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ON-SITE CERTIFIED ADVANCED 208-COMPLIANT VEHICLE INVESTIGATION

CASE NUMBER - IN-05-016
LOCATION - TEXAS
VEHICLE - 2003 CHEVROLET K1500 SILVERADO
CRASH DATE - April 2005

Submitted:

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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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On-site air bag investigation involving a 2003 Chevrolet K1500 pickup truck with integrated manual safety belts and certified advanced 208-compliant air bag system.

16. *Abstract*
This report covers an on-site investigation of an air bag deployment crash that involved a 2003 Chevrolet K1500 Silverado pickup truck (case vehicle) and a 2000 Mercury Mystique GS (other vehicle), which collided front-to-side on a divided, ten lane U.S. highway. This crash is of special interest because the supplemental restraint (air bag) system in the Chevrolet Silverado is certified by the manufacturer to be compliant to the Advanced Air Bag portion of the Federal Motor Vehicle Standard (FMVSS) No. 208. In addition, the case vehicle was equipped with an Event Data Recorder (EDR) and the driver (29-year-old, male) sustained a police reported "C" (possible) injury. The case vehicle was traveling north in the inside center lane and the Mercury was traveling north in the outside lane. Meanwhile, a non-contact vehicle was traveling in the exit lane on the east side of the expressway. The non-contact vehicle veered left into the outside lane and into the travel path of the Mercury. The Mercury steered to the left to avoid a collision with the non-contact vehicle and crossed the outside center lane and entered the path of the case vehicle. The case vehicle's driver braked in an attempt to avoid a collision. It is unknown if he also steered to avoid the crash. The front of the case vehicle impacted the left front side of the Mercury causing a first stage deployment of the case vehicle driver's air bag. The impact caused the case vehicle to deflect to the left and its front impacted the concrete median barrier. The impact caused the Mercury to rotate clockwise, and its front also impacted the concrete median barrier. The case vehicle came to final rest with its front against the median barrier facing northwest. The Mercury also came to rest with its front against the median barrier facing northwest. The case vehicle's driver was restrained by his integrated, three-point, lap-and shoulder safety belt. He sustained a police-reported "C" injury and was transported from the scene to a local hospital. The case vehicle driver's use of his safety belt system and the deployment of his air bag mitigated his interaction with the case vehicle's interior frontal components.

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This investigation was brought to NHTSA's attention on or before May 2, 2005 by NASS CDS/GES sampling activities. This crash involved a 2003 Chevrolet K1500 Silverado pickup truck (case vehicle), a 2000 Mercury Mystique GS (other vehicle), and an unknown non-contact vehicle. The crash occurred in April, 2005, at 6:55 a.m., in Texas and was investigated by the applicable city police department. This crash is of special interest because the supplemental restraint (air bag) system in the Chevrolet Silverado is certified by the manufacturer to be compliant to the Advanced Air Bag portion of the Federal Motor Vehicle Standard (FMVSS) No. 208. In addition, the case vehicle was equipped with an Event Data Recorder (EDR) and the driver [29-year-old, unknown race (Hispanic) male] sustained a police reported "C" (possible) injury, possibly from his deploying driver air bag. This contractor inspected the scene and vehicles on 10-12 May, 2005 and downloaded the EDR. The driver was not interviewed. He could not be located. This report is based on the police crash report, scene and vehicle inspections, occupant kinematic principles, and this contractor's evaluation of the evidence.

SUMMARY

The case vehicle was traveling north in the inside center lane of a multi-lane, divided urban U.S highway. The Mercury was traveling north in the outside lane. Meanwhile, a non-contact vehicle was traveling in the exit lane on the east side of the expressway. The non-contact vehicle veered left into the outside lane and into the Mercury's travel path. The Mercury's driver steered to the left to avoid a collision with the non-contact vehicle and crossed the outside center lane and entered the path of the case vehicle. The case vehicle's driver braked in an attempt to avoid a collision. It is unknown if he also steered to avoid the crash. The front of the case vehicle impacted the left front side of the Mercury causing a first stage deployment of the case vehicle driver's air bag. The impact caused the case vehicle to deflect to the left and its front impacted the concrete median barrier. The case vehicle's EDR recorded a deployment level event (i.e., an impact severe enough to deploy the driver's air bag had it not already deployed from the previous impact) for this impact. The impact caused the Mercury to rotate clockwise and its front also impacted the concrete median barrier. The case vehicle came to final rest with its front against the median barrier facing northwest. The Mercury also came to rest with its front against the median barrier facing northwest.

Two CDCs were assigned to the case vehicle. One to describe the totality of the damage to the front end due to overlapping from both impacts, and a second to capture the second impact. The CDC to describe the totality of the damage to the front of the case vehicle was determined to be: **12-FDEW-2** (**10** degrees). The second CDC was determined to be: **12-FDEW-9** (i.e., extent zone unknown). The WinSMASH reconstruction program could not be used to calculate the case vehicle's Delta V due to the overlapping damage. The EDR recorded a maximum longitudinal Delta V of -14.61 km.p.h. (-9.08) m.p.h for the deployment event (i.e., impact with the Mercury) and a maximum Delta V for the deployment level event (i.e., impact with the concrete median barrier) of -22.55 km.p.h. (-14.01 m.p.h.). The case vehicle was towed due to damage.

