CRASH DATA RESEARCH CENTER
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CALSPAN ON-SITE CERTIFIED ADVANCED 208-COMPLIANT VEHICLE CRASH INVESTIGATION

SCI CASE NO: CA05-033

VEHICLE: 2005 BUICK LACROSSE
LOCATION: PENNSYLVANIA
CRASH DATE: MAY 2005

Contract No. DTNH22-01-C-17002

Prepared for:

U.S. Department of Transportation
National Highway Traffic Safety Administration
Washington, D.C. 20590

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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 are 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 STANDARD TITLE PAGE

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16. Abstract

This on-site investigative effort focused on the performance of the Certified Advanced 208-Compliant (CAC) safety system in a 2005 Buick Lacrosse. This advanced occupant protection system was comprised of dual-stage frontal air bags, seat track position sensors for both front seats, front safety belt buckle switch sensors and a front right occupant presence detection sensor. The manufacturer certified that the CAC system met the advanced air bag requirements of the advanced Federal Motor Vehicle Safety Standard (FMVSS) 208. The CAC system was controlled and monitored by the vehicle's Sensing and Diagnostic control Module (SDM) that was located under the front right passenger seat. The SDM tailored the deployment of the frontal air bags based the crash severity and inputs from the CAC sensors. The SDM was equipped with an Event Data Recorder (EDR) that had the ability to record pre-crash vehicle systems and crash related data. The EDR was downloaded during the course of the SCI inspection as a supplement to the on-site investigation.

The Buick Lacrosse was involved in a single vehicle run-off road crash. Crash reconstruction determined the Buick departed the right side of the road and engaged the positive slope of an embankment with its right front corner. The vehicle then climbed the embankment and subsequently rolled to the right two quarter-turns coming to rest on its roof back in the road. The Buick's advanced driver air bag deployed as a result of this impact. The vehicle was driven by a 26 year old unrestrained female and she was its sole occupant. She was not injured in the crash and refused medical attention.

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BACKGROUND

This on-site investigative effort focused on the performance of the Certified Advanced 208-Compliant (CAC) safety system in a 2005 Buick Lacrosse, **Figure 1**. This advanced occupant protection system was comprised of dual-stage frontal air bags, seat track position sensors for both front seats, front safety belt buckle switch sensors and a front right occupant presence detection sensor. The manufacturer certified that the CAC system met the advanced air bag requirements of the advanced Federal Motor Vehicle Safety Standard (FMVSS) 208. The CAC system was controlled and monitored by the vehicle's Sensing and Diagnostic control Module (SDM) that was located under the front right passenger seat. The SDM tailored the deployment of the frontal air bags based the crash severity and inputs from the CAC sensors. The SDM was equipped with an Event Data Recorder (EDR) that had the ability to record pre-crash vehicle systems and crash related data. The EDR was downloaded during the course of the SCI inspection as a supplement to the on-site investigation.

Figure 1: Right oblique view of the Buick.

The Buick Lacrosse was involved in a single vehicle run-off road crash. Crash reconstruction determined the Buick departed the right side of the road and engaged the positive slope of an embankment with its front right corner. The vehicle then climbed the embankment and subsequently rolled to the left two quarter-turns coming to rest on its roof back in the road. The Buick's advanced driver air bag deployed as a result of this impact. The vehicle was driven by a 26 year old unrestrained female and she was its sole occupant. She was not injured in the crash and refused medical attention.

This crash was identified from a list of claims provided by an insurance company to the National Highway Traffic Safety Administration (NHTSA). The list identified Certified Advanced 208-Compliant vehicles that had been involved in traffic crashes. The NHTSA analyzed the list based on vehicle type and location and then forwarded a list of selected crashes to the Calspan Special Crash Investigations (SCI) team for follow-up investigation. The subject Buick was located and cooperation was established with the local insurance adjuster and salvage yard. An on-site investigation was assigned to the SCI team on June 1, 2005. The on-site investigation took place on June 2, 2005.

SUMMARY

VEHICLE DATA: 2005 Buick Lacrosse

The 2005 Buick Lacrosse was identified by the Vehicle Identification Number (VIN): 2G4WC532251 (production sequence deleted). The four-door sedan was owned by a car rental company and was being operated under a rental agreement at the time of the crash. The Buick was manufactured in April 2005 and its odometer had registered 4,584 km (2,849 miles) at the time of the SCI inspection. The subject vehicle was equipped with base model trim to include: cloth upholstered interior for five passengers, six-way powered driver seat, power rack and pinion steering, power windows, power door locks, and power mirrors. The power train consisted of a 3.8 liter/V6 engine linked to a four-speed automatic transmission. The service brakes were a four-wheel disc system with ABS. The manual restraint system consisted of three-point lap and shoulder belts in all seat positions. The front restraints were equipped with buckle pretensioners. The rear bench seat was equipped with Lower Anchors and Tethers for Children (LATCH) in all positions. The frontal air bag system in the vehicle consisted of driver and front right passenger air bags certified by the manufacturer to be compliant with the advanced FMVSS No. 208 occupant protection standard. The Buick was equipped with an Event Data Recorder (EDR) that was downloaded at the time of the SCI inspection. The vehicle was not equipped with an inflatable side impact protection system. The Buick was equipped with Goodyear Integrity P225/60R16 tires on OEM steel rims with plastics wheel covers. The recommended tire pressure was 210 kPa (30 PSI) front and rear. The specific measured tire data was as follows:

