Vehicle Information

HYUNDAI | TUCSON(TL) | 2016 | AIRBAG SYSTEM	
VIN as Programmed into EMS	KM8J33A28GU128434

Additional Information

User-entered VIN	KM8J33A28GU128434
User Name	
Case Number	
Crash Date	
Saved-on Date	2019-10-08 10:25
EDR Tool Version	E-N-H-01-00-0031
EDR Report Version	EDR001-R01
Tire Size(s)	
Memo	

Data Limitation

General Information:

Tools for downloading and interpreting the EDRs in Hyundai 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 Hyundai 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.

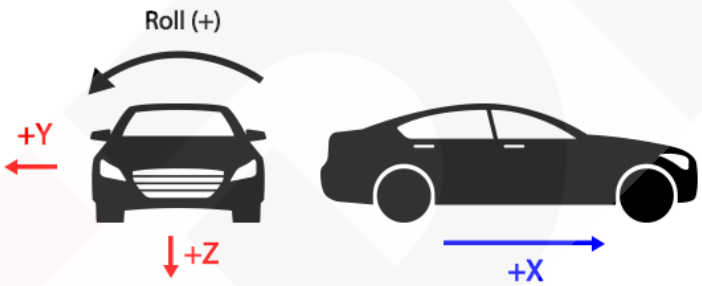
Data Limitation

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-D3200(D332)
ECU SW Version as programmed into ACU	2.03
EDR Version as programmed into ACU	

< Event 1 >

Event Status at Event

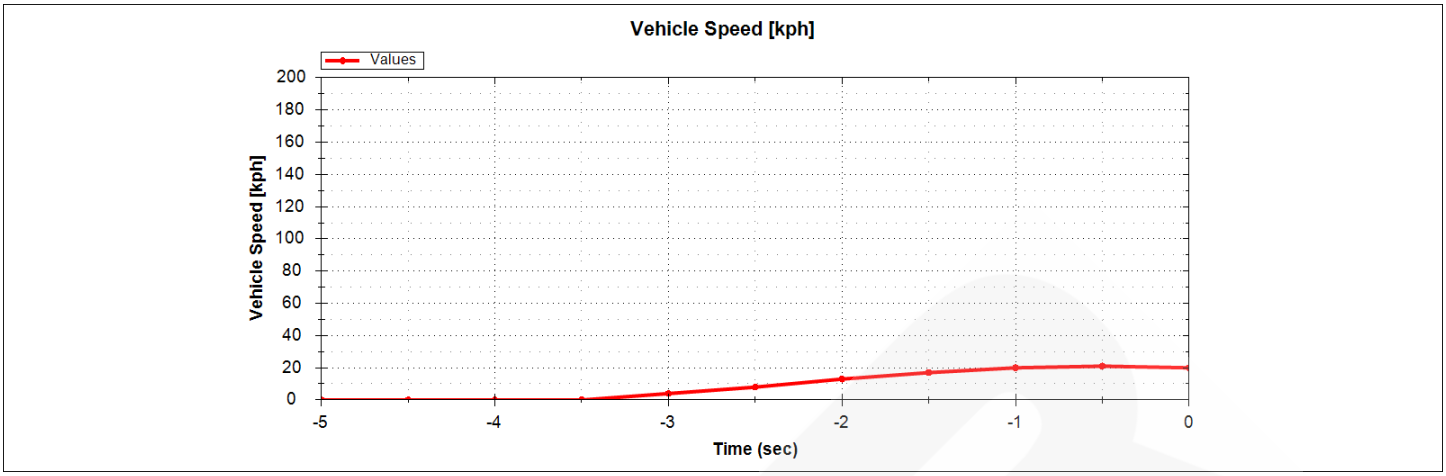
Multi-event, Number of Event (1 or 2)	1 event
Time from Event 1 to 2 [msec]	0
Completed File Recorded (Yes or No)	YES
Ignition cycle, crash [cycle]	5022
Ignition cycle, download [cycle]	7038

Pre-Crash Information (-5 ~ 0 sec)

Time (sec)	Vehicle Speed [kph]	Engine RPM [rpm]	Engine Throttle [%]	Acceleration Pedal [%]	Service Brake [on/off]	ABS Activity [on/off]	Stability Control [on/off/engaged]	Steering Input [degree]
-5.0	0	600	3	0	ON	OFF	ON	0
-4.5	0	700	3	0	ON	OFF	ON	0
-4.0	0	700	8	11	OFF	OFF	ON	0
-3.5	0	1400	19	22	OFF	OFF	ON	0
-3.0	4	1600	22	26	OFF	OFF	ON	5
-2.5	8	1800	25	29	OFF	OFF	ON	10
-2.0	13	2100	25	28	OFF	OFF	ON	70
-1.5	17	2500	25	26	OFF	OFF	ON	120
-1.0	20	3000	23	23	OFF	OFF	ON	145
-0.5	21	2100	9	0	ON	OFF	ON	150
0.0	20	1800	4	0	ON	OFF	ON	250

