U.S. Department of Transportation

National Highway Traffic Safety Administration

DOT Auto Safety Hotline

Vehicle Owner's Questionnaire

To Report Vehicle Safety Defects
1-888-DASH-2-DOT
(1-888-327-4236)
INTERNET:www.nhtsa.dot.gov/hotline

FOR AGENCY USE ONLY 100148

Date Received	Repository ☐
03-APR-2019 AUG 1 8 2019	Reference No. 11193611

OWNER INFORMATION (Type or Print)

Name [redacted]			Daytime Telephone Number [redacted]	E-mail Address [redacted]
Address [redacted]			Evening Telephone Number	
City DINGMANS FERRY	State PA	Zip Code [redacted]		

The information you provide will be used to identify potential safety-related defects. We may share your information with the applicable vehicle manufacturer during an investigation or recall in accordance with the routine uses described in the agency's Privacy Act notice. See 49 FR 53971 (Sep. 3, 2004).

VEHICLE INFORMATION

17 digit Vehicle Identification Number Located at bottom of windshield on driver's side	Make	Model	Model Year
2T3BFREV2HW5[redacted]	TOYOTA	RAV4	2017

Date Purchased	Dealer's Name and Telephone Number		Engine:	Fuel Type:
JAN. 2017	TOYOTA OF NEWTON 973-383-0200		No: Cylinders 4	REG.
Original Owner ☐	Dealer's City NEWTON	State NJ Zip Code		

Transmission Type		Powertrain	Multiple Failure:	Incident Date(s)
4 CYL.	☑ Antilock Brakes ☑ Cruise Control	YES	AIR BAGS & SEAT BELT	26-DEC-2018

FAILED COMPONENT(S)/PART(S) INFORMATION

Vehicle Component Code: 140000 AIR BAGS & SEAT BELT	Failure Mileage	Failure Speed
	23000	~~45~~ 40

ADDITIONAL ITEMS TO BE COMPLETED WHEN REPORTING A TIRE FAILURE

Tire Make	Tire Model (Name or Number)	Tire Size (Example P215/65R15)
DOT No. (Example: DOTMAL9ABC036)	☐ Original Equipment ☐ Prior Repair	Failure Location:
Tire Component Code		Tire Failure Type:

ADDITIONAL ITEMS TO BE COMPLETED WHEN REPORTING A CHILD SEAT FAILURE

Make:	Date Manufactured:	Model No./Name:
Seat Type:	Installation System:	
Child Seat Component Code:	Failed Part:	

APPLICABLE INCIDENT INFORMATION

(Please describe in detail the incident(s), Failure(s), Crash(es), and injury(ies).)

Crash	Fire	Number of Persons Injured	Number of Deaths	Reported to Police
☒ Yes ☐ No	☐ Yes ☒ No	1	0	N

Narrative Description of Incident(S), Crash(es), and Injury(ies).
Please describe (1) events leading up to the failure, (2) failure and its consequences, and (3) what was done to correct the failure; i.e, parts repaired or replaced (and if old part is available).

TL* THE CONTACT OWNED A 2017 TOYOTA RAV4. WHILE DRIVING 45 MPH, THE CONTACT SWERVED TO AVOID A DEER AND HIS FOOT SLIPPED OFF THE BRAKE PEDAL. THE CONTACT CRASHED THE VEHICLE INTO A GUARDRAIL. THE AIR BAGS DID NOT DEPLOY. THE CONTACT'S ARMS AND RIBS WERE BRUISED AND HIS NECK SNAPPED BACK AND WAS SWOLLEN. MEDICAL ATTENTION WAS NOT RECEIVED; HOWEVER, X-RAYS WERE PERFORMED. THE CONTACT PLANNED TO SCHEDULE AN APPOINTMENT WITH A DOCTOR. A POLICE REPORT WAS NOT FILED. THE CONTACT TOOK THE VEHICLE TO AN INDEPENDENT MECHANIC WHO DEEMED THE VEHICLE DESTROYED. THE CAUSE OF THE FAILURE WAS NOT DETERMINED. THE DEALER AND MANUFACTURER WERE NOT NOTIFIED. THE FAILURE MILEAGE WAS 23,000. THE VIN WAS UNKNOWN.

Include, if available: Police/Fire Department Report, Photos, and Repair Invoice. ATTACH ADDITIONAL SHEETS IF NECESSARY

The Privacy Act of 1974-Public Law 93-579 This information is requested pursuant to authority vested in the National Highway Traffic Safety Act and subsequent amendments. You are under no obligation to respond this questionnaire. Your response may be used to assist the NHTSA in determining whether a Manufacturer should take appropriate action to correct a safety defect. If the NHTSA proceeds with administrative enforcement or litigation against a manufacturer, your response, or a statistical summary thereof, may be used in support of the agency's action.

Narrative Description of Incident(s), Failure(s), Crash(es), and Injury(ies)

ON 12-26-18, A DEER (BUCK) CAME HEAD ON AT my VEHICLE I CUT WHEEL TO TRY NOT TO HIT HIM, my FOOT SLIPPED OFF BRAKE AND I HIT GUARD RAIL. AIR BAG DID NOT DEPLOY. I RECEIVED INJURIES TO my ARM, RIBS AND NECK. my VEHICLE WAS TOTALED (CHASIS WAS BENT 2 IN. APPOX. DAMAGE WAS $20,000.00, AND FRONT END TOTALLY DESTROYED.

NOTE: ENCLOSED IS THE ANALYTICAL FINDING OF THEIR REPORT (COMPUTER-JACK) THIS IS RIDICULOUS, AND TOYOTA IS RESPONSIBLE FOR THESE FAULTY AIR BAGS.

ATTACH ADDITIONAL SHEETS IF NECESSARY

U.S. Department of Transportation

National Highway Traffic Safety Administration

1200 New Jersey Avenue SE.
Washington, D.C. 20077-9382

Official Business
Penalty for Private Use $300

NO POSTAGE NECESSARY IF MAILED IN THE UNITED STATES

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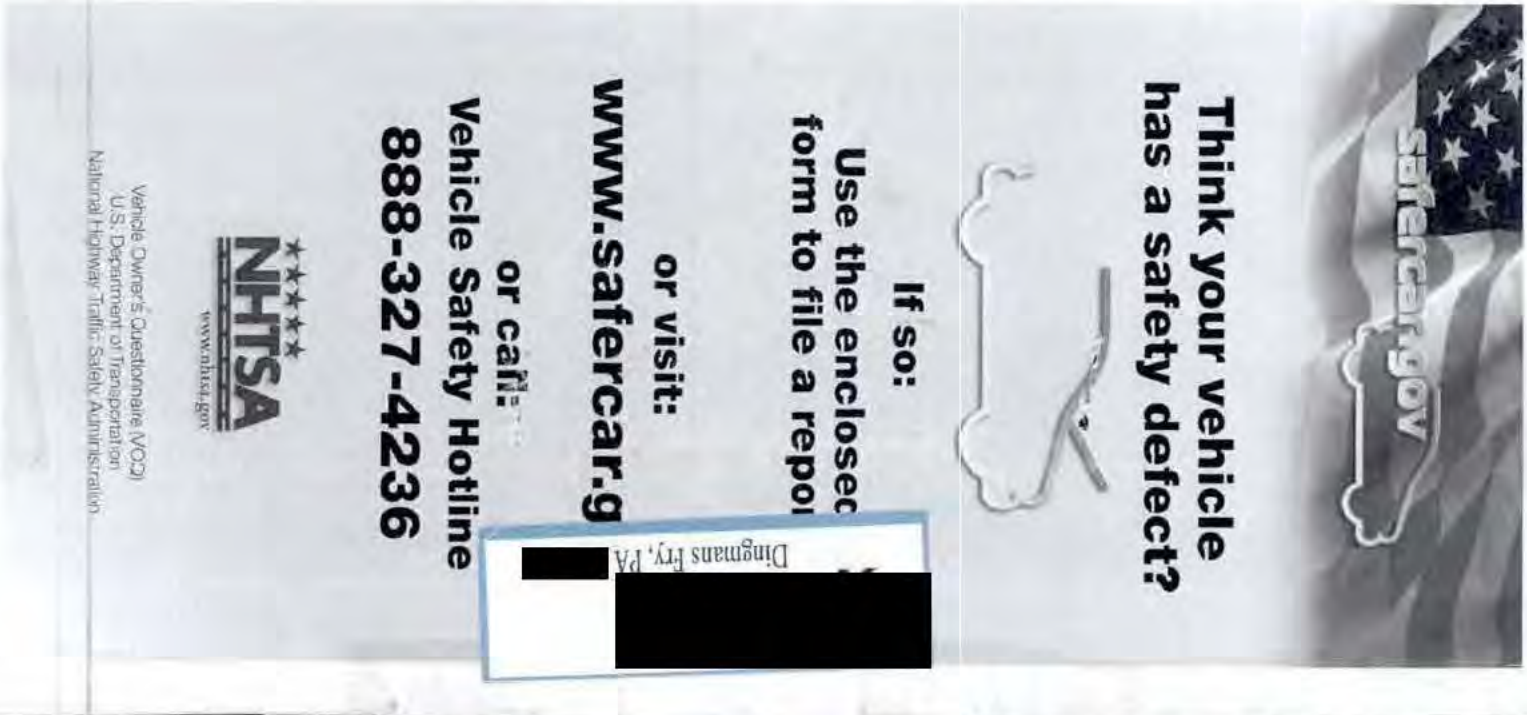


IMPORTANT NOTICE: Robert Bosch LLC and the manufacturers whose vehicles are accessible using the CDR System urge end users to use the latest production release of the Crash Data Retrieval system software when viewing, printing or exporting any retrieved data from within the CDR program. Using the latest version of the CDR software is the best way to ensure that retrieved data has been translated using the most current information provided by the manufacturers of the vehicles supported by this product.

CDR File Information

User Entered VIN/Frame Number	2T3BFREV2HW[redacted]
User	Charles Brady
Case Number	[redacted]
EDR Data Imaging Date	01/24/2019
Crash Date	12/26/2018
Filename	2T3BFREV2HW[redacted]_ACM.CDRX
Saved on	Thursday, January 24 2019 at 10:13:34
Imaged with CDR version	Crash Data Retrieval Tool 17.9.1
Imaged with Software Licensed to (Company Name)	Engineering Analysis Associates
Reported with CDR version	Crash Data Retrieval Tool 17.9.1
Reported with Software Licensed to (Company Name)	Engineering Analysis Associates
EDR Device Type	Airbag Control Module
Event(s) recovered	Front/Rear (1), Side (2), Rollover (2)

Comments

No comments entered.

Data Limitations

CDR Record Information:

- Due to limitations of the data recorded by the airbag ECU, such as the resolution, data range, sampling interval, time period of the recording, and the items recorded, the information provided by this data may not be sufficient to capture the entire crash.
- Pre-Crash data is recorded in discrete intervals. Due to different refresh rates within the vehicle's electronics, the data recorded may not be synchronous to each other.
- Airbag ECU data should be used in conjunction with other physical evidence obtained from the vehicle and the surrounding circumstances.
- If any of the front passenger seat airbags, side airbags, or Curtain Shield Airbags have deployed, data will not be overwritten or deleted by the airbag ECU following that event. If none of the airbags have deployed, the data of that event may be overwritten by a following event even if other airbags (pretensioner, rear seat airbag, etc.) have deployed.
- If power supply to the airbag ECU is lost during an event, all or part of the data may not be recorded.
- "Diagnostic Trouble Codes" are information about faults when a recording trigger is established. Various diagnostic trouble codes could be set and recorded due to component or system damage during an accident.
- The airbag ECU records only diagnostic information related to the airbag system. It does not record diagnostic information related to other vehicle systems.
- The TaSCAN, Global Tech Stream, or Intelligent Tester II devices (or any other Toyota genuine diagnostic tool) can be used to obtain detailed information on the diagnostic trouble codes from the airbag system, as well as diagnostic information from other systems. However, in some cases, the diagnostic trouble codes of the airbag system recorded by the airbag ECU when the event occurred may not match the diagnostic trouble codes read out when the diagnostic tool is used.

General Information:

- The data recording specifications of Toyota's airbag ECUs are divided into the following categories. The specifications for 12EDR or later are designed to be compatible with NHTSA's 49CFR Part 563 rule.
  - 00EDR / 02EDR / 04EDR / 06EDR / 10EDR / 12EDR / 13EDR / 15EDR / 17EDR
- The airbag ECU records data for all or some of the following accident types: frontal crash, rear crash , side crash, and rollover events. Depending on the installed airbag ECU, data for side crash and/or rollover events may not be recorded.
- This airbag ECU records record pre-crash data and post-crash data.
  - If a single event occurs independently, the data for that event is recorded on a one-to-one basis.
  - If multiple events occur successively (within a period of approximately 500ms), the establishment of the recording trigger for the first event is defined as the "pre-crash recording trigger". Pre-crash data for the first event and post-crash data for each successive event is then recorded.
- The airbag ECU has two recording pages (memory maps) to store pre-crash data. Additionally, to store post-crash data, the airbag ECU has two recording pages for each accident type: two pages for frontal and rear crash, two pages for a side crash, and two pages for rollover event.
- The data recorded by the airbag ECU includes correlating information between each previously occurring event (i.e., information that clarifies the collision event sequence. This correlation information consists of the following items.
  - Time from Previous Pre-Crash TRG
  - Linked Pre-Crash Page
  - Time from Pre-Crash TRG
  - TRG Count
  - Previous Crash Type

- In frontal and rear collision events, the first point where a longitudinal cumulative delta-V of over 0.8 km/h (0.5 mph) is reached is regarded as time zero for the recorded data. In side impact collision and rollover events, the point in time at which the recording trigger is established is regarded as time zero for the recorded data.
- The recording trigger judgment threshold value differs depending on the collision type (i.e., frontal crash, rear crash, side crash, or rollover event).
- Some of the data recorded by the airbag ECU is transmitted to the airbag ECU from various vehicle control modules by the vehicle's Controller Area Network (CAN).
- In some cases, the airbag ECU part number printed on the ECU label may not match the airbag ECU part number that the CDR tool reports. The part number retrieved by the CDR tool should be considered as the official ECU part number.
- In frontal and rear collision events, the record time varies depending on the period during which a longitudinal cumulative delta-V of over 0.8 km/h (0.5 mph) is reached, and time series data is recorded for up to 250 ms. The record time descr bed above is indicated as "Length of Delta-V". "Delta-V, Longitudinal" outside the record time is indicated by area shaded in the table, and not indicated in the graph.

Data Element Sign Convention:
The following table provides an explanation of the sign notation for data elements that may be included in this CDR report.

Data Element Name	Positive Sign Notation Indicates
Maximum Delta-V, Longitudinal	Forward
Delta-V, Longitudinal	Forward
Lateral Acceleration for Frontal/Rear Crash, Floor Sensor	Left to Right
Lateral Acceleration, Side Satellite Sensor 1	Left to Right
Lateral Acceleration, Side Satellite Sensor 2	Left to Right
Lateral Acceleration, Side Satellite Sensor 3	Left to Right
Lateral Acceleration, Side Satellite Sensor 4	Left to Right
Lateral Acceleration for Side Crash, Floor Sensor	Left to Right
Roll Angle Peak	Clockwise Rotation
Roll Angle at the Time of TRG	Clockwise Rotation
Roll Rate	Clockwise Rotation
Lateral Acceleration for Rollover, Floor Sensor	Left to Right
Longitudinal Acceleration , VSC Sensor	Forward
Yaw Rate	Left Turn
Steering Input	Left Turn

Data Definitions:
1)
- The "ON" setting for the "Freeze Signal" indicates a state in which the non-volatile memory can not be overwritten or deleted by the airbag ECU. After "Freeze Signal" has been turned ON, subsequent events will not be recorded.
- "Recording Status" indicates a state in which all recorded event data has been written into the non-volatile memory, or a state in which this process was interrupted and not fully written into the non-volatile memory. If "Recording Status" is "Incomplete", recorded event data may not be valid.
- If the "Occupant Size Classification, Front Passenger" displays "Child" or "Not Occupied", "Side Air Bag Deployment, Time to Deploy" and "Pretensioner Deployment, Time to Fire" may indicate a time even if deployment did not occur on the for following part no's:
  - 89170-07280, 35400, 35410, 35470, 42660, 0R120, 0R080, 0R081, 0R150
- "Engine RPM" indicates the number of engine revolutions, not the number of motor revolutions. The recorded value has an upper limit of 12,800 rpm. Resolution is 100 rpm and the value is rounded down and recorded. For example, if the actual engine speed is 799 rpm, the recorded value will be 700 rpm.
- If the electric vehicle is using a calculated/virtual engine RPM for drivetrain control, "Engine RPM" may be recorded, but should not be used during data analysis.
- The upper limit for the recorded "Vehicle Speed" value is 200 km/h (125mph). Resolution is 1km/h (0.6mph) and the value is rounded down and recorded. The accuracy of the "Vehicle Speed" value can be affected by various factors. These include, but not limited, to the following.
  - Significant changes in the tire's rolling radius
  - Wheel lock and wheel slip
- "Accelerator Pedal" has two recording specifications. Both the recorded value increases as the driver depresses the accelerator.
  - Percentage of accelerator pedal depressed (recorded as 0-100(%)).
  - Output voltage of accelerator pedal module (recorded as 0-5(V)).
- If M/T transmission vehicle of some limited model, "Shift Position" may display "Drive" regardless of the actual shift position.
- Depending on the type of occupant sensor installed in the vehicle, one of the following three recording formats for "Occupant Size Classification, Front Passenger" will be utilized.
  - Occupied / Not Occupied
  - AM50 / AF05 / Child / Not Occupied
  - AM50 / AF05 / Child or Not Occupied
- "Cruise Control Status" indicates whether the cruise control system is actuated or not. OFF indicates that the cruise control system is not actuated, but can also indicates that the vehicle is not equipped with the system.
- "Air Bag Warning Lamp, On/Off", "Ignition Cycle, Crash", "Seat Track Position Switch, Foremost, Status, Driver", "Occupant Size Classification, Front Passenger", "Safety Belt Status, Driver", "Safety Belt Status, Front Passenger", "Frontal Air Bag Suppression Switch Status, Front Passenger", and "RSCA Disable Switch" indicate the state approximately 1 second before time zero. They may not always indicate the state at the moment of collision.
- The upper and lower limits for the recorded value of "Motor RPM" is 17,500 rpm and -7,500 rpm respectively. Resolution is 100 rpm and the value is rounded down and recorded.
- "Brake Oil Pressure" has an upper limit of 12.14 Mpa. In the case of the vehicle that has not VSC system, "0 Mpa" or "Invalid" may be displayed.
- "Longitudinal Acceleration , VSC Sensor" has upper and lower limits for the recorded value of 8.973 m/s^2 and -8.973 m/s^2 respectively. This acceleration sensor does not sense collisions.