Tire	Measured Pressure	Tread Depth	Restricted	Damage
LF	228 kPa (33 PSI)	8 mm (10/32)	No	None
LR	103 kPa (15 PSI)	8 mm (10/32)	No	Wheel cover abraded
RF	241 kPa (35 PSI)	8 mm (10/32)	No	None
RR	0 kPa	8 mm (10/32)	No	None visible

CRASH SITE

This single vehicle roadside departure crash occurred during the nighttime hours of May 2005. At the time of the crash, it was dark with overhead artificial lighting. The weather was not a factor in the crash; the road surface was dry. The crash occurred on a one-lane entrance ramp to the southbound lanes of an interstate highway. **Figure 2** is a southbound trajectory view at the crash site. The entrance ramp measured 3 m (10 ft) in width and was delineated by white edge lines. There was a right curve for the southbound traffic and a

Figure 2: Southbound trajectory view of the crash site.

positive grade greater than two percent. On the east side of the ramp there was a gore area prior to merging into the interstate. A 3.7 m (12 ft) wide concrete shoulder bordered the west side of the ramp. There was a positive 65 degree embankment located immediately outboard of the shoulder. The positive slope of the embankment contributed to the vehicle's fall-over crash. The speed limit on the entrance ramp was 89 km/h (55 mph). The SCI scene inspection took place one month after the crash due to the delay in crash notification. There was no physical evidence related to the subject crash that identified the specific point of impact or final rest location of the Buick.

CRASH SEQUENCE

Pre-Crash

The 26 year old female driver was operating the Buick Lacrosse in a southbound direction on the interstate entrance ramp. She was not utilizing the vehicle's manual three-point lap and shoulder belt; she was unrestrained. For unknown reasons, the driver relinquished directional control of the Buick and departed the travel lane to the right. The EDR recorded speed of the Buick five seconds (T-5) before Algorithm Enable (AE) was 84 km/h (52 mph). The vehicle decelerated throughout the five second pre-crash record. The vehicle's speed one second (T-1) prior to AE was 56 km/h (35 mph). The brake status changed from "Off" to "On" one second prior to AE. A schematic of the crash is attached to the end of the report as **Figure 8**.

Crash

The right frontal area of the Buick engaged the positive slope of the embankment. This was evidenced by the Buick's scuffed and deformed front bumper fascia. This initial impact enabled the algorithm in the EDR and a Non-Deployment event was recorded. The vehicle then rode up the slope with its right side tires. This imparted a roll angle to the Buick that exceeded its stability by placing the center of gravity beyond the left side tires. During the roll sequence, the full width of the front bumper engaged the embankment. The force of the frontal engagement against the embankment resulted in a deployment of the vehicle's advanced driver air bag. The maximum EDR recorded longitudinal delta V of this long duration event was -50.9 km/h (-31.6 mph). The maximum delta V occurred 347.5 milliseconds after AE. The vehicle then rolled two quarter turns to the left coming to rest on its top. The vehicle came to rest on the concrete shoulder facing south.

Post-Crash

The police responded to the crash site. The driver had exited the vehicle under her own power and was uninjured. She refused medical attention. The Buick sustained disabling damage and was towed from the scene. The driver was charged with three traffic violations resultant to the crash.

2005 BUICK LACROSSE

Exterior Damage

Figures 3 and 4 are exterior views of the damaged Buick. The front plane of the vehicle exhibited minor direct contact damage as a result of a long continuous impact with the embankment. This contact enabled the algorithm in the EDR and resulted in the Non-Deployment event. The frontal damage began at the right corner and then extended across the

full 152 cm (60 in) frontal width of the Buick as the crash developed. The right aspect of the fascia was fractured and abraded. The contact pattern also wrapped around the right corner and continued 53 cm (21 in) along the left side of the fascia. As the vehicle climbed the embankment and began to fall-over, the center and left aspects of the front plane contacted the embankment. This direct contact pattern began on the vehicle's center line and extended 67 cm (26.5 in) to the left. Within this contact pattern there was a localized 13 cm (5 in) contact to the left corner that resulted in deformation of the bumper reinforcement bar. Immediately above this contact pattern was a 50 cm (19.5 in wide) longitudinal contact pattern to the leading edge of the hood. The direct hood contact began on the centerline and extended to the left ending immediately inboard of the left headlamp assembly. The entire bumper fascia and the foam absorber were rotated down exposing the reinforcement bar. The residual crush profile measured along the bumper reinforcement was as follows: C1 = 11 cm (4.3 in), C2 = 8 cm (3.1.in), C3 = 3 cm (1.2 in), C4 = 1 cm (0.4 in), C5 = 1 cm (0.4 in), C6 = 0 cm (0 in). The center grille was fractured and missing. The Collision Deformation Classification (CDC) of the front impact was 12-FDEW1.

