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

SCI CASE NO: CA04-017

VEHICLE: 2004 HONDA ACCORD
LOCATION: NORTH CAROLINA
CRASH DATE: MARCH 2004

Contract No. DTNH22-01-C-17002

Prepared for:

U.S. Department of Transportation
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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 safety system in a 2004 Honda Accord and the injury sources for the 46 year restrained female driver. The Honda's CAC system was comprised of dual-stage frontal air bags, seat track position sensors for both front seats, front safety belt buckle switches, front safety belt retractor pretensioners and a front right occupant detection sensor. The frontal air bag system was certified by the manufacturer to have met the advanced air bag requirements of Federal Motor Vehicle Safety Standard 208. The Honda's Air bag Control Module (ACM) tailored the deployment of the frontal air bags based the severity of the crash and inputs from these sensors. The ACM had Event Data Recorder (EDR) capabilities. The Honda was involved in a front-to-side intersection collision with a 2002 Saturn SL1. The force of the crash caused the driver air bag of the Honda to deploy. The Saturn was equipped with a redesigned frontal air bag system that also deployed as a result of the crash. The driver of the Honda was transported a local hospital with "B-type" (evident) injuries. The 63 year old unrestrained front right passenger of the Saturn sustained police reported "A-type" (disabling) injuries and was transported to a hospital. The police report indicated the driver and rear right passenger of the Saturn were not transported to a medical facility.			
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BACKGROUND

This on-site investigative effort focused on the performance of the Certified Advanced 208-Compliant safety system in a 2004 Honda Accord and the injury sources for the 46 year old restrained female driver. **Figure 1** is a left front view of the Honda. The Honda's CAC system was comprised of dual-stage frontal air bags, seat track position sensors for both front seats, front safety belt buckle switches, front safety belt retractor pretensioners and a front right occupant detection sensor. The frontal air bag system was certified by the manufacturer to have met the advanced air bag requirements of Federal Motor Vehicle Safety Standard 208. The Honda's Air bag Control Module (ACM) tailored the deployment of the frontal air bags based on the severity of the crash and inputs from these sensors. The ACM had Event Data Recorder (EDR) capabilities.

Figure 1: Left front oblique view of the Honda.

The Honda was involved in a front-to-side intersection collision with a 2002 Saturn SL1. The force of the crash caused the driver air bag of the Honda to deploy. The Saturn was equipped with a redesigned frontal air bag system that also deployed as a result of the crash. The driver of the Honda was transported a local hospital with "B-type" (evident) injuries. The 63 year old unrestrained front right passenger of the Saturn sustained police reported "A-type" (disabling) injuries and was transported to a hospital. The police report indicated the driver and rear right passenger of the Saturn were not transported to a medical facility.

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 crash 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 Honda Accord was located and cooperation was established with the local insurance adjuster and salvage yard. An on-site investigation was assigned to the Calspan SCI team on April 19, 2004. The on-site investigation took place during the week of April 26, 2004. The Honda's ACM was removed during the on-site investigation and was forwarded to the manufacturer by the NHTSA for analysis of the internally stored crash data. The Event Data Recorder in the Saturn was downloaded as a supplement to the field investigation.

SUMMARY

VEHICLE DATA

2004 Honda Accord

The subject Honda Accord was identified by the Vehicle Identification Number (VIN): 1HGCM66544A (production sequence deleted). The four-door sedan was equipped with a 3.0 liter/V6 engine linked to a five speed automatic transmission. The service brakes were a four-wheel disc system with ABS. The five passenger interior was trimmed with leather upholstery. The manual restraint systems consisted of three-point lap and shoulder belts in all five seat positions. The front restraints were equipped with retractor pretensioners. The Honda was equipped with driver and front right passenger air bags certified by the manufacturer to have met the advanced air bag FVMSS 208 ruling. The vehicle was also equipped with inflatable side impact protection consisting of front seat back mounted thorax bags and roof rail mounted side curtains. The firing of the pretensioners and deployment of the air bags in the Honda was controlled by an Air bag Control Module (ACM) mounted under the center instrument stack. The ACM had the capability to records crash related data. The ACM was removed during the SCI inspection and forwarded to the NHTSA. The NHTSA in-turn forwarded the module to Honda America Inc. for analysis. The Accord was manufactured in October 2003. The digital odometer could not be read due to a lack of electrical power. The Honda was equipped with Michelin Energy MXV4 P205/60R16 91V tires on OEM alloy wheels. The recommended tire pressure was 221 kPa (32 PSI) front and 207 kPa (30 PSI) rear. The specific measured tire data at the time of the SCI inspection was as follows:

