VEHICLE FACTORS GROUP CHAIRMAN'S FACTUAL REPORT

Vehicle Attachment 2 – Buick – Airbag Control Module Download

Houston, Texas

HWY15FH010

(7 pages)

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	1G4HP52K344[redacted]
User	[redacted]
Case Number	1196374-15
EDR Data Imaging Date	09/16/2015
Crash Date	09/15/2015
Filename	1G4HP52K344[redacted]_ACM.CDRX
Saved on	Wednesday, September 16 2015 at 13:56:30
Collected with CDR version	Crash Data Retrieval Tool 16.0
Reported with CDR version	Crash Data Retrieval Tool 16.0
EDR Device Type	Airbag Control Module
Event(s) recovered	Non-Deployment

Comments

DLC
TIRES ON VEHICLE 225 60R/16
SAME SIZE ON STICKER
COURT ORDER

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 can be overwritten by an event that has a greater SDM recorded vehicle longitudinal velocity change. 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 multiple Non-Deployment Events occur within five seconds prior to a Deployment Event, then the most severe Non-Deployment Event will be recorded and locked. If multiple Non-Deployment Events precede a Deployment Event, and occur within five seconds of each other (but not necessarily all within five seconds of the Deployment Event), then the most severe of the Non-Deployment Events (which may have occurred more than five seconds prior to the Deployment Event) will be recorded and locked. 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. If multiple Non-Deployment Events occur within five seconds prior to a Deployment Event, and one or more of those events was a Pretensioner Deployment Event, then the most recent Pretensioner Deployment Event will be recorded and locked. 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 Recorded Vehicle Longitudinal Velocity Change reflects the change in longitudinal velocity that the sensing system experienced during the recorded portion of the event. SDM Recorded Vehicle Longitudinal Velocity Change is the change in velocity during the recording time and is not the speed the vehicle was traveling before the event, and is also not the Barrier Equivalent Velocity. 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. For Non-Deployment Events, the SDM can record up to the first 150 milliseconds of data after algorithm enable. 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.

-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 Non-Deployment Event to Deployment Events is displayed in seconds. If the time between the two events is greater than 25.4 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.
-Multiple Events will indicate whether one or more associated events preceded the recorded event.
-Multiple Events Not Recorded can be used in the following scenarios:
    -If a single event is recorded, this parameter will indicate whether one or more associated events prior to the recorded event was not recorded due to insufficient record space (because there were more events than there were available event records).
    -If two associated events are recorded, this parameter for the first event will indicate whether one or more associated events prior to the first event was not recorded due to insufficient record space.
    -If two associated events are recorded, this parameter for the second event will indicate whether one or more associated events between the first and second events was not recorded due to insufficient record space.
-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 by either the ABS module or the PCM, via the vehicle's communication network, to the SDM.
-The Belt Switch Circuit is wired directly to the SDM.

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.

