019

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:

Dynamic Science, Inc. (2020, September). *Special Crash Investigations: Air Bag Non-Deployment Crash Investigation; Vehicle: 2016 Honda HR-V; Location: Texas; Crash Date: June 2019* (Report No. DOT HS 813 001). National Highway Traffic Safety Administration.

Technical Report Documentation Page

1. Report No. DOT HS 813 001	**2. Government Accession No.**	**3. Recipient's Catalog No.**
4. Title and Subtitle Special Crash Investigations: Air Bag Non-Deployment Crash Investigation; Vehicle: 2016 Honda HR-V; Location: Texas; Crash Date: June 2019		**5. Report Date** September 2020 **6. Performing Organization Code**
7. Author Dynamic Science, Inc.		**8. Performing Organization Report No.** DS19017
9. Performing Organization Name and Address Dynamic Science, Inc. 26141 Marguerite Parkway, Suite C Mission Viejo, CA 92692		**10. Work Unit No. (TRAIS)** 11. Contract or Grant No. 693JJ918C000012
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 Crash Date: June 2019 **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 vehicle(s) or their safety systems. This report and associated case data are based on information available to the Special Crash Investigation team on the date this report was published.

16. Abstract
This report documents the on-site investigation of an air bag non-deployment crash involving a 2016 Honda HR-V. This two-vehicle crash occurred in June 2019 in the morning in a four-leg intersection of an urban street and two private driveways. The Honda was being driven by a belted 44-year-old female and was traveling westbound in the second lane from the right of a four-lane, divided roadway at a driver-reported speed of 64 km/h (40 mph). A 2008 Hyundai Veracruz being driven by a 24-year-old female was initially traveling eastbound in the left turn lane. The second row right seat position was occupied by a 2-year-old male seated in a child restraint system. As the Hyundai entered the intersection, the driver began a left turn into a parking lot. The front plane of the Honda struck the right plane of the Hyundai. The Honda driver's seat belt pretensioner actuated, but the frontal air bags did not deploy in this case. The system detected the crash; the algorithm likely determined that the severity was sufficient to actuate the driver's seat belt pretensioner, but that it did not require the deployment of the frontal air bag. The police report indicated that none of the occupants were injured. The driver of the Honda reported that she sustained seat belt-related injuries to her abdomen, neck, and shoulder. Both of the vehicles sustained disabling damage and were towed from the scene. The driver of the Honda sustained minor injuries. She was not transported, but she did obtain treatment at a later date.

17. Key Words Air bag non-deployment, minor injury, crash	**18. Distribution Statement** The document is available to the public from the National Technical Information Service, www.ntis.gov.

19 Security Classif. (of this report) Unclassified	**20. Security Classif. (of this page)** Unclassified	**21 No. of Pages** 30	**22. Price**

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

Table of Contents

Special Crash Investigations
Air Bag Non-Deployment Crash Investigation
On-Site Office of Defects Investigation
Case Number: DS19017
Vehicle: 2016 Honda HR-V
Location: Texas
Crash Date: June 2019

BACKGROUND

This report documents the on-site investigation of an air bag non-deployment crash involving a 2016 Honda HR-V (**Figure 1**). This investigation was initiated by the Office of Defects Investigation in response to a driver notification. The Special Crash Investigations (SCI) group of the National Highway Traffic Safety Administration assigned the case to Dynamic Science, Inc., in July 2019. The Honda was supported by the Bosch Crash Data Retrieval (CDR) system, and the vehicle's Event Data Recorder (EDR) was imaged during the vehicle inspection. A Honda representative was present during the inspection.

Figure 1. The 2016 Honda HR-V.

This two-vehicle crash occurred in June 2019 in the morning in a four-leg intersection of an urban street and two private driveways. The Honda was driven by a belted 44-year-old female and was traveling westbound in the second lane from the right of a four-lane, divided roadway at a driver-reported speed of 64 km/h (40 mph). A 2008 Hyundai Veracruz driven by a 24-year-old female was initially traveling eastbound in the left turn lane. The second row right seat position was occupied by a 2-year-old male seated in a child restraint system (CRS). As the Hyundai entered the intersection, the driver began a left turn into a parking lot. The front plane of the Honda struck the right plane of the Hyundai. The Honda driver's seat belt pretensioner actuated, but the frontal air bags did not deploy. The system detected the crash; the algorithm likely determined that the severity was sufficient to actuate the driver's seat belt pretensioner, but that it did not require the deployment of the frontal air bag. The police report indicated that no occupants were injured. The driver of the Honda reported that she sustained seat belt-related injuries to her abdomen, neck, and shoulder. She sought treatment at a later date at an unknown location. Both vehicles sustained disabling damage and were towed from the scene.

SUMMARY

Crash Site

The crash site was the four-leg intersection of an urban street and two private driveways. The concrete eastbound roadway was straight, level, and had three through lanes and a left-turn lane.

The travel lanes were separated by white dashed lines. The eastbound roadway was bordered by a white painted fog line and asphalt shoulder on the right, and by a yellow painted fog line and raised median on the left. The westbound roadway was straight, level, and had three through lanes and a left-turn lane. The travel lanes were separated by white dashed lines. The westbound roadway was also bordered by a white painted fog line and asphalt shoulder on the right, and by a yellow painted fog line and raised median on the left.

Figure 2. Westbound approach, the 2016 Honda HR-V.

There were no traffic controls for westbound and eastbound traffic. The speed limit was 64 km/h (40 mph) in all directions. The weather at the nearest reporting station was 16 degrees C (62 degrees F), 61 percent humidity, with clear and calm winds. A crash diagram is attached at the end of this report.

Pre-Crash

The Honda was driven westbound by a belted 44-year-old female in the second lane from the right (**Figure 2**). According to the EDR report, at five seconds prior to the crash, the vehicle speed was 61 km/h (38 mph), and the service brakes were "On." From four to one seconds, the service brakes were "Off" before going back to "On" prior to impact. The Honda's pre-crash speeds and distances covered are shown in the table below:

Time	Vehicle Speed		Distance Traveled			
			Incremental		Cumulative	
-sec	km/h	mph	m	ft	m	ft
5	61	38	NA	NA	NA	NA
4	60	37	16.8	55	16.8	55
3	60	37	16.6	54.3	33.3	109.3
2	64	40	17.2	56.5	50.5	165.8
1	56	35	16.8	55	67.3	220.8
0	35	22	12.7	41.8	80	262.6

The Hyundai, driven eastbound by a 24-year-old female, was in the left-turn lane waiting for traffic to clear (**Figure 3**).

Crash

The Honda entered the driveway intersection. The Hyundai entered the intersection and began to turn left. The front plane of the Honda struck the right plane of the Hyundai (Event 1).

The standard algorithm of the WinSMASH program calculated a Total delta V of 28 km/h (17 mph) for the Honda. The longitudinal and lateral components were -27 km/h (-16 mph) and 5 km/h (3 mph), respectively. The results fit the model and appeared reasonable. The EDR

reported a maximum longitudinal delta V of -26 km/h (-16 mph) at 155 milliseconds (ms) and a maximum lateral delta V of 6 km/h (4 mph) at 112 ms. The driver's seat belt lap pretensioner actuated at 66 ms. The frontal air bags did not deploy.

The standard algorithm of the WinSMASH program calculated a total delta V of 18 km/h (11 mph) for the Hyundai. The longitudinal and lateral components were -6 km/h (-4 mph) and -17 km/h (-11 mph), respectively. The results fit the model and appeared reasonable. The right inflatable curtain (IC) air bag deployed during the crash.

Figure 3. Eastbound approach, the 2008 Hyundai Veracruz.

Post-Crash

The police report indicated that none of the occupants were injured. The driver of the Honda reported that she sustained seat belt-related injuries to her abdomen, neck, and shoulder. Both vehicles came to rest in the intersection. Both vehicles sustained disabling damage and were towed from the scene. The driver of the Honda sustained minor injuries. She was treated later at an unknown location.

2016 HONDA HR-V

Description

The Honda was a 5-door, 5-passenger "crossover" sport utility vehicle (SUV) identified by the Vehicle Identification Number (VIN) 3CZRU5H59GMxxxxxx with a manufacture date of May 2015. The vehicle was equipped with a 1.8-liter, 4-cylinder, gasoline engine; an automatic transmission; and front-wheel drive. The vehicle manufacturer's recommended tire size was P215/55R17 with a cold pressure of 221 kPa (32 psi). The vehicle was equipped with Michelin Primacy tires of the recommended size. The specific tire information is as follows:

Position	Measured Tread Depth	Restricted	Damage
LF	2 mm (3/32 in)	No	None
LR	3 mm (4/32 in)	No	None
RR	3 mm (4/32 in)	No	None
RF	3 mm (4/32 in)	Yes	None

The Honda was configured with seating for five occupants. The front row was equipped with bucket seats with adjustable head restraints that had been installed backwards. The second row was equipped with a 60/40 split bench with folding backs.

Vehicle History
The Honda was purchased in 2015 and has had a single owner. A CARFAX report was obtained, and it did not contain any reports of any previous crashes. The driver reported that the vehicle had not been in any crashes and that the air bags had never been serviced.

Exterior Damage
The Honda sustained moderate front plane damage from the impact to the right plane of the Hyundai (**Figure 4**). The direct damage began at the left front bumper corner on the backing bar and hood and extended 42 cm (16.5 in) to the right. Direct damage extended from bumper corner to bumper corner on the displaced bumper fascia. The Field L extended from bumper corner to bumper corner. Twelve measurements were taken at bumper backing bar level by the Nikon Total Station and the Faro Blitz program computed crush measurement in six increments as follows: $C_1 = 0$ cm, $C_2 = 9$ cm (3.5 in), $C_3 = 17$ cm (6.6 in), $C_4 = 21$ cm (8.2 in), $C_5 = 19$ cm (7.4 in), and $C_6 = 7$ cm (2.7 in). The maximum crush was located 30 cm (11.8 in) right of the left front bumper corner. The Collision Deformation Classification (CDC) was 12FDEW2.

Event Data Recorder
The Honda was equipped with an air bag supplemental restraint system that had EDR capability to store deployment and non-deployment events. The EDR was capable of recording one event.

