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## ON-SITE SIDE IMPACT INFLATABLE OCCUPANT PROTECTION INVESTIGATION

CASE NUMBER - IN09015

LOCATION - TEXAS

VEHICLE - 2003 BUICK RENDEZVOUS

CRASH DATE - March 2009

Submitted:

October 20, 2009



Contract Number: DTNH22-07-C-00044

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National Highway Traffic Safety Administration  
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The crash investigation process is an inexact science which requires that physical evidence such as skid marks, vehicular damage measurements, and occupant contact points be coupled with the investigator's expert knowledge and experience of vehicle dynamics and occupant kinematics in order to determine the pre-crash, crash, and post-crash movements of involved vehicles and occupants.

Because each crash is a unique sequence of events, generalized conclusions cannot be made concerning the crashworthiness performance of the involved vehicle(s) or their safety systems.

**Technical Report Documentation Page**

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16. <i>Abstract</i> This report covers an On-Site Side Impact Inflatable Occupant Protection Investigation that involved a 2003 Buick Rendezvous CX and 1999 Buick Century Custom. The investigation focused on the Rendezvous and the sources of the driver's injuries. The Rendezvous was equipped with front seat-mounted side impact air bags. The Rendezvous was occupied by a restrained 27-year-old female driver and a restrained 32-year-old female front passenger. The crash occurred within a 4-leg, urban intersection when the Rendezvous was impacted on the left side plane by the front plane of the Century. The driver and front passenger of the Rendezvous were transported by ambulance to a hospital. Both were treated in the emergency room and released for minor injuries caused by loading their seat belts. The driver also sustained a neck strain due to impact forces.					
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This on-site investigation focused on a 2003 Buick Rendezvous CX (**Figure 1**) in a side impact crash and the sources of the driver's injuries. The Rendezvous was equipped with front seat-mounted side impact air bags. This crash was brought to the attention of the National Highway Traffic Safety Administration (NHTSA) on April 3, 2009 by the sampling activities of the National Automotive Sampling System-General Estimates System (NASS-GES). This investigation was assigned on May 1, 2009. This crash involved the Rendezvous and a 1999 Buick Century Custom. The crash occurred in March, 2009, at 1020 hours, in Texas and was investigated by the city police department. The Buick and the crash scene were inspected on May 6-7, 2009. Multiple attempts to contact the driver of the Rendezvous were unsuccessful. The Buick Century could not be located and was not inspected. This report is based on the police crash report, scene and vehicle inspections, occupant kinematic principles, and evaluation of the evidence.



**Figure 1:** The damaged 2003 Buick Rendezvous CX

### CRASH CIRCUMSTANCES

**Crash Environment:** The trafficway on which the Rendezvous was traveling was a 2-lane, undivided, city street, traversing in a north-south direction and approached a 4-leg intersection. The trafficway had one through lane in each direction. Each lane was 3.6 m (11.8 ft) in width that widened to 6.7 m (22 ft) at the mouth of the intersection. The trafficway on which the Century was traveling was a 7-lane, divided, state highway, traversing in an east-west direction. The trafficway had three through lanes in each direction with opposing left turn lanes, and was divided by a concrete median. Each lane was approximately 3.4 m (11.2 ft) in width and the median was 1.2 m (3.8 ft) in width. The intersection was controlled by three-phase traffic signal lights. The posted speed limit was 48 km/h (30 mph) for the Rendezvous and 72 km/h (45 mph) for the Century. At the time of the crash the light condition was daylight, the atmospheric condition was cloudy, and the roadway pavement was wet bituminous. The roadway on which the Rendezvous was traveling had a positive 1.6% grade. The roadway on which Century was traveling had a negative 3.3% grade. The traffic density at the time of the crash was unknown and the crash site was suburban commercial. See the Crash Diagram on page 10 of this report.



**Figure 2:** Approach of the Rendezvous to the intersection; arrow shows approach of the Century

**Pre-Crash:** The Rendezvous was occupied by a restrained 27-year-old female driver and a restrained 32-year-old female front passenger. The driver was initially traveling north (**Figure 2**)

and was in the process of making a left turn at the intersection. The Century's restrained 67-year-old female driver was initially traveling east and was in the process of executing a left turn at the intersection from the left turn lane (**Figure 3**). The Rendezvous was equipped with an Event Data Recorder (EDR). The pre-crash data indicated that the vehicle was traveling 32 km/h (20 mph) 5 seconds prior to Algorithm Enable (AE). The brake switch circuit was recorded as on from 8 to 4 sec prior to AE and then off for 3 and 2 sec prior to AE. The brake switch circuit was recorded as on at 1 sec prior to AE. The vehicle's speed was recorded as 23 km/h (14 mph) at the 1 sec point of recorded pre-crash data.