- "Sequential Shift Range" displaying "Undetermined" indicates the shift range is undetermined or was not being used.
- Some vehicles will not be equipped with all "Drive Mode" types indicated in the "Drive Mode" table. If some or all drive modes are not applicable to vehicle, "OFF" or "Invalid" may be displayed. The item in the "Drive Mode" table may not match the name of switch or indicator that equipped the vehicle.
- The upper and lower limits for the recorded value of "Steering Input" is 375 deg and -375 deg respectively. Resolution is 1.5 deg and the value is rounded down and recorded.
- Resolution of the "Air Bag Warning Lamp ON Time Since DTC was Set" is 15 minutes, and the value is rounded down and recorded.
- "Delta-V, Longitudinal" indicates the change in forward speed after time zero. This does not refer to vehicle speed, and it does not include the change in speed during the period from the start of the actual collision to establishment of the time zero.
- "Location of Side Satellite Sensor" shows the outline of a typical sensor position. Sensory location can be confirmed using the repair manual.
- "Time from Previous Pre-Crash TRG" indicates the time between the establishment of an event's pre-crash recording trigger to the establishment of a more recent event's pre-crash recording trigger. The upper limit for the recorded value is 16,381 milliseconds. In the event of establishment of the first pre-crash recording trigger after the ignition is switched ON, the upper limit value(max value) is recorded.
- "TRG Count" indicates a calculated value of the number of times recording triggers have been established for all crash types. The sequence in which each event occurred can be verified from the "TRG Count". The smaller the "TRG Count" value, the older the data. The upper limit for the recorded value is 65,533 times. When more than one event reaches the upper limit, the actual "TRG Count" may be greater than what is displayed for that event.
- "Linked Pre-Crash Page" is used to link 'paged" pre-crash data with 'paged" post-crash data. When old pre-crash data is overwritten by new pre-crash data, the "Linked Pre-Crash Page" value may record a page number that is not actually linked.
- Resolution of the "Time from Pre-Crash to TRG" is 50 [ms], and the value is rounded up and recorded.
- "Roll Angle at the Time of TRG" and "Roll Angle Peak" do not represent the actual roll angle of the vehicle. These values are used internally by the airbag ECU for sensing a rollover.

05013_ToyotaS00std_r026

System Status at Time of Retrieval

ECU Part Number	89170-0R191
EDR Generation	13EDR
Complete File Recorded	Yes
Freeze Signal	OFF
Freeze Signal Factor	None
Diagnostic Trouble Codes Exist	No
Ignition Cycle ,Download (times)	3170
Multi-event, number of events (times)	2 or greater
Time from event 1 to 2 (s)	0.13
Time from Previous Pre Crash TRG (msec)	16381 or greater
Latest Pre-Crash Page	1
Contains Unlinked Pre-Crash Data	No

Event Record Summary at Retrieval

Events Recorded	TRG Count	Crash Type	Time (msec)	Pre-Crash & DTC Data Recording Status	Event & Crash Pulse Data Recording Status
Most Recent Event	7	Side Crash	0	Complete (Page 1)	Complete (Side Page 1)
1st Prior Event	6	Side Crash	-130	Complete (Page 1)	Complete (Side Page 0)
2nd Prior Event	5	Front/Rear Crash	-187	Complete (Page 1)	Complete (Front/Rear Page 0)
3rd Prior Event	4	Rollover	-143	Complete (Page 1)	Complete (Rollover Page 1)
4th Prior Event	3	Rollover	-16381 or greater	Complete (Page 0)	Complete (Rollover Page 0)

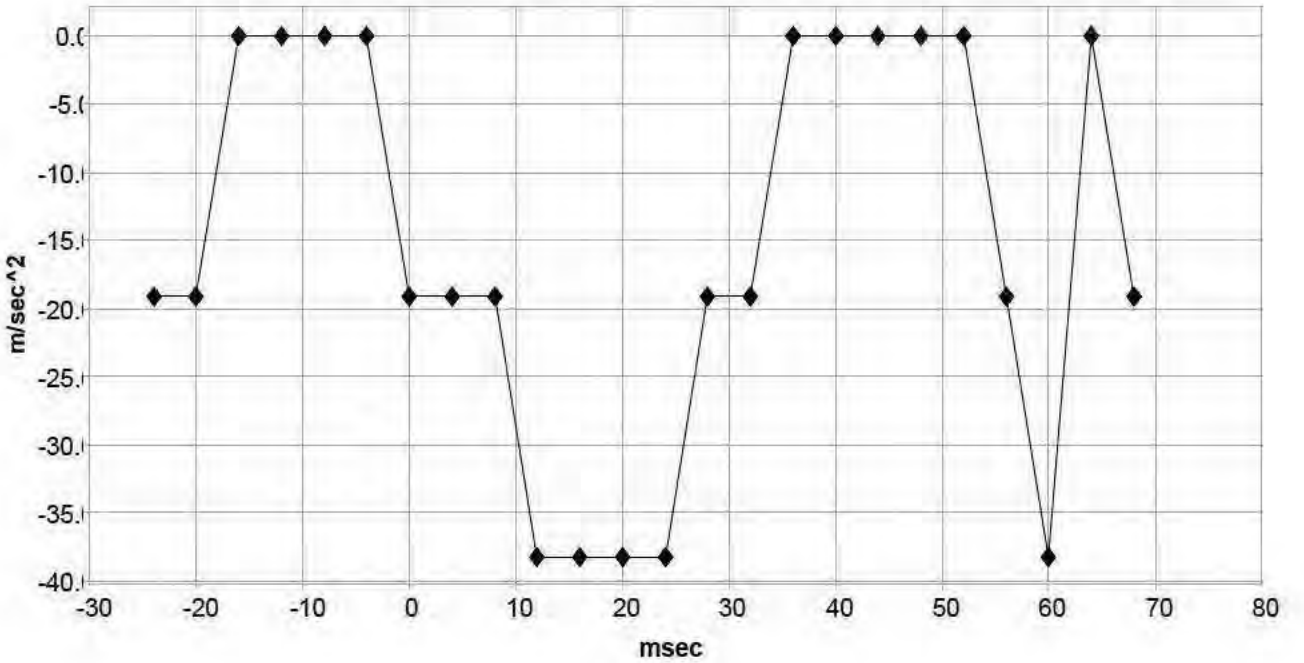
System Status at Event (Most Recent Event, TRG 7)

Recording Status, Side Crash Info.	Complete
Crash Type	Side Crash
TRG Count (times)	7
Previous Crash Type	Side Crash
Time from Pre-Crash TRG (msec)	143
Linked Pre-Crash Page	1
Side Airbag Deployment, Time to Deploy (If Equipped) (msec)	No
Side Curtain Airbag Deployment, Time to Deploy (If Equipped) (msec)	No
Pretensioner Deployment, Time to Fire (msec)	No
Rear Window Airbag Deployment, Time to Deploy (msec)	SNA

Lateral Crash Pulse (Most Recent Event, TRG 7 - table 1 of 2)

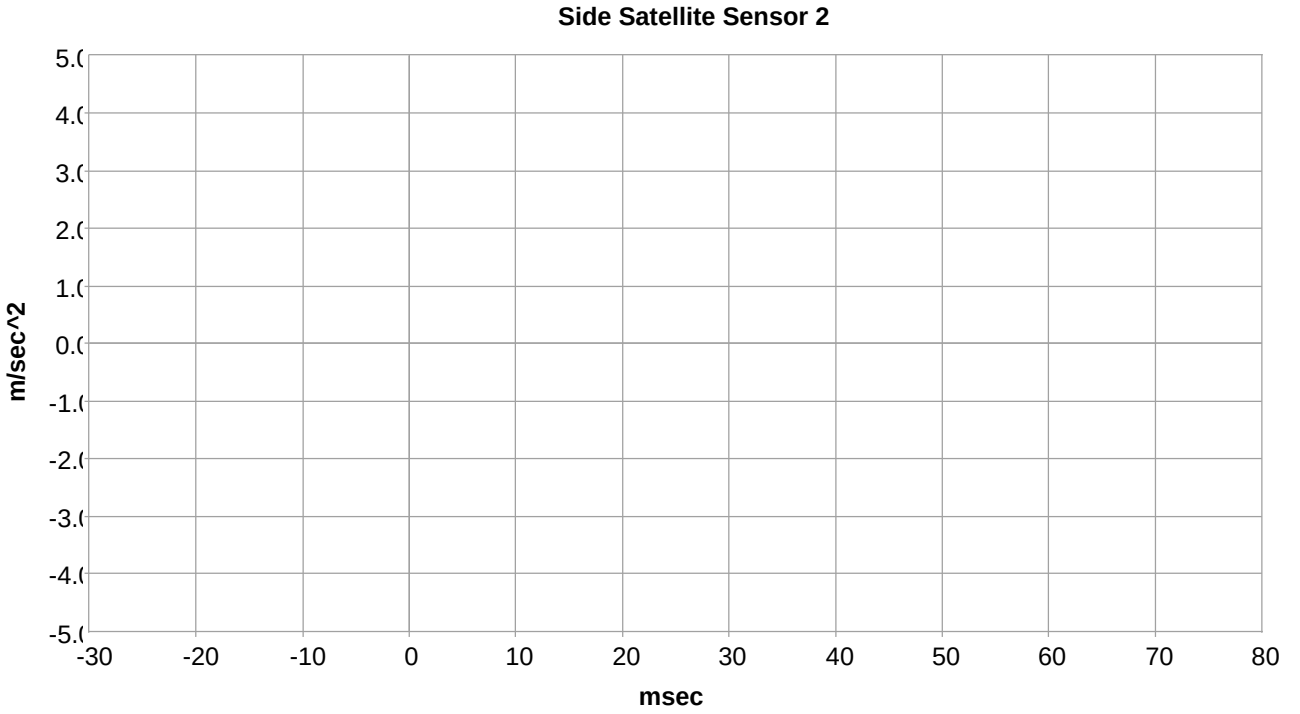
Recording Status, Time Series Data	Complete
Recorded Side	Right Side
Time from TRG to Next Sample (msec)	0
Location of Side Satellite Sensor 1	Front Door
Location of Side Satellite Sensor 2	Not Equipped
Location of Side Satellite Sensor 3	Not Equipped
Location of Side Satellite Sensor 4	C-Pillar
Location of Floor Sensor	Airbag ECU
Clipping Time of Lateral Acceleration, Side Satellite Sensor 1 (msec)	No
Clipping Time of Lateral Acceleration, Side Satellite Sensor 2 (msec)	SNA
Clipping Time of Lateral Acceleration, Side Satellite Sensor 3 (msec)	SNA
Clipping Time of Lateral Acceleration, Side Satellite Sensor 4 (msec)	No
Clipping Time of Lateral Acceleration, Floor Sensor (msec)	No

Side Satellite Sensor 1



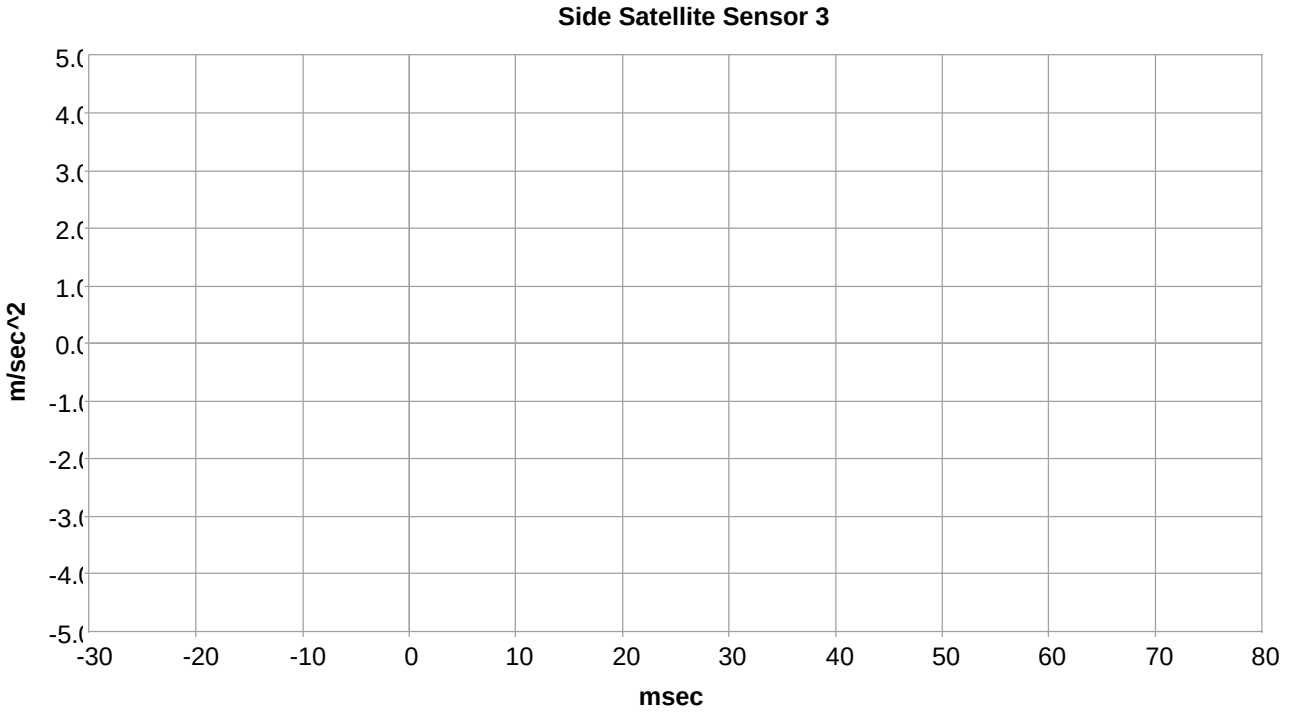
Deployment Time Marker Key

1	Driver/Passenger Pretensioner
2	Side Airbag
3	Rear Window Airbag Deployment Time



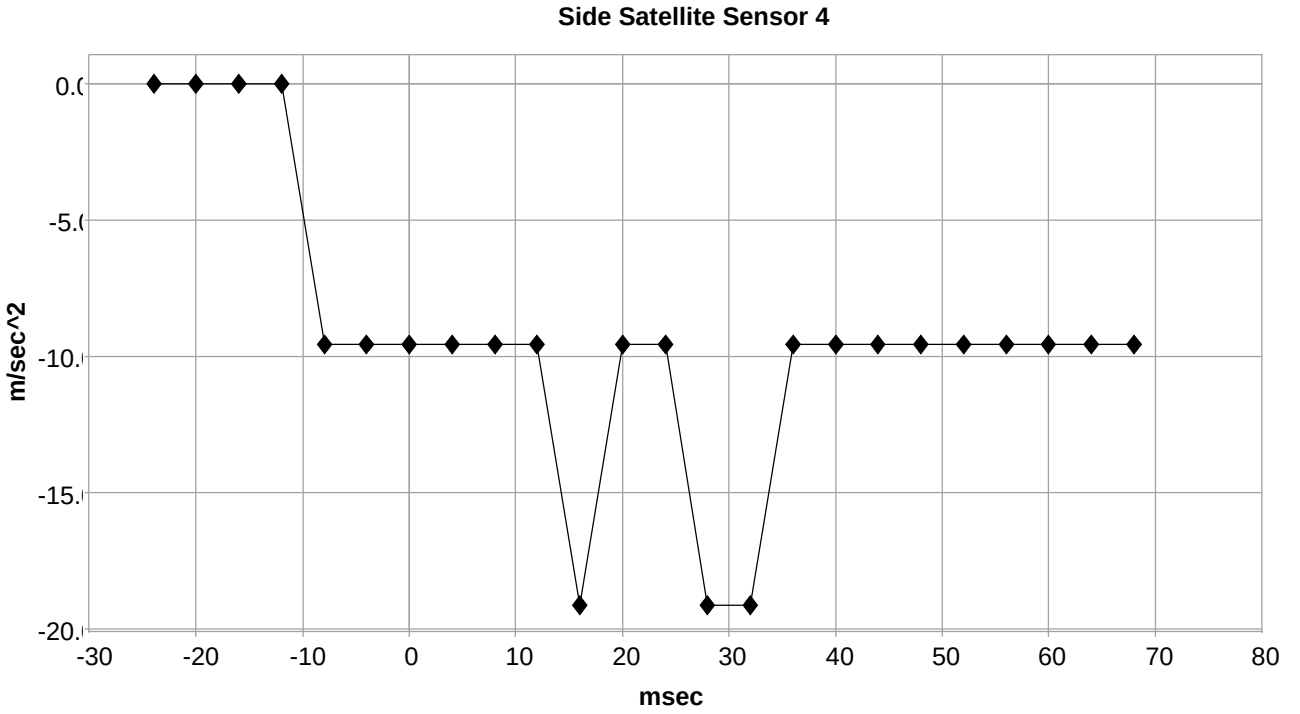
Deployment Time Marker Key

1	Driver/Passenger Pretensioner
2	Side Airbag
3	Rear Window Airbag Deployment Time



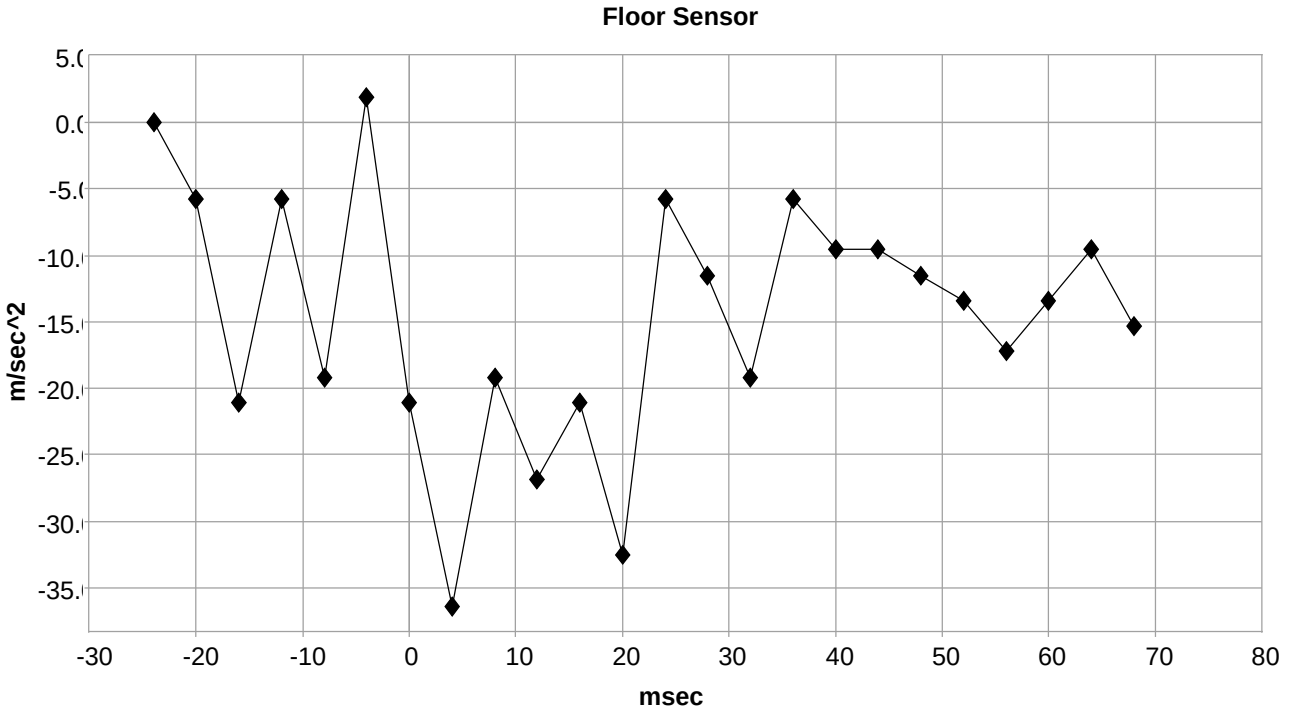
Deployment Time Marker Key

1	Side Curtain Airbag



Deployment Time Marker Key

1	Side Curtain Airbag



Deployment Time Marker Key

1	Driver/Passenger Pretensioner
2	Side Airbag
3	Rear Window Airbag Deployment Time
4	Side Curtain Airbag

Lateral Crash Pulse (Most Recent Event, TRG 7 - table 2 of 2)