Figure 4. Frontal damage, the 2016 Honda HR- V.

Per the data limitations, two events can be recorded if the T0 (time zero) values for each event occur within five seconds of each other. Therefore, a non-deployment event can be recorded and locked if it occurs in five seconds of a deployment event. The record contains five seconds of pre-crash data and 250 ms of post-crash data. The pre-crash data includes vehicle speed, accelerator pedal position, service brake, ABS activity, stability control, steering input, and engine RPM. During the SCI inspection, the Honda's EDR data was imaged using the Bosch Crash Data Retrieval (CDR) scan tool and software version 19.0 via a connection to the vehicle's Diagnostic Link Connector (DLC) and is reported using version 19.4.2. The Bosch CDR report is included as **Appendix A** at the end of this report. The pre-crash data is as follows:

Time Stamp (sec)	Speed, Vehicle Indicated (MPH [km/h])	Accelerator Pedal Position % full	Service Brake (On, Off)	ABS Activity (On, Off)	Stability Control (On, Off, Engaged)	Steering Input (deg)	Engine RPM
-5.0	38 [61]	0	On	Off	On Non-Engaged	-5	1,200
-4.5	37 [60]	0	On	Off	On Non-Engaged	-5	1,200
-4.0	37 [59]	25	Off	Off	On Non-Engaged	-5	1,200

Time Stamp (sec)	Speed, Vehicle Indicated (MPH [km/h])	Accelerator Pedal Position % full	Service Brake (On, Off)	ABS Activity (On, Off)	Stability Control (On, Off, Engaged)	Steering Input (deg)	Engine RPM
-3.5	37 [59]	40	Off	Off	On Non-Engaged	0	2,300
-3.0	37 [60]	39	Off	Off	On Non-Engaged	0	2,500
-2.5	39 [62]	39	Off	Off	On Non-Engaged	0	2,500
-2.0	40 [64]	36	Off	Off	On Non-Engaged	0	2,600
-1.5	40 [65]	0	Off	Off	On Non-Engaged	-5	2,700
-1.0	35 [56]	0	On	On	On Non-Engaged	0	1,300
-0.5	22 [35]	0	On	On	On Non-Engaged	-5	1,200
0.0	22 [36]	0	On	On	On Non-Engaged	0	1,200

One event was recovered. This was a deployment-level event that occurred during the front to right plane impact to the Hyundai. The maximum longitudinal delta V was -26 km/h (-16 mph) at 155 ms. The delta V trace was truncated at 170 ms. The lateral delta V was 6 km/h (4 mph) at 112 ms. The driver's seat belt pretensioner actuated at 66 ms.

NHTSA Recalls and Investigations

There were no recalls associated with the VIN for this vehicle. The most recent query to the recall database was in July 2020.

Interior Damage

The Honda did not sustain any interior damage from this crash. The doors remained closed and operational, and the glazing was undamaged. There were scuff-type occupant contacts to the left lower instrument panel.

Manual Restraint Systems

The front row was equipped with driver and front right passenger lap and shoulder seat belts. The driver's belt was equipped with continuous loop belt webbing, a sliding latch plate, an emergency locking retractor (ELR), and an adjustable upper anchor that was adjusted to the full-down position. The front right passenger's seat belt was equipped the same as the driver's, but it had a switchable ELR/automatic locking retractor. The anchor was adjusted to the full-up position. Both seat belts were equipped with retractor pretensioners. The driver's seat belt pretensioner actuated and locked in the spooled-out position. There was a 28 cm (11.0 in) scuff on the belt that was located 41 cm (16.1 in) above the stop button. Based on the post-crash condition of the driver's seat belt, it was apparent that the driver was belted at the time of the crash. This conclusion was supported by the EDR data that reported the driver seat belt status as "On."

Supplemental Restraint Systems

The Honda was equipped with eight air bags: dual-stage frontal air bags for the driver and front right passenger positions, front row seat-mounted side air bags, and side-impact IC air bags for

the front and second row seats. There were no air bag deployments. The vehicle was configured with an air bag sensor assembly, front impact sensors, and side-impact sensors. The dual front impact sensors were located on the vehicle body above the backing bar on the frame rails and were undamaged.

Air Bag Non-Deployment Discussion

The driver's frontal air bag did not deploy. The owner's manual indicated that the front SRS air bags are designed to inflate in a moderate-to-severe frontal collision. This was a borderline severity collision, falling somewhere between minor and moderate. The seat belt pretensioners operate independently from the frontal air bags and are also designed to actuate during a moderate-to-severe collision. The owner's manual states that the pretensioners will sometimes actuate. Even though the collision was not severe enough to inflate the frontal air bags in this case, the system detected the crash. The algorithm likely determined that the severity was sufficient to actuate the driver's seat belt pretensioner, but that it did not require the deployment of the frontal air bag.

2016 HONDA HR-V OCCUPANTS

Driver Demographics

Age/sex:	44 years/female
Height:	157 cm (62 in)
Weight:	91 kg (200 lbs)
Eyewear:	None
Seat type:	Bucket
Seat track position:	Unknown
Manual restraint usage:	Lap and shoulder used
Usage source:	Vehicle inspection, EDR report
Air bags:	Frontal, side-impact, and IC air bags not deployed
Alcohol/drug data:	None
Egress from vehicle:	Exited under own power
Transport from scene:	None
Type of medical treatment:	Treated later at an unknown location

Driver Injuries

Injury No.	Injury	Injury Severity AIS 2015	Involved Physical Component (IPC)	IPC Confidence Level
1	Abdominal contusion	510402.1	Lap belt	Certain
2	Left neck injury	300099.9	Shoulder belt	Probable
3	Left shoulder injury	700099.9	Shoulder belt	Probable

Source: the driver interview.

Driver Kinematics

The 44-year-old female driver was seated in an unknown posture. At the time of the vehicle inspection, the seat was adjusted to the full forward track position. The EDR reported that the seat track was not in the full forward position. The track position at the time of the crash could not be determined. The driver was wearing the manual lap and shoulder belt. She was actively steering and braking prior to the crash. At impact, she was displaced forward. The seat belt pretensioner actuated at impact, and she loaded the seat with her neck, shoulder, and abdomen. She came to rest in her seated position and was able to exit the vehicle under her own power. She was not transported from the scene, but she did seek medical treatment at a later date at an unknown location.

2008 HYUNDAI VERACRUZ

Description

The 2008 Hyundai Veracruz was a 5-door "crossover" SUV identified by the VIN KM8NU13CX8Uxxxxxx. The vehicle was equipped with a 6-cylinder, 3.8-liter, gasoline engine; a 6-speed automatic transmission; and front-wheel drive.

Exterior Damage

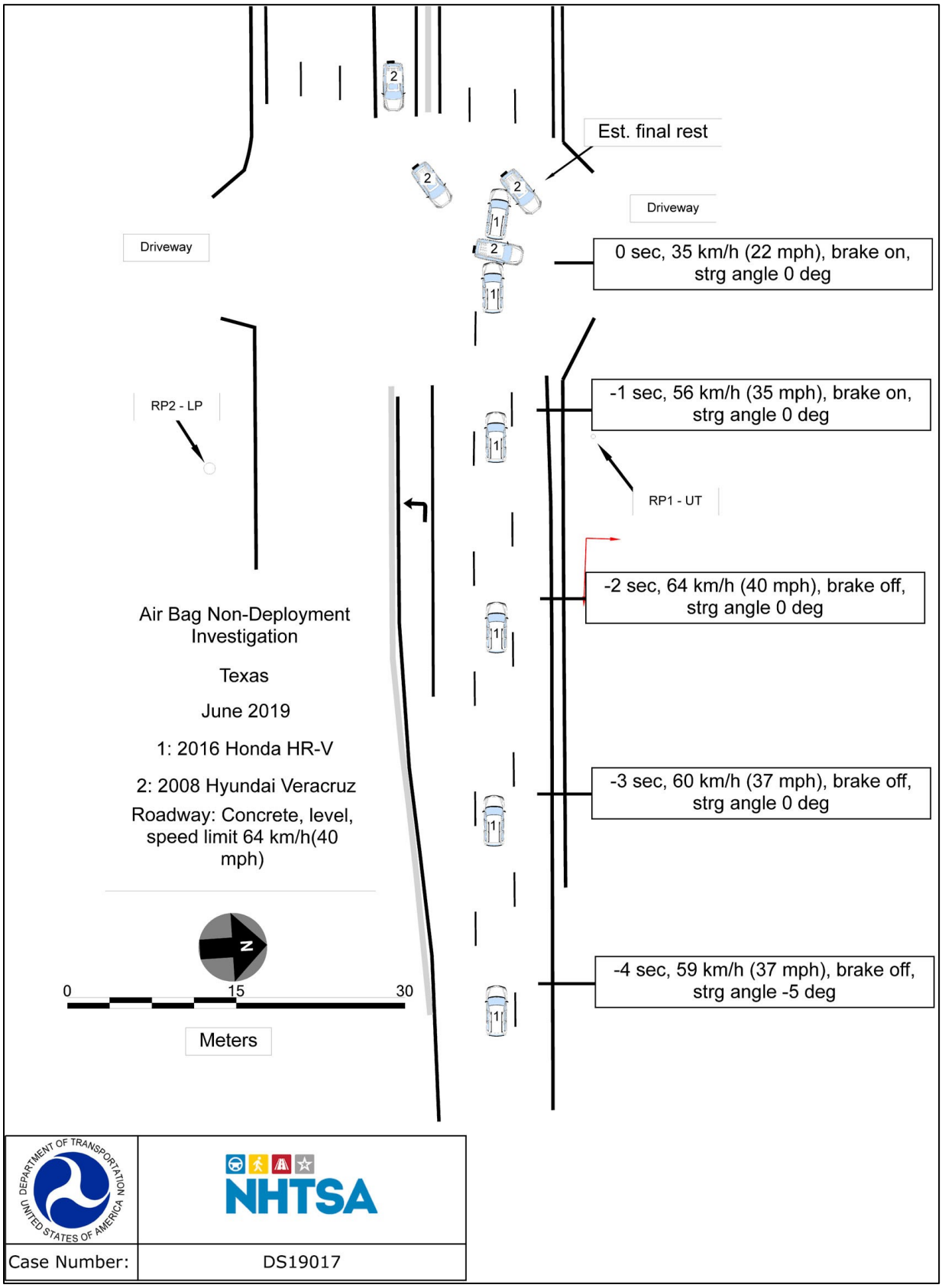
The Hyundai sustained moderate right plane damage from the impact to the front plane of the Honda (**Figure 5**). The direct damage began 1 cm (0.4 in) aft of the rear axle and extended 136 cm (53.5 in) forward. The Field L began 1 cm (0.4 in) aft of the rear axle and extended 133 cm (53.5 in) forward. Twelve measurements were taken at the mid-door level by the Nikon Total Station and the Faro Blitz program computed crush measurement in six increments as follows: C_1 = 7 cm (2.7 in), C_2 = 10 cm (3.9 in), C_3 =21 cm (8.2 in), C_4 = 23 cm (9.0 in), C_5 = 9 cm (3.5 in), and C_6 = 9 cm (3.5 in). The maximum crush was located 70 cm (27.5 in) forward of the rear axle. The CDC was 02RPEW2.