**Figure 3:** Approach of the Century in the left turn lane; arrow shows approach of Rendezvous

**Crash:** The front plane of the Century impacted the left side plane of the Rendezvous (**Figure 4**). The direction of force on the Rendezvous was within the 11 o'clock sector and the impact force was sufficient to trigger the deployment of the driver's seat-mounted side impact air bag and the driver's and front right passenger's frontal air bags. The impact caused both vehicles to rotate counterclockwise. The scene inspection revealed no evidence of the final rest positions of either vehicle. The police crash schematic did not depict the final rest position of the Rendezvous. The Rendezvous probably came to final rest within the intersection heading northwest. The police crash schematic showed the final rest position of the Century north of the intersection on the west side of the roadway. It is probable that the Century came to final rest within the intersection heading northeast, and the driver drove the vehicle to the position indicated on the police crash schematic following the crash.



**Figure 4:** Damage to the left side plane of the Rendezvous from the impact with the Century

**Post-Crash:** The police were notified of the crash and arrived on the scene in five minutes. The pry marks and damage on the left front and left rear doors of the Rendezvous indicated that rescue personnel forced the door open to extricate the driver from the vehicle. Both occupants of the Rendezvous and the driver of the Century were transported by ambulance to a local hospital. Both vehicles were towed from the crash scene due to damage.

**Post-Crash:** The police were notified of the crash and arrived on the scene in five minutes. The pry marks and damage on the left front and left rear doors of the Rendezvous indicated that rescue personnel forced the door open to extricate the driver from the vehicle. Both occupants of the Rendezvous and the driver of the Century were transported by ambulance to a local hospital. Both vehicles were towed from the crash scene due to damage.

## CASE VEHICLE

The 2003 Buick Rendezvous CX was a front wheel drive, 4-door sport utility vehicle (VIN: 3G5DA03E73S-----), equipped with a 3.4-L, V6 engine, an automatic transmission, 4-wheel anti-lock brakes, and an EDR. The front row was equipped with bucket seats, adjustable head restraints, lap-and-shoulder belts, tilt steering column, dual stage driver and front passenger

frontal air bags, and seat-mounted side impact air bags. The second row was equipped with a split bench seat with folding backs (50/50) and lap-and-shoulder belts. Adjustable head restraints and Lower Anchors and Tethers for Children (LATCH) were present at the outboard seating positions. The vehicle’s specified wheelbase was 285 cm (112.2 in).

**CASE VEHICLE DAMAGE**

**Exterior Damage:** The impact with the Century involved the left side plane of the Rendezvous. The left fender, left front and left rear doors, the sill, and the front and back wheels were directly damaged. The direct damage began 290 cm (114 in) forward of the left rear axle and extended 270 cm (106 in) along the left side. The crush measurements were taken on the lower door level (**Figure 5**) and the residual maximum crush was 26 cm (10.2 in) occurring at C<sub>3</sub>. The height of the maximum door crush was 55 cm (21.6 in) and the Door Sill Differential was 9 cm (3.5 in). The table below shows the vehicle’s left side plane crush profile.



**Figure 5:** Damage to the left side plane of the Rendezvous from the impact with the Century

Units	Event	Direct Damage		Field L	C <sub>1</sub>	C <sub>2</sub>	C <sub>3</sub>	C <sub>4</sub>	C <sub>5</sub>	C <sub>6</sub>	Direct	Field L
		Width CDC	Max Crush								±D	±D
cm	1	270	26	343	0	6	26	20	5	0	13	49
in		106.3	10.2	135.0	0.0	2.4	10.2	7.9	2.0	0.0	5.1	19.3

The vehicle’s left wheelbase was shortened 3 cm (1.2 in) and the right wheelbase was extended 1 cm (0.4 in). The induced damage involved the left fender, front bumper fascia, and both left side doors.