Tire	Measured Pressure	Tread Depth	Restricted	Damage
LF	207 kPa (30 PSI)	7 mm (9/32)	No	None
LR	207 kPa (30 PSI)	7 mm (9/32)	No	None
RF	193 kPa (28 PSI)	7 mm (9/32)	Yes	None
RR	193 kPa (28 PSI)	8 mm (10/32)	No	None

2002 Saturn SL1

The 2002 Saturn SL1 was identified by the VIN: 1G8ZH52892Z (production sequence deleted). The front wheel drive, four-door sedan was equipped with a 1.9 liter/I4 engine linked to a four speed automatic transmission. The service brakes were a front disc/rear drum system with ABS. The vehicle was manufactured in May 2002. The digital odometer reading was unknown. The manual restraint systems consisted of three-point lap and shoulder belts in the four outboard positions with a center rear lap belt. The Saturn was equipped with redesigned air bags for the driver and front right passenger that deployed as a result of the crash. The deployment of the air bags was controlled and monitored by a Sensing and Diagnostic control Module (SDM) mounted on the center line of the vehicle aft of the transmission selector. The SDM had Event Data Recorder capabilities. The EDR data was downloaded at the time of the SCI inspection and was used as a supplement to the investigation. The downloaded data is attached to the end of this report. The Saturn was equipped with Firestone FR680 P185/65R14 tires on OEM steel wheels. The vehicle manufacturer's recommended tire pressure was 207 kPa (30 PSI) for the front tires

and 179 kPa (26 PSI) rear. The specific measured tire data at the time of the SCI inspection was as follows:

Tire	Measured Pressure	Tread Depth	Restricted	Damage
LF	0 kPa	6 mm (8/32)	No	Debeaded
LR	0 kPa	7 mm (9/32)	No	None
RF	0 kPa	6 mm (8/32)	No	Direct contact damage, Severed valve stem
RR	0 kPa	6 mm (8/32)	No	Severed valve stem

CRASH SITE

This two-vehicle crash occurred during the morning hours of March, 2004. At the time of the crash, it was daylight and the weather was not a factor. The crash occurred at the four leg intersection of a five-lane northeast/southwest road and a five-lane southeast/northwest road in an urban commercial setting. The traffic lanes were bordered by 15 cm (6 in) curbs and sidewalks. The traffic flow through the intersection was controlled by overhead (red/amber/green) traffic signals. The terrain was level in the area of the crash and there were no contributory vision obstructions. The posted speed limit at the crash site was 56 km/h (35 mph). **Figure 2** is a trajectory view of the Honda. A schematic of the crash included at the end of this narrative report as **Figure 10**.

Figure 2: Northeast trajectory view of the Honda approaching the intersection.

CRASH SEQUENCE

Pre-Crash

The 2002 Saturn SL1 was southeast-bound driven by a 36 year old restrained female. The Saturn was also occupied a 63 year old restrained female front right passenger and a 45 year old restrained rear right passenger. The downloaded EDR data indicated the Saturn was traveling 84 km/h (52 mph) five seconds prior Algorithm Enable (AE) and decelerated to 80 km/h (50 mph) one second before AE. A witness traveling behind the Saturn reported that the Saturn entered the intersection on the green traffic signal. The 2004 Honda Accord was northeast-bound driven by a 46 year old restrained female. She was the sole occupant of the Honda. The Honda driver disregarded the red traffic signal and entered the intersection precipitating the crash. It was in the intention of both drivers to pass straight through the intersection.

Crash

The crash occurred with the front plane of the Honda impacting the right side plane of the Saturn in a 10/1 o'clock impact configuration. The Honda impacted the Saturn at the front right axle. The lateral momentum of the Saturn resulted in a damage pattern that extended rearward to the mid aspect of the right rear door. The force of the impact caused the Honda driver's seat belt pretensioner to actuate and deployed vehicle's driver air bag. The redesigned frontal air bags in the Saturn also deployed. Both vehicles separated from the crash with an eastward trajectory. The police report indicated the Honda came to rest within the intersection quadrant approximately 10 m (33 ft) from the impact. The Saturn reportedly came to rest along the curb in the outboard northwest traffic lane 52 m (172 ft) from the impact. There was no visible physical evidence that identified the final rest positions at the time of the SCI scene inspection.

