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ON-SITE CERTIFIED ADVANCED 208- COMPLIANT VEHICLE INVESTIGATION

CASE NUMBER - IN08011
LOCATION - TEXAS
VEHICLE - 2006 CHEVROLET COBALT LS
CRASH DATE - December 2007

Submitted:

December 22, 2008



Contract Number: DTNH22-07-C-00044

Prepared for:

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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> The focus of this report involves a 2006 Chevrolet whose frontal air bags were certified by the manufacturer to be compliant to the Advanced Air Bag portion of Federal Motor Vehicle Safety Standard (FMVSS) No. 208. This report covers an on-site investigation of an oblique head-on crash that involved a 2006 Chevrolet Cobalt LS and a 2000 Lexus GS300. The crash occurred at a 4-leg intersection; the Chevrolet was proceeding straight ahead and the Lexus was making a left-hand turn. The Chevrolet's driver (18-year-old, female) was seated and restrained by her lap-and-shoulder, safety belt system. The driver sustained only minor soft tissue injuries as a result of this crash.					
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This crash was brought to the National Highway Traffic Safety Administration's attention on or before February 22, 2008 by the sampling activities of the National Automotive Sampling System. This crash involved a 2006 Chevrolet Cobalt LS and a 2000 Lexus GS300. The crash occurred in December 2007, at 0803 hours, in Texas and was investigated by the applicable city police department. The focus of this investigation is that the frontal air bags in the Chevrolet are certified by the manufacturer to be compliant to the Advanced Air Bag portion of Federal Motor Vehicle Safety Standard (FMVSS) No. 208. This contractor inspected the Chevrolet and downloaded the Event Data Recorder (EDR) on March 18, 2008 and inspected the crash scene on March 19, 2008. This contractor was unable to locate the driver of the Chevrolet. The Lexus was not inspected. It had been sold at auction and could not be located. This report is based on the police crash report, scene and Chevrolet inspections, EDR data, occupant kinematic principles, occupant medical records, and this contractor's evaluation of the evidence.

CRASH CIRCUMSTANCES

Crash Environment: The trafficway on which both the Chevrolet and Lexus were traveling was a 7-lane, divided, city street, traversing in an east-west direction, and both vehicles were approaching a 4-leg intersection (**Figure 1**). Each vehicle's roadway had 3 through lanes and a left turn lane, and the trafficway was divided by a curbed, grass median. The Lexus was making a left-hand turn at the 4-leg intersection (**Figure 2**). The trafficway onto which the Lexus was turning was a 5-lane, divided, city street, traversing in a north-northeasterly and south-southwesterly direction. On the northern leg, the northern roadway had 2 through lanes while the southern roadway had 1 through lane, a combination right turn/through lane, and a left turn lane. The north leg of the intersection was divided by a raised concrete median. The southern leg of the intersection was undivided and had 2 northbound through lanes and 2 southbound through lanes. The east-west city trafficway was straight, and westbound roadway had a 3.8% grade negative to the west (a downgrade in the Chevrolet's direction of travel), near the area of impact. The eastbound roadway was level (actual grade was 0.1%, negative to the east). The pavement was concrete, and the width of the outside westbound lane was 3.3 meters (10.8 feet) while the eastbound left turn lane was 3.2 meters (10.5 feet). Both the east and west roadways were bordered by curbs with associated concrete rain gutters. For both roadways, pavement markings at the mouth of the intersection consisted of single solid white lines



Figure 1: Chevrolet's westbound approach to the intersection



Figure 2: Lexus' approach in left turn lane to area of the crash

separating the through and turn lanes. Traffic controls consisted of on-colors, pre-timed, horizontal-mounted traffic control signals that were located over each roadway's outside and center through lanes as well as a common signal controlling each roadways inside through lane and left turn lane. The speed limit for both vehicles was 64 km/h (40 mph). At the time of the crash the light condition was daylight, the atmospheric condition was clear, and the roadway pavement was dry. Traffic density was heavy, and the site of the crash was urban residential/commercial. See the Crash Diagram on page 10 of this report.

Pre-Crash: The Chevrolet was traveling west in the outside lane (**Figure 1**), and the driver intended to continue straight through the intersection. The Chevrolet's EDR data indicated that the Chevrolet was traveling 69 km/h (43 mph) approximately 1 second prior to algorithm enable (AE). The Lexus was traveling east in the left turn lane, and the driver was intending to turn left and travel northbound (**Figure 2**). The police crash report indicated that the Lexus was proceeding on a green turn arrow. The police report indicated that the Chevrolet's driver did not stop for the red signal light. It is unknown if the Chevrolet's driver took any actions to avoid the crash. The crash occurred within the 4-leg intersection of the 2 trafficways (**Figure 3**).