Figure 3: Frontal damage to the Buick.

The damage associated to the two-quarter turn fall-over (Event 2) consisted of abrasions and minor deformation to the body panels of the left and top planes. The left front fender, left upper A-pillar, roof and hood exhibited scratches/abrasions oriented in a lateral direction. The mount for the left exterior mirror fractured and the mirror was separated from the Buick. The left rear wheel cover also exhibited abrasions. There was localized rollover damage to the left front aspect of the roof at the windshield header junction, **Figure 4**. The damage began 32 cm (12.5 in) left of center measured 17 cm x 15 cm (6.5 in by 6 in), width by length. The residual depth of the crush measured 6 cm (2.5 in). The top left aspect of the windshield fractured and separated from the header. The windshield sagged post-crash due to its exposure to the elements. There was no measurable change to the wheelbase dimensions. All the doors remained closed during the crash and were operational at the time of the inspection. The CDC of the rollover damage was 00-TDDO-2.

Figure 4: View of the roof deformation.

The right side of the Buick sustained a minor 8 cm (3 in) wide damage pattern to the right rear door panel. This narrow pattern was centered 10 cm (4 in) rearward of the right B-pillar and was attributed to the process of up-righting the vehicle post-crash.

Interior Damage

The interior damage to the Buick was limited to the deployment of the advanced CAC driver air bag and the 6 cm (2.5 in) intrusion of the windshield header. There was no other intrusion or interior damage related to the exterior force of the impact. There were no identified interior occupant contacts. **Figure 5** is a view of the left front interior.

Figure 5: Left front interior view.

The six-way powered driver seat was adjusted to a rear track position at the time of the inspection. The seat position measured 6 cm (2.5 in) forward of full rear. The total track adjustment measured 25 cm (9.8 in). The seat back was reclined 20 degrees aft of vertical. The head restraint was adjusted up 3 cm (1 in). The horizontal distance from the seat back to the center of the steering wheel rim measured 67 cm (26.5 in). This distance was measured 41 cm (16 in) above the seat bight. The four-spoke tilt steering wheel was adjusted to the center position. There was no deformation of the steering wheel rim. There was no displacement of the steering column shear capsules.

The unoccupied front right passenger seat was adjusted to a full rear track position. The seat track travel measured 28 cm (11.0 in). The seat back was reclined 15 degrees. The horizontal distance from the seat back to the vertical face of the instrument panel measured 81 cm (32 in).

Manual Restraint Systems

The manual restraint systems in the Buick Lacrosse consisted of three-point lap and shoulder belts in all five seat positions. The front restraints utilized buckle pretensioners. The driver restraint consisted of continuous loop webbing, a sliding latch plate, adjustable D-ring and an Emergency Locking Retractor (ELR) in the base of the B-pillar. At the time of the SCI inspection, the driver restraint was in the stowed position. The webbing was extended from the retractor and inspected. There was no physical evidence on the webbing indicative of its use at the time of the crash. The adjustable D-ring was in the lowest position. There was no crash related evidence on the friction surface of the D-ring. There was no crash related loading evidence on the latch plate. Inspection of the latch plate revealed minor evidence of historical use; however due to the fact that the Buick was a rental car, historical use was not an indicator of the driver's habits. The SCI inspection of the driver's restraint indicated that it was not in use at the time of the crash. The data downloaded from the vehicle's EDR also indicated the driver seat belt was unbuckled. It should be noted that the police report indicated the driver was restrained at the time of the crash.

During the course of the manual restraint inspection, it was observed that the height of both the driver's and front right passenger's seat belt buckles was compressed to the level of the seat cushion. Detailed inspection of each buckle revealed that the accordion sleeve surrounding the buckle stalk was compressed, **Figure 6**. It was determined that both front seat pretensioners had actuated. The compression of the buckle height was an estimated 5 cm (2 in).

Certified Advanced 208-Compliant Air Bag System

The Certified Advanced 208-Compliant (CAC) frontal air bag consisted of advanced dual stage air bags for the driver and front right passenger, seat track position sensors, front safety belt buckle switch sensors, and a front right occupant advanced air bag detection sensor. The frontal air bag system was certified by the manufacturer to have met the requirements of the advanced Federal Motor Vehicle Safety Standard No. 208. The system was controlled and monitored by a Sensing and Diagnostic control Module (SDM) located under the front right passenger seat. The SDM was equipped with an Event Data Recorder (EDR) that recorded data related to the crash. This data was downloaded by the SCI investigator at the time of the vehicle inspection.

The driver air bag deployed from an I-configuration module located in the center hub of the steering wheel rim. The cover flaps were asymmetrical. The left cover flap incorporated the Buick logo design and measured 10 cm x 16 cm (4 in x 6.2 in), width by height, respectively. The right cover flap had a cut-out for the logo and measured 5 cm x 16 cm (2 in x 6.2 in). The flaps opened at the designed tear seams during the deployment sequence and were not damaged. There was no evidence of occupant contact to the flaps. **Figure 7** is a view of the driver air bag. The driver air bag measured 66 cm (26 in) in diameter in its deflated state. The bag was tethered by two 5 cm (2 in) wide straps in the 6/12 o'clock sectors and was vented by two 3 cm (1.2 in) diameter ports located in the 11/1 o'clock sectors. The deflated bag was water-soaked from rain that had infiltrated the interior through the windshield separation. There was no residual evidence of occupant contact to the driver air bag.

