EDR

▸ Vehicle Information

KIA	SOUL(AM)	2013	AIRBAG SYSTEM
VIN as Programmed into EMS	

▸ Additional Information

User-entered VIN	KNDJT2A63D7537209
User Name	KMA
Case Number	C02248232
Crash Date	1/11/2017
Saved-on Date	2017-08-31 08:10
EDR Tool Version	E-N-K-01-00-0021
EDR Report Version	EDR001-R01
Tire Size(s)	
Memo	Loughran 2013 Soul accident vehicle at T. Tracy's Dallas, TX 8/31/2017

Data Limitation

General Information:

Tools for downloading and interpreting the EDRs in Kia vehicles have been developed for vehicles produced after September 1, 2012. Currently, there is no tool for downloading and accurate interpreting data from the EDRs in Kia vehicles produced prior to this date.

The EDR Report requires Adobe Reader Version 9.00 or higher to open.

EDR(Event Data Recorder):

- The EDR function is part of the Airbag Control Unit(ACU).

- ACU can store up to two events.

- Event means a crash or other physical occurrence that causes the trigger threshold to be met or exceeded, or any non-reversible deployable restraint to be deployed, whichever occurs first:

    1. Deployment Event:
       1) the event which is recorded if an airbag is commanded to deploy.
       2) the event is locked and cannot be overwritten.

    2. Non-deployment Event:
       1) the event which is recorded, but in which an airbag is not commanded to deploy
       2) the event is not locked and can be overwritten by a subsequent event (Deployment or Non-deployment event), for example, Pretensioner(s) only deployment
       3) An example of a non-deployment event is a pretensioner-only deployment with no airbag deployments

- Ignition cycle count will increment by 1 in the following cases

    1. the power mode change from OFF/Accessary to IGN ON/RUN

    2. EDR data download by tools

- The ACU can record data for all or some of the following events. But, depending on the vehicle's configurations, data for side crash and/or rollover crash(event) may not be recorded.

- If power supply to the ACU is lost during an event, all or part of the data may not be recorded.

Data Limitation

Data Element Sign Convention:

The following table provides an explanation of the sign notation for data elements that may be included in the EDR report. Directional references to sign convention are from the point of view of the driver.

Data element name	Positive sign	Note
Longitudinal acceleration	Forward direction	+X at the figure 1
Delta V, longitudinal	Forward direction	+X at the figure 1
Lateral acceleration	Left to Right direction	+Y at the figure 1
Delta V, lateral	Left to Right direction	+Y at the figure 1
Normal(vertical) acceleration	Downward direction	+Z at the figure 1
Vehicle roll angle	Clockwise about the longitudinal axis	Roll(+) at the figure 1
Steering input	Counterclockwise rotation	-

Figure 1. Sign Conventions
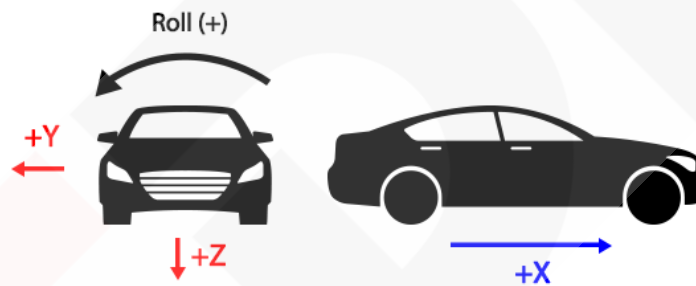
Data Sources:

Many EDR data elements are sourced from other control modules in the vehicle.

1. Most of them can be measured and calculated by the ACU. For example, Delta-V and Rollover angle can be calculated from internal sensors in the ACU (if applicable).

2. The following pre-crash data can be transmitted to the ACU via the vehicle's communication network.
   - Vehicle Speed
   - Engine RPM
   - Engine Throttle
   - Acceleration Pedal
   - Service Brake
   - ABS Activity
   - Stability Control
   - Steering Input Angle
   *Note) Depending on the vehicle's configuration and the conditions described above, some items may not be recorded.

3. Pre-crash data is recorded in discrete intervals. Due to different refresh rates within the vehicle's electronics, the data recorded may be asynchronous to each other.

Data Limitation

Data Definitions:

–   Data recorded by the ACU and imaged by the EDR tool is displayed relative to Time zero(T0). Time zero(T0) is not typically the time at which the vehicle made contact with another vehicle or object.

–   Time zero (T0) means whichever of the following occurs first

1. For systems with ''wake-up'' air bag control systems, the time at which the occupant restraint control algorithm is activated; or

2. For continuously running algorithms,
 1) The first point in the interval where a longitudinal cumulative delta-V of over 0.8 km/h (0.5 mph) is reached within a 20msec time period; or
 2) For vehicles that record ''delta-V, lateral,'' the first point in the interval where a lateral cumulative delta-V of over 0.8 km/h (0.5 mph) is reached within a 5msec time period; or

3. Deployment of a non-reversible deployable restraint.

–   Multi-event crash means the occurrence of 2 events, the first and last of which begin not more than 5 seconds apart. If an event is not part of a multi-event crash, the value of this data element will be "1".

