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## Vehicle Information

HY | SONATA(YF) | 2013 | ALL | AIRBAG SYSTEM

## Additional Information

User : Richard R. Ruth, P.E.

CaseNumber : NHTSA 6940, MB5000, 2011 Hyundai Sonata

CrashDate :

Part No. : 95910 - 3Q000

Save on : Saturday, April 20, 2013, at 23:21:34

G-EDR Software Version : 1.00

### EDR Data Limitations

The retrieval of his EDR data has authorized by the vehicle's owner, or other legal authority.

The airbag ECU can store up to two events. Deployment events cannot be overwritten or cleared from airbag ECU. Non-deployment events(which did not qualify as deployable events) can be overwritten by subsequent events.

The specifications for EDR are designed to be compatible with NHTSA 49 CFR Part 563 rule. The EDR data recording specifications of airbag ECU are divided into the following four categories.

- For the Event#1: Event#1-1 Event#1-2 Event#1-3 Real-Time Data.

- For the Event#2: Event#2-1 Event#2-2 Event#2-3 Real-Time Data.

The airbag ECU records data for all or some of the following crash(event)

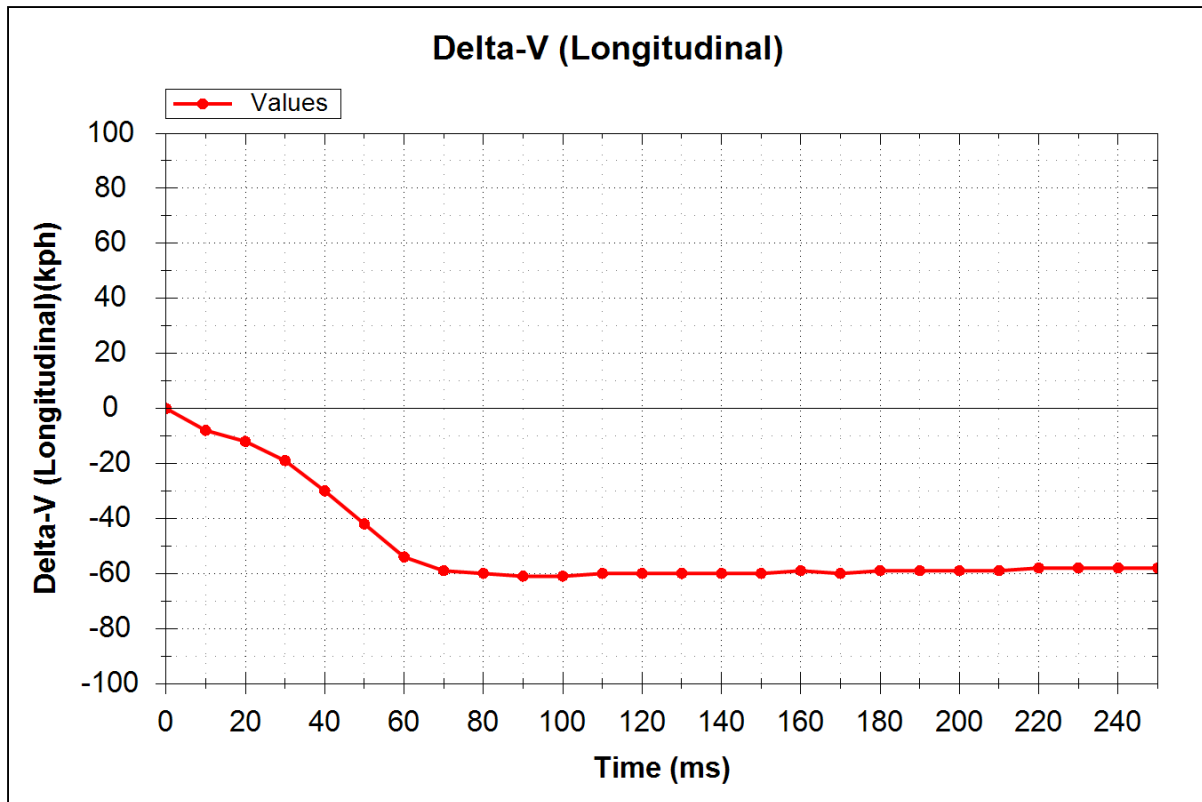
But, depending on the installed airbag ECU, data for side crash and/or rollover crash(event) may not be recored.

Ignition cycle counter(download) will increment by 1 every time when the power mode cycles is changed from OFF/Accessory to IGN/RUN or EDR data is downloaded by using the retrieval tool.

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## < Event # 1 - 1 >

# 1 [ Delta-V (Longitudinal) ]



| Num | Time (ms) | Delta-V (Longitudinal) (kph) |
|-----|-----------|------------------------------|
| 1   | 0.0       | 0                            |
| 2   | 10.0      | -8                           |
| 3   | 20.0      | -12                          |
| 4   | 30.0      | -19                          |
| 5   | 40.0      | -30                          |
| 6   | 50.0      | -42                          |
| 7   | 60.0      | -54                          |
| 8   | 70.0      | -59                          |
| 9   | 80.0      | -60                          |
| 10  | 90.0      | -61                          |
| 11  | 100.0     | -61                          |
| 12  | 110.0     | -60                          |
| 13  | 120.0     | -60                          |
| 14  | 130.0     | -60                          |
| 15  | 140.0     | -60                          |
| 16  | 150.0     | -60                          |
| 17  | 160.0     | -59                          |
| 18  | 170.0     | -60                          |
| 19  | 180.0     | -59                          |
| 20  | 190.0     | -59                          |

|    |       |     |
|----|-------|-----|
| 21 | 200.0 | -59 |
| 22 | 210.0 | -59 |
| 23 | 220.0 | -58 |
| 24 | 230.0 | -58 |
| 25 | 240.0 | -58 |
| 26 | 250.0 | -58 |