Immediately prior to the crash, the case vehicle's driver (29-year-old, male) was seated in a nominal upright driving posture with one of his feet on the brake and both of his hands in an

unknown position. His seat track was located between its middle and rear-most positions, the seat back was slightly reclined, and the tilt steering column was located between its center and full-down positions. The driver was restrained by his integrated, three-point, lap-and-shoulder safety belt system. It is unknown if the driver was wearing glasses at the time of the crash.

Just prior to the impact with the Mercury, the case vehicle's driver applied the brakes attempting to avoid the crash. As a result of the braking, his safety belt retractor most likely locked and he moved forward into his safety belt. The case vehicle's impact with the Mercury caused the driver to continue forward and slightly to the right opposite the case vehicle's 10 degree direction of principal force as the case vehicle decelerated, and his face and chest most likely contacted his deployed air bag. The driver then moved to his right within his seat as the case vehicle was redirected to the left. The driver moved forward and loaded his safety belt as the case vehicle impacted the concrete median barrier. He then most likely rebounded back into his seat as the case vehicle came to final rest. The driver most likely exited the case vehicle under his own power following the crash. The driver's use of his integrated, three-point, lap-and-shoulder safety belt system and the deployment of his air bag mitigated his interaction with the case vehicle's frontal components. The driver sustained a police reported "C" (possible) injury and was transported from the scene by ambulance to a local hospital. He sustained a neck strain.

CRASH CIRCUMSTANCES

Crash Environment: The trafficway on which all vehicles were traveling was a ten-lane, divided, urban, U.S. highway, traversing in a north-south direction (**Figure 1**). There were four through lanes and one exit lane on the vehicle's roadway. Each lane was approximately 3.7 meters (12 feet) wide. Roadway pavement markings consisted of broken white lane lines, white edge line and a yellow median line. The trafficway was divided by a positive concrete median barrier. At the time of the crash the light condition was dawn, the atmospheric condition was cloudy, and the roadway pavement was dry, level, traffic polished concrete with an estimated coefficient of friction of 0.65. Traffic density was heavy and the site of the crash was urban commercial. See the Crash Diagram at the end of this report.

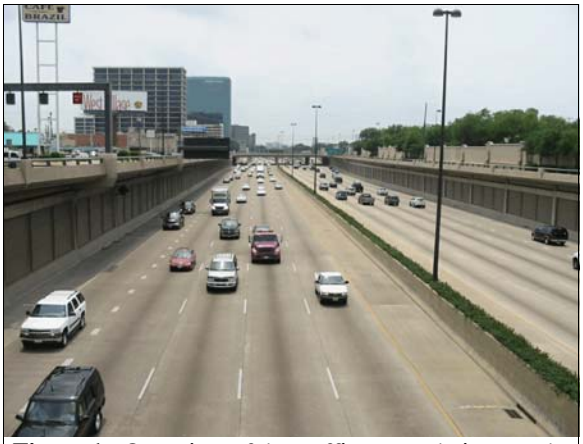


Figure 1: Overview of the trafficway and view south opposite case vehicle's approach

Pre-Crash: The case vehicle was traveling north in the inside center lane (**Figure 2** below), and the driver was intending to continue straight ahead. The Mercury was traveling north in the outside lane, and its driver was intending to proceed straight ahead. Meanwhile, the non-contact vehicle was traveling in the exit lane on the east side of the expressway. The non-contact vehicle veered left into the outside lane and into the Mercury's travel path. The Mercury's driver steered to the left to avoid a collision with the non-contact vehicle and crossed the outside center lane and entered the path of the case vehicle. It is unknown if the case vehicle's driver made any steering

avoidance maneuvers prior to the crash. However, the EDR data indicates the case vehicle's driver applied the brakes just prior to the impact. The crash occurred in the inside, center northbound lane of the roadway.

Figure 2: Approach of case vehicle to area of impact, impact occurred somewhere prior to overpass

Figure 3: Front damage to case vehicle from impact with the Mystique and the median barrier, each increment on rod is 5 cm (2 in)

Crash: The front of the case vehicle (**Figure 3**) impacted the left front side of the Mercury, causing the case vehicle's driver air bag to deploy. The EDR data indicated that only the first stage of the dual-stage air bag activated. The impact caused the case vehicle to deflect to the left and its front impacted the concrete median barrier. The EDR recorded a deployment level event for this impact. A deployment level event is an event that would have been severe enough to deploy the air bag had it not deployed previously in the crash sequence. The impact caused the Mercury to rotate clockwise. The police crash report indicates that the front of the Mercury also impacted the concrete median barrier.

Post-Crash: The case vehicle came to final rest with its front against the median barrier facing northwest. The Mercury also came to rest with its front against the median barrier facing northwest.

