CRASH DATA RESEARCH CENTER

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CALSPAN REMOTE CERTIFIED ADVANCED 208-COMPLIANT CRASH INVESTIGATION

NASS/SCI COMBO CASE NO.: 04-12-083J

SUBJECT VEHICLE: 2003 GMC SIERRA PICKUP TRUCK

LOCATION: MICHIGAN

CRASH DATE: MAY 2004

Contract No. DTNH22-01-C-17002

Prepared for:

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

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

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

TECHNICAL REPORT STANDARD TITLE PAGE

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16. Abstract This remote crash investigation focused on the performance of the Certified Advanced 208-Compliant (CAC) frontal air bag system in a 2003 GMC Sierra K-1500 series extended cab pickup truck. The manufacture of this vehicle has certified that this 2003 GMC Sierra meets the advanced requirements of the Federal Motor Vehicle Safety Standard (FMVSS) No. 208. The CAC safety system included dual stage frontal air bags, seat track positioning sensors, seatbelt buckle switches, and a front right seat occupant-detecting sensor. Additionally, the Sierra was equipped with an air bag cutoff switch. The Sierra also contained a Sensing and Diagnostic Module (SDM) for the safety system, which had event data recording capabilities. This module was downloaded during the NASS inspection and its output is discussed in the *Electronic Data Recorder* (EDR) section of this report. A 55-year-old male driver occupied the Sierra. The Sierra was traveling in a northerly direction of a two-lane residential roadway while a 1987 GMC P4500 step van, operated by a 34-year-old male, was southbound in the opposite direction. The step van reportedly hydroplaned on the wet road surface and lost control by rotating counterclockwise and entering the northbound lane into the path of the Sierra. The Sierra's front end impacted the front end of the step van. The impact was sufficient to command a stage-1 deployment of the driver's frontal air bag. The driver sustained a left femur fracture and open fractures to his right tibia and fibula. The driver was transported by ambulance to a local hospital and admitted for 22 days.			
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BACKGROUND

This remote crash investigation focused on the performance of the Certified Advanced 208-Compliant (CAC) frontal air bag system in a 2003 GMC Sierra K-1500 series extended cab pickup truck (**Figure 1**). The manufacture of this vehicle has certified that this 2003 GMC Sierra meets the advanced requirements of the Federal Motor Vehicle Safety Standard (FMVSS) No. 208. The CAC safety system included dual stage frontal air bags, seat track positioning sensors, seatbelt buckle switches, and a front right seat occupant-detecting sensor. Additionally, the Sierra was equipped with an air bag cutoff switch. The Sierra also contained a Sensing and Diagnostic Module (SDM) for the safety system, which had event data recording capabilities. This module was downloaded during the NASS inspection and its output is discussed in the *Electronic Data Recorder* (EDR) section of this report. A 55-year-old male driver occupied the Sierra. The Sierra was traveling in a northerly direction of a two-lane residential roadway while a 1987 GMC P4500 step van, operated by a 34-year-old male, was southbound in the opposite direction. The step van reportedly hydroplaned on the wet road surface and lost control by rotating counterclockwise and entering the northbound lane into the path of the Sierra. The Sierra's front end impacted the front of the step van. The impact was sufficient to command a stage-1 deployment of the driver's frontal air bag. The driver sustained a left femur fracture and open fractures to his right tibia and fibula. The driver was transported by ambulance to a local hospital and admitted for 22 days.

Figure 1 – Subject vehicle 2003 GMC Sierra K-1500 pickup truck.

This crash was initially selected for investigation by the NASS as CDS Case No. 04-12-083J. The NASS researcher inspected the 2003 GMC Sierra and downloaded the vehicle's EDR. After reviewing the Police Accident Report, the NHTSA assigned the case to the Calspan Special Crash Investigations (SCI) team on June 8, 2003. The NASS investigation consisted of a complete exterior and interior inspection of the Sierra. The NASS team was unsuccessful in inspecting the 1987 GMC P4500 step van. The data from the inspection was utilized for this SCI narrative report.

SUMMARY

Crash Site

This two-vehicle crash occurred during the afternoon hours of May 2004. At the time of the crash, it was raining and the roadway was wet. The crash occurred in the northbound lane of a two-lane residential roadway. The roadway was surfaced with worn asphalt and solid and broken yellow lines delineated the travel lanes. The roadside environment consisted of gravel shoulders and natural growth accompanied by sporadic dwellings. The travel lanes were 3.5 m (11.5') in width. The east shoulder was 3.6 m (11.8') wide and the west shoulder was 2.8 m (9.2') in width. The posted speed limit for traffic was 72 km/h (45 mph). The scene schematic is included as **Figure 10** of this report.