–   Service brake, on or off means the status of the device that is installed in or connected to the brake pedal system to detect whether the pedal was pressed. The device can include the brake pedal switch or other driver-operated service brake control,

–   Engine RPM means

1. For vehicles powered by internal combustion engines, the number of revolutions per minute of the main crankshaft of the vehicle's engine, and

2. For vehicles not entirely powered by internal combustion engines, the number of revolutions per minute of the motor shaft at the point at which it enters the vehicle transmission gearbox.

–   Engine Throttle is a measure of the throttle position.

–   Accelerator Pedal is a measure of the accelerator pedal value.

–   Seat belt status is determined by whether the buckle switch is open or closed.

–   Delta-V means the cumulative change in velocity, and is calculated from internal sensors in the ACU

◘ EDR Information

Part No. (EOL Code) as programmed into ACU	95910-2K061(AM54)
ECU SW Version as programmed into ACU	041101
EDR Version as programmed into ACU	

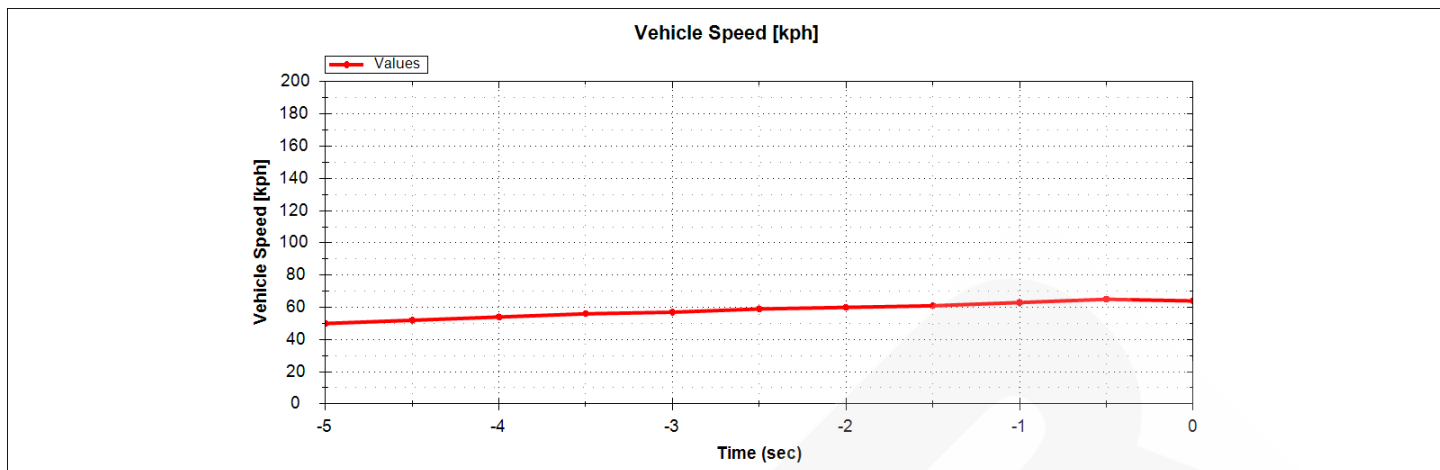# ‹ Event 1 ›

Event Status at Event

Multi-event, Number of Event (1 or 2)	1 event
Time from Event 1 to 2 [msec]	0
Completed File Recorded (Yes or No)	YES
Ignition cycle, crash [cycle]	5613
Ignition cycle, download [cycle]	5616

Pre-Crash Information (-5 ~ 0 sec)

Time (sec)	Vehicle Speed [kph]	Engine RPM [rpm]	Engine Throttle [%]	Service Brake [on/off]	ABS Activity [on/off]	Stability Control [on/off/engaged]	Steering Input [degree]
-5.0	50	2000	25	OFF	OFF	On	0
-4.5	52	2100	23	OFF	OFF	On	0
-4.0	54	2200	22	OFF	OFF	On	0
-3.5	56	2200	20	OFF	OFF	On	0
-3.0	57	2300	19	OFF	OFF	On	0
-2.5	59	2200	16	OFF	OFF	On	0
-2.0	60	1800	14	OFF	OFF	On	0
-1.5	61	1800	14	OFF	OFF	On	0
-1.0	63	2400	41	OFF	OFF	On	0
-0.5	65	2400	29	OFF	OFF	On	0
0.0	64	2300	20	OFF	OFF	Engaged	25

‹ Event 1 ›
Vehicle Speed

Vehicle Speed [kph]

Num	Time (sec)	Vehicle Speed [kph]
1	−5.0	50
2	−4.5	52
3	−4.0	54
4	−3.5	56
5	−3.0	57
6	−2.5	59
7	−2.0	60
8	−1.5	61
9	−1.0	63
10	−0.5	65
11	0.0	64

