Missouri State Highway Patrol

Reconstruction Report

[redacted]

Missouri State Highway Patrol
Reconstruction Report

[redacted]

Sections

Appendices

Missouri State Highway Patrol
Reconstruction Report

[redacted]

County:

Date:

Time:

Location:

Drivers:

Original Investigator: Tpr. B.A. Moore, #514, C-11

Troop Reconstructionist: N/A

Assisting Officer: Cpl. K.A. Lichay, #443, C-11

Assisting Agencies: N/A

Level IV Reconstruction:

Sgt. M.H. Mahon, #298, C-SS, ACTAR #1054
Major Crash Investigation Unit
Team Two, Troop C
Wentzville, Missouri

Date of Report: October 14, 2005

[redacted]

Synopsis

On Wednesday, [redacted] at 0911 hours, there was a two-vehicle crash on [redacted] Franklin County, Missouri. This crash occurred in the city of [redacted]. A white Chevy Malibu was traveling west on US 50 when it drove into the eastbound lane and collided with a blue Dodge Dynasty that was traveling east in the eastbound lane of US 50. The driver of the Dodge was killed in this crash. Tpr. B.A. Moore, #514, C-11, was the original investigator.

Troop C Radio personnel notified me of this crash via telephone at 0920 hours, [redacted] I was at the office of the Missouri State Highway Patrol Major Crash Investigation Unit, Team Two, in Wentzville, Missouri. I drove to the crash scene. When I arrived at 0955 hours, I contacted Tpr. Moore and Cpl. K.A. Lichay, #443, C-11. They explained the circumstances of the crash. I walked through the crash scene. I used paint to mark items of evidence that were relevant to this crash. I took photos at the scene and later at the tow yard. The images on CD-ROM are stored at Missouri State Highway Patrol, General Headquarters, Traffic Division, Accident Records, 1510 East Elm, P.O. Box 568, Jefferson City, Missouri. A photo log is attached as Appendix I.

Cpl. Lichay and I used a Sokkia SET 5oo total station to record the data and points of evidence that were utilized to produce the diagrams attached to the original accident report and to this narrative.

Vehicles

Vehicle #1

Vehicle #1 was a white 2004 Chevrolet Malibu Classic four-door sedan. At the time of the crash, it was traveling west in the eastbound lane of US 50. Vehicle #1 was demolished in this crash. It was towed from the scene by Sturm's County Wide Towing and taken to their facility at 5th and International in Washington, Missouri.

Vehicle #2

Vehicle #2 was a blue 1989 Dodge Dynasty four-door sedan. At the time of the crash, it was traveling east in the eastbound lane of US 50. Vehicle #2 was demolished in this crash. It was towed from the scene by Sturm's County Wide Towing and taken to their facility at 5th and International in Washington, Missouri.

[redacted]

Driver #1

[redacted]

Tpr. Moore's investigation indicated that Driver #1 was not using a seatbelt at the time of the crash. The driver's front air bag did deploy in this collision.

Driver #2

[redacted]

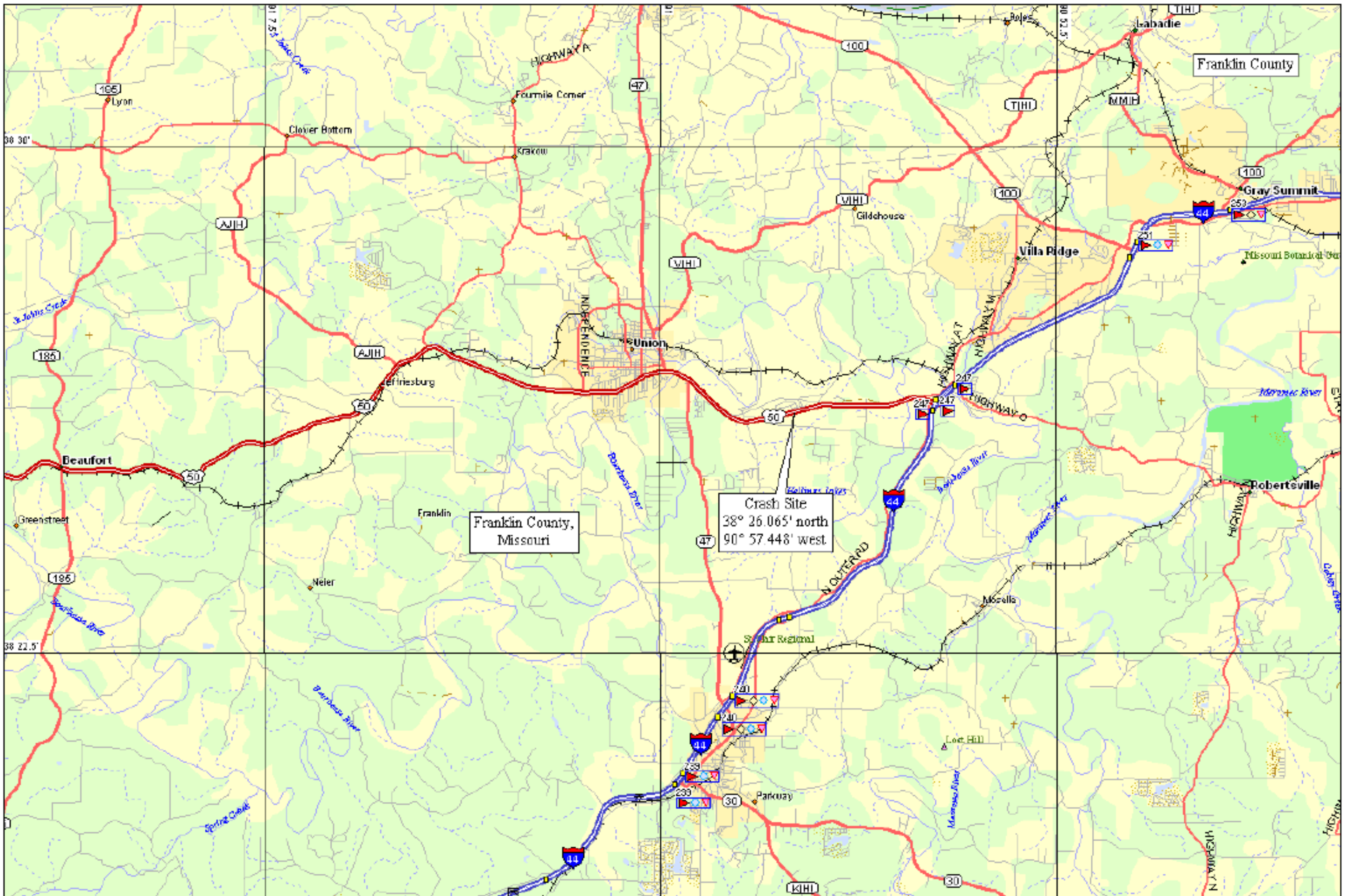
Tpr. Moore's investigation indicated Driver #2 was wearing a shoulder and lap belt at the time of the crash.

Passengers

At the time of the crash, there were no passengers in either vehicle.

[redacted]

Environmental Factors



Note: Top of Map is North

US 50 is an east/west two-lane Federal highway. It tracks from west-southwest (255°) to east-northeast (75°) in the area of the crash. The traveled portion and its shoulders are asphalt. US 50 is straight in the area of the crash. The traveled portion was approximately 23.5' wide. The shoulders adjacent to both sides of the traveled portion of US 50 were approximately 10.5' wide. US 50 is maintained by the Missouri Department of Transportation.

Grade of US 50

As one views the crash scene, there is no appreciable grade in the area of the crash. Vehicle #1 was traveling up an indistinguishable grade of 0.1 percent as it was westbound on US 50. Data collected with the

[redacted]

total station was used to calculate the grade of US 50. Math calculations and formulas are included in Appendix II.

Super-elevation of US 50

Near the area of impact, the westbound lane of US 50 had a super-elevation of 0.9 percent. The high point was the center of the traveled portion of the roadway. The low point was the white fog line adjacent to the right edge of the westbound lane. The super-elevation of the eastbound lane of US 50 was 1.6 percent. The high point was the center of the traveled portion of the roadway. The low point was the white fog line adjacent to the right edge of the eastbound lane. Data collected with the total station was used to calculate the super-elevation of US 50. Math calculations and formulas are included in Appendix II.

Coefficient of Friction of US 50

I used a drag tire and scale to calculate the coefficient of friction. I made three pulls in the eastbound lane adjacent to and in the direction of the skid made by Vehicle #1. The coefficient of friction was calculated at 0.87. Math calculations and formulas are included in Appendix II.

Condition of US 50

US 50 was free from defects, debris and extraneous material in the area of the crash. The surface was overlaid with new asphalt in the late summer of 2004.

Traffic Control

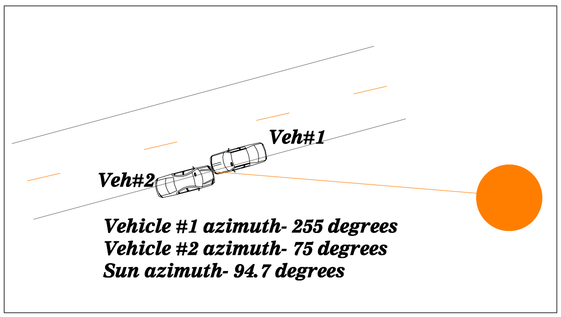
The speed limit in the area of the crash was 55 miles per hour. There were no other signs or signaling devices in the area to regulate the flow of traffic. The traveled portion was divided into a westbound lane and an eastbound lane by a series of yellow center stripes that were approximately 10.0’ long and spaced approximately 30.0’ apart. The right edges of the traveled portions were delineated from the asphalt shoulders by solid white fog lines. There were rumble strips ground into the pavement of both shoulders. Rumble strips are designed to cause vibration and noise in a vehicle that strays from the traveled portion of the highway.