The severity of the impact was calculated using the Damage Algorithm of the WINSMASH model. The total delta V for the Honda was 27 km/h (17.0 mph). The longitudinal and lateral components were -18 km/h (-11.2 mph) and 21 km/h (13.0 mph), respectively. The EDR reported longitudinal Delta V of the Honda was 32 km/h (19.8 mph). The total delta V for the Saturn was 36 km/h (24.2 mph). The longitudinal and lateral components were -27 km/h (-16.8 mph) and -23 km/h (-14.3 mph). The EDR reported longitudinal Delta V of the Saturn was 33 km/h (20.5 mph). The Delta V calculated by the WINSMASH model underestimated the crash severity as compared to the EDR measured values.

Post-Crash

The police and ambulance personnel responded to the crash. The driver of the Honda exited the vehicle under her own power and was outside of the Honda upon their arrival. She was transported via ground ambulance to a local hospital, treated for a metacarpal fracture and released the day of the crash. The driver and right rear passenger of the Saturn exited the vehicle and were reportedly not injured. The Saturn's front right passenger was removed from the vehicle by EMS and transported to a local hospital with police reported "A" injuries. Both vehicles sustained disabling damage and were towed from the crash scene. The Honda and Saturn were both deemed a total loss by their respective insurance companies.

2004 HONDA ACCORD

Exterior Damage

Figures 3 through 5 are the front, left lateral and right lateral views of the Honda. The damaged vehicle had been dismantled prior to the SCI inspection for the purposes of insurance damage estimation. The front bumper fascia, bumper reinforcement bar, hood, and front fenders were removed from the vehicle and missing. The absence of these components hampered documentation of the vehicle's frontal damage per SCI protocol. Through the inspection of the exposed components (sub-frame and engine compartment), it was determined that the direct contact damage extended across the entire 152 cm (60 in) frontal end width of the Honda. The frontal crush was documented at the exposed ends of the vehicle's sub-frame and across the engine cradle. The deformation of the left end of the sub-frame measured 20 cm (7.8 in) longitudinal. It was deflected (shifted) to the right 25 cm (9.7 in). The right sub-frame was deformed 30 cm (11.9 in) longitudinally and 29 cm (11.5 in) to the right. The center of the engine cradle was displaced 8 cm (3 in) rearward. The right wheelbase was reduced 10 cm (3.8

in). The right front tire was restricted due to its contact with the trailing edge of the wheel house. The left wheelbase lengthened 6 cm (2.3 in) due to distortion of the vehicle. The windshield was not damaged. There was no damage to the side glazing and all the doors remained operational. The Collision Deformation Classification (CDC) of the Honda was 70-FDEW2. The 10 o'clock direction of force was incremented by 60 to reflect the right end shift of the vehicle.

Figure 3: Front view of the Honda.

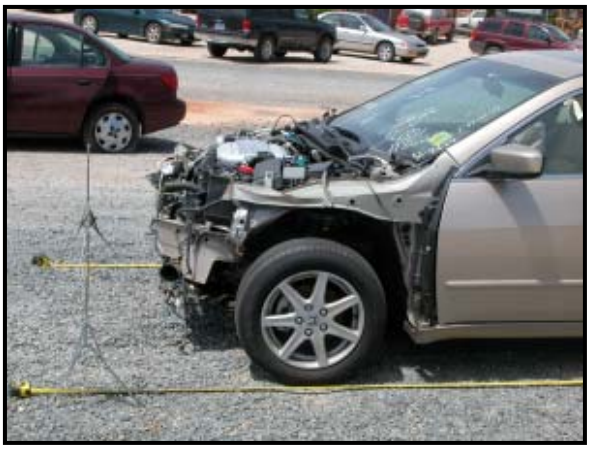


Figure 4: Left lateral view.

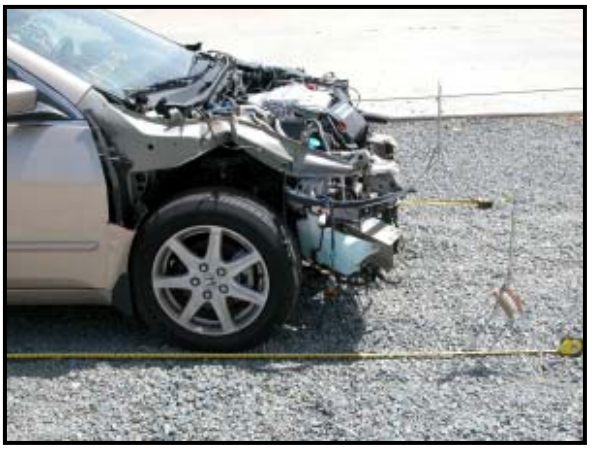


Figure 5: Right lateral view.