Time (msec)	Lateral Acceleration, Side Satellite Sensor 1 (m/sec^2)	Lateral Acceleration, Side Satellite Sensor 2 (m/sec^2)	Lateral Acceleration, Side Satellite Sensor 3 (m/sec^2)	Lateral Acceleration, Side Satellite Sensor 4 (m/sec^2)	Lateral Acceleration for Side Crash, Floor Sensor (m/sec^2)
-24	-19.2	SNA	SNA	0.0	0.0
-20	-19.2	SNA	SNA	0.0	-5.7
-16	0.0	SNA	SNA	0.0	-21.1
-12	0.0	SNA	SNA	0.0	-5.7
-8	0.0	SNA	SNA	-9.6	-19.2
-4	0.0	SNA	SNA	-9.6	1.9
0	-19.2	SNA	SNA	-9.6	-21.1
4	-19.2	SNA	SNA	-9.6	-36.4
8	-19.2	SNA	SNA	-9.6	-19.2
12	-38.3	SNA	SNA	-9.6	-26.8
16	-38.3	SNA	SNA	-19.2	-21.1
20	-38.3	SNA	SNA	-9.6	-32.6
24	-38.3	SNA	SNA	-9.6	-5.7
28	-19.2	SNA	SNA	-19.2	-11.5
32	-19.2	SNA	SNA	-19.2	-19.2
36	0.0	SNA	SNA	-9.6	-5.7
40	0.0	SNA	SNA	-9.6	-9.6
44	0.0	SNA	SNA	-9.6	-9.6
48	0.0	SNA	SNA	-9.6	-11.5
52	0.0	SNA	SNA	-9.6	-13.4
56	-19.2	SNA	SNA	-9.6	-17.2
60	-38.3	SNA	SNA	-9.6	-13.4
64	0.0	SNA	SNA	-9.6	-9.6
68	-19.2	SNA	SNA	-9.6	-15.3

DTCs Present at Time of Event (Most Recent Event, TRG 7)

Recording Status, Diagnostic	Complete
Ignition Cycle Since DTC was Set (times)	0
Airbag Warning Lamp ON Time Since DTC was Set (min)	0
Diagnostic Trouble Codes	None

Pre-Crash Data, 1 Sample (Most Recent Event, TRG 7)

Recording Status, Pre-Crash/Occupant	Complete
Time from Pre-Crash to TRG (msec)	350
TRG Count when Pre-crash TRG was Established (times)	4
Safety Belt Status, Driver	ON
Safety Belt Status, Front Passenger	OFF
Occupant Size Classification, Front Passenger	Child or Not Occupied
Frontal Airbag Suppression Switch Status, Front Passenger	SNA
RSCA Disable Switch	SNA
Seat Track Position Switch, Foremost, Status, Driver	No
Airbag Warning Lamp, On/Off	OFF
Ignition Cycle ,Crash (times)	3142

Pre-Crash Data, -5 to 0 seconds (Most Recent Event, TRG 7)

Time (sec)	-4.85	-4.35	-3.85	-3.35	-2.85	-2.35	-1.85	-1.35	-0.85	-0.35	0 (TRG)
Vehicle Speed (MPH [km/h])	94.4 [152]	94.4 [152]	93.8 [151]	93.2 [150]	92.6 [149]	87.6 [141]	77.1 [124]	67.7 [109]	55.9 [90]	31.1 [50]	29.8 [48]
Accelerator Pedal, % Full (%)	25.5	16.0	36.5	19.5	0.0	0.0	0.0	0.0	0.0	0.0	0.0
Percentage of Engine Throttle (%)	20.5	13.5	34.0	10.5	0.0	0.0	0.0	0.0	0.0	0.0	0.0
Engine RPM (RPM)	3,300	3,300	2,900	2,800	2,800	2,500	1,900	1,400	1,400	1,000	900
Motor RPM (RPM)	Invalid	Invalid	Invalid	Invalid	Invalid	Invalid	Invalid	Invalid	Invalid	Invalid	Invalid
Service Brake, ON/OFF	OFF	OFF	OFF	OFF	ON	ON	ON	ON	ON	ON	ON
Brake Oil Pressure (Mpa)	0.00	0.00	0.00	0.00	0.96	6.62	10.32	8.88	12.14	12.14	12.14
Longitudinal Acceleration , VSC Sensor (m/sec^2)	0.000	0.000	-0.287	-0.502	-1.292	-1.723	-2.656	-4.163	-1.507	-1.866	-8.973
Yaw Rate (deg/sec)	-0.49	0.00	-0.49	0.00	-0.49	15.62	26.84	42.46	35.62	25.86	35.62
Steering Input (degrees)	-3.0	-3.0	-1.5	-3.0	-3.0	43.5	-10.5	-90.0	-105.0	-103.5	-100.5
Shift Position	D	D	D	D	D	D	D	D	D	D	D
Sequential Shift Range	Undetermined	Undetermined	Undetermined	Undetermined	Undetermined	Undetermined	Undetermined	Undetermined	Undetermined	Undetermined	Undetermined
Cruise Control Status	OFF	OFF	OFF	OFF	OFF	OFF	OFF	OFF	OFF	OFF	OFF
Drive Mode, PWR	OFF	OFF	OFF	OFF	OFF	OFF	OFF	OFF	OFF	OFF	OFF
Drive Mode, ECO	OFF	OFF	OFF	OFF	OFF	OFF	OFF	OFF	OFF	OFF	OFF
Drive Mode, Sport	OFF	OFF	OFF	OFF	OFF	OFF	OFF	OFF	OFF	OFF	OFF
Drive Mode, Snow	OFF	OFF	OFF	OFF	OFF	OFF	OFF	OFF	OFF	OFF	OFF
Drive Mode, EV	Invalid	Invalid	Invalid	Invalid	Invalid	Invalid	Invalid	Invalid	Invalid	Invalid	Invalid

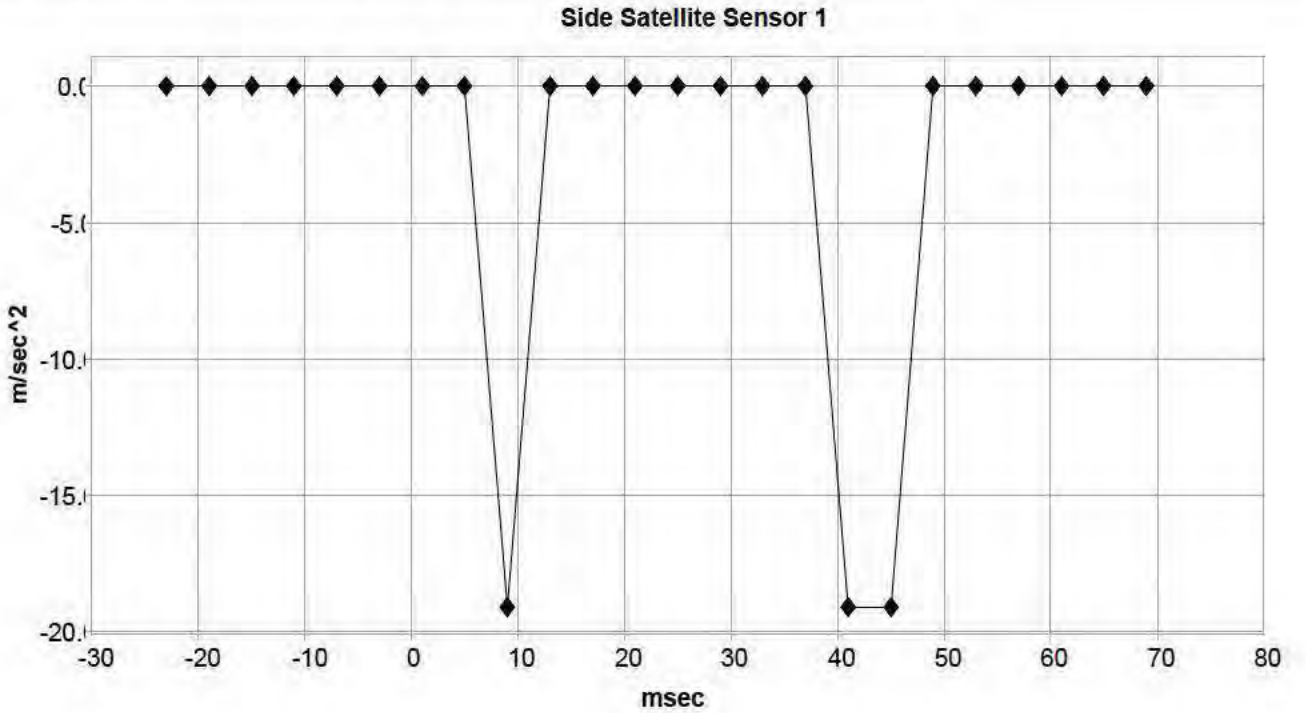
Fuel Injection Quantity (mm3/st)	Invalid	Invalid	Invalid	Invalid	Invalid	Invalid	Invalid	Invalid	Invalid	Invalid	Invalid

System Status at Event (1st Prior Event, TRG 6)

Recording Status, Side Crash Info.	Complete
Crash Type	Side Crash
TRG Count (times)	6
Previous Crash Type	Front/Rear Crash
Time from Pre-Crash TRG (msec)	13
Linked Pre-Crash Page	1
Side Airbag Deployment, Time to Deploy (If Equipped) (msec)	No
Side Curtain Airbag Deployment, Time to Deploy (If Equipped) (msec)	No
Pretensioner Deployment, Time to Fire (msec)	No
Rear Window Airbag Deployment, Time to Deploy (msec)	SNA

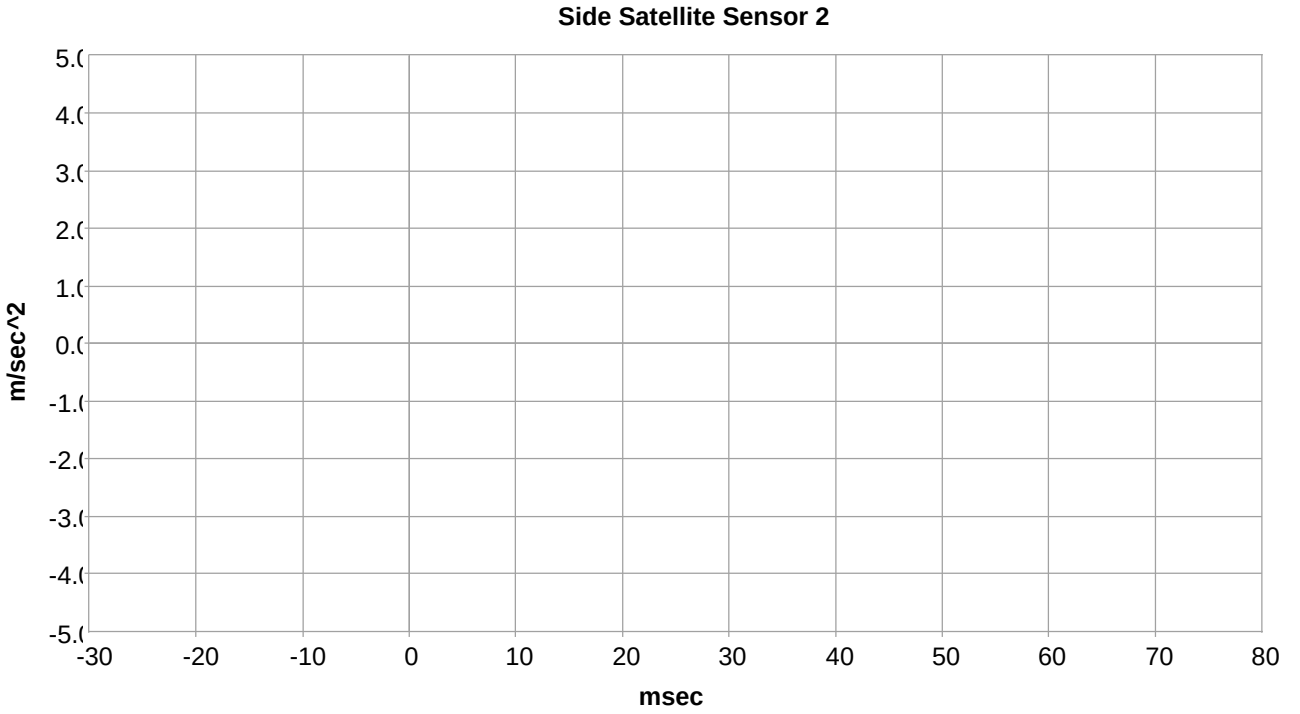
Lateral Crash Pulse (1st Prior Event, TRG 6 - table 1 of 2)

Recording Status, Time Series Data	Complete
Recorded Side	Right Side
Time from TRG to Next Sample (msec)	1
Location of Side Satellite Sensor 1	Front Door
Location of Side Satellite Sensor 2	Not Equipped
Location of Side Satellite Sensor 3	Not Equipped
Location of Side Satellite Sensor 4	C-Pillar
Location of Floor Sensor	Airbag ECU
Clipping Time of Lateral Acceleration, Side Satellite Sensor 1 (msec)	No
Clipping Time of Lateral Acceleration, Side Satellite Sensor 2 (msec)	SNA
Clipping Time of Lateral Acceleration, Side Satellite Sensor 3 (msec)	SNA
Clipping Time of Lateral Acceleration, Side Satellite Sensor 4 (msec)	No
Clipping Time of Lateral Acceleration, Floor Sensor (msec)	No