Figure 5. Right plane damage, the 2008 Hyundai Veracruz.

Occupant Data

According to the police report, the 24-year-old female driver was belted, not injured. The 2-year-old male child, seated in a CRS in the second row right, was not injured. Neither occupant was transported.

CRASH DIAGRAM



APPENDIX A: 2016 Honda HR-V 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 View application may differ relative to this report.

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	3CZRU5H59GM******
User	
Case Number	
EDR Data Imaging Date	
Crash Date	
Filename	19017_V1_ACM.CDRX
Saved on	
Imaged with CDR version	Crash Data Retrieval Tool 19.0
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 19.4.2
Reported with Software Licensed to (Company Name)	NHTSA
EDR Device Type	Airbag Control Module
Event(s) recovered	1

Comments

No comments entered.

Data Limitations

General Information:

These limitations are intended to assist you in reading the event data that has been imaged from the vehicle's SRS control unit. They contain general information and are not specific to this particular event. Event data should be considered in conjunction with other available physical evidence from the vehicle and scene.

Honda and Acura passenger vehicles designated as 2013 or later model year production are designed to be compatible with the Bosch CDR tool. Only some 2012 model year vehicles are compatible with the Bosch CDR tool.

Recorded Crash Events:

Data for front, side, rear and rollover events can be recorded as either non-deployment or deployment events. Both types of events can contain pre-crash and crash data.

- A non-deployment event is recorded if the change in longitudinal or lateral velocity equals or exceeds 8km/h over a 150ms timeframe or another type of non-reversible deployable restraint device other than a front, side, or side curtain airbag (e.g. seatbelt pretensioner) is commanded to deploy. Except as indicated below, non-deployment events are not locked into memory and can be over-written by subsequent non-deployment or deployment events.
- A deployment event is recorded if front airbag(s), side airbag(s), or side curtain airbag(s) are commanded to deploy. Deployment events are locked into memory and cannot be over-written.

The SRS control unit typically records only one event. Two events can be recorded if the T0 (time zero) values for each event occur within 5 seconds of each other. Therefore, a non-deployment event can be recorded and locked if it occurs within 5 seconds of a deployment event.

T0 is established by whichever of the following occurs first: (1) the change in longitudinal velocity at the SRS control unit equals or exceeds 0.8km/h over a 20ms timeframe; or (2) the change in lateral velocity at the SRS control unit equals or exceeds 0.8km/h over a 5ms timeframe; or (3) the occupant restraint control algorithm is activated; or (4) a commanded deployment of any type of non-reversible deployable restraint device (e.g. airbag or seatbelt pretensioner). If the time to deploy equals 0, then the command to deploy occurred at T0 or the device was not commanded to deploy during the event.

TEnd (end of event) is established by whichever of the following occurs first: (1) the change in longitudinal and lateral Delta V equals or falls below 0.8km/h over a 20ms timeframe; or (2) the occupant restraint control algorithm resets; or (3) time from T0 exceeds 300ms.

Data:

- Data recorded by the SRS control unit and imaged by the CDR tool is displayed relative to T0, not the time at which the vehicle made contact with another vehicle or object.
- Pre-crash data is recorded at 2 samples per second within the 5 seconds before T0. The sampling point at 0.0 is taken at T0 and is asynchronous with the other sample points. The time between -0.5 and 0.0 is not recorded and is between 1 and 500ms.
- Delta V data is recorded at 100 samples per second from T0 to 250ms or T0 to TEnd plus 30ms.
- Acceleration data is recorded at 100 samples per second from T0 to 250ms.
- Delta V, longitudinal reflects the change in velocity that the SRS control unit experienced in the longitudinal direction during the recorded portion of the event and is not the speed the vehicle was traveling before the event.
- Depending on the severity of the event and the accelerometer characteristics, saturation of the SRS control unit longitudinal or lateral accelerometers may occur, decreasing the recorded Delta V value.

- Time, accelerometer range exceeded is recorded if saturation of the SRS control unit longitudinal, lateral and/or normal (vertical) accelerometer occurs. The recorded data is the time at which the sensor range is first exceeded.
- The maximum recording capability of Deployment Command Data is 254ms or 255ms depending on vehicle model. A recorded value of 254ms or 255ms may indicate that the recording maximum was exceeded. In this case, the deployment command may have occurred between the recorded time and TEnd.
- Speed, vehicle indicated data is the speed indicated to the driver by the speedometer, not actual vehicle ground speed. Data accuracy can be affected by various factors, including but not limited to the following:
    - Significant changes in tire size from the factory setting
    - Wheel lockup or spin
    - Data latency or filtering and hysteresis within the speedometer module
- Accelerator pedal position, percent full is the ratio of accelerator pedal position compared to the fully depressed position.
- PCM (Powertrain Control Module) derived accelerator pedal position, percent full may differ from the accelerator pedal position, percent full under circumstances such as brake override activation or cruise control system engagement. These circumstances are based on vehicle equipment application and vary by model.
- Steering input angle is recorded in 5 degree increments.
- Side air bag suppression system status, right front passenger is recorded when the vehicle is equipped with the Occupant Position Detection System (OPDS).
- Occupant size classification, right front passenger airbag suppressed data is recorded as yes (suppressed) if the front passenger seat weight sensor system determined the passenger seat was empty or occupied by a child-size occupant.
- EV mode data records the vehicle powertrain status, not a driver selected operation mode. EV mode is recorded as On when the vehicle is moving and the internal combustion engine is not operating. EV mode may be recorded as On or Off when the vehicle is stopped.
- If power to the SRS control unit is lost during an event, all or part of the data may not be recorded.

Roll Rate Data:
- Vehicle roll rate data is recorded separately from the non-deployment and deployment events as described above. Therefore, the T0 for the roll rate data may differ from the T0 for the other data in this report.
- Roll rate recording trigger (T0) is established by whichever of the following occurs first: (1) a rollover algorithm ON judgment (SRS control unit decision to command deployment);; or (2) a change in relative roll angle at the SRS control unit equal to or exceeding 30 degrees (roll angle is not measured, but is calculated from the roll rate data); or (3) the rollover algorithm is activated.
- Once a recording trigger has been met, roll rate data is recorded for one rollover event at 10 samples per second from 1 second before to 2 seconds after T0. If a roll angle trigger is satisfied without a rollover algorithm ON judgment, the recorded roll rate data is unlocked and can be over-written by a subsequent rollover event. Roll rate data triggered by or recorded during a rollover algorithm ON judgment is locked into memory and cannot be over-written.
- If roll rate is detected at the SRS control unit during a non-deployment or deployment event but the recording trigger has not been satisfied, no roll rate data will be recorded. A graph of roll rate data will only be present in this report if roll rate data is recorded.

Data Element Sign Convention:
Except as noted below, all data is displayed in SAE J211 sign convention. The following table provides an explanation of the sign notation for data elements that may be included in this CDR report. All directional references to sign notation are from the perspective of the driver when seated in the vehicle facing the direction of forward vehicle travel.

Data element name	Positive sign indicates
Longitudinal Acceleration	Forward direction acceleration
Delta-V, Longitudinal	Forward direction acceleration
Lateral Acceleration	Left to right direction acceleration
Delta-V, Lateral	Left to right direction acceleration
Normal (Vertical) Acceleration	Downward direction acceleration
Vehicle Roll Rate*	See roll rate graph and data (if recorded)
Steering Input Angle*	Left Turn

*Not SAE J211 sign convention

Data Source:
All recorded data is measured and calculated within the SRS control unit except for the following parameters (if applicable) which are transmitted via the vehicle's communication network to the SRS control unit:
- Speed, vehicle indicated
- Accelerator pedal position, percent full
- Service brake
- ABS activity
- Stability control
- Steering input angle
- Engine RPM
- PCM derived accelerator pedal position, percent full
- EV mode

Depending on vehicle feature content, capability, or conditions described above, the following items may not be recorded. If these items are not recorded, they will not be present in this document.
- ABS activity
- Stability control
- Steering input angle
- PCM derived accelerator pedal position, percent full
- Side air bag suppression system status, right front passenger
- Vehicle roll rate
- Normal acceleration
- Time, accelerometer range exceeded (longitudinal, lateral or normal)

- EV mode

Hexadecimal Data:
All data that has been specified for imaging is shown in the hexadecimal data section of this report. However, not all of this data is translated by the CDR tool. The SRS control unit may contain additional data that is not retrievable by the CDR tool.

Data Imaging:
If the SRS control unit is imaged outside of the vehicle, ensure that it is not moved, tilted or turned while connected to the CDR tool. Also, after imaging is complete, wait 3 minutes after removing the CDR tool before moving the SRS control unit. Not following this guideline could cause current non-deployment event data to be overwritten and a new event to be recorded. Current fault status could also be altered if the SRS control unit is imaged outside of the vehicle.