The front right passenger air bag was a mid-mount design located in the right aspect of the instrument panel. The deployment of this air bag was suppressed by the occupant presence detection system in the unoccupied seat.

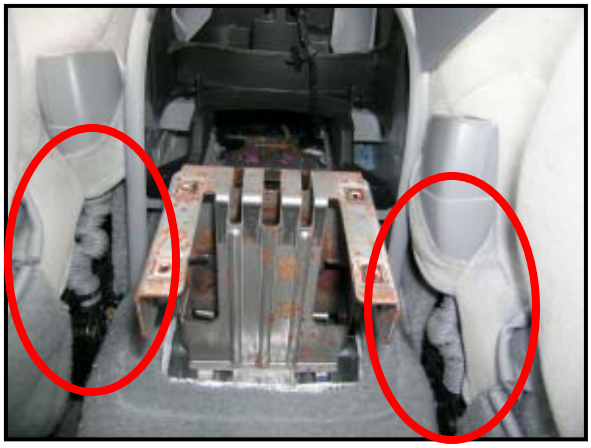

Figure 6: View of the fired buckle pretensioners.

Figure 7: Deployed driver air bag.

Event Data Recorder (EDR)
The EDR was downloaded utilizing the Vetronix Crash Data Retrieval (CDR) hardware and software version 2.7. The CDR hardware was connected to the J1962 diagnostic port located on the lower left side on the instrument panel and downloaded through the Buick's electrical system. The electrical system was operational and the vehicle's on-board battery was used to supply electrical power.

The EDR recorded and stored both a Non-Deployment event and a Deployment event related to the subject crash. Both events occurred on Ignition cycle 134. Data flags within the download indicated the recording of the event was complete. Analysis of the data indicated that the Non-Deployment event occurred before the Deployment event. The time between the events was reported as zero. Reconstruction of the time line in the recorded events indicated that the EDR recorded these two events as a single long crash pulse with a duration of 350 milliseconds. The crash pulse was displayed over two graphs. The Non-Deployment Delta V graph displayed the crash pulse from 10 to 150 milliseconds after AE and the Deployment Delta V graph displayed the duration of the crash pulse from 210 to 350 milliseconds. The crash pulse data from 150 to 210 milliseconds (although calculated) was not displayed due to limitations within the EDR.

The Buick's SDM commanded a Stage 1 deployment of the driver air bag 255 milliseconds after AE. The maximum longitudinal EDR recorded delta V was -50.9 km/h (-31.6 mph) and occurred 347.5 milliseconds after AE. The delta V was consistent with the vehicle's pre-crash speed of 56 km/h (35 mph) recorded one second (T-1) before AE. The complete EDR report downloaded from the vehicle is attached to the end of this report as *Attachment A*.

DRIVER DEMOGRAPHICS

Age / Sex:	26 year old / Female
Height:	Not Reported
Weight:	Not Reported
Seat Position:	Rear Track, 6 cm (2.5 in) forward of full rear
Manual Restraint Use:	None
Restraint Usage Source:	SCI Inspection, EDR
Medical Treatment:	None, not injured

DRIVER INJURY
The unrestrained driver was not injured in the crash.

DRIVER KINEMATICS
The 26 year old female driver was seated in a presumed upright posture and was unrestrained. The driver was in the process of negotiating a right curve on the entrance ramp to an interstate highway at an EDR reported speed of 84 km/h (52 mph) five seconds before AE. For unknown reasons the driver relinquished directional control and the Buick departed the right side of the entrance ramp. The front bumper of the Buick engaged the near vertical embankment.

The driver responded to the force of this engagement by bracing and was able to maintain position. The vehicle then climbed the embankment and began to fall-over in a “soft” left side roll. Reconstruction of the crash determined the Buick experienced a long duration/low magnitude deceleration of sufficient magnitude to warrant a Stage 1 deployment of the driver air bag. The driver responded to the rolling vehicle dynamics by contacting and loading the left front door panel. The vehicle rolled two quarter-turns and came to rest of its roof. The driver braced herself throughout this motion and was not injured in the event. She was able to exit the vehicle under her own power and refused medical attention.