**Damage Classification:** The Collision Deformation Classification was **11-LDEW-3 (320 degrees)**. The Missing Vehicle algorithm of the WinSMASH program calculated the vehicle’s total Delta V for the left side impact as 23 km/h (14 mph). The longitudinal and lateral velocity changes were -17.6 km/h (-10.9 mph) and 14.8 km/h (9.2 mph), respectively. The results were based only on the crush profile of the Rendezvous and should be considered a borderline reconstruction of the vehicle’s Delta V.

The vehicle manufacturer’s recommended tire size was P215/70R16. The Rendezvous was equipped with tires of the recommended size. The vehicle’s tire data are shown in the table below.

Tire	Measured Pressure		Vehicle Manufacturer's Recommended Cold Tire Pressure		Tread Depth		Damage	Restricted	Deflated
	kPa	psi	kPa	psi	milli-meters	32 <sup>nd</sup> of an inch			
LF	262	38	241	35	5	6	None	Yes	No
LR	255	37	241	35	3	4	None	No	No
RR	262	38	241	35	8	10	None	No	No
RF	207	30	241	35	4	5	None	No	No

**Vehicle Interior:** The inspection of the interior (Figures 6 and 7) revealed no discernable occupant contact evidence and no evidence of steering rim deformation or compression of the energy absorbing steering column.

Both left side doors were jammed shut and the left front door had been pried open by rescue personnel. The right side doors remained closed and operational. The pre-crash status of the left front, right front, and right rear window glazing was partially open. The remaining window glazing was either closed or fixed. None of the window glazing sustained damage during the crash.

The left sill and left side panel forward of the left A-pillar intruded laterally into the driver's space 15 cm (6 in) and 11 cm (4.3 in), respectively. The left front door was damaged during rescue operations and the interior panel was detached. Based on the intrusion of the left sill and the exterior damage on the door, it was estimated that the rear lower quadrant of the left front door intruded 8-15 cm (3-6 in).

#### EVENT DATA RECORDER

The EDR was imaged using version 3.1 of the Bosch Crash Data Retrieval tool via connection to the vehicle's diagnostic link connector. The imaged EDR file was subsequently read using version 3.3. The EDR recorded a deployment event and a non-deployment event. The ignition cycle count for the non-deployment event indicated that it occurred prior to this crash and

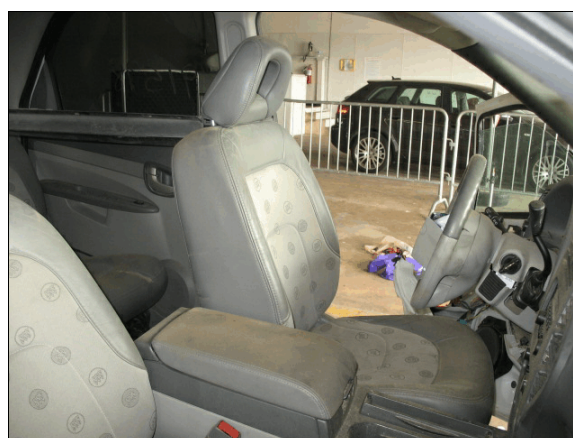


Figure 6: Driver's seating position



Figure 7: Instrument panel, steering wheel and windshield



was therefore unrelated to this crash. The imaged data for the deployment event indicated that the recording was complete and the SIR warning lamp was off. The driver's seat belt switch circuit was recorded as buckled. The data indicated that the deployment criteria was met at approximately 60 msec after AE. The Delta V reached a maximum value of -17.49 km/h (-10.87 mph) at the 150 msec point of recorded data. The EDR's pre-crash data was discussed in the pre-crash section above on page 2. The EDR report is attached at the end of this report<sup>1</sup>.

### AUTOMATIC RESTRAINT SYSTEM

The Rendezvous was equipped with dual stage driver and front passenger frontal air bags. The frontal impact sensors were located on the vehicle's right and left upper radiator supports. The Rendezvous was also equipped with front seat-mounted side impact air bags. Based on the Holmatro Rescuer's Guide to Vehicle Safety Systems, the vehicle's side impact sensors were located within the lower B-pillars. The driver's seat-mounted side impact air bag, frontal air bag, and the front passengers frontal air bag deployed in this crash.