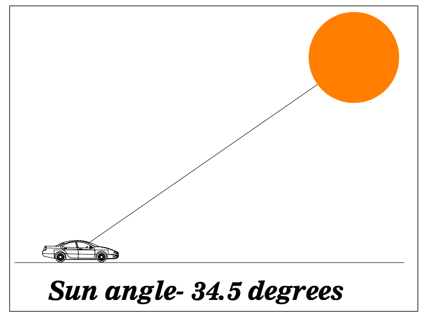
Vision Obstructions

There are no natural or permanent vision obstructions in the area of the crash. There was no evidence to indicate that a temporary vision obstruction was present at the time of the crash.

Light Conditions

On the day of the crash, the sun rose at 0607 hours and set at 2010 hours. The moon rose at 0420 hours and set at 1946 hours. The moon phase was 0.03. The sky was clear. There was no evidence to indicate the angle or azimuth of the sun was a factor in this crash.





Weather Conditions

Tpr. Moore's investigation indicated this crash occurred under clear skies. According to data archived by the National Weather Service at Spirit of St. Louis Airport, Chesterfield, Missouri, at 0900 hours on the day of the crash, the temperature was 88^{o}. The relative humidity was 54 percent. The barometric pressure was 30.07" Hg. The wind was from the south-southwest at 13 miles per hour. Visibility was 10 miles under mostly sunny skies.

Spirit of St. Louis Airport is approximately 22.7 miles northeast of the crash site on an azimuth of 46.46^{o}. It was the closest weather monitoring station that I located.

[redacted]

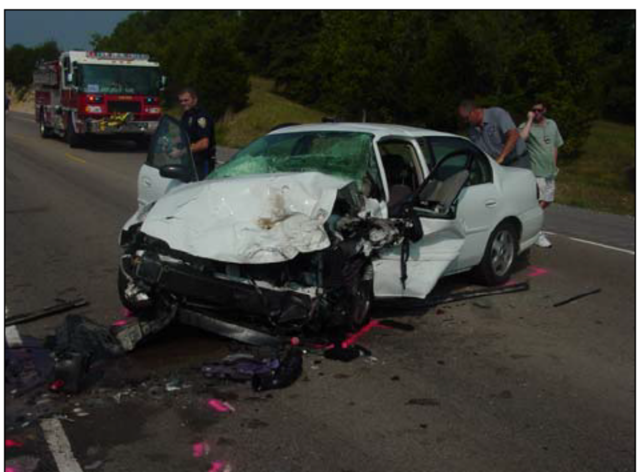
echanical Factors

Vehicles

Vehicle #1

Vehicle #1 was a white 2004 Chevrolet Malibu Classic four-door sedan. At the time of the crash, it was traveling west in the eastbound lane of US 50. Vehicle #1 was owned by Enterprise Rent A Car, 1512 Vandalia Street, Collinsville, Illinois. It displayed Illinois registration, [redacted] which was to expire in December of 2005. The VIN was [redacted]. Vehicle #1 was equipped with the following tires:

Tire	***Make***	***Size***	***Tread Depth***	***Air Pressure***
Right front	Goodyear Eagle GA	P205/65R15	6/32” 6/32” 5/32”	30 psi
Left front	Goodyear Eagle GA	P205/65R15	unknown	0 psi
Right rear	Goodyear Eagle GA	P205/65R15	6/32” 5/32” 5/32”	0 psi
Left rear	Goodyear Eagle GA	P205/65R15	8/32” 8/32” 7/32”	24 psi



DSC00001

DSC00003

Vehicle #1 was demolished when it collided with Vehicle #2. It was towed from the scene by Sturm’s County Wide Towing and taken to their facility at 5th and International in Washington, Missouri.

Vehicle #2

Vehicle #2 was a blue 1989 Dodge Dynasty four-door sedan. At the time of the crash, it was traveling [redacted]. The odometer and certificate of inspection were obliterated by damage from the collision with Vehicle #1. Vehicle #2 was equipped with the following tires:

Tire	***Make***	***Size***	***Tread Depth***	***Air Pressure***
Right front	Champiro 75 Steel Belted	P195/75R14	10/32” 9/32” 9/32”	34 psi
Left front	Champiro 75 Steel Belted	P195/75R14	Unknown	0 psi
Right rear	Remington Maximum	P195/75R14	4/32” 4/32” 4/32”	30 psi
Left rear	GrandAm Radial STE	P195/75R14	5/32” 5/32” 5/32”	26 psi

DSC00012

Vehicle #2 was demolished in this crash. It was towed from the scene by Sturm’s County Wide Towing and taken to their facility at 5th and International in Washington, Missouri.

[redacted]

Drivers

Driver #1

[redacted]

There was no evidence to indicate Driver #1 was under the influence of intoxicants or controlled substances at the time of the crash. There was no evidence to indicate Driver #1 had a medical condition that contributed to this crash.

I am unaware if Driver #1 was familiar with the roadway or the area of the crash. US 50 was straight and flat in the area of the crash. There is nothing in the design of the roadway or in the area of the crash that requires specific knowledge to safely operate a motor vehicle.

Driver #1 made no statements regarding the circumstances of this crash to Tpr. Moore.

Driver #2

[redacted]

There was no evidence to indicate Driver #2 was under the influence of intoxicants or controlled substances at the time of the crash. There was no evidence to indicate Driver #2 had a medical condition that contributed to this crash.

I am unaware if Driver #2 was familiar with the roadway or the area of the crash. There is nothing in the design of the roadway or in the area of the crash that requires specific knowledge to safely operate a motor vehicle.

[redacted]

Witnesses

Witness #1

[redacted] g

[redacted] , but

[redacted]

Witness #2

[redacted]

Witness #3

[redacted]

Scene Investigation

Cpl. Lichay and I used a Sokkia SET 5oo total station to record the data and points of evidence that were utilized to produce the diagrams attached to the original accident report and to this narrative. With regards to the accuracy of the measurements obtained with the total station, a fixed reference prism was established. The first shot taken with the total station was to that fixed reference prism. The distance recorded was 23.5’. The last shot taken was to the fixed reference prism. The distance recorded was 23.5’. Additionally, the distance between the total station and the fixed reference prism was physically measured with a steel tape at 23’6”, or 23.5’.

DSC00021

DSC00023

There was evidence on the roadway to indicate the impact between Vehicle #1 and Vehicle #2 occurred astride the white fog line that delineated the eastbound lane of US 50 from the eastbound shoulder. There was a skid from the left front of Vehicle #1 that was approximately 20.0’ long. It started approximately 1.0’ from the fog line in the eastbound lane. It crossed the fog line and ended approximately 1.0’ on the eastbound shoulder. There were scrapes and small gouges on both sides of the fog line. There was a post-impact skid and scrape from the right front tire of Vehicle #2 that led to the impact between the guardrail and the right front fender of Vehicle #2.

[redacted]

DSC00003

DSC00013

Vehicle #1 came to rest on the traveled portion of US 50. It rotated counterclockwise from impact. The center of mass of Vehicle #1 moved approximately 14.25’ from impact to its final position. At rest, the left front tire of Vehicle #1 was approximately 3.0’ from the fog line separating delineating the eastbound lane from the eastbound shoulder. The right rear tire was approximately 0.8’ from the centerline and 11.5’ from the fog line delineating the eastbound lane from the eastbound shoulder. Vehicle #1 was facing southeast. It had not been moved prior to my arrival.

Vehicle #2 rotated counterclockwise from the area of impact. The center of mass moved approximately 18.0’ from the initial impact area to the point where it was redirected when the right front fender struck the end of the guardrail. It then moved approximately 14.5’ to its final position. The right front tire was approximately 8.5’ from the edge of the eastbound shoulder. The right rear tire was approximately 14.8’ from the edge of the eastbound shoulder. It was facing northwest. Vehicle #2 had not been moved prior to my arrival. The roof had been cut and folded by emergency personnel during the extrication of Driver #2.

During the examination of Vehicle #1 at the tow yard, I obtained data from the sensing diagnostic module in Vehicle #1. It had recorded a deployment file in association with this crash. Approximately 5 seconds prior to impact, the deployment file indicated Vehicle #1 was traveling 59 miles per hour and then increased to 61 miles per hour. It showed that within approximately 1 second of impact, Vehicle #1 had slowed to 52 miles per hour, which is consistent with the evidence of deceleration on the roadway. The deployment file also

[redacted]
showed evidence of an increase of engine speed, which is consistent with a vehicle pulling out to pass or overtake other vehicles. The readings in the deployment file are consistent with Tpr. Lowe's observations. A copy of the crash data retrieval file is included in Appendix V.

Findings

Vehicle #1 was traveling west on US 50. Vehicle #2 was traveling east on US 50. Vehicle #1 had been reported as a stolen vehicle from the city of [redacted]. Tpr. Lowe was watching for and attempting to locate Vehicle #1. He was traveling east on US 50 when he met Vehicle #1. As Tpr. Lowe turned around and started west on US 50, Vehicle #1 drove into the eastbound lane, apparently to pass other westbound traffic. Vehicle #1 collided with Vehicle #2 as Vehicle #2 drove onto the eastbound shoulder to avoid Vehicle #1.

There was no physical evidence on the roadway to indicate either vehicle was exceeding the posted 55 miles per hour speed limit. The data from the event data recorded in Vehicle #1 indicated an impact speed of approximately 52 miles per hour.

There was adequate sight distance in both directions from the area of impact. Driver #1 should have been able to see approaching traffic and realized that passing traffic moving in the same direction was dangerous and not advisable.

[redacted]

Event Analysis

This crash occurred because Driver #1, while driving a vehicle that was reported stolen, attempted to pass a vehicle or vehicles traveling in the same direction. As he traveled into the oncoming lane during his attempt to pass, his vehicle collided with Vehicle #2. Driver #2 died from injuries sustained in the collision.

My observations, findings, and calculations are based on information and evidence that was available at the time this report was prepared. New information and evidence could alter these observations, findings, and calculations.