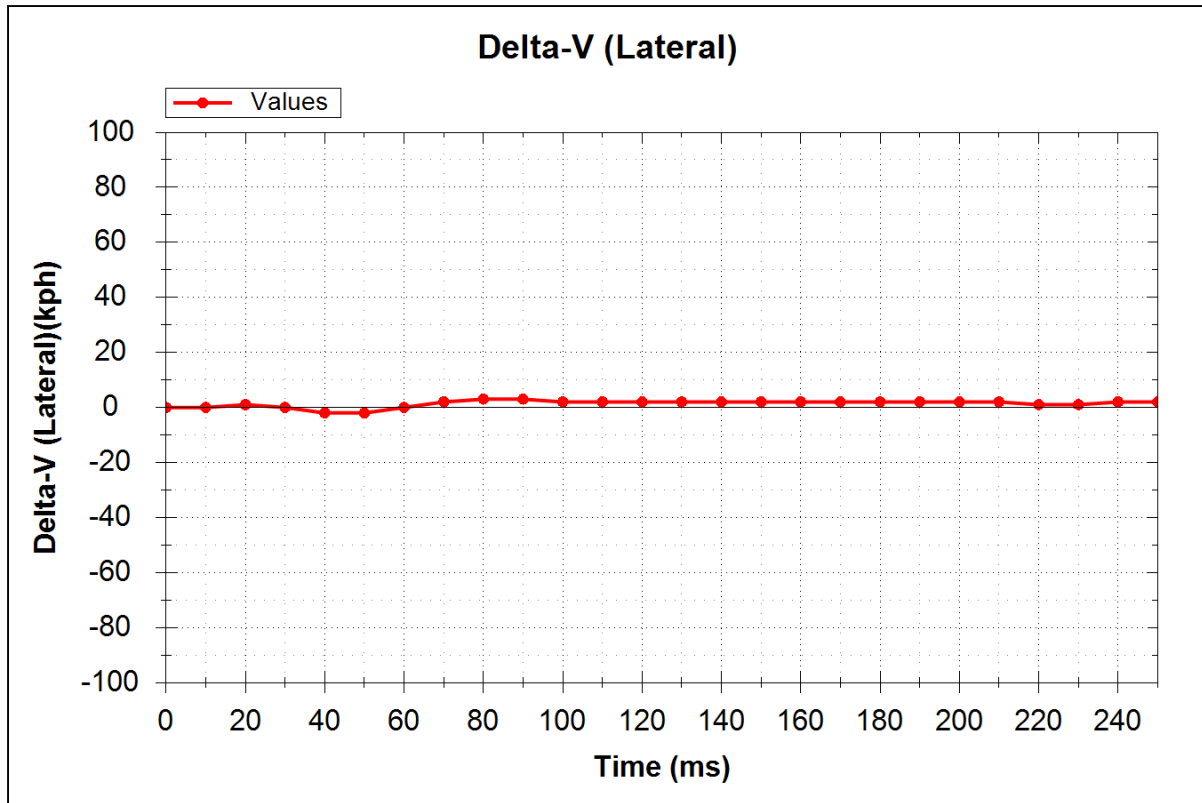
# 2 [ Max. Delta-V (Longitudinal) ]

| Num | Max. Delta-V (Longitudinal) (kph) |
|-----|-----------------------------------|
| 1   | -61                               |

# 3 [ Time\_ Max. Delta-V (Longitudinal) ]

| Num | Time_ Max. Delta-V (Longitudinal) (ms) |
|-----|----------------------------------------|
| 1   | 300.0                                  |

#### # 4 [ Delta-V (Lateral) ]



| Num | Time (ms) | Delta-V (Lateral) (kph) |
|-----|-----------|-------------------------|
| 1   | 0.0       | 0                       |
| 2   | 10.0      | 0                       |
| 3   | 20.0      | 1                       |
| 4   | 30.0      | 0                       |
| 5   | 40.0      | -2                      |
| 6   | 50.0      | -2                      |
| 7   | 60.0      | 0                       |
| 8   | 70.0      | 2                       |
| 9   | 80.0      | 3                       |
| 10  | 90.0      | 3                       |
| 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     | 2                       |
| 22  | 210.0     | 2                       |

|    |       |   |
|----|-------|---|
| 23 | 220.0 | 1 |
| 24 | 230.0 | 1 |
| 25 | 240.0 | 2 |
| 26 | 250.0 | 2 |

# 5 [ Max. Delta-V (Lateral) ]

| Num | Max. Delta-V (Lateral) (kph) |
|-----|------------------------------|
| 1   | -3                           |

# 6 [ Time\_ Max. Delta-V (Lateral) ]

| Num | Time_ Max. Delta-V (Lateral) (ms) |
|-----|-----------------------------------|
| 1   | 300.0                             |