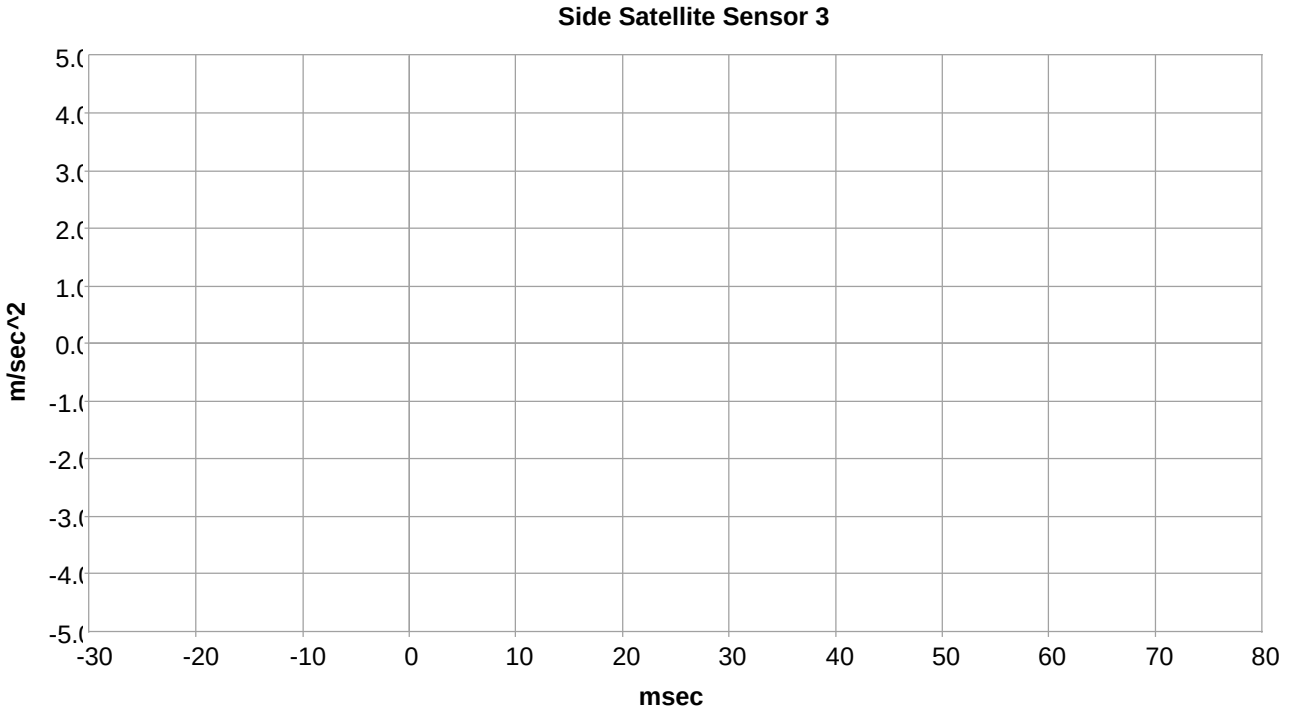
Deployment Time Marker Key

1	Driver/Passenger Pretensioner
2	Side Airbag
3	Rear Window Airbag Deployment Time



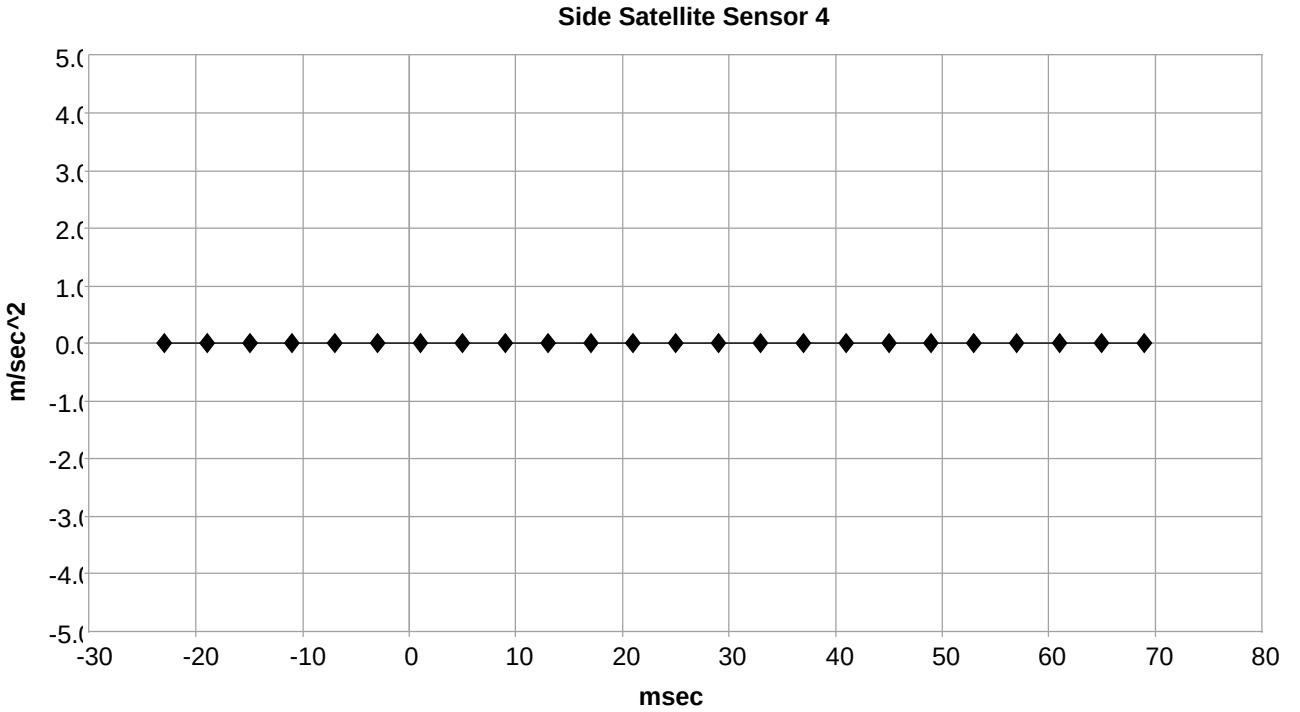
Deployment Time Marker Key

1	Driver/Passenger Pretensioner
2	Side Airbag
3	Rear Window Airbag Deployment Time



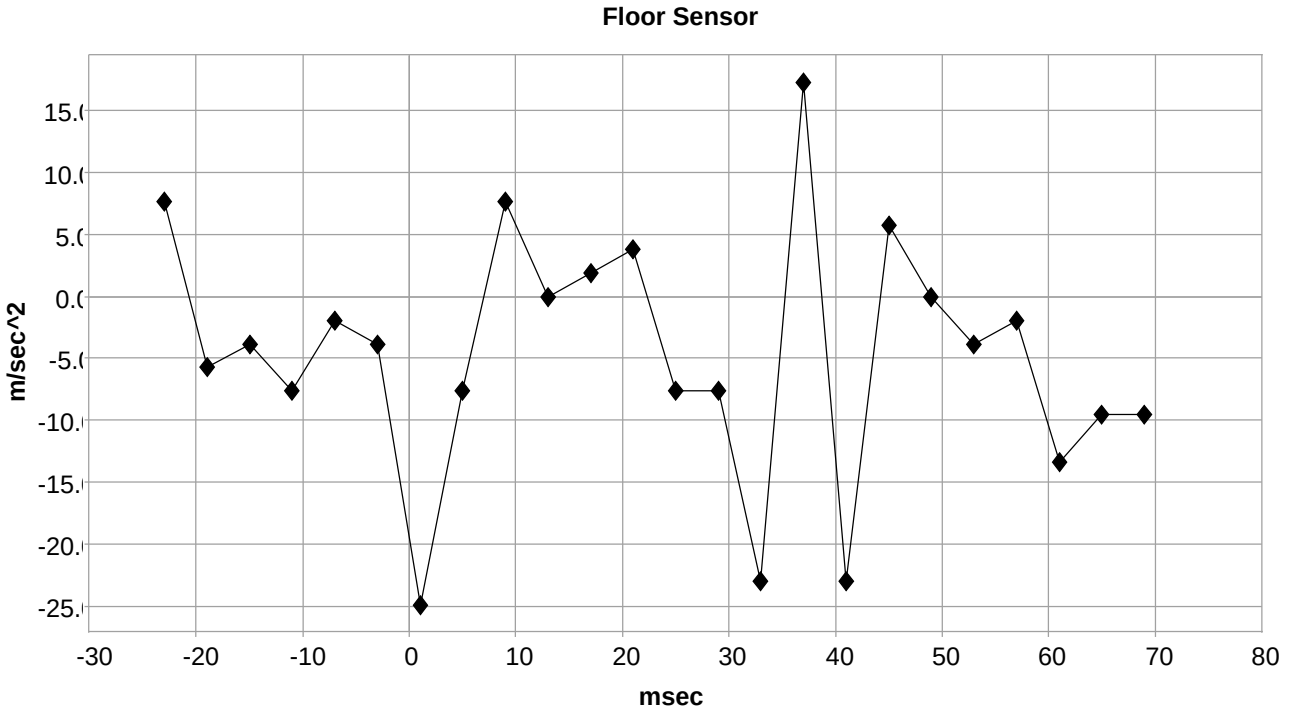
Deployment Time Marker Key

1	Side Curtain Airbag



Deployment Time Marker Key

1	Side Curtain Airbag



Deployment Time Marker Key

1	Driver/Passenger Pretensioner
2	Side Airbag
3	Rear Window Airbag Deployment Time
4	Side Curtain Airbag

Lateral Crash Pulse (1st Prior Event, TRG 6 - table 2 of 2)

Time (msec)	Lateral Acceleration, Side Satellite Sensor 1 (m/sec^2)	Lateral Acceleration, Side Satellite Sensor 2 (m/sec^2)	Lateral Acceleration, Side Satellite Sensor 3 (m/sec^2)	Lateral Acceleration, Side Satellite Sensor 4 (m/sec^2)	Lateral Acceleration for Side Crash, Floor Sensor (m/sec^2)
-23	0.0	SNA	SNA	0.0	7.7
-19	0.0	SNA	SNA	0.0	-5.7
-15	0.0	SNA	SNA	0.0	-3.8
-11	0.0	SNA	SNA	0.0	-7.7
-7	0.0	SNA	SNA	0.0	-1.9
-3	0.0	SNA	SNA	0.0	-3.8
1	0.0	SNA	SNA	0.0	-24.9
5	0.0	SNA	SNA	0.0	-7.7
9	-19.2	SNA	SNA	0.0	7.7
13	0.0	SNA	SNA	0.0	0.0
17	0.0	SNA	SNA	0.0	1.9
21	0.0	SNA	SNA	0.0	3.8
25	0.0	SNA	SNA	0.0	-7.7
29	0.0	SNA	SNA	0.0	-7.7
33	0.0	SNA	SNA	0.0	-23.0
37	0.0	SNA	SNA	0.0	17.2
41	-19.2	SNA	SNA	0.0	-23.0
45	-19.2	SNA	SNA	0.0	5.7
49	0.0	SNA	SNA	0.0	0.0
53	0.0	SNA	SNA	0.0	-3.8
57	0.0	SNA	SNA	0.0	-1.9
61	0.0	SNA	SNA	0.0	-13.4
65	0.0	SNA	SNA	0.0	-9.6
69	0.0	SNA	SNA	0.0	-9.6

DTCs Present at Time of Event (1st Prior Event, TRG 6)

Recording Status, Diagnostic	Complete
Ignition Cycle Since DTC was Set (times)	0
Airbag Warning Lamp ON Time Since DTC was Set (min)	0
Diagnostic Trouble Codes	None

Pre-Crash Data, 1 Sample (1st Prior Event, TRG 6)

Recording Status, Pre-Crash/Occupant	Complete
Time from Pre-Crash to TRG (msec)	350
TRG Count when Pre-crash TRG was Established (times)	4
Safety Belt Status, Driver	ON
Safety Belt Status, Front Passenger	OFF
Occupant Size Classification, Front Passenger	Child or Not Occupied
Frontal Airbag Suppression Switch Status, Front Passenger	SNA
RSCA Disable Switch	SNA
Seat Track Position Switch, Foremost, Status, Driver	No
Airbag Warning Lamp, On/Off	OFF
Ignition Cycle ,Crash (times)	3142

Pre-Crash Data, -5 to 0 seconds (1st Prior Event, TRG 6)

Time (sec)	-4.85	-4.35	-3.85	-3.35	-2.85	-2.35	-1.85	-1.35	-0.85	-0.35	0 (TRG)
Vehicle Speed (MPH [km/h])	94.4 [152]	94.4 [152]	93.8 [151]	93.2 [150]	92.6 [149]	87.6 [141]	77.1 [124]	67.7 [109]	55.9 [90]	31.1 [50]	29.8 [48]
Accelerator Pedal, % Full (%)	25.5	16.0	36.5	19.5	0.0	0.0	0.0	0.0	0.0	0.0	0.0
Percentage of Engine Throttle (%)	20.5	13.5	34.0	10.5	0.0	0.0	0.0	0.0	0.0	0.0	0.0
Engine RPM (RPM)	3,300	3,300	2,900	2,800	2,800	2,500	1,900	1,400	1,400	1,000	900
Motor RPM (RPM)	Invalid	Invalid	Invalid	Invalid	Invalid	Invalid	Invalid	Invalid	Invalid	Invalid	Invalid
Service Brake, ON/OFF	OFF	OFF	OFF	OFF	ON	ON	ON	ON	ON	ON	ON
Brake Oil Pressure (Mpa)	0.00	0.00	0.00	0.00	0.96	6.62	10.32	8.88	12.14	12.14	12.14
Longitudinal Acceleration , VSC Sensor (m/sec^2)	0.000	0.000	-0.287	-0.502	-1.292	-1.723	-2.656	-4.163	-1.507	-1.866	-8.973
Yaw Rate (deg/sec)	-0.49	0.00	-0.49	0.00	-0.49	15.62	26.84	42.46	35.62	25.86	35.62
Steering Input (degrees)	-3.0	-3.0	-1.5	-3.0	-3.0	43.5	-10.5	-90.0	-105.0	-103.5	-100.5
Shift Position	D	D	D	D	D	D	D	D	D	D	D
Sequential Shift Range	Undetermined	Undetermined	Undetermined	Undetermined	Undetermined	Undetermined	Undetermined	Undetermined	Undetermined	Undetermined	Undetermined
Cruise Control Status	OFF	OFF	OFF	OFF	OFF	OFF	OFF	OFF	OFF	OFF	OFF
Drive Mode, PWR	OFF	OFF	OFF	OFF	OFF	OFF	OFF	OFF	OFF	OFF	OFF
Drive Mode, ECO	OFF	OFF	OFF	OFF	OFF	OFF	OFF	OFF	OFF	OFF	OFF
Drive Mode, Sport	OFF	OFF	OFF	OFF	OFF	OFF	OFF	OFF	OFF	OFF	OFF
Drive Mode, Snow	OFF	OFF	OFF	OFF	OFF	OFF	OFF	OFF	OFF	OFF	OFF
Drive Mode, EV	Invalid	Invalid	Invalid	Invalid	Invalid	Invalid	Invalid	Invalid	Invalid	Invalid	Invalid

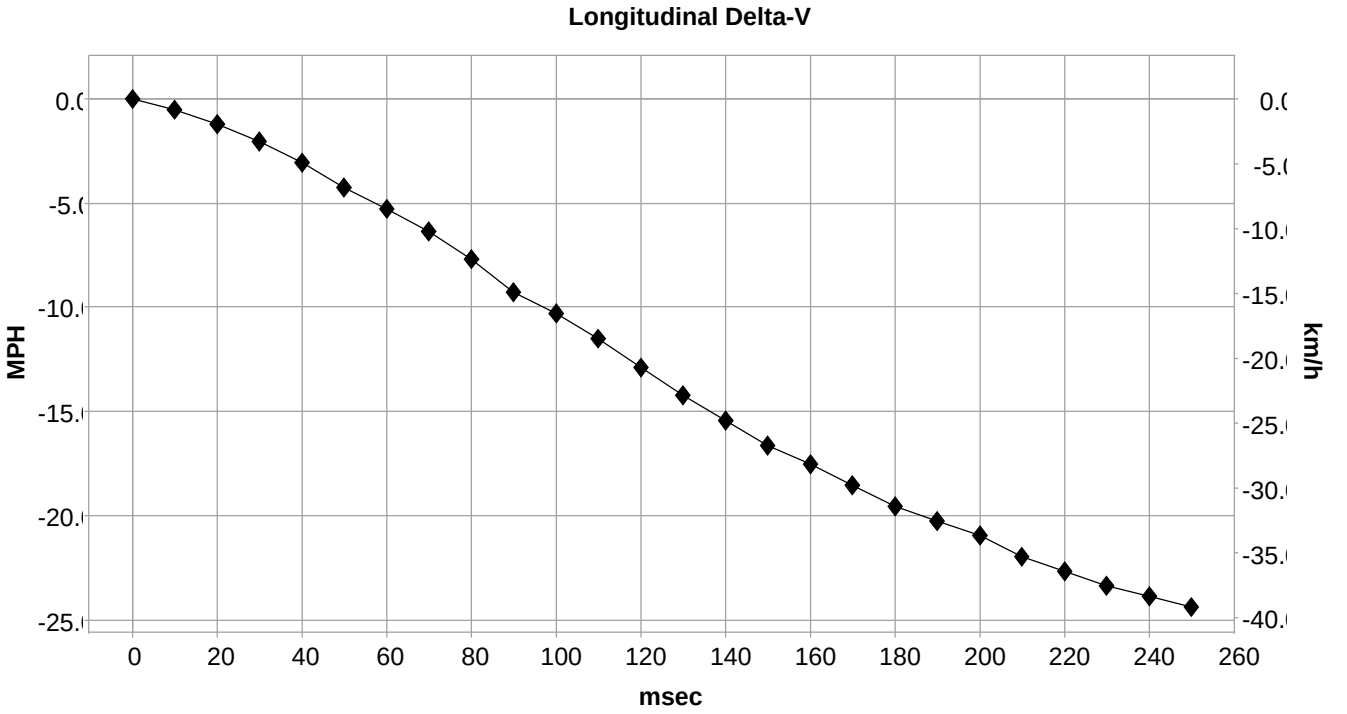
Fuel Injection Quantity (mm3/st)	Invalid	Invalid	Invalid	Invalid	Invalid	Invalid	Invalid	Invalid	Invalid	Invalid	Invalid

System Status at Event (2nd Prior Event, TRG 5)

Recording Status, Front/Rear Crash Info.	Complete
Crash Type	Front/Rear Crash
TRG Count (times)	5
Previous Crash Type	Rollover
Time from Pre-Crash TRG (msec)	9
Linked Pre-Crash Page	1
Frontal Airbag Deployment, Time to 1st Stage Deployment, Driver (msec)	No
Frontal Airbag Deployment, Time to 1st Stage Deployment, Front Passenger (msec)	No
Pretensioner Deployment, Time to Fire, Driver (msec)	No
Pretensioner Deployment, Time to Fire, Front Passenger (msec)	No
Frontal Airbag Deployment, Time to 2nd Stage, Driver (msec)	N/A
Frontal Airbag Deployment, Time to 2nd Stage, Front Passenger (msec)	N/A
Active Head Restraint, Time to Deploy, Driver (msec)	SNA
Active Head Restraint, Time to Deploy, Front Passenger (msec)	SNA
Side Curtain Airbag Deployment, Time to Deploy, Driver (msec)	No
Side Curtain Airbag Deployment, Time to Deploy, Passenger (msec)	No
Side Airbag Deployment, Time to Deploy, Driver (msec)	No
Side Airbag Deployment, Time to Deploy, Passenger (msec)	No
Rear Window Airbag Deployment, Time to Deploy (msec)	SNA

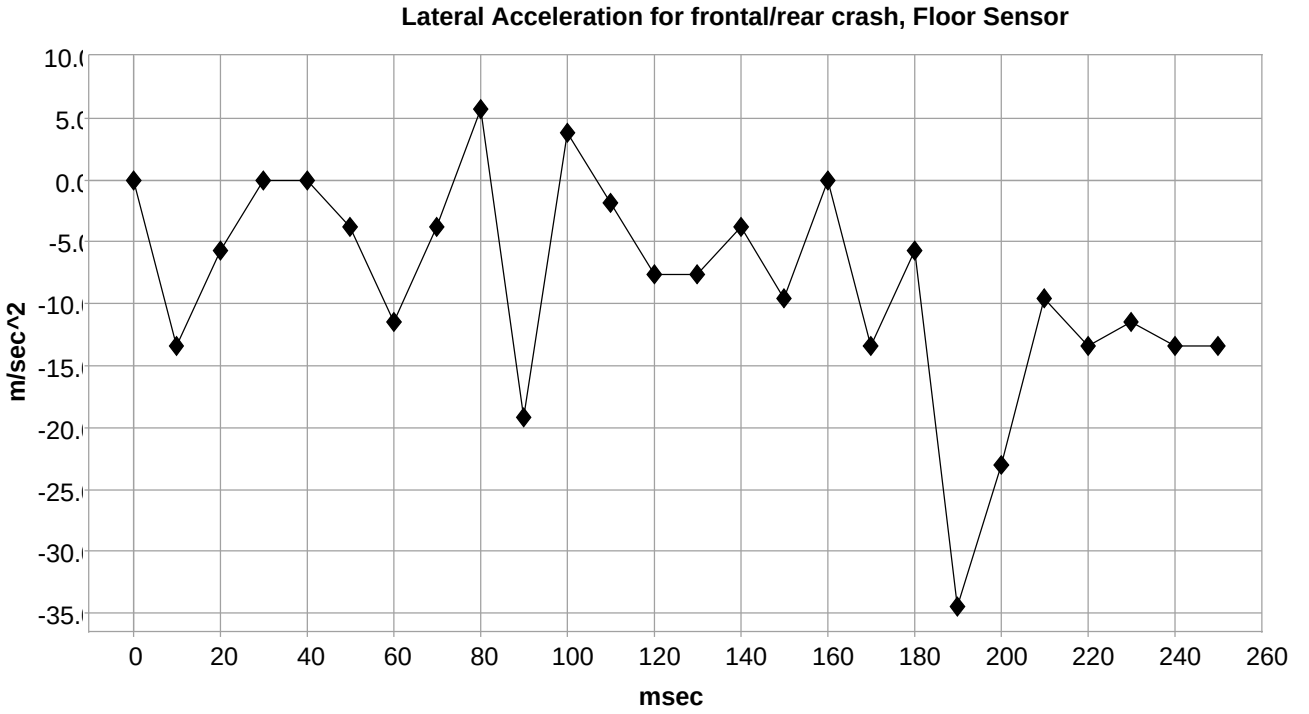
Longitudinal/Lateral Crash Pulse (2nd Prior Event, TRG 5 - table 1 of 2)

Recording Status, Time Series Data	Complete
Time from Time Zero to TRG (msec)	52.5
Length of Delta-V (msec)	250
Max. Longitudinal Delta-V (MPH [km/h])	-26.7 [-43.0]
Time, Maximum Delta-V, Longitudinal (msec)	297.5
Power Supply Status at Max. Delta-V	ON
Clipping Time of Longitudinal Delta-V (msec)	No
Clipping Time of Lateral Acceleration, Floor Sensor (msec)	No