< Event 1 >
Engine RPM
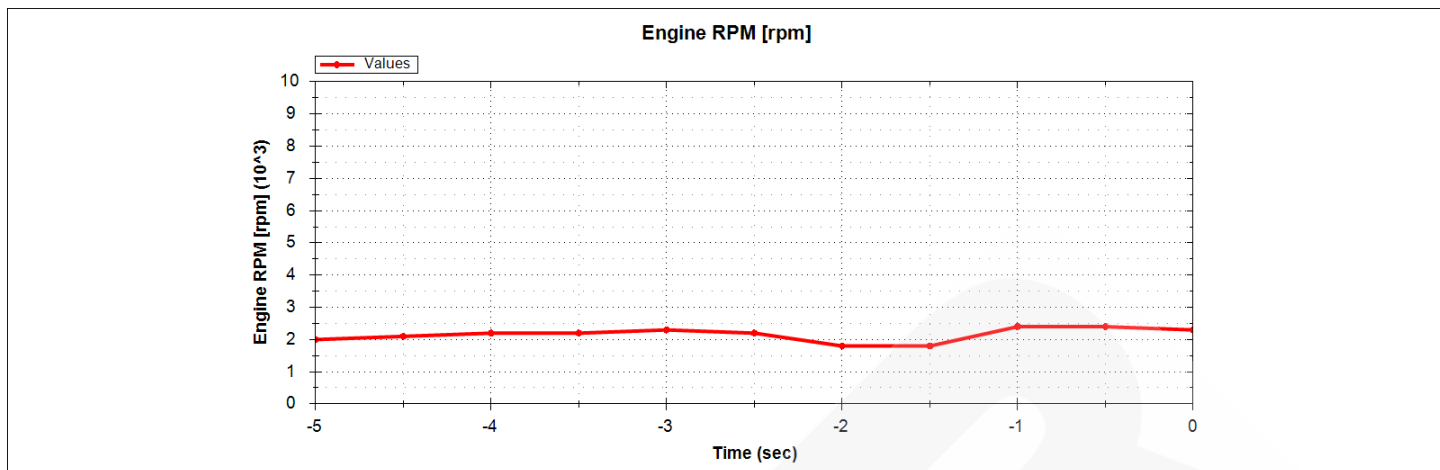
Num	Time (sec)	Engine RPM [rpm]
1	−5.0	2000
2	−4.5	2100
3	−4.0	2200
4	−3.5	2200
5	−3.0	2300
6	−2.5	2200
7	−2.0	1800
8	−1.5	1800
9	−1.0	2400
10	−0.5	2400
11	0.0	2300

‹ Event 1 ›
Engine Throttle
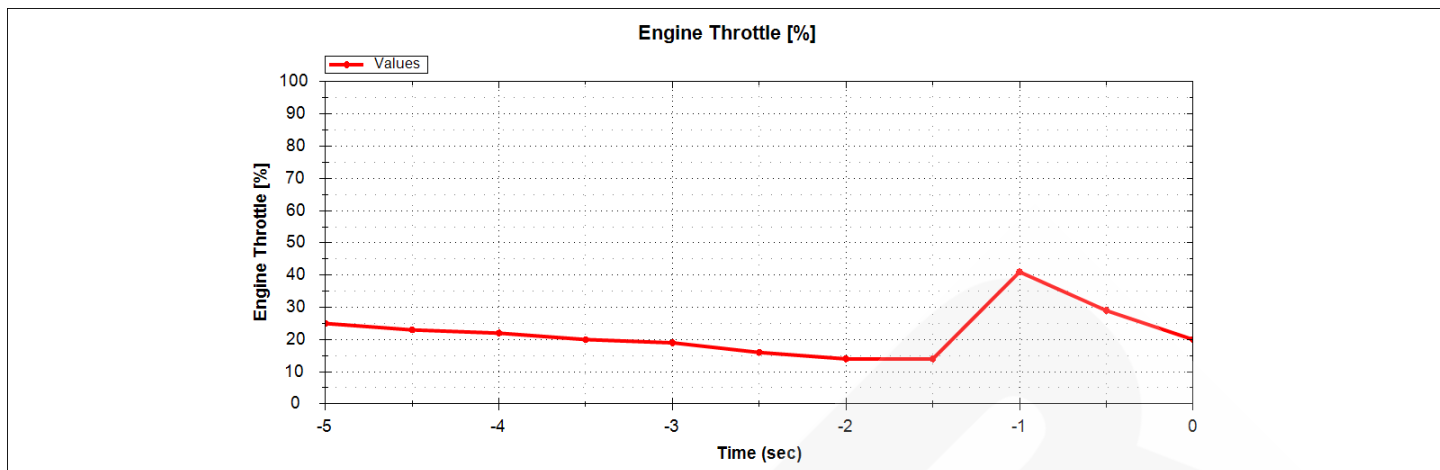
Engine Throttle [%]

Num	Time (sec)	Engine Throttle [%]
1	-5.0	25
2	-4.5	23
3	-4.0	22
4	-3.5	20
5	-3.0	19
6	-2.5	16
7	-2.0	14
8	-1.5	14
9	-1.0	41
10	-0.5	29
11	0.0	20