04001_HondaSRS_GEN1_r002

System Status at Retrieval

EDR Version	1.2.2.0

System Status at Crash Judgment

Frontal Air Bag Suppression System Status, Right Front Passenger at 1st Front Crash Judgment	Actuation Prohibited
Frontal Air Bag Suppression System Status, Right Front Passenger at 2nd Front Crash Judgment	No Crash Judgment
Frontal Air Bag Suppression System Status, Right Front Passenger at Left Side Crash Judgment	No Crash Judgment
Frontal Air Bag Suppression System Status, Right Front Passenger at Right Side Crash Judgment	No Crash Judgment
Frontal Air Bag Suppression System Status, Right Front passenger at Roll Over Judgment	No Crash Judgment

System Status at Event (Event Record 1)

Multi-Event, Number of Events (1, 2)	1
Complete File Recorded (Yes/No)	Yes
Ignition Cycle, Download	6856
Maximum Delta-V, Longitudinal (MPH [km/h])	-16 [-26]
Time, Maximum Delta-V, Longitudinal (msec)	155.0
Maximum Delta-V, Lateral (MPH [km/h])	4 [6]
Time, Maximum Delta-V, Lateral (msec)	112.5
Time, Maximum Delta-V, Resultant (msec)	142.5
Time, Accelerometer Range Exceeded, Longitudinal (msec)	0
Time, Accelerometer Range Exceeded, Lateral (msec)	0
Time, Accelerometer Range Exceeded, Normal (msec)	35.5

Deployment Command Data (Event Record 1)

Pretensioner Deployment, Time to Fire, Driver (msec)	66
Pretensioner Deployment, Time to Fire, Right Front Passenger (msec)	0
Lap Pretensioner Deployment, Time to Fire, Driver (msec)	66
Frontal Air Bag Deployment, Time to Deploy First Stage, Driver (msec)	0
Frontal Air Bag Deployment, Time to Deploy First Stage, Right Front Passenger (msec)	0
Frontal Air Bag Deployment, Time to 2nd Stage, Driver (msec)	0
Frontal Air Bag Deployment, Time to 2nd Stage, Right Front Passenger (msec)	0
Safety Belt Adaptive Load Limiter, Time to Initiation, Right Front Passenger (msec)	0
Side Air Bag Deployment, Time to Deploy, Driver (msec)	0
Side Air Bag Deployment, Time to Deploy, Right Front Passenger (msec)	0
Side Curtain/Tube Air Bag Deployment, Time to Deploy, Driver Side (msec)	0
Side Curtain/Tube Air Bag Deployment, Time to Deploy, Right Side (msec)	0
Frontal Air Bag Deployment, nth Stage Disposal, Driver (Yes/No)	No
Frontal Air Bag Deployment, nth Stage Disposal, Right Front Passenger (Yes/No)	No

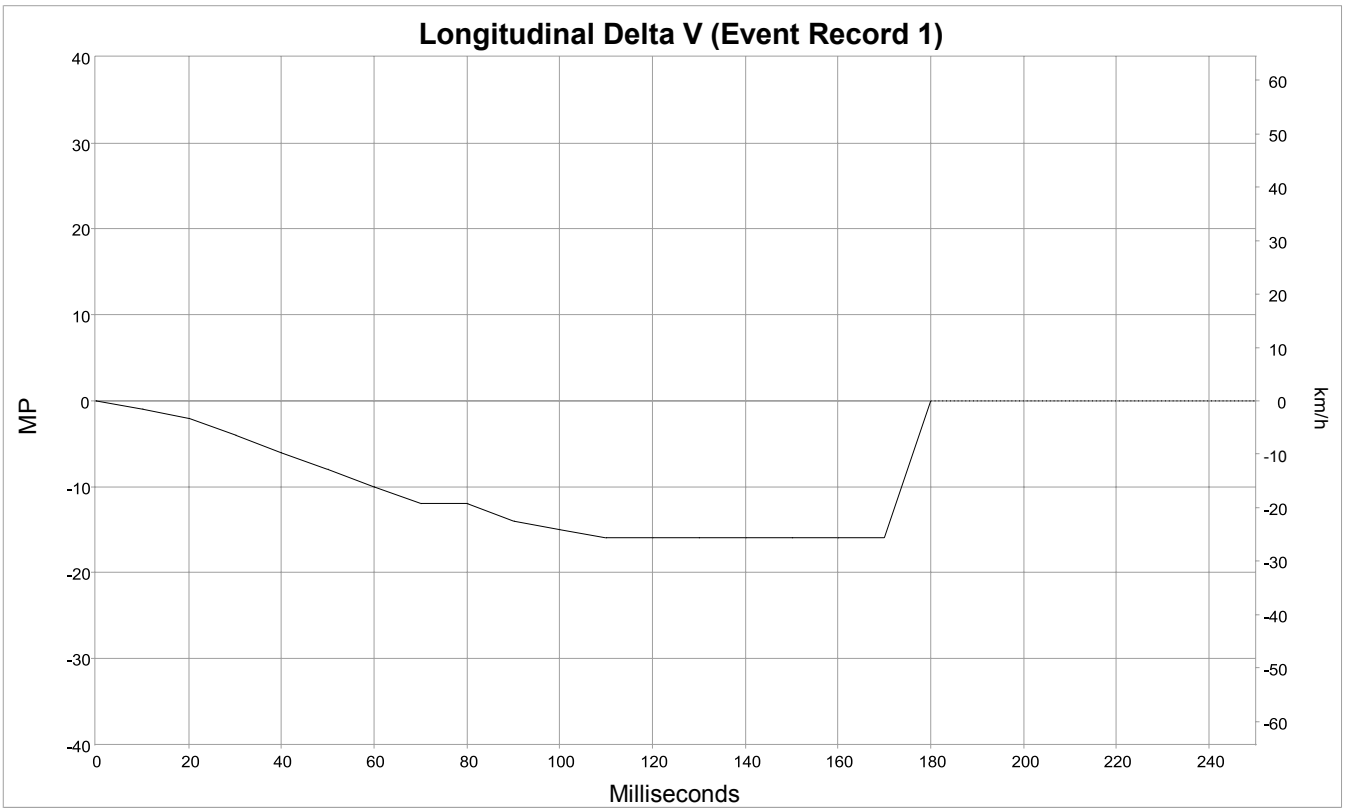
Pre-Crash Data -1 sec (Event Record 1)

Safety Belt Status, Driver	On
Safety Belt Status, Right Front Passenger	Off
Seat Track Position Switch, Foremost, Status, Driver	No
Occupant Size Classification, Right Front Passenger Airbag Suppressed (Yes/No)	Yes
Frontal Air Bag Warning Lamp (On, Off)	Off
Ignition Cycle, Crash	6851

Pre-Crash Data -5 to 0 sec [2 samples/sec] (Event Record 1)

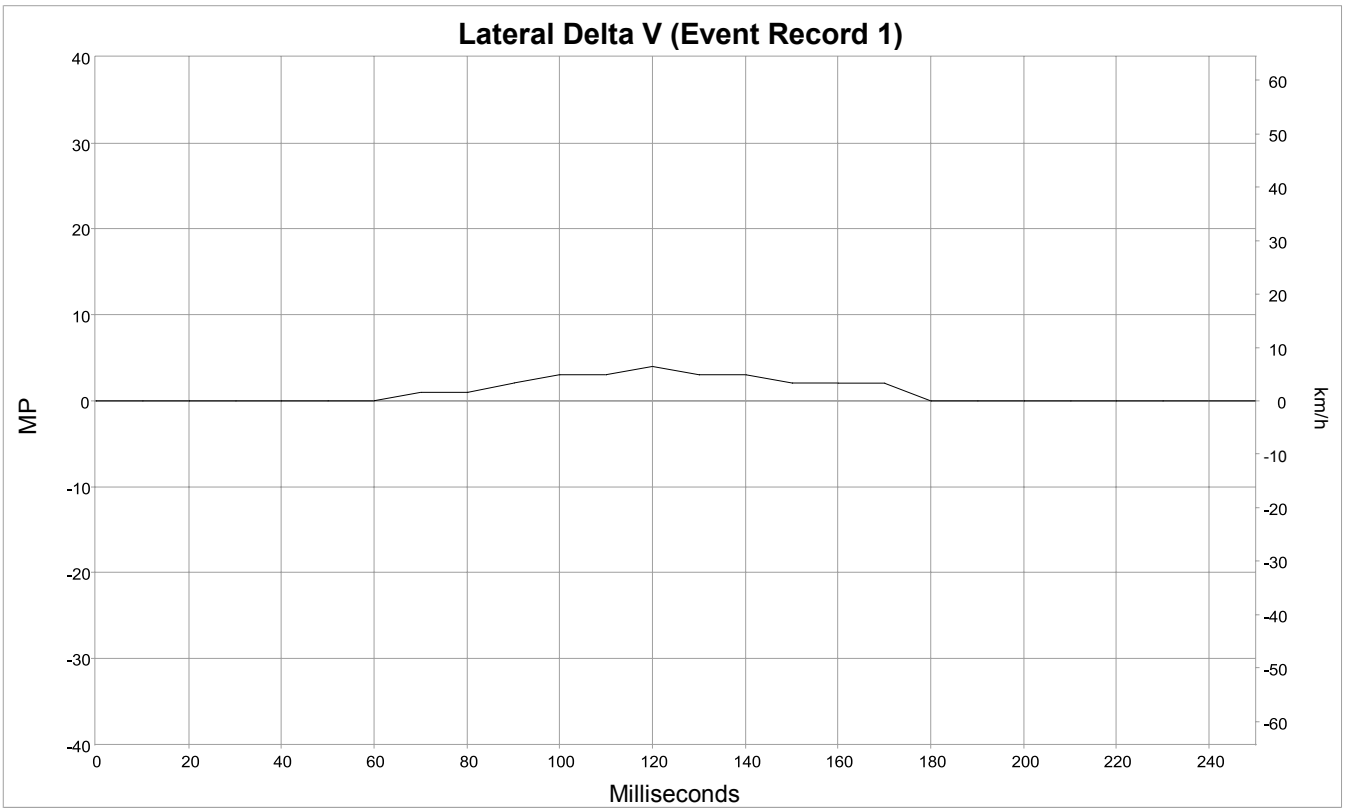
(the most recent sampled values are recorded prior to the event)