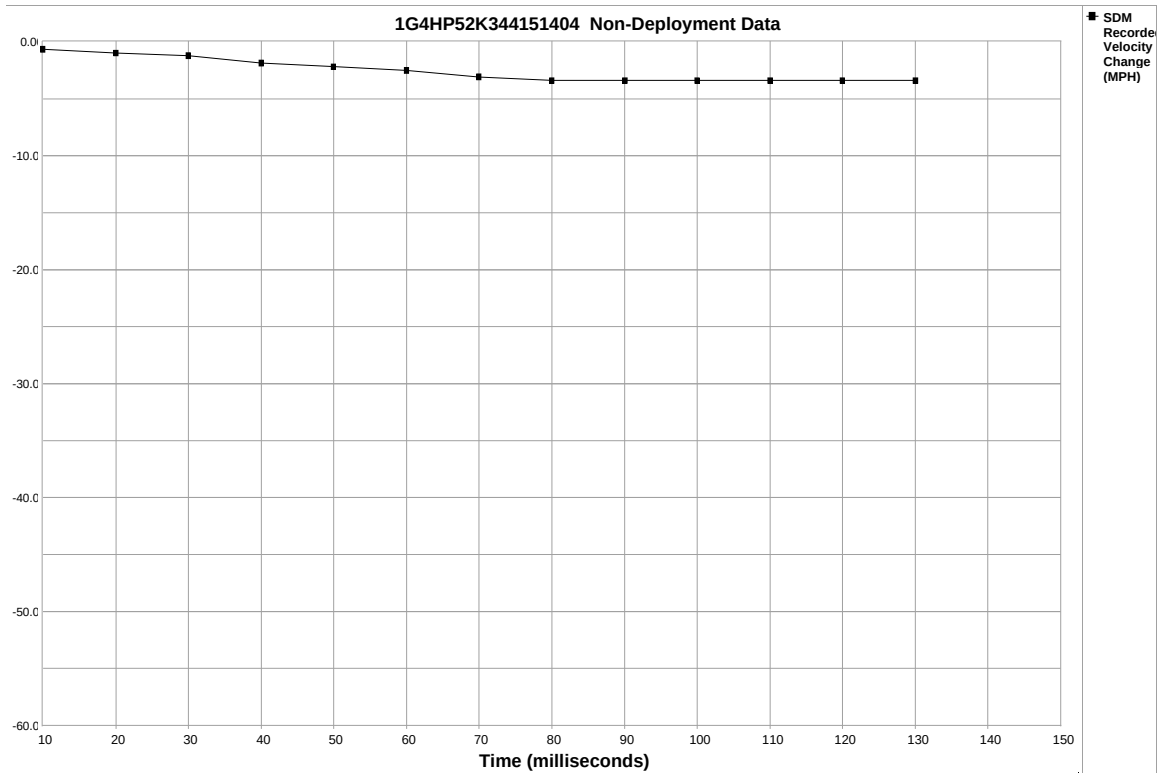
01029_SDMGT-2001_r005

System Status At Non-Deployment

SIR Warning Lamp Status	OFF
Driver's Belt Switch Circuit Status	BUCKLED
Ignition Cycles At Non-Deployment	28351
Ignition Cycles At Investigation	28355
Maximum SDM Recorded Velocity Change (MPH)	-3.65
Algorithm Enable to Maximum SDM Recorded Velocity Change (msec)	102.5
Crash Record Locked	No
Event Recording Complete	Yes
Multiple Events Associated With This Record	No
One Or More Associated Events Not Recorded	No

Seconds Before AE	Vehicle Speed (MPH)	Engine Speed (RPM)	Percent Throttle
-5	70	1792	10
-4	69	1792	10
-3	68	1792	10
-2	68	1792	10
-1	68	1728	10

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



Time (milliseconds)	10	20	30	40	50	60	70	80	90	100	110	120	130	140	150
Recorded Velocity Change (MPH)	-0.62	-0.93	-1.24	-1.86	-2.17	-2.48	-3.10	-3.41	-3.41	-3.41	-3.41	-3.41	-3.41	N/A	N/A

Hexadecimal Data

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```
$01  E0 27 AF 78 9A E8
$02  E1 00 00 00 00
$03  41 53 33 33 32 39
$04  4B 33 5A 53 39 31
$06  25 74 68 35
$10  F2 27 F8
$11  7D 7C 7D 7B 7B 7B
$12  9A 01 00 00 00 00
$13  00 01
$14  1D 00 00 00 00 00
$15  33 FA 47 52 53 53
$16  53 FA FA 48 FA FA
$17  FA FA
$18  0F 00 01 AC 01
$1F  FF
$20  12 FE 00 00 FF FF
$21  FF FF FF FF FF FF
$22  FF FF FF FF FF FF
$23  FF FF FF FF FF FF
$24  00 00 BC 04 29 1C
$25  1D 00 00 03 FF FF
$26  02 03 04 06 07 08
$27  0A 0B 0B 0B 0B 0B
$28  0B 00 00 0D F2 28
$29  80 A5 FF FF FF FF
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$2C  FF FF FF FF FF FF
$2D  FF FF
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$3C  FF FF FF FF FF FF
$3D  FF FF
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$41  00 00 1A 1A 1A 1A
$42  1A 00 1B 1C 1C 1C
$43  1C 00 38 F8
$44  55 6E 6E 6E 6F 00
$45  00 00 30 1A 1A 1A
$46  1A 00 16 1B 1C 1C
$47  1C 00 38 F8
$48  0D 07 03 00 00 00
$49  07 00 3C 3C 2B 15
$4A  15 00 30 30 1A 1B
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$4C  FF FF FF FF FF FF
$4D  FF FF FF FF FF FF
$4E  FF FF FF FF FF FF
$4F  FF FF FF FF
$50  FF FF FF FF FF FF
$51  FF FF FF FF FF FF
$52  FF FF FF FF FF FF
$53  FF FF FF FF FF FF
$54  FF FF FF FF FF FF
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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.