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‹ Event 1 ›
Service Brake

Num	Time (sec)	Service Brake [on/off]
1	−5.0	OFF
2	−4.5	OFF
3	−4.0	OFF
4	−3.5	OFF
5	−3.0	OFF
6	−2.5	OFF
7	−2.0	OFF
8	−1.5	OFF
9	−1.0	OFF
10	−0.5	OFF
11	0.0	OFF

ABS Activity

Num	Time (sec)	ABS Activity [on/off]
1	−5.0	OFF
2	−4.5	OFF
3	−4.0	OFF
4	−3.5	OFF
5	−3.0	OFF
6	−2.5	OFF
7	−2.0	OFF
8	−1.5	OFF
9	−1.0	OFF
10	−0.5	OFF
11	0.0	OFF

Stability Control

Num	Time (sec)	Stability Control [on/off/engaged]
1	−5.0	On
2	−4.5	On
3	−4.0	On
4	−3.5	On
5	−3.0	On
6	−2.5	On
7	−2.0	On
8	−1.5	On
9	−1.0	On
10	−0.5	On
11	0.0	Engaged

‹ Event 1 ›
Steering Input

Steering Input [degree]
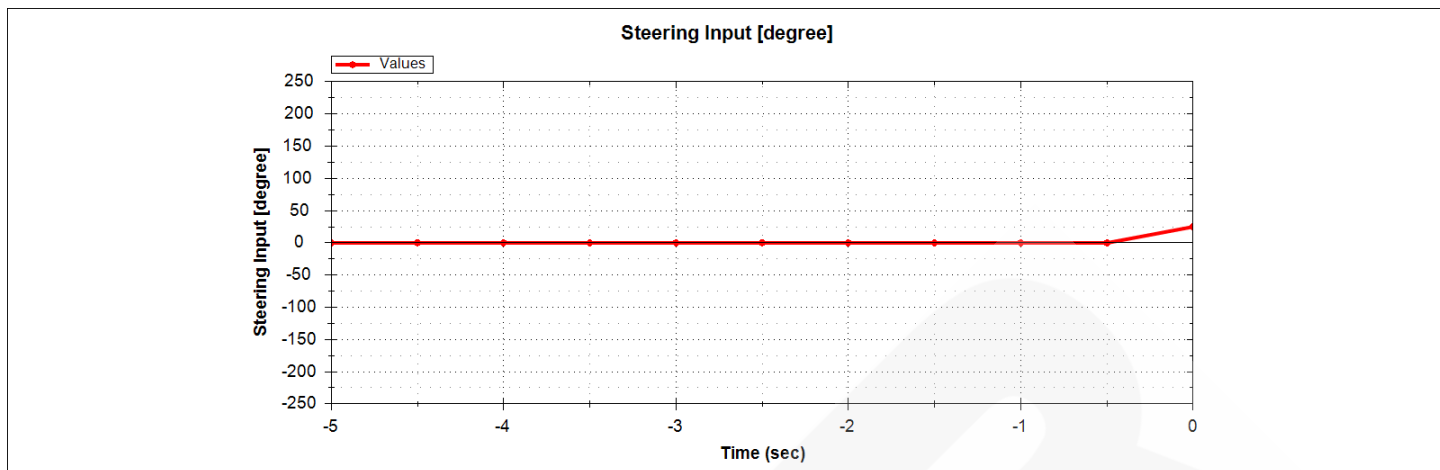
Num	Time (sec)	Steering Input [degree]
1	-5.0	0
2	-4.5	0
3	-4.0	0
4	-3.5	0
5	-3.0	0
6	-2.5	0
7	-2.0	0
8	-1.5	0
9	-1.0	0
10	-0.5	0
11	0.0	25

Note) Positive value(CCW), Negative value(CW)

‹ Event 1 ›

## System Status at Event

Airbag warning lamp on/off	ON
Safety seat belt status, driver	ON
Safety seat belt status, passenger	OFF
Seat track position switch foremost status, driver	Not Supported
Seat track position switch foremost status, passenger	Not Supported
Occupant size classification, driver (5% female or larger)	Not Supported
Occupant size classification, passenger (child)	YES

Deployment Command Data at Event

Front airbag deployment time, driver (first stage) [msec]	16
Front airbag deployment time, passenger (first stage) [msec]	No deployment
Front airbag deployment time, driver (second stage) [msec]	26
Front airbag deployment time, passenger (second stage) [msec]	No deployment
Front airbag deployment time, driver (third stage) [msec]	Not Supported
Front airbag deployment time, passenger (third stage) [msec]	Not Supported
Front airbag disposal deployment, driver (second stage) (Yes or No)	NO
Front airbag disposal deployment, passenger (second stage) (Yes or No)	NO
Front side airbag deployment time, driver [msec]	No deployment
Front side airbag deployment time, passenger [msec]	No deployment
Curtain airbag deployment time, driver [msec]	No deployment
Curtain airbag deployment time, passenger [msec]	No deployment
Seat belt pretensioner deployment time, driver [msec]	16
Seat belt pretensioner deployment time, passenger [msec]	No deployment