Crash: The front left corner of the Chevrolet (**Figure 4**) impacted the front of the Lexus, causing the Chevrolet's driver and front right passenger air bags to deploy. Based on the downloaded EDR data, both the first and second stages of the multi-stage air bags were activated. As a result of the impact, the Chevrolet rotated clockwise and the Lexus to rotated counterclockwise. As both vehicle's rotated, the left quarter panel of the Chevrolet (**Figure 5**) side slapped the right quarter panel of the Lexus. The scene inspection revealed no evidence of either vehicle's final rest position. The police crash schematic did not depict the final rest positions of either vehicle. The impact location and impact configuration



Figure 3: Impact area and converging trajectories of Chevrolet (straight arrow) and Lexus (curvilinear arrow)

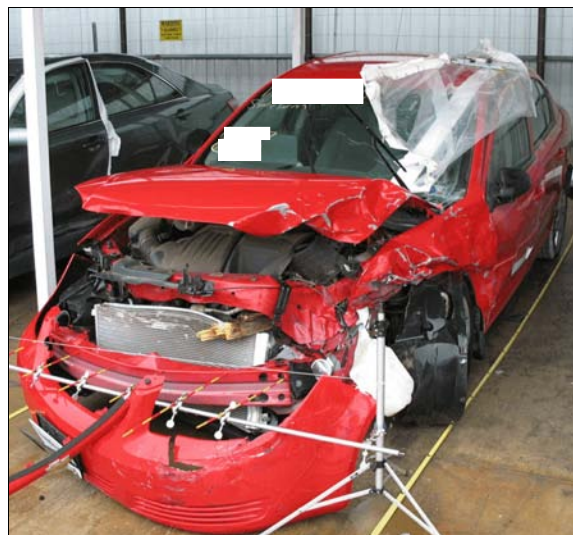


Figure 4: Damage to Chevrolet's front left corner from impact with the Lexus

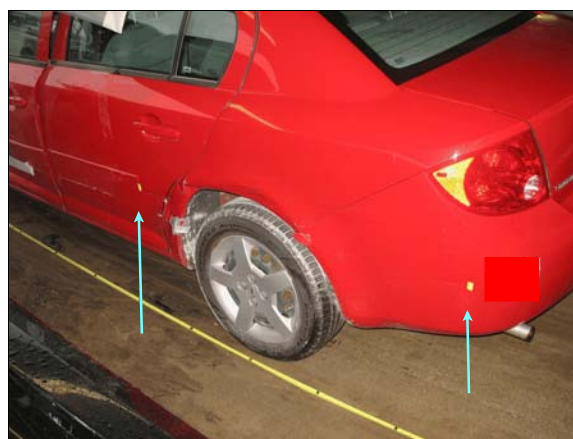


Figure 5: Damage to Chevrolet's left rear door and quarter panel, as a result of side-slap impact with Lexus; Note: arrows show yellow incremented tape which indicates damage length

indicated that both vehicles probably came to final rest in the mouth of the intersection's north leg (Figure 3) and were probably facing in a west-northwesterly direction.

Post-Crash: The driver of the Chevrolet remained inside the vehicle at final rest. She was conscious but it is not known if the driver required assistance to exit her vehicle. The investigating police agency was notified of the crash within 2 minutes post-crash and arrived on-scene 15 minutes later. Traffic control procedures were established and emergency medical and towing services were called to assist. The driver was transported by emergency medical services to a medical facility. Following the police investigation, both the Chevrolet and Lexus were towed from the scene.

CASE VEHICLE

The 2006 Chevrolet Cobalt LS Level 1 was a front wheel drive, 5-passenger, 4-door sedan (VIN: 1G1AK55F467-----) equipped with a 2.2 liter, L-4 engine and 4-speed automatic transmission. This vehicle's date of manufacture could not be determined because the driver's door was jammed at the time of this contractor's inspection. Braking was achieved by a power-assisted, front disc and rear drum system. Inspection of the vehicle's interior revealed adjustable front bucket seats with adjustable head restraints and a non-adjustable, split-folding second row back bench seat with non-adjustable head restraints for the back outboard seating positions. The Chevrolet was equipped with and Lower Anchors and Tethers for Children (LATCH) system features. The Chevrolet was also equipped with an Event Data Recorder (EDR) housed within the vehicle's Sensing and Diagnostic Module (SDM). The Chevrolet's wheelbase was 262 centimeters (103.3 inches), and the odometer reading at inspection is unknown because the vehicle was equipped with an electronic odometer.

CASE VEHICLE DAMAGE

Damage Classification: The Collision Deformation Classification for the Chevrolet was determined to be **11-FLEE-6 (340 degrees)** for the front impact (1st event) with the Lexus, and **09-LZEW-1 (270 degrees)** for the side slap (2nd event). The WinSMASH reconstruction program, missing vehicle algorithm, was used to reconstruct the Chevrolet's Delta Vs for the most severe impact (i.e., the front impact). The Total, Longitudinal, and Lateral Delta Vs were, respectively: 16 km/h (9.9 mph), -15.0 km/h (-9.3 mph), and 5.5 km/h (3.4 mph).