2002 SATURN SL1

Exterior Damage

Figure 6 is a right side view of the Saturn. The vehicle's right plane sustained 222 cm (87.5 in) of direct contact damage that began at the right front bumper corner and extended to right B-pillar. The induced damage extended an additional 21 cm (8.3 in) onto the right rear door panel. The total length of the direct and induced damage measured 243 cm (95.8 in). The force of the side impact caused the vehicle to bow to the right. The bowing of the Saturn's front structure measured 13 cm (5.1 in) with reference to the vehicle's center line. The residual crush (inclusive of a 6 cm (2.5 in) average bowing factor) was as follows: C1 = 6 cm (2.5 in), C2 = 24 cm (9.4 in), C3 = 26 cm (10.2 in), C4 = 21 cm (8.1 in), C5 = 20 cm (7.9 in), C6 = 6 cm (2.5 in). The front right door was removed by the

Figure 6: Right side view of the Saturn.

fire department personnel and was missing. The rear right door compressed rearward into the C-pillar and was jammed shut. The left doors were operational. The right wheelbase was reduced 23 cm (9.1 in) due to the vehicle's bowing. The left wheelbase lengthened 6 cm (2.1 in). The CDC of the Saturn was 01-RYEW3.

The Saturn was equipped with an Event Data Recorder that was downloaded at the time of the SCI inspection. The data was downloaded through the use of the Vetronix Crash Data Retrieval (CDR) hardware and software version 2.24. The data was obtained by connecting the hardware directly to the module. The downloaded data is attached to the end of this report.

2004 HONDA ACCORD

Interior Damage

The interior of the Honda sustained minimal damage as a result of the crash. Its interior damage only consisted of the deployment of the vehicle's driver air bag. There was no intrusion. There were no identified driver contacts.

The driver seat was located in a rear track position that measured 3 cm (1.3 in) forward of full rear. The total seat track travel measured 23 cm (9.0 in). The seat back was reclined 15 degrees. The horizontal distance from the center of the steering wheel hub/driver air bag module to the seat back measured 64 cm (25 in). This horizontal distance was measured 41 cm (16 in) above the seat bight.

The four-spoke steering wheel rim was rotated approximately 90 degrees clockwise at the time of the SCI inspection. The tilt steering column was in the full up position. There was no deformation of the steering wheel rim and no displacement of the steering column shear capsules.

Manual Restraint System

The driver's manual restraint consisted of continuous loop webbing, a sliding latch plate, an adjustable D-ring and an Emergency Locking Retractor located in the base of the B-pillar. **Figure 7** is a view of the driver seat and restraint. The retractor was equipped with a pretensioner that fired as a result of the crash. Upon initial inspection, the webbing was found extended from the retractor and the retractor was locked. The length of the extended webbing measured 173 cm (68.2 in). Examination of the webbing was unremarkable for crash related evidence. The D-ring was adjusted to the full down position. The surface of the D-ring was not abraded. Inspection of the latch plate revealed usage indicators consistent with the vehicle's age. The friction surface of the latch plate hardware was not abraded. The driver was restrained at the time of the crash. The locked and extended condition of the webbing was consistent with the use of the restraint at the time of the crash. The downloaded EDR data indicated the driver was restrained as well.

Figure 7: Driver seat and safety belt.

Certified Advanced 208-Compliant Air Bag System

The Certified Advanced 208-Compliant (CAC) frontal air bag consisted of advanced dual stage/dual threshold air bags for the driver and front right passenger, seat track position sensors, front safety belt buckle switches, front safety belt buckle pretensioners and a front right occupant 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 208. The system was controlled and monitored by a control module located under the center instrument stack forward of the transmission selector. Additionally, two crash sensors, symmetrically located on forward sub-frame, were used to aid in crash detection and assess crash severity.