CASE VEHICLE

The 2003 Chevrolet K1500 was a four wheel drive, four-door pickup truck (VIN: 2GCEK19T031------) equipped with a 5.3L, V8 engine; four speed automatic transmission with overdrive and four wheel, anti-lock brakes. The front seating row was equipped with a split bench seat with adjustable head restraints; driver and front right passenger integrated, three-point, lap-and-shoulder safety belt systems with safety belt usage sensors; dual stage driver and front right passenger air bags, front right air bag suppression switch, front right passenger seat occupant detection sensor, a center seat two-point lap belt and an EDR contained within the vehicle's Sensing and Diagnostic Module (SDM). The back seating row was equipped with a bench seat with adjustable head restraints and manual, three-point, lap-and-shoulder safety belts in the outboard positions and a two-point lap belt in the center seat position. In addition, the back seat was equipped with a LATCH system for securing child safety seats. Traction control is listed as

an option for the case vehicle, but it is not known if the vehicle was so equipped. The case vehicle's wheelbase was 364.5 centimeters (143.5 inches). The odometer reading at the time of the inspection was 38,857 kilometers (24,145 miles).

The various sensors in the case vehicle's advanced occupant restraint system 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, an occupant pressure sensor and a seat belt tension sensor provide data to the electronic control module. The electronic control module (a) compares the seat pressure and seat belt tension data to threshold values, (b) determines if the front right air bag should be suppressed or enabled, and (c) communicates the decision to the air bag control module. The air bag will be suppressed when the seat pressure is at or below the established threshold or there is above normal tension on the safety belt (e.g., a secured child seat). The air bag will be enabled if the pressure is above the threshold and the seat belt tension is normal (e.g., a restrained adult occupant) or below (e.g., unrestrained occupant).

CASE VEHICLE DAMAGE

Exterior Damage: The case vehicle's impacts with the Mercury and concrete median barrier involved the front plane. The case vehicle's front bumper, bumper fascia, grille, left turn signal and headlamp assemblies, left fender, and hood were directly damaged and crushed rearward Direct damage began at the front left bumper corner and extended 168 centimeters (66.1 inches) along the front bumper. Residual maximum crush was measured as 25 centimeters (15.5 inches) occurring 11 centimeters (6.8 inches) to the right of C_1 (**Figure 4**). The table below shows the case vehicle's crush profile due to both impacts.

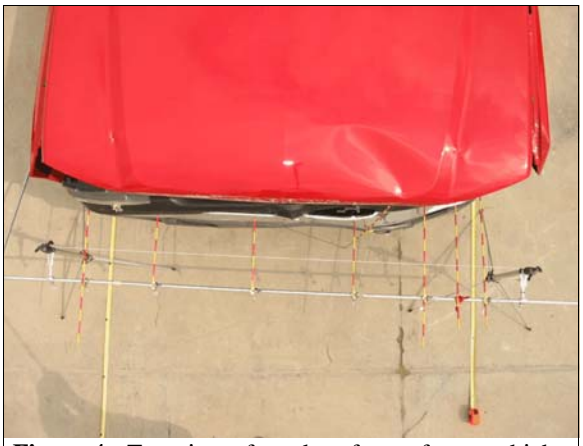


Figure 4: Top view of crush to front of case vehicle

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	168	25	169	23	24	15	16	13	8	0	0
in		66.1	9.8	66.5	9.1	9.4	5.9	6.3	5.1	3.2	0.0	0.0

The case vehicle's left side wheelbase was shortened 2 centimeters (0.8 inch) while the right side wheelbase was extended 1 centimeter (0.4 inch). Induced damage involved the hood, right headlamp/turn signal assembly and both fenders. No obvious induced damage or remote buckling was noted to the remainder of the case vehicle's exterior.

The recommended tire size was: P265/75R16, and the case vehicle was equipped with tires of this size. There was no damage or restriction of any of the wheels. The case vehicle's tire information is provided in the table below.

Tire	*Measured Pressure*		*Recommend Pressure*		*Tread Depth*		*Damage*	*Restricted*	*Deflated*
	kpa	psi	kpa	psi	milli-meters	32nd of an inch			
LF	228	33	241	35	8	10	None	No	No
RF	241	35	241	35	8	10	None	No	No
LR	248	36	241	35	8	10	None	No	No
RR	241	35	241	35	8	10	None	No	No

Vehicle Interior: Inspection of the case vehicle's interior (**Figure 5**) revealed a deployment of the case vehicle driver's air bag. Though there was no obvious contact evidence, it was most likely contacted by the driver. There was loading of the driver's shoulder belt as evidenced by a slight friction burn to the shoulder belt webbing. In addition, the driver's shoulder belt was jammed in the shoulder belt guide. Lastly, there was no occupant compartment intrusions and no evidence of compression of the steering column or deformation of the steering wheel (**Figure 6**).

Figure 5: Overview of instrument panel, windshield and steering wheel

Figure 6: Case vehicle's steering assembly showing lack of deformation

Damage Classification: The case vehicle sustained two frontal impacts producing overlapping damage that could not be separated (**Figures 7** and **8** below). Therefore, one CDC was assigned to describe the totality of the damage to the front end, and a second CDC was assigned based on what could be distinguished from the damage and to account for both impacts. The CDC to describe the totality of the damage to the front of the case vehicle was determined to be: **12-FDEW-2** (**10** degrees). The second CDC was determined to be: **12-FDEW-9** (unknown extent zone. The WinSMASH reconstruction program could not be used to calculate the case vehicle's Delta V due to the overlapping damage. The EDR recorded a maximum longitudinal Delta V of

-14.61 km.p.h. (-9.08) m.p.h for the deployment event (i.e., impact with the Mercury) and a maximum Delta V for the deployment level event (i.e., impact with the concrete median barrier) of -22.55 km.p.h. (-14.01 m.p.h.). The case vehicle was towed due to damage.