Exterior Damage: The Chevrolet's first impact with the Lexus involved the front left corner. The front bumper, bumper fascia, grille, radiator, hood, left fender, left headlight and turn signal assemblies, left front rim, left front door, and side view mirror all sustained direct contact. The direct damage began at the front left bumper

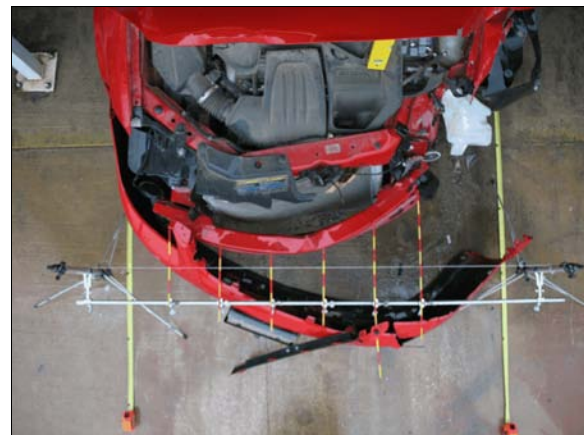


Figure 6: Overhead view of Chevrolet's frontal crush; each increment on rods is 5 cm (2 in)

corner and extended 27 centimeters (10.6 inches) along the front of the vehicle. Crush measurements were taken on the front bumper bar, and the residual maximum crush was measured as 18 centimeters (7.1 inches) occurring at C₁ (**Figure 6**). The side slap impact involved the Chevrolet's left side. The left rear door, quarter panel, and rim sustained direct contact (**Figure 5**). The direct damage began 50 centimeters (19.7 inches) forward of the left rear axle and extended rearward 121 centimeters (47.6 inches) to the left rear bumper corner. The maximum residual crush was estimated from photographs to be 3 centimeters (1.2 inches) occurring at C₅. The table below shows the Chevrolet's crush profile for each event.

Units	Event	Direct Damage		Field L	C ₁	C ₂	C ₃	C ₄	C ₅	C ₆	Direct	Field L
		Width CDC	Max Crush								±D	±D
cm	1	27	18	102	18	11	4	2	1	0	0	-47
in		10.6	7.1	40.2	7.1	4.3	1.6	0.8	0.4	0.0	0.0	-18.5
cm	2	0	0	121	0	0	0	1	3	0	-54	-54
in		0.0	0.0	47.6	0.0	0.0	0.0	0.4	1.2	0.0	-21.3	-21.3

The Chevrolet's left side wheelbase was shortened 5 centimeters (2.0 inches) and the right side wheelbase was lengthened 3 centimeters (1.2 inches). Induced damage involved the hood, windshield glazing, left rear door, and right front headlight and turn signal assemblies.

The Chevrolet's recommended tire size was: P195/60R15 and the vehicle was equipped with tires of this size. The Chevrolet'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 nd of an inch			
LF	214	31	207	30	8	10	None	Yes	No
LR	179	26	207	30	6	8	None	No	No
RR	221	32	207	30	6	8	None	No	No
RF	214	31	207	30	8	10	None	No	No

Interior Damage: Inspection of the Chevrolet's interior (**Figure 7**) revealed a slight deformation of the driver's left arm rest, indicating probable driver contact during the crash (**Figure 8**). Furthermore, no contact evidence was observed on the front right instrument panel, glove box door, or greenhouse area. There was no evidence of steering rim deformation or compression of

the energy absorbing steering column. Lastly, the vehicle’s passenger compartment sustained no intrusions as a result of this crash.



Figure 8: Close-up of dent in arm rest of Chevrolet’s driver door from driver contact



Figure 7: Chevrolet’s driver seating area showing deployed driver air bag, steering wheel, greenhouse, driver’s safety belt—with evidence of loading, and contact on interior door surface

MANUAL RESTRAINT SYSTEM

The Chevrolet’s manual restraint systems are shown in the table below.

Both front row seat belts exhibited indications of historical usage. The inspection of the driver’s safety belt webbing, D-ring, and latch plate revealed that a length of belt extended out of the retractor. The retractor was jammed, indicating that the pretensioner had actuated, and the webbing was firm (i.e., the webbing would not spool or re-spool). Furthermore, there was a slight stress mark on the driver’s shoulder belt webbing from occupant loading on the D-ring (**Figure 9**).



Figure 9: Load mark on Chevrolet’s driver shoulder belt webbing

Based on the vehicle inspection and supported by the EDR data, the Chevrolet’s driver was restrained by her lap-and-shoulder, safety belt system. The inspection of the front right passenger safety belt webbing, D-ring, and latch plate revealed that the pretensioner had probably actuated but showed no evidence of loading. The front right webbing would spool and re-spool but only if the belt was moved gingerly.

