

**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	[REDACTED]
User	[REDACTED]
Case Number	[REDACTED]
EDR Data Imaging Date	12/28/2017
Crash Date	12/04/2017
Filename	5GZCZ23D03S842549_ACM.CDRX
Saved on	Thursday, December 28 2017 at 10:38:57
Imaged with CDR version	Crash Data Retrieval Tool 17.5.1
Imaged with Software Licensed to (Company Name)	Accident Research Specialists, PLLC
Reported with CDR version	Crash Data Retrieval Tool 17.5.1
Reported with Software Licensed to (Company Name)	Accident Research Specialists, PLLC
EDR Device Type	Airbag Control Module
Event(s) recovered	Deployment Non-Deployment

## Comments

All tires 225/75R16

## Data Limitations

### Recorded Crash Events:

There are two types of Recorded Crash Events. The first is the Non-Deployment Event. A Non-Deployment Event records data but does not deploy the air bag(s). It contains Pre-Crash and Crash data. The SDM can store up to one Non-Deployment Event. This event may be overwritten by another Non-Deployment Event. This event will be cleared by the SDM, after approximately 250 ignition cycles. This event can be overwritten by a second Deployment Event, referred to as a Deployment Level Event, if the Non-Deployment Event is not locked. The data in the Non-Deployment Event file will be locked, if the Non-Deployment Event occurred within five seconds before a Deployment Event. A locked Non Deployment Event cannot be overwritten or cleared by the SDM. The second type of SDM recorded crash event is the Deployment Event. It also contains Pre-Crash and Crash data. The SDM can store up to two different Deployment Events, if they occur within five seconds of one another. If a Deployment Level Event occurs within five seconds after the Deployment Event, the Deployment Level Event will overwrite any non-locked Non-Deployment Event. Deployment Events cannot be overwritten or cleared by the SDM. Once the SDM has deployed an air bag, the SDM must be replaced.

### Data:

-SDM Adjusted Algorithm Longitudinal Velocity Change:

Once the crash data is downloaded, the CDR tool mathematically adjusts the recorded algorithm longitudinal velocity data to generate an adjusted algorithm longitudinal velocity change that may more closely approximate the longitudinal velocity change the sensing system experienced during the recorded portion of the event. The adjustment takes place within the downloading tool and does not affect the crash data stored in the SDM, which is displayed in hexadecimal format. The SDM Adjusted Algorithm Longitudinal Velocity Change may not closely approximate what the sensing system experienced in all types of events. For example, if a crash is preceded by other common events, such as rough road, struck objects, or off-road travel, the SDM Adjusted Algorithm Longitudinal Velocity Change may be less than and sometimes significantly less than the actual longitudinal velocity change the sensing system experienced. For Deployment Events, the SDM will record 100 milliseconds of data after Deployment criteria is met and up to 50 milliseconds before Deployment criteria is met. Velocity Change data is displayed in SAE sign convention.

-Event Recording Complete will indicate if data from the recorded event has been fully written to the SDM memory or if it has been interrupted and not fully written.

-SDM Recorded Vehicle Speed accuracy can be affected by various factors, including but not limited to the following:

- Significant changes in the tire's rolling radius
- Final drive axle ratio changes
- Wheel lockup and wheel slip

-Brake Switch Circuit Status indicates the open/closed state of the brake switch circuit.

-Some of the Pre-Crash data may be recorded after Algorithm Enable (AE). If this occurs, it may affect the reported pre-crash data values, but does not affect other data such as SDM Adjusted Algorithm Longitudinal Velocity Change.

-Pre-Crash data is recorded asynchronously. The 1.0 second Pre-crash data value (most recent recorded data point) is the data point last sampled before AE. That is to say, the last data point may have been captured just before AE but no more than 1.0 second before AE. All subsequent Pre-crash data values are referenced from this data point.