Sgt. M. H. Mahon 298C-SS

Sgt. M.H. Mahon, #298, C-SS
Reconstructionist, ACTAR # 1054

Reviewed by:
Cpl. A.A. Mallery, 533, C-SS
Reconstructionist, ACTAR #1055

[redacted]

Photo Log

[redacted]

Original Investigating Officer: Tpr. B.A. Moore, #514, C-11
Photographer: Sgt. M.H. Mahon, #298, C-SS

The following is a log of digital photos taken at the crash scene, crash site, and the tow yard. The images on CD-ROM are stored at Missouri State Highway Patrol, General Headquarters, Traffic Division, Accident Records, 1510 East Elm, P.O. Box 568, Jefferson City, Missouri.

Note: All digital image files are prefixed DSC000… The image number in the photo log corresponds to the image file number (1=DSC00001).

Digital Images

1. Left front of Vehicle #1
2. Front of Vehicle #1
3. Right side of Vehicle #1
4. Right rear of Vehicle #1
5. Rear of Vehicle #1
6. Left rear of Vehicle #1
7. Left side of Vehicle #1
8. Area of impact
9. Right front of Vehicle #2
10. Front of Vehicle #2
11. Left front of Vehicle #2
12. Left side of Vehicle #2
13. Left side of Vehicle #2
14. Left rear of Vehicle #2
15. Right rear of Vehicle #2
16. Path of Vehicle #2 to impact area
17. Path of Vehicle #2 to impact area
18. Path of Vehicle #2 to impact area
19. Path of Vehicle #2 to impact area
20. Area of impact
21. Area of impact
22. Area of impact
23. Path of Vehicle #2 to impact area
24. Path of Vehicle #2 to impact area
25. Second impact of Vehicle #2
26. Area of impact
27. Path of Vehicle #1 to impact area
28. Path of Vehicle #1 to impact area
29. Path of Vehicle #1 to impact area
30. Path of Vehicle #1 to impact area

[redacted]

32. Path of Vehicle #1 to impact area
33. Area of impact
34. VIN plate of Vehicle #2
35. Registration of Vehicle #2
36. Registration of Vehicle #1
37. Front of Vehicle #1
38. VIN plate of Vehicle #1
39. Right side of Vehicle #1
40. Interior of Vehicle #1
41. Left front of Vehicle #2
42. Left front of Vehicle #2
43. Right side of Vehicle #2
44. Front of Vehicle #2

[redacted]

[redacted]

Comments: Page 3, paragraph 2, grade of US 50

** SLOPE OF SURFACE W/ RISE AND RUN **

$$m/e = \frac{\text{Rise}}{\text{Run}}$$

m / e = the Slope of the surface.
Rise = The Rise in feet.
Run = The Run in feet.

$$m/e = \frac{0.5810}{425.4480}$$

m/e = 0.0013

° = InvTan (m/e)
° = InvTan (0.0013)
° = 0.0744

INPUTS:	
The Rise in Feet is:	0.5810
The Run in Feet is:	425.4480

RESULTS:	
The Percentage of Grade is:	0.0013
The Degrees of Grade is:	0.0744

Sgt. Michael H. Mahon, #298, C-SS
Missouri State Highway Patrol
599 South Mason Road
St. Louis, Missouri, 63141
Phone: 636-639-9017
Fax: 636-639-1878

E-Mail: michael.mahon@mshp.dps.mo.gov

705 711 581

7.50.18

[redacted]

[redacted]

Comments: Page 4, paragraph 1, super-elevation of US 50

** SLOPE OF SURFACE W/ RISE AND RUN **

$$m/e = \frac{Rise}{Run}$$

m / e = the Slope of the surface.
Rise = The Rise in feet.
Run = The Run in feet.

$$m/e = \frac{0.1200}{12.2540}$$

m/e = 0.0097

° = InvTan (m/e)
° = InvTan (0.0097)
° = 0.5557

INPUTS:	
The Rise in Feet is:	0.1200
The Run in Feet is:	12.2540

RESULTS:	
The Percentage of Grade is:	0.0097
The Degrees of Grade is:	0.5557

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705 711 581

7.50.18

[redacted]

[redacted]

Comments: Page 4, paragraph 1, super-elevation of US 50

*** * SLOPE OF SURFACE W/ RISE AND RUN * ***

$$m/e = \frac{\text{Rise}}{\text{Run}}$$

m / e = the Slope of the surface.
Rise = The Rise in feet.
Run = The Run in feet.

$$m/e = \frac{0.1720}{10.7340}$$

$$m/e = 0.0160$$

$° = \text{InvTan}(m/e)$
$° = \text{InvTan}(0.0160)$
$° = 0.9166$

INPUTS:	
The Rise in Feet is:	0.1720
The Run in Feet is:	10.7340

RESULTS:	
The Percentage of Grade is:	0.0160
The Degrees of Grade is:	0.9166

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705 711 581
7.50.18

[redacted]

[redacted]

Comments: Page 4, paragraph 2, coefficient of friction of US 50

* * AVERAGE DRAG FACTOR * *

$$f = \frac{F}{W}$$

f = The Acceleration/Drag Factor.
F = The Pull Force in Pounds.
W = The Weight in Pounds.

$$f = \frac{29.3000}{33.5000} \quad f = \frac{29.5000}{33.5000} \quad f = \frac{29.3000}{33.5000}$$

$f = 0.8746$ $\quad f = 0.8805$ $\quad f = 0.8746$

Sum of DF's = 0.8746 + 0.8805 + 0.8746

Sum of DF's = 2.6297

$$af = \frac{\text{Sum of DF's}}{\text{\# of DF's}} \qquad af = \frac{2.6297}{3}$$

af = The Average Drag Factor.

$af = 0.8765$

INPUTS:	
The Drag Sled Weight in Pounds is:	33.5000
The Sum of the DF's is:	2.6297
The # of DF's is:	3.0000

RESULTS:	
The Average Drag Factor is:	0.8765

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705 711 581

7.50.18

[redacted]

Astronomical Data

Sunrise and Sunset

[redacted]

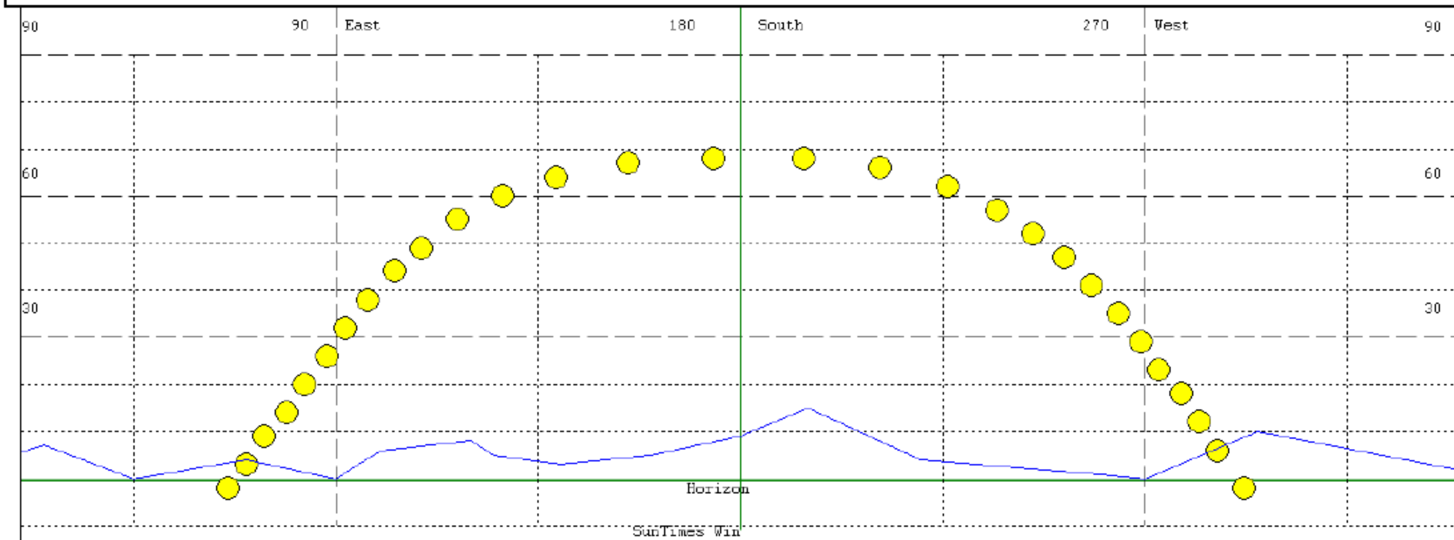
Latitude = 38.26.065 North, Longitude = 90.57.448 West
Zone = 6   Savings = Yes   Twilight = Civil

Day	Rise	@Azm	Twilight	Set	@Azm	Twilight	Hrs	MaxA	@Time

[redacted]

** SunTimes ** - Zephyr Services, 1900 Murray Ave., Pittsburgh PA 15217

[redacted]



[redacted]

Place: , Missouri
Lat: 38°15' North
Lon: 90°34' West
Z=6S
Rise: 06:07
Azm: 066°52'

Set: 20:10
Azm: 292°54'

Twilite: 05:37/20:38Civ
Hrs Sun: 14:03
Max Alt: 69.1° @ 13:08

Time	Alt	Azm	Time	Alt	Azm	Time	Alt	Azm
06:30	03.6	070.5	13:00	69.0	174.4	19:30	06.6	286.9
07:00	09.2	074.9	13:30	68.5	194.2			
07:30	14.9	079.3	14:00	66.2	211.9			
08:00	20.6	083.7	14:30	62.5	226.1			
08:30	26.5	088.2	15:00	57.9	237.1			
09:00	32.4	092.8	15:30	52.7	245.8			
09:30	38.2	097.9	16:00	47.2	252.9			
10:00	44.0	103.5	16:30	41.5	259.0			
10:30	49.7	110.0	17:00	35.6	264.3			
11:00	55.0	117.7	17:30	29.7	269.2			
11:30	60.0	127.3	18:00	23.9	273.7			
12:00	64.3	139.7	18:30	18.0	278.1			
12:30	67.5	155.5	19:00	12.2	282.5			

[redacted]