	Left	Center	Right
First Row	continuous loop, lap-and-shoulder, safety belt system with upper anchorage adjustor for the D-ring located in its down-most position; retractor-mounted pretensioner without force limiter; sliding type latch plate with ELR		continuous loop, lap-and-shoulder, safety belt system with upper anchorage adjustor for the D-ring located in its upmost position; retractor-mounted pretensioner without force limiter; sliding type latch plate with ELR

	Left	Center	Right
Second Row	continuous loop, lap-and-shoulder, safety belt system without upper anchorage adjustment; sliding type latch plate with switchable retractor type; lower anchor present; top tether anchor located behind the seat back	continuous loop, lap-and-shoulder, safety belt system; sliding type latch plate with switchable retractor type; no lower anchor present; top tether anchor located behind the seat back	continuous loop, lap-and-shoulder, safety belt system without upper anchorage adjustment; sliding type latch plate with switchable retractor type; lower anchor present; top tether anchor located behind the seat back
ELR = Emergency Locking Retractor Switchable = either ALR = Automatic Locking Retractor			

AUTOMATIC RESTRAINT SYSTEM

The manufacturer of this vehicle has certified that the frontal air bags meet the advanced air bag requirements of Federal Motor Vehicle Safety Standard (FMVSS) No. 208. The Chevrolet was equipped with multi stage driver and front right passenger air bag inflators, driver and front right passenger seat belt buckle switch sensors, and seat belt pretensioners. Furthermore, there was an occupant detection and automatic air bag suppression system for the front right passenger seating position. Based on the manufacturer’s website, the various sensors analyze a combination of factors including the predicted crash severity and driver and front right passenger safety belt usage to determine the front air bag inflation level appropriate for the severity of the crash. For the front right seat position, an occupant weight sensor in the seat cushion determines if an occupant is on the seat and enables or suppresses deployment of the air bag based on the amount of weight and type of pressure on the seat.



Figure 10: Chevrolet’s steering wheel with driver air bag module and flaps; steering wheel rotated clockwise approximately 90 degrees

The Chevrolet’s driver air bag was located in the steering wheel hub (**Figure 10**). An inspection of the air bag module cover flaps and the air bag fabric revealed that the cover flaps opened at the designated tear points, and there was no evidence of damage during the deployment to the air bag fabric or the module cover flaps. The deployed driver’s air bag was round with a diameter of approximately 60 centimeters (23.6 inches). An inspection of the driver’s air bag revealed no discernable contact evidence on the air bag’s fabric (**Figure 11**).



Figure 11: Chevrolet’s deployed driver air bag showing no obvious evidence of occupant contact

The front right passenger front air bag was located on the top of the instrument panel (**Figure 12**). An inspection of the air bag module cover flap and air bag fabric revealed the cover flap opened at the designated tear points, and there was no evidence of damage during the deployment to the air bag fabric or the module cover flap. The deployed front right air bag was rectangular with a height of approximately 58 centimeters (22.8 inches) and a width of approximately 44 centimeters (17.3 inches). An inspection of the front right passenger's air bag revealed no discernable contact evidence on the air bag's fabric (**Figure 13**).

The police crash report did not indicate the presence of a front right passenger in the Chevrolet; however, the EDR data reported the front right passenger's safety belt switch circuit status as buckled. This contractor was unable to locate the Chevrolet's driver, and could not determine if a front right passenger was present, or if perhaps some cargo was secured on the front right seat with the safety belt.

EVENT DATA RECORDER

The download of the Chevrolet's EDR was completed during the vehicle inspection via direct connection to the Sensing and Diagnostic Module. The EDR reports are attached at the end of this report. The reports indicated that the EDR recorded a deployment event. The System Status at Deployment report indicated that the crash record was locked, the event recording was complete, and the pre-crash data was associated with the event. The system status report indicated that the SIR warning lamp was off, the driver's and the front right passenger's seat belt switch circuits were recorded as buckled, and the driver and front right passenger's safety belt pretensioners were commanded to actuate. The system status report also showed that the time from algorithm enable (AE) to the deployment command criteria being met for the driver and front right passenger's air bags was 26 milliseconds for the stage one deployment and 42 milliseconds for the stage two deployment. The EDR recorded the maximum longitudinal and lateral velocity changes as -30.54 km/h (-18.98 mph) and 22.90 km/h (14.23 mph) respectively.



Figure 12: Chevrolet's front right seating area showing deployed front right air bag, center and right instrument panels, center console, and greenhouse area; no occupant contacts evident



Figure 13: Chevrolet's deployed front right passenger air bag showing no occupant contact evidence

The Chevrolet's driver made no known pre-crash avoidance maneuvers. As a result and independent of the use of her safety belts, the driver's pre-impact body position did not change just prior to impact. The Chevrolet's front left impact with the Lexus enabled the driver to continue forward and slightly leftward along a path opposite the Chevrolet's 340 degree Direction of Principal Force as the Chevrolet decelerated. At maximum engagement, the Chevrolet was redirected clockwise and, as a result, side slapped the Lexus. The Chevrolet's driver was redirected leftward in response to the left side slap impact. Following separation of the vehicles, the Chevrolet moved forward toward its final rest position.