The driver's seat-mounted side impact air bag was located in the outboard side of the driver's seat back (**Figure 8**). The module cover was rectangular and constructed of pliable vinyl. It was 8 cm (3.1 in) in width and 21 cm (8.3 in) in height. Inspection of the cover flap revealed that it opened at the designated tear points. The deployed air bag (**Figure 9**) was 29 cm (11.4 in) in width at the bottom, 36 cm (14.2 in) in width at the top, and 70 cm (27.6 in) in height. There were no vent ports, but the inboard and outboard sides of the air bag fabric were sewn together in two locations. The sewn areas were 12 cm (4.7 in) in width and 1 cm (0.4 in) in height. They were located 15 cm (5.9 in) and 33 cm (13 in) from the top, respectively, and 13 cm (5.1 in) from the leading edge of the air bag. Inspection of the air bag revealed a possible occupant contact on the lower left quadrant on the inboard side located 17 cm (6.7 in) from the bottom and 17 cm (6.7 in) from the leading edge.



**Figure 8:** The driver's seat; arrow shows the packed seat-mounted side impact air bag and the module cover flap

The driver's frontal air bag was located in the steering wheel hub and the module cover was a two-flap configuration constructed of pliable vinyl. Each flap was 8 cm (3.1 in) in width and 10 cm (3.9 in) in height. An inspection of the air bag module cover flaps revealed that they

<sup>1</sup>Please note that for confidentiality purposes, pages 6 and 7 are not included with the EDR report.

opened at the designated tear points. The deployed air bag (**Figure 10**) had a diameter of 64 cm (25.2 in) and was designed with four tethers and two vent ports. The vent ports were located on the back of the air bag at the 2 and 10 o'clock positions. Inspection of the air bag revealed no damage and no discernable evidence of occupant contact.

The front passenger's air bag was located within the top of the instrument panel. The air bag module cover consisted of a single flap constructed of pliable vinyl. The cover flap was 36 cm (14.2 in) in width and 24 cm (9.4 in) in height. It opened along the designated tear seam and was undamaged. The deployed air bag (**Figure 11**) was 48 cm (18.9 in) in width and 67 cm (26.4 in) in height. It was designed with two tethers and two vent ports located at the 10 and 2 o'clock positions. There were no discernable occupant contacts and no damage on the air bag.

**MANUAL RESTRAINT SYSTEM**

The Rendezvous was equipped with lap-and-shoulder belts for the front and second row seating positions. The second row center seating position was equipped with a lap belt. The driver's seat belt consisted of continuous loop belt webbing, an Emergency Locking Retractor (ELR), sliding latch plate, and an adjustable upper anchor that was in the full-down position. The front right seat belt consisted of continuous loop belt webbing, an ELR, locking latch plate, and adjustable upper anchor that was located in the full-up position.

Both front row seat belts were equipped with retractor-mounted pretensioners. The second row outboard seat belts consisted of continuous loop belt webbing, ELRs, locking latch plates, and adjustable upper anchors. The center seat position had a lap belt with a locking latch plate.

The inspection of the driver's seat belt assembly revealed a scuff on the seat belt webbing located 5 cm (2 in) below the stop button. This was not an occupant load mark and was probably related to the intrusion of the left front door. There was no evidence of occupant loading on the seat belt assembly. The retractor functioned normally and there was insufficient evidence to determine if the pretensioner had actuated. The driver's medical record reported injuries that were



**Figure 9:** The deployed left front seat-mounted side impact air bag



**Figure 10:** The driver's frontal air bag

consistent with restraint usage in this crash. The EDR also recorded the driver’s seat belt switch circuit as buckled. This evidence indicated that the driver was restrained at the time of the crash.

Inspection of the front passenger’s seat belt assembly revealed light load abrasions on the D-ring. The retractor functioned normally and there was insufficient evidence to determine if the pretensioner had actuated. The loading evidence on the D-ring indicated that the front passenger was restrained at the time of the crash. The remaining seat positions were unoccupied.



Figure 11: The Rendezvous’ front right passenger’s frontal air bag

**CASE VEHICLE DRIVER KINEMATICS**

The driver of the Rendezvous [27-year-old, female; 155 cm (61 in) and 69 kg (152 lbs)] was seated in an unknown posture. At the time of vehicle inspection, the driver’s seat track was adjusted between the middle and full-forward position and the seat back was slightly reclined. The adjustable head restraint was located in the full-down position. The distance from the top of the seat back to the top of the head restraint was 22 cm (8.7 in). The tilt steering column was located in the full-down position.