# 7 [ Time\_ Max. Delta-V (Resultant) ]

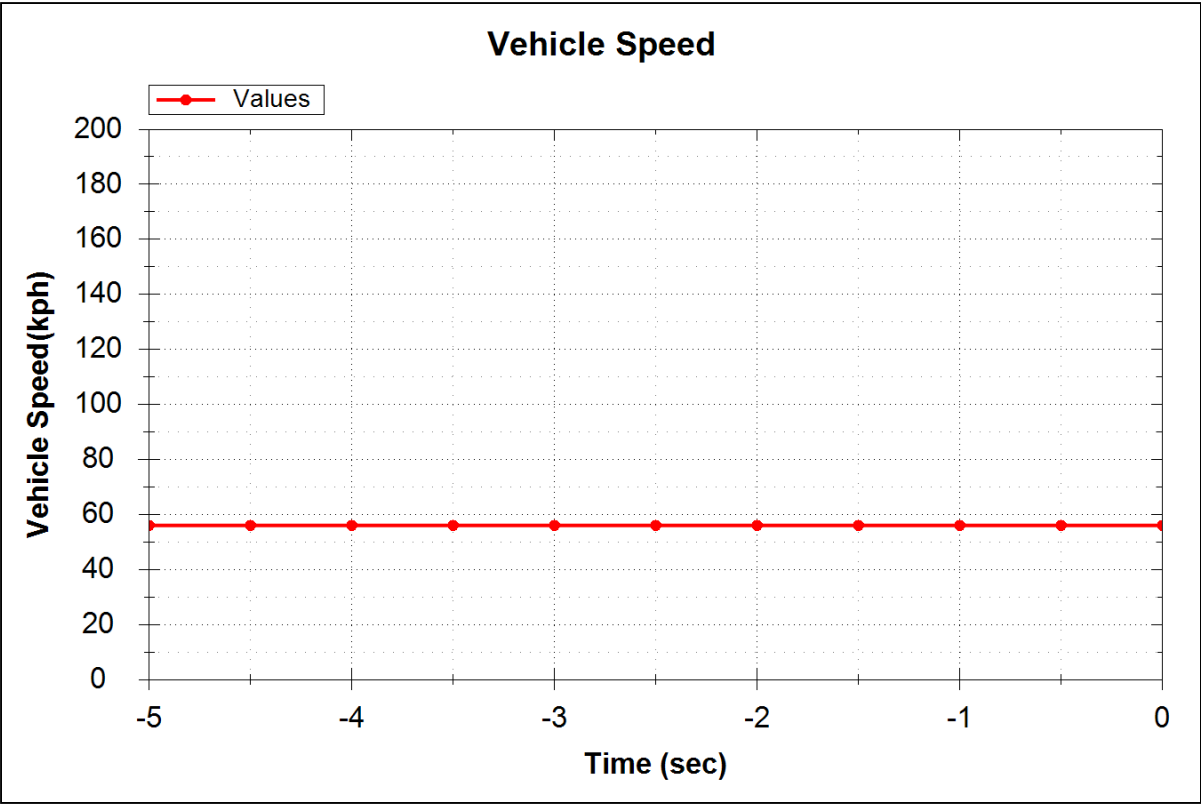
| Num | Time_ Max. Delta-V (Resultant) (ms) |
|-----|-------------------------------------|
| 1   | 300.0                               |

# 8 [ Vehicle roll angle ]

Not Supported...

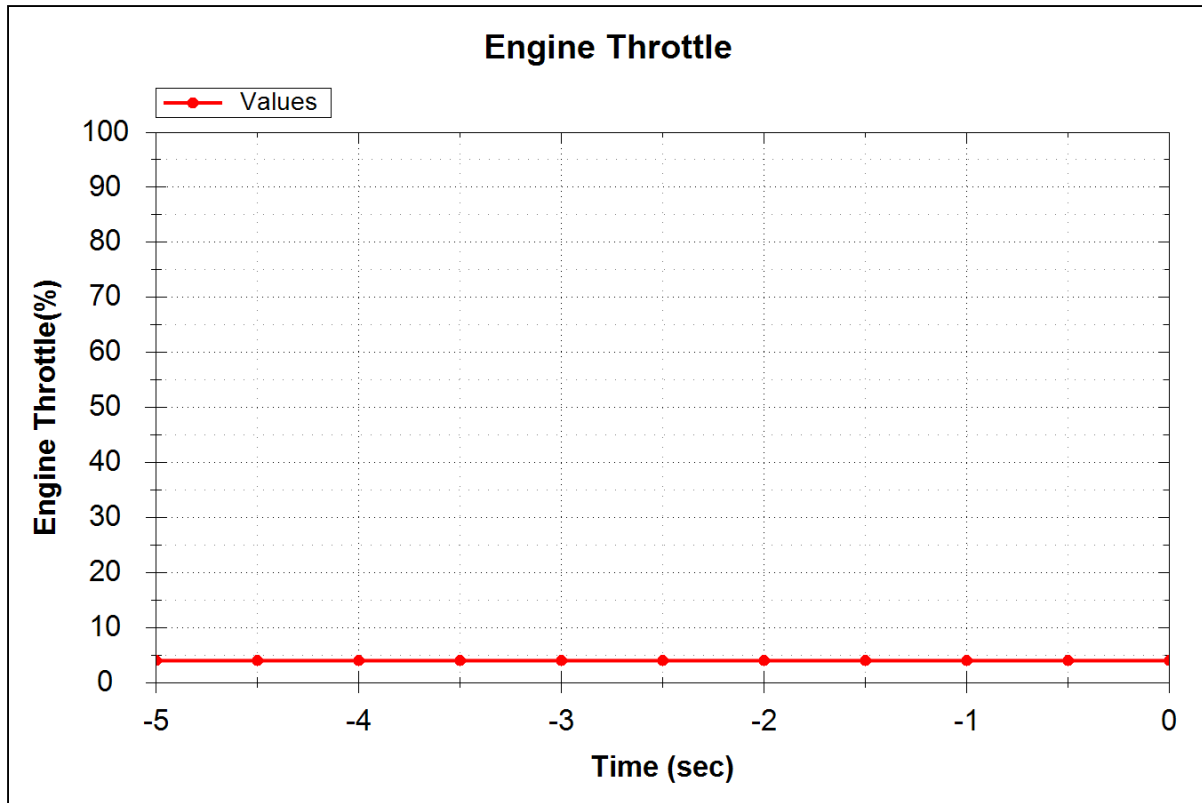
< Event # 1 - 2 >

# 1 [ Vehicle Speed ]



| Num | Time (sec) | Vehicle Speed (kph) |
|-----|------------|---------------------|
| 1   | -5.0       | 56                  |
| 2   | -4.5       | 56                  |
| 3   | -4.0       | 56                  |
| 4   | -3.5       | 56                  |
| 5   | -3.0       | 56                  |
| 6   | -2.5       | 56                  |
| 7   | -2.0       | 56                  |
| 8   | -1.5       | 56                  |
| 9   | -1.0       | 56                  |
| 10  | -0.5       | 56                  |
| 11  | 0.0        | 56                  |