						Steering Input (deg)	Engine RPM
-5.0	38 [61]	0	On	Off	On Non-Engaged	-5	1,200
-4.5	37 [60]	0	On	Off	On Non-Engaged	-5	1,200
-4.0	37 [59]	25	Off	Off	On Non-Engaged	-5	1,200
-3.5	37 [59]	40	Off	Off	On Non-Engaged	0	2,300
-3.0	37 [60]	39	Off	Off	On Non-Engaged	0	2,500
-2.5	39 [62]	39	Off	Off	On Non-Engaged	0	2,500
-2.0	40 [64]	36	Off	Off	On Non-Engaged	0	2,600
-1.5	40 [65]	0	Off	Off	On Non-Engaged	-5	2,700
-1.0	35 [56]	0	On	On	On Non-Engaged	0	1,300
-0.5	22 [35]	0	On	On	On Non-Engaged	-5	1,200
0.0	22 [36]	0	On	On	On Non-Engaged	0	1,200



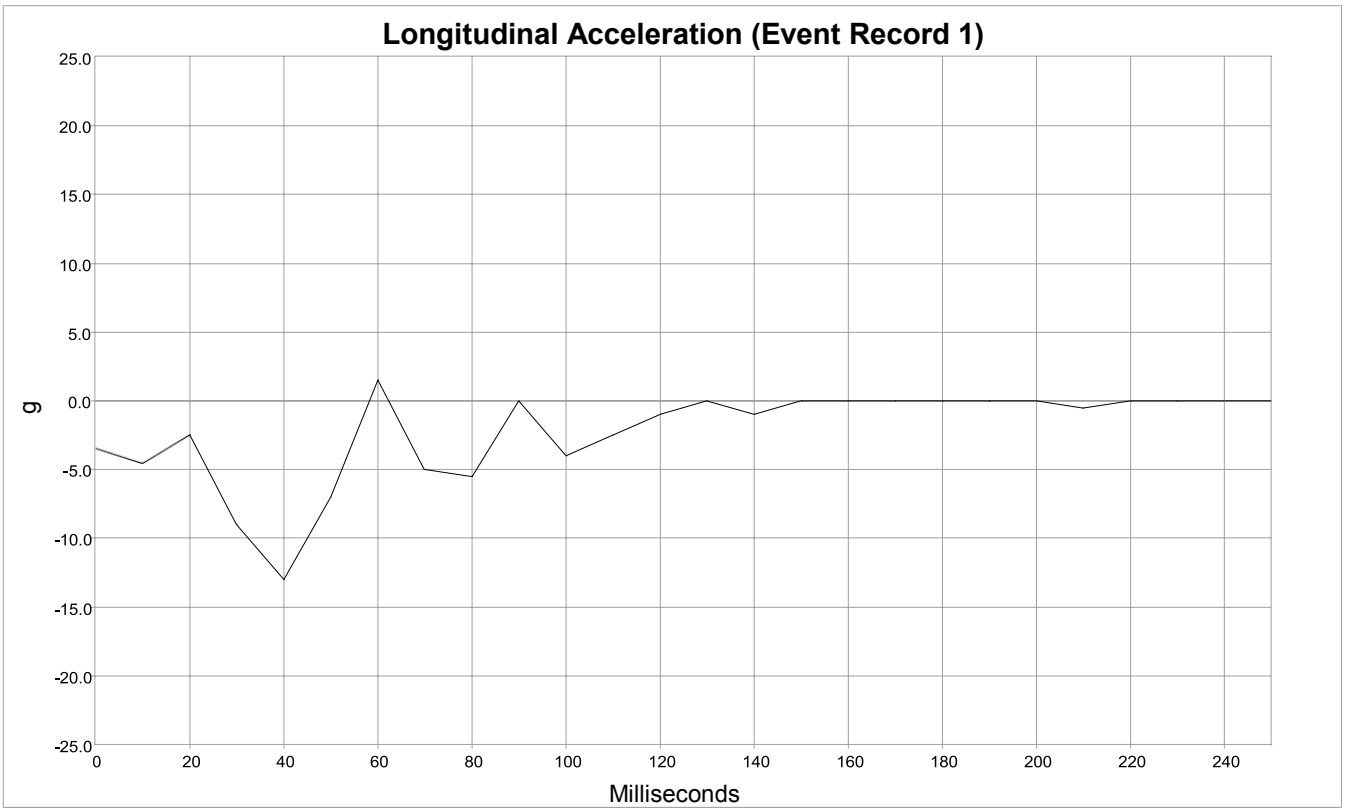
Longitudinal Delta V (Event Record 1)

Time (msec)	MPH [km/h]
0	0 [0]
10	-1 [-1]
20	-2 [-3]
30	-4 [-6]
40	-6 [-9]
50	-8 [-13]
60	-10 [-16]
70	-12 [-19]
80	-12 [-20]
90	-14 [-23]
100	-15 [-24]
110	-16 [-25]
120	-16 [-25]
130	-16 [-26]
140	-16 [-26]
150	-16 [-26]
160	-16 [-26]
170	-16 [-26]
180	0 [0]
190	0 [0]
200	0 [0]
210	0 [0]
220	0 [0]
230	0 [0]
240	0 [0]
250	0 [0]



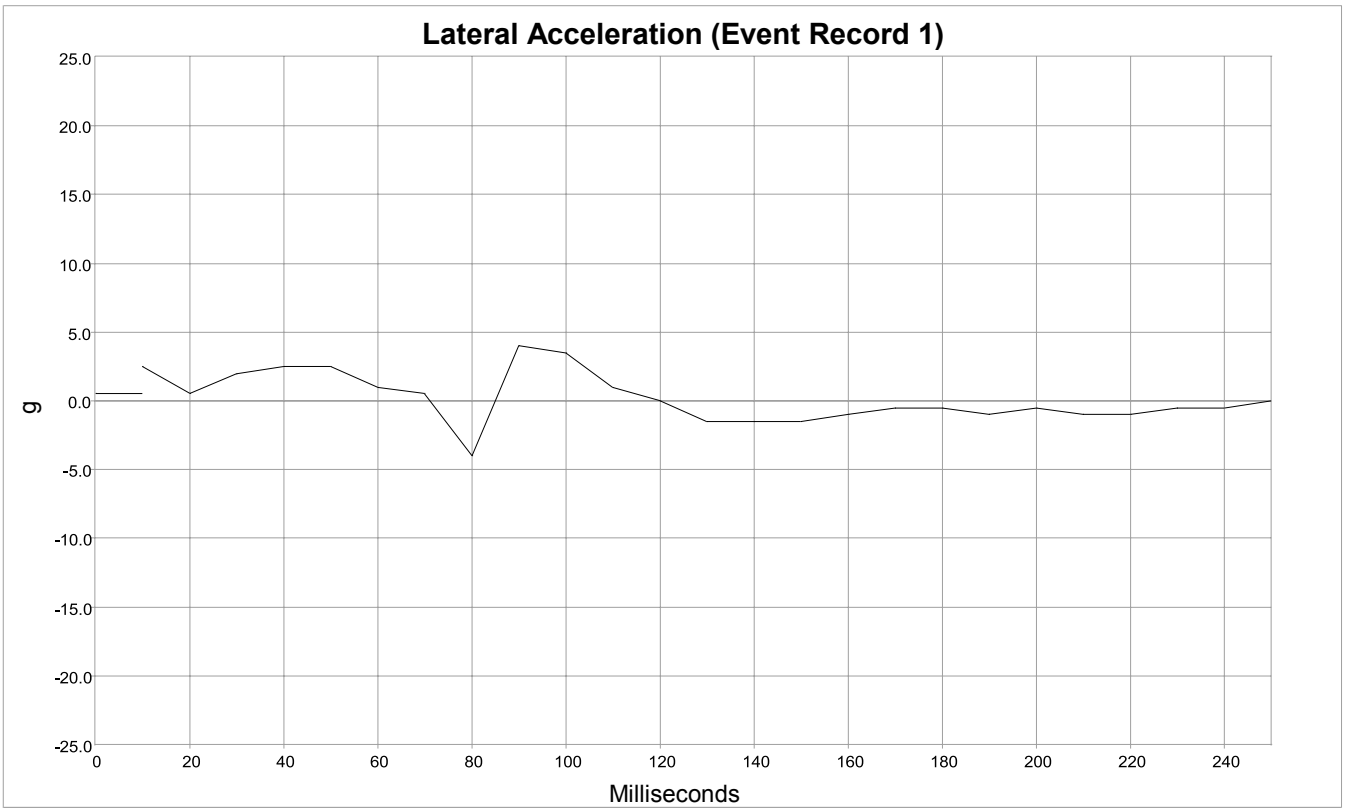
Lateral Delta V (Event Record 1)

Time (msec)	MPH [km/h]
0	0 [0]
10	0 [0]
20	0 [0]
30	0 [0]
40	0 [0]
50	0 [0]
60	0 [0]
70	1 [2]
80	1 [2]
90	2 [3]
100	3 [5]
110	3 [5]
120	4 [6]
130	3 [5]
140	3 [5]
150	2 [4]
160	2 [4]
170	2 [3]
180	0 [0]
190	0 [0]
200	0 [0]
210	0 [0]
220	0 [0]
230	0 [0]
240	0 [0]
250	0 [0]