Deployment Time Marker Key

1	Driver Airbag Deployment Time
2	Passenger Airbag Deployment Time
3	Driver/Passenger Pretensioner
4	Driver 2nd Stage Airbag Deployment Time
5	Passenger 2nd Stage Airbag Deployment
6	Driver/Passenger AHR
7	Driver CSA
8	Passenger CSA
9	Rear Window Airbag Deployment Time
10	Driver SAB
11	Passenger SAB



Deployment Time Marker Key

1	Driver Airbag Deployment Time
2	Passenger Airbag Deployment Time
3	Driver/Passenger Pretensioner
4	Driver 2nd Stage Airbag Deployment Time
5	Passenger 2nd Stage Airbag Deployment
6	Driver/Passenger AHR
7	Driver CSA
8	Passenger CSA
9	Rear Window Airbag Deployment Time
10	Driver SAB
11	Passenger SAB

Longitudinal/Lateral Crash Pulse (2nd Prior Event, TRG 5 - table 2 of 2)

Time (msec)	Longitudinal Delta-V (MPH [km/h])	Lateral Acceleration for Frontal/Rear Crash, Floor Sensor (m/sec^2)	Power Supply Status
0	0.0 [0.0]	0.0	ON
10	-0.5 [-0.8]	-13.4	ON
20	-1.2 [-1.9]	-5.7	ON
30	-2.1 [-3.3]	0.0	ON
40	-3.1 [-5.0]	0.0	ON
50	-4.3 [-6.9]	-3.8	ON
60	-5.3 [-8.6]	-11.5	ON
70	-6.3 [-10.2]	-3.8	ON
80	-7.7 [-12.4]	5.7	ON
90	-9.3 [-14.9]	-19.2	ON
100	-10.3 [-16.5]	3.8	ON
110	-11.5 [-18.5]	-1.9	ON
120	-12.9 [-20.7]	-7.7	ON
130	-14.2 [-22.9]	-7.7	ON
140	-15.4 [-24.8]	-3.8	ON
150	-16.6 [-26.8]	-9.6	ON
160	-17.5 [-28.1]	0.0	ON
170	-18.5 [-29.8]	-13.4	ON
180	-19.5 [-31.4]	-5.7	ON
190	-20.2 [-32.5]	-34.5	ON
200	-20.9 [-33.6]	-23.0	ON
210	-21.9 [-35.3]	-9.6	ON
220	-22.6 [-36.4]	-13.4	ON
230	-23.3 [-37.5]	-11.5	ON
240	-23.8 [-38.3]	-13.4	ON
250	-24.3 [-39.2]	-13.4	ON

DTCs Present at Time of Event (2nd Prior Event, TRG 5)

Recording Status, Diagnostic	Complete
Ignition Cycle Since DTC was Set (times)	0
Airbag Warning Lamp ON Time Since DTC was Set (min)	0
Diagnostic Trouble Codes	None

Pre-Crash Data, 1 Sample (2nd Prior Event, TRG 5)

Recording Status, Pre-Crash/Occupant	Complete
Time from Pre-Crash to TRG (msec)	350
TRG Count when Pre-crash TRG was Established (times)	4
Safety Belt Status, Driver	ON
Safety Belt Status, Front Passenger	OFF
Occupant Size Classification, Front Passenger	Child or Not Occupied
Frontal Airbag Suppression Switch Status, Front Passenger	SNA
RSCA Disable Switch	SNA
Seat Track Position Switch, Foremost, Status, Driver	No
Airbag Warning Lamp, On/Off	OFF
Ignition Cycle ,Crash (times)	3142

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

Time (sec)	-4.85	-4.35	-3.85	-3.35	-2.85	-2.35	-1.85	-1.35	-0.85	-0.35	0 (TRG)
Vehicle Speed (MPH [km/h])	94.4 [152]	94.4 [152]	93.8 [151]	93.2 [150]	92.6 [149]	87.6 [141]	77.1 [124]	67.7 [109]	55.9 [90]	31.1 [50]	29.8 [48]
Accelerator Pedal, % Full (%)	25.5	16.0	36.5	19.5	0.0	0.0	0.0	0.0	0.0	0.0	0.0
Percentage of Engine Throttle (%)	20.5	13.5	34.0	10.5	0.0	0.0	0.0	0.0	0.0	0.0	0.0
Engine RPM (RPM)	3,300	3,300	2,900	2,800	2,800	2,500	1,900	1,400	1,400	1,000	900
Motor RPM (RPM)	Invalid	Invalid	Invalid	Invalid	Invalid	Invalid	Invalid	Invalid	Invalid	Invalid	Invalid
Service Brake, ON/OFF	OFF	OFF	OFF	OFF	ON	ON	ON	ON	ON	ON	ON
Brake Oil Pressure (Mpa)	0.00	0.00	0.00	0.00	0.96	6.62	10.32	8.88	12.14	12.14	12.14
Longitudinal Acceleration , VSC Sensor (m/sec^2)	0.000	0.000	-0.287	-0.502	-1.292	-1.723	-2.656	-4.163	-1.507	-1.866	-8.973
Yaw Rate (deg/sec)	-0.49	0.00	-0.49	0.00	-0.49	15.62	26.84	42.46	35.62	25.86	35.62
Steering Input (degrees)	-3.0	-3.0	-1.5	-3.0	-3.0	43.5	-10.5	-90.0	-105.0	-103.5	-100.5
Shift Position	D	D	D	D	D	D	D	D	D	D	D
Sequential Shift Range	Undetermined	Undetermined	Undetermined	Undetermined	Undetermined	Undetermined	Undetermined	Undetermined	Undetermined	Undetermined	Undetermined
Cruise Control Status	OFF	OFF	OFF	OFF	OFF	OFF	OFF	OFF	OFF	OFF	OFF
Drive Mode, PWR	OFF	OFF	OFF	OFF	OFF	OFF	OFF	OFF	OFF	OFF	OFF
Drive Mode, ECO	OFF	OFF	OFF	OFF	OFF	OFF	OFF	OFF	OFF	OFF	OFF
Drive Mode, Sport	OFF	OFF	OFF	OFF	OFF	OFF	OFF	OFF	OFF	OFF	OFF
Drive Mode, Snow	OFF	OFF	OFF	OFF	OFF	OFF	OFF	OFF	OFF	OFF	OFF
Drive Mode, EV	Invalid	Invalid	Invalid	Invalid	Invalid	Invalid	Invalid	Invalid	Invalid	Invalid	Invalid

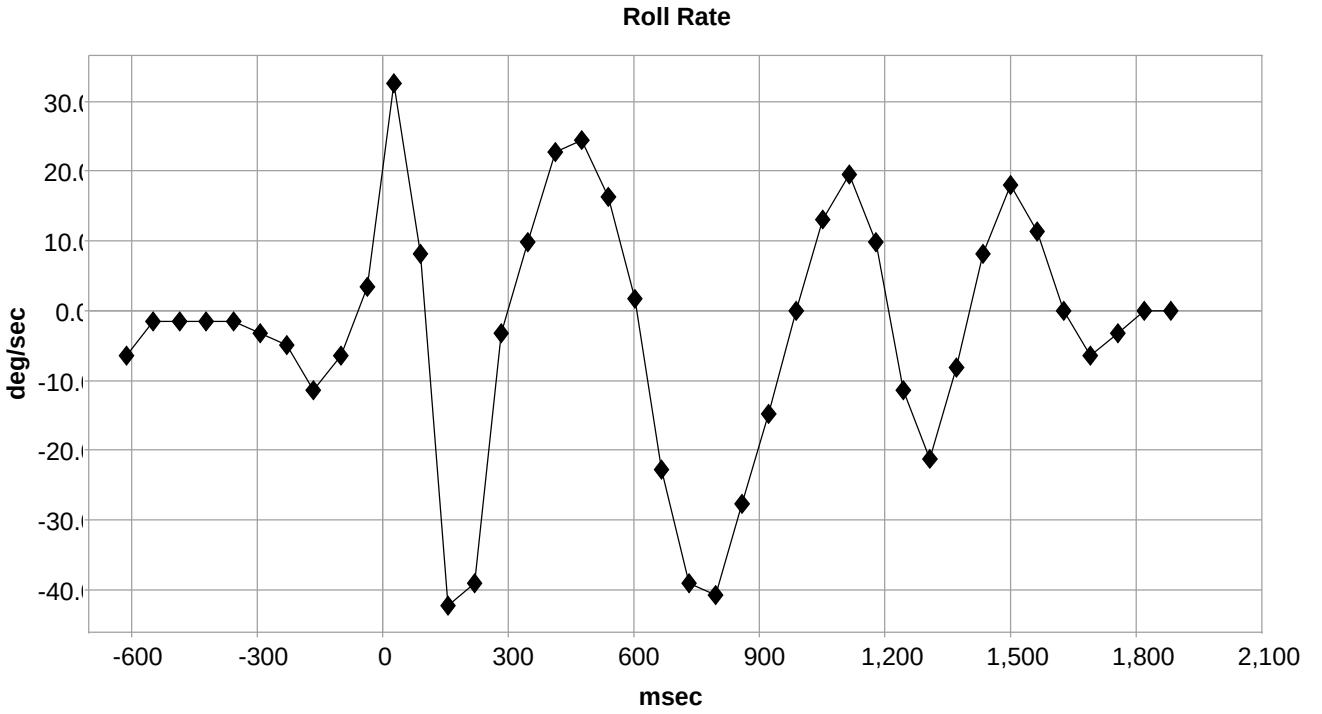
Fuel Injection Quantity (mm3/st)	Invalid	Invalid	Invalid	Invalid	Invalid	Invalid	Invalid	Invalid	Invalid	Invalid	Invalid

System Status at Event (3rd Prior Event, TRG 4)

Recording Status, Rollover Crash Info.	Complete
Crash Type	Rollover
TRG Count (times)	4
Previous Crash Type	No Event
Time from Pre-Crash TRG (msec)	0
Linked Pre-Crash Page	1
Side Curtain Airbag Deployment, Time to Deploy (msec)	No
Pretensioner Deployment, Time to Fire, Driver (msec)	No
Pretensioner Deployment, Time to Fire, Front Passenger (msec)	No

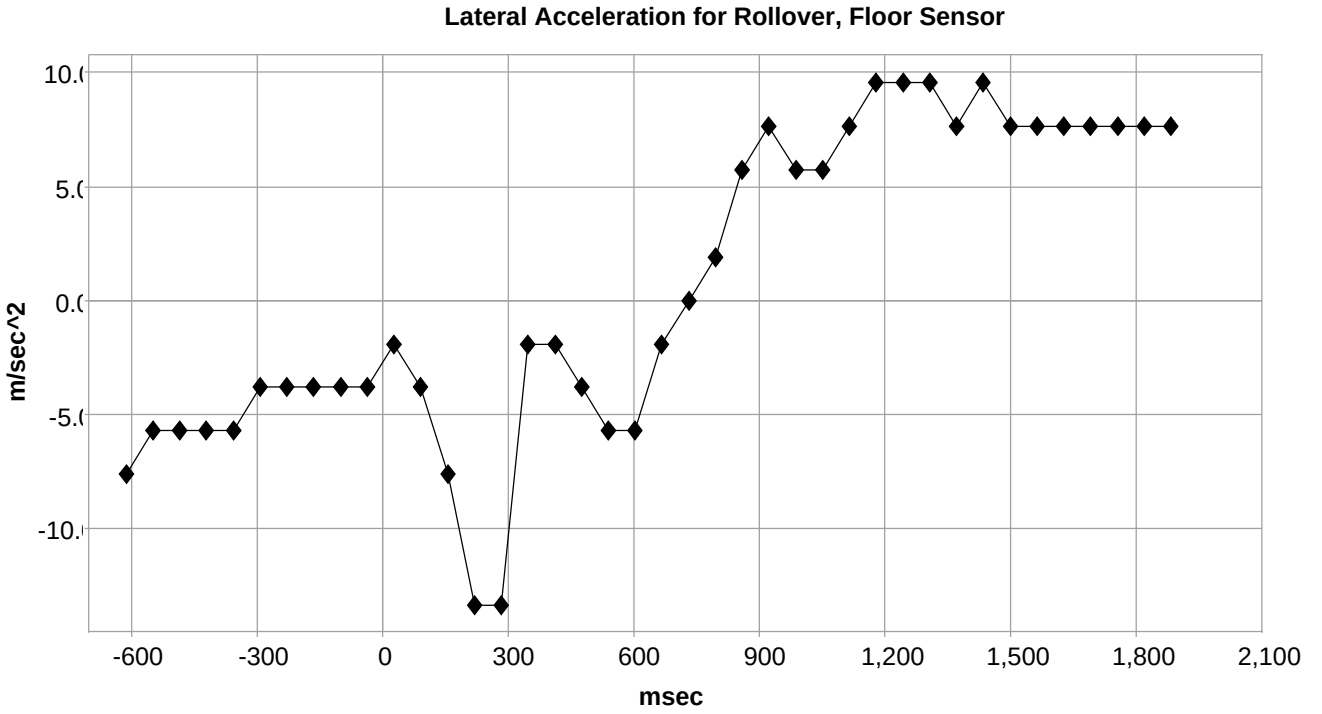
Rollover Crash Pulse (3rd Prior Event, TRG 4 - table 1 of 2)

Recording Status, Time Series Data	Complete
Time from TRG to Next Sample (msec)	27
Roll Angle Peak (degrees)	-7.6
Roll Angle at the Time of TRG (degrees)	1.5



Deployment Time Marker Key

1	Driver/Passenger CSA
2	Driver/Passenger Pretensioner



Deployment Time Marker Key

1	Driver/Passenger CSA
2	Driver/Passenger Pretensioner

Rollover Crash Pulse (3rd Prior Event, TRG 4 - table 2 of 2)

Time (msec)	Roll Rate (deg/sec)	Lateral Acceleration for Rollover, Floor Sensor (m/sec^2)
-613	-6.5	-7.7
-549	-1.6	-5.7
-485	-1.6	-5.7
-421	-1.6	-5.7
-357	-1.6	-5.7
-293	-3.3	-3.8
-229	-4.9	-3.8
-165	-11.4	-3.8
-101	-6.5	-3.8
-37	3.3	-3.8
27	32.6	-1.9
91	8.1	-3.8
155	-42.3	-7.7
219	-39.1	-13.4
283	-3.3	-13.4
347	9.8	-1.9
411	22.8	-1.9
475	24.4	-3.8
539	16.3	-5.7
603	1.6	-5.7
667	-22.8	-1.9
731	-39.1	0.0
795	-40.7	1.9
859	-27.7	5.7
923	-14.7	7.7
987	0.0	5.7
1051	13.0	5.7
1115	19.5	7.7
1179	9.8	9.6
1243	-11.4	9.6
1307	-21.2	9.6
1371	-8.1	7.7
1435	8.1	9.6
1499	17.9	7.7
1563	11.4	7.7
1627	0.0	7.7
1691	-6.5	7.7
1755	-3.3	7.7
1819	0.0	7.7
1883	0.0	7.7

DTCs Present at Time of Event (3rd Prior Event, TRG 4)

Recording Status, Diagnostic	Complete
Ignition Cycle Since DTC was Set (times)	0
Airbag Warning Lamp ON Time Since DTC was Set (min)	0
Diagnostic Trouble Codes	None

Pre-Crash Data, 1 Sample (3rd Prior Event, TRG 4)

Recording Status, Pre-Crash/Occupant	Complete
Time from Pre-Crash to TRG (msec)	350
TRG Count when Pre-crash TRG was Established (times)	4
Safety Belt Status, Driver	ON
Safety Belt Status, Front Passenger	OFF
Occupant Size Classification, Front Passenger	Child or Not Occupied
Frontal Airbag Suppression Switch Status, Front Passenger	SNA
RSCA Disable Switch	SNA
Seat Track Position Switch, Foremost, Status, Driver	No
Airbag Warning Lamp, On/Off	OFF
Ignition Cycle ,Crash (times)	3142

Pre-Crash Data, -5 to 0 seconds (3rd Prior Event, TRG 4)

Time (sec)	-4.85	-4.35	-3.85	-3.35	-2.85	-2.35	-1.85	-1.35	-0.85	-0.35	0 (TRG)
Vehicle Speed (MPH [km/h])	94.4 [152]	94.4 [152]	93.8 [151]	93.2 [150]	92.6 [149]	87.6 [141]	77.1 [124]	67.7 [109]	55.9 [90]	31.1 [50]	29.8 [48]
Accelerator Pedal, % Full (%)	25.5	16.0	36.5	19.5	0.0	0.0	0.0	0.0	0.0	0.0	0.0
Percentage of Engine Throttle (%)	20.5	13.5	34.0	10.5	0.0	0.0	0.0	0.0	0.0	0.0	0.0
Engine RPM (RPM)	3,300	3,300	2,900	2,800	2,800	2,500	1,900	1,400	1,400	1,000	900
Motor RPM (RPM)	Invalid	Invalid	Invalid	Invalid	Invalid	Invalid	Invalid	Invalid	Invalid	Invalid	Invalid
Service Brake, ON/OFF	OFF	OFF	OFF	OFF	ON	ON	ON	ON	ON	ON	ON
Brake Oil Pressure (Mpa)	0.00	0.00	0.00	0.00	0.96	6.62	10.32	8.88	12.14	12.14	12.14
Longitudinal Acceleration , VSC Sensor (m/sec^2)	0.000	0.000	-0.287	-0.502	-1.292	-1.723	-2.656	-4.163	-1.507	-1.866	-8.973
Yaw Rate (deg/sec)	-0.49	0.00	-0.49	0.00	-0.49	15.62	26.84	42.46	35.62	25.86	35.62
Steering Input (degrees)	-3.0	-3.0	-1.5	-3.0	-3.0	43.5	-10.5	-90.0	-105.0	-103.5	-100.5
Shift Position	D	D	D	D	D	D	D	D	D	D	D
Sequential Shift Range	Undetermined	Undetermined	Undetermined	Undetermined	Undetermined	Undetermined	Undetermined	Undetermined	Undetermined	Undetermined	Undetermined
Cruise Control Status	OFF	OFF	OFF	OFF	OFF	OFF	OFF	OFF	OFF	OFF	OFF
Drive Mode, PWR	OFF	OFF	OFF	OFF	OFF	OFF	OFF	OFF	OFF	OFF	OFF
Drive Mode, ECO	OFF	OFF	OFF	OFF	OFF	OFF	OFF	OFF	OFF	OFF	OFF
Drive Mode, Sport	OFF	OFF	OFF	OFF	OFF	OFF	OFF	OFF	OFF	OFF	OFF
Drive Mode, Snow	OFF	OFF	OFF	OFF	OFF	OFF	OFF	OFF	OFF	OFF	OFF
Drive Mode, EV	Invalid	Invalid	Invalid	Invalid	Invalid	Invalid	Invalid	Invalid	Invalid	Invalid	Invalid