The driver air bag, **Figure 8**, deployed as a result of the frontal crash. The driver air bag was housed in the center hub of the steering wheel in the typical manner. The air bag deployed from the H-configuration module as designed. There was no occupant contact to the flaps. The air bag measured 57 cm (22.5 in) in diameter in its deflated state. It was vented by two 5 cm (1.8 in) diameter ports located in the 11/1 o'clock sectors on the back side of the bag and it was tethered by two 6 cm (2.3 in) wide straps in the 12/6 o'clock sector. The excursion of the face of the bag measured 24 cm (9.5 in) from the module. A 5 x 6 cm (1.8 x 2.5 in) patterned deployment scuff was identified in the 4'oclock sector of the air bag. Note: the steering wheel was rotated 90 degrees clockwise. There was no other evidence on the driver air bag.

Figure 8: Front interior and driver air bag.

Inflatable Side Impact Protection

The Honda Accord was equipped with front seat back mounted thorax bags and roof rail mounted side curtains. The inflatable protection was not commanded to deploy to the crash.

Event Data Recorder

The Air bag Control Module (ACM) in the Honda had the capability to record crash event data. A secondary focus of this investigation involved removing the ACM from the Honda. The module was located under the center instrument panel, **Figure 9.** The ACM was forwarded to the NHTSA which in-turn forwarded the module to Honda in order to retrieve the EDR data. Upon analysis, Honda forwarded a text report of the data recorded at the time of the crash to the NHTSA. The text data is summarized below.

Figure 9: ACM location.

- The driver seat belt was buckled and its pretensioner fired.
- The front right seat belt was not in use and its pretensioner did not fire.
- The weight sensor in the front right indicated the seat was empty.
- The driver air bag deployed 22 ms after wake up.
- The front right passenger air bag did not deploy.
- The delta V calculated by the ACM was approximately 32 km/h (19.8 mph).
- The left side impact sensor recognized the (angular) crash event, but the inflatable side protection did not fire.

The reported text data was consistent with the physical evidence observed during the SCI inspection. The EDR did not record any pre-crash vehicle system data (Vehicle Speed, Engine RPM, etc).

DRIVER DEMOGRAPHICS
2004 Honda Accord

	Driver
Age/Sex:	46 year old / Female
Height:	185 cm (73 in)
Weight:	77g (170 lb)
Seat Track Position:	Rear track, 3 cm (1.3 in) forward of full rear
Restraint Use:	Three-point lap and shoulder belt
Usage Source:	SCI inspection, Event Data Recorder, PAR
Medical Treatment:	Transported, treated, and released

DRIVER INJURY
2004 Honda Accord

Injury	***Injury Severity (AIS 98 Update)***	***Injury Source***
Fracture of the right 5th metacarpal	Moderate (752002.2,1)	Fling contact to the instrument panel
Contusion right wrist, NFS	Minor (790402.1,1)	Fling contact to the instrument panel
Contusion right hand, NFS	Minor (790402.1,1)	Fling contact to the instrument panel

Note: the above injuries were identified in the driver's Emergency Room records.

DRIVER KINEMATICS
2004 Honda Accord
The 46 year old driver was seated in a rear track position in a presumed upright posture and was restrained by the vehicle's three-point lap and shoulder belt system. The driver entered the intersection against the red traffic signal precipitating the crash.

Upon impact, the seat belt pretensioner fired and the driver air bag deployed. The firing of the retractor pretensioner removed potential slack from the belt system and tightened the webbing about the driver. The driver responded to the 10 o'clock direction of the impact force by initiating a forward and right trajectory. The driver's hands were displaced from the steering wheel by the expanding air bag and her right hand contacted the instrument panel. This contact resulted in a fracture of the 5th metacarpal and a contusion of the wrist and hand. The driver rode down the force of the crash through the combined use of the seat and driver air bag. The driver then rebounded back into her seat where she came to rest.