Figure 7: Overview of front damage from the front left corner

Figure 8: Overview of front damage from front right corner

AUTOMATIC RESTRAINT SYSTEM

The case vehicle's driver air bag was located in the steering wheel hub. 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 (**Figure 9**). The module cover consisted of "I" configuration cover flaps made of pliable vinyl. Each cover flap was approximately 7.3 centimeters (2.9 inches) in width at the top, 5 centimeters (2 inches) in width at the bottom and 12 centimeters (4.7 inches) in length along the vertical tear seam. There was no evidence of damage during the deployment to the air bag or the cover flaps. The driver's air bag was designed with two tethers, each approximately 12 centimeters (4.7 inches) in width. The driver's air bag had two vent ports, each approximately 3 centimeters (1.2 inches) in diameter, located at the 10:30 and 2:30 clock positions (**Figure 10**). The deployed driver's air bag (**Figure 11** below) was round with a diameter of approximately 65 centimeters (25.6 inches). There was no evidence of driver contact to the air bag. The distance between the mid-center of the driver's seat back, as positioned at the time of the vehicle inspection

Figure 9: Driver's air bag module flaps

Figure 10: Driver's air bag vent ports

(i.e., seat track between the middle and rear-most positions and the seat back slightly reclined), and the front surface of the air bag's fabric at approximate full excursion was 36 centimeters (14.2 inches).

Figure 11: Overview of driver's air bag

The front right passenger air bag was located in the middle of the front right instrument panel. The case vehicle was also equipped with an air bag suppression switch, which was set to the "Auto" position. The front right passenger's air bag did not deploy in this crash because there was no passenger seated in the front right seat. The case vehicle's advanced occupant protection system properly determined the absence of a front right passenger and suppressed deployment of the front right air bag.

CRASH DATA RECORDING

The download of the case vehicle's EDR was done during the vehicle inspection through the data link connector. The EDR recorded a deployment event (i.e., impact with the Mercury) and a deployment level event (i.e., impact with the concrete median barrier). The EDR reports for both events are presented at the end of this report (**Figures 14-19**). The system status report for the deployment event recorded the SIR warning lamp status as off, the driver's seat belt switch circuit status as buckled and the front right passenger air bag as suppressed. The system status report also indicated that the event recording was complete and only the first stage of the driver's dual stage air bag deployed. The first stage deployment criteria was met at 25.0 milliseconds after algorithm enable (AE), and the maximum recorded velocity change was recorded as -14.61 km.p.h. (-9.08 m.p.h.) occurring 152.5 milliseconds after AE. The system status report for the deployment level event indicates the maximum recorded velocity change was -22.55 km.p.h. (-14.01 m.p.h.) occurring 7.5 milliseconds after AE, and the recording of this event was also complete. The report also indicates there was 1.6 seconds between the deployment event and the deployment level event.

The deployment event pre-crash data indicated that the case vehicle was traveling 108 km.p.h. (67 mph) at 22% throttle five seconds prior to AE. The case vehicle remained at this speed for the next three, one second sample periods. At one second prior to the AE, the brake switch is recorded as on indicating the driver applied the brakes to avoid the impact with the Mercury.

CASE VEHICLE DRIVER KINEMATICS

Immediately prior to the crash, the case vehicle's driver [29-year-old, unknown race, (Hispanic) male; unknown height and weight] was seated in a nominal upright driving posture with

one of his feet on the brake and both of his hands in an unknown position. His seat track was located between its middle and rear-most positions, the seat back was slightly reclined, and the tilt steering column was located between its center and full-down positions. It is unknown if the driver was wearing glasses at the time of the crash.

Figure 12: Close view of friction burn on driver's safety belt webbing

Based on this contractor's vehicle inspection and supported by the EDR data, the case vehicle's driver was restrained by his integrated, three-point, lap-and-shoulder safety belt system. Inspection of the driver's safety belt assembly showed evidence of loading. There was a slight friction burn on the safety belt webbing (**Figure 12**) from the sliding latch plate, and the shoulder belt was stuck in the corner of the integrated shoulder belt guide (**Figure 13**).

Figure 13: Driver's shoulder belt jammed in the shoulder belt guide

Just prior to the impact with the Mercury, the case vehicle's driver applied the brakes attempting to avoid the crash. As a result of the braking, his safety belt retractor most likely locked and he moved forward into his safety belt. The case vehicle's impact with the Mercury caused the driver to continue forward and slightly to the right opposite the case vehicle's 10 degree direction of principal force as the case vehicle decelerated, and his face and upper chest most likely contacted his deployed air bag. The driver then moved to his right within his seat as the case vehicle was redirected to the left. The driver moved forward and loaded his safety belt as the case vehicle impacted the concrete median barrier causing a neck strain. He then most likely rebounded back into his seat as the case vehicle came to final rest. The driver most likely exited the case vehicle under his own power following the crash.

CASE VEHICLE DRIVER INJURIES

The police crash report indicated that the case vehicle's driver sustained a "C" (possible) injury. The driver was transported from the scene by ambulance to a local hospital and treated and released. The driver's injury and injury mechanism are shown in the table below.