DRIVER KINEMATICS

Immediately prior to the crash the posture of Chevrolet's driver (18-year-old, female) is not known. Based on this contractor's experience and occupant kinematic principles, she was probably seated in an upright posture with her back against the seat back, her left foot on the floor, her right foot on the accelerator, and at least one of her hands on the steering wheel. During the vehicle inspection, her seat track was located between its middle and rearmost positions, the seat back was upright, and the tilt steering column was located in its upmost position.

As a result of the Chevrolet's impact with the Lexus, the driver loaded her safety belts and her face and chest probably made contact with her deploying driver air bag, limiting her forward movement. Furthermore, no contact evidence was observed on the air bag. Following maximum engagement the driver's left arm and/or elbow, hip and/or thigh areas probably contacted and deformed the left front door armrest (**Figure 8**) during the secondary side slap impact. As the vehicle moved forward to final rest, the driver remained in her seat restrained by her safety belts.

DRIVER INJURIES

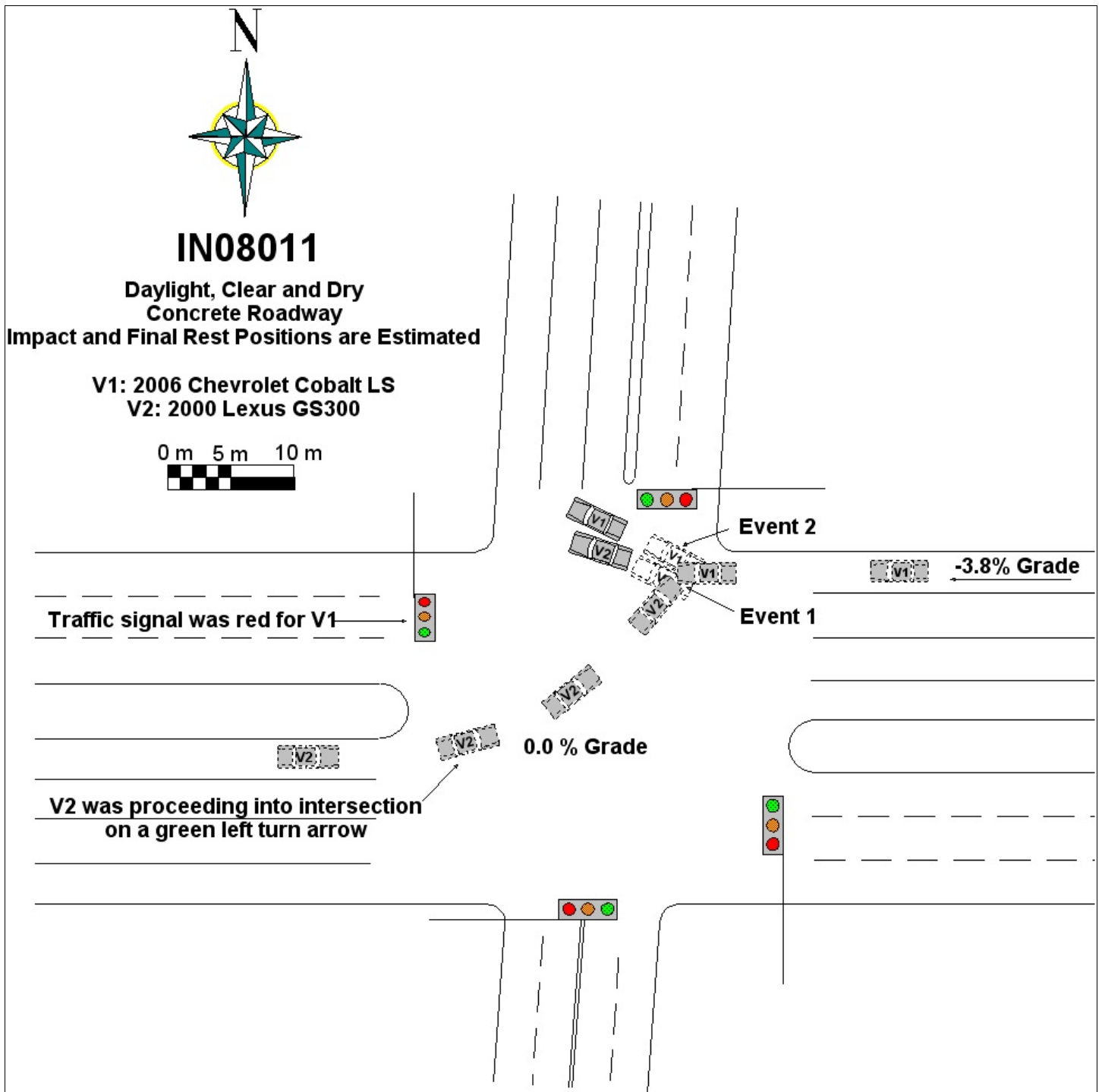
The police crash report indicated the Chevrolet's driver sustained "A" (incapacitating) injuries and was transported by ambulance to the hospital. She sustained minor injuries and was treated and released. The injuries sustained by the Chevrolet's driver included extremity sprains and strains.