⟨ Event 1 ⟩

## Longitudinal crash pulse_acceleration (g, 0 ~ 250msec)
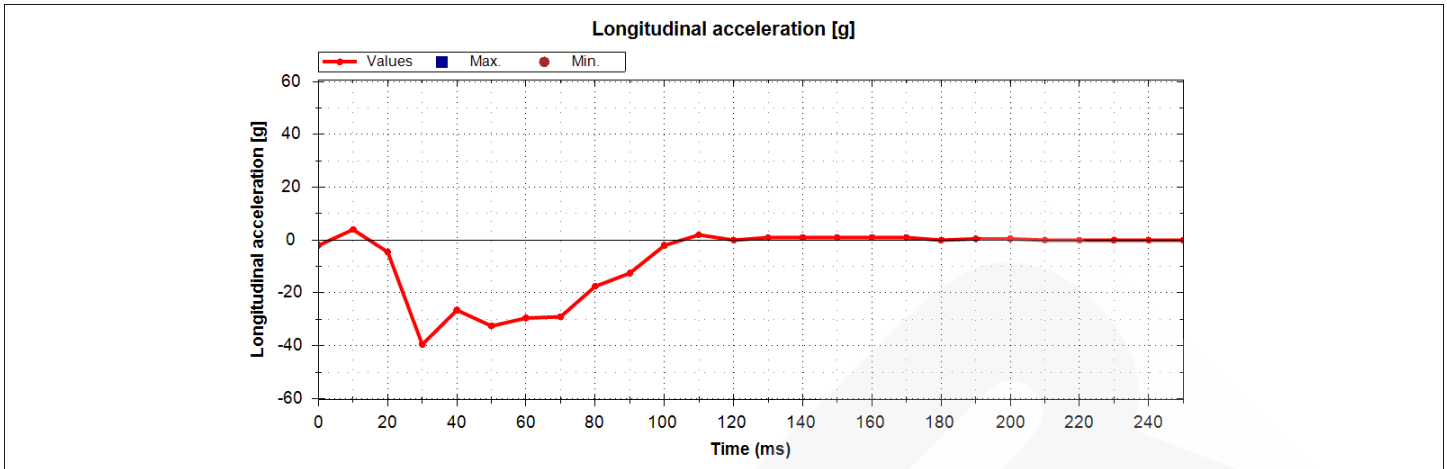
Num	Time (ms)	Longitudinal acceleration [g]
1	0.0	−2.0
2	10.0	4.0
3	20.0	−4.5
4	30.0	−39.5
5	40.0	−26.5
6	50.0	−32.5
7	60.0	−29.5
8	70.0	−29.0
9	80.0	−17.5
10	90.0	−12.5
11	100.0	−2.0
12	110.0	2.0
13	120.0	0.0
14	130.0	1.0
15	140.0	1.0
16	150.0	1.0
17	160.0	1.0
18	170.0	1.0
19	180.0	0.0
20	190.0	0.5
21	200.0	0.5
22	210.0	0.0
23	220.0	0.0
24	230.0	0.0
25	240.0	0.0
26	250.0	0.0

⟨ Event 1 ⟩

Longitudinal crash pulse_delta-v (kph, 0 ~ 250msec)

Max. delta-V [kph]	−71
Time, Max. delta-V [msec]	102.5
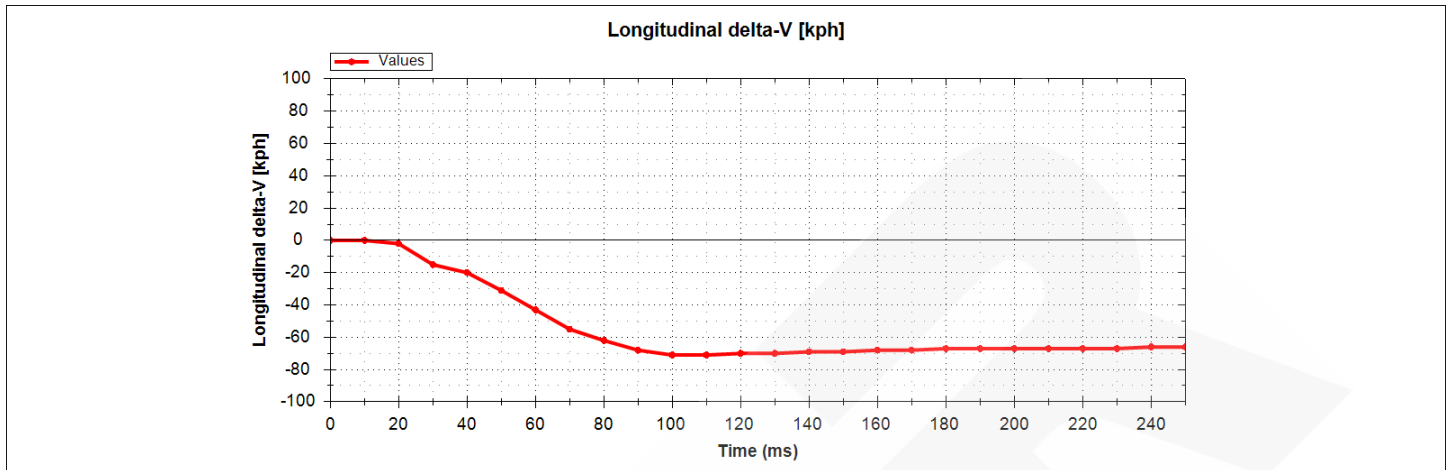
Num	Time (ms)	Longitudinal delta-V [kph]
1	0.0	0
2	10.0	0
3	20.0	−2
4	30.0	−15
5	40.0	−20
6	50.0	−31
7	60.0	−43
8	70.0	−55
9	80.0	−62
10	90.0	−68
11	100.0	−71
12	110.0	−71
13	120.0	−70
14	130.0	−70
15	140.0	−69
16	150.0	−69
17	160.0	−68
18	170.0	−68
19	180.0	−67
20	190.0	−67
21	200.0	−67
22	210.0	−67
23	220.0	−67
24	230.0	−67
25	240.0	−66
26	250.0	−66