< Event 1 >

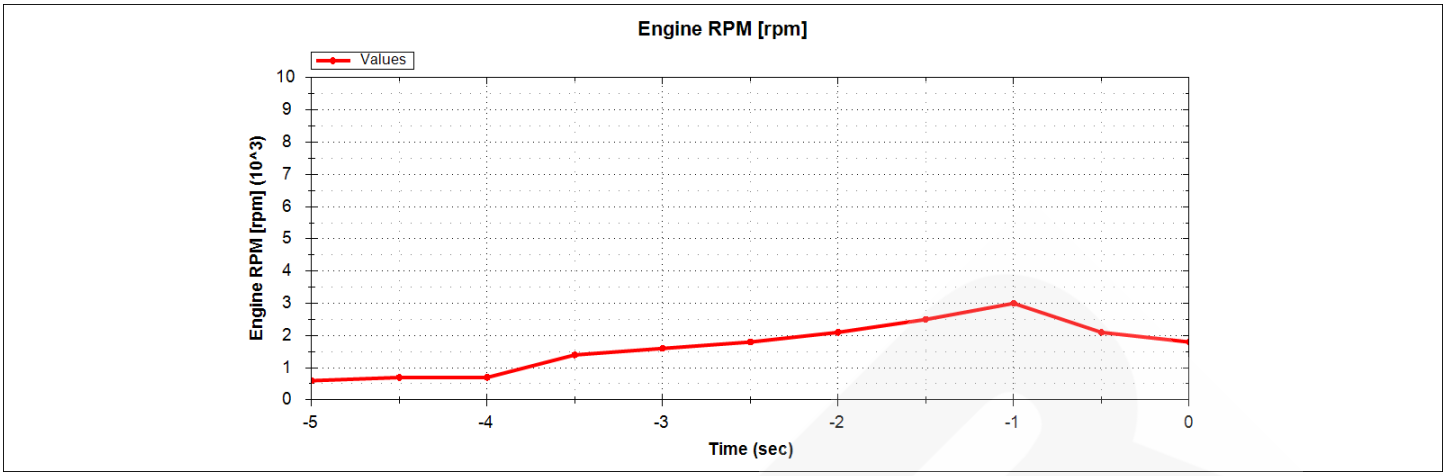
Vehicle Speed



Num	Time (sec)	Vehicle Speed [kph]
1	-5.0	0
2	-4.5	0
3	-4.0	0
4	-3.5	0
5	-3.0	4
6	-2.5	8
7	-2.0	13
8	-1.5	17
9	-1.0	20
10	-0.5	21
11	0.0	20