Moonrise and Moonset

[redacted]

Latitude = 38.26.065 North, Longitude = 90.57.448 West

Zone = 6   Savings = Yes

Day	Rise	@Azm	Set	@Azm	Phase
[redacted]	[redacted]	[redacted]	[redacted]	[redacted]	[redacted]
[redacted]	[redacted]	[redacted]	[redacted]	[redacted]	[redacted]
[redacted]	[redacted]	[redacted]	[redacted]	[redacted]	[redacted]

[redacted]

[redacted]

[redacted]eather Data

Union, MO Past 24 Hours

Union, MO is your default location. (What is this?)
English | Metric

Past 24 Hours from 6p[redacted]

(Reports from St Louis Intl Arp[redacted]

Time	Temp (° F)	RealFeel (° F)	Rel. Hum.	Wind Dir.	Wind Spd.	Press. (in)	Precip. (in)	Vis. (mi)	Weather
6pm	92	89	35	S	11	29.99	0.00	7	M/Sunny
7pm	90	88	43	S	11	30.00	0.00	7	M/Clear
8pm	89	89	47	SSE	10	30.01	0.00	10	Clear
9pm	86	86	52	SSE	10	30.01	0.00	10	Clear
10pm	85	86	56	SSE	9	30.02	0.00	10	Clear
11pm	83	83	60	S	12	30.02	0.00	10	Clear
Mid	81	82	66	S	9	30.02	0.00	10	Clear
1am	80	82	68	S	6	30.02	0.00	9	Clear
2am	79	82	71	SSW	4	30.02	0.00	8	Clear
3am	78	81	73	SSW	5	30.02	0.00	7	Clear
4am	77	79	76	S	7	30.02	0.00	6	Clear
5am	76	79	79	SSW	4	30.04	0.00	6	M/Sunny
6am	76	79	81	S	7	30.05	0.00	6	M/Sunny
7am	81	85	68	SSW	7	30.06	0.00	6	M/Sunny
8am	85	88	60	SSW	12	30.08	0.00	8	M/Sunny
9am	88	92	54	SSW	13	30.07	0.00	9	M/Sunny
10am	91	97	46	SW	10	30.06	0.00	9	Sunny
11am	93	99	39	SSW	7	30.05	0.00	9	M/Sunny
Noon	95	97	33	S	13	30.02	0.00	9	M/Sunny
1pm	95	101	36	S	7	30.01	0.00	9	M/Sunny
2pm	97	100	35	S	12	29.99	0.00	9	M/Sunny
3pm	96	97	36	SE	14	29.98	0.00	9	M/Sunny
4pm	96	96	35	SE	16	29.97	0.00	9	P/Sunny
5pm	94	93	38	SSE	13	29.96	0.00	9	M/Sunny

Past 24 Hour Totals
High Temperature: 97° F (at 2pm), Low Temperature: 76° F (at 5am)
Average Temperature: 87° F, Total Precipitation: 0.00 in

[redacted]

DR File

Vetronix

CDR CRASH DATA RETRIEVAL SYSTEM

CDR File Information

Vehicle Identification Number	[redacted]
Investigator	[redacted]
Case Number	[redacted]
Investigation Date	[redacted]
Crash Date	[redacted]
Filename	[redacted]
Saved on	[redacted]
Collected with CDR version	Crash Data Retrieval Tool 2.710
Collecting program verification number	3F8F669A
Reported with CDR version	Crash Data Retrieval Tool 2.710
Reporting program verification number	3F8F669A
Interface used to collected data	Block number: 00 Interface version: 42 Date: 03-10-05 Checksum: 1300
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 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 file will be locked after a deployment, if the non-deployment occurred within 5 seconds before the deployment or a deployment level event occurs within 5 seconds after the deployment.

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 deployments 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-deployments, 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 does not receive a valid message.

-Driver's Belt Switch Circuit Status indicates the status of the driver's seat belt switch circuit

-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.

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 Class 2 data link, to the SDM.

-Brake Switch Circuit Status data is transmitted once a second by either the ABS module or the PCM, via the Class 2 data link, to the SDM. Depending on vehicle option content, the Brake Switch Circuit Status data may not be available.

-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".

-In most vehicles, the Driver's Belt Switch Circuit is wired directly to the SDM. In some vehicles, the Driver's Belt Switch Circuit Status data is transmitted from the Body Control Module (BCM), via the Class 2 data link, to the SDM.

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

[redacted]

Printed on: Thursday, August 4 2005 at 08:29:17 AM

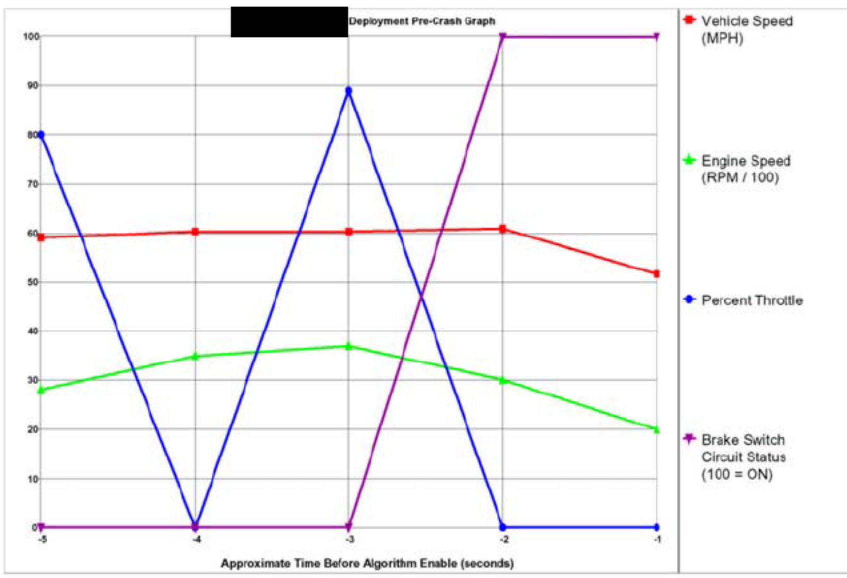
[redacted]

Vetronix

CDR CRASH DATA RETRIEVAL SYSTEM

System Status At Deployment

SIR Warning Lamp Status	OFF
Driver's Belt Switch Circuit Status	UNBUCKLED
Passenger Front Air Bag Suppression Switch Circuit Status	Air Bag Not Suppressed
Ignition Cycles At Deployment	3075
Ignition Cycles At Investigation	3076
Maximum SDM Algorithm Forward Velocity Change (MPH)	-34.17
Algorithm Enable to Maximum SDM Recorded Velocity Change (msec)	107.5
Time Between Non-Deployment And Deployment Events (sec)	.1
Time From Algorithm Enable to Deployment Command Criteria Met (msec)	10

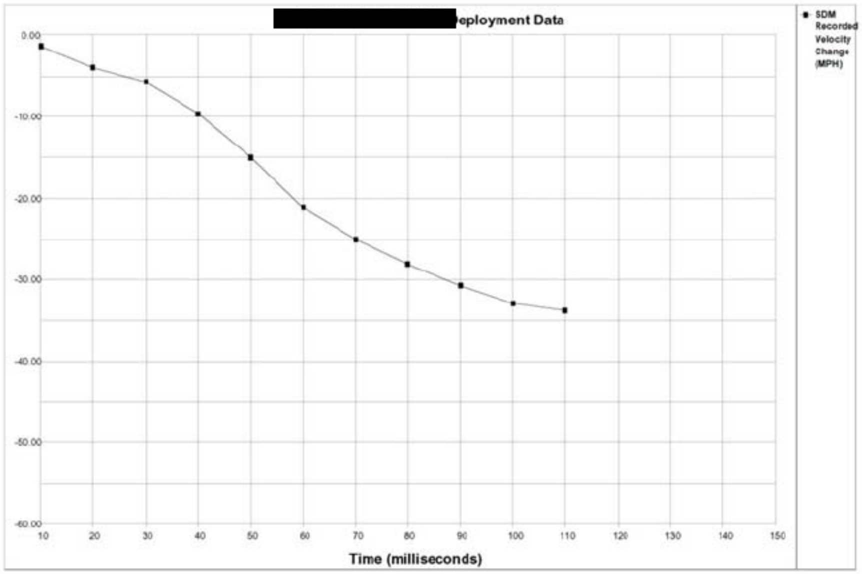


Seconds Before AE	Vehicle Speed (MPH)	Engine Speed (RPM)	Percent Throttle	Brake Switch Circuit Status
-5	59	2816	80	OFF
-4	60	3456	0	OFF
-3	60	3712	89	OFF
-2	61	3008	0	ON
-1	52	1984	0	ON

[redacted]

Vetronix

CDR CRASH DATA RETRIEVAL SYSTEM



Time (milliseconds)	10	20	30	40	50	60	70	80	90	100	110	120	130	140	150
SDM Recorded Velocity Change	-1.32	-3.95	-5.70	-9.65	-14.92	-21.06	-25.01	-28.08	-30.72	-32.91	-33.79	N/A	N/A	N/A	N/A

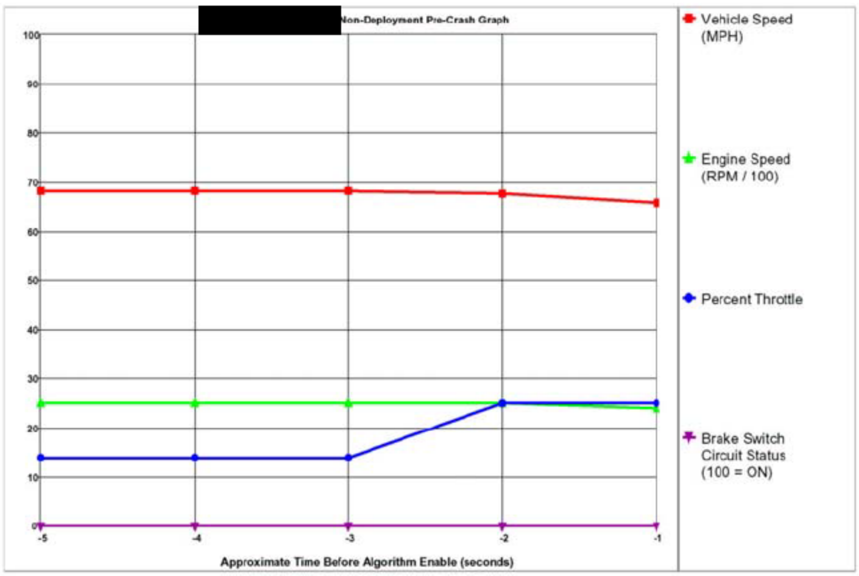
[redacted]

