

**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           | 1GKEK63U11J*****                    |
| User                       | Ralph Cunningham                    |
| Case Number                | 10.038                              |
| EDR Data Imaging Date      | 12/03/2010                          |
| Crash Date                 | 11/24/2010                          |
| Filename                   | YUKONDENALI.CDRX                    |
| Saved on                   | Friday, December 3 2010 at 11:07:12 |
| Collected with CDR version | Crash Data Retrieval Tool 3.5.1     |
| Reported with CDR version  | Crash Data Retrieval Tool 3.5.1     |
| EDR Device Type            | airbag control module               |
| Event(s) recovered         | Deployment<br>Non-Deployment        |

## Comments

No comments entered.

## 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 cycle. 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 some times 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.

-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.

-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 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

-Engine Speed is reported at two times the actual value in the following vehicles, if the vehicle is equipped with a 6.6L Duramax diesel engine (RPO LB7, LBZ, LLY, or LMM):

- 2001-2006 Chevrolet Silverado
- 2007 Chevrolet Silverado Classic
- 2001-2006 GMC Sierra
- 2007 GMC Sierra Classic
- 2006-2007 Chevrolet Express
- 2006-2007 GMC Savana
- 2003-2009 Chevrolet Kodiak
- 2003-2009 GMC Topkick

-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.

-Passenger Front Air Bag Suppression Switch Circuit Status indicates the status of the suppression switch circuit.

-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.

-If the vehicle is a 2000 - 2002 Chevrolet Cavalier Z24 or a Pontiac Sunfire GT, with a manual transmission (RPO MM5) and a 2.4L engine (RPO LD9), the Brake Switch Circuit Status data will be reported in the opposite state than what actually occurred, e.g. an actual brake switch status of "ON" will be reported as "OFF".

-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 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.

-The Passenger Front Air Bag Suppression Switch Circuit is wired directly to the SDM.