‹ Event 1 ›

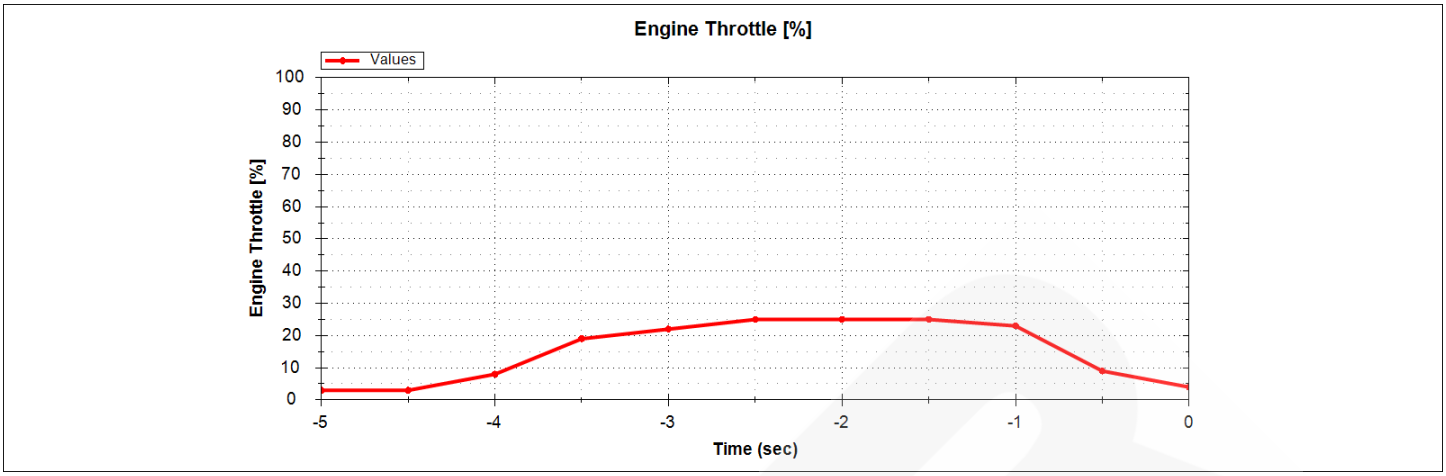
Engine RPM



Num	Time (sec)	Engine RPM [rpm]
1	-5.0	600
2	-4.5	700
3	-4.0	700
4	-3.5	1400
5	-3.0	1600
6	-2.5	1800
7	-2.0	2100
8	-1.5	2500
9	-1.0	3000
10	-0.5	2100
11	0.0	1800

< Event 1 >

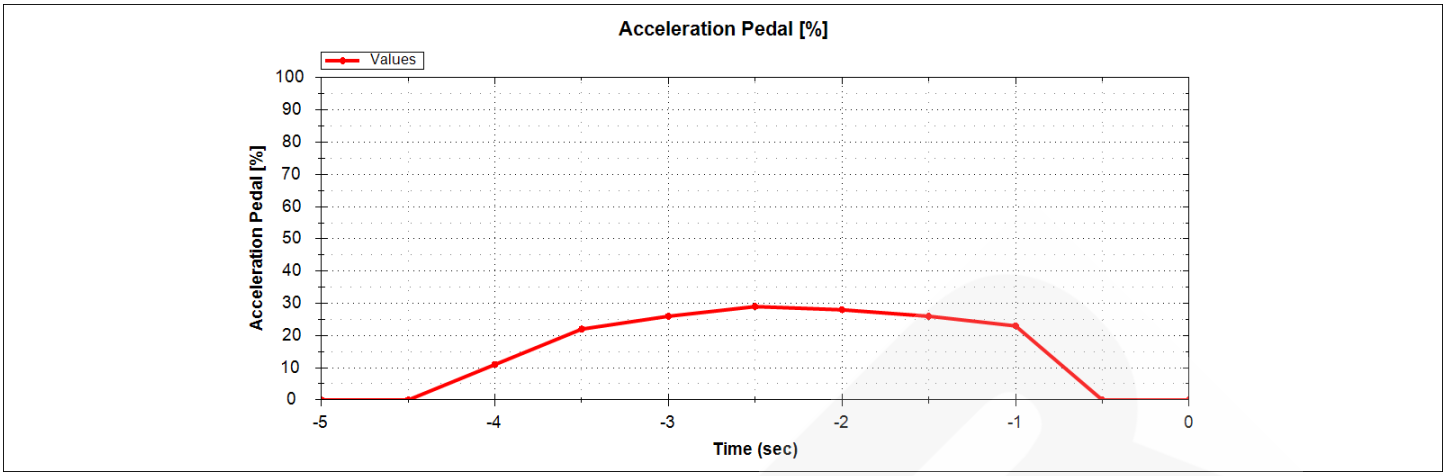
Engine Throttle



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

‹ Event 1 ›

Acceleration Pedal



Num	Time (sec)	Acceleration Pedal [%]
1	-5.0	0
2	-4.5	0
3	-4.0	11
4	-3.5	22
5	-3.0	26
6	-2.5	29
7	-2.0	28
8	-1.5	26
9	-1.0	23
10	-0.5	0
11	0.0	0

< Event 1 >

Service Brake

Num	Time (sec)	Service Brake [on/off]
1	-5.0	ON
2	-4.5	ON
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	ON
11	0.0	ON