Vehicle Data - 2003 GMC Sierra K-1500

The 2003 GMC Sierra K-1500 was identified by the Vehicle Identification Number (VIN): 2GTEK19T231 (production sequence omitted). The odometer reading could not be determined during the vehicle inspection due to the vehicle having no power; the driver's wife estimated the mileage during a surrogate interview to be approximately 16,000 km (10,000 miles). The vehicle was a four-door extended cab pick-up truck that was equipped with a 5.3-liter, eight-cylinder engine, 5-speed automatic transmission, four-wheel drive, four-wheel disc brakes with anti-lock (ABS), electronic brake distribution, power steering and a tilt steering wheel. The Sierra was configured with Bridgestone Dueler A/T tires, sized P265/75/R16. The maximum pressure for these tires was 303 kPa (44 PSI). The specific tire data at the time of the NASS vehicle inspection was as follows:

Tire	Measured Pressure	Tread Depth	Restricted	Damage
Left Front	0 kPa	9 mm (11/32")	Yes	Puncture in tread
Right Front	276 kPa (40 PSI)	9 mm (11/32")	No	None
Left Rear	262 kPa (38 PSI)	9 mm (11/32")	No	None
Right Rear	276 kPa (40 PSI)	9 mm (11/32")	No	None

The Sierra's seating positions consisted of leather appointed front bucket seats with height adjustable head restraints. Both head restraints were in the full-down position at the time of the NASS inspection. The second row was configured with a leather upholstered three-passenger bench seat and height adjustable head restraints for the outboard seating positions. The head restraints were adjusted to the full down position.

Vehicle Data – 1987 GMC P4500 Step Van

The 1987 GMC P4500 Step Van was identified by the VIN: 1GDG4T1T2HV (production number omitted). The vehicle was a three-door step van equipped with a 4.8-liter, six-cylinder engine and hydraulic brakes. The step van was used to deliver packages for large delivery service. The NASS researcher did not inspect this medium-duty truck.

Crash Sequence

Pre-Crash

The restrained 55-year-old male driver of the 2003 GMC Sierra was operating the vehicle northbound on the tow-lane roadway (**Figure 2**). The 34-year-old male driver of the 1987 GMC P4500 step van was southbound (**Figure 3**) in the opposite direction on the same roadway. As the driver of the step van continued southbound, he applied his brakes to slow down, hydroplaned, and lost control on the wet roadway. The step van began to rotate counterclockwise, crossed the centerline of the roadway, and entered the northbound lane. The driver of the Sierra applied his brakes in an attempt to avoid the step van at one second prior to impact, evidenced by the EDR report.

Figure 2 – Northbound approach of the 2003 GMC Sierra.

Figure 3 – Southbound approach of the 1987 GMC P4500 step van.

Crash

The full frontal aspect of Sierra impacted the front of the step van. The maximum crush to the Sierra was located at the front left bumper corner and measured 80 cm (31.5”). The vehicle’s SDM recorded a maximum delta-V of -41 km/h (-25.4 mph). The barrier-only algorithm of the WinSMASH program computed a barrier delta V of -42 km/h (-26.1 mph) based on the frontal crush measured during the NASS inspection.

As a result of the frontal impact, the vehicle’s air bag control module commanded a stage 1 deployment at 20 milliseconds from algorithm enable (AE) for the driver’s frontal air bag. The vehicle was equipped with a manual air bag cutoff switch for the front right passenger air bag. The switch was in the automatic position allowing deployment based on occupancy of the seat. Since no occupant was seated in the front right position, the SDM suppressed the air bag deployment. After the initial impact, the Sierra traveled off the right roadside in a northeasterly direction and came to rest approximately 4 m (13’) onto the grassy roadside. The step van came top rest on the roadway near the approximate location of the impact in a northwesterly direction.

Post-Crash

Emergency personnel arrived on the scene and removed the driver of the Sierra due to perceived serious injuries. The driver was removed through the front left door after a prolonged extrication of approximately 40 minutes. He was transported by ambulance to a local hospital due to multiple fractures to both legs and was admitted for 22 days. The

driver of the P4500 step van was reportedly ejected from his vehicle from the open right side door. He sustained soft tissue injuries to his head, back, and lower extremities and was transported and released from a local hospital.

Vehicle Damage

Exterior – 2003 GMC Sierra

The 2003 GMC Sierra sustained severe damage as a result of the impact with the 1987 GMC P4500 step van **(Figure 4)**. The NASS investigation revealed that the maximum crush was located 73 cm (28.7") left of the vehicle's centerline at the front left bumper corner and measured 80 cm (31.5"). The direct contact damage began 73 cm (28.7") left of the vehicle's centerline and extended 115 cm (45.3") along the bumper to the right. The Field L measurement began at the left front bumper corner and extended across the entire front-end 145 cm (57.1") to the right front bumper corner. The crush profile measured to the bumper level was as follows: C1 = 80 cm (31.5"), C2 = 70 cm (27.6"), C3 = 48 cm (18.9"), C4 = 21 cm (8.3"), C5 = 0 cm, and C6 = 0 cm. The NASS reported Collision Deformation Classification (CDC) was 12-FDEW-3. The Principal Direction of Force (PDOF) was 350 degrees.

Figure 4 – Frontal damage to 2003 GMC Sierra.

Interior – 2003 GMC Sierra

The interior of the Sierra sustained moderate damage as a result of intrusion and occupant contact. The greatest area of intrusion occurred in the driver's seating position. The left and center instrument panel intruded longitudinally 16 cm (6.3"). Additionally, the front left toe pan intruded 11 cm (4.3") longitudinally. The NASS investigation reported vertical intrusion of the roof side rail into the front left seating area; however, after a closer examination, it was determined that it did not.