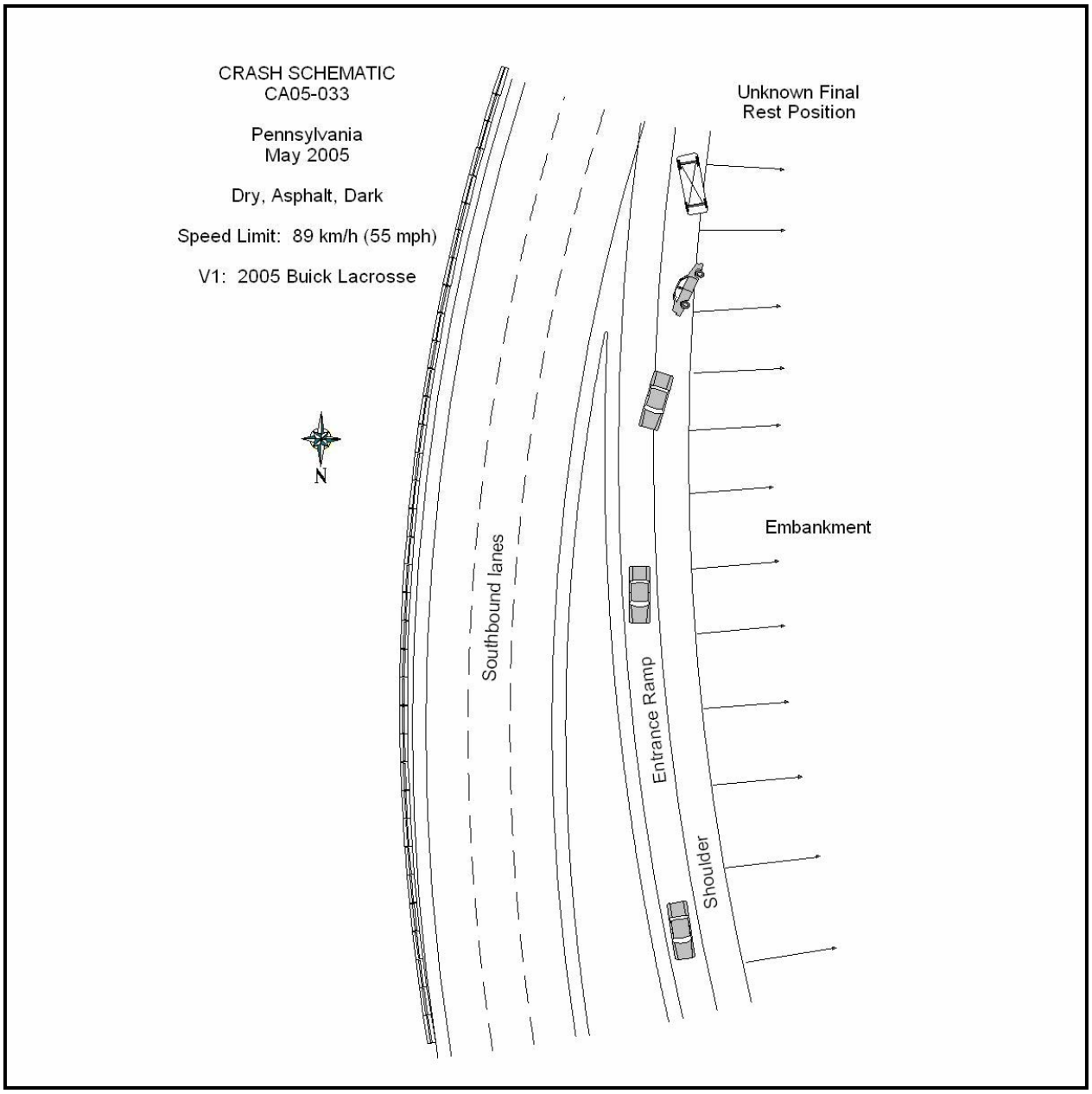

Figure 8: Crash Schematic.

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ATTACHMENT A
EDR Data

CDR File Information

Vehicle Identification Number	2G4WC532251xxxxxx
Investigator	
Case Number	
Investigation Date	
Crash Date	
Filename	BUICK LACROSSE NO SEQ.CDR
Saved on	Thursday, June 2 2005 at 02:28:53 PM
Collected with CDR version	Crash Data Retrieval Tool 2.70
Collecting program verification number	70812808
Reported with CDR version	Crash Data Retrieval Tool 2.800
Reporting program verification number	9238B95E
Interface used to collected data	Block number: 00 Interface version: 41 Date: 11-04-04 Checksum: 9E00
Event(s) recovered	Deployment Non-Deployment