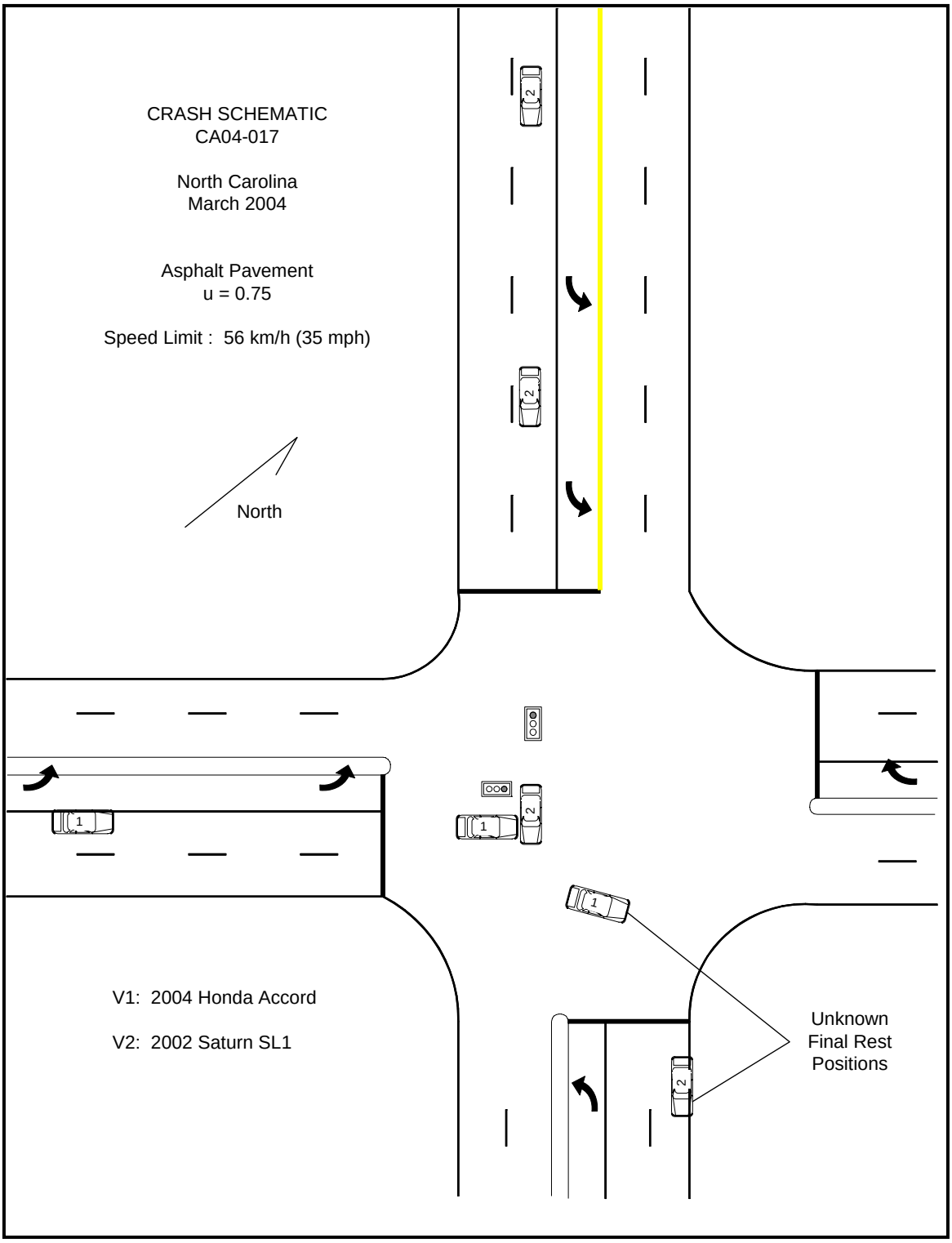


Figure 10: Crash schematic.

ATTACHMENT A

EDR Data
2002 Saturn SL1

CDR File Information

Vehicle Identification Number	1G8ZH52892Z******
Investigator	
Case Number	
Investigation Date	
Crash Date	
Filename	CA04-017 CDR.CDR
Saved on	Thursday, April 29 2004 at 02:58:03 PM
Collected with CDR version	Crash Data Retrieval Tool 2.24
Collecting program verification number	70CD83DD
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: 39 Date: 10-09-03 Checksum: 0300
Event(s) recovered	Deployment

