

From: [Wells, Cynthia CTR \(NHTSA\)](#)
To: [Fogle, Brenda CTR \(NHTSA\)](#)
Subject: FW: 2013Rav4toyota
Date: Tuesday, June 23, 2015 10:02:30 AM
Attachments: [2013 TOYOTA Rav4.pdf](#)
[Screenshots.pdf](#)

INFORMATION Redacted PURSUANT TO THE FREEDOM OF
INFORMATION ACT (FOIA), 5 U.S.C. 552(B)(6)

From: Reid, Randy (NHTSA)
Sent: Wednesday, June 10, 2015 2:10 PM
Subject: FW: 2013Rav4toyota

please add the attached files to VOQ 10701827, private and public repositories.

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	2T3DFREV7DW [REDACTED]
User	Gary Falls EAA
Case Number	[REDACTED]
EDR Data Imaging Date	03/12/2015
Crash Date	02/04/2015
Filename	2T3DFREV7DW [REDACTED].ACM.CDRX
Saved on	Thursday, March 12 2015 at 10:08:04
Collected with CDR version	Crash Data Retrieval Tool 15.0
Reported with CDR version	Crash Data Retrieval Tool 15.0
EDR Device Type	Airbag Control Module
Event(s) recovered	Front/Rear (1), Rollover (1)

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 TechStream, 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 seven 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
- 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 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 described 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
Max. Longitudinal Delta-V	Forward
Longitudinal Delta-V	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 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 indicate 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_r023

System Status at Time of Retrieval

ECU Part Number	89170-0R140
EDR Generation	13EDR
Complete File Recorded	Yes
Freeze Signal	ON
Freeze Signal Factor	Front Airbag Deployment
Diagnostic Trouble Codes Exist	No
Ignition Cycle ,Download (times)	2093
Multi-event, number of events (times)	1
Time from event 1 to 2 (s)	5.0 or greater
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	2	Front/Rear Crash	0	Complete (Page 1)	Complete (Front/Rear Page 0)
1st Prior Event	1	Rollover	-16381 or greater	Complete (Page 0)	Complete (Rollover Page 0)

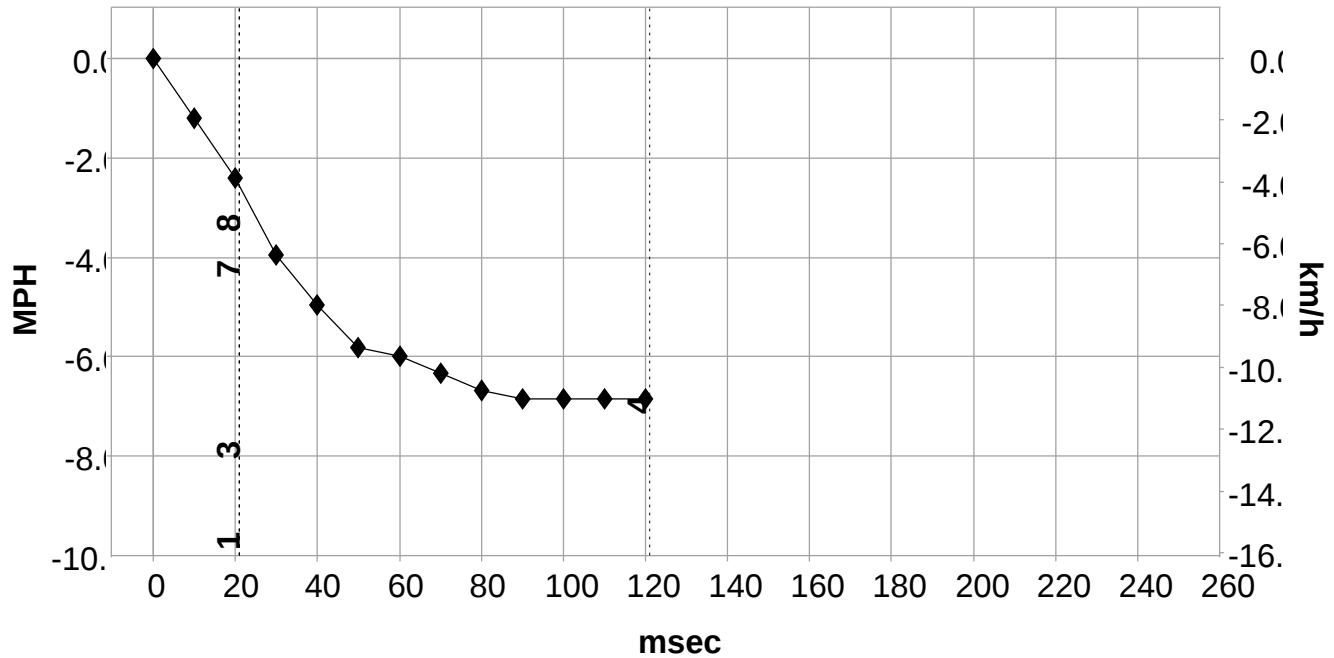
System Status at Event (Most Recent Event, TRG 2)