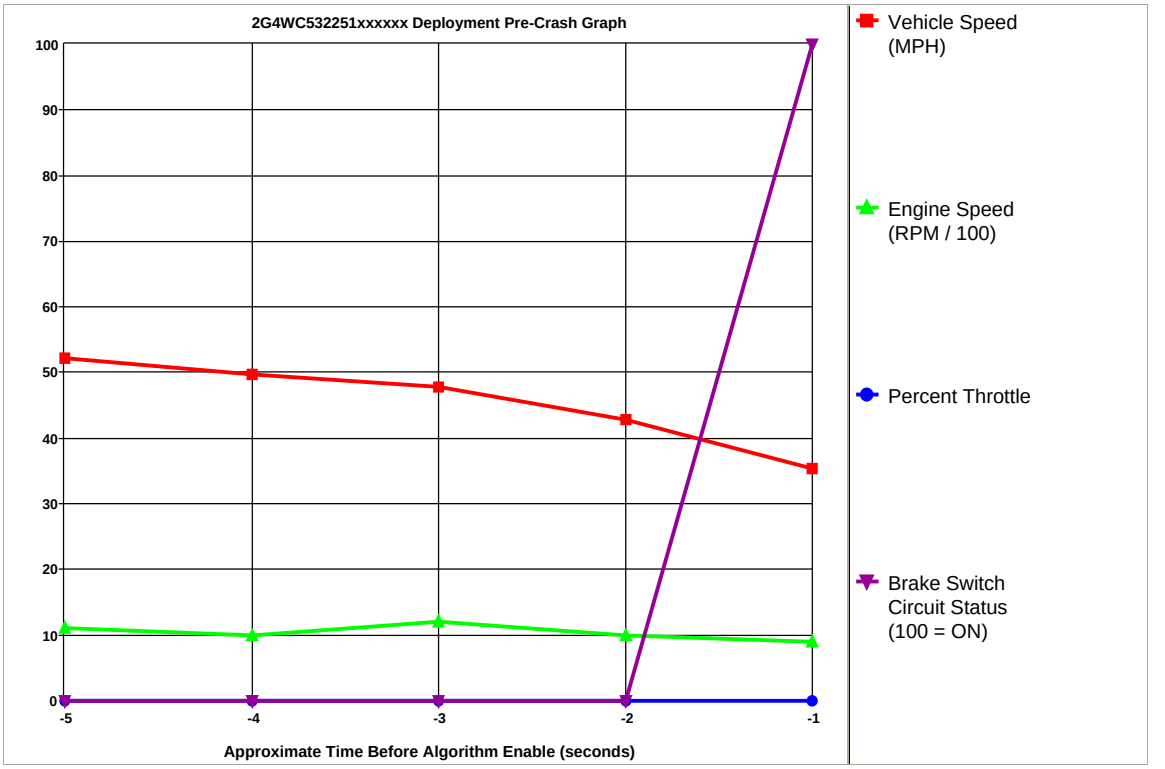
SDM Data Limitations

SDM Recorded Crash Events:
There are two types of SDM recorded crash events. The first is the Non-Deployment Event. A Non-Deployment Event is an event severe enough to "wake up" the sensing algorithm but not severe enough to 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 forward velocity change. This event will be cleared by the SDM after the ignition has been cycled 250 times.
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. Deployment Events cannot be overwritten or cleared from the SDM. Once the SDM has deployed the air bag, the SDM must be replaced.
The data in the Non-Deployment Event file will be locked after a Deployment Event, if the Non-Deployment Event occurred within 5 seconds before the Deployment Event unless a Deployment Level Event occurs within 5 seconds after the Deployment Event, then the Deployment Level Event will overwrite the Non-Deployment Event file.

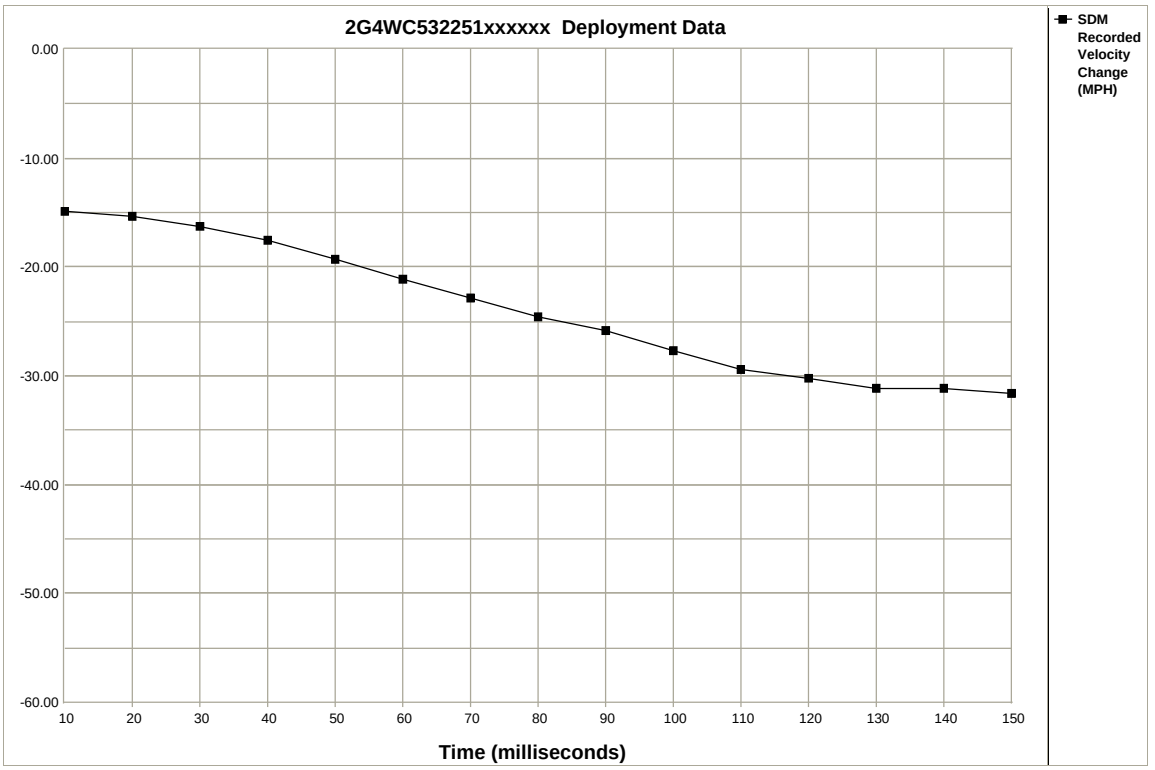
SDM Data Limitations:
-SDM Recorded Vehicle Forward Velocity Change reflects the change in forward velocity that the sensing system experienced during the recorded portion of the event. SDM Recorded Vehicle Forward Velocity Change is the change in velocity during the recording time and is not the speed the vehicle was traveling before the event, and is also not the Barrier Equivalent Velocity. This data should be examined in conjunction with other available physical evidence from the vehicle and scene when assessing occupant or vehicle forward velocity change. For Deployment Events and Deployment Level 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 will record the first 150 milliseconds of data after algorithm enable.
-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 if the vehicle has had the tire size or the final drive axle ratio changed from the factory build specifications.
-Brake Switch Circuit Status indicates the status of the brake switch circuit.
-Pre-Crash Electronic Data Validity Check Status indicates "Data Invalid" if the SDM receive an invalid message from the module sending 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 and Deployment 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.
SDM 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	UNBUCKLED
Ignition Cycles At Deployment	134
Ignition Cycles At Investigation	148
Maximum SDM Algorithm Forward Velocity Change (MPH)	-31.56
Algorithm Enable to Maximum SDM Recorded Velocity Change (msec)	347.5
Driver First Stage Time Algorithm Enabled to Deployment Command Criteria Met (msec)	255
Driver Second Stage Time Algorithm Enabled to Deployment Command Criteria Met (msec)	N/A
Passenger First Stage Time Algorithm Enabled to Deployment Command Criteria Met (msec)	255
Passenger Second Stage Time Algorithm Enabled to Deployment Command Criteria Met (msec)	N/A
Time Between Non-Deployment And Deployment Events (sec)	0
Event Recording Complete	Yes