Injury Number	Injury Description (including Aspect)	NASS Injury Code & AIS 90	Injury Source (Mechanism)	Source Confidence	Source of Injury Data
1	Strain, acute cervical, not further specified	minor 640278.1,6	Noncontact injury: impact forces	Probable	Emergency room records

OTHER VEHICLE

The 2000 Mercury Mystique was a front wheel drive, four-door sedan (VIN: 1MEFM6533YK------). The case vehicle was equipped with redesigned driver and front right passenger air bags which deployed during the crash sequence.

Exterior Damage: The Mercury was not inspected. It could not be located. No photographs of the Mercury were available, so a CDC could not be estimated. The Mercury was towed due to damage.

Mercury's Occupants: According to the police crash report, the Mercury's driver [30-year-old, unknown race, (Hispanic) male]; was restrained by his manual, three-point, lap-and-shoulder safety belt system. The driver sustained no police reported injuries and was not transported from the scene to a hospital.

2GCEK19T031xxxxxx System Status At Deployment	
SIR Warning Lamp Status	OFF
Driver's Belt Switch Circuit Status	BUCKLED
Ignition Cycles At Deployment	2864
Ignition Cycles At Investigation	2872
Maximum SDM Recorded Velocity Change (MPH)	-9.08
Algorithm Enable to Maximum SDM Recorded Velocity Change (msec)	152.5
Driver First Stage Time Algorithm Enabled to Deployment Command Criteria Met (msec)	25
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)	Suppressed
Passenger Second Stage Time Algorithm Enabled to Deployment Command Criteria Met (msec)	N/A
Time Between Non-Deployment And Deployment Events (sec)	N/A
Frontal Deployment Level Event Counter	2
Event Recording Complete	Yes
Multiple Events Associated With This Record	No
One Or More Associated Events Not Recorded	No

Time (milliseconds)	10	20	30	40	50	60	70	80	90	100	110	120	130	140	150
Recorded Velocity Change (MPH)	-0.31	-0.93	-1.86	-2.79	-4.34	-5.27	-6.20	-7.44	-8.06	-8.68	-8.68	-8.99	N/A	N/A	N/A

PRE-CRASH DATA				
Seconds Before AE	**Vehicle Speed (MPH)**	**Engine Speed (RPM)**	**Percent Throttle**	**Brake Switch Circuit Status**
-5	67	1856	22	OFF
-4	67	1856	22	OFF
-3	67	1856	22	OFF
-2	67	1856	9	OFF
-1	60	1600	0	ON