Recording Status, Front/Rear Crash Info.	Complete
Crash Type	Front/Rear Crash
TRG Count (times)	2
Previous Crash Type	No Event
Time from Pre-Crash TRG (msec)	0
Linked Pre-Crash Page	1
Frontal Airbag Deployment, Time to 1st Stage Deployment, Driver (msec)	21
Frontal Airbag Deployment, Time to 1st Stage Deployment, Front Passenger (msec)	No
Pretensioner Deployment, Time to Fire, Driver (msec)	21
Pretensioner Deployment, Time to Fire, Front Passenger (msec)	21
Frontal Airbag Deployment, Time to 2nd Stage, Driver (msec)	121
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)	21
Side Curtain Airbag Deployment, Time to Deploy, Passenger (msec)	21
Side Airbag Deployment, Time to Deploy, Driver (msec)	SNA
Side Airbag Deployment, Time to Deploy, Passenger (msec)	SNA
Rear Window Airbag Deployment, Time to Deploy (msec)	SNA

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

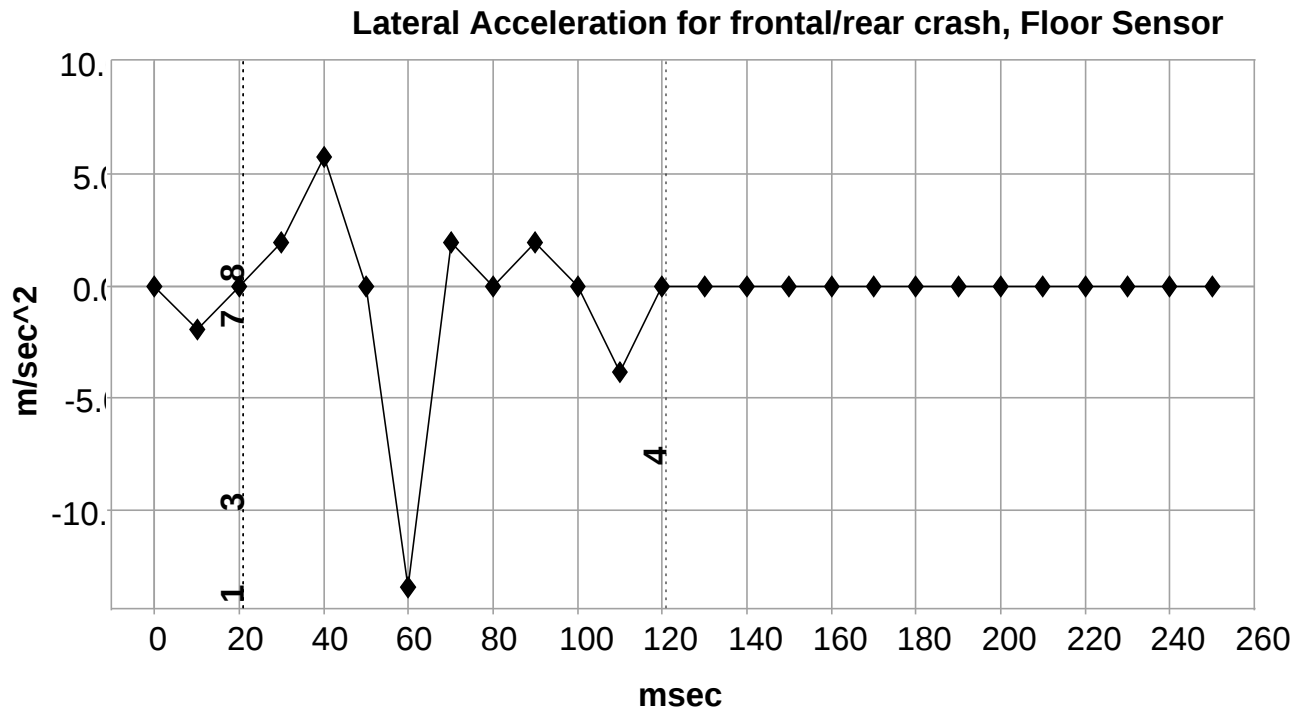
Recording Status, Time Series Data	Complete
Time from Time Zero to TRG (msec)	21.5
Length of Delta-V (msec)	120
Max. Longitudinal Delta-V (MPH [km/h])	-6.9 [-11.0]
Time, Maximum Delta-V, Longitudinal (msec)	82.5
Power Supply Status at Max. Delta-V	ON
Clipping Time of Longitudinal Delta-V (msec)	No
Clipping Time of Lateral Acceleration, Floor Sensor (msec)	No