Vetronix

CDR CRASH DATA RETRIEVAL SYSTEM

System Status At Non-Deployment

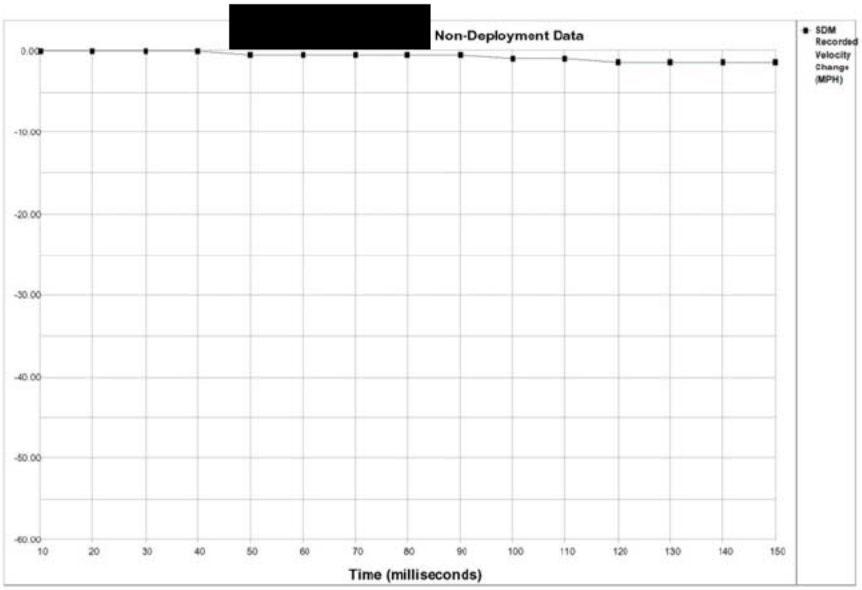
SIR Warning Lamp Status	OFF
Driver's Belt Switch Circuit Status	UNBUCKLED
Passenger Front Air Bag Suppression Switch Circuit Status	Air Bag Not Suppressed
Ignition Cycles At Non-Deployment	3010
Ignition Cycles At Investigation	3076
Maximum SDM Algorithm Forward Velocity Change (MPH)	-1.73
Algorithm Enable to Maximum SDM Recorded Velocity Change (msec)	100



Seconds Before AE	Vehicle Speed (MPH)	Engine Speed (RPM)	Percent Throttle	Brake Switch Circuit Status
-5	68	2496	14	OFF
-4	68	2496	14	OFF
-3	68	2496	14	OFF
-2	68	2496	25	OFF
-1	66	2432	25	OFF

[redacted]

Vetronix CDR CRASH DATA RETRIEVAL SYSTEM



Time (milliseconds)	10	20	30	40	50	60	70	80	90	100	110	120	130	140	150
SDM Recorded Velocity Change	0.00	0.00	0.00	0.00	-0.44	-0.44	-0.44	-0.44	-0.44	-0.88	-0.88	-1.32	-1.32	-1.32	-1.32

[redacted] Page 5 of 6 Printed on: Thursday, August 4 2005 at 08:29:17 AM

[redacted]

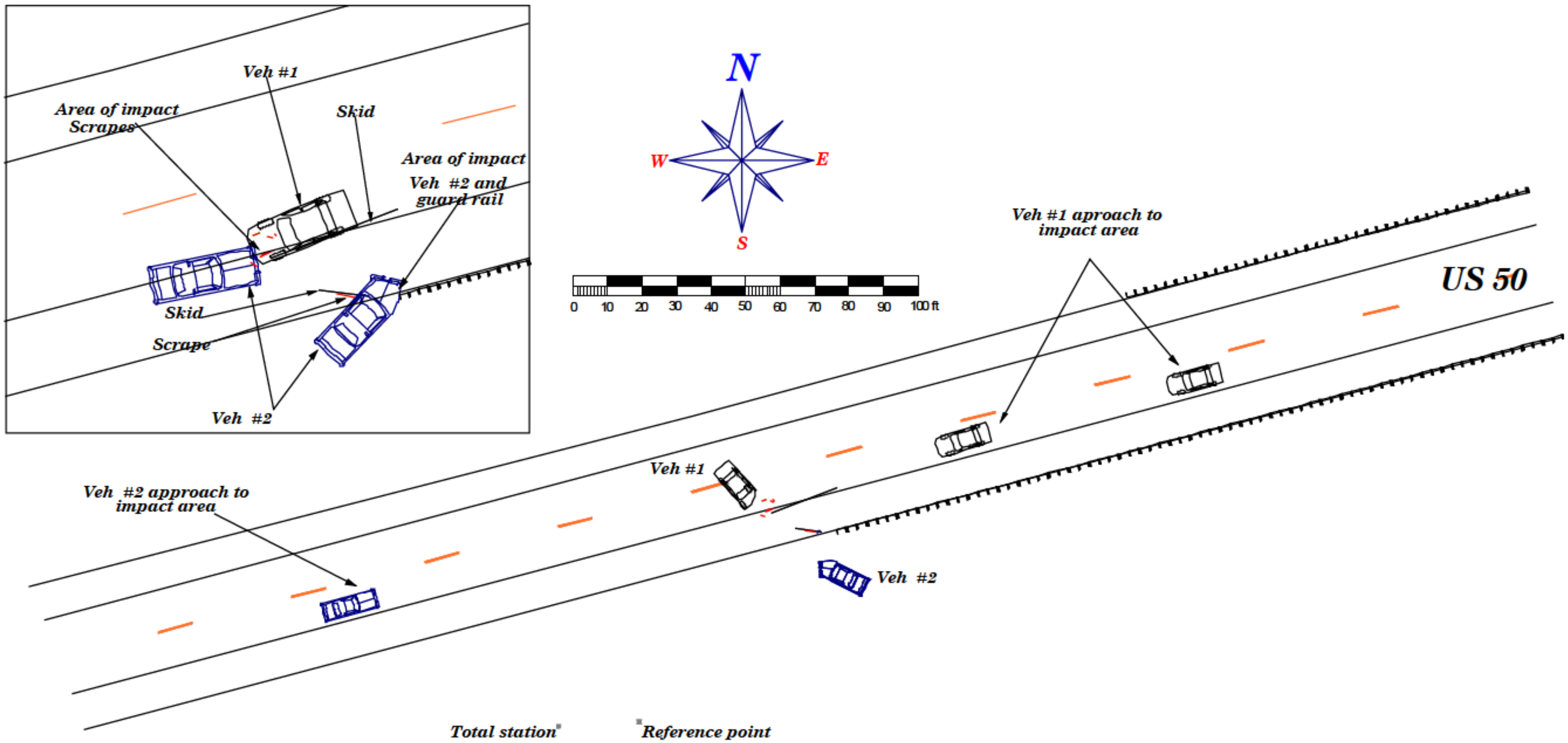
Hexadecimal Data

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  95 26
$03  41 53 34 30 37 36
$04  4B 54 4B 34 37 33
$05  00
$06  22 67 41 00
$10  FE 7F F0
$11  A7 AA AA E3 B2 00
$14  03 04 2B 80
$18  88 85 90 BC FF 00
$1C  FA 32 4E FA FA FA
$1D  FA FA 32 4E FA FA
$1E  FA FA
$1F  FF 02 00 00 00
$20  A0 00 00 FF 27 F0
$21  FF FF FF FF FF FF
$22  FF FF FF FF FF FF
$23  FF 00 00 7E 00 00
$24  00 00 00 01 01 01
$25  01 01 02 02 03 03
$26  03 03 00 6A 6D 6E
$27  6E 6E 00 00 00 41
$28  41 24 24 24 00 26
$29  27 27 27 27 00 FE
$2A  87 FC FF FF FF FF
$2B  FF FF FF 00 00 00
$2C  00 00 00 00
$2D  28 11 27 00
$30  A0 00 00 FF 27 F0
$31  FF BF FF FF FF FF
$32  FF FF FF FF FF FF
$33  7C 08 03 00 03 09
$34  0D 16 22 30 39 40
$35  46 4B 4D FF FF FF
$36  FF 0B 56 09 BE 53
$37  62 61 61 5F 00 C0
$38  00 00 00 E2 00 CC
$39  00 1F 2F 3A 36 2C
$3A  00 FE 7F F8 31 00
$3B  00 40 00
$3C  04 2B 56 2B
$40  FF FF FF FF FF FF
$41  FF FF FF FF FF FF
$42  FF FF FF FF FF FF
$43  FF
```

[redacted]

orensic Map