The driver loaded the steering assembly through the deployed air bag during the impact (**Figure 5**). A small blood transfer located 5 cm (2") left of center on the horizontal centerline was present on the driver's air bag. As the driver loaded through the air bag, the steering column compressed an undetermined amount and the hub and spoke pivoted to the right approximately 20 degrees (**Figure 6**). The left half aspect of the wheel rim was deformed approximately 3 cm (1.2") (**Figure 7**). There were two distinct scuffmarks on the rigid plastic faced knee bolster, usually indicative of knee contact. The NASS

Figure 5 – Steering assembly and instrument panel of the 2003 GMC Sierra.

team also reported a “starburst” crack on the windshield and surmised that the driver’s left hand may have struck the component.
The SCI revised intrusions identified during the NASS inspection are listed by their magnitude in the following table:

Position	Component	Magnitude	Direction
Front Left	Instrument panel	16 cm (6.3”)	Longitudinal
Front Center	Instrument panel	16 cm (6.3”)	Longitudinal
Front Left	Toe pan	11 cm (4.3”)	Longitudinal

Figure 6 – Lateral view of steering wheel/column compression.

Figure 7 – Lateral view of steering wheel rim deformation.

Manual Restraint Systems – 2003 GMC Sierra
The Sierra was equipped with 3-point integrated safety belt systems for both front seat positions. They were configured with sliding latch plates and were retracted into the seatbacks at the time of the NASS inspection. The driver’s restraint was equipped with an Emergency Locking Retractor (ELR) while the front right position equipped with a switchable ELR/Automatic Locking Retractor (ALR). Both retractors incorporated the belt sensitive feature which locked the belts during rapid spool-out of the webbing. The driver was wearing his restraint evidenced by minor stretching on the shoulder belt webbing. The EDR output supports belt usage.

The rear safety belts were configured with sliding latch plates and switchable ELR/Automatic Locking Retractors for both outboard seating positions. The rear center seat was equipped with a fixed length lap belt.

Certified Advanced 208-Compliant Safety System – 2003 GMC Sierra
The 2003 GMC Sierra was equipped with a Certified Advanced 208-Compliant (CAC) Safety System. The manufacture of this vehicle has certified that this 2003 GMC Sierra meets the advanced requirements of the FMVSS No.: 208. The safety system included dual stage frontal air bags, seat track positioning sensors, seatbelt buckle switches and a front right seat occupant-detecting sensor. The system also consisted of a two-setting passenger air bag cutoff switch. The system can manually be set in either the Off or

Automatic position. In the Off position the mid-mounted passenger air bag is suppressed and will not deploy. In the Automatic position, the SDM determines whether to deploy the air bag and will suppress it if the seat is unoccupied, if a child is seated in the front right position, or if the impact does not warrant supplemental restraint deployment. The setting at the time of the NASS inspection was in the Automatic position (**Figure 8**); therefore, given that the seat was unoccupied, the front right system was suppressed during this crash.

Figure 8 – Passenger's air bag switch in automatic mode.

Figure 9 – Driver's air bag.

The driver's frontal bag deployed at impact with the P4500 step van. The air bag was housed in the center of the steering wheel hub and deployed through two I –configuration cover flaps **(Figure 9)**. According to the NASS investigation, the cover flaps were symmetrical and measured 8 cm (3.1") in width and 12 cm (4.7") in height. The air bag membrane measured 70 cm (27.6) in diameter in its deflated state. The air bag contained two vent ports that were located in the 10 and 2 o'clock positions. Two internal straps, the locations of which were not reported, tethered the air bag. A small blood transfer located 5 cm (2") left of center on the horizontal centerline was present on the driver's air bag.

Event Data Recorder (EDR) – 2003 GMC Sierra

The 2003 GMC Sierra was equipped with an Event Data Recorder (EDR) and its data was downloaded during the NASS vehicle inspection. The EDR was downloaded using the Vetronix Crash Data Retrieval Tool with software version 2.24 and reported with software version 2.80. The download was accomplished by connecting the CDR tool to the diagnostic port located on the underside of the left instrument panel. The EDR recorded a Deployment and Non-Deployment event simultaneously – there was no time or ignition cycle variation between the data outputs.

The EDR system at Deployment recorded the driver's safety belt switch circuit status to be buckled. The maximum EDR recorded velocity change was -41 km/h (–25.4 mph) at 165 msec of Algorithm Enable (AE). The driver's air bag met the First Stage deployment command at 20 msec of AE. The EDR output is included in this narrative report as Attachment A.

Occupant Demographics

Driver:

Age/Sex:	55-year-old/Male
Height:	182 cm (72”)
Weight:	127 kg (280 lbs)
Seat Track Position:	Between center and full-rear
Safety Belt Usage:	Manual lap and shoulder restraint
Usage Source:	Vehicle inspection/EDR output
Eyewear:	Prescription eyeglasses
Type of Medical Treatment:	Transported to a local hospital and admitted for 22 days

Driver Injuries

Injury	Injury Severity (AIS 90/Update 98)	Injury Source
Left Femoral intertrochanteric fracture	Serious (851810.3,2)	Knee bolster indirect*
Right open tibia fracture to posterior malleolus	Serious (853418.3,1)	Floor pan, including pedals
Right tibia fracture to medial malleolus	Moderate (853412.2,1)	Floor pan, including pedals
Right fibula fracture – distal fibular diaphysis	Moderate (851606.2,1)	Floor pan, including pedals

Source: Medical records.