ABS Activity

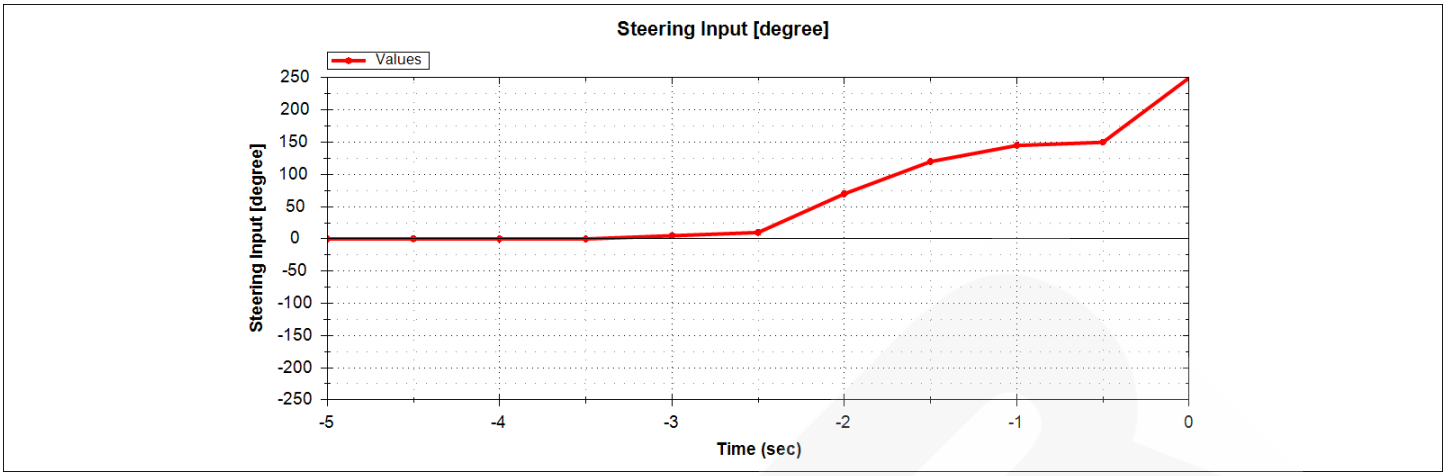
Num	Time (sec)	ABS Activity [on/off]
1	-5.0	OFF
2	-4.5	OFF
3	-4.0	OFF
4	-3.5	OFF
5	-3.0	OFF
6	-2.5	OFF
7	-2.0	OFF
8	-1.5	OFF
9	-1.0	OFF
10	-0.5	OFF
11	0.0	OFF

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	ON

< Event 1 >

Steering Input



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	5
6	-2.5	10
7	-2.0	70
8	-1.5	120
9	-1.0	145
10	-0.5	150
11	0.0	250

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

‹ Event 1 ›

System Status at Event

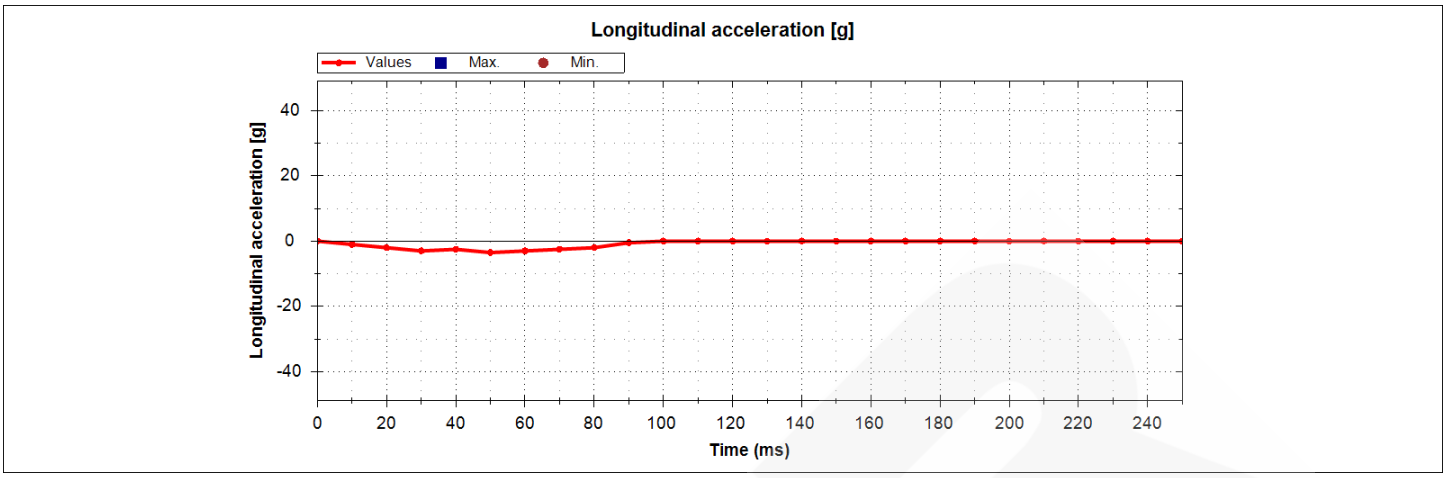
Airbag warning lamp on/off	OFF
Safety seat belt status, driver	ON
Safety seat belt status, passenger	ON
Seat track position switch foremost status, driver	Not Supported
Seat track position switch foremost status, passenger	Not Supported
Occupant size classification, driver (5% female or larger)	Not Supported
Occupant size classification, passenger (child)	NO