## # 2 [ Engine Throttle ]



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

## # 3 [ Service brake\_ on/off ]

| 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 |

#### # 4 [ Ignition Cycle\_ Crash ]

| Num | Ignition Cycle_ Crash (Cyc.) |
|-----|------------------------------|
| 1   | 74                           |

#### # 5 [ Safety belt status\_ driver ]

| Num | Safety belt status_ driver |
|-----|----------------------------|
| 1   | ON                         |

#### # 6 [ Airbag warning lamp on/off ]

| Num | Airbag warning lamp on/off |
|-----|----------------------------|
| 1   | OFF                        |

#### # 7 [ Time to deploy\_ Frontal airbag-1st stage\_ driver ]

| Num | Time to deploy_ Frontal airbag-1st stage_ driver (ms) |
|-----|-------------------------------------------------------|
| 1   | 8                                                     |

#### # 8 [ Time to deploy\_ Frontal airbag-1st stage\_ passenger ]

| Num | Time to deploy_ Frontal airbag-1st stage_ passenger (ms) |
|-----|----------------------------------------------------------|
| 1   | 8                                                        |

# 9 [ Number of event ]

| Num | Number of event |
|-----|-----------------|
| 1   | 1 event         |

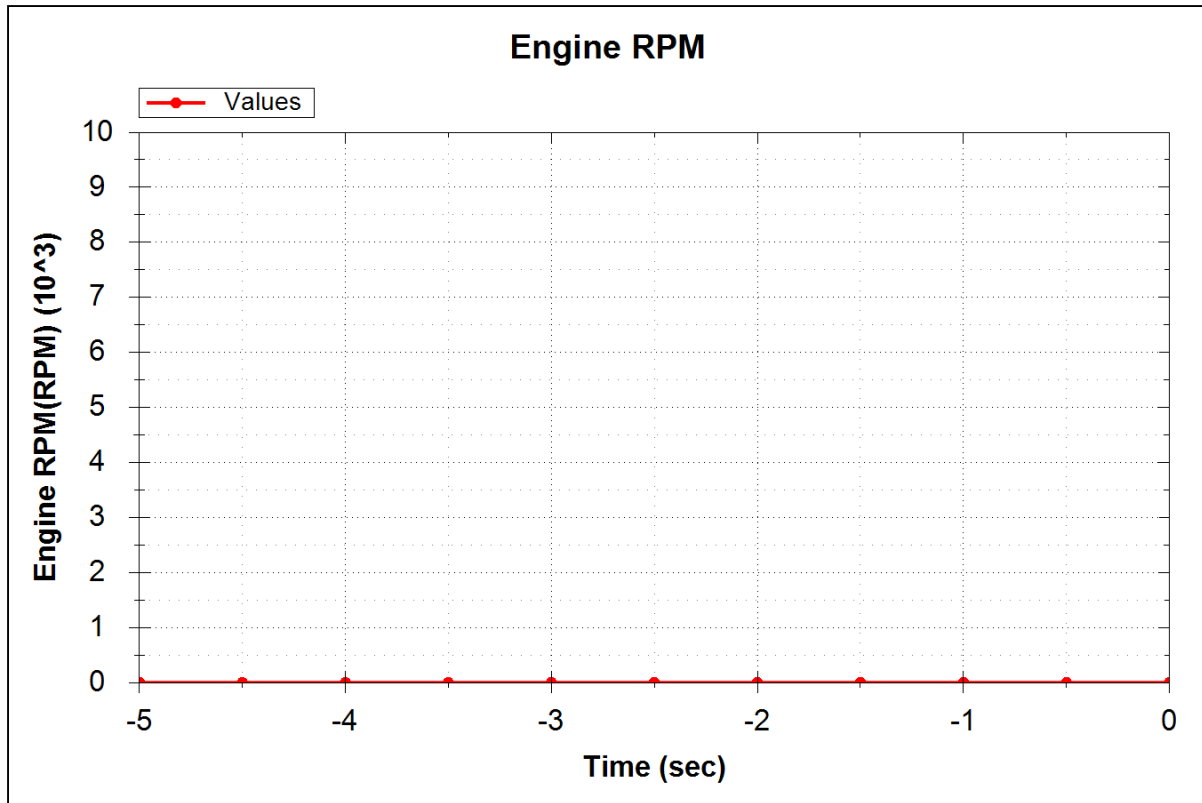
# 10 [ Time from Event 1 to 2 ]

| Num | Time from Event 1 to 2 (ms) |
|-----|-----------------------------|
| 1   | 0                           |

# 11 [ Completed file recorded ]

| Num | Completed file recorded |
|-----|-------------------------|
| 1   | YES                     |

## # 12 [ Engine RPM ]



| Num | Time (sec) | Engine RPM (RPM) |
|-----|------------|------------------|
| 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        | 0                |