**The EDS case sourced the femoral fracture to the left side door panel. Upon closer examination it appears to be an indirect injury sourced to the knee bolster from occupant loading.*

Driver Kinematics

The 55-year-old driver of the 2003 GMC Sierra was seated between the middle and rear track position in a normal posture. At impact, the driver responded to the 350 degree PDOF by initiating a forward and slightly left trajectory. The driver loaded the safety belt system and the deployed frontal air bag. Due to the severity of the crash and the size of the male driver, the left front seatback deflected forward as the driver loaded the integrated belt system. This allowed his torso to travel forward through the air bag and into the steering assembly. Significant steering column compression, along with hub and spoke deflection to the left of approximately 20 degrees, was present. The left half of the steering wheel rim was deformed 3 cm (1.2”) from the driver’s abdomen. A specific injury to the driver’s abdomen was not clinically diagnosed; however, it was noted in the medical records that the driver complained of tenderness to his abdomen and pain in his lower back. This most likely is linked to loading the steering assembly.

During the impact, the toe pan and control pedals intruded 11 cm (4.3”) causing fractures to the driver’s right tibia and fibula. He sustained two distinct comminuted open fractures to his right tibia at the medial and posterior malleolus. He also sustained an open right fibula fracture through contact with either the floor pan or the control pedals. The NASS investigation revealed a scuffmark on the left knee bolster, which the

researcher attributed to loading of the driver's left knee. As the driver's knee contacted the knee bolster, an indirect femoral fracture resulted in his left leg. The driver was transported to a local hospital by ambulance and admitted for 22 days.

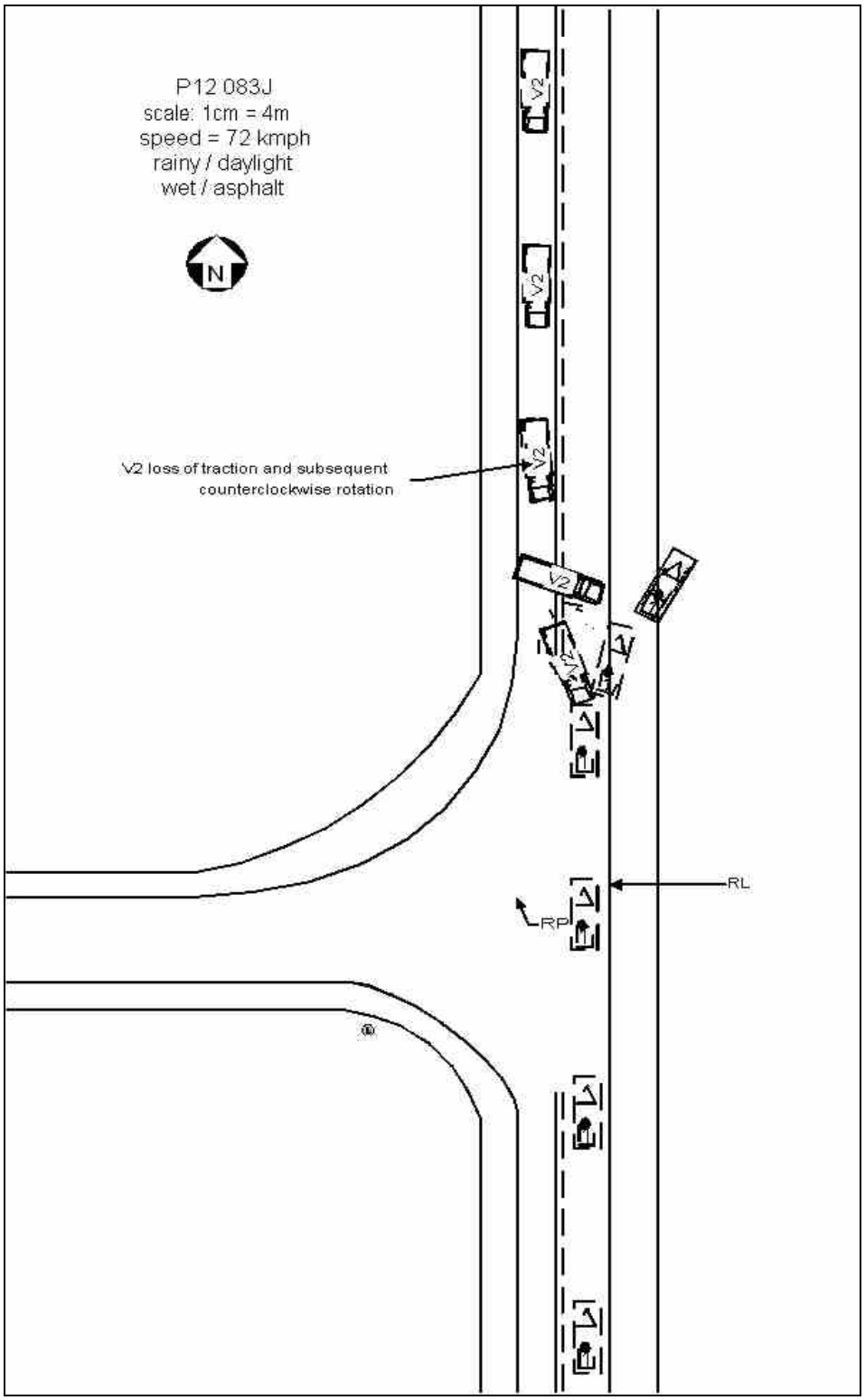


Figure 10. NASS Scene Schematic

Attachment A – 2003 GMC Sierra K-1500 EDR Report

CDR File Information

Vehicle Identification Number	2GTEK19T231
Investigator	
Case Number	
Investigation Date	Thursday, June 3 2004
Crash Date	Tuesday, May 25 2004
Filename	N04-12-083V1.CDR
Saved on	Thursday, June 3 2004 at 10:39:44 AM
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 Non-Deployment