Deployment Command Data at Event

Front airbag deployment time, driver (first stage) [msec]	No deployment
Front airbag deployment time, passenger (first stage) [msec]	No deployment
Front airbag deployment time, driver (second stage) [msec]	No deployment
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]	No deployment
Front airbag disposal deployment, driver (second stage) (Yes or No)	NO
Front airbag disposal deployment, passenger (second stage) (Yes or No)	NO
Front airbag disposal deployment, driver (third stage) (Yes or No)	NO
Front airbag disposal deployment, passenger (third 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]	No deployment
Seat belt pretensioner deployment time, passenger [msec]	No deployment

‹ Event 1 ›

Longitudinal crash pulse_acceleration (g, 0 ~ 250msec)

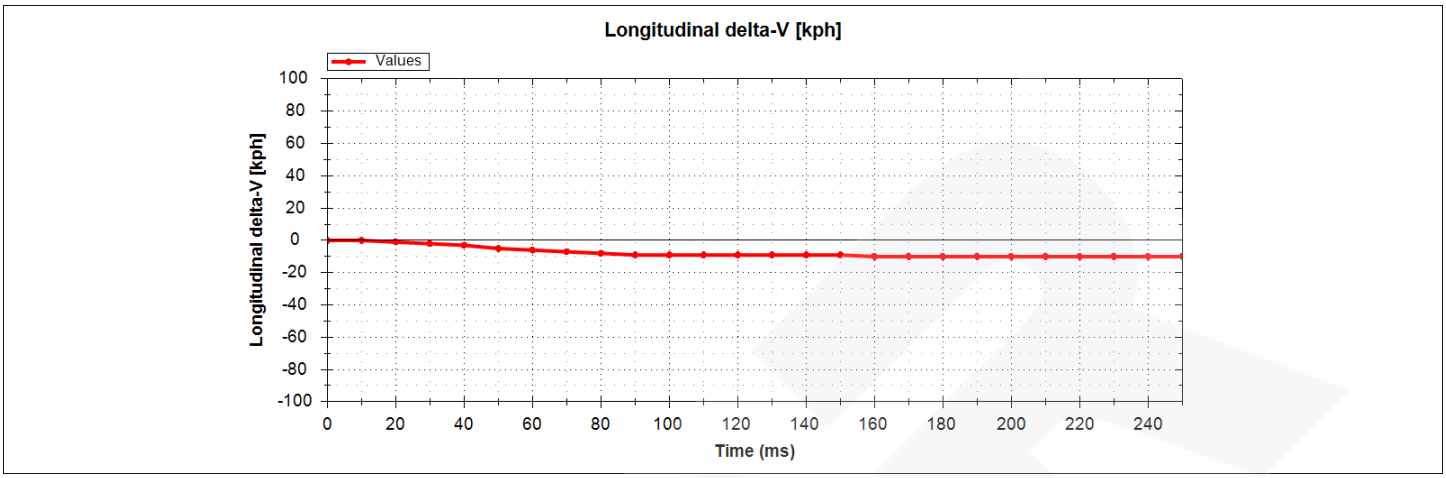


Num	Time (ms)	Longitudinal acceleration [g]
1	0.0	0.0
2	10.0	-1.0
3	20.0	-2.0
4	30.0	-3.0
5	40.0	-2.5
6	50.0	-3.5
7	60.0	-3.0
8	70.0	-2.5
9	80.0	-2.0
10	90.0	-0.5
11	100.0	0.0
12	110.0	0.0
13	120.0	0.0
14	130.0	0.0
15	140.0	0.0
16	150.0	0.0
17	160.0	0.0
18	170.0	0.0
19	180.0	0.0
20	190.0	0.0
21	200.0	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