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‹ Event 1 ›

Lateral crash pulse_acceleration (g, 0 ~ 250msec)
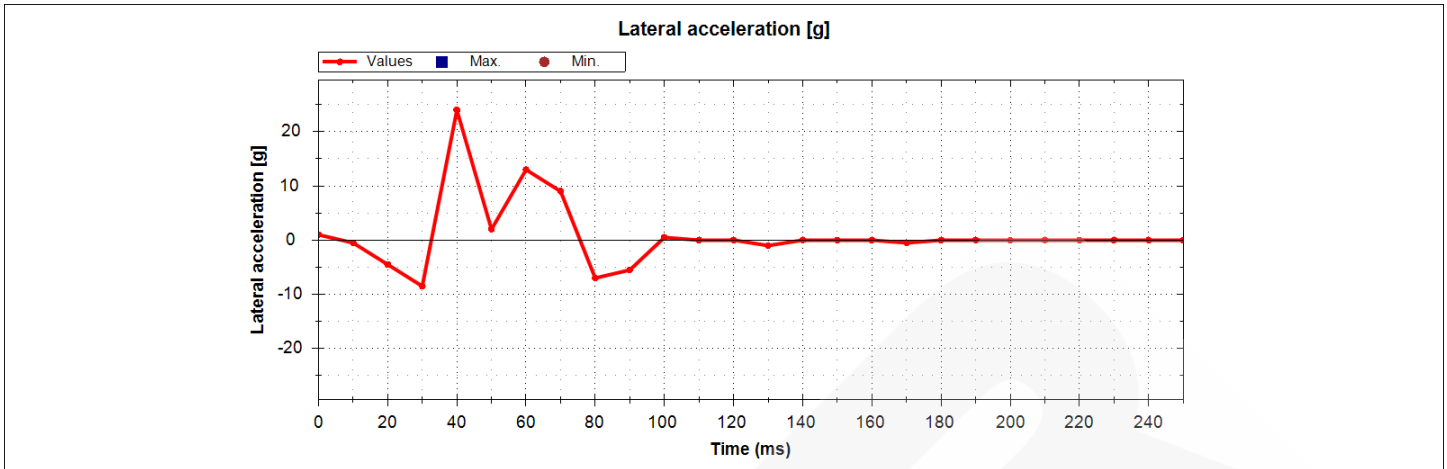
Num	Time (ms)	Lateral acceleration [g]
1	0.0	1.0
2	10.0	−0.5
3	20.0	−4.5
4	30.0	−8.5
5	40.0	24.0
6	50.0	2.0
7	60.0	13.0
8	70.0	9.0
9	80.0	−7.0
10	90.0	−5.5
11	100.0	0.5
12	110.0	0.0
13	120.0	0.0
14	130.0	−1.0
15	140.0	0.0
16	150.0	0.0
17	160.0	0.0
18	170.0	−0.5
19	180.0	0.0
20	190.0	0.0
21	200.0	0.0
22	210.0	0.0
23	220.0	0.0
24	230.0	0.0
25	240.0	0.0
26	250.0	0.0

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‹ Event 1 ›

Lateral crash pulse_delta-v (kph, 0 ~ 250msec)