## # 13 [ ABS activity ]

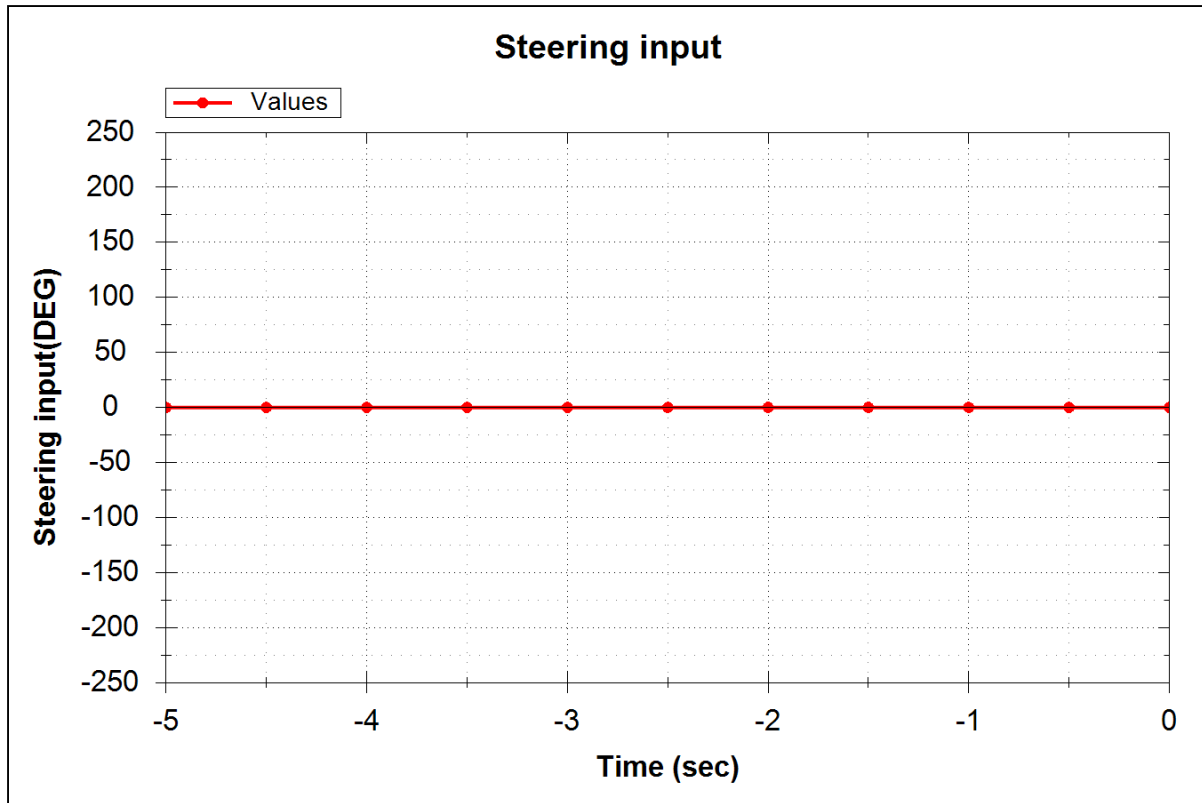
| Num | Time (sec) | ABS activity |
|-----|------------|--------------|
| 1   | -5.0       | OFF          |
| 2   | -4.5       | OFF          |
| 3   | -4.0       | OFF          |
| 4   | -3.5       | OFF          |

|    |      |     |
|----|------|-----|
| 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 |

#### # 14 [ Stability control ]

| Num | Time (sec) | Stability control |
|-----|------------|-------------------|
| 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                |

### # 15 [ Steering input ]



| Num | Time (sec) | Steering input (DEG) |
|-----|------------|----------------------|
| 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        | 0                    |

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

### # 16 [ Safety seat belt\_ passenger ]

| Num | Safety seat belt_ passenger |
|-----|-----------------------------|
| 1   | ON                          |

# 17 [ Seat track position switch\_ foremost\_ status\_ driver ]

| Num | Seat track position switch_ foremost_ status_ driver |
|-----|------------------------------------------------------|
| 1   | NO                                                   |

# 18 [ Seat track position switch\_ foremost\_ status\_ passenger ]

| Num | Seat track position switch_ foremost_ status_ passenger |
|-----|---------------------------------------------------------|
| 1   | Not Supported                                           |

# 19 [ Occupant size(5th percentile female or larger) classification\_ driver ]

| Num | Occupant size(5th percentile female or larger) classification_ driver |
|-----|-----------------------------------------------------------------------|
| 1   | Not Supported                                                         |

# 20 [ Occupant size(Child) classification\_ passenger ]

| Num | Occupant size(Child) classification_ passenger |
|-----|------------------------------------------------|
| 1   | No                                             |

# 21 [ Time to deploy\_ Frontal airbag-2nd stage\_ driver ]

| Num | Time to deploy_ Frontal airbag-2nd stage_ driver (ms) |
|-----|-------------------------------------------------------|
| 1   | 13                                                    |

# 22 [ Time to deploy\_ Frontal airbag-2nd stage\_ passenger ]

| Num | Time to deploy_ Frontal airbag-2nd stage_ passenger (ms) |
|-----|----------------------------------------------------------|
| 1   | 13                                                       |

# 23 [ Time to deploy\_ side airbag\_ driver ]

| Num | Time to deploy_ side airbag_ driver (ms) |
|-----|------------------------------------------|
| 1   | 0                                        |

# 24 [ Time to deploy\_ side airbag\_ passenger ]

| Num | Time to deploy_ side airbag_ passenger (ms) |
|-----|---------------------------------------------|
| 1   | 42                                          |

# 25 [ Time to deploy\_ curtain airbag\_ driver ]

| Num | Time to deploy_ curtain airbag_ driver (ms) |
|-----|---------------------------------------------|
| 1   | 0                                           |