-Pre-Crash Electronic Data Validity Check Status indicates "Data Invalid" if:

- The SDM receives a message with an "invalid" flag from the module sending the pre-crash data

- No data is received from the module sending the pre-crash data
- No module present to send the pre-crash data
- Driver's Belt Switch Circuit Status indicates the status of the driver's seat belt switch circuit. If the vehicle's electrical system is compromised during a crash, the state of the Driver's Belt Switch Circuit may be reported other than the actual state.
- The Time Between Events is displayed in seconds. If the time between the two events is greater than five seconds, "N/A" is displayed in place of the time.
- If power to the SDM is lost during a crash event, all or part of the crash record may not be recorded.
- All data should be examined in conjunction with other available physical evidence from the vehicle and scene.

**Data Source:**

All SDM recorded data is measured, calculated, and stored internally, except for the following:

- Vehicle Speed, Engine Speed, and Percent Throttle data are transmitted by the Powertrain Control Module (PCM), via the vehicle's communication network, to the SDM.
- Brake Switch Circuit Status data is transmitted once a second by either the ABS module or the PCM, via the vehicle's communication network, to the SDM. Depending on vehicle option content, the Brake Switch Circuit Status data may not be available.
- The SDM may obtain Belt Switch Circuit Status data a number of different ways, depending on the vehicle architecture. Some switches are wired directly to the SDM, while others may obtain the data from various vehicle control modules, via the vehicle's communication network.

**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 tool.

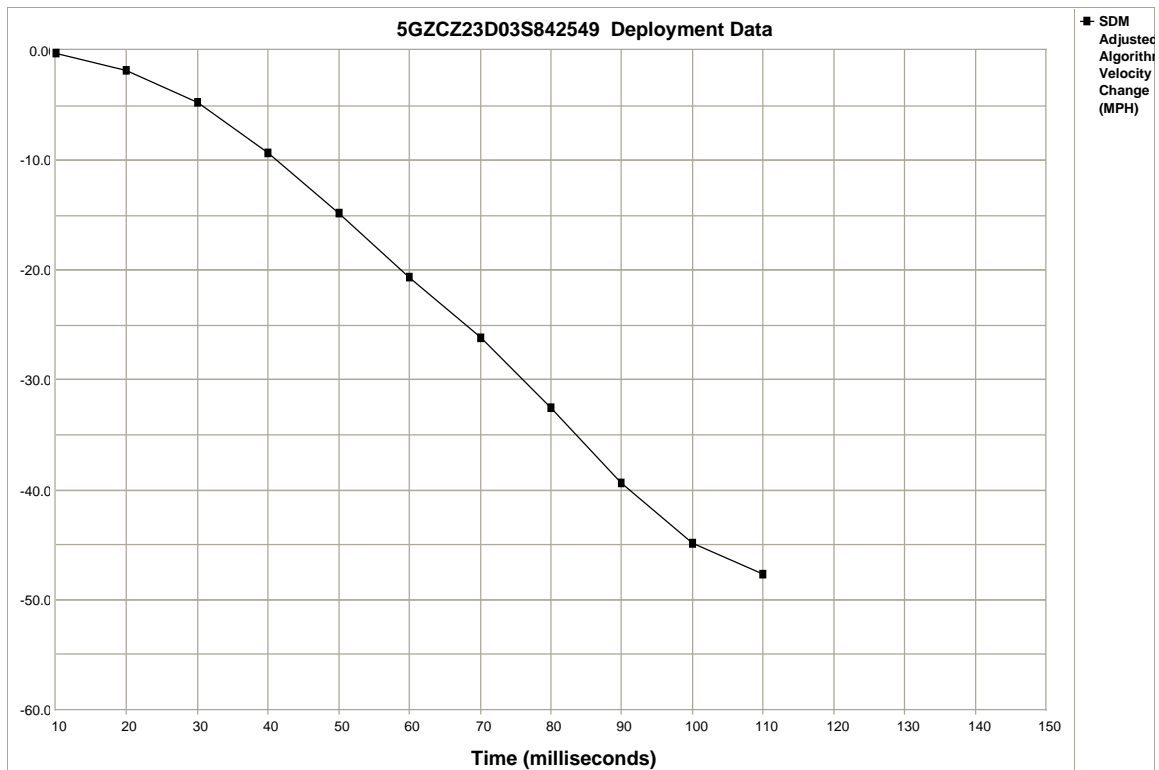
01009\_SDMD\_r004

## System Status At Deployment

SIR Warning Lamp Status	OFF
Driver's Belt Switch Circuit Status	BUCKLED
Ignition Cycles At Deployment	25442
Ignition Cycles At Investigation	25444
Time Between this Event and the Previous Event (sec)	0.2
Event Recording Complete	Yes