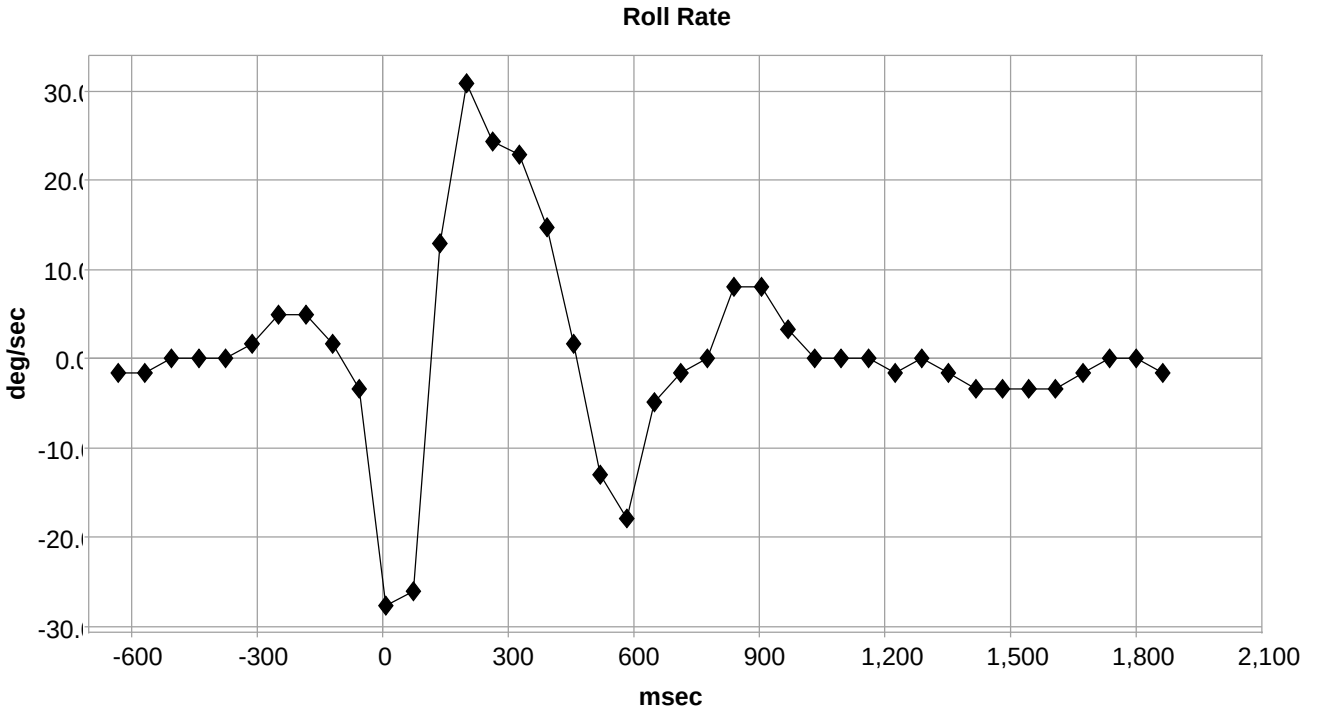
Fuel Injection Quantity (mm3/st)	Invalid	Invalid	Invalid	Invalid	Invalid	Invalid	Invalid	Invalid	Invalid	Invalid	Invalid

System Status at Event (4th Prior Event, TRG 3)

Recording Status, Rollover Crash Info.	Complete
Crash Type	Rollover
TRG Count (times)	3
Previous Crash Type	No Event
Time from Pre-Crash TRG (msec)	0
Linked Pre-Crash Page	0
Side Curtain Airbag Deployment, Time to Deploy (msec)	No
Pretensioner Deployment, Time to Fire, Driver (msec)	No
Pretensioner Deployment, Time to Fire, Front Passenger (msec)	No

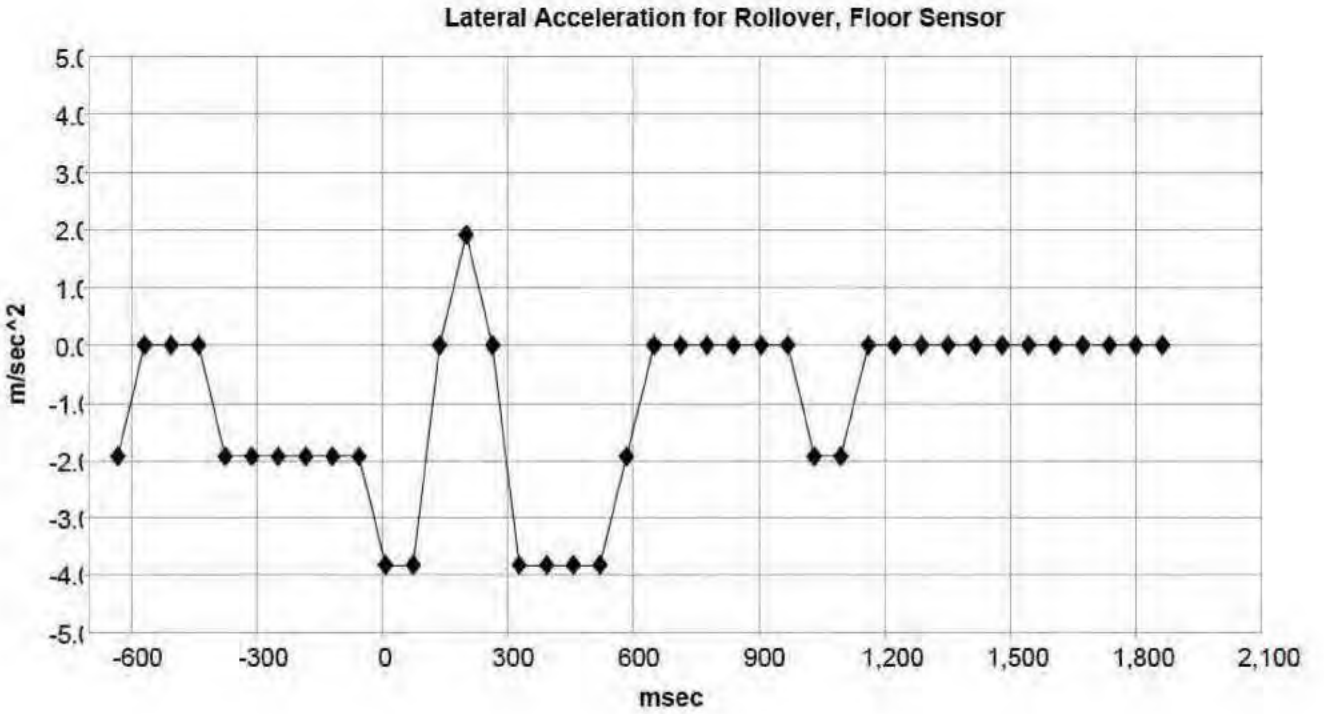
Rollover Crash Pulse (4th Prior Event, TRG 3 - table 1 of 2)

Recording Status, Time Series Data	Complete
Time from TRG to Next Sample (msec)	8
Roll Angle Peak (degrees)	3.9
Roll Angle at the Time of TRG (degrees)	-1.6



Deployment Time Marker Key

1	Driver/Passenger CSA
2	Driver/Passenger Pretensioner



Deployment Time Marker Key

1	Driver/Passenger CSA
2	Driver/Passenger Pretensioner

Rollover Crash Pulse (4th Prior Event, TRG 3 - table 2 of 2)

Time (msec)	Roll Rate (deg/sec)	Lateral Acceleration for Rollover, Floor Sensor (m/sec^2)
-632	-1.6	-1.9
-568	-1.6	0.0
-504	0.0	0.0
-440	0.0	0.0
-376	0.0	-1.9
-312	1.6	-1.9
-248	4.9	-1.9
-184	4.9	-1.9
-120	1.6	-1.9
-56	-3.3	-1.9
8	-27.7	-3.8
72	-26.1	-3.8
136	13.0	0.0
200	30.9	1.9
264	24.4	0.0
328	22.8	-3.8
392	14.7	-3.8
456	1.6	-3.8
520	-13.0	-3.8
584	-17.9	-1.9
648	-4.9	0.0
712	-1.6	0.0
776	0.0	0.0
840	8.1	0.0
904	8.1	0.0
968	3.3	0.0
1032	0.0	-1.9
1096	0.0	-1.9
1160	0.0	0.0
1224	-1.6	0.0
1288	0.0	0.0
1352	-1.6	0.0
1416	-3.3	0.0
1480	-3.3	0.0
1544	-3.3	0.0
1608	-3.3	0.0
1672	-1.6	0.0
1736	0.0	0.0
1800	0.0	0.0
1864	-1.6	0.0

DTCs Present at Time of Event (4th Prior Event, TRG 3)

Recording Status, Diagnostic	Complete
Ignition Cycle Since DTC was Set (times)	0
Airbag Warning Lamp ON Time Since DTC was Set (min)	0
Diagnostic Trouble Codes	None

Pre-Crash Data, 1 Sample (4th Prior Event, TRG 3)

Recording Status, Pre-Crash/Occupant	Complete
Time from Pre-Crash to TRG (msec)	250
TRG Count when Pre-crash TRG was Established (times)	3
Safety Belt Status, Driver	ON
Safety Belt Status, Front Passenger	OFF
Occupant Size Classification, Front Passenger	Child or Not Occupied
Frontal Airbag Suppression Switch Status, Front Passenger	SNA
RSCA Disable Switch	SNA
Seat Track Position Switch, Foremost, Status, Driver	No
Airbag Warning Lamp, On/Off	OFF
Ignition Cycle ,Crash (times)	3130

Pre-Crash Data, -5 to 0 seconds (4th Prior Event, TRG 3)

Time (sec)	-4.75	-4.25	-3.75	-3.25	-2.75	-2.25	-1.75	-1.25	-0.75	-0.25	0 (TRG)
Vehicle Speed (MPH [km/h])	3.7 [6]	3.7 [6]	3.1 [5]	3.1 [5]	4.3 [7]	6.8 [11]	8.7 [14]	10.6 [17]	11.2 [18]	11.8 [19]	13 [21]
Accelerator Pedal, % Full (%)	0.0	0.0	0.0	10.5	26.5	17.5	18.5	16.5	6.0	0.0	0.0
Percentage of Engine Throttle (%)	0.0	0.0	0.0	3.0	15.0	6.5	7.5	6.5	1.5	0.0	0.0
Engine RPM (RPM)	700	700	600	800	1,400	1,700	1,800	1,900	1,900	1,600	1,500
Motor RPM (RPM)	Invalid	Invalid	Invalid	Invalid	Invalid	Invalid	Invalid	Invalid	Invalid	Invalid	Invalid
Service Brake, ON/OFF	ON	ON	OFF	OFF	OFF	OFF	OFF	OFF	OFF	OFF	OFF
Brake Oil Pressure (Mpa)	0.19	0.53	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00
Longitudinal Acceleration , VSC Sensor (m/sec^2)	-0.359	-0.502	-0.144	0.287	1.507	1.723	1.723	0.861	-0.215	-0.215	0.072
Yaw Rate (deg/sec)	0.49	0.00	0.49	0.49	6.83	16.59	22.45	25.86	26.84	30.26	27.82
Steering Input (degrees)	9.0	7.5	9.0	25.5	156.0	228.0	240.0	229.5	222.0	255.0	259.5
Shift Position	D	D	D	D	D	D	D	D	D	D	D
Sequential Shift Range	Undetermined	Undetermined	Undetermined	Undetermined	Undetermined	Undetermined	Undetermined	Undetermined	Undetermined	Undetermined	Undetermined
Cruise Control Status	OFF	OFF	OFF	OFF	OFF	OFF	OFF	OFF	OFF	OFF	OFF
Drive Mode, PWR	OFF	OFF	OFF	OFF	OFF	OFF	OFF	OFF	OFF	OFF	OFF
Drive Mode, ECO	OFF	OFF	OFF	OFF	OFF	OFF	OFF	OFF	OFF	OFF	OFF
Drive Mode, Sport	OFF	OFF	OFF	OFF	OFF	OFF	OFF	OFF	OFF	OFF	OFF
Drive Mode, Snow	OFF	OFF	OFF	OFF	OFF	OFF	OFF	OFF	OFF	OFF	OFF
Drive Mode, EV	Invalid	Invalid	Invalid	Invalid	Invalid	Invalid	Invalid	Invalid	Invalid	Invalid	Invalid

Fuel Injection Quantity (mm3/st)	Invalid	Invalid	Invalid	Invalid	Invalid	Invalid	Invalid	Invalid	Invalid	Invalid	Invalid

Hexadecimal Data

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

PIDs	PID	Data
	00	BC 64 00 01
	01	00
	03	30 52 31 39 31 30 30 30 39 33 30 30 30 39 33 30 30 30 39 44 30 30 30 39 44 30 30 30 39 46 30 30 30 39 46
	04	02 03 01 01
	05	01
	06	00
	0A	03
	0B	00
	20	80 00 00 01
	21	02 A0
	40	00 00 00 01
	60	FF FF F0 01
	61	02 05 E8 00 C0 E0 05 00 02 80 02 80 00 00 00 00 00 00 00 00 05 00 05 00 19 00 29 B1 85 5F C8 00
	62	00 00 7F FD 0C 62 00 00 00 00
	63	55 10 0C 3A 11 10 00 00 11 11 11 11 11 10 06 06 05 05 07 0B 0E 11 12 13 15 00 00 00 15 35 23 25 21 0C 00 00 50 00 00 07 07 06 08 0E 11 12 13 13 10 0F 00 00 00 00 00 00 00 03
	64	55 18 0C 46 11 10 00 00 11 11 11 11 11 10 98 98 97 96 95 8D 7C 6D 5A 32 30 33 20 49 27 00 00 00 00 00 00 00 00 55 54 21 21 1D 1C 1C 19 13 0E 0E 0A 09 00 00 00 00 00 00 00 04
	65	55 00 00 00 00 00 00 00 00 00 00 00 00 00 00 00 00
	66	55 00 00 00 00 00 00 00 00 00 00 00 00 00 00 00 00
	67	55 24 09 00 05 FE FE FE FE FE 55 FD FD FF FE FF FE FF FE FF FE 03 FE
	68	00 00 00 00 00 00 00 00 00 00 00 00 00 00 00 00 00 00 00 00 00 00 00
	69	00 69 1A 00 00 00 03 00 07 00 0C 00 12 00 19 00 1F 00 25 00 2D 00 36 00 3C 00 43 00 4B 00 53 00 5A 00 61 00 66 00 6C 00 72 00 76 00 7A 00 80 00 84 00 88 00 8B 00 8E 00 9C 02 53
	6A	00 00 00 00 00 00 00 00 00 00 00 00 00 00 00 00 00 00 00 00 00 00 00 00 00 00 00 00 00 00 00 00 00 00 00 00 00 00 00 00 00 00 00 00 00 00 00 00 00 00 00 00 00 00 00 00 00 00
	6B	55 04 0D 00 06 FE FE FE FE 55 11 00 00 00 00 00 00 00 00 01 00 00 00 00 00 00 00 01 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
	6C	55 14 8F 00 07 FE FE FE FE 55 10 01 01 00 00 00 00 01 01 01 02 02 02 02 01 01 00 00 00 00 00 01 02 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
	6D	00 00 00 00 00 00 00 00 00 00 00 00 00 00 00 00 00 00 00 00 00 00 00 00 00 00 00 00 00 00 00 00 00 00 00 00 00 00 00 00 00 00 00 00 00 00 00 00 00 FE 01 FE 01 FE 01 FE 01 FE
	6E	00 00 00 00 00 00 00 00 00 00 00 00 00 00 00 00 00 00 00 00 00 00 00 00 00 00 00 00 01 01 01 01 01 01 02 01 01 02 02 01 01 01 01 01 01 01 01 01 00 FE 01 FE 01 FE 01 FE 01 FE
	6F	55 FF FE E0 00 00 03 55 C8 FF FF 00 00 00 01 03 03 01 FE EF F0 08 13 0F 0E 09 01 F8 F5 FD FF 00 05 05 02 00 00 00 FF 00 FF FE FE FE FE FF 00 00 FF FF E1 00 4A
	70	55 FF FE E4 00 00 04 55 DB FC FF FF FF FF FE FD F9 FC 02 14 05 E6 E8 FE 06 0E 0F 0A 01 F2 E8 E7 EF F7 00 08 0C 06 F9 F3 FB 05 0B 07 00 FC FE 00 00 00 1C FF 6E
	71	01 00 00 00 01 01 01 01 01 01 02 02 00 FF 00 02 02 02 02 01 00 00 00 00 00 00 01 01 00 00 00 00 00 00 00 00 00 00 00
	72	04 03 03 03 03 02 02 02 02 02 01 02 04 07 07 01 01 02 03 03 01 00 FF FD FC FD FD FC FB FB FB FC FB FC FC FC FC FC FC FC
	73	04 0B 00 00 00 00 00 00 00 00 00 00 00 00 00 00 00 00 00 00 00 00 01 00 01 01 0E 22 2E 35 37 3E 39 FB F9 FE 04 15 18 18 0C FD FD 01 00 00 00 06 1E 0D 0F 0D 03 00 00 00 00 00
	74	00 00 00 00 14 8A D7 B9 FD FD FD 00 00 00 00 00 00 00 00 00 00 00 FF 00 FF 00 FF 20 37 57 49 35 49 00 00 FC F9 EE E8 DB C6 EB E6 83

```
      29 1B 44 15 00 00 00 00 00 00 00 00 00
80    00 00 00 01
A0    0C 00 DF 81
A5    00 40 00 40 00 40 00 40 00 40 00 40 00 40 00 40 00 40 00 40 00 40
      FE FE FE FE FE FE FE FE FE FE FE FE FE FE FE FE FE FE FE FE FE
      FE FE FE FE FE FE FE FE FE FE
A6    00 40 00 40 00 40 00 40 00 40 00 40 00 40 00 40 00 40 00 40 00 40
      FE FE FE FE FE FE FE FE FE FE FE FE FE FE FE FE FE FE FE FE FE
      FE FE FE FE FE FE FE FE FE FE
B4    FC 03 02 04 01 02 0D 04 FC 00 FF FE 04 04 0C F7 0C FD 00 02 01 07
      05 05 01 FE
B5    00 03 0B 03 0A FF 0B 13 0A 0E 0B 11 03 06 0A 03 05 05 06 07 09 07
      05 08 01 FE
B6    00 07 03 00 00 02 06 02 FD 0A FE 01 04 04 02 05 00 07 03 12 0C 05
      07 06 07 07 03 FE
B7    00 00 00 00 00 00 00 00 00 00 00 00 00 00 00 00 00 00 00 00 00 00
      00 00 00 00 00 00
B8    00 06 00 05 00 06 00 11 00 68 00 98 00 A0 00 99 00 94 00 AA 00 AD

B9    03 FE 03 FE 03 FF 03 FE 03 FE 00 1D 03 F9 03 C4 03 BA 03 BB 03 BD
```

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.