SDM Data Limitations

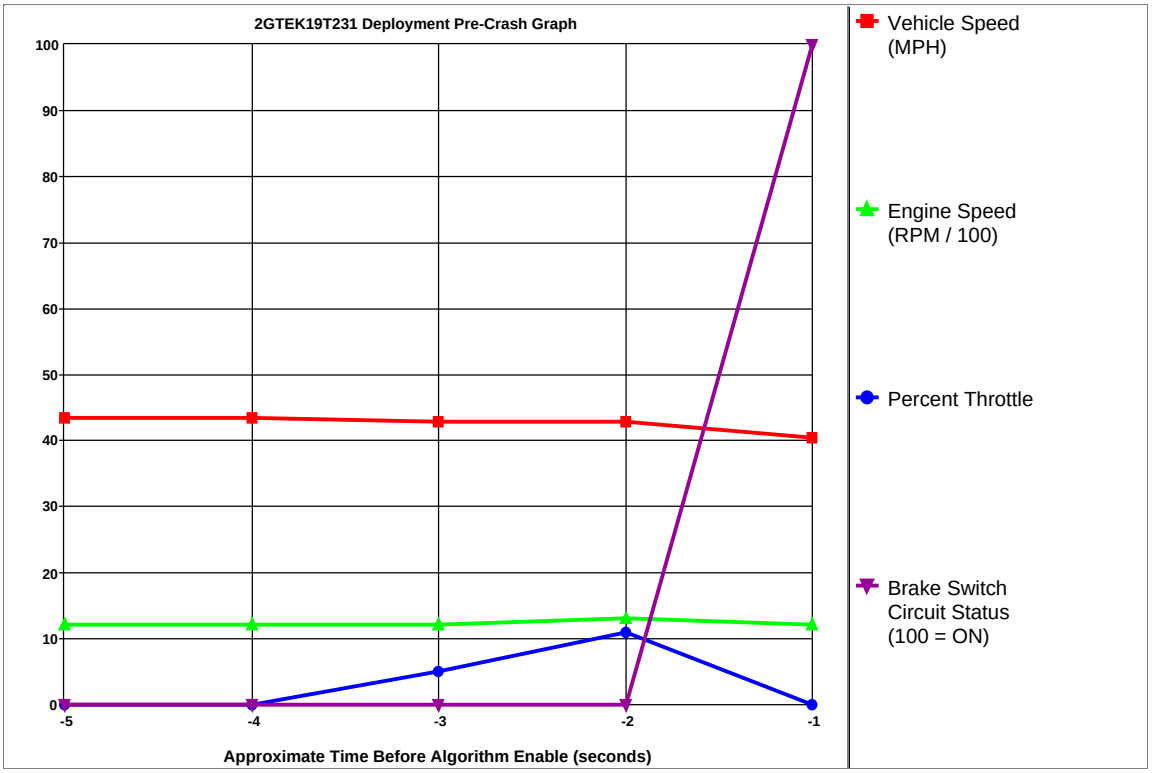
SDM Recorded Crash Events:
There are two types of SDM recorded crash events. The first is the Non-Deployment Event. A Non-Deployment Event is an event severe enough to "wake up" the sensing algorithm but not severe enough to deploy the air bag(s). It contains Pre-Crash and Crash data. The SDM can store up to one Non-Deployment Event. This event can be overwritten by an event that has a greater SDM recorded 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 contains Pre-Crash and Crash data. The SDM can store up to two different Deployment Events, if they occur within 25.4 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. If multiple Non-Deployment Events occur within 5 seconds prior to a Deployment Event, then the most severe Non-Deployment Event will be recorded and locked. If multiple Non-Deployment Events precede a Deployment Event, and multiple Non-Deployment Events occur within 5 seconds of each other (but not necessarily all within 5 seconds of the Deployment Event), and subsequent Non-Deployment Events are less severe than prior Non-Deployment Events, and the last of the multiple Non-Deployment Events occurs within 5 seconds of a Deployment Event, then the most severe of the Non-Deployment Events (which may have occurred more than 5 seconds prior to the Deployment Event) will be recorded and locked.