Seconds Before AE	Vehicle Speed (MPH)	Engine Speed (RPM)	Percent Throttle
-5	45	1984	6
-4	45	1984	6
-3	45	1984	6
-2	45	1984	6
-1	30	1408	0

Seconds Before AE	Brake Switch Circuit State
-8	OFF
-7	OFF
-6	OFF
-5	OFF
-4	OFF
-3	OFF
-2	OFF
-1	ON



Time (milliseconds)	10	20	30	40	50	60	70	80	90	100	110	120	130	140	150
Adjusted Algorithm Velocity Change	-0.27	-1.81	-4.66	-9.27	-14.76	-20.68	-26.17	-32.53	-39.33	-44.82	-47.67	N/A	N/A	N/A	N/A

## System Status At Non-Deployment

SIR Warning Lamp Status	OFF
Driver's Belt Switch Circuit Status	BUCKLED
Ignition Cycles At Non-Deployment	24918
Ignition Cycles At Investigation	25444
Maximum SDM Algorithm Longitudinal Velocity Change (MPH)	-1.14
Time Between this Event and the Previous Event (sec)	N/A

Seconds Before AE	Vehicle Speed (MPH)	Engine Speed (RPM)	Percent Throttle
-5	16	2176	28
-4	19	2304	12
-3	21	1920	1
-2	19	1472	1
-1	16	1664	1

Seconds Before AE	Brake Switch Circuit State
-8	OFF
-7	OFF
-6	OFF
-5	OFF
-4	OFF
-3	OFF
-2	ON
-1	OFF

## Hexadecimal Data

```
$01 0C 04 00 00 00 00
$02 B8 8E 00 00 00 00
$03 41 53 32 33 31 33
$04 4B 32 38 53 34 31
$05 02 41 00 00 00 00
$06 22 68 71 96 00 00
$10 F3 93 F0 00 00 00
$11 8A 00 7D 00 00 84
$12 00 00 00 00 00 00
$13 01 00 00 00 00 00
$14 03 04 EB 00 00 00
$18 84 83 84 46 FF 00
$1C 5A FA FA FA FA FA
$1D FA 5A FA FA FA FA
$1E FA FA 00 00 00 00
$1F FF 02 00 00 00 00
$20 40 00 00 22 FF 00
$21 FF FF DF FF FF FF
$22 FF FF FF FF 00 00
$23 02 02 02 00 00 01
$24 01 01 01 01 01 FF
$25 FF FF FF 0C 00 00
$26 1A 1F 21 1F 19 40
$27 02 02 02 1E 47 00
$28 1A 17 1E 24 22 00
$29 F3 D5 C0 00 00 00
$2A 00 00 00 00 00 00
$2B 00 00 00 00 00 00
$2C 00 00 FF 00 00 53
$2D 00 00 00 00 00 00
$2E 00 00 00 00 00 00
$30 40 00 00 22 FF 00
$31 FF FF DF FF FF FF
$32 FF FF FF FF 00 00
$33 0A 0A 00 00 03 03
$34 00 00 02 05 0B 15
$35 21 2E 3A 48 57 63
$36 69 FF FF FF FF 0B
$37 31 48 48 48 48 80
$38 00 0F 0F 0F 0F 00
$39 16 1F 1F 1F 1F 00
$3A F3 93 FC 30 00 00
$3B 41 41 00 00 00 00
$3C 57 0D 37 00 00 AA
$3D 00 00 00 00 00 00
$3E 00 00 00 00 00 00
$40 FF FF FF FF FF 00
$41 FF FF FF FF FF FF
$42 FF FF FF FF 00 00
$43 FF FF FF 00 00 00
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## 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.