SDM Data Limitations

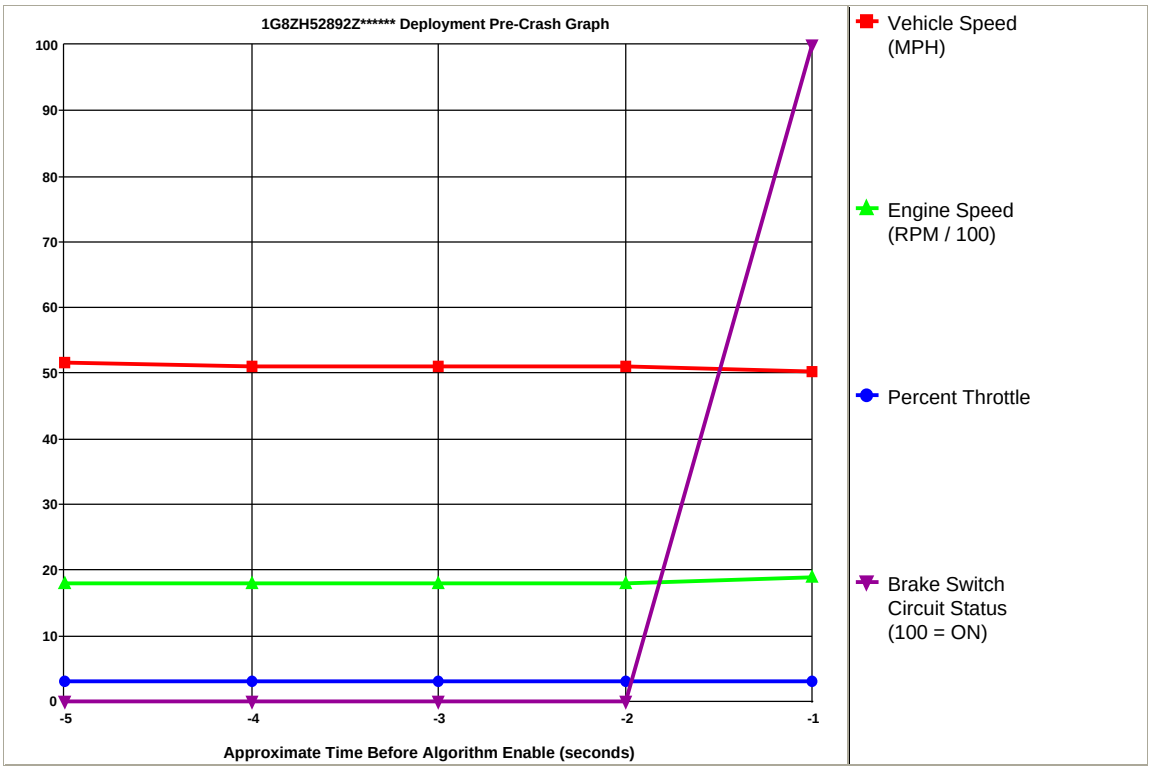
SDM Recorded Crash Events:
There are two types of SDM recorded crash events. The first is the Non-Deployment Event. A Non-Deployment Event is an event severe enough to "wake up" the sensing algorithm but not severe enough to deploy the air bag(s). It contains Pre-Crash and Crash data. The SDM can store 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 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, and then the Deployment Level Event will overwrite the Non-Deployment Event file.

SDM Data Limitations:
-SDM Recorded Vehicle Forward Velocity Change is one of the measures used to make air bag deployment decisions. 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.
-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.
-Passenger Front Air Bag Suppression Switch Circuit Status indicates the status of the suppression switch circuit.
-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.
-If the vehicle is a 2000 - 2002 Chevrolet Cavalier Z24 or a Pontiac Sunfire GT, with a manual transmission (RPO MM5) and a 2.4L engine (RPO LD9), the Brake Switch Circuit Status data will be reported in the opposite state than what actually occurred, e.g. an actual brake switch status of "ON" will be reported as "OFF".
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.
-The SDM may obtain Belt Switch Circuit Status data a number of different ways, depending on the vehicle architecture. Some switches are wired directly to the SDM, while others may obtain the data from various vehicle control modules, via the vehicle's communication network.