Longitudinal Delta-V



Deployment Time Marker Key

1	Driver Airbag Deployment Time
2	Passenger Airbag Deployment Time
3	Driver/Passenger Pretensioner Deployment
4	Driver 2nd Stage Airbag Deployment Time
5	Passenger 2nd Stage Airbag Deployment Time
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 Deployment
4	Driver 2nd Stage Airbag Deployment Time
5	Passenger 2nd Stage Airbag Deployment Time
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 (Most Recent Event, TRG 2 - 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	-1.2 [-1.9]	-1.9	ON
20	-2.4 [-3.9]	0.0	ON
30	-3.9 [-6.3]	1.9	ON
40	-5.0 [-8.0]	5.7	ON
50	-5.8 [-9.4]	0.0	ON
60	-6.0 [-9.7]	-13.4	ON
70	-6.3 [-10.2]	1.9	ON
80	-6.7 [-10.8]	0.0	ON
90	-6.9 [-11.0]	1.9	ON
100	-6.9 [-11.0]	0.0	ON
110	-6.9 [-11.0]	-3.8	ON
120	-6.9 [-11.0]	0.0	ON
130	0.0 [0.0]	0.0	ON
140	0.0 [0.0]	0.0	ON
150	0.0 [0.0]	0.0	ON
160	0.0 [0.0]	0.0	ON
170	0.0 [0.0]	0.0	ON
180	0.0 [0.0]	0.0	ON
190	0.0 [0.0]	0.0	ON
200	0.0 [0.0]	0.0	ON
210	0.0 [0.0]	0.0	ON
220	0.0 [0.0]	0.0	ON
230	0.0 [0.0]	0.0	ON
240	0.0 [0.0]	0.0	ON
250	0.0 [0.0]	0.0	ON

DTCs Present at Time of Event (Most Recent Event, TRG 2)

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 2)

Recording Status, Pre-Crash/Occupant	Complete
Time from Pre-Crash to TRG (msec)	150
TRG Count when Pre-crash TRG was Established (times)	2
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)	2079

Pre-Crash Data, -5 to 0 seconds (Most Recent Event, TRG 2)