```
  1 N:    0.000 E:     0.000 El:  100.000 D:  TS
100 N:    1.261 E:    23.435 El:   98.829 D:  RP
101 N:  157.006 E:   281.422 El:   96.464 D:  GR
102 N:  156.981 E:   281.378 El:   96.466 D:  EP
103 N:  146.709 E:   283.838 El:   96.938 D:  WL
104 N:  113.983 E:   291.741 El:   96.575 D:  EP
105 N:  113.983 E:   291.741 El:   96.575 D:  GR
106 N:  124.262 E:   288.541 El:   96.911 D:  WL
107 N:   56.898 E:    81.007 El:   97.002 D:  GR
108 N:  126.187 E:   164.746 El:   96.837 D:  GR
109 N:   90.879 E:    38.420 El:   97.121 D:  EP
110 N:   81.849 E:    40.588 El:   97.360 D:  WL
111 N:   59.397 E:    45.460 El:   97.308 D:  WL
112 N:   48.972 E:    48.565 El:   97.051 D:  EP
113 N:   40.978 E:  -153.751 El:   97.181 D:  EP
114 N:   31.079 E:  -149.285 El:   97.524 D:  WL
115 N:   19.953 E:  -144.990 El:   97.697 D:  LL
116 N:    9.393 E:  -141.012 El:   97.453 D:  WL
117 N:   -0.989 E:  -137.689 El:   97.268 D:  EP
118 N:   69.809 E:    42.869 El:   97.480 D:  LL
119 N:   77.397 E:    49.261 El:   97.455 D:  VB
120 N:   74.603 E:    45.111 El:   97.458 D:  VB
121 N:   71.732 E:    46.916 El:   97.507 D:  11R
122 N:   75.235 E:    51.392 El:   97.432 D:  11R
123 N:   70.170 E:    55.106 El:   97.428 D:  11R
124 N:   64.612 E:    53.058 El:   97.358 D:  11R
125 N:   64.167 E:    54.495 El:   97.337 D:  VB
126 N:   69.214 E:    56.948 El:   97.406 D:  VB
127 N:   62.678 E:    62.044 El:   97.201 D:  S1
128 N:   69.984 E:    80.575 El:   97.264 D:  S1
129 N:   66.099 E:    59.267 El:   97.357 D:  GM
130 N:   66.433 E:    60.255 El:   97.325 D:  GM
131 N:   65.888 E:    62.197 El:   97.293 D:  GM
132 N:   62.972 E:    60.311 El:   97.264 D:  SC
133 N:   63.417 E:    60.946 El:   97.279 D:  SC
134 N:   63.534 E:    61.834 El:   97.286 D:  SC
135 N:   65.878 E:    61.478 El:   97.312 D:  SC
136 N:   65.703 E:    62.189 El:   97.301 D:  SC
137 N:   66.189 E:    62.417 El:   97.283 D:  SC
138 N:   66.044 E:    62.732 El:   97.308 D:  SC
139 N:   61.976 E:    58.847 El:   97.256 D:  SC
140 N:   61.448 E:    59.770 El:   97.245 D:  SC
141 N:   57.333 E:    71.695 El:   97.058 D:  SC
142 N:   56.819 E:    74.306 El:   97.022 D:  SC
143 N:   56.999 E:    76.341 El:   97.070 D:  S1
144 N:   57.831 E:    69.000 El:   97.096 D:  S1
145 N:  129.107 E:   266.217 El:   97.116 D:  LL
146 N:  139.511 E:   304.297 El:   97.041 D:  LL
147 N:   38.229 E:    87.386 El:   91.762 D:  VB
148 N:   42.738 E:    90.100 El:   91.800 D:  VB
```

149 N: 47.889 E: 80.630 El: 94.082 D: VB
150 N: 48.418 E: 79.345 El: 94.444 D: VB
151 N: 47.803 E: 75.310 El: 94.720 D: VB
152 N: 45.206 E: 76.057 El: 93.681 D: VB
153 N: 42.072 E: 77.769 El: 92.843 D: VB
154 N: 39.810 E: 84.512 El: 91.928 D: 11L
----
155 N: 44.757 E: 87.109 El: 92.508 D: 11L
156 N: 48.508 E: 79.040 El: 94.408 D: 11L
157 N: 43.956 E: 80.248 El: 92.807 D: 11L
158 N: 1.255 E: 23.426 El: 98.830 D: RM

Traverse Print Out

Job Description: Crew: Inst: Temp: Press:

Continue File 05-0803C036 2-10.raw 10:31:50 8/3/05
10:34:01 [redacted]

Setup	Backsight	BS Azimuth	BS Reading	Instrument Height
1	100	N/A	86.5508	5.475

1 N: 0.000 E: 0.000 El: 100.000 D: TS
100 N: 1.261 E: 23.435 El: 98.829 D: RP

Pt#	HZAngle	SlpDist	VTAng	ParOff	PerpOff	TgtHt	Description
101	60.5034	322.280	90.4143	0.000	0.000	5.100	GR
102	60.5034	322.230	90.4142	0.000	0.000	5.100	EP
103	62.4000	319.530	90.3659	0.000	0.000	5.100	WL
104	68.3934	313.240	90.4142	0.000	0.000	5.100	EP
105	68.3934	313.240	90.4142	0.000	0.000	5.100	GR
106	66.4202	314.180	90.3754	0.000	0.000	5.100	WL
107	54.5459	99.050	91.5705	0.000	0.000	5.100	GR
108	52.3259	207.550	90.5836	0.000	0.000	5.100	GR
109	22.5501	98.720	91.5320	0.000	0.000	5.100	EP
110	26.2235	91.410	91.5324	0.000	0.000	5.100	WL
111	37.2545	74.860	92.2053	0.000	0.000	5.100	WL
112	44.4539	69.050	92.4532	0.000	0.000	5.100	EP
113	284.5525	159.150	91.0900	0.000	0.000	5.100	EP
114	281.4537	152.490	90.2557	0.000	0.000	6.800	WL
115	277.5008	146.360	90.2258	0.000	0.000	6.800	LL
116	273.4839	141.330	90.2944	0.000	0.000	6.800	WL
117	269.3518	137.700	90.3508	0.000	0.000	6.800	EP
118	31.3314	81.930	90.5009	0.000	0.000	6.800	LL
119	32.2832	91.790	91.4923	0.000	0.000	5.100	VB
120	31.0937	87.230	91.5459	0.000	0.000	5.100	VB
121	33.1112	85.760	91.5500	0.000	0.000	5.100	11R
122	34.2012	91.160	91.5100	0.000	0.000	5.100	11R
123	38.0835	89.270	91.5331	0.000	0.000	5.100	11R
124	39.2331	83.660	92.0400	0.000	0.000	5.100	11R
125	40.2025	84.240	92.0401	0.000	0.000	5.100	VB
126	39.2649	89.680	91.5351	0.000	0.000	5.100	VB
127	44.4233	88.250	92.0339	0.000	0.000	5.100	S1