Max. delta-V [kph]	4
Time, Max. delta-V [msec]	70.0
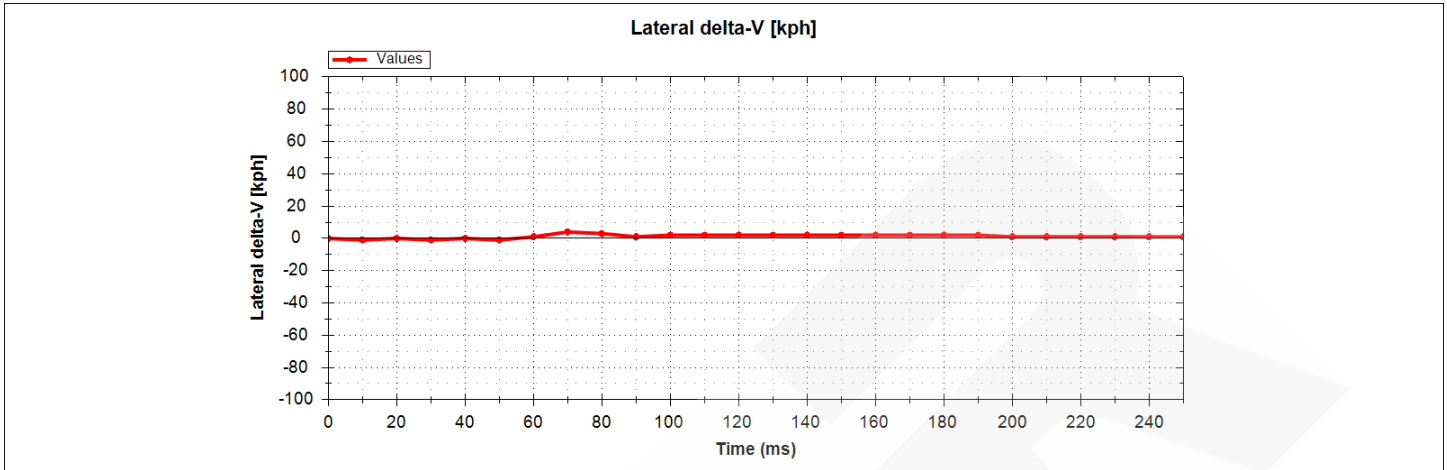
Num	Time (ms)	Lateral delta-V [kph]
1	0.0	0
2	10.0	-1
3	20.0	0
4	30.0	-1
5	40.0	0
6	50.0	-1
7	60.0	1
8	70.0	4
9	80.0	3
10	90.0	1
11	100.0	2
12	110.0	2
13	120.0	2
14	130.0	2
15	140.0	2
16	150.0	2
17	160.0	2
18	170.0	2
19	180.0	2
20	190.0	2
21	200.0	1
22	210.0	1
23	220.0	1
24	230.0	1
25	240.0	1
26	250.0	1

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‹ Event 1 ›

Crash pulse Resultant, Time_Max. delta-V resultant (0 ~ 300 msec)

Time, Max. delta-V, resultant [msec]	102.5

Normal acceleration (g, 0 ~ 250msec)
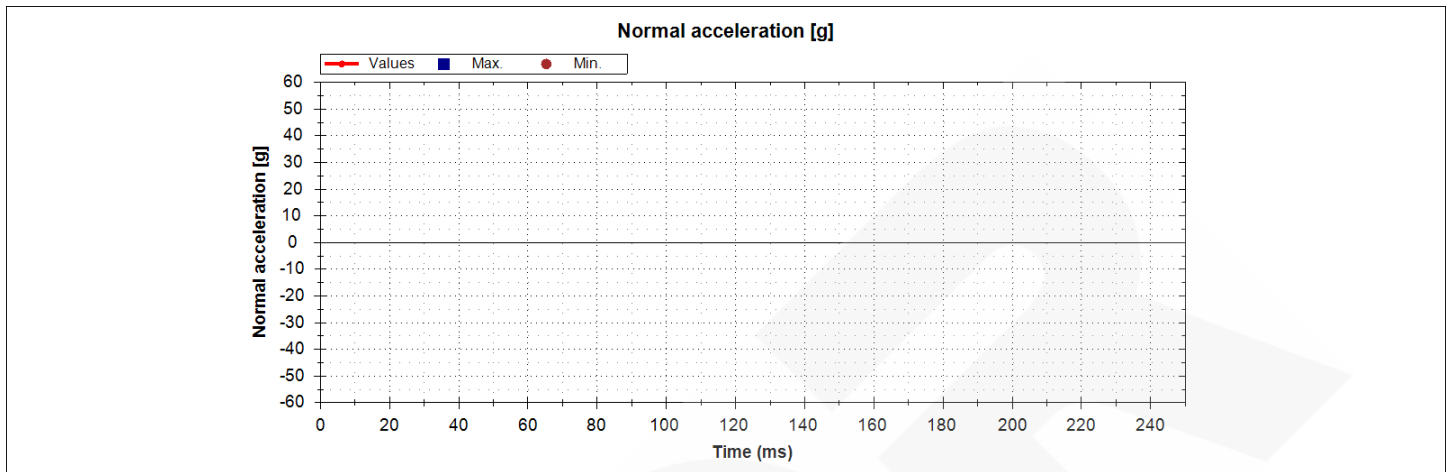
Num	Time (ms)	Normal acceleration [g]
1	0.0	Not supported
2	10.0	Not supported
3	20.0	Not supported
4	30.0	Not supported
5	40.0	Not supported
6	50.0	Not supported
7	60.0	Not supported
8	70.0	Not supported
9	80.0	Not supported
10	90.0	Not supported
11	100.0	Not supported
12	110.0	Not supported
13	120.0	Not supported
14	130.0	Not supported
15	140.0	Not supported
16	150.0	Not supported
17	160.0	Not supported
18	170.0	Not supported
19	180.0	Not supported
20	190.0	Not supported
21	200.0	Not supported
22	210.0	Not supported
23	220.0	Not supported
24	230.0	Not supported
25	240.0	Not supported
26	250.0	Not supported