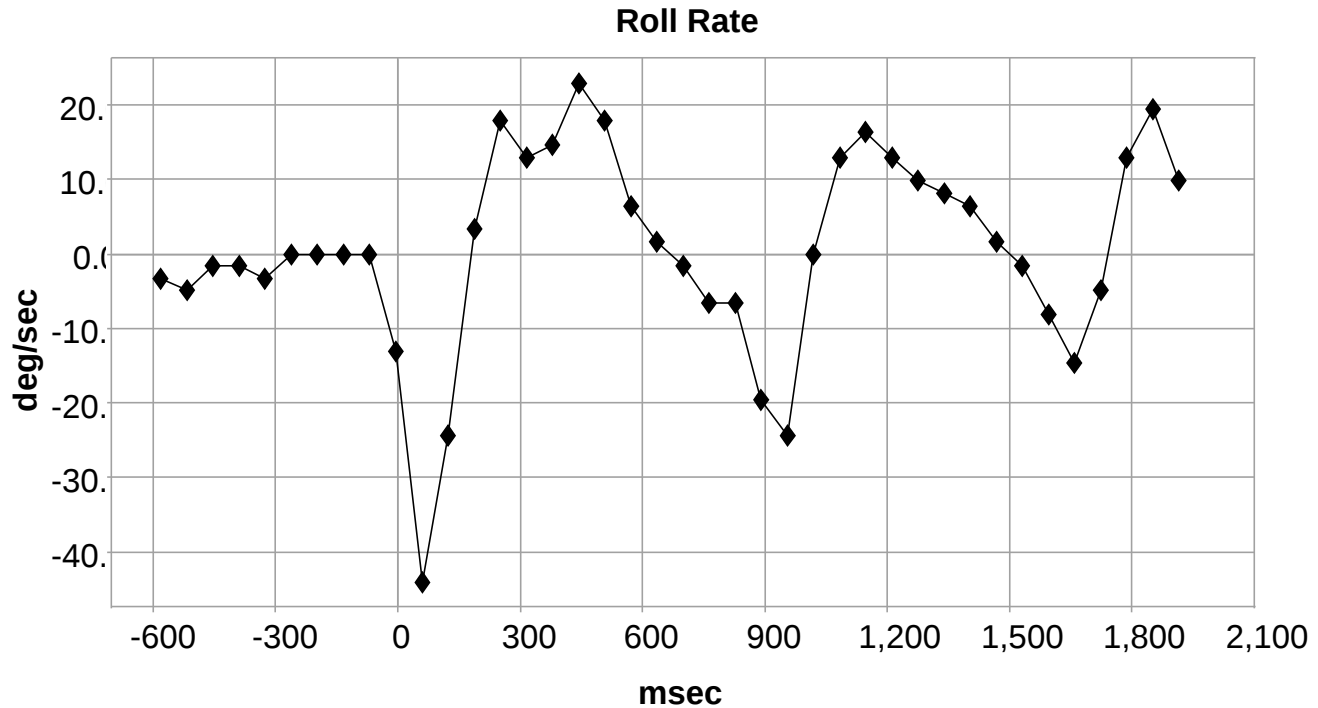
Time (sec)	-4.65	-4.15	-3.65	-3.15	-2.65	-2.15	-1.65	-1.15	-0.65	-0.15	0 (TRG)
Vehicle Speed (MPH [km/h])	1.2 [2]	0 [0]	0 [0]	0 [0]	0 [0]	0 [0]	0 [0]	3.1 [5]	3.7 [6]	12.4 [20]	6.8 [11]
Accelerator Pedal, % Full (%)	60.0	71.0	60.5	56.0	51.5	43.0	46.5	3.0	38.0	0.0	0.0
Percentage of Engine Throttle	60.0	72.0	64.5	57.5	51.0	41.5	37.0	6.0	14.5	0.0	0.0
Engine RPM (RPM)	2,200	2,300	2,400	2,400	2,400	2,400	2,400	2,200	1,300	2,200	2,100
Motor RPM (RPM)	Invalid	Invalid	Invalid	Invalid	Invalid	Invalid	Invalid	Invalid	Invalid	Invalid	Invalid
Service Brake, ON/OFF	ON	ON	ON	ON	ON	ON	ON	ON	ON	ON	ON
Brake Oil Pressure (Mpa)	5.66	5.04	4.22	3.79	3.50	2.93	3.22	0.00	2.93	0.43	0.82
Longitudinal Acceleration ,	-5.384	-1.866	-0.215	-0.646	-0.718	-0.431	0.431	5.025	-2.225	-5.025	-8.973
Yaw Rate (deg/sec)	2.93	0.00	0.00	0.00	0.00	-0.49	-0.49	-1.95	9.27	12.20	-3.42
Steering Input (degrees)	-54.0	-48.0	-48.0	-46.5	-46.5	-46.5	-45.0	-42.0	-49.5	-109.5	-105.0
Shift Position	Seq	Seq	Seq	Seq	Seq	Seq	Seq	Seq	Seq	Seq	Seq
Sequential Shift Range	3	3	3	3	3	3	3	3	4	4	4
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 1)

Recording Status, Rollover Crash Info.	Complete
Crash Type	Rollover
TRG Count (times)	1
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