Injury Number	Injury Description (including Aspect)	NASS Injury Code & AIS 90	Injury Source	Source Confidence	Source of Injury Data
1	Sprain right wrist with tenderness, not further specified	minor 751420.1,1	Steering wheel rim	Possible	Emergency room records
2	Sprain left hip joint with tenderness, not further specified	minor 850606.1,2	Left side interior hardware or armrest	Certain	Emergency room records
3	Strain left thigh, not further specified	minor 840602.1,2	Left side interior hardware or armrest	Probable	Emergency room records

Based on the VIN and manufacturer's specifications, the 2000 Lexus GS300 was a rear wheel drive, 5-passenger, 4-door sedan (VIN: JT8BD68SXY0-----) equipped with a 3.0L, I-6 engine and 5-speed automatic transmission. Braking was achieved by a power-assisted, front and rear disc, 4-wheel, anti-lock system. The Lexus's wheelbase was 280 centimeters (110.2 inches), but the odometer reading is unknown because the Lexus was not inspected. The model was also equipped with redesigned driver and front right passenger air bags, front safety belt pretensioners, front seat back-mounted side impact air bags, electronic stability control, and traction control. Based on the police crash report, the Lexus' driver air bag deployed in this crash.

Damage Classification: The Lexus was sold at auction prior to this contractor's inspection of the Chevrolet. With no available vehicle photographs, a CDC could not be estimated.

Lexus's Occupants: According to the police crash report, the Lexus's driver (25-year-old, male) was restrained by his lap-and-shoulder, safety belt system. The police crash report indicated the driver did not sustain any injury and was not transported to a hospital.



CDR File Information	
Vehicle Identification Number	1G1AK55F467*****
Investigator	
Case Number	
Investigation Date	
Crash Date	
Filename	IN08011.CDR
Saved on	Tuesday, March 18 2008 at 12:27:52 PM
Collected with CDR version	Crash Data Retrieval Tool 2.900
Reported with CDR version	Crash Data Retrieval Tool 2.900
Event(s) recovered	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 can contain 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 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 can contain 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 220 milliseconds of data after deployment criteria is met and up to 70 milliseconds before deployment criteria is met. For Non-Deployment Events, the SDM will record up to the first 300 milliseconds of data after algorithm enable. The minimum SDM Recorded Vehicle Forward Velocity Change, that is needed to record a Non-Deployment Event, is 5 MPH.

-Maximum Recorded Vehicle Velocity Change is the maximum recorded velocity change in the vehicle's combined "X" and "Y" axis.

-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 and Passenger's Belt Switch Circuit Status indicates the status of the seat belt switch circuit. The Passenger Belt Switch Circuit Status for 2005 vehicles is only available on the Cadillac STS. Also, the Passenger Belt Switch Circuit Status for 2006 Chevrolet Cobalt Sport Coupe (AP) model vehicles, with the option package that includes Recaro brand seats (RPO ALV), will always report a default value of "Buckled".

-The Time Between Non-Deployment and Deployment Events is displayed in seconds. If the time between the two events is greater than 5 seconds, "N/A" is displayed in place of the time. If the value is negative, then the Deployment Event occurred first. If the value is positive, then the Non-Deployment Event occurred first.

-If power to the SDM is lost during a crash event, all or part of the crash record may not be recorded.

-The ignition cycle counter relies upon the transitions through OFF->RUN->CRANK power-moding messages, on the GMLAN communication bus, to increment the counter. Applying and removing of battery power to the module will not increment the ignition counter.

-Steering Wheel Angle data is displayed as a positive value, when the steering wheel is turned to the right, and a negative value, when the steering wheel is turned to the left.

SDM Data Source:

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

-Vehicle Status Data (Pre-Crash) is transmitted to the SDM, by various vehicle control modules, via the vehicle's communication network.

-The Belt Switch Circuit is wired directly to the SDM.