‹ Event 1 ›

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

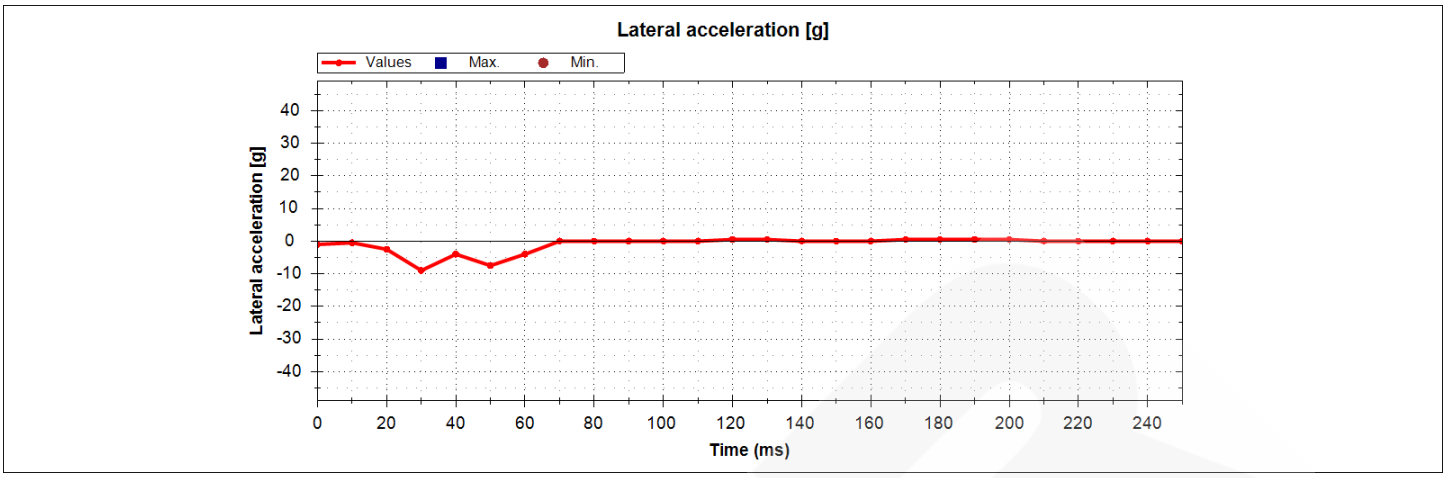
Max. delta-V [kph]	-11
Time, Max. delta-V [msec]	297.5



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

‹ Event 1 ›

Lateral crash pulse_acceleration (g, 0 ~ 250msec)

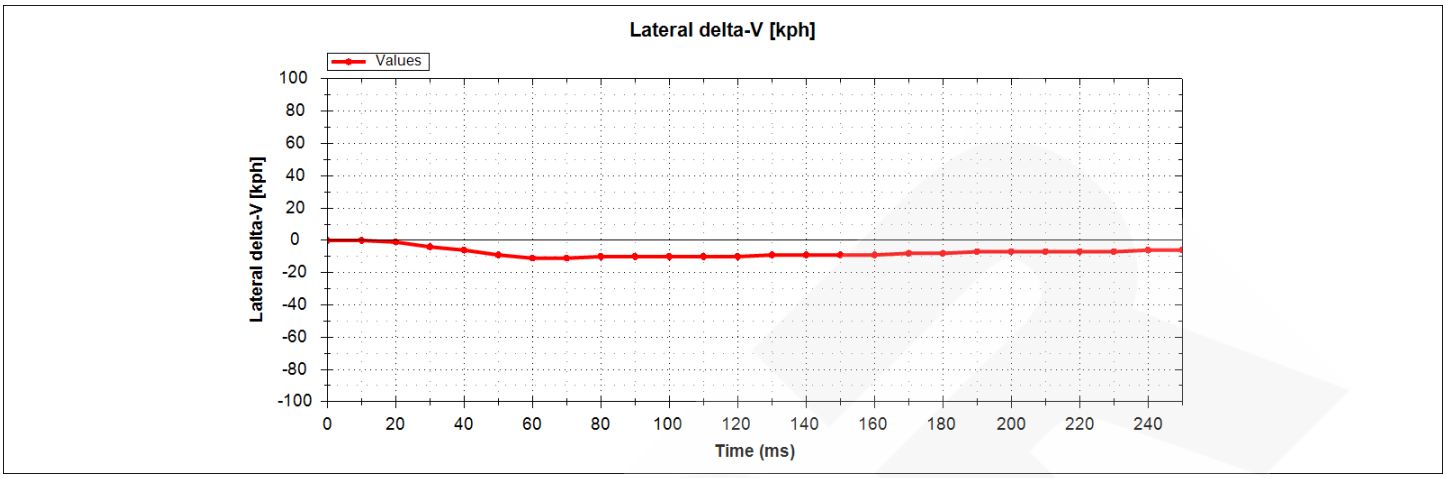


Num	Time (ms)	Lateral acceleration [g]
1	0.0	-1.0
2	10.0	-0.5
3	20.0	-2.5
4	30.0	-9.0
5	40.0	-4.0
6	50.0	-7.5
7	60.0	-4.0
8	70.0	0.0
9	80.0	0.0
10	90.0	0.0
11	100.0	0.0
12	110.0	0.0
13	120.0	0.5
14	130.0	0.5
15	140.0	0.0
16	150.0	0.0
17	160.0	0.0
18	170.0	0.5
19	180.0	0.5
20	190.0	0.5
21	200.0	0.5
22	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 ›