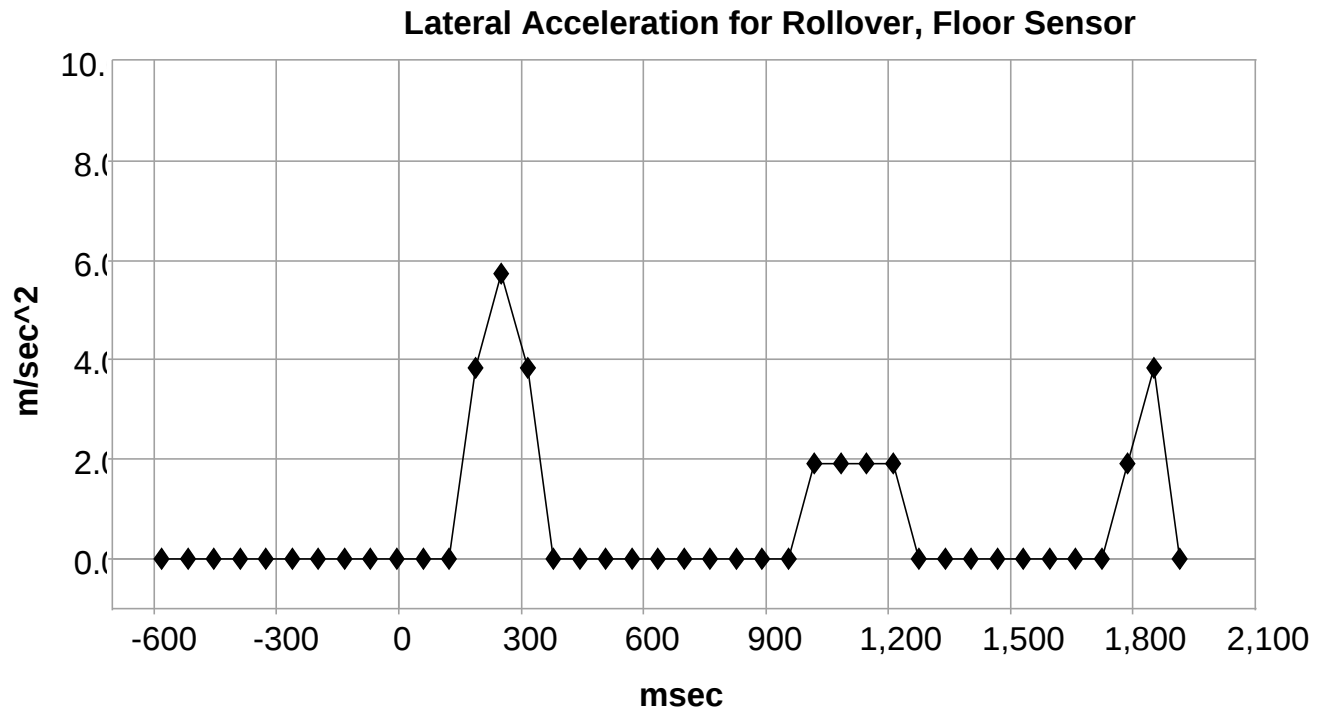
Rollover Crash Pulse (1st Prior Event, TRG 1 - table 1 of 2)

Recording Status, Time Series Data	Complete
Time from TRG to Next Sample (msec)	59
Roll Angle Peak (degrees)	-5.1
Roll Angle at the Time of TRG (degrees)	-3.5



Deployment Time Marker Key

1	Driver/Passenger CSA
2	Driver/Passenger Pretensioner Deployment



Deployment Time Marker Key

1	Driver/Passenger CSA
2	Driver/Passenger Pretensioner Deployment

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

Time (msec)	Roll Rate (deg/sec)	Lateral Acceleration for Rollover, Floor Sensor (m/sec^2)
-581	-3.3	0.0
-517	-4.9	0.0
-453	-1.6	0.0
-389	-1.6	0.0
-325	-3.3	0.0
-261	0.0	0.0
-197	0.0	0.0
-133	0.0	0.0
-69	0.0	0.0
-5	-13.0	0.0
59	-44.0	0.0
123	-24.4	0.0
187	3.3	3.8
251	17.9	5.7
315	13.0	3.8
379	14.7	0.0
443	22.8	0.0
507	17.9	0.0
571	6.5	0.0
635	1.6	0.0
699	-1.6	0.0
763	-6.5	0.0
827	-6.5	0.0
891	-19.5	0.0
955	-24.4	0.0
1019	0.0	1.9
1083	13.0	1.9
1147	16.3	1.9
1211	13.0	1.9
1275	9.8	0.0
1339	8.1	0.0
1403	6.5	0.0
1467	1.6	0.0
1531	-1.6	0.0
1595	-8.1	0.0
1659	-14.7	0.0
1723	-4.9	0.0
1787	13.0	1.9
1851	19.5	3.8
1915	9.8	0.0

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

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 1)

Recording Status, Pre-Crash/Occupant	Complete
Time from Pre-Crash to TRG (msec)	50
TRG Count when Pre-crash TRG was Established (times)	1
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)	339