SDM Data Limitations:
-SDM Recorded Vehicle Forward Velocity Change reflects the change in forward velocity that the sensing system experienced during the recorded portion of the event. SDM Recorded Vehicle Forward Velocity Change is the change in velocity during the recording time and is not the speed the vehicle was traveling before the event, and is also not the Barrier Equivalent Velocity. This data should be examined in conjunction with other available physical evidence from the vehicle and scene when assessing occupant or vehicle forward velocity change. For Deployment Events and Deployment Level Events, the SDM will record 100 milliseconds of data after deployment criteria is met and up to 50 milliseconds before deployment criteria is met. For Non-Deployment Events, the SDM will record the first 150 milliseconds of data after algorithm enable.
-Event Recording Complete will indicate if data from the recorded event has been fully written to the SDM memory or if it has been interrupted and not fully written.
-SDM Recorded Vehicle Speed accuracy can be affected if the vehicle has had the tire size or the final drive axle ratio changed from the factory build specifications.
-Brake Switch Circuit Status indicates the status of the brake switch circuit.
-Pre-Crash Electronic Data Validity Check Status indicates "Data Invalid" if the SDM receive an invalid message from the module sending the pre-crash data.
-Driver's and Passenger's Belt Switch Circuit Status indicates the status of the seat belt switch circuit. If the vehicle's electrical system is compromised during a crash, the state of the Belt Switch Circuit may be reported other than the actual state.
-The Time Between Non-Deployment and Deployment Events is displayed in seconds. If the time between the two events is greater than 25.4 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.
-Multiple Events Associated with this Record: This parameter will indicate whether one or more associated events preceded the recorded event.
-One or More Associated Events Not Recorded: If a single event is recorded, this parameter will indicate whether one or more associated events, prior to the recorded event, was not recorded.
If two associated events are recorded, this parameter for the first event will indicate whether one or more associated events, prior to the first event, was not recorded.
If two associated events are recorded, this parameter, for the second event, will indicate whether one or more associated events, between the first and second events, was not recorded.

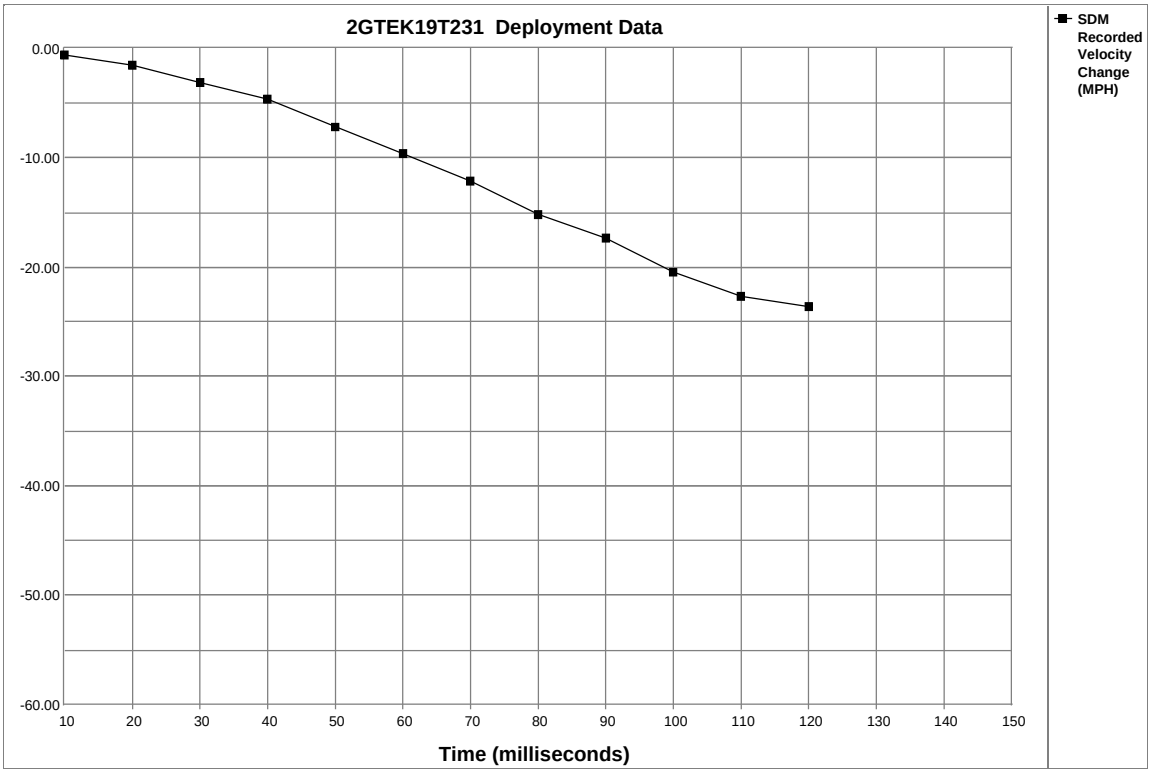
SDM Data Source:
All SDM recorded data is measured, calculated, and stored internally, except for the following:
-Vehicle Speed, Engine Speed, and Percent Throttle data are transmitted once a second by the Powertrain Control Module (PCM), via the vehicle's communication network, to the SDM.
-Brake Switch Circuit Status data is transmitted once a second by either the ABS module or the PCM, via the vehicle's communication network, to the SDM.
-The SDM may obtain Belt Switch Circuit Status data a number of different ways, depending on the vehicle architecture. Some switches are wired directly to the SDM, while others may obtain the data from various vehicle control modules, via the vehicle's communication network.