# 26 [ Time to deploy\_ curtain airbag\_ passenger ]

| Num | Time to deploy_ curtain airbag_ passenger (ms) |
|-----|------------------------------------------------|
| 1   | 42                                             |

# 27 [ Time to fire\_ pretensioner\_ driver ]

| Num | Time to fire_ pretensioner_ driver (ms) |
|-----|-----------------------------------------|
| 1   | 8                                       |

# 28 [ Time to fire\_ pretensioner\_ passenger ]

| Num | Time to fire_ pretensioner_ passenger (ms) |
|-----|--------------------------------------------|
| 1   | 8                                          |

# 29 [ Frontal airbag deployment\_ Second stage disposal\_ driver ]

| Num | Frontal airbag deployment_ Second stage disposal_ driver |
|-----|----------------------------------------------------------|
| 1   | NO                                                       |

# 30 [ Frontal airbag deployment\_ Third stage disposal\_ driver ]

| Num | Frontal airbag deployment_ Third stage disposal_ driver |
|-----|---------------------------------------------------------|
| 1   | NO                                                      |

# 31 [ Frontal airbag deployment\_ Second stage disposal\_ right front passenger ]

| Num | Frontal airbag deployment_ Second stage disposal_ right front passenger |
|-----|-------------------------------------------------------------------------|
| 1   | NO                                                                      |

# 32 [ Frontal airbag deployment\_ Third stage disposal\_ right front passenger ]

| Num | Frontal airbag deployment_ Third stage disposal_ right front passenger |
|-----|------------------------------------------------------------------------|
| 1   | NO                                                                     |

# 33 [ Time to deploy\_ Frontal airbag-3rd stage\_ driver ]

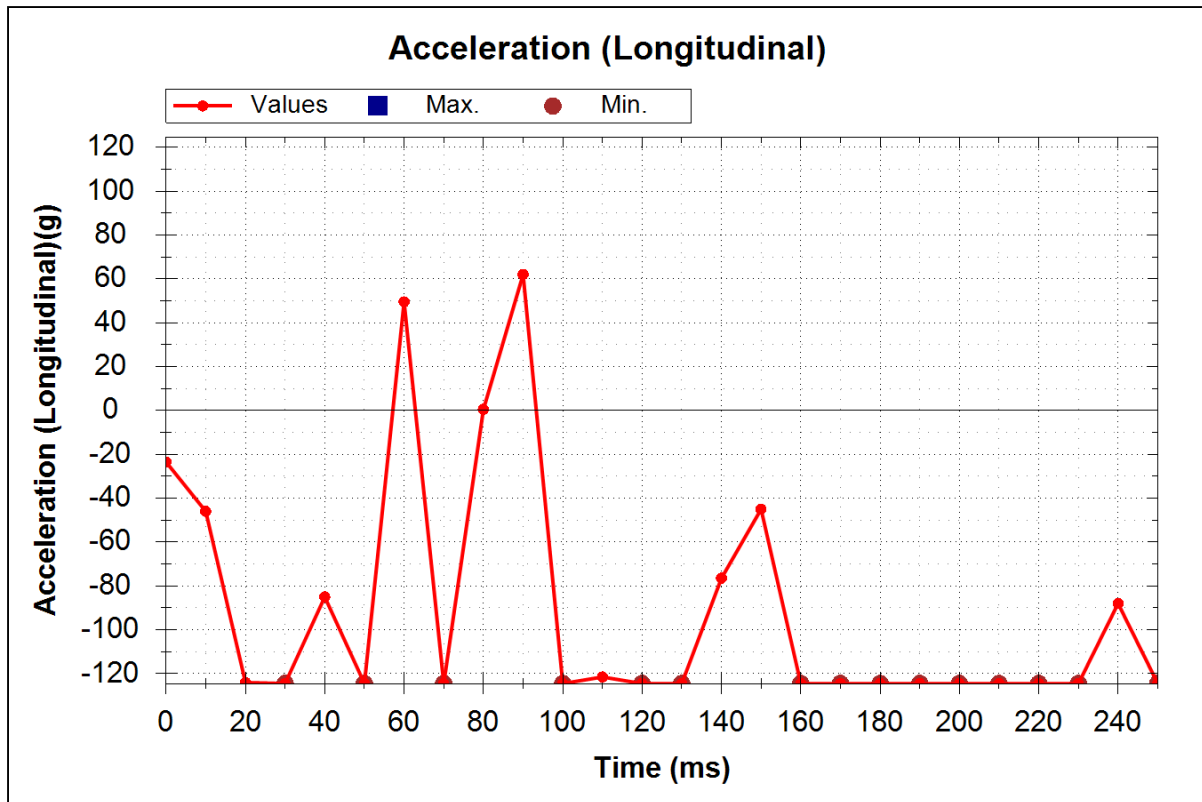
Not Supported...

# 34 [ Time to deploy\_ Frontal airbag-3rd stage\_ passenger ]

Not Supported...