The left side plane impact with the front of the Century displaced the driver of the Rendezvous to the left and forward, opposite the 11 o’clock direction of force. She loaded the seat belt and sustained contusions on the chest and left shoulder. While there was no discernable evidence of occupant contact on the seat-mounted side impact air bag, occupant kinematic principles suggest that the left side of her upper torso and head loaded the deployed air bag. The driver also sustained a cervical strain, which was probably due to impact force.

**CASE VEHICLE DRIVER INJURIES**

The driver of the Rendezvous was transported by ambulance to a hospital where she was treated in the emergency room and released. The table below shows the driver’s injuries and injury sources.

Injury Number	Injury Description (including Aspect)	NASS Injury Code & AIS 90	Injury Source	Source Confidence	Source of Injury Data
1	Strain, acute, cervical with muscle spasm and straightening of the lordosis	minor 640278.1,6	Noncontact injury: impact forces	Probable	Emergency room records
2	Contusion chest, not further specified	minor 490402.1,4	Torso portion of safety belt system	Certain	Emergency room records

Injury Number	Injury Description (including Aspect)	NASS Injury Code & AIS 90	Injury Source	Source Confidence	Source of Injury Data
3	Contusion left shoulder, not further specified	minor 790402.1,2	Torso portion of safety belt system	Certain	Emergency room records

#### CASE VEHICLE FRONT ROW PASSENGER KINEMATICS

The front passenger of the Rendezvous [32-year-old, female; unknown height and 91 kg (200 lbs)] was seated in an unknown posture. At the time of the vehicle inspection, the front passenger's seat track was adjusted to the rear position and the seat back was moderately reclined. The adjustable head restraint was located in the full-up position. The distance from the top of the seat back to the top of the head restraint was 22 cm (8.7 inches).

The left side plane impact with the front of the Century displaced the front passenger of the Rendezvous to the left and forward, opposite the 11 o'clock direction of force. She loaded the seat belt and sustained a contusion on the right shoulder.

#### CASE VEHICLE FRONT ROW PASSENGER INJURIES

The front row passenger was transported by ambulance to a hospital where she was treated in the emergency room and released. The table below shows the passenger's injuries and injury sources.

Injury Number	Injury Description (including Aspect)	NASS Injury Code & AIS 90	Injury Source	Source Confidence	Source of Injury Data
1	Contusion right shoulder, not further specified	minor 790402.1,1	Torso portion of safety belt system	Certain	Emergency room records