System Status At Deployment

SIR Warning Lamp Status	OFF
Driver's Belt Switch Circuit Status	BUCKLED
Passenger Seat Position Switch Circuit Status	Rearward
Ignition Cycles At Deployment	2089
Ignition Cycles At Investigation	2090
Maximum SDM Recorded Velocity Change (MPH)	-25.36
Algorithm Enable to Maximum SDM Recorded Velocity Change (msec)	165
Driver First Stage Time Algorithm Enabled to Deployment Command Criteria Met (msec)	20
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	1
Event Recording Complete	Yes
Multiple Events Associated With This Record	No
One Or More Associated Events Not Recorded	No



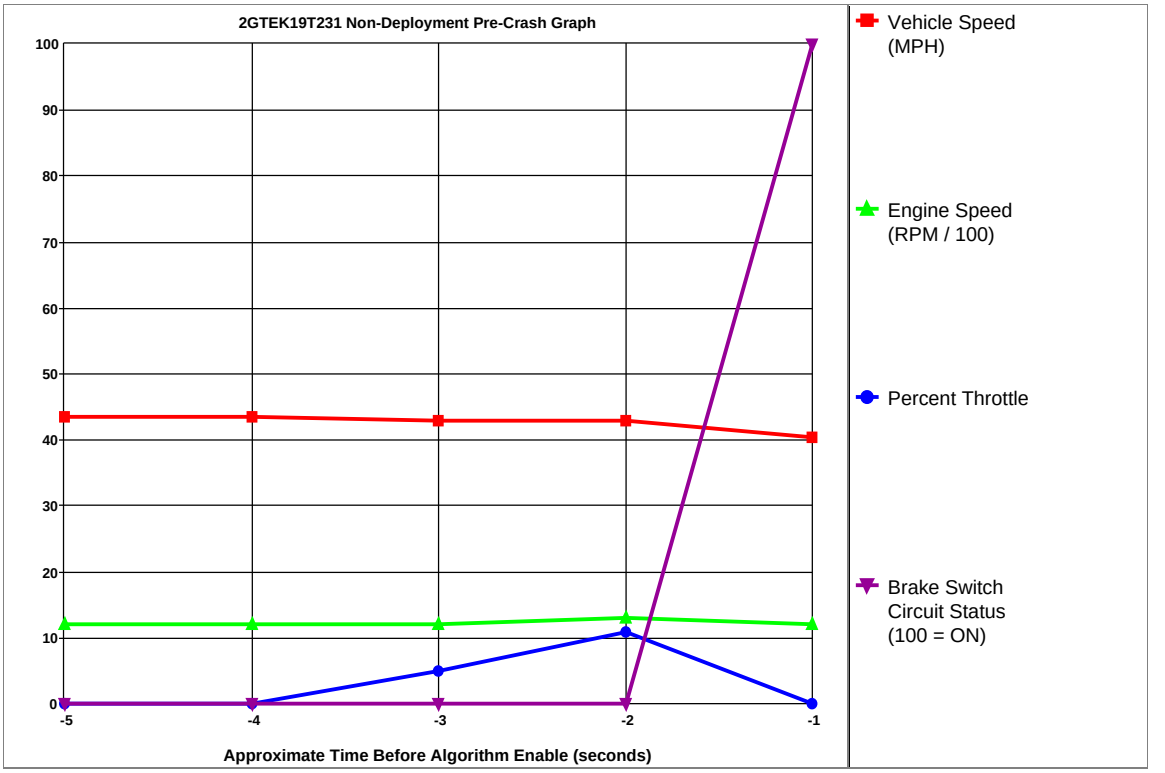
Seconds Before AE	Vehicle Speed (MPH)	Engine Speed (RPM)	Percent Throttle	Brake Switch Circuit Status
-5	44	1216	0	OFF
-4	44	1216	0	OFF
-3	43	1216	5	OFF
-2	43	1280	11	OFF
-1	40	1152	0	ON