Multiple Event Data	
Associated Events Not Recorded	0
An Event(s) Preceded the Recorded Event(s)	No
An Event(s) was in Between the Recorded Event(s)	No
An Event(s) Followed the Recorded Event(s)	No
The Event(s) Not Recorded was a Deployment Event(s)	No
The Event(s) Not Recorded was a Non-Deployment Event(s)	No

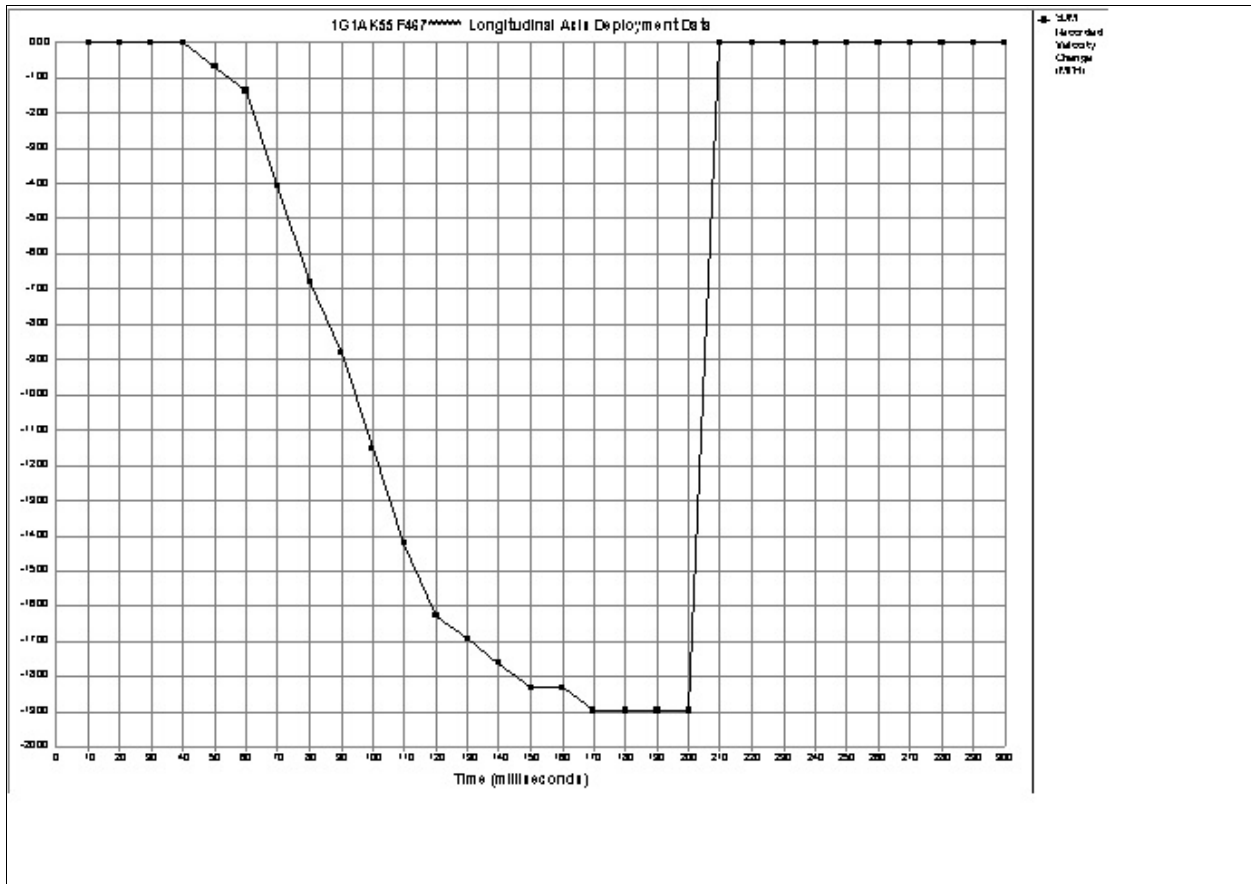
System Status At AE	
Vehicle Identification Number	**1AK55F*6*****
Low Tire Pressure Warning Lamp (If Equipped)	Invalid
Vehicle Power Mode Status	Run
Remote Start Status (If Equipped)	Inactive
Run/Crank Ignition Switch Logic Level	Active
Brake System Warning Lamp (If Equipped)	OFF

System Status At 1 second	
Transmission Range (If Equipped)	Fourth Gear
Transmission Selector Position (If Equipped)	Fourth Gear
Traction Control System Active (If Equipped)	Invalid
Service Engine Soon (Non-Emission Related) Lamp	OFF
Service Vehicle Soon Lamp	OFF
Outside Air Temperature (degrees F) (If Equipped)	55
Left Front Door Status (If Equipped)	Closed
Right Front Door Status (If Equipped)	Closed
Left Rear Door Status (If Equipped)	Unused
Right Rear Door Status (If Equipped)	Unused
Rear Door(s) Status (If Equipped)	Closed

Pre-crash data		
Parameter	-2 sec	-1 sec
Reduced Engine Power Mode	OFF	OFF
Cruise Control Active (If Equipped)	No	No
Cruise Control Resume Switch Active (If Equipped)	No	No
Cruise Control Set Switch Active (If Equipped)	No	No