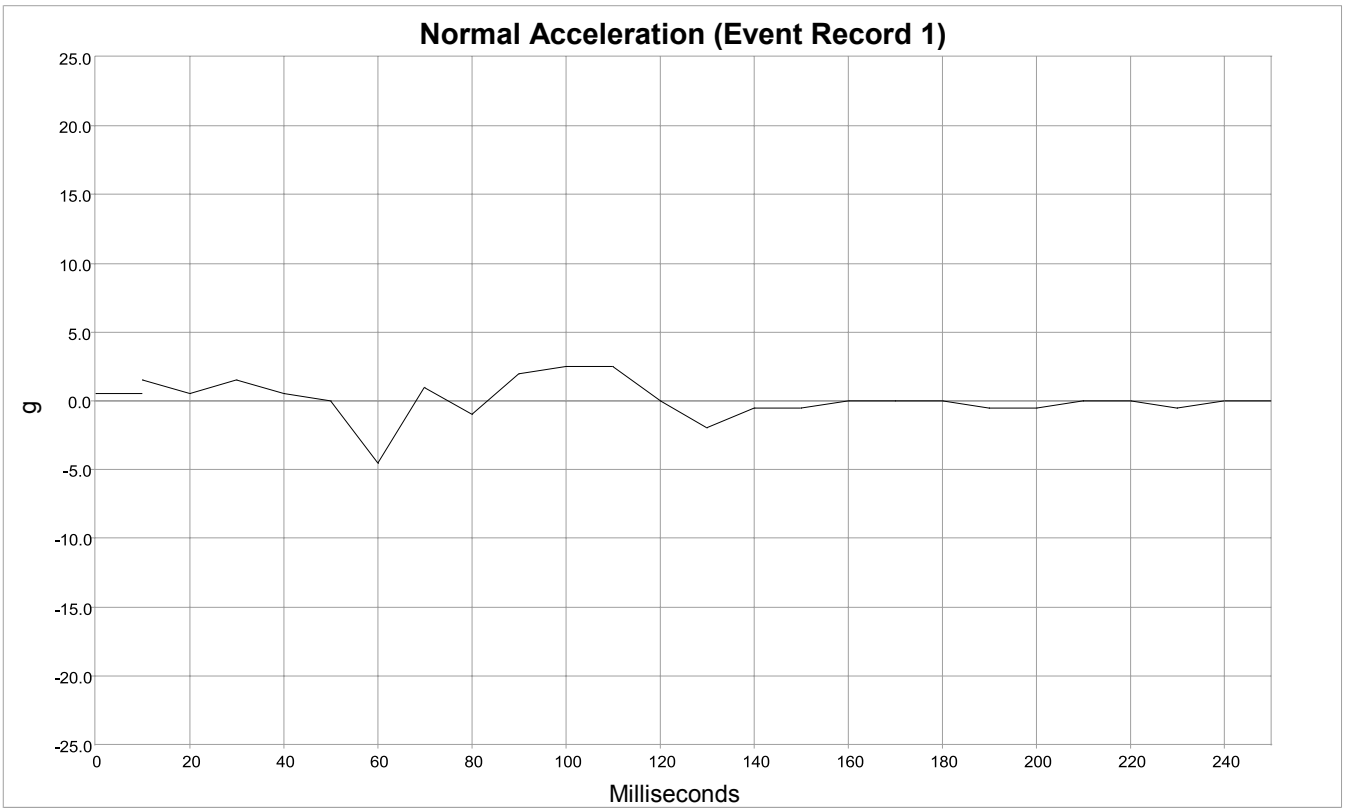
Longitudinal Acceleration (Event Record 1)

Time (msec)	g
0	-3.5
10	-4.5
20	-2.5
30	-9.0
40	-13.0
50	-7.0
60	1.5
70	-5.0
80	-5.5
90	0.0
100	-4.0
110	-2.5
120	-1.0
130	0.0
140	-1.0
150	0.0
160	0.0
170	0.0
180	0.0
190	0.0
200	0.0
210	-0.5
220	0.0
230	0.0
240	0.0
250	0.0



Lateral Acceleration (Event Record 1)

Time (msec)	g
0	0.5
10	2.5
20	0.5
30	2.0
40	2.5
50	2.5
60	1.0
70	0.5
80	-4.0
90	4.0
100	3.5
110	1.0
120	0.0
130	-1.5
140	-1.5
150	-1.5
160	-1.0
170	-0.5
180	-0.5
190	-1.0
200	-0.5
210	-1.0
220	-1.0
230	-0.5
240	-0.5
250	0.0



Normal Acceleration (Event Record 1)

Time (msec)	g
0	0.5
10	1.5
20	0.5
30	1.5
40	0.5
50	0.0
60	-4.5
70	1.0
80	-1.0
90	2.0
100	2.5
110	2.5
120	0.0
130	-2.0
140	-0.5
150	-0.5
160	0.0
170	0.0
180	0.0
190	-0.5
200	-0.5
210	0.0
220	0.0
230	-0.5
240	0.0
250	0.0