#### OTHER VEHICLE

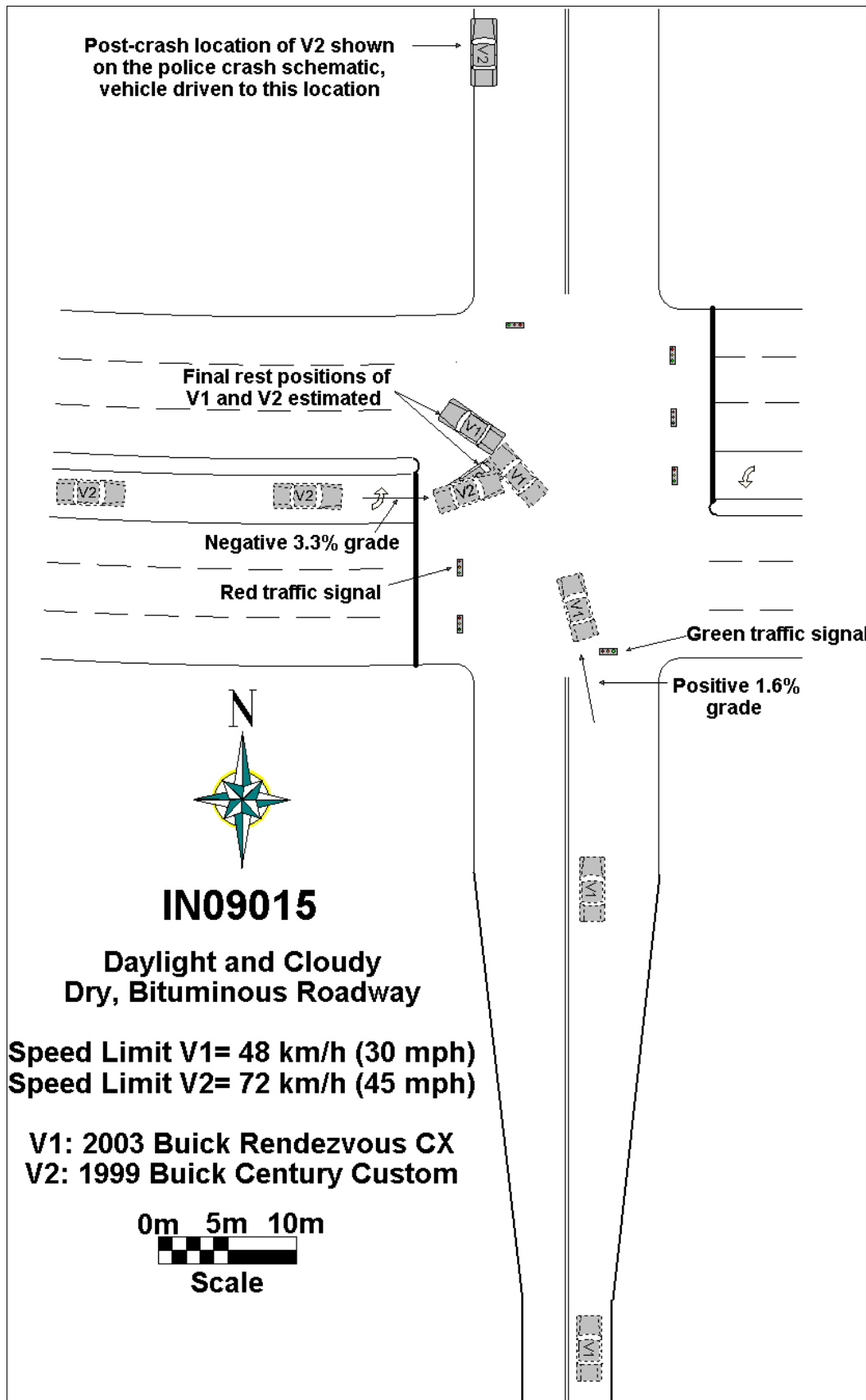
The 1999 Buick Century Custom was a front wheel drive, 4-door, sedan (VIN: 2G4WS52MXX1-----) equipped with a 3.1-L, V6 engine, an automatic transmission, four wheel anti-lock disc brakes, and dual stage driver and front passenger frontal air bags.

**Exterior Damage:** The Century could not be located and was not inspected. There were no photographs of the vehicle available and a CDC could not be estimated.

The Missing Vehicle algorithm of the WinSMASH program calculated the Century's total Delta V for the front impact as 29 km/h (18 mph). The longitudinal and lateral velocity changes were -25.1 km/h (-15.6 mph) and -14.5 km/h (9 mph), respectively. The results were based only

on the crush profile on the Rendezvous and should be considered as a borderline reconstruction of the Century's Delta V.

***Century's Driver:*** The police crash report indicated that the driver (67-year-old, female] was restrained by the lap-and-shoulder belt and the driver's frontal air bag deployed. The driver sustained a police reported C-injury and was transported by ambulance to a medical facility.



## CDR File Information

User Entered VIN	3G5DA03E73S*****
User	
Case Number	
EDR Data Imaging Date	
Crash Date	
Filename	IN09015.CDR
Saved on	Wednesday, May 6 2009 at 10:51:44 AM
Collected with CDR version	Crash Data Retrieval Tool 3.1
Reported with CDR version	Crash Data Retrieval Tool 3.3
EDR Device Type	airbag control module
Event(s) recovered	Deployment Non-Deployment

**IMPORTANT NOTICE:** Robert Bosch LLC recommends that the latest production release of Crash Data Retrieval software be utilized when viewing, printing or exporting any retrieved data from within the CDR program. This ensures that the retrieved data has been translated using the most recent information including but not limited to that which was provided by the manufacturers of the vehicles supported in this product.

## 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 crash data also remains stored in the SDM. 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.

-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.

- 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 once a second 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.