Figure 14: Case vehicle's System Status at Deployment report

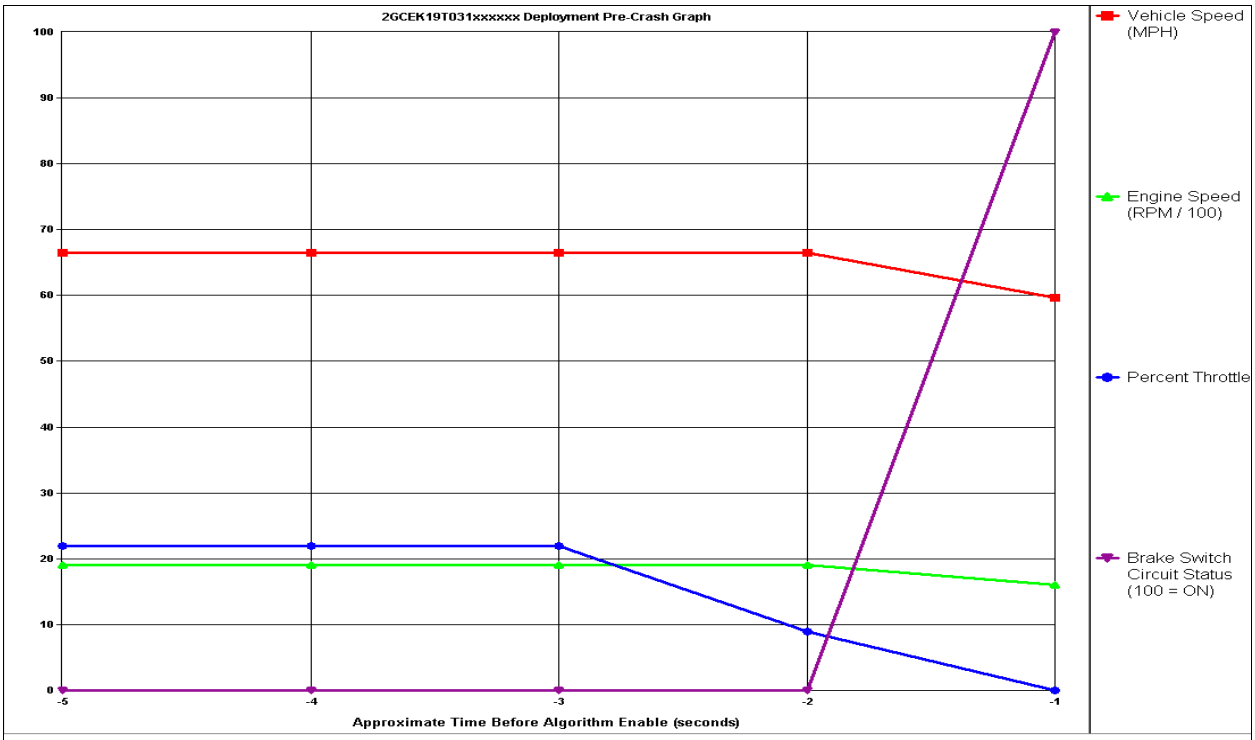


Figure 15: Case vehicle's Deployment Pre-Crash Data Graph

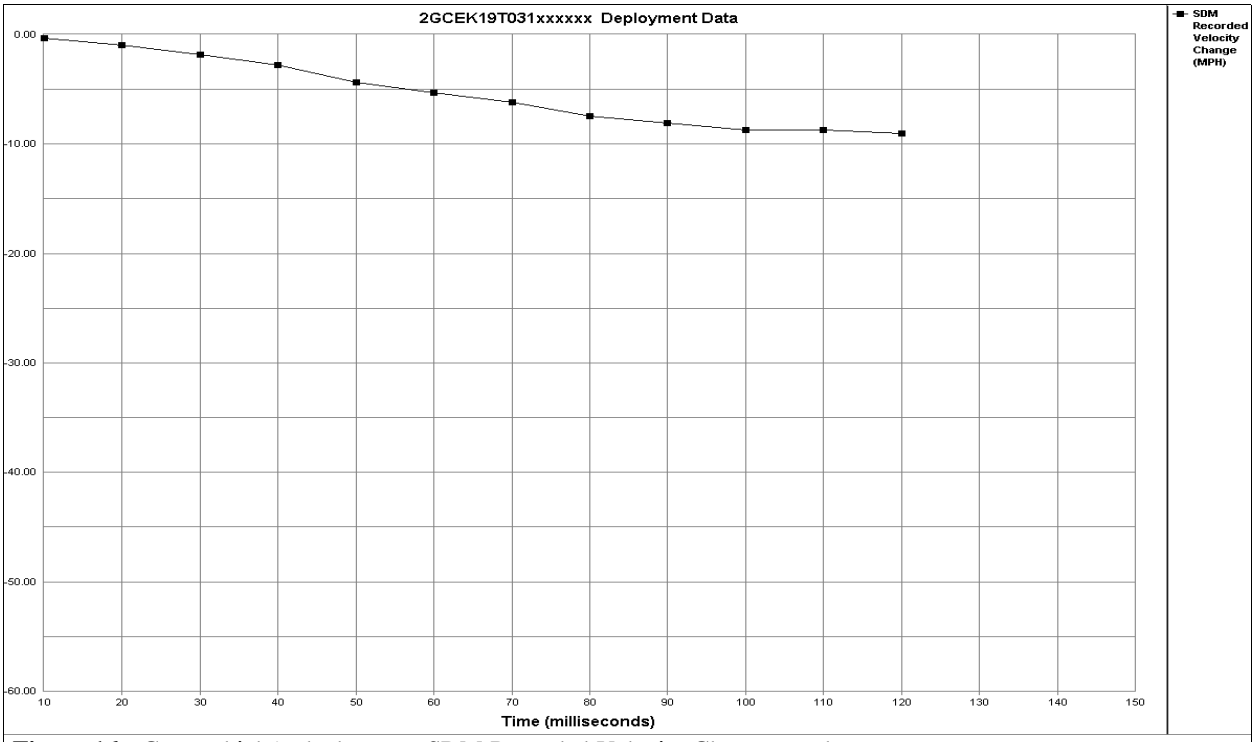


Figure 16: Case vehicle's deployment SDM Recorded Velocity Change graph

2GCEK19T031xxxxxx System Status At Deployment Level	
SIR Warning Lamp Status	OFF
Driver's Belt Switch Circuit Status	UNBUCKLED
Ignition Cycles At Deployment Level	2864
Ignition Cycles At Investigation	2872
Maximum SDM Recorded Velocity Change (MPH)	-14.01
Algorithm Enable to Maximum SDM Recorded Velocity Change (msec)	87.5
Driver First Stage Time Algorithm Enabled to Deployment Command Criteria Met (msec)	7.5
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)	Suppressed
Passenger Second Stage Time Algorithm Enabled to Deployment Command Criteria Met (msec)	N/A
Frontal Deployment Level Event Counter	2
Time Between Deployment And Deployment Level Events (sec)	1.6
Event Recording Complete	Yes
Multiple Events Associated With This Record	Yes
One Or More Associated Events Not Recorded	No

Time (milliseconds)	10	20	30	40	50	60	70	80	90	100	110	120	130	140	150
Recorded Velocity Change (MPH)	-1.55	-3.72	-6.20	-8.68	-10.85	-12.09	-12.71	-13.33	-13.95	-13.95	N/A	N/A	N/A	N/A	N/A

PRE-CRASH DATA				
Seconds Before AE	**Vehicle Speed (MPH)**	**Engine Speed (RPM)**	**Percent Throttle**	**Brake Switch Circuit Status**
-5	67	1856	22	OFF
-4	67	1856	9	OFF
-3	60	1600	0	ON
-2	47	1152	5	OFF
-1	25	960	0	OFF