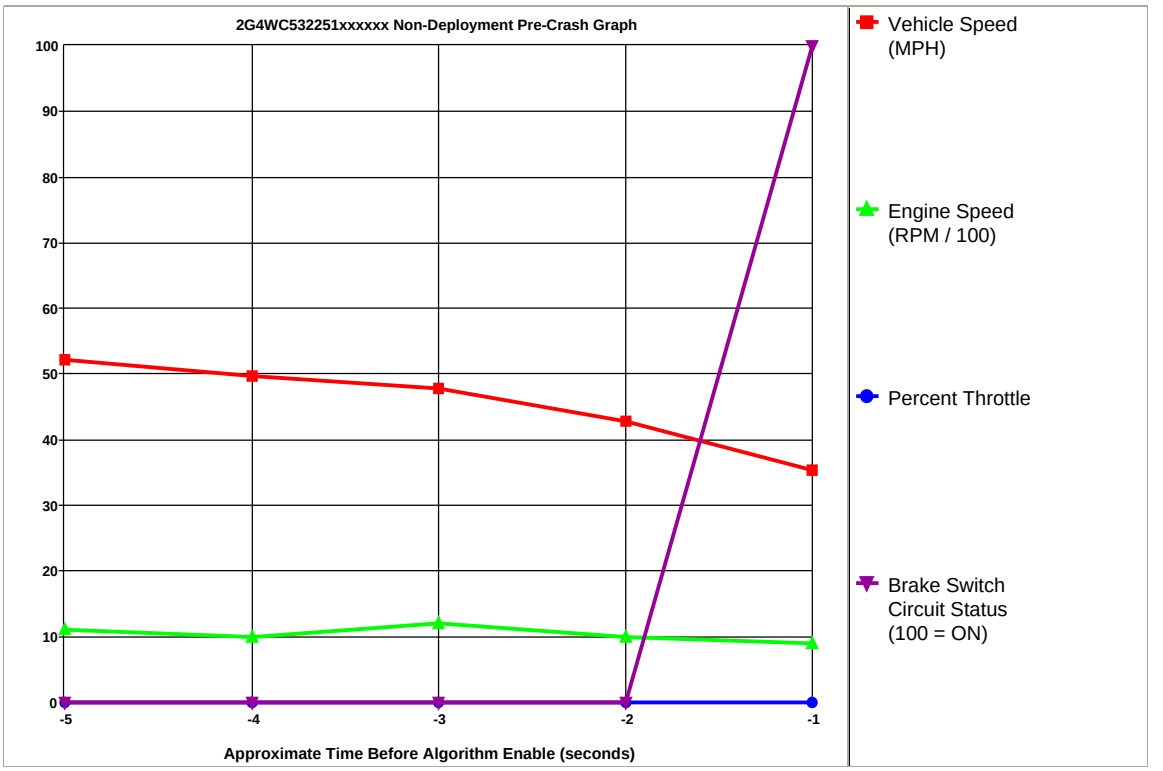
Seconds Before AE	Vehicle Speed (MPH)	Engine Speed (RPM)	Percent Throttle	Brake Switch Circuit Status
-5	52	1088	0	OFF
-4	50	1024	0	OFF
-3	48	1216	0	OFF
-2	43	1024	0	OFF
-1	35	896	0	ON