TOYOTA

Toyota Motor Sales, U.S.A., Inc.
19001 S. Western Avenue
Torrance, CA 90501

TOYOTA EDR DATA IMAGING INVESTIGATION RECORD

2017 (MY) Toyota (Make) RAV4 (Model) 2T3BFREV2HW[redacted] VIN

Purpose: Use this form to record circumstances of obtaining an EDR image or accessing VCH data. Attach it to any report when sending it back to Toyota Motor Sales, U.S.A., Inc. Where noted below, do not disclose owner identification information (name or full VIN). Contact TMS Legal Department if you have questions.

CONSENT HISTORY (check box that applies)

OWNER CONSENT

- [x] From a person having all the incidents of ownership, including legal title, of a motor vehicle, whether or not the person lends, rents, or creates a security interest in the motor vehicle.
- [ ] From a person entitled to the possession of a motor vehicle as the purchaser under a security agreement.
- [ ] From a person entitled to possession of a motor vehicle as a lessee pursuant to a written lease agreement for a period of more than three months).
- [ ] **For Arkansas** [written consent is not consent to release owner identification information]: From all owners of the subject vehicle. [Where the subject vehicle has been involved in an accident] From all owners of the subject vehicle at the time the data was recorded on, _____.
- [ ] **For California and Connecticut**: From a registered owner of the subject vehicle.
- [ ] **For Oregon**: From all owners of the subject vehicle.
- [ ] **For New Hampshire**: From an owner of the subject vehicle at the time the data was recorded on, _____.
- [ ] **For Washington** [where Toyota is a third party in a suit where data is being imaged after a crash]: From an owner of the subject vehicle at the time of the crash on _____.
- [ ] **For Utah**, "owner" does not include lienholder unless the lienholder gains possession of the motor vehicle as a result of purchaser's default.

OWNER REFUSED CONSENT

- [ ] The Owner refused to allow imaging. [You may only proceed with readout (after getting consent from Toyota's counsel) if other circumstances below apply.]

_____

Notes:

OTHER CIRCUMSTANCES (consent not obtained)
REQUIRES PRIOR CONSENT FROM TOYOTA'S COUNSEL

A.	☐	I imaged the data under a court or administrative order.
B.	☐	I imaged the data with permission of Toyota's counsel in a legal proceeding.
C.	☐	I imaged the data on behalf of and at the request of the following law enforcement officer: [For use only in Arkansas, Maine, Utah and Virginia]. _____ (Name, Position, Date)
D.	☐	I imaged the data for the purpose of improving motor vehicle safety: [For use in California, Connecticut, Maine, Nevada, New York, North Dakota, Oregon, Texas and Washington.] [Do not provide owner identification information (name or full VIN; providing VIN is ok if last 6 digits removed)]. _____ (Name, Position, Date)
E.	☐	I imaged the data on behalf of and at the request of the following emergency medical responder who, in the course of responding to a motor vehicle crash, including injury, requested the data to determine the need for, or to facilitate, emergency medical response: [For use only in Arkansas, Maine, New Hampshire, New York, Oregon, Texas, Utah, Virginia and Washington]. _____ (Name, Position, Date)
F.	☐	I imaged the data from an EDR that was installed after the manufacture date of the subject motor vehicle [for use only in Colorado]. _____ (Name, Position, Date)
G.	☐	I imaged the data permitted by, and pursuant to, a subscription service contract or agreement [for use only in Nevada and Virginia]. _____ (Name, Position, Date)

(Toyota Representative and Date)

TOYOTA LEXUS

Toyota Motor Sales, U.S.A., Inc
Attn: Toyota Customer Experience Center, E1-5A
PO Box 259001
Plano, TX 75025-9001

Toyota Motor Sales, U.S.A., Inc
Attn: Lexus Guest Experience Center, E3-2D
PO Box 259001
Plano, TX 75025-9001

TOYOTA IMAGING AUTHORIZATION AND CONSENT
(EDR / VCH Data)

I am the "owner" (a person having all the incidents of ownership, including legal title, of a motor vehicle, whether or not the person lends, rents, or creates a security interest in the motor vehicle; a person entitled to the possession of a motor vehicle as the purchaser under a security agreement; a person entitled to possession of a motor vehicle as a lessee pursuant to a written lease agreement for a period of more than three months) of the RAV-4 2017 Model Year Toyota / Lexus / Scion TOYOTA. VIN 2T3BFREV2HW[redacted] (the "Subject Vehicle").

I hereby authorize Toyota Personnel, and [redacted]es, to obtain Event Data Recorder (EDR) and / or any other data (including, if equipped, recordings of images outside the vehicle) or computer memory contained within the Subject Vehicle. In doing so, I acknowledge and agree voluntarily to waive any privacy rights in the disclosure of information or data obtained from the subject vehicle's EDR or other computer memory.

[redacted]
Signature of Owner / Owners / Authorized Representative

[redacted]
Printed Name of Owner / Owners / Authorized Representative

[redacted]
Status (i.e. title holder, security agreement holder, lessee, etc.)

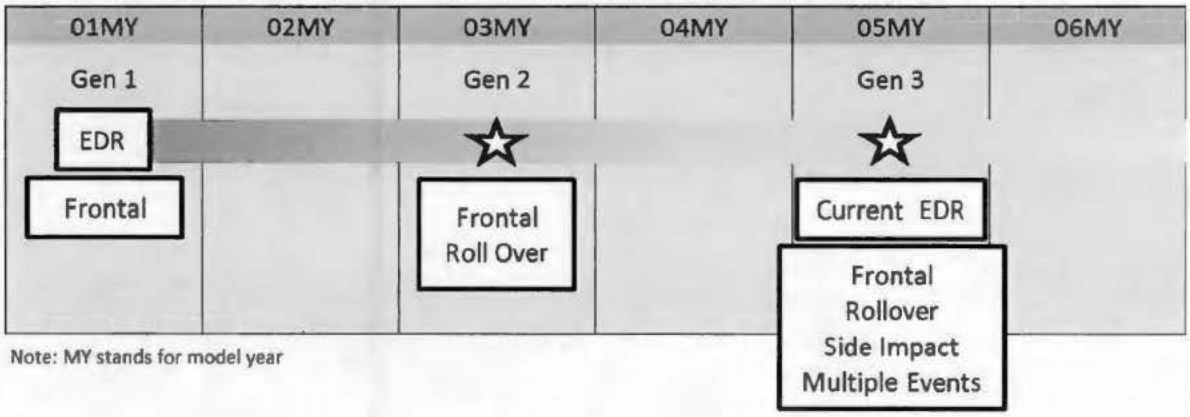
1-16-19
Date

Event Data Recorder - Reference Document

An Event Data Recorder (EDR) is a part of the Supplemental Restraint System (SRS) ECU that records data for some types of collision events for future safety research or analysis. The EDR will record data when the vehicle experiences a rapid change in speed that exceeds a specified threshold. The threshold to start recording is above changes in speeds that are considered normal driving use. For example, stopping hard with the brakes would not cause a recording, but hitting a curb may. EDRs were installed on Toyota/Lexus/Scion vehicles because they have the capability to serve several purposes, such as assisting in vehicle development, quality control and/or safety research. An EDR is also helpful in determining the circumstances that caused an airbag to be deployed or not deployed.

EDR Generations

Starting with the 2001 Lexus LS400, EDRs were incorporated into to all Toyota, Lexus and Scion vehicles by 2007. SRS ECUs with EDRs were typically installed at full model change years, which generally occur every 4 to 6 years, depending on the model. The chart below outlines the three generations of EDRs installed on Toyota, Lexus, and Scion vehicles and what each EDR generation is capable of recording.



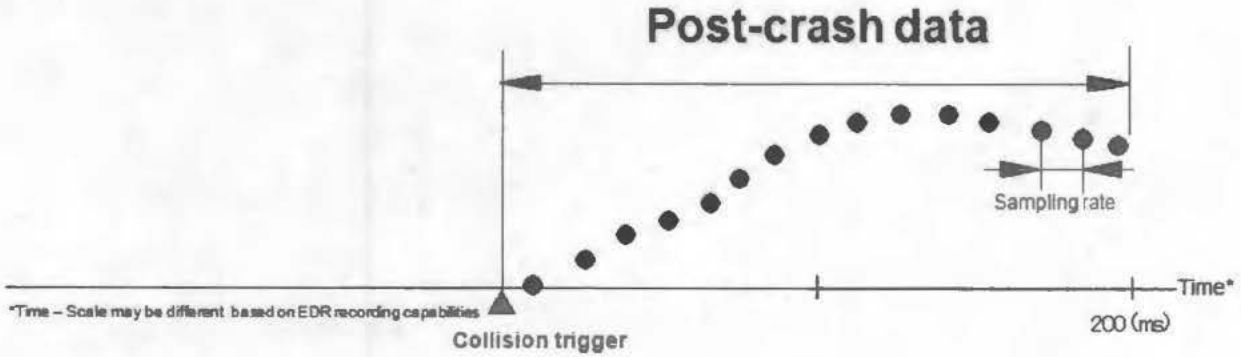
Note: MY stands for model year

Post-Crash & Pre-Crash data

Post-Crash Data - All vehicles equipped with an EDR will record post-crash data

If an impact occurs that has exceeded the rapid change in speed threshold, the EDR system will begin to record data for varying lengths of time depending on the parameters it is capable of recording. Figure 1 shows a collision 'trigger' and the data sampling rate recorded in the EDR.

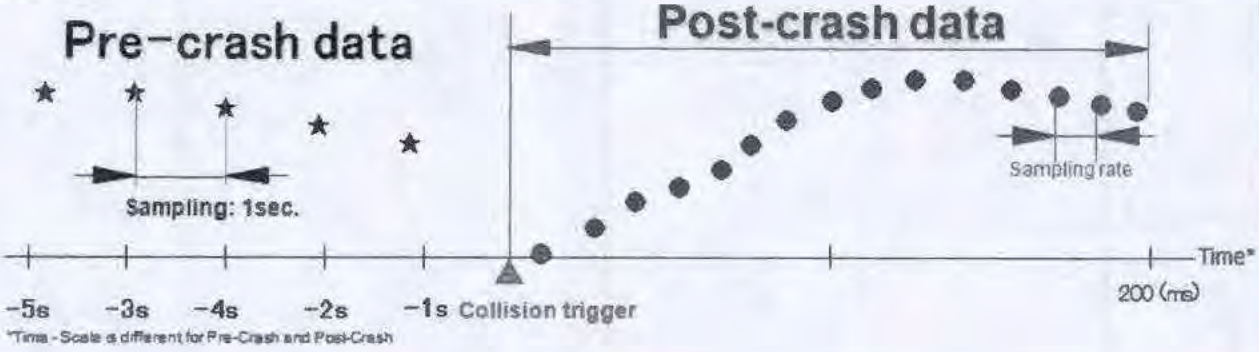
Figure 1



Pre-Crash Data - Not all models have an EDR capable of recording pre-crash data

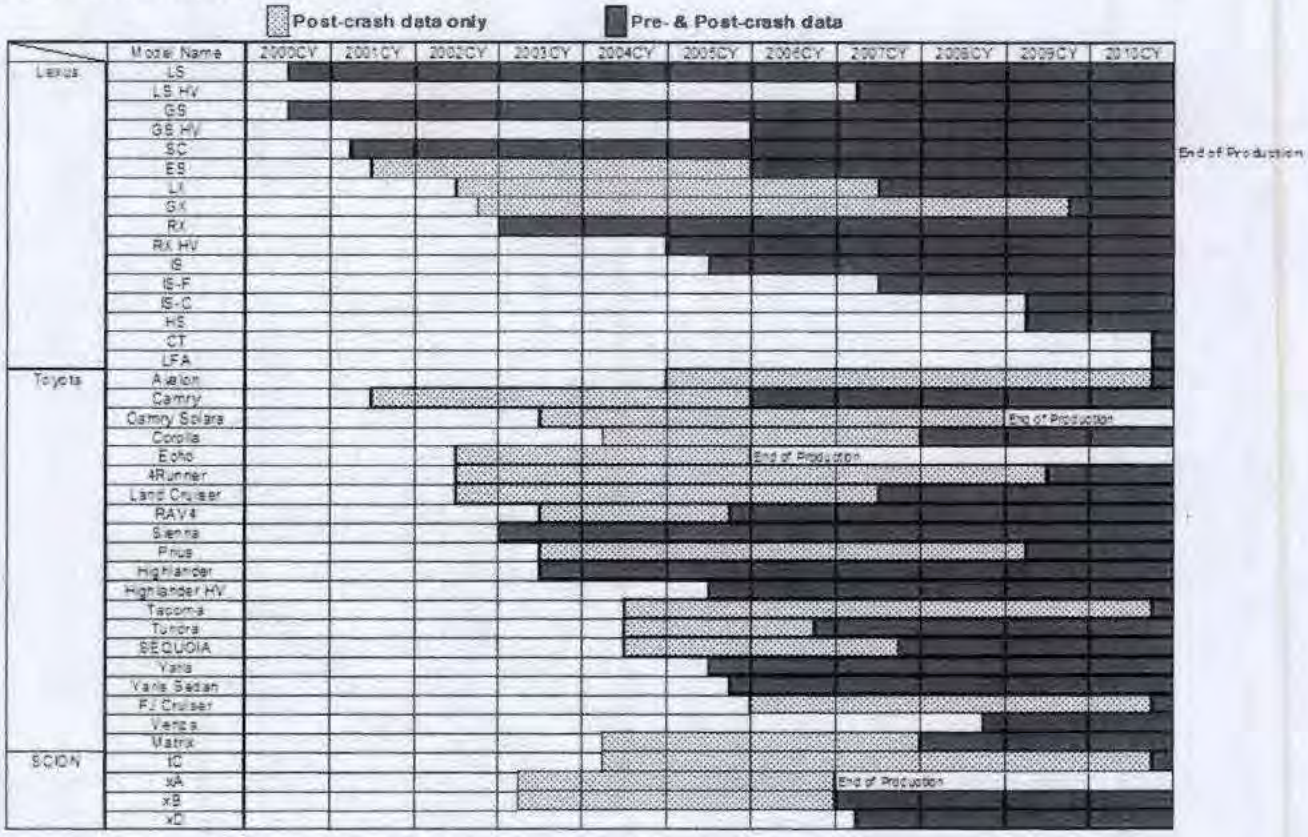
As explained in the Post-crash section, the EDR System begins recording data when an impact exceeds the rapid change in speed threshold. On certain models, the EDR will also record about 5 seconds of data that took place before the impact. Figure 2 shows the sampling rate of Pre-Crash data is different than Post-Crash data.

Figure 2



Post Crash & Pre-Crash Applicability Chart

The chart below provides EDR capability of each model and the corresponding calendar year (CY) it was built. Vehicles and the corresponding year that have a yellow bar are equipped with EDR that have the ability to record post-crash data only. Vehicles and the corresponding year that have a red bar, are equipped with EDRs capable of pre & post-crash data recording.



EDR - Frequently Asked Questions

What is an EDR? An Event Data Recorder (EDR) is part of the Supplemental Restraint System (SRS) ECU that records data for some types of collision events for future safety research or analysis. An event is a change in vehicle speed that is more than typical of everyday use. For example, stopping hard with the brakes would not cause a recording, but hitting a curb may cause the EDR to record an event.

Are EDRs required in cars? They are currently not required.

Is the EDR a black box? No, the EDR is not a black box like on an airplane. It does not record sounds or conversations and does not have the capacity like an airplane blackbox. The EDR is simply part of the Supplemental Restraint System (SRS) ECU that only records certain vehicle data for a short period of time before or during a collision.

What causes the EDR to record? The EDR starts to record when the vehicle experiences a rapid change in speed (like acceleration or deceleration) that exceeds a specified threshold higher than normal use. Hard braking will not cause an EDR to record, because that may be considered normal use. Impacting a curb hard may cause a recording as the vehicle body may change speed much quicker than normal use.

Why were EDRs installed in Toyota/Lexus/Scion vehicles? EDRs have the capability to serve several purposes, such as assisting in vehicle development, quality control or safety research. Airbag deployment occurs very rapidly and it may be difficult to determine exactly what occurred during a collision. Although indirect methods may be used to determine airbag deployment circumstances, an EDR is a more direct method to understand airbag deployment circumstances.

Do all EDRs record the same information? No. Due to different vehicle designs and changes in equipment, the information recorded varies by model and model year.

Were there other recording systems before EDR in Toyota vehicles? Yes, some vehicles in the past had some impact recording capabilities, but these were not considered reliable for field use. There is no current capability to read these predecessors to EDRs.

How accurate is the EDR data? The accuracy of the data from the EDR depends on the collision and the EDR capabilities. Government studies of Toyota EDRs indicate that Toyotas EDRs have similar capabilities to other vehicle manufacturers.

What has Toyota done to validate its EDRs and EDR tools? Toyota has been analyzing data from vehicles since they were first introduced to ensure the reliability of the EDR technology. Toyota performs imaging of our own vehicles as part of crash testing. Toyota also performs EDR imaging from U.S. Government crash testing and investigations, and when requested, in law enforcement investigations.

How does the EDR record information? During a collision, the EDR calculates the delta V based on accelerometer data every 10 milliseconds and puts it into the permanent memory. During the intervals, other data is also placed into memory. If all the data is not transferred into the permanent memory, a writing flag is put on the report. If all data is successfully transferred, the report states 'Finished writing'. In some very severe impacts, electrical connections or internal EDR components may be damaged, resulting in incomplete data transfer to the permanent memory.

How long is an event stored in the EDR? If the airbags are deployed in a collision, the EDR data is locked and cannot be erased or overwritten. If the airbags have not been deployed in previous EDR events, an event that causes the vehicle to experience a rapid change in speed (example: hitting a curb) that exceeds a specified threshold will overwrite previous EDR events.

Why is a signed consent form required before performing imaging? Various states have privacy regulations that require consent before performing an EDR image.

How is EDR data retrieved and does the retrieval process affect/change the data contained in the EDR? Depending on the vehicle's condition, data can be imaged in one of two ways. The EDR tool is either connected through the vehicles DLC port, or the EDR is removed from the vehicle and the EDR tool is connected directly to the SRS ECU. Neither method alters or erases EDR data during the process. In some rare circumstances such as water immersions- the EDR data may not be able to be imaged.

What will I receive after the EDR image process has taken place on my vehicle? After the imaging has been completed, the EDR report and other reference documents will be provided.

What is the difference between vehicle speed and delta V? Vehicle speed is how fast the vehicle moves relative to the ground - usually in miles per hour. It is understood that vehicle speed is the straight line speed of the entire vehicle. Delta V is the change in vehicle speed over milliseconds and is usually discussed as longitudinal, lateral or total delta V.

Is there more than one deltaV? In some EDR reports there are longitudinal and lateral delta V data.

Why can't the EDR tool operator just tell the customer what the report says? Crashes can be very complex events. The EDR report is just one piece of information and without knowing other critical crash information, the EDR data could be misinterpreted with the context for the overall crash.