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

Max. delta-V [kph]	-11
Time, Max. delta-V [msec]	65.0



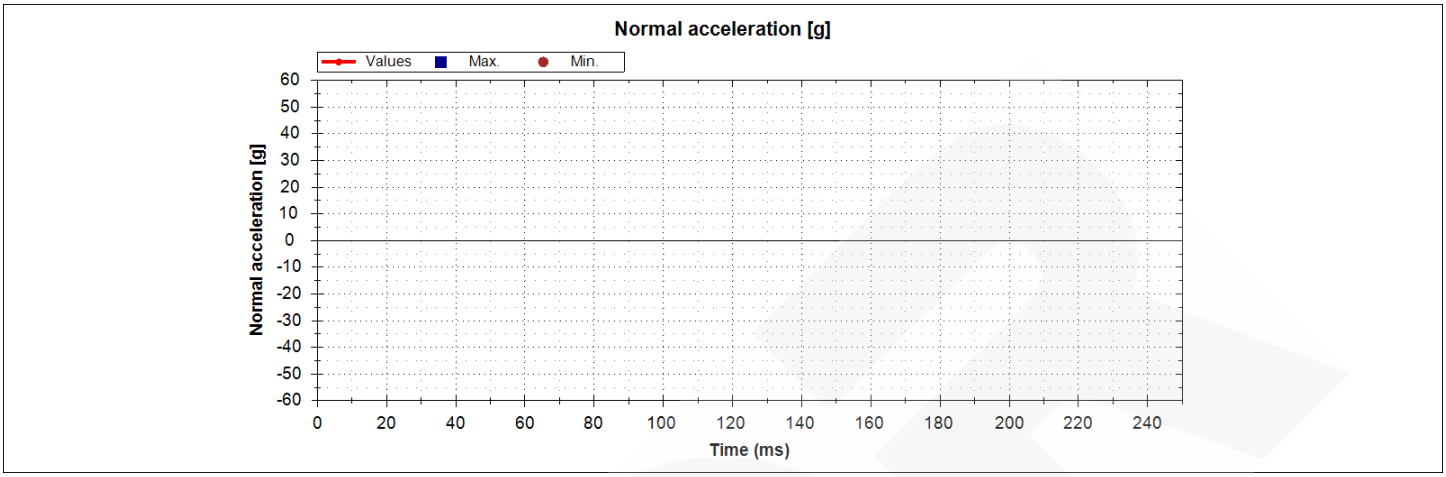
Num	Time (ms)	Lateral delta-V [kph]
1	0.0	0
2	10.0	0
3	20.0	-1
4	30.0	-4
5	40.0	-6
6	50.0	-9
7	60.0	-11
8	70.0	-11
9	80.0	-10
10	90.0	-10
11	100.0	-10
12	110.0	-10
13	120.0	-10
14	130.0	-9
15	140.0	-9
16	150.0	-9
17	160.0	-9
18	170.0	-8
19	180.0	-8
20	190.0	-7
21	200.0	-7
22	210.0	-7
23	220.0	-7
24	230.0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