Pre-crash data					
Parameter	-5 sec	-4 sec	-3 sec	-2 sec	-1 sec
Vehicle Speed (MPH)	42	42	43	43	43
Engine Speed (RPM)	1408	1408	1408	1408	1408
Percent Throttle	13	14	14	14	14
Accelerator Pedal Position (percent)	0	0	0	0	0
Antilock Brake System Active (If Equipped)	Invalid	Invalid	Invalid	Invalid	Invalid
Lateral Acceleration (feet/s ²) (If Equipped)	Invalid	Invalid	Invalid	Invalid	Invalid
Yaw Rate (degrees per second) (If Equipped)	Invalid	Invalid	Invalid	Invalid	Invalid
Steering Wheel Angle (degrees) (If Equipped)	0	0	0	0	0
Vehicle Dynamics Control Active (If Equipped)	Invalid	Invalid	Invalid	Invalid	Invalid

System Status At Deployment	
Ignition Cycles At Investigation	4178
SIR Warning Lamp Status	OFF
SIR Warning Lamp ON/OFF Time (seconds)	655200
Number of Ignition Cycles SIR Warning Lamp was ON/OFF Continuously	3942
Ignition Cycles At Event	4178
Ignition Cycles Since DTCs Were Last Cleared	254
Driver's Belt Switch Circuit Status	BUCKLED
Passenger's Belt Switch Circuit Status	BUCKLED
Diagnostic Trouble Codes at Event, fault number: 1	N/A
Diagnostic Trouble Codes at Event, fault number: 2	N/A
Diagnostic Trouble Codes at Event, fault number: 3	N/A
Diagnostic Trouble Codes at Event, fault number: 4	N/A
Diagnostic Trouble Codes at Event, fault number: 5	N/A
Diagnostic Trouble Codes at Event, fault number: 6	N/A
Automatic Passenger SIR Suppression System Validity Status at AE	Valid
Automatic Passenger SIR Suppression System Status at AE	Air Bag Not Suppressed
Automatic Passenger SIR Suppression System Validity Status at First Deployment Command	Valid
Automatic Passenger SIR Suppression System Status at First Deployment Command	Air Bag Not Suppressed
Driver 1st Stage Time From Algorithm Enable to Deployment Command Criteria Met (msec)	26
Driver 2nd Stage Time From Algorithm Enable to Deployment Command Criteria Met (msec)	42
Passenger 1st Stage Time From Algorithm Enable to Deployment Command Criteria Met (msec)	26
Passenger 2nd Stage Time From Algorithm Enable to Deployment Command Criteria Met (msec)	42
Time Between Events (sec)	0
Driver First Stage Deployment Loop Commanded	Yes
Driver Second Stage Deployment Loop Commanded	Yes
Driver Side Deployment Loop Commanded	No
Driver Pretensioner Deployment Loop Commanded	Yes
Driver (Initiator 1) Roof Rail/Head Curtain Loop Commanded	No
Driver (Initiator 2) Roof Rail/Head Curtain Loop Commanded	No
Driver Knee Deployment Loop Commanded	No
Passenger First Stage Deployment Loop Commanded	Yes
Passenger Second Stage Deployment Loop Commanded	Yes
Passenger Side Deployment Loop Commanded	No
Passenger Pretensioner Deployment Loop Commanded	Yes
Passenger (Initiator 1) Roof Rail/Head Curtain Loop Commanded	No
Passenger (Initiator 2) Roof Rail/Head Curtain Loop Commanded	No
Passenger Knee Deployment Loop Commanded	No
Second Row Left Side Deployment Loop Commanded	No
Second Row Left Pretensioner Deployment Loop Commanded	No
Third Row Left Roof Rail/Head Curtain Loop Commanded	No
Second Row Right Side Deployment Loop Commanded	No
Second Row Right Pretensioner Deployment Loop Commanded	No
Third Row Right Roof Rail/Head Curtain Loop Commanded	No
Second Row Center Pretensioner Deployment Loop Commanded	No
Driver 2nd Stage Deployment Loop Commanded for Disposal	No
Passenger 2nd Stage Deployment Loop Commanded for Disposal	No
Crash Record Locked	Yes
Vehicle Event Data (Pre-Crash) Associated With This Event	Yes
Deployment Event Recorded in the Non-Deployment Record	No
Event Recording Complete	Yes



Time (milliseconds)	10	20	30	40	50	60	70	80	90	100	110	120	130	140	150
Longitudinal Axis Recorded Velocity	0.00	0.00	0.00	0.00	-0.88	-1.36	-4.07	-6.78	-8.81	-11.52	-14.23	-16.27	-16.95	-17.62	-18.30
Time (milliseconds)	160	170	180	190	200	210	220	230	240	250	260	270	280	290	300
Longitudinal Axis Recorded Velocity	-18.30	-18.98	-18.98	-18.98	-18.98	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00