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

Time (sec)	-4.55	-4.05	-3.55	-3.05	-2.55	-2.05	-1.55	-1.05	-0.55	-0.05	0 (TRG)
Vehicle Speed (MPH [km/h])	9.9 [16]	9.3 [15]	9.3 [15]	9.3 [15]	9.3 [15]	9.3 [15]	9.9 [16]	9.3 [15]	8.7 [14]	6.8 [11]	7.5 [12]
Accelerator Pedal, % Full (%)	12.5	13.5	18.0	17.5	17.5	17.5	8.0	0.0	0.0	0.0	0.0
Percentage of Engine Throttle	4.0	4.5	7.0	6.5	6.5	6.5	3.5	0.0	0.0	0.0	0.0
Engine RPM (RPM)	1,100	1,100	1,000	1,000	900	1,000	1,000	1,000	900	800	800
Motor RPM (RPM)	Invalid	Invalid	Invalid	Invalid	Invalid	Invalid	Invalid	Invalid	Invalid	Invalid	Invalid
Service Brake, ON/OFF	OFF	OFF	OFF	OFF	OFF	OFF	OFF	OFF	ON	ON	ON
Brake Oil Pressure (Mpa)	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.53	0.77	1.15
Longitudinal Acceleration ,	0.431	0.502	0.718	0.790	0.790	0.646	0.861	0.215	-0.215	1.005	-8.326
Yaw Rate (deg/sec)	17.57	12.69	11.22	11.71	14.15	18.54	24.40	25.86	20.98	13.18	11.71
Steering Input (degrees)	159.0	118.5	111.0	117.0	142.5	196.5	235.5	252.0	207.0	177.0	162.0
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 34 30 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	02
	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 05 00 05 00 19 00 29 B1 85 5F C0 00
	62	A5 01 7F FD 08 2D 00 00 00 00
	63	55 00 01 53 11 10 00 00 11 11 11 11 10 10 0F 0F 0F 0F 0F 10 0F 0E 0B 0C 19 1B 24 23 23 23 10 00 00 00 00 00 54 0B 0B 0A 0A 09 0A 0A 0A 09 08 08 00 00 00 00 00 00 00 01
	64	55 08 08 1F 11 10 00 00 BB BB BB BB B0 02 00 00 00 00 00 00 05 06 14 0B 78 8E 79 70 67 56 5D 06 4C 00 00 55 55 54 16 17 18 18 18 18 18 16 0D 16 15 33 33 33 33 44 40 00 02
	65	55 00 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 00
	67	55 E4 00 00 02 15 15 15 64 1E 55 FD FD 00 15 00 15 FF FE FF FE 03 FE
	68	00 00
	69	00 2B 0D 00 00 00 07 00 0E 00 17 00 1D 00 22 00 23 00 25 00 27 00 28 00 28 00 28 00 28 00 28 00 A5
	6A	00 00
	6B	00 00
	6C	00 00
	6D	00 00
	6E	00 00
	6F	55 FF FE E0 00 00 01 55 FB FE FD FF FF FE 00 00 00 00 F8 E5 F1 02 0B 08 09 0E 0B 04 01 FF FC FC F4 F1 00 08 0A 08 06 05 04 01 FF FB F7 FD 08 0C 06 FF BD FF 9E
	70	00 00
	71	00 00 00 00 00 00 00 00 00 00 00 00 00 FE FD FE 00 00 00 00 00 00 00 00 00 FF FF FF FF 00 00 00 00 00 00 00 FF FE 00
	72	00 00
	73	00 0A 00 00 00 00 00 00 0B 10 18 00 00 00 00 00 00 00 00 00 24 1A 17 18 1D 26 32 35 2B 1B 18 06 07 0A 0B 0B 09 0C 03 FD 0E 8C 08 09 0E 0D 0D 0D 07 00 00 00 00 00 00 00

```
74 76 69 58 4F 49 3D 43 00 3D 09 11 00 00 00 00 00 00 00 00 00 00 00
06 00 00 00 00 FF FF FC 13 19 F9 B5 E6 FD F7 F6 FA 06 46 E1 BA 83
78 90 81 73 66 53 4A 0C 1D 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 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 FE FE
A6 00 40 00 40 00 40 00 40 00 40 00 40 00 40 00 40 00 40 00 40 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 FE FE
B4 00 00 00 00 00 00 00 00 00 00 00 00 00 00 00 00 00 00 00 00 00
00 00 00 00
B5 00 00 00 00 00 00 00 00 00 00 00 00 00 00 00 00 00 00 00 00 00
00 00 00 00
B6 00 01 00 FF FD 00 07 FF 00 FF 00 02 00 00 00 00 00 00 00 00 00
00 00 00 00 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
B8 00 6A 00 4F 00 4A 00 4E 00 5F 00 83 00 9D 00 A8 00 8A 00 76 00 6C
B9 03 DC 03 E0 03 E0 03 E1 03 E1 03 E1 03 E2 03 E4 03 DF 03 B7 03 BA
```

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.