## < Event # 1 - 3 >

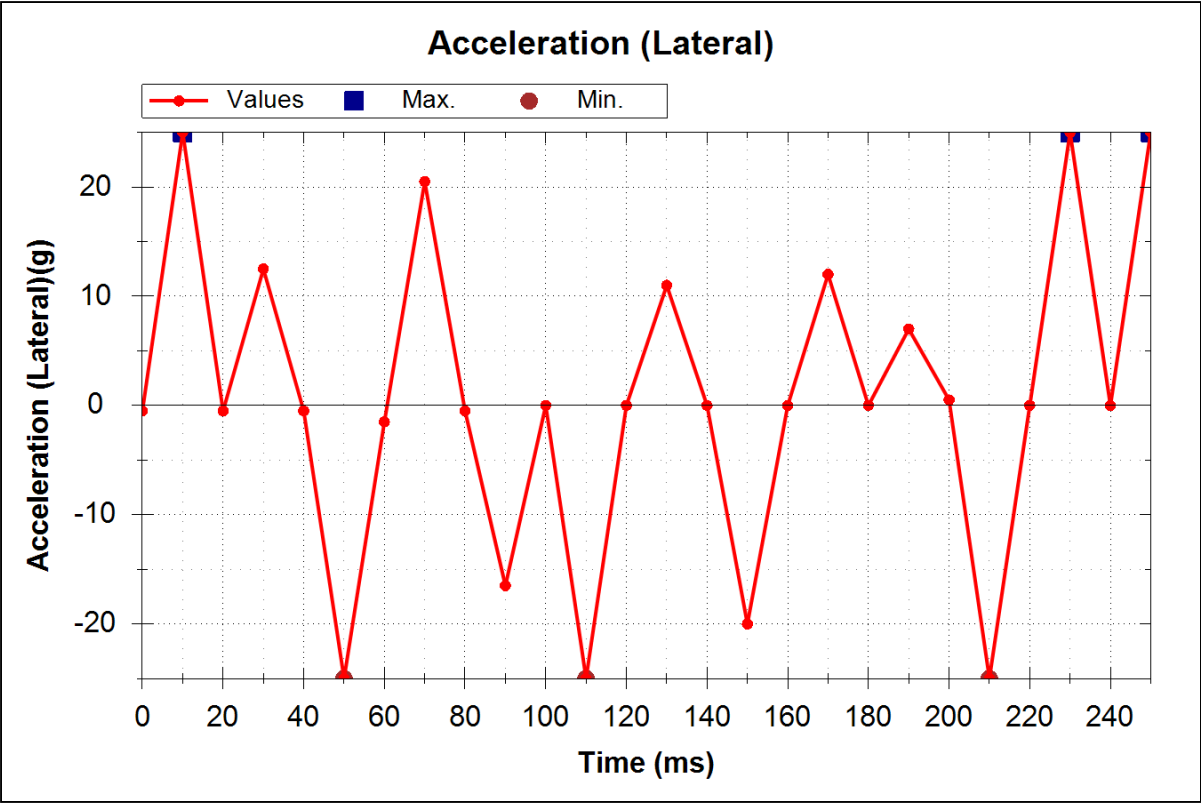
# 1 [ Acceleration (Longitudinal) ]



| Num | Time (ms) | Acceleration (Longitudinal) (g) |
|-----|-----------|---------------------------------|
| 1   | 0.0       | -23.5                           |
| 2   | 10.0      | -46.0                           |
| 3   | 20.0      | -124.0                          |
| 4   | 30.0      | -124.5                          |
| 5   | 40.0      | -85.0                           |
| 6   | 50.0      | -124.5                          |
| 7   | 60.0      | 49.5                            |
| 8   | 70.0      | -124.5                          |
| 9   | 80.0      | 0.5                             |
| 10  | 90.0      | 62.0                            |
| 11  | 100.0     | -124.5                          |
| 12  | 110.0     | -121.5                          |
| 13  | 120.0     | -124.5                          |
| 14  | 130.0     | -124.5                          |
| 15  | 140.0     | -76.5                           |
| 16  | 150.0     | -45.0                           |
| 17  | 160.0     | -124.5                          |
| 18  | 170.0     | -124.5                          |
| 19  | 180.0     | -124.5                          |
| 20  | 190.0     | -124.5                          |

|    |       |        |
|----|-------|--------|
| 21 | 200.0 | -124.5 |
| 22 | 210.0 | -124.5 |
| 23 | 220.0 | -124.5 |
| 24 | 230.0 | -124.5 |
| 25 | 240.0 | -88.0  |
| 26 | 250.0 | -124.5 |

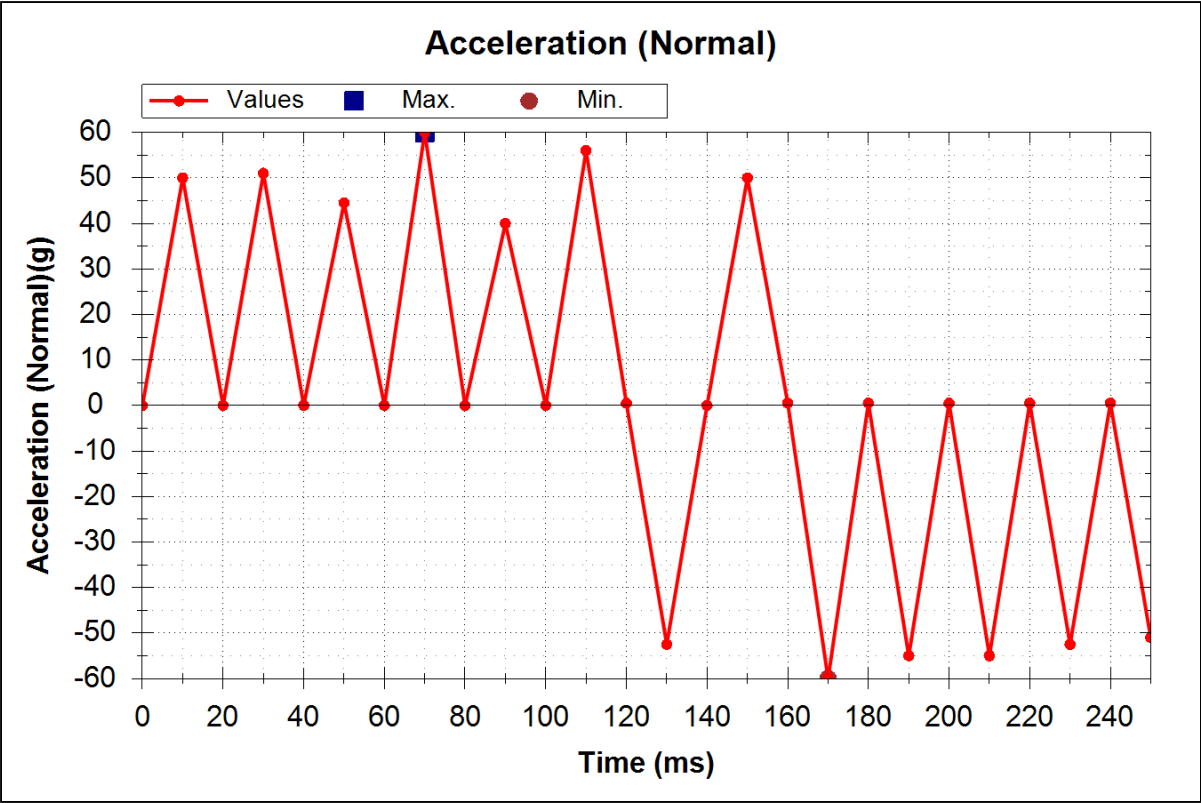
# 2 [ Acceleration (Lateral) ]