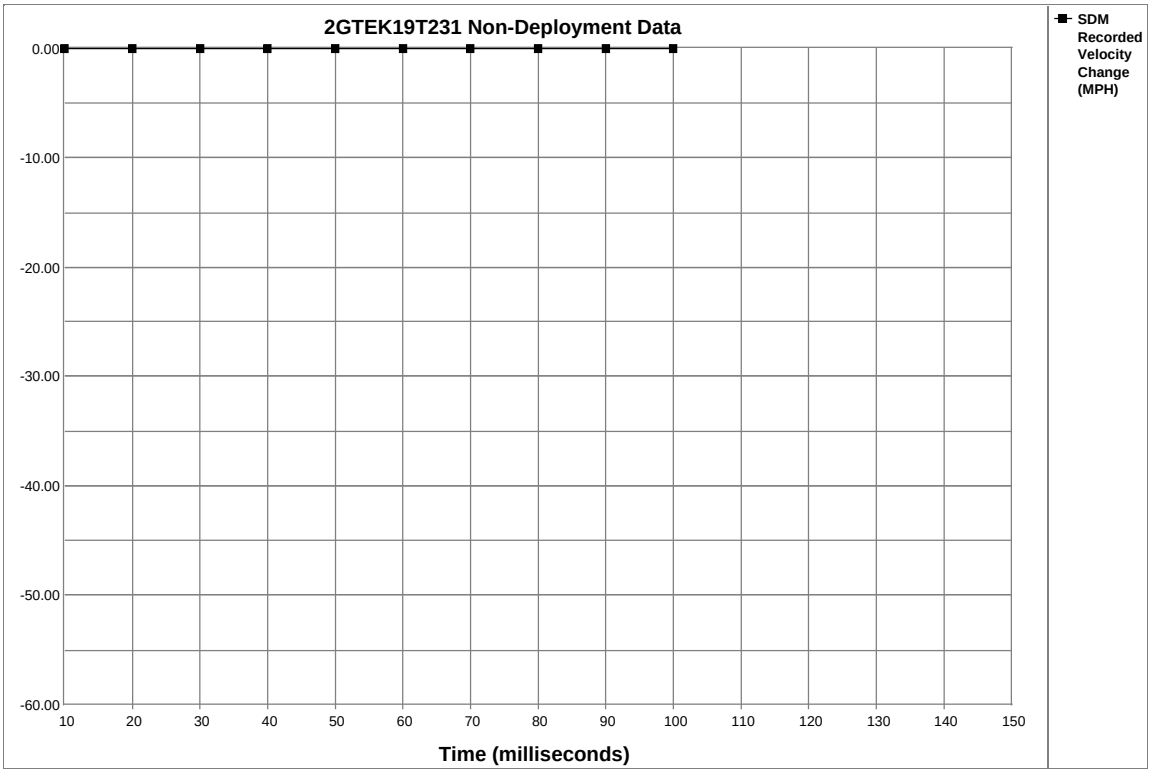
Time (milliseconds)	10	20	30	40	50	60	70	80	90	100	110	120	130	140	150
Recorded Velocity Change (MPH)	-0.62	-1.55	-3.10	-4.65	-7.13	-9.61	-12.09	-15.19	-17.36	-20.46	-22.63	-23.56	N/A	N/A	N/A

System Status At Non-Deployment

SIR Warning Lamp Status	ON
Driver's Belt Switch Circuit Status	BUCKLED
Passenger Seat Position Switch Circuit Status	Rearward
Ignition Cycles At Non-Deployment	2089
Ignition Cycles At Investigation	2090
Maximum SDM Recorded Velocity Change (MPH)	-0.02
Algorithm Enable to Maximum SDM Recorded Velocity Change (msec)	0
Crash Record Locked	No
Event Recording Complete	Yes
Multiple Events Associated With This Record	No
One Or More Associated Events Not Recorded	No



Seconds Before AE	Vehicle Speed (MPH)	Engine Speed (RPM)	Percent Throttle	Brake Switch Circuit Status
-5	44	1216	0	OFF
-4	44	1216	0	OFF
-3	43	1216	5	OFF
-2	43	1280	11	OFF
-1	40	1152	0	ON



Time (milliseconds)	10	20	30	40	50	60	70	80	90	100	110	120	130	140	150
Recorded Velocity Change (MPH)	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	N/A	N/A	N/A	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.

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$04  4B 41 4D 45 41 31
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$0A  00 00 00 00 00 00
$0B  00 00 00 00 00 00
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$0D  00 00 00 00 00 00
$0E  00 00 00 00 00 00
$0F  00 00 00 00 00 00
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$15  FA FA FA FA FA FA
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$18  00 0F 05 AC F1 00
$19  09 00 0A 00 00 64
$1A  00 00 00 00 00 00
$1B  00 00 00 00 00 00
$1C  00 0C 00 00 00 00
$1D  00 00 00 00 00 00
$1F  FE 00 00 00 00 00
$20  52 FD 00 00 FF FF
$21  FF F7 FF FF FF FF
$22  FF FF FF FF FF FF
$23  FF FF FF FF FF F7
$24  00 00 01 00 00 31
$25  53 00 00 03 FF FF
$26  00 00 00 00 00 00
$27  00 00 00 00 00 00
$28  00 00 00 0A FE FA
$29  FE A5 FF FF FF FF
$2A  FF FF FF FF FF FF
$2B  FF FF FF FF FF FF
$2C  FF FF FF FF FF FF
$2D  FF FF 00 00 00 00
$30  B2 FE 00 00 FF FF
$31  FF FF FF FF FF FF
$32  FF FF FF FF FF FF
$33  FF FF FF FF FF FF
$34  00 00 33 10 08 05
$35  00 00 00 00 00 00
$36  00 00 00 00 00 00
$37  00 00 00 05 1B 57
$38  42 0B 62 36 00 00
$39  01 00 00 03 FF FF
$3A  02 05 0A 0F 17 1F
$3B  27 31 38 42 49 4C
$3C  00 00 00 0C FE FA
$3D  FE A5 00 00 00 00
$40  41 45 45 46 46 00
$41  80 00 00 1B 0E 00
$42  00 00 12 14 13 13
$43  13 00 0D 80 00 00
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$45  80 00 00 1B 0E 00
$46  00 00 12 14 13 13
$47  13 00 80 FE 00 00
$48  FF FF FF FF FF FF
$49  FF FF FF FF FF FF
$4A  FF FF FF FF FF FF
$4B  FF FF FF FF 00 00
$4C  FF FF FF FF FF FF
$4D  FF FF FF FF FF FF
$4E  FF FF FF FF FF FF
$4F  FF FF FF FF 00 00
$50  FF FF FF FF FF FF
$51  FF FF FF FF FF FF
$52  FF FF FF FF FF FF
$53  FF FF FF FF FF FF
$54  FF FF FF FF FF FF
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