BOSCH

CDR CRASH DATA RETRIEVAL

Hexadecimal Data

DID #	Data
$8000	21 36 14 14 01 33 00 59 00 55 00 00 11 33 80 00
	62 0F 00 E9 00 00 00 00 00 00 00 00 1B 80 AA C1
	00 00 00 00 00 00 00 00 00 00 00 00 00 00 00 00
	00 00 00 00 00 00 00 00 00 00 00 00 00 00 00 7B
$8020	01 02 00 00 00 00 00 00 00 00 00 00 00 00 00 FD
$8021	AA 00 01 00 00 00 00 00 00 00 00 55 1A C8 AA 00
$8022	AA 00 C8 78 E6 00 00 00 42 00 00 00 42 00 00 00
	00 00 00 00 00 00 00 00 00 00 00 00 00 00 00 00
	00 00 00 00 00 00 00 00 00 00 00 00 00 00 00 00
	00 00 00 00 00 00 00 00 00 00 00 00 00 00 00 00
	11 00 00 00 00 00 00 00 00 00 00 00 00 00 00 9B
$8023	AA 00 C8 78 E6 00 00 00 00 00 00 00 00 00 00 00
	00 00 00 00 00 00 00 00 00 00 00 00 00 00 00 00
	00 00 00 00 00 00 00 00 00 00 00 00 00 00 00 00
	00 00 00 00 00 00 00 00 00 00 00 00 00 00 00 00
	11 00 00 00 00 00 00 00 00 00 00 00 00 00 00 1F
$8024	AA 00 FF 00 00 40 43 02 12 12 01 00 1A C3 00 00
	00 00 00 00 00 00 00 00 00 00 00 00 00 00 00 D0
$8025	AA 00 FF 00 00 40 43 00 12 00 01 00 00 00 00 00
	00 00 00 00 00 00 00 00 00 00 00 00 00 00 00 C1
$8026	AA 00 BC 00 35 00 00 00 00 00 00 00 00 00 00 00
	3D 00 FF 0C 00 01 00 00 00 00 00 00 00 00 00 00
	3C 00 FF 0C 00 01 00 00 00 00 00 00 00 00 00 00
	3B 00 FF 0C 19 00 00 00 00 00 00 00 00 00 00 00
	3B 00 00 17 28 00 00 00 00 00 00 00 00 00 00 00
	3C 00 00 19 27 00 00 00 00 00 00 00 00 00 00 00
	3E 00 00 19 27 00 00 00 00 00 00 00 00 00 00 00
	40 00 00 1A 24 00 00 00 00 00 00 00 00 00 00 00
	41 00 FF 1B 00 00 00 00 00 00 00 00 00 00 00 00
	38 00 00 0D 00 05 00 00 00 00 00 00 00 00 00 00
	23 00 FF 0C 00 05 00 00 00 00 00 00 00 00 00 00
	24 00 00 0C 00 05 00 00 00 00 00 00 00 00 00 76
$8027	AA 00 BC 00 35 00 00 00 00 00 00 00 00 00 00 00
	00 00 00 00 00 00 00 00 00 00 00 00 00 00 00 00
	00 00 00 00 00 00 00 00 00 00 00 00 00 00 00 00
	00 00 00 00 00 00 00 00 00 00 00 00 00 00 00 00
	00 00 00 00 00 00 00 00 00 00 00 00 00 00 00 00
	00 00 00 00 00 00 00 00 00 00 00 00 00 00 00 00
	00 00 00 00 00 00 00 00 00 00 00 00 00 00 00 00
	00 00 00 00 00 00 00 00 00 00 00 00 00 00 00 00
	00 00 00 00 00 00 00 00 00 00 00 00 00 00 00 00
	00 00 00 00 00 00 00 00 00 00 00 00 00 00 00 00
	00 00 00 00 00 00 00 00 00 00 00 00 00 00 00 00
	00 00 00 00 00 00 00 00 00 00 00 00 00 00 00 65
$8028	AA 00 00 FF FD FA F7 F3 F0 ED EC E9 E8 E7 E7 E6
	E6 E6 E6 E6 00 00 00 00 00 00 00 00 00 00 00 00
	00 00 00 00 00 00 00 00 E6 3E 00 00 00 00 00 6C
$8029	AA 00 00 00 00 00 00 00 00 00 00 00 00 00 00 00
	00 00 00 00 00 00 00 00 00 00 00 00 00 00 00 00
	00 00 00 00 00 00 00 00 00 00 00 00 00 00 00 56
$802A	AA 00 00 00 00 00 00 00 00 02 02 03 05 05 06 05
	05 04 04 03 00 00 00 00 00 00 00 00 00 00 00 00
	00 00 00 00 00 00 00 00 06 2D 00 39 00 00 00 BE

```
$802B          AA 00 00 00 00 00 00 00 00 00 00 00 00 00 00 00
               00 00 00 00 00 00 00 00 00 00 00 00 00 00 00 00
               00 00 00 00 00 00 00 00 00 00 00 00 00 00 00 56

$802C          AA 01 F9 F7 FB EE E6 F2 03 F6 F5 00 F8 FB FE 00
               FE 00 00 00 00 00 00 FF 00 00 00 00 00 00 00 00
               00 00 00 00 00 00 00 00 00 00 00 00 00 00 00 C8

$802D          AA 01 00 00 00 00 00 00 00 00 00 00 00 00 00 00
               00 00 00 00 00 00 00 00 00 00 00 00 00 00 00 00
               00 00 00 00 00 00 00 00 00 00 00 00 00 00 00 55

$802E          AA 01 01 05 01 04 05 05 02 01 F8 08 07 02 00 FD
               FD FD FE FF FF FE FF FE FE FF FF 00 00 00 00 00
               00 00 00 00 00 00 00 00 00 00 00 00 00 00 00 4A

$802F          AA 01 00 00 00 00 00 00 00 00 00 00 00 00 00 00
               00 00 00 00 00 00 00 00 00 00 00 00 00 00 00 00
               00 00 00 00 00 00 00 00 00 00 00 00 00 00 00 55

$8030          AA 01 01 03 01 03 01 00 F7 02 FE 04 05 05 00 FC
               FF FF 00 00 00 FF FF 00 00 FF 00 00 01 63 00 00
               00 00 00 00 00 00 00 00 00 00 00 00 00 00 00 EC

$8031          AA 01 00 00 00 00 00 00 00 00 00 00 00 00 00 00
               00 00 00 00 00 00 00 00 00 00 00 00 00 00 00 00
               00 00 00 00 00 00 00 00 00 00 00 00 00 00 00 55

$8007          00 00 00 00 00 00 00 00 0E 00 00 00 00 00 00 00
               00 00 00 00 00 00 00 00 00 00 00 00 00 00 00 F2

$803F          AA 00 02 10 00 00 00 00 00 00 00 00 00 00 00 00
               80 06 07 00 00 00 00 00 00 00 00 00 00 00 00 00
               00 00 00 00 00 00 00 00 00 00 00 00 00 00 00 00

$8011          AA 00 C4 3F 00 00 00 00 00 01 27 16 00 00 00 16
               00 00 00 00 00 00 59 3C 10 7F 00 00 00 00 00 00
               00 00 00 00 00 00 00 00 00 00 00 00 00 00 00 00
               00 00 00 00 00 00 00 00 00 00 00 00 00 00 00 00
               00 00 00 00 00 00 00 00 00 DB

$8012          AA 00 11 08 D1 09 16 00 00 00 00 00 00 10 1D 12
               00 00 10 1D 12 00 00 10 1D 12 00 00 00 00 00 00
               00 00 00 00 00 00 00 00 00 00 00 00 00 00 00 90
               00 00 00 00 00 00 00 00 00 00 00 00 00 00 00 00
               00 00 00 00 00 00 00 00 00 00 00 00 00 00 00 00

$8013          AA 00 C4 3F 00 00 00 00 00 01 00 00 00 00 00 00
               00 00 00 00 00 00 00 00 00 00 00 00 00 00 00 00
               00 00 00 00 00 00 00 00 00 00 00 00 00 00 00 00
               00 00 00 00 00 00 00 00 00 00 00 00 00 00 00 00
               00 00 00 00 00 00 00 00 00 52

$8014          AA 00 00 00 00 00 00 00 00 00 00 00 00 00 00 00
               00 00 00 00 00 00 00 00 00 00 00 00 00 00 00 00
               00 00 00 00 00 00 00 00 00 00 00 00 00 00 00 56
               00 00 00 00 00 00 00 00 00 00 00 00 00 00 00 00
               00 00 00 00 00 00 00 00 00 00 00 00 00 00 00 00

$8015          AA 00 C4 3F 00 00 00 00 00 01 00 00 00 00 00 00
               00 00 00 00 00 00 00 00 00 00 00 00 00 00 00 00
               00 00 00 00 00 00 00 00 00 00 00 00 00 00 00 00
               00 00 00 00 00 00 00 00 00 00 00 00 00 00 00 00
               00 00 00 00 00 00 00 00 00 52

$8016          AA 00 00 00 00 00 00 00 00 00 00 00 00 00 00 00
               00 00 00 00 00 00 00 00 00 00 00 00 00 00 00 56

$8017          AA 00 C4 3F 00 00 00 00 00 01 00 00 00 00 00 00
```

```
                00 00 00 00 00 00 00 00 00 00 00 00 00 00 00 00
                00 00 00 00 00 00 00 00 00 00 00 00 00 00 00 00
                00 00 00 00 00 00 00 00 00 00 00 00 00 00 00 00
                00 00 00 00 00 00 00 00 00 52

$8018           AA 00 00 00 00 00 00 00 00 00 00 00 00 00 00 00
                00 00 00 00 00 00 00 00 00 00 00 00 00 00 00 56

$8019           AA 00 C4 3F 03 10 FC 00 00 01 00 00 00 00 00 00
                00 00 00 00 00 00 00 00 00 00 00 00 00 00 00 00
                00 00 00 00 00 00 00 00 00 00 00 00 00 00 00 00
                00 00 00 00 00 00 00 00 00 00 00 00 00 00 00 00
                00 00 00 00 00 00 00 00 00 43

$801A           AA 00 00 00 00 00 00 00 00 00 00 00 00 00 00 00
                00 00 00 00 00 00 00 00 00 00 00 00 00 00 00 00
                00 00 00 00 00 00 00 00 00 00 00 00 00 00 00 00
                00 00 00 00 00 00 00 00 00 00 00 00 00 00 00 00
                00 00 00 00 00 00 00 00 00 00 00 00 00 00 00 00
                00 00 00 00 00 00 00 00 00 00 00 00 00 00 00 00
                00 00 00 00 00 00 00 00 00 00 00 00 00 00 00 00

$801B           AA 00 00 00 00 00 00 00 00 00 00 00 00 00 00 00
                00 00 00 00 00 00 00 00 00 00 00 00 00 00 00 00
                00 00 00 00 00 00 00 00 00 00 00 00 00 00 00 00
                00 00 00 00 00 00 00 00 00 00 00 00 00 00 00 00
                00 00 00 00 00 00 00 00 00 00 00 00 00 00 00 00
                00 00 00 00 00 00 00 00 00 00 00 00 00 00 00 00

$8001           00 00 C4 18 00 00 00 00 16 16 00 00 00 16 00 00
                00 00 00 06 07 00 00 00 00 00 00 00 00 00 00 00
                00 00 00 00 00 00 00 00 00 00 00 00 00 00 00 00
                00 00 00 00 00 00 00 00

$8002           00 00 E0 FE F8 00 00 00 02 80 11 00 00 00 00 00
                80 54 E6 00 06 00 14 00 00 00 00 06 03 00 00 00
                00 00 00 00 00 00 00 00 00 00 00 00 00 00 00 00
                00 00 00 00 00 00 00 00

$8003           00 00 E0 00 00 0A 00 03 00 00 00 00 00 00 00 00
                00 00 00 00 00 00 00 00 00 00 00 00 00 00

$8004           Not Used

$8008           Not Used

$8009           00 00 90 00 AA 00 00 AA 00 00 00 00 00 00 00 00
                00 00 00 00

$8010           00 00 F8 F8 F8 F8 E0 E0 E0 E3 00 00 00 00 00 00
                A3 C0 00 00 00 00 00 00 63 00 00 10 0F 00 00 00
                00 00 00 00 00 00 00 00 00 00 00 00 00 00 00 00
                00 00 00 00 00 00 00 00 00 00 00 00 00 00 00 00
                00 00 00 00 00 00 00 00 00 00 00 00 00 00 00 00
                00 00 00 00 00 00 00 00 00 00 00 00 00 00 00 00
                00 00 00 00 00 00 00 00 00 00 00 00 00 00 00 00
                00 00 00 00 00 00 00 00 00 00 00 00 00 00 00 00

$801C           AA 00 00 00 00 00 00 00 00 00 00 00 00 00 00 00
                00 00 00 00 00 00 00 00 00 00 00 00 00 00 00 56

$801F           Not Used

$8040           AA 00 F0 00 FF FC 00 00 00 00 00 0E 00 00 00 00
                00 00 00 00 00 00 00 00 00 00 00 00 00 00 30 F7
                90 00 80 00 00 00 00 00 00 00 00 00 00 00 00 00
                00 00 00 00 00 00 00 00

$8041           AA 00 FE CC 08 00 00 00 1B 1B 15 15 58 16 55 00
                14 13 00 00 15 15 00 00 00 00 00 00 12 00 00 00
```

```
                00 00 00 00 00 00 00 00 00 00 00 00 00 00 00 00
                00 00 00 00 00 00 00 00

$8042           AA 00 FE 00 00 00 00 59 3C 12 7F 00 5A 80 00 00
                00 00 00 00 00 00 00 00 00 00 00 00 00 00 00 00
                00 00 00 00 00 00 00 00 00 00 00 00 00 00 00 00

$8043           AA 00 FF F0 03 00 00 02 00 02 00 02 00 02 00 01