‹ Event 1 ›

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

Time, Max. delta-V, resultant [msec]	92.5

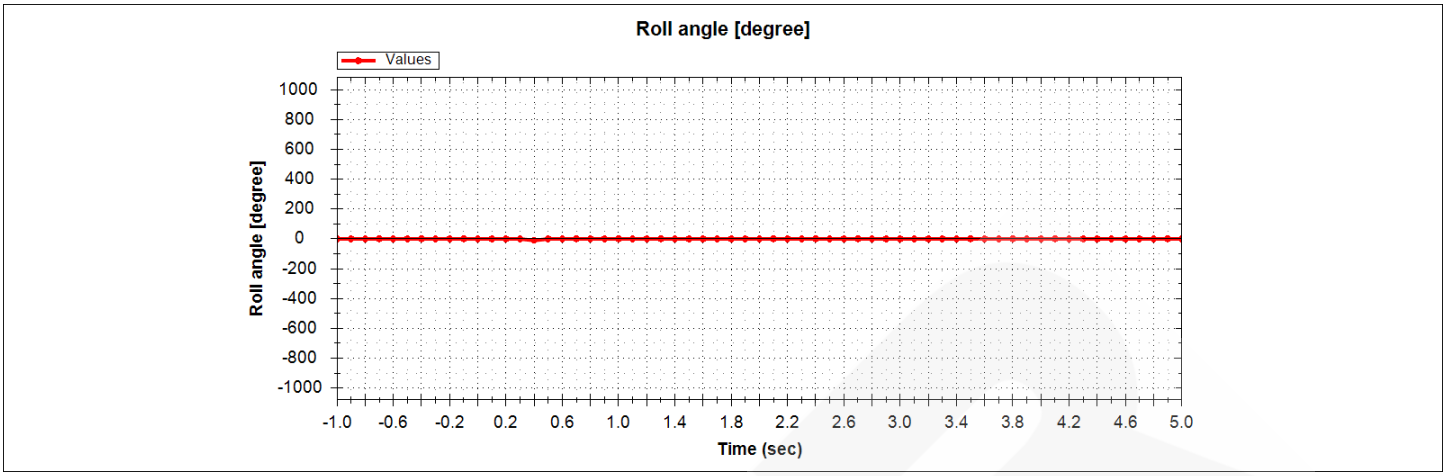
Normal acceleration (g, 0 ~ 250msec)



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	0
2	-0.9	0
3	-0.8	0
4	-0.7	0
5	-0.6	0
6	-0.5	0
7	-0.4	0
8	-0.3	0
9	-0.2	0
10	-0.1	0
11	0.0	0
12	0.1	0
13	0.2	0
14	0.3	0
15	0.4	-10
16	0.5	0
17	0.6	0
18	0.7	0
19	0.8	0
20	0.9	0
21	1.0	0
22	1.1	0
23	1.2	0
24	1.3	0
25	1.4	0
26	1.5	0
27	1.6	0
28	1.7	0
29	1.8	0
30	1.9	0
31	2.0	0

32	2.1	0
33	2.2	0
34	2.3	0
35	2.4	0
36	2.5	0
37	2.6	0
38	2.7	0
39	2.8	0
40	2.9	0
41	3.0	0
42	3.1	0
43	3.2	0
44	3.3	0
45	3.4	0
46	3.5	0
47	3.6	0
48	3.7	0
49	3.8	0
50	3.9	0
51	4.0	0
52	4.1	0
53	4.2	0
54	4.3	0
55	4.4	0
56	4.5	0
57	4.6	0
58	4.7	0
59	4.8	0
60	4.9	0
61	5.0	0

< Event 1 >

Raw Data

FF 80 00 00 7F 7F 7E 7D 7C 7A 79 78 77 76 76 76 76 76 76 76 75 75 75 75 75 75 75 75 75 75
74 77 7F 7F 7E 7B 79 76 74 74 75 75 75 75 75 76 76 76 76 77 77 78 78 78 78 78 79 79 74 1A
25 7F 7F 7F 7F 7F 7F 7F 7F 7F 7F 7F 7F 7F 7F 7E 7F 7F 7F 7F 7F 7F 7F 7F 7F 7F 7F 7F 7F 7F
7F 7F 7F 7F 7F 7F 7F 7F 7F 7F 7F 7F 7F 7F 7F 7F 7F 7F 7F 7F 7F 7F 7F 7F 7F 7F 7F 7F 7F 7F
7F 7F

FF FF FF FF 00 00 00 00 04 08 0D 11 14 15 14 03 03 08 13 16 19 19 19 17 09 04 5A 55 29 13
9E 01 00 FF FE FF FE 00 00 01 06 07 07 0E 10 12 15 19 1E 15 12 00 00 00 55 55 15 7F 7F 7F
7F 80 81 8D 97 9C 9D B1 01 03 03 07 02 FF FE FF FE FF FE FF FE FF FE FF FE FF FE FF FE 00
00 FF FF FF FE

E0 00 00 00 7F 7D 7B 79 7A 78 79 7A 7B 7E 7F 7F 7F 7F 7F 7F 7F 7F 7F 7F 7F 7F 7F 7F 7F 7F
7D 7E 7A 6D 77 70 77 7F 7F 7F 7F 7F 80 80 7F 7F 7F 80 80 80 80 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 00

80 00 00 00 00 00 0B 16 1A 1D 1C 1A 17 00 00

FF FF FF 80 97 C2 F5 20 1E 19 19 18 18 19 19 FF FF 1D 1C 19 1A FF FF 1B 7E 19 FF FF FF 0F

‹ Event 2 ›

There is no recorded event.