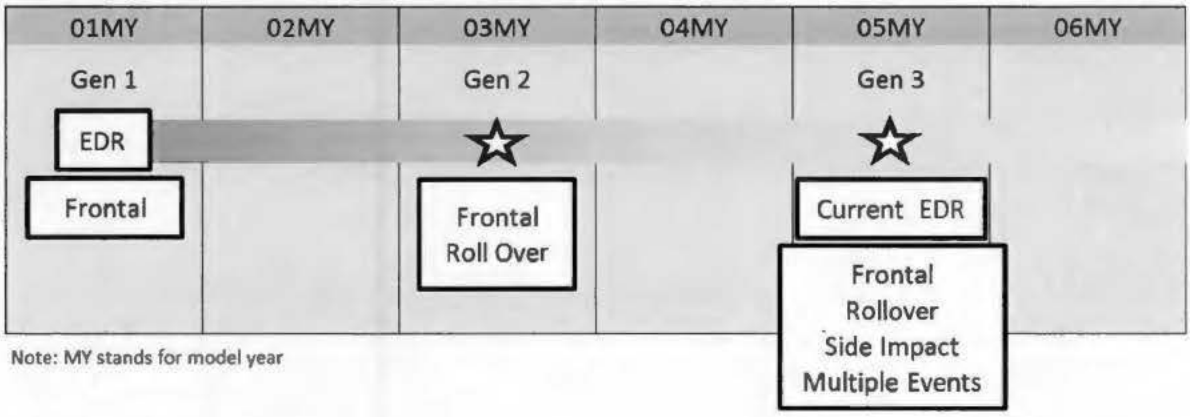
Can the EDR tell me the date and time of collision? No, the EDR does not have a time stamp function.

Event Data Recorder - Reference Document

An Event Data Recorder (EDR) is a part of the Supplemental Restraint System (SRS) ECU that records data for some types of collision events for future safety research or analysis. The EDR will record data when the vehicle experiences a rapid change in speed that exceeds a specified threshold. The threshold to start recording is above changes in speeds that are considered normal driving use. For example, stopping hard with the brakes would not cause a recording, but hitting a curb may. EDRs were installed on Toyota/Lexus/Scion vehicles because they have the capability to serve several purposes, such as assisting in vehicle development, quality control and/or safety research. An EDR is also helpful in determining the circumstances that caused an airbag to be deployed or not deployed.

EDR Generations

Starting with the 2001 Lexus LS400, EDRs were incorporated into to all Toyota, Lexus and Scion vehicles by 2007. SRS ECUs with EDRs were typically installed at full model change years, which generally occur every 4 to 6 years, depending on the model. The chart below outlines the three generations of EDRs installed on Toyota, Lexus, and Scion vehicles and what each EDR generation is capable of recording.



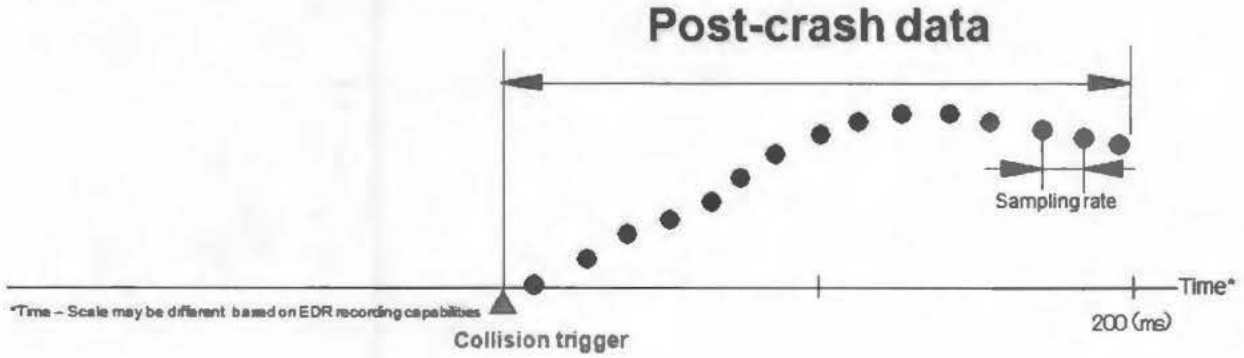
Note: MY stands for model year

Post-Crash & Pre-Crash data

Post-Crash Data - All vehicles equipped with an EDR will record post-crash data

If an impact occurs that has exceeded the rapid change in speed threshold, the EDR system will begin to record data for varying lengths of time depending on the parameters it is capable of recording. Figure 1 shows a collision 'trigger' and the data sampling rate recorded in the EDR.

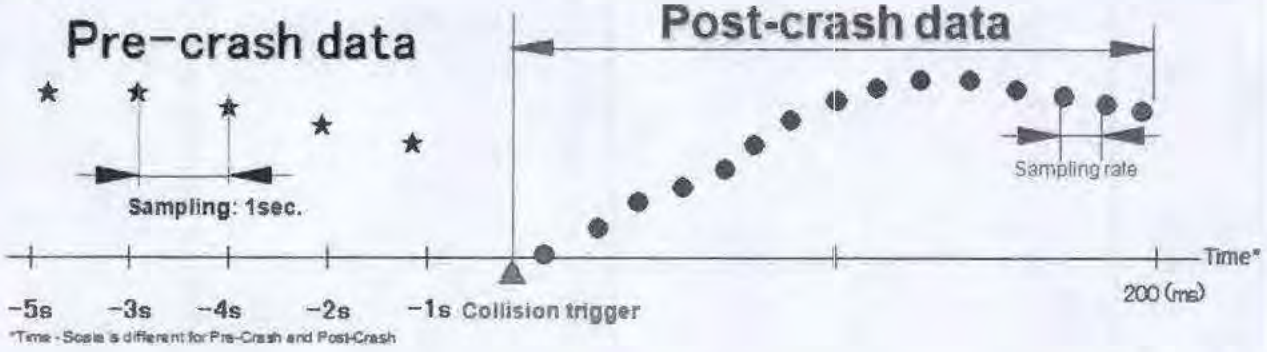
Figure 1



Pre-Crash Data - Not all models have an EDR capable of recording pre-crash data

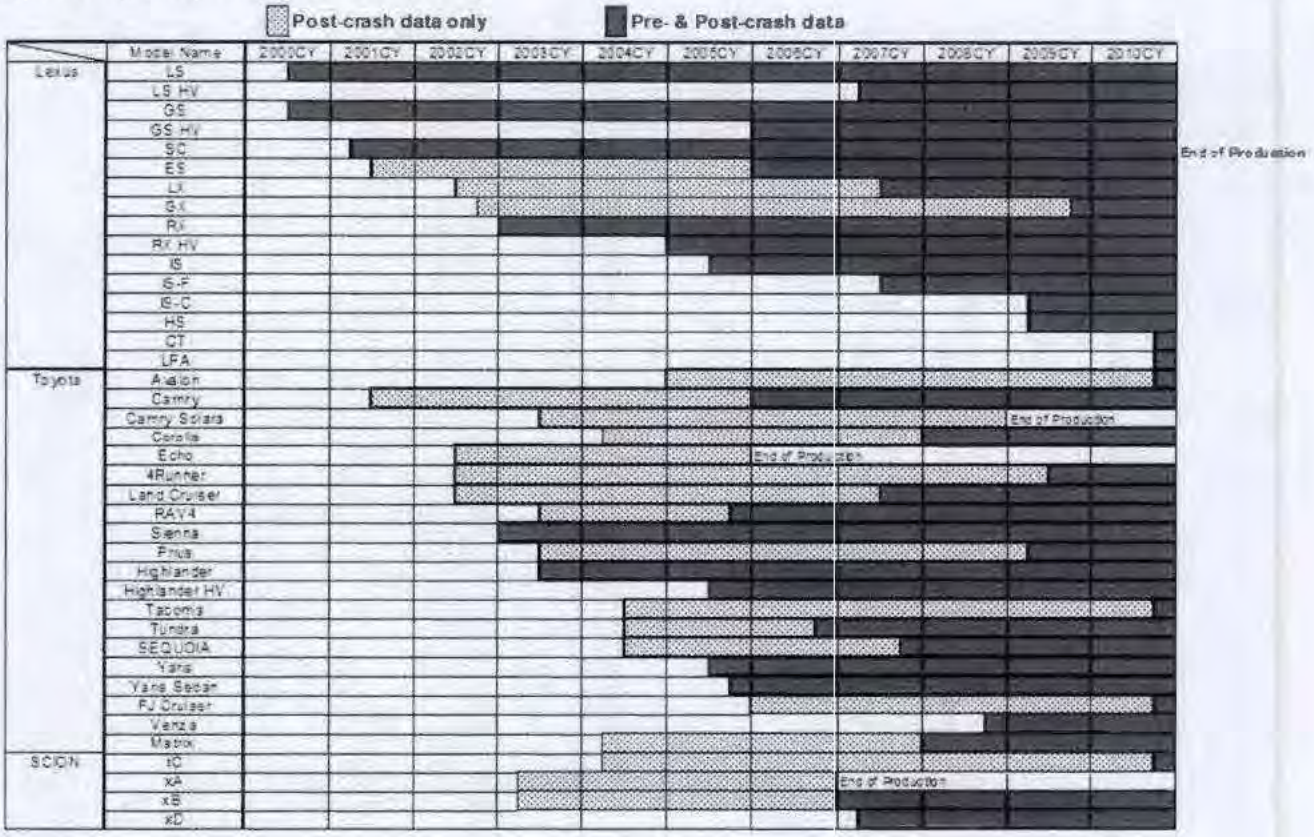
As explained in the Post-crash section, the EDR System begins recording data when an impact exceeds the rapid change in speed threshold. On certain models, the EDR will also record about 5 seconds of data that took place before the impact. Figure 2 shows the sampling rate of Pre-Crash data is different than Post-Crash data.

Figure 2



Post Crash & Pre-Crash Applicability Chart

The chart below provides EDR capability of each model and the corresponding calendar year (CY) it was built. Vehicles and the corresponding year that have a yellow bar are equipped with EDR that have the ability to record post-crash data only. Vehicles and the corresponding year that have a red bar, are equipped with EDRs capable of pre & post-crash data recording.



EDR - Frequently Asked Questions

What is an EDR? An Event Data Recorder (EDR) is part of the Supplemental Restraint System (SRS) ECU that records data for some types of collision events for future safety research or analysis. An event is a change in vehicle speed that is more than typical of everyday use. For example, stopping hard with the brakes would not cause a recording, but hitting a curb may cause the EDR to record an event.

Are EDRs required in cars? They are currently not required.

Is the EDR a black box? No, the EDR is not a black box like on an airplane. It does not record sounds or conversations and does not have the capacity like an airplane blackbox. The EDR is simply part of the Supplemental Restraint System (SRS) ECU that only records certain vehicle data for a short period of time before or during a collision.

What causes the EDR to record? The EDR starts to record when the vehicle experiences a rapid change in speed (like acceleration or deceleration) that exceeds a specified threshold higher than normal use. Hard braking will not cause an EDR to record, because that may be considered normal use. Impacting a curb hard may cause a recording as the vehicle body may change speed much quicker than normal use.

Why were EDRs installed in Toyota/Lexus/Scion vehicles? EDRs have the capability to serve several purposes, such as assisting in vehicle development, quality control or safety research. Airbag deployment occurs very rapidly and it may be difficult to determine exactly what occurred during a collision. Although indirect methods may be used to determine airbag deployment circumstances, an EDR is a more direct method to understand airbag deployment circumstances.

Do all EDRs record the same information? No. Due to different vehicle designs and changes in equipment, the information recorded varies by model and model year.

Were there other recording systems before EDR in Toyota vehicles? Yes, some vehicles in the past had some impact recording capabilities, but these were not considered reliable for field use. There is no current capability to read these predecessors to EDRs.

How accurate is the EDR data? The accuracy of the data from the EDR depends on the collision and the EDR capabilities. Government studies of Toyota EDRs indicate that Toyotas EDRs have similar capabilities to other vehicle manufacturers.

What has Toyota done to validate its EDRs and EDR tools? Toyota has been analyzing data from vehicles since they were first introduced to ensure the reliability of the EDR technology. Toyota performs imaging of our own vehicles as part of crash testing. Toyota also performs EDR imaging from U.S. Government crash testing and investigations, and when requested, in law enforcement investigations.

How does the EDR record information? During a collision, the EDR calculates the delta V based on accelerometer data every 10 milliseconds and puts it into the permanent memory. During the intervals, other data is also placed into memory. If all the data is not transferred into the permanent memory, a writing flag is put on the report. If all data is successfully transferred, the report states 'Finished writing'. In some very severe impacts, electrical connections or internal EDR components may be damaged, resulting in incomplete data transfer to the permanent memory.

How long is an event stored in the EDR? If the airbags are deployed in a collision, the EDR data is locked and cannot be erased or overwritten. If the airbags have not been deployed in previous EDR events, an event that causes the vehicle to experience a rapid change in speed (example: hitting a curb) that exceeds a specified threshold will overwrite previous EDR events.

Why is a signed consent form required before performing imaging? Various states have privacy regulations that require consent before performing an EDR image.

How is EDR data retrieved and does the retrieval process affect/change the data contained in the EDR? Depending on the vehicle's condition, data can be imaged in one of two ways. The EDR tool is either connected through the vehicles DLC port, or the EDR is removed from the vehicle and the EDR tool is connected directly to the SRS ECU. Neither method alters or erases EDR data during the process. In some rare circumstances such as water immersions- the EDR data may not be able to be imaged.

What will I receive after the EDR image process has taken place on my vehicle? After the imaging has been completed, the EDR report and other reference documents will be provided.

What is the difference between vehicle speed and delta V? Vehicle speed is how fast the vehicle moves relative to the ground - usually in miles per hour. It is understood that vehicle speed is the straight line speed of the entire vehicle. Delta V is the change in vehicle speed over milliseconds and is usually discussed as longitudinal, lateral or total delta V.

Is there more than one deltaV? In some EDR reports there are longitudinal and lateral delta V data.

Why can't the EDR tool operator just tell the customer what the report says? Crashes can be very complex events. The EDR report is just one piece of information and without knowing other critical crash information, the EDR data could be misinterpreted with the context for the overall crash.

Can the EDR tell me the date and time of collision? No, the EDR does not have a time stamp function.

TOYOTA LEXUS

Toyota Motor Sales, U.S.A., Inc
Attn: Toyota Customer Experience Center, E1-5A
PO Box 259001
Plano, TX 75025-9001

Toyota Motor Sales, U.S.A., Inc
Attn: Lexus Guest Experience Center, E3-2D
PO Box 259001
Plano, TX 75025-9001

TOYOTA IMAGING AUTHORIZATION AND CONSENT
(EDR / VCH Data)

I am the "owner" (a person having all the incidents of ownership, including legal title, of a motor vehicle, whether or not the person lends, rents, or creates a security interest in the motor vehicle; a person entitled to the possession of a motor vehicle as the purchaser under a security agreement; a person entitled to possession of a motor vehicle as a lessee pursuant to a written lease agreement for a period of more than three months) of the _____ Model Year Toyota / Lexus / Scion _____, VIN _____ (the "Subject Vehicle").

I hereby authorize Toyota Personnel, and their authorized representatives, to obtain Event Data Recorder (EDR) and / or any other data (including, if equipped, recordings of images outside the vehicle) or computer memory contained within the Subject Vehicle. In doing so, I acknowledge and agree voluntarily to waive any privacy rights in the disclosure of information or data obtained from the subject vehicle's EDR or other computer memory.

_____
Signature of Owner / Owners / Authorized Representative

_____
Printed Name of Owner / Owners / Authorized Representative

_____
Status (i.e. title holder, security agreement holder, lessee, etc.)

_____
Date

TOYOTA

Toyota Motor Sales, U.S.A., Inc.
19001 S. Western Avenue
Torrance, CA 90501

TOYOTA EDR DATA IMAGING INVESTIGATION RECORD

_____ _____ _____ ☐☐☐☐☐☐☐☐☐☐☐☐☐☐☐☐☐

(MY) **(Make)** **(Model)** **VIN**

Purpose: Use this form to record circumstances of obtaining an EDR image or accessing VCH data. Attach it to any report when sending it back to Toyota Motor Sales, U.S.A., Inc. Where noted below, do not disclose owner identification information (name or full VIN). Contact TMS Legal Department if you have questions.

CONSENT HISTORY (check box that applies)

OWNER CONSENT

☐ From a person having all the incidents of ownership, including legal title, of a motor vehicle, whether or not the person lends, rents, or creates a security interest in the motor vehicle.

☐ From a person entitled to the possession of a motor vehicle as the purchaser under a security agreement.

☐ From a person entitled to possession of a motor vehicle as a lessee pursuant to a written lease agreement for a period of more than three months).

☐ **For Arkansas** [written consent is not consent to release owner identification information]: From all owners of the subject vehicle. [Where the subject vehicle has been involved in an accident] From all owners of the subject vehicle at the time the data was recorded on, _____.

☐ **For California and Connecticut**: From a registered owner of the subject vehicle.

☐ **For Oregon**: From all owners of the subject vehicle.

☐ **For New Hampshire**: From an owner of the subject vehicle at the time the data was recorded on, _____.

☐ **For Washington** [where Toyota is a third party in a suit where data is being imaged after a crash]: From an owner of the subject vehicle at the time of the crash on _____.

☐ **For Utah**, "owner" does not include lienholder unless the lienholder gains possession of the motor vehicle as a result of purchaser's default.

OWNER REFUSED CONSENT

☐ The Owner refused to allow imaging. [You may only proceed with readout (after getting consent from Toyota's counsel) if other circumstances below apply.]

Notes:

OTHER CIRCUMSTANCES (consent not obtained)
REQUIRES PRIOR CONSENT FROM TOYOTA'S COUNSEL

A.	☐	I imaged the data under a court or administrative order.
B.	☐	I imaged the data with permission of Toyota's counsel in a legal proceeding.
C.	☐	I imaged the data on behalf of and at the request of the following law enforcement officer: [For use only in Arkansas, Maine, Utah and Virginia]. _____ (Name, Position, Date)
D.	☐	I imaged the data for the purpose of improving motor vehicle safety: [For use in California, Connecticut, Maine, Nevada, New York, North Dakota, Oregon, Texas and Washington.] [Do not provide owner identification information (name or full VIN; providing VIN is ok if last 6 digits removed)]. _____ (Name, Position, Date)
E.	☐	I imaged the data on behalf of and at the request of the following emergency medical responder who, in the course of responding to a motor vehicle crash, including injury, requested the data to determine the need for, or to facilitate, emergency medical response: [For use only in Arkansas, Maine, New Hampshire, New York, Oregon, Texas, Utah, Virginia and Washington]. _____ (Name, Position, Date)
F.	☐	I imaged the data from an EDR that was installed after the manufacture date of the subject motor vehicle [for use only in Colorado]. _____ (Name, Position, Date)
G.	☐	I imaged the data permitted by, and pursuant to, a subscription service contract or agreement [for use only in Nevada and Virginia]. _____ (Name, Position, Date)

_____
(Toyota Representative and Date)