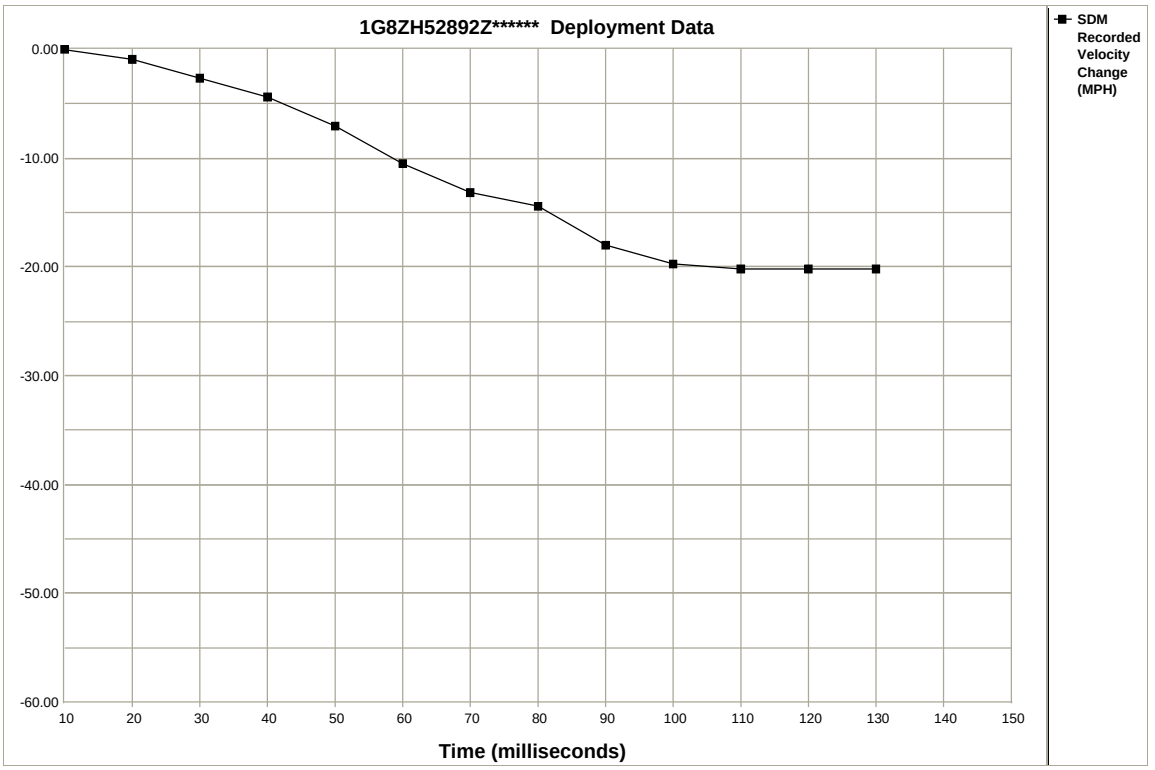
-The Passenger Front Air Bag Suppression Switch Circuit is wired directly to the SDM.

System Status At Deployment

SIR Warning Lamp Status	OFF
Driver's Belt Switch Circuit Status	BUCKLED
Passenger Front Air Bag Suppression Switch Circuit Status	Air Bag Not Suppressed
Ignition Cycles At Deployment	3735
Ignition Cycles At Investigation	3737
Maximum SDM Algorithm Forward Velocity Change (MPH)	-20.54
Algorithm Enable to Maximum SDM Recorded Velocity Change (msec)	110
Time Between Non-Deployment And Deployment Events (sec)	N/A
Time From Algorithm Enable to Deployment Command Criteria Met (msec)	20



Seconds Before AE	Vehicle Speed (MPH)	Engine Speed (RPM)	Percent Throttle	Brake Switch Circuit Status
-5	52	1792	3	OFF
-4	51	1792	3	OFF
-3	51	1792	3	OFF
-2	51	1792	3	OFF
-1	50	1856	3	ON



Time (milliseconds)	10	20	30	40	50	60	70	80	90	100	110	120	130	140	150
SDM Recorded Velocity Change	0.00	-0.88	-2.63	-4.39	-7.02	-10.53	-13.16	-14.48	-17.99	-19.75	-20.18	-20.18	-20.18	N/A	N/A

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  08 23 00 00
$02  90 D2
$03  41 53 32 31 34 30
$04  4B 34 50 45 35 32
$05  00
$06  21 02 54 07
$10  FE 2C FE
$11  86 89 89 DD 8F 01
$14  03 04 AB 80
$18  81 81 82 C0 FF 00
$1C  38 32 5A FA FA FA
$1D  FA 38 32 5A FA FA
$1E  FA FA
$1F  FF 02 00 00 00
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$2B  FF FF FF FF FF FF
$2C  FF FF FF FF
$2D  FF FF FF FF
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$31  FF BF FF FF FF FF
$32  FF FF FF FF FF FF
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$34  06 0A 10 18 1E 21
$35  29 2D 2E 2E 2E FF
$36  FF 0D 45 05 DB 51
$37  52 52 52 53 00 80
$38  00 07 07 07 07 07
$39  00 1D 1C 1C 1C 1C
$3A  00 FE 2D 80 00 00
$3B  00 40 00
$3C  08 2C 49 24
$40  FF FF FF FF FF FF
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$42  FF FF FF FF FF FF
$43  FF
```