From: [REDACTED]
To: [Hayes, Nathaniel \(NHTSA\)](#)
Subject: [REDACTED] (2013 Toyota rav4 -UA) Screenshot
Date: Thursday, March 26, 2015 2:34:19 PM
Attachments: [Screenshot.png](#)

I don't know how to enlarge these pictures.

Sent from Windows Mail

From: [REDACTED]
To: [Hayes, Nathaniel \(NHTSA\)](#)
Subject: [REDACTED] (2013 Toyota rav4 -UA) Screenshot
Date: Thursday, March 26, 2015 2:34:19 PM
Attachments: [Screenshot.png](#)

I don't know how to enlarge these pictures.

Sent from Windows Mail

From: [REDACTED]
To: [Hayes, Nathaniel \(NHTSA\)](#)
Subject: [REDACTED] (2013 Toyota rav4 -UA) Reader
Date: Thursday, March 26, 2015 9:57:46 AM
Attachments: [2T3DFREV7DW0\[REDACTED\].ACM.PDF](#)

I think I figured out how to do this on my computer.

From: [REDACTED]
To: [Hayes, Nathaniel \(NHTSA\)](#)
Subject: Screenshot - 100_0456 Wooded area across Hwy 139
Date: Sunday, March 29, 2015 10:14:05 PM
Attachments: [Screenshot.png](#)

In this picture the wooded area you see is just across highway 139. The electric pole just at the rear of the Toyota is approximately 3 feet from the highway . Something in that car was causing the motor to speed up and that something was not me .

Sent from Windows Mail

From: [REDACTED]
To: [Hayes, Nathaniel \(NHTSA\)](#)
Subject: Screenshot - 100_0456 Wooded area across Hwy 139
Date: Sunday, March 29, 2015 10:14:05 PM
Attachments: [Screenshot.png](#)

In this picture the wooded area you see is just across highway 139. The electric pole just at the rear of the Toyota is approximately 3 feet from the highway . Something in that car was causing the motor to speed up and that something was not me .

Sent from Windows Mail

From: [REDACTED]
To: [Hayes, Nathaniel \(NHTSA\)](#)
Subject: Screenshot - 100_0454 Car moved back on top
Date: Friday, March 27, 2015 12:59:34 PM
Attachments: [Screenshot.png](#)

Car moved back to the top after the accident.

Sent from Windows Mail

From: [REDACTED]
To: [Hayes, Nathaniel \(NHTSA\)](#)
Subject: Screenshot - 100_0454 Car moved back on top
Date: Friday, March 27, 2015 12:59:34 PM
Attachments: [Screenshot.png](#)

Car moved back to the top after the accident.

Sent from Windows Mail

From: [REDACTED]
To: [Hayes, Nathaniel \(NHTSA\)](#)
Subject: Screenshot - 100_0457 spot by the fence
Date: Friday, March 27, 2015 12:57:06 PM
Attachments: [Screenshot.png](#)

The spot by the fence is where the front end of the car landed then bounced then the rear end of the car landed.

Sent from Windows Mail

From: [REDACTED]
To: [Hayes, Nathaniel \(NHTSA\)](#)
Subject: Screenshot - 100_0457 spot by the fence
Date: Friday, March 27, 2015 12:57:06 PM
Attachments: [Screenshot.png](#)

The spot by the fence is where the front end of the car landed then bounced then the rear end of the car landed.

Sent from Windows Mail

From: [REDACTED]
To: [Hayes, Nathaniel \(NHTSA\)](#)
Subject: Screenshot - Screenshot - 100_0458 some right rear damage
Date: Sunday, March 29, 2015 10:07:11 PM
Attachments: [Screenshot.png](#)

Some right rear damage from the impact with the ground . This was a very frightening ride. I still have physical and mental problems today , Which is Sunday the 29th of March .

Sent from Windows Mail

From: [REDACTED]
To: [Hayes, Nathaniel \(NHTSA\)](#)
Subject: Screenshot - Screenshot - 100_0458 some right rear damage
Date: Sunday, March 29, 2015 10:07:11 PM
Attachments: [Screenshot.png](#)

Some right rear damage from the impact with the ground . This was a very frightening ride. I still have physical and mental problems today , Which is Sunday the 29th of March .