                FF 02 00 00 00 00 00 00 00 00 00 00 00 02 00 00
                00 00 00 00 00 00 00 00 00 00 00 00 00 00 00 00

$8044           AA 00 AC 00 80 00 81 00 82 7D 00 00 00 00 00 00
                00 00 00 00

$8045           AA 00 B0 00 74 00 78 5C 00 00 00 00 00 00 00 00
                00 00 00 00

$8046           AA 00 C0 00 00 00 00 00 08 00 00 00 00 00 00 00
                00 00 00 00 00 00 00 00 00 00 00 00 00 00 00 00
                00 00 00 00 00 00 00 00 00 00 00 00 00 00 00 00

$8050           00 00 00 00 00 00 00 00 00 00 00 00 00 00 00 00
                00 00 00 00 00 00 00 00 00 00 00 00 00 00 00 00
                00 00 00 00 00 00 00 00 00 00 00 00 00 00 00 00
                00 00 00 00 00 00 00 00 00 00 00 00 00 00 00 00
                00 00 00 00 00 00 00 00 00 00 00 00 00 00 00 00

$8051           81 62 01 00 12 31 1A 00 11 31 14 00 33 31 0B 00
                12 61 02 00 25 31 09 00 34 31 09 00 11 61 02 00

$8052           31 13 03 03 03 00 00 00 01 00 00 00 00 00 00 00

$8053           40 40 00 00 00 00 00 00 00 00 00 00 00 00 00 00

$8060           AA 00 21 11 25 11 00 00 00 00 00 00 1A C3 00 00
                00 00 00 00 00 00 00 00 00 00 00 00 00 00 00 00

$8061           AA 00 CF 00 00 00 00 00 00 00 00 00 00 00 00 00
                7C 7C 00 00 78 78 5C 5C 00 00 00 00 00 00 00 00
                7C 7C 00 00 78 78 5C 5C 00 00 00 00 00 00 00 00
                7D 79 00 00 78 78 5C 5C 00 00 00 00 00 00 00 00
                7B 79 00 00 78 78 5C 5C 00 00 00 00 00 00 00 00
                7B 76 00 00 78 78 5C 5C 00 00 00 00 00 00 00 00
                7A 78 00 00 78 78 5C 5C 00 00 00 00 00 00 00 00
                7D 79 00 00 78 78 5C 5C 00 00 00 00 00 00 00 00
                7D 7B 00 00 78 78 5C 5C 00 00 00 00 00 00 00 00
                7D 7A 00 00 78 78 5C 5C 00 00 00 00 00 00 00 00
                7D 7A 00 00 78 78 5C 5C 00 00 00 00 00 00 00 00
                7D 7C 00 00 78 78 5C 5C 00 00 00 00 00 00 00 00

$8062           AA 00 FF F0 C0 00 00 00 00 00 00 00 00 00 00 00
                80 7F 80 7F 80 7F 80 80 80 80 80 80 00 00 00 00
                80 7F 00 00 00 00 00 00 00 00 00 00 00 00 00 00
                80 80 80 7F 80 80 80 80 80 80 80 80 00 00 00 00
                80 7F 00 00 00 00 00 00 00 00 00 00 00 00 00 00
                80 80 80 80 80 80 80 80 80 80 80 80 00 00 00 00
                80 7F 00 00 00 00 00 00 00 00 00 00 00 00 00 00
                80 80 80 80 80 80 80 80 80 7F 80 7F 00 00 00 00
                80 80 00 00 00 00 00 00 00 00 00 00 00 00 00 00
                A2 7F 80 7B 80 7F 81 7F 80 7D 84 7F 00 00 00 00
                82 7C 00 00 00 00 00 00 00 00 00 00 00 00 00 00
                80 7F 81 7F 81 7F 80 7F 81 7F 80 7E 00 00 00 00
                84 7F 00 00 00 00 00 00 00 00 00 00 00 00 00 00
                81 7F 81 7F 80 7F 80 80 80 7F 80 7F 00 00 00 00
                80 7F 00 00 00 00 00 00 00 00 00 00 00 00 00 00
                80 7F 80 7F 80 80 80 80 80 7F 80 7F 00 00 00 00
                80 7F 00 00 00 00 00 00 00 00 00 00 00 00 00 00
                80 7F 80 80 80 7F 80 80 80 7F 80 80 00 00 00 00
                80 7F 00 00 00 00 00 00 00 00 00 00 00 00 00 00
                80 7F 80 80 7F 7F 80 80 80 7F 80 80 00 00 00 00
```

```
                80 7F 00 00 00 00 00 00 00 00 00 00 00 00 00 00
                80 7F 80 80 7F 7F 80 80 80 7F 80 80 00 00 00 00
                7F 7F 00 00 00 00 00 00 00 00 00 00 00 00 00 00

$8063           AA 00 CF C0 00 00 00 00 00 00 00 00 00 00 00 00
                81 81 00 00 82 82 7F 7D 80 7F 00 00 00 00 00 00
                81 81 00 00 82 81 7E 7D 80 7F 00 00 00 00 00 00
                81 80 00 00 82 82 83 7D 81 7E 00 00 00 00 00 00
                80 80 00 00 83 81 80 7D 80 7F 00 00 00 00 00 00
                80 74 00 00 87 7A 86 73 8F 76 00 00 00 00 00 00
                81 80 00 00 85 81 82 7A 87 78 00 00 00 00 00 00
                80 80 00 00 82 81 80 7D 81 7F 00 00 00 00 00 00
                81 80 00 00 82 81 7F 7B 80 7F 00 00 00 00 00 00
                81 81 00 00 82 82 7F 7D 80 7F 00 00 00 00 00 00
                81 81 00 00 82 82 7F 7E 80 80 00 00 00 00 00 00
                81 81 00 00 82 82 7E 7E 80 80 00 00 00 00 00 00

$8064           AA 00 F0 30 00 00 00 00 00 00 00 00 00 00 00 00
                8C 8B 3C 3B 00 00 00 00 00 00 3C 3B 00 00 00 00
                00 00 00 00 00 00 00 00 00 00 00 00 00 00 00 00
                8C 8B 3D 3C 00 00 00 00 00 00 3C 3B 00 00 00 00
                00 00 00 00 00 00 00 00 00 00 00 00 00 00 00 00
                8C 8B 3C 3B 00 00 00 00 00 00 3C 3B 00 00 00 00
                00 00 00 00 00 00 00 00 00 00 00 00 00 00 00 00
                8C 8B 3D 3B 00 00 00 00 00 00 3C 3B 00 00 00 00
                00 00 00 00 00 00 00 00 00 00 00 00 00 00 00 00
                8D 8B 3D 3C 00 00 00 00 00 00 3C 3B 00 00 00 00
                00 00 00 00 00 00 00 00 00 00 00 00 00 00 00 00
                8C 8B 3D 3C 00 00 00 00 00 00 3C 3B 00 00 00 00
                00 00 00 00 00 00 00 00 00 00 00 00 00 00 00 00
                8C 8B 3D 3B 00 00 00 00 00 00 3C 3B 00 00 00 00
                00 00 00 00 00 00 00 00 00 00 00 00 00 00 00 00
                8C 8B 3D 3B 00 00 00 00 00 00 3C 3B 00 00 00 00
                00 00 00 00 00 00 00 00 00 00 00 00 00 00 00 00
                8C 8B 3C 3B 00 00 00 00 00 00 3C 3B 00 00 00 00
                00 00 00 00 00 00 00 00 00 00 00 00 00 00 00 00
                8C 8B 3D 3C 00 00 00 00 00 00 3C 3B 00 00 00 00
                00 00 00 00 00 00 00 00 00 00 00 00 00 00 00 00
                8C 8B 3C 3B 00 00 00 00 00 00 3C 3B 00 00 00 00
                00 00 00 00 00 00 00 00 00 00 00 00 00 00 00 00

$8065           AA 00 FF FC F0 CC 00 C0 00 00 00 00 00 00 00 00
                1B 1B 1B 1B 15 15 15 15 16 16 16 16 16 14 00 00
                14 14 13 13 00 00 00 00 15 15 00 00 15 15 00 00
                00 00 00 00 00 00 00 00 13 12 00 00 00 00 00 00
                1B 1B 1B 1B 15 15 15 15 16 16 16 16 14 14 00 00
                14 14 13 13 00 00 00 00 15 15 00 00 16 15 00 00
                00 00 00 00 00 00 00 00 13 12 00 00 00 00 00 00
                1B 1B 1B 1B 15 15 15 15 16 16 16 16 15 14 00 00
                14 14 14 13 00 00 00 00 15 15 00 00 15 15 00 00
                00 00 00 00 00 00 00 00 13 13 00 00 00 00 00 00
                1B 1B 1B 1B 15 15 15 15 16 16 16 16 15 14 00 00
                14 13 13 13 00 00 00 00 15 14 00 00 16 15 00 00
                00 00 00 00 00 00 00 00 13 12 00 00 00 00 00 00
                1C 1B 1B 1B 16 15 15 15 58 16 16 16 55 14 00 00
                14 14 13 13 00 00 00 00 15 15 00 00 15 15 00 00
                00 00 00 00 00 00 00 00 13 12 00 00 00 00 00 00
                1B 1B 1B 1B 15 15 15 15 58 58 16 16 55 55 00 00
                14 14 13 13 00 00 00 00 15 15 00 00 15 15 00 00
                00 00 00 00 00 00 00 00 13 13 00 00 00 00 00 00
                1C 1B 1C 1A 15 15 15 15 58 58 16 16 55 55 00 00
                14 14 14 13 00 00 00 00 15 15 00 00 15 15 00 00
                00 00 00 00 00 00 00 00 13 13 00 00 00 00 00 00
                1B 1B 1B 1B 15 15 15 15 58 58 16 16 55 55 00 00
                14 13 13 13 00 00 00 00 15 15 00 00 16 15 00 00
                00 00 00 00 00 00 00 00 13 12 00 00 00 00 00 00
                1C 1B 1B 1B 15 15 15 15 58 58 16 16 55 55 00 00
                14 13 13 13 00 00 00 00 15 15 00 00 15 15 00 00
                00 00 00 00 00 00 00 00 13 13 00 00 00 00 00 00
                1B 1B 1B 1B 15 15 15 15 58 58 16 16 55 55 00 00
```

```
                14 14 13 13 00 00 00 00 15 14 00 00 16 15 00 00
                00 00 00 00 00 00 00 00 13 13 00 00 00 00 00 00
                1B 1B 1B 1B 15 15 15 15 58 58 16 16 55 55 00 00
                14 14 13 13 00 00 00 00 15 15 00 00 15 15 00 00
                00 00 00 00 00 00 00 00 13 12 00 00 00 00 00 00

$8066           AA 00 FF 80 00 00 00 00 00 00 00 00 00 00 00 00
                00 00 59 3C 10 7F 00 5A 82 00 00 00 00 00 00 00
                00 00 59 3C 10 7F 00 5A 82 00 00 00 00 00 00 00
                00 00 59 3C 10 7F 00 5A 82 00 00 00 00 00 00 00
                00 00 59 3C 10 7F 00 5A 82 00 00 00 00 00 00 00
                00 02 59 3C 10 7F 00 5A 82 00 00 00 00 00 00 00
                00 02 59 3C 12 7F 00 5A 80 00 00 00 00 00 00 00
                00 02 59 3C 10 7F 00 5A 82 00 00 00 00 00 00 00
                00 02 59 3C 12 7F 00 5A 80 00 00 00 00 00 00 00
                00 02 59 3C 12 7F 00 5A 80 00 00 00 00 00 00 00
                00 02 59 3C 12 7F 00 5A 80 00 00 00 00 00 00 00
                00 03 59 3C 12 7F 00 5A 80 00 00 00 00 00 00 00

$E600           2C FB

$E604           01 00 00 00

$F100           00 00 00 00

$F110           0E 37 37 39 36 30 54 37 53 41 32 31 32 4D 32 00
                00

$F112           0B 43 31 4E 34 30 31 33 54 4E 33 44 00 00 00 00
                00 00 00 00 00 00 00 00 00 00 00 00 00 00 00 00

$F181           37 37 39 35 39 2D 54 37 53 2D 41 32 33 30 00 00
```

Disclaimer of Liability

The users of the CDR product and reviewers of the CDR reports and exported data shall ensure that data and information supplied is applicable to the vehicle, vehicle's system(s) and the vehicle ECU. Robert Bosch LLC and all its directors, officers, employees and members shall not be liable for damages arising out of or related to incorrect, incomplete or misinterpreted software and/or data. Robert Bosch LLC expressly excludes all liability for incidental, consequential, special or punitive damages arising from or related to the CDR data, CDR software or use thereof.

DOT HS 813 001
September 2020

U.S. Department
of Transportation

**National Highway
Traffic Safety
Administration**

14926-091720-v2