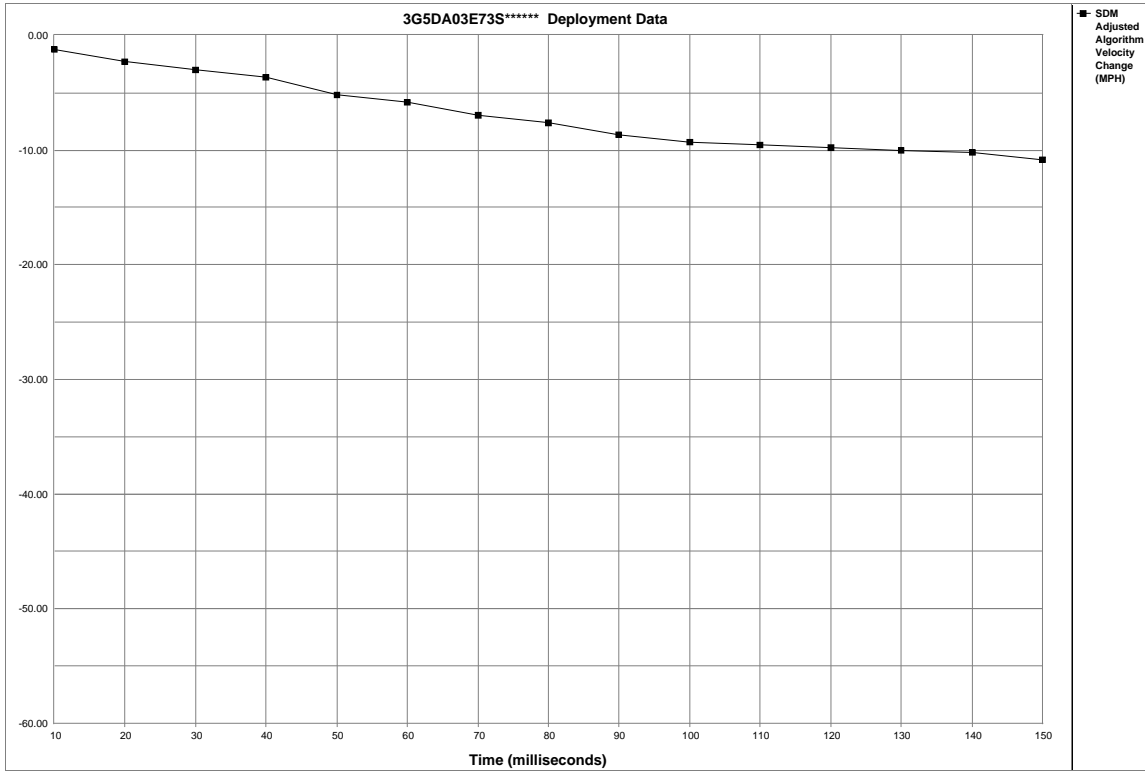


### System Status At Deployment

SIR Warning Lamp Status	OFF
Driver's Belt Switch Circuit Status	BUCKLED
Ignition Cycles At Investigation	10953
Ignition Cycles At Deployment	10950
Time Between Non-Deployment And Deployment Events (sec)	N/A
Event Recording Complete	Yes

Seconds Before AE	Vehicle Speed (MPH)	Engine Speed (RPM)	Percent Throttle
-5	20	896	0
-4	18	832	0
-3	17	832	0
-2	16	1024	6
-1	14	1088	0

Seconds Before AE	Brake Switch Circuit Status
-8	ON
-7	ON
-6	ON
-5	ON
-4	ON
-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	-1.21	-2.30	-2.96	-3.62	-5.16	-5.82	-6.91	-7.57	-8.67	-9.33	-9.55	-9.77	-9.99	-10.21	-10.87

### System Status At Non-Deployment

SIR Warning Lamp Status	OFF
Driver's Belt Switch Circuit Status	BUCKLED
Ignition Cycles At Investigation	10953
Ignition Cycles At Non-Deployment	10880
Maximum SDM Algorithm Longitudinal Velocity Change (MPH)	-0.97

Seconds Before AE	Vehicle Speed (MPH)	Engine Speed (RPM)	Percent Throttle
-5	37	1216	0
-4	37	1024	0
-3	35	960	0
-2	34	832	0
-1	30	768	0

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