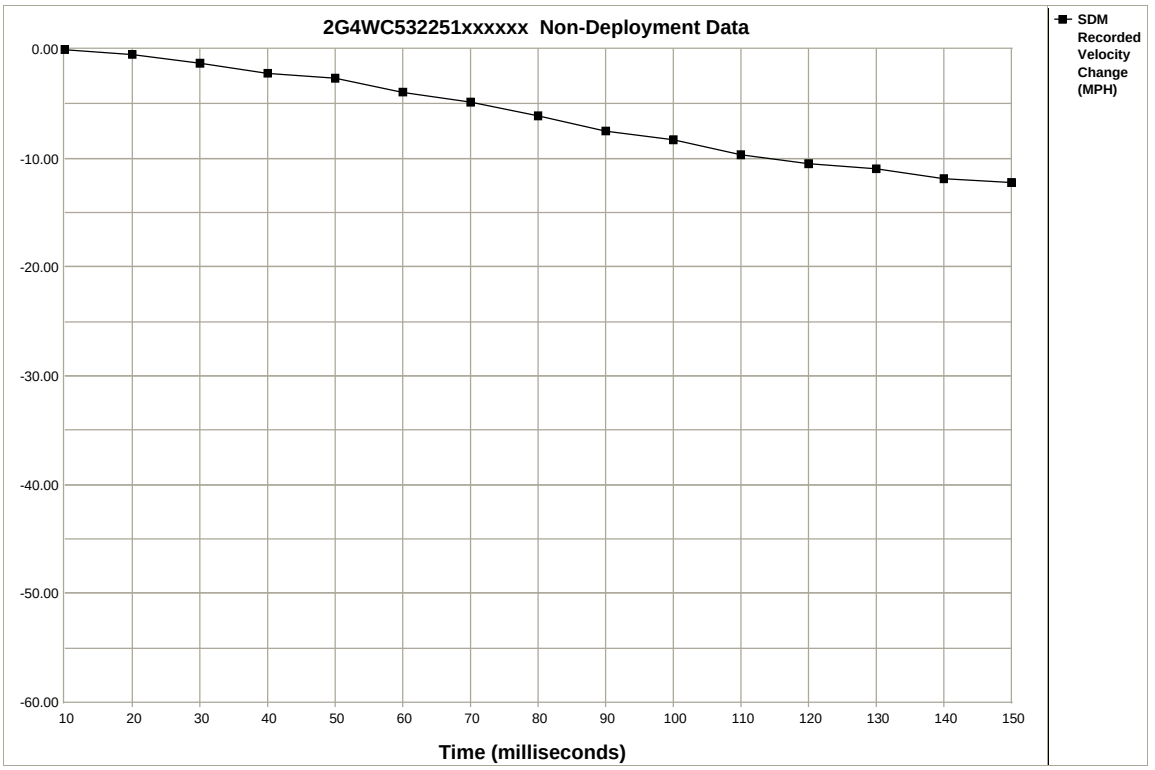
Time (milliseconds)	10	20	30	40	50	60	70	80	90	100	110	120	130	140	150
SDM Recorded Velocity Change	-14.92	-15.36	-16.24	-17.55	-19.31	-21.06	-22.82	-24.57	-25.89	-27.64	-29.40	-30.28	-31.15	-31.15	-31.59

System Status At Non-Deployment

SIR Warning Lamp Status	OFF
Driver's Belt Switch Circuit Status	UNBUCKLED
Ignition Cycles At Non-Deployment	134
Ignition Cycles At Investigation	148
Maximum SDM Algorithm Forward Velocity Change (MPH)	-31.56
Algorithm Enable to Maximum SDM Recorded Velocity Change (msec)	347.5
A Deployment was Commanded Prior to this Event	No



Seconds Before AE	Vehicle Speed (MPH)	Engine Speed (RPM)	Percent Throttle	Brake Switch Circuit Status
-5	52	1088	0	OFF
-4	50	1024	0	OFF
-3	48	1216	0	OFF
-2	43	1024	0	OFF
-1	35	896	0	ON



Time (milliseconds)	10	20	30	40	50	60	70	80	90	100	110	120	130	140	150
SDM Recorded Velocity Change	0.00	-0.44	-1.32	-2.19	-2.63	-3.95	-4.83	-6.14	-7.46	-8.34	-9.65	-10.53	-10.97	-11.85	-12.29

Hexadecimal Data

This page displays all the data retrieved from the air bag module.
It contains data that is not converted by this program.

```
$01  A1 3B 00 00 00 00
$02  BC 84 00 00 00 00
$03  41 53 35 30 38 38
$04  4B 37 51 38 59 31
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Comments