128	49.0125	106.770	91.4011	0.000	0.000	5.100	S1
129	41.5251	88.830	91.5650	0.000	0.000	5.100	GM
130	42.1229	89.740	91.5651	0.000	0.000	5.100	GM
131	43.2057	90.660	91.5654	0.000	0.000	5.100	GM

Continue File 05-0803C036 2-10.raw 11:05:11 8/3/05

Pt#	HZAngle	SlpDist	VTAng	ParOff	PerpOff	TgtHt	Description
132	43.4550	87.250	92.0236	0.000	0.000	5.100	SC
133	43.5143	88.010	92.0057	0.000	0.000	5.100	SC
134	44.1323	88.710	91.5945	0.000	0.000	5.100	SC
135	43.0116	90.160	91.5649	0.000	0.000	5.100	SC
136	43.2534	90.520	91.5647	0.000	0.000	5.100	SC
137	43.1912	91.030	91.5647	0.000	0.000	5.100	SC

138	43.3135	91.140	91.5543	0.000	0.000	5.100	SC
139	43.3059	85.520	92.0525	0.000	0.000	5.100	SC
140	44.1225	85.780	92.0527	0.000	0.000	5.100	SC
141	51.2105	91.860	92.0410	0.000	0.000	5.100	SC
142	52.3547	93.600	92.0311	0.000	0.000	5.100	SC

143 53.1513 95.330 91.5912 0.000 0.000 5.100 S1C:\Reconstructions\2005\0803c\0803c\0803C Job
Description:
16:26:41 [redacted] Page No.: 2

144	50.0158	90.090	92.0510	0.000	0.000	5.100	S1
145	64.0741	295.890	90.3752	0.000	0.000	5.100	LL
146	65.2212	334.770	90.3414	0.000	0.000	5.100	LL
147	66.2218	95.770	95.0936	0.000	0.000	5.100	VB
148	64.3723	100.090	94.5454	0.000	0.000	5.100	VB
149	59.1733	93.990	93.5021	0.000	0.000	5.100	VB
150	58.3628	93.140	93.3903	0.000	0.000	5.100	VB
151	57.3541	89.380	93.3738	0.000	0.000	5.100	VB
152	59.1627	88.730	94.1937	0.000	0.000	5.100	VB
153	61.3515	88.740	94.5209	0.000	0.000	5.100	VB
154	64.4637	93.800	95.0959	0.000	0.000	5.100	11L
155	62.4821	98.250	94.3533	0.000	0.000	5.100	11L
156	58.2743	92.930	93.4053	0.000	0.000	5.100	11L
157	61.1717	91.810	94.4341	0.000	0.000	5.100	11L
158	86.5556	23.510	93.4607	0.000	0.000	5.100	RM

CDR File Information

Vehicle Identification Number	[redacted]
Investigator	
Case Number	
Investigation Date	
Crash Date	
Filename	
Saved on	
Collected with CDR version	
Collecting program verification number	
Reported with CDR version	
Reporting program verification number	
Interface used to collected data	Block number: 00 Interface version: 42 Date: 03-10-05 Checksum: 1300
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 may be overwritten by another Non-Deployment event. This event will be cleared by the SDM after the ignition has been cycled 250 times.
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The data in the non-deployment file will be locked after a deployment, if the non-deployment occurred within 5 seconds before the deployment or a deployment level event occurs within 5 seconds after the deployment.

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 deployments 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-deployments, 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 does not receive a valid message.
-Driver's Belt Switch Circuit Status indicates the status of the driver's seat belt switch circuit
-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.

SDM Data Source:
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-Brake Switch Circuit Status data is transmitted once a second by either the ABS module or the PCM, via the Class 2 data link, to the SDM. Depending on vehicle option content, the Brake Switch Circuit Status data may not be available.
-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".
-In most vehicles, the Driver's Belt Switch Circuit is wired directly to the SDM. In some vehicles, the Driver's Belt Switch Circuit Status data is transmitted from the Body Control Module (BCM), via the Class 2 data link, to the SDM.
-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	UNBUCKLED
Passenger Front Air Bag Suppression Switch Circuit Status	Air Bag Not Suppressed
Ignition Cycles At Deployment	3075
Ignition Cycles At Investigation	3076
Maximum SDM Algorithm Forward Velocity Change (MPH)	-34.17
Algorithm Enable to Maximum SDM Recorded Velocity Change (msec)	107.5
Time Between Non-Deployment And Deployment Events (sec)	.1
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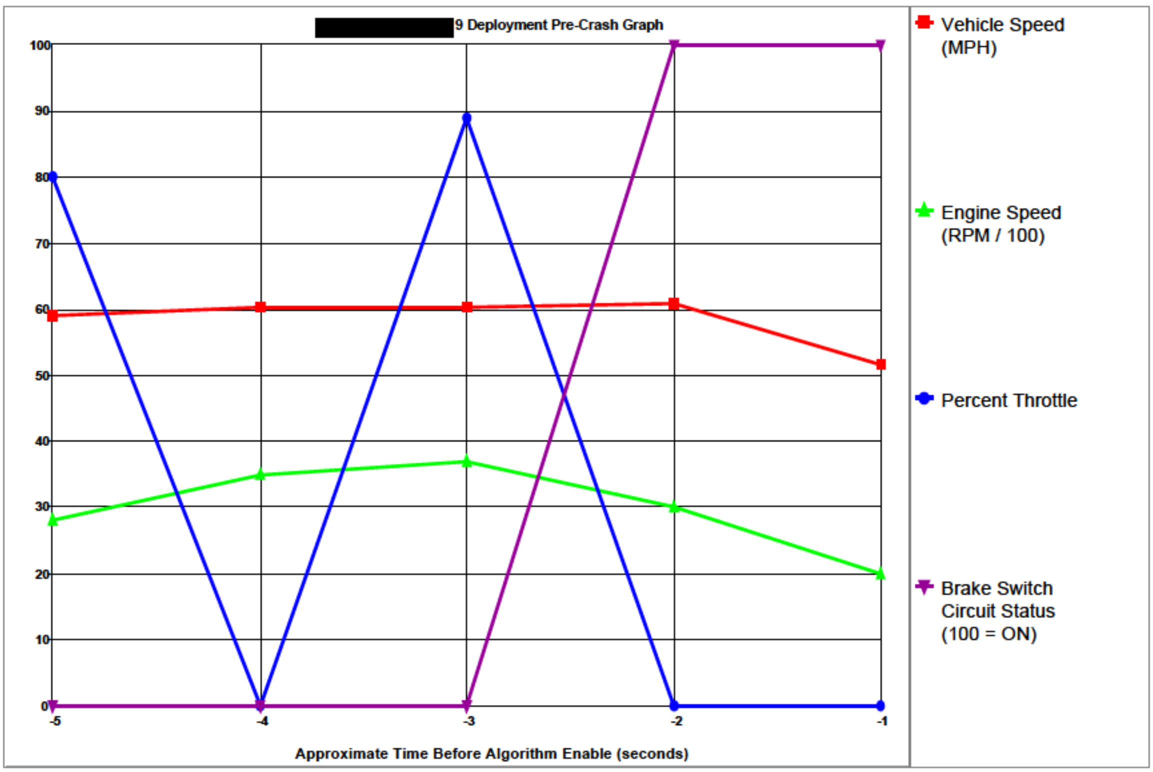
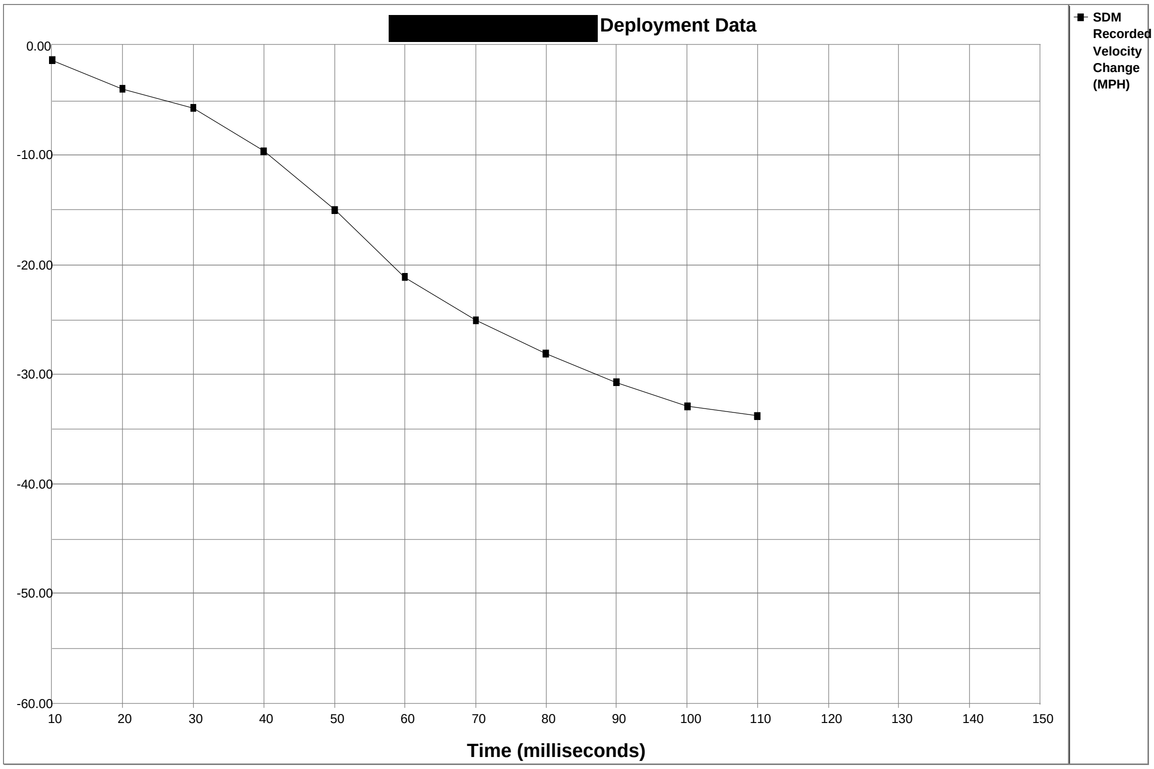


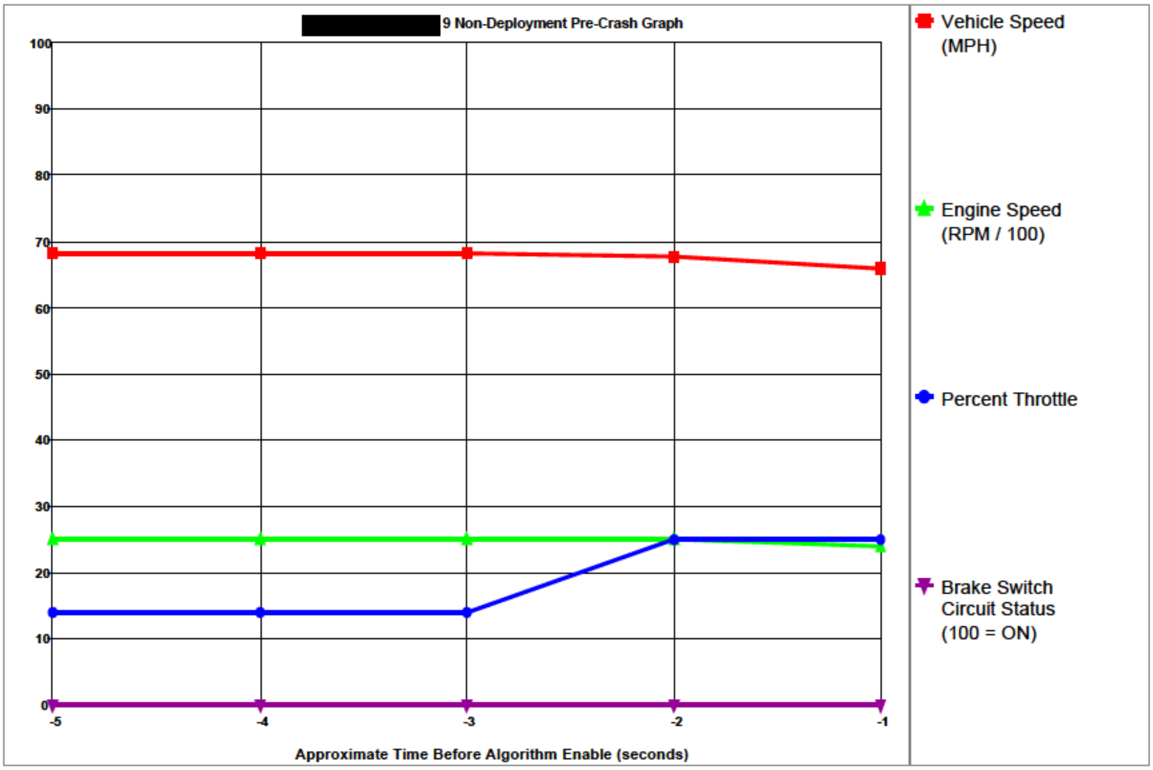
Seconds Before AE	Vehicle Speed (MPH)	Engine Speed (RPM)	Percent Throttle	Brake Switch Circuit Status
-5	59	2816	80	OFF
-4	60	3456	0	OFF
-3	60	3712	89	OFF
-2	61	3008	0	ON
-1	52	1984	0	ON



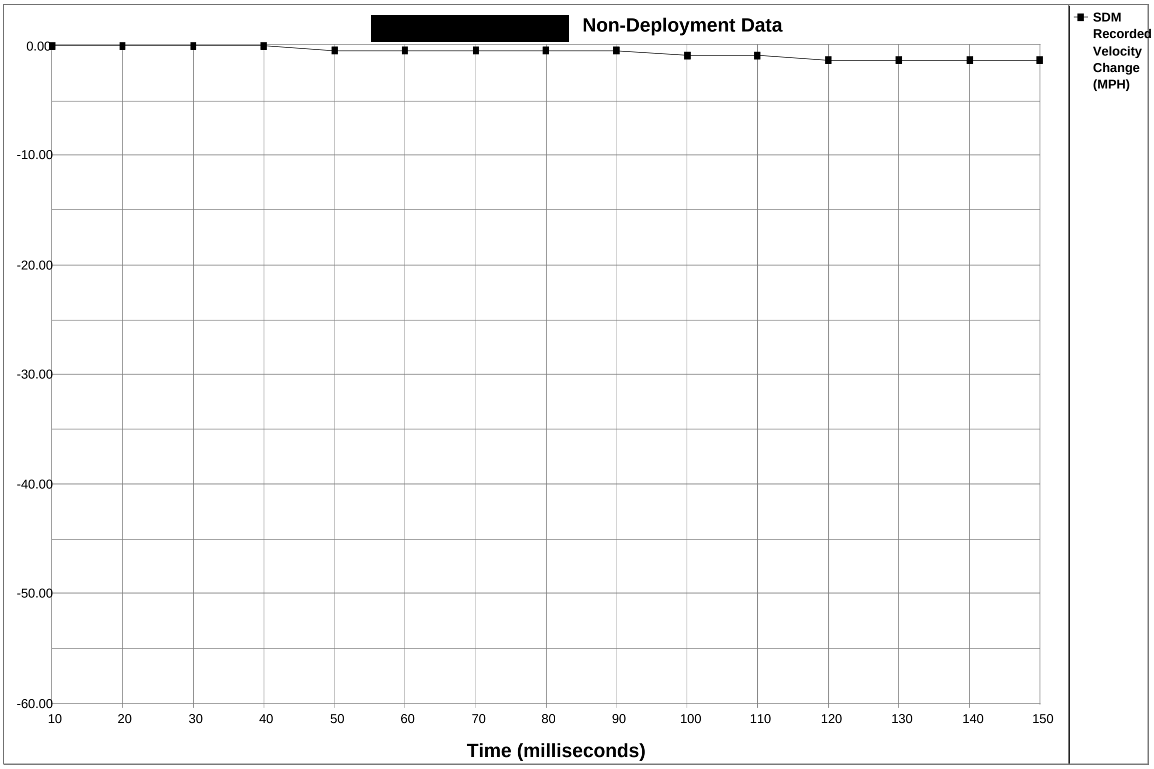
Time (milliseconds)	10	20	30	40	50	60	70	80	90	100	110	120	130	140	150
SDM Recorded Velocity Change	-1.32	-3 95	-5.70	-9.65	-14.92	-21 06	-25.01	-28 08	-30.72	-32.91	-33.79	N/A	N/A	N/A	N/A

System Status At Non-Deployment