Figure 17: Case vehicle's System Status at Deployment Level Report

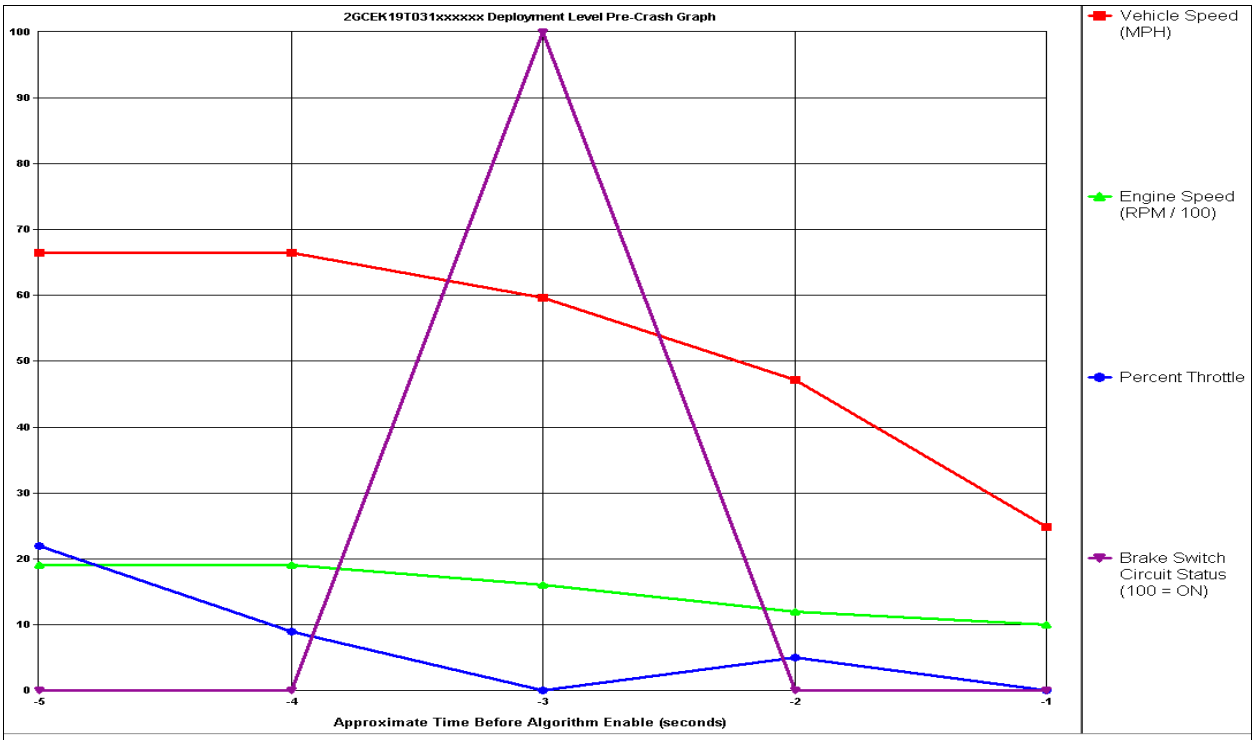


Figure 18: Case vehicle's Deployment Level Pre-Crash Graph

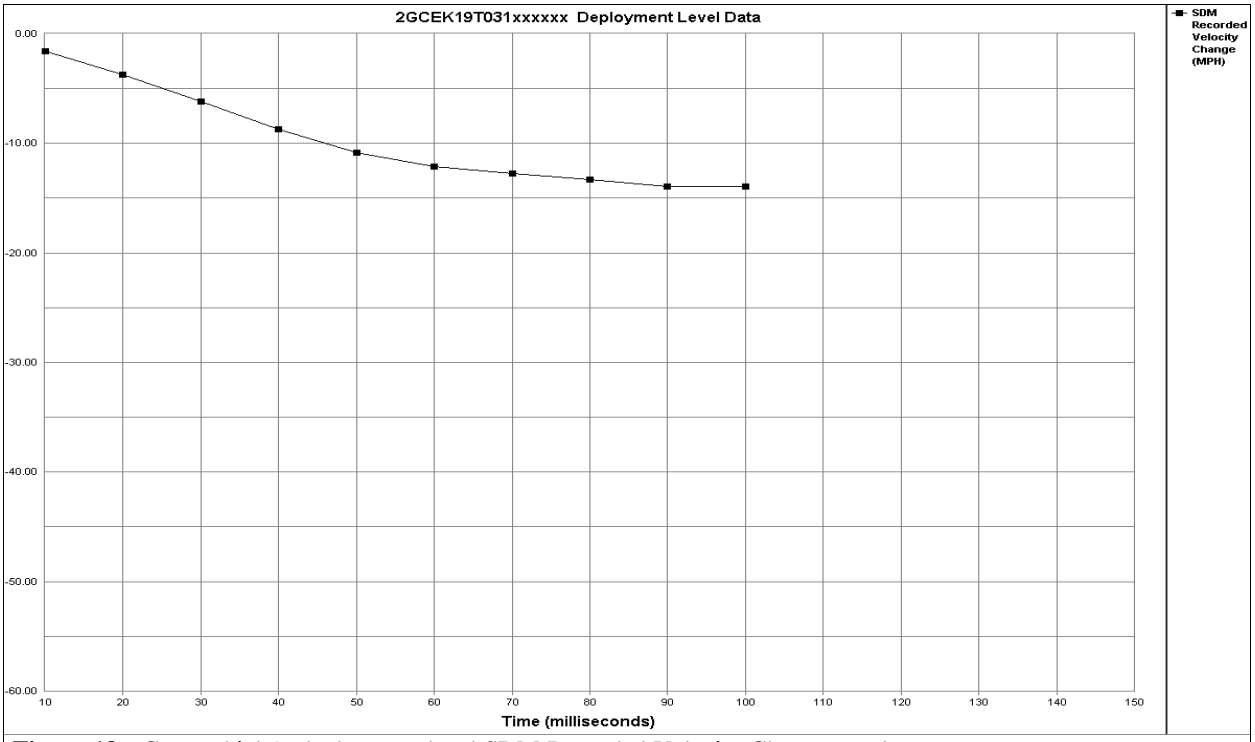
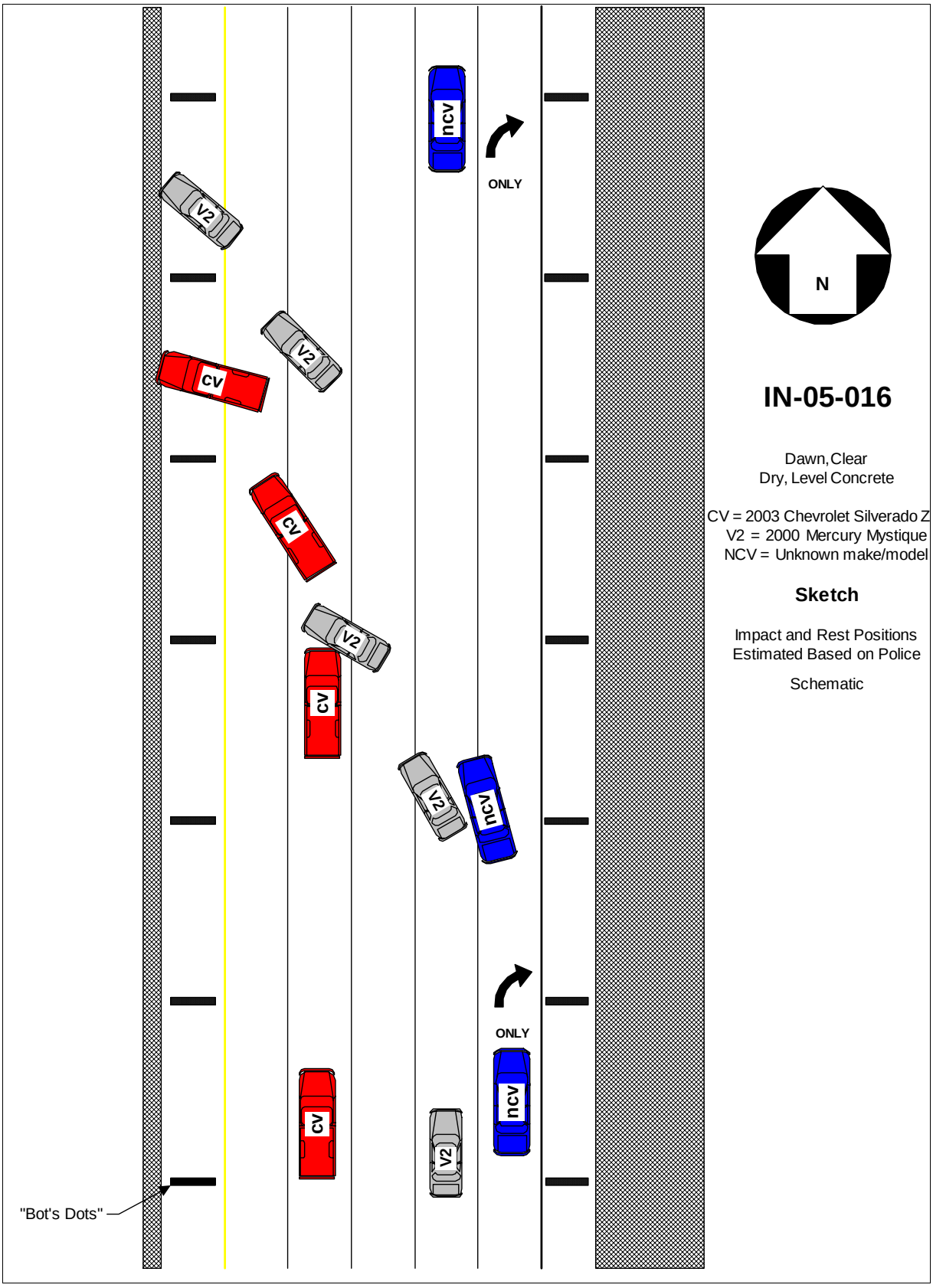


Figure 19: Case vehicle's deployment level SDM Recorded Velocity Change graph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ONLY
V2
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CV
V2
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ONLY
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"Bot's Dots"
IN-05-016
Dawn, Clear
Dry, Level Concrete
CV = 2003 Chevrolet Silverado Z
V2 = 2000 Mercury Mystique
NCV = Unknown make/model
Sketch
Impact and Rest Positions
Estimated Based on Police
Schematic