‹ Event 1 ›

Roll angle (degree, –1 ~ 5sec)
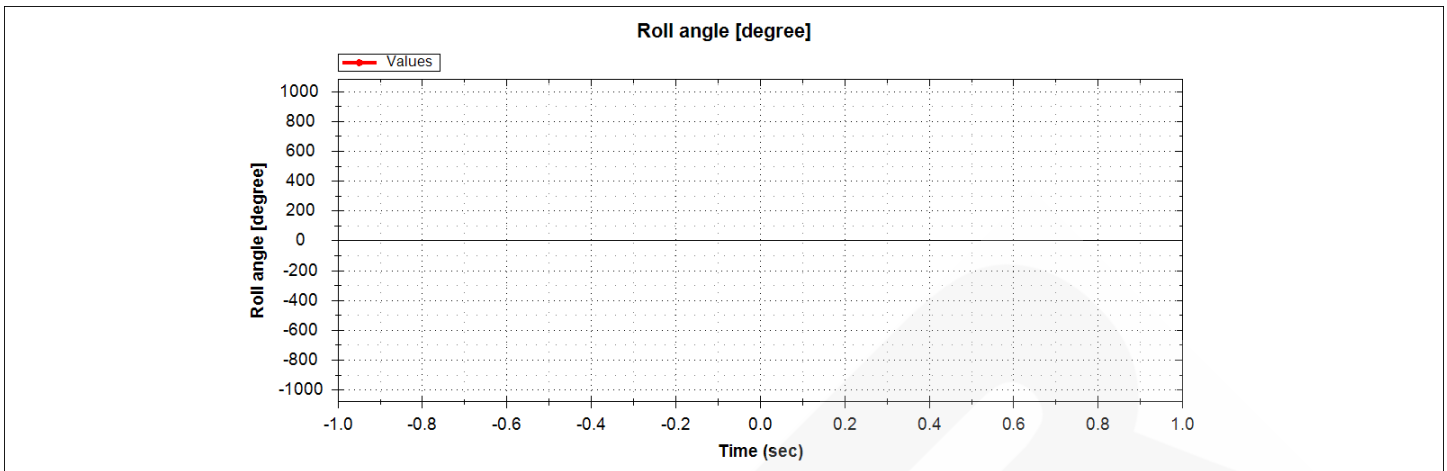
Num	Time (sec)	Roll angle [degree]
1	–1.0	Not supported
2	–0.9	Not supported
3	–0.8	Not supported
4	–0.7	Not supported
5	–0.6	Not supported
6	–0.5	Not supported
7	–0.4	Not supported
8	–0.3	Not supported
9	–0.2	Not supported
10	–0.1	Not supported
11	0.0	Not supported
12	0.1	Not supported
13	0.2	Not supported
14	0.3	Not supported
15	0.4	Not supported
16	0.5	Not supported
17	0.6	Not supported
18	0.7	Not supported
19	0.8	Not supported
20	0.9	Not supported
21	1.0	Not supported

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Raw Data

FF 00 00 00 7F 7F 7D 70 6B 60 54 48 41 3B 38 38 39 39 3A 3A 3B 3B 3C 3C 3C 3C 3C 3C 3D 3D
38 29 7F 7E 7F 7E 7F 7E 80 83 82 80 81 81 81 81 81 81 81 81 81 80 80 80 80 80 80 83 1C
29 00 00 00 00 00 00 00 00 00 00 00 00 00 00 00 00 00 00 00 00 00 00 00

FF FF FF FC 32 34 36 38 39 3B 3C 3D 3F 41 40 19 17 16 14 13 10 0E 0E 29 1D 14 55 55 15 15
ED 01 01 10 00 00 00 01 14 15 16 16 17 16 12 12 18 18 17 00 00 00 55 55 25 7F 7F 7F 7F 7F
7F 7F 7F 7F 7F 84 00 03 03 07 01 1A 00 00 00 00 00 10 00 00 00

E0 00 00 00 7B 87 76 30 4A 3E 44 45 5C 66 7B 83 7F 81 81 81 81 81 7F 80 80 7F 7F 7F 7F 7F
81 7E 76 6E AF 83 99 91 71 74 80 7F 7F 7D 7F 7F 7F 7E 7F 7F 7F 7F 7F 7F 7F 7F 00 00 00 00
00 00 00 00 00 00 00 00 00 00 00 00 00 00 00 00 00 00 00 00 00

FF FF F0 00 64 D1 F1 FF FF 03 FF FF FF 17 17 00 00 19 18 FF FF 00 00 15 F0

There is no recorded event.