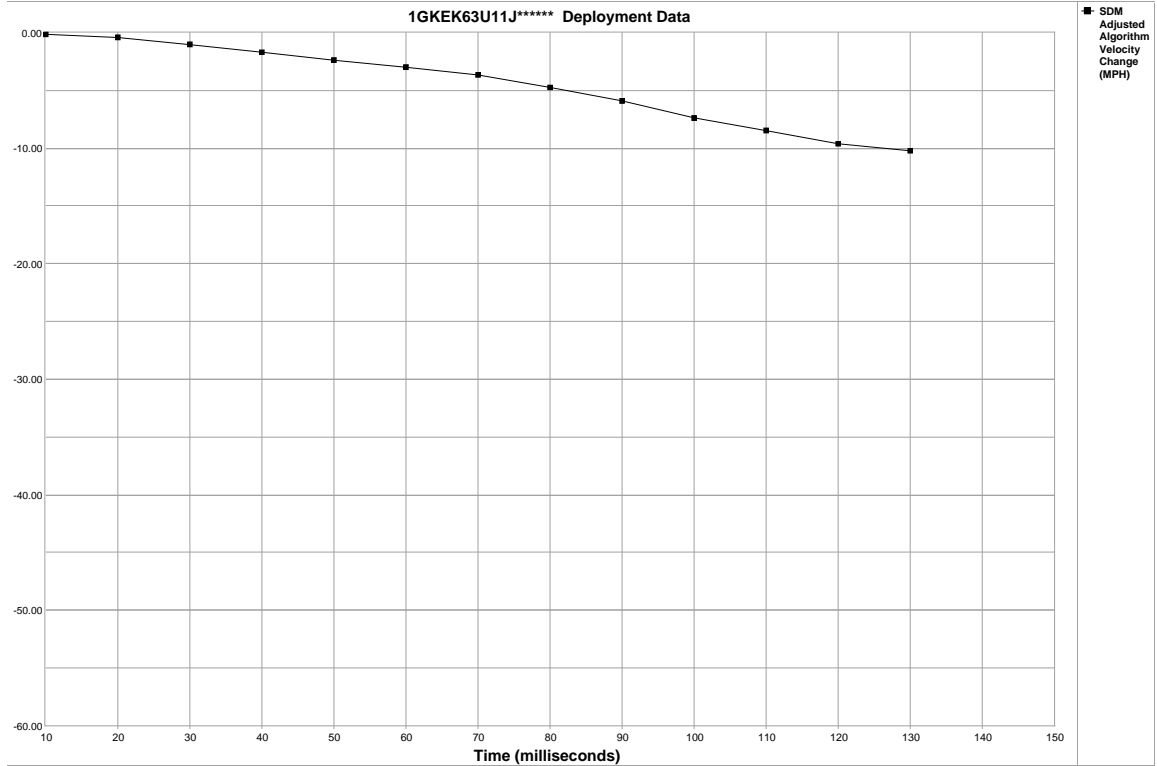
01023\_SDMG-99JXZ01-07\_r002

### System Status At Deployment

|   |                        |
|---|------------------------|
| SIR Warning Lamp Status                                       | OFF                    |
| Driver's Belt Switch Circuit Status                           | BUCKLED                |
| Passenger SIR Suppression Switch Circuit Status (if equipped) | Air Bag Not Suppressed |
| Ignition Cycles At Deployment                                 | 29253                  |
| Time Between Non-Deployment And Deployment Events (sec)       | N/A                    |

| Seconds Before AE | Vehicle Speed (MPH) | Engine Speed (RPM) | Percent Throttle |
|-------------------|---------------------|--------------------|------------------|
| -5                | 27                  | 1536               | 33               |
| -4                | 28                  | 1536               | 28               |
| -3                | 29                  | 1152               | 0                |
| -2                | 29                  | 768                | 0                |
| -1                | 12                  | 64                 | 58               |

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



| Time (milliseconds)                | 10    | 20    | 30    | 40    | 50    | 60    | 70    | 80    | 90    | 100   | 110   | 120   | 130    | 140 | 150 |
|------------------------------------|-------|-------|-------|-------|-------|-------|-------|-------|-------|-------|-------|-------|--------|-----|-----|
| Adjusted Algorithm Velocity Change | -0.15 | -0.37 | -1.03 | -1.69 | -2.35 | -3.01 | -3.67 | -4.77 | -5.86 | -7.40 | -8.50 | -9.59 | -10.25 | N/A | N/A |

## System Status At Non-Deployment

|   |                        |
|---|------------------------|
| SIR Warning Lamp Status                                       | OFF                    |
| Driver's Belt Switch Circuit Status                           | UNBUCKLED              |
| Passenger SIR Suppression Switch Circuit Status (if equipped) | Air Bag Not Suppressed |
| Ignition Cycles At Non-Deployment                             | 29170                  |
| Maximum SDM Algorithm Longitudinal Velocity Change (MPH)      | -0.07                  |

| Seconds Before AE | Vehicle Speed (MPH) | Engine Speed (RPM) | Percent Throttle |
|-------------------|---------------------|--------------------|------------------|
| -5                | 19                  | 896                | 1                |
| -4                | 24                  | 640                | 0                |
| -3                | 25                  | 512                | 0                |
| -2                | 25                  | 576                | 0                |
| -1                | 24                  | 576                | 0                |

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

## 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 system.

```
$01 91 17 2C 2C
$02 AB A9
$03 41 53 31 30 31 37
$04 4B 45 56 42 34 33
$05 00
$06 15 76 31 79
$11 84 84 84 7C 8A 00
$14 0F C4 34 A0
$18 82 82 83 84 83 84
$1C FA FA FA FA FA FA
$1D FA FA FA FA FA FA
$1E FA FA
$1F FF 02 05 05 00
$20 80 00 00 FF 7D 80
$21 FF FF FF FF FF FF
$22 FF FF FF FF FF FF
$23 FF 04 00 05 00 00
$24 00 00 00 00 FF FF
$25 FF FF FF FF FF FF
$26 FF FF 05 27 29 29
$27 27 1E 00 F0 00 00
$28 00 00 00 02 00 09
$29 09 08 0A 0E 00 F1
$2A C1 FC FF 51 88 5F
$2B BE 5F BE 00 00 00
$2C 00 31 00 00
$30 80 00 00 FF 80 FE
$31 FF BF FF FF FF FF
$32 FF FF FF FF FF FF
$33 7C 1B 03 01 00 00
$34 01 02 03 04 05 07
$35 09 0C 0E 10 11 FF
$36 FF 0D 64 02 3C 13
$37 2F 2F 2D 2B 00 C0
$38 00 94 00 00 47 54
$39 00 01 0C 12 18 18
$3A 00 F1 B7 E0 00 00
$3B 00 04 00
$40 FF FF FF FF FF FF
$41 FF FF FF FF FF FF
$42 FF FF FF FF FF FF
$43 FF
```

## 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.