Sent from Windows Mail

From: [REDACTED]
To: [Hayes, Nathaniel \(NHTSA\)](#)
Subject: Screenshot - Screenshot - 100_0459 Front end damage
Date: Sunday, March 29, 2015 10:04:40 PM
Attachments: [Screenshot.png](#)

Front end damage from impact with the ground one the left side of the car all the way across the front end to the right side.

Sent from Windows Mail

From: [REDACTED]
To: [Hayes, Nathaniel \(NHTSA\)](#)
Subject: Screenshot - Screenshot - 100_0459 Front end damage
Date: Sunday, March 29, 2015 10:04:40 PM
Attachments: [Screenshot.png](#)

Front end damage from impact with the ground one the left side of the car all the way across the front end to the right side.

Sent from Windows Mail

From: [REDACTED]
To: [Hayes, Nathaniel \(NHTSA\)](#)
Subject: Screenshot - Screenshot - 100_0462 right side of parking area
Date: Sunday, March 29, 2015 10:02:05 PM
Attachments: [Screenshot.png](#)

This picture is the right side of my parking area. If you will look at the ground to the left of that pine tree and bird feeder , you will see where the earth is torn up . This is where I got the Toyota stopped. I sure was a fortunate person . It took me a few minutes to get the seatbelt unhooked .The air bags were deployed and all around me. My wife, who seen the entire event , was crying a screaming . She thought I was hurt really bad. The car climbed over that wall . If the throttle had not been stuck that wall would have stopped the car. I'm sure the data from the car computer will prove me tp be right.

From: [REDACTED]
To: [Hayes, Nathaniel \(NHTSA\)](#)
Subject: Screenshot - Screenshot - 100_0462 right side of parking area
Date: Sunday, March 29, 2015 10:02:05 PM
Attachments: [Screenshot.png](#)

This picture is the right side of my parking area. If you will look at the ground to the left of that pine tree and bird feeder , you will see where the earth is torn up . This is where I got the Toyota stopped. I sure was a fortunate person . It took me a few minutes to get the seatbelt unhooked .The air bags were deployed and all around me. My wife, who seen the entire event , was crying a screaming . She thought I was hurt really bad. The car climbed over that wall . If the throttle had not been stuck that wall would have stopped the car. I'm sure the data from the car computer will prove me tp be right.

From: [REDACTED]
To: [Hayes, Nathaniel \(NHTSA\)](#)
Subject: Screenshot - Screenshot - 100_0464 - My parking area
Date: Sunday, March 29, 2015 9:46:20 PM
Attachments: [Screenshot.png](#)

Picture of my parking area and where the car went over the retaining wall. Highway 139 is directly in the rear of this picture. The highway is not shown. There was not much wiggle room . I tried desperately to stop my car. I had my foot on the brake the entire time of this event .I managed to turn the car to the right keeping from going into the lake . The lake is a TVA lake named Douglas .

Sent from Windows Mail

From: [REDACTED]
To: [Hayes, Nathaniel \(NHTSA\)](#)
Subject: Screenshot - Screenshot - 100_0464 - My parking area
Date: Sunday, March 29, 2015 9:46:20 PM
Attachments: [Screenshot.png](#)

Picture of my parking area and where the car went over the retaining wall. Highway 139 is directly in the rear of this picture. The highway is not shown. There was not much wiggle room . I tried desperately to stop my car. I had my foot on the brake the entire time of this event .I managed to turn the car to the right keeping from going into the lake . The lake is a TVA lake named Douglas .

Sent from Windows Mail

From: [REDACTED]
To: [Hayes, Nathaniel \(NHTSA\)](#)
Subject: Screenshot
Date: Friday, March 27, 2015 10:27:05 AM
Attachments: [Screenshot.png](#)

Nathaniel , I don't know how to enlarge these pictures and send individually.

Sent from Windows Mail

From: [REDACTED]
To: [Hayes, Nathaniel \(NHTSA\)](#)
Subject: Screenshot
Date: Friday, March 27, 2015 10:27:05 AM
Attachments: [Screenshot.png](#)

Nathaniel , I don't know how to enlarge these pictures and send individually.

Sent from Windows Mail

From: [REDACTED]
To: [Hayes, Nathaniel \(NHTSA\)](#)
Subject: Screenshot
Date: Thursday, March 26, 2015 8:45:40 PM
Attachments: [Screenshot.png](#)

Sent from Windows Mail

From: [REDACTED]
To: [Hayes, Nathaniel \(NHTSA\)](#)
Subject: Screenshot
Date: Thursday, March 26, 2015 8:45:40 PM
Attachments: [Screenshot.png](#)

Sent from Windows Mail