| Num | Time (ms) | Acceleration (Lateral) (g) |
|-----|-----------|----------------------------|
| 1   | 0.0       | -0.5                       |
| 2   | 10.0      | 25.0                       |
| 3   | 20.0      | -0.5                       |
| 4   | 30.0      | 12.5                       |
| 5   | 40.0      | -0.5                       |
| 6   | 50.0      | -25.0                      |
| 7   | 60.0      | -1.5                       |
| 8   | 70.0      | 20.5                       |
| 9   | 80.0      | -0.5                       |
| 10  | 90.0      | -16.5                      |
| 11  | 100.0     | 0.0                        |
| 12  | 110.0     | -25.0                      |
| 13  | 120.0     | 0.0                        |
| 14  | 130.0     | 11.0                       |
| 15  | 140.0     | 0.0                        |
| 16  | 150.0     | -20.0                      |
| 17  | 160.0     | 0.0                        |
| 18  | 170.0     | 12.0                       |
| 19  | 180.0     | 0.0                        |
| 20  | 190.0     | 7.0                        |
| 21  | 200.0     | 0.5                        |
| 22  | 210.0     | -25.0                      |

|    |       |      |
|----|-------|------|
| 23 | 220.0 | 0.0  |
| 24 | 230.0 | 25.0 |
| 25 | 240.0 | 0.0  |
| 26 | 250.0 | 25.0 |

# 3 [ Acceleration (Normal) ]



| Num | Time (ms) | Acceleration (Normal) (g) |
|-----|-----------|---------------------------|
| 1   | 0.0       | 0.0                       |
| 2   | 10.0      | 50.0                      |
| 3   | 20.0      | 0.0                       |
| 4   | 30.0      | 51.0                      |
| 5   | 40.0      | 0.0                       |
| 6   | 50.0      | 44.5                      |
| 7   | 60.0      | 0.0                       |
| 8   | 70.0      | 60.0                      |
| 9   | 80.0      | 0.0                       |
| 10  | 90.0      | 40.0                      |
| 11  | 100.0     | 0.0                       |
| 12  | 110.0     | 56.0                      |
| 13  | 120.0     | 0.5                       |
| 14  | 130.0     | -52.5                     |
| 15  | 140.0     | 0.0                       |
| 16  | 150.0     | 50.0                      |
| 17  | 160.0     | 0.5                       |
| 18  | 170.0     | -60.0                     |
| 19  | 180.0     | 0.5                       |
| 20  | 190.0     | -55.0                     |
| 21  | 200.0     | 0.5                       |
| 22  | 210.0     | -55.0                     |

|    |       |       |
|----|-------|-------|
| 23 | 220.0 | 0.5   |
| 24 | 230.0 | -52.5 |
| 25 | 240.0 | 0.5   |
| 26 | 250.0 | -51.0 |

## < Real-time Data >

# 1 [ Ignition cycle\_download ]

| Num | Ignition cycle_download (Cyc.) |
|-----|--------------------------------|
| 1   | Invalid data                   |

## < Event # 2 - 1 >

There is no recorded event.

## < Event # 2 - 2 >

There is no recorded event.

## < Event # 2 - 3 >

There is no recorded event.

< Real-time Data >

# 1 [ Ignition cycle\_download ]

| Num | Ignition cycle_download (Cyc.) |
|-----|--------------------------------|
| 1   | Invalid data                   |

**< Event # 1 - 1 >**

```
07 DA 61 50 7F 00 00 00 7F 77 73 6C 61 55 49 44 43 42 42 43 43 43 43 44 43 44 44 44 44
45 45 45 45 42 78 7F 7F 80 7F 7D 7D 7F 81 82 82 81 81 81 81 81 81 81 81 81 81 81 80 80
81 81 7C 78 78
```

## < Event # 1 - 2 >

[illegible]

## < Event # 1 - 3 >

[illegible]

## **< Real-time Data >**

07 DA 61 D0 FF FF 0F 00 7D C5 BA FF FF FF FF FF FF FF FF 00 00 FF FF FF FF 00 00 FF FF

## **< Event # 2 - 1 >**

There is no recorded event.

## **< Event # 2 - 2 >**

There is no recorded event.

## **< Event # 2 - 3 >**

There is no recorded event.

## **< Real-time Data >**

07 DA 61 D0 FF FF 0F 00 7D C5 BA FF FF FF FF FF FF FF FF 00 00 FF FF FF FF 00 00 FF FF