SIR Warning Lamp Status	OFF
Driver's Belt Switch Circuit Status	UNBUCKLED
Passenger Front Air Bag Suppression Switch Circuit Status	Air Bag Not Suppressed
Ignition Cycles At Non-Deployment	3010
Ignition Cycles At Investigation	3076
Maximum SDM Algorithm Forward Velocity Change (MPH)	-1.73
Algorithm Enable to Maximum SDM Recorded Velocity Change (msec)	100



Seconds Before AE	Vehicle Speed (MPH)	Engine Speed (RPM)	Percent Throttle	Brake Switch Circuit Status
-5	68	2496	14	OFF
-4	68	2496	14	OFF
-3	68	2496	14	OFF
-2	68	2496	25	OFF
-1	66	2432	25	OFF



Time (milliseconds)	10	20	30	40	50	60	70	80	90	100	110	120	130	140	150
SDM Recorded Velocity Change	0.00	0 00	0.00	0.00	-0.44	-0.44	-0.44	-0.44	-0.44	-0 88	-0.88	-1 32	-1 32	-1.32	-1 32

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 95 26
$03 41 53 34 30 37 36
$04 4B 54 4B 34 37 33
$05 00
$06 22 67 41 00
$10 FE 7F F0
$11 A7 AA AA E3 B2 00
$14 03 04 2B 80
$18 88 85 90 BC FF 00
$1C FA 32 4E FA FA FA
$1D FA FA 32 4E FA FA
$1E FA FA
$1F FF 02 00 00 00
$20 A0 00 00 FF 27 F0
$21 FF FF FF FF FF FF
$22 FF FF FF FF FF FF
$23 FF 00 00 7E 00 00
$24 00 00 00 01 01 01
$25 01 01 02 02 03 03
$26 03 03 00 6A 6D 6E
$27 6E 6E 00 00 00 41
$28 41 24 24 24 00 26
$29 27 27 27 27 00 FE
$2A 87 FC FF FF FF FF
$2B FF FF FF 00 00 00
$2C 00 00 00 00
$2D 28 11 27 00
$30 A0 00 00 FF 27 F0
$31 FF BF FF FF FF FF
$32 FF FF FF FF FF FF
$33 7C 08 03 00 03 09
$34 0D 16 22 30 39 40
$35 46 4B 4D FF FF FF
$36 FF 0B 56 09 BE 53
$37 62 61 61 5F 00 C0
$38 00 00 00 E2 00 CC
$39 00 1F 2F 3A 36 2C
$3A 00 FE 7F F8 31 00
$3B 00 40 00
$3C 04 2B 56 2B
$40 FF FF FF FF FF FF
$41 FF FF FF FF FF FF
$42 FF FF FF FF FF FF
$43 FF


UNION


DIAMOND GRIP
Rock!


CLASSIC
DIAMOND GRIP


UNION


INTERSTATE


INTERSTATE


STATE TROOPER
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INTERSTATE


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INTERSTATE

Continue File 05-0803C036 2-10.raw 10:31:50 [redacted]

Parameters

Display Format : N Azimuth
Surface to Grid: 1.000000000
Angle Sets Tolerance   0.0"
Reciprocal Angles   OFF
Correct Curv. & Refract. OFF
Distance Units   FEET

Project Info

Control Number: 38.26.065
Project Number: 90.57.448
Project Name :
Project Scope :
Crew   :
Instrument   :
 Serial Num. :
Temperature   :
Pressure   :
PPM's   : 0

Occupy Point

BS POINT
ID :100
Desc:RP
Elev:98.829
N E :1.2615 23.4352
OCC POINT
ID :1
Desc:TS
Elev:100.000
N E :0.0000 0.0000

BS Bearing: N 86-55-08.0 E
IH   : 5.475
10:34:01 8/3/05

New Backsight for Sideshots

IH: 5.475
HAng: 86.55080 SDist: 23.52
HzDst: 23.47 VtDst: -1.55

VAng: 93.46070 TH: 5.10

Standard Sideshot

ID :101
Desc:GR
Fig :1
HAng: 60.50340 SDist: 322.28
HzDst: 322.26 VtDst: -3.91
VAng: 90.41430 TH: 5.10
Angle RT:333.5526

Standard Sideshot

ID :102
Desc:EP
Fig :2
HAng: 60.50340 SDist: 322.23
HzDst: 322.21 VtDst: -3.91
VAng: 90.41420 TH: 5.10
Angle RT:333.5526

Standard Sideshot

ID :103
Desc:WL
Fig :3
HAng: 62.40000 SDist: 319.53
HzDst: 319.51 VtDst: -3.44
VAng: 90.36590 TH: 5.10
Angle RT:335.4452

Standard Sideshot

ID :104
Desc:EP
Fig :4
HAng: 68.39340 SDist: 313.24
HzDst: 313.22 VtDst: -3.80
VAng: 90.41420 TH: 5.10
Angle RT:341.4426

Standard Sideshot

ID :105
Desc:GR
Fig :5
HAng: 68.39340 SDist: 313.24
HzDst: 313.22 VtDst: -3.80

VAng: 90.41420 TH: 5.10
Angle RT:341.4426

Standard Sideshot

ID :106
Desc:WL
Fig :6
HAng: 66.42020 SDist: 314.18
HzDst: 314.16 VtDst: -3.46
VAng: 90.37540 TH: 5.10
Angle RT:339.4654

Standard Sideshot

ID :107
Desc:GR
Fig :5
HAng: 54.54590 SDist: 99.05
HzDst: 98.99 VtDst: -3.37
VAng: 91.57050 TH: 5.10
Angle RT:327.5951

Standard Sideshot

ID :108
Desc:GR
Fig :1
HAng: 52.32590 SDist: 207.55
HzDst: 207.52 VtDst: -3.54
VAng: 90.58360 TH: 5.10
Angle RT:325.3751

Standard Sideshot

ID :109
Desc:EP
Fig :2
HAng: 22.55010 SDist: 98.72
HzDst: 98.67 VtDst: -3.25
VAng: 91.53200 TH: 5.10
Angle RT:295.5953

Standard Sideshot

ID :110
Desc:WL
Fig :3
HAng: 26.22350 SDist: 91.41

HzDst: 91.36 VtDst: -3.01
VAng: 91.53240 TH: 5.10
Angle RT:299.2727

Standard Sideshot

ID :111
Desc:WL
Fig :6
HAng: 37.25450 SDist: 74.86
HzDst: 74.80 VtDst: -3.07
VAng: 92.20530 TH: 5.10
Angle RT:310.3037

Standard Sideshot

ID :112
Desc:EP
Fig :4
HAng: 44.45390 SDist: 69.05
HzDst: 68.97 VtDst: -3.32
VAng: 92.45320 TH: 5.10
Angle RT:317.5031

Standard Sideshot

ID :113
Desc:EP
Fig :2
HAng:284.55250 SDist: 159.15
HzDst: 159.12 VtDst: -3.19
VAng: 91.09000 TH: 5.10
Angle RT:198.0017

Standard Sideshot

ID :114
Desc:EP
Fig :2
HAng:281.45360 SDist: 152.34
HzDst: 152.34 VtDst: -1.15
VAng: 90.25560 TH: 6.80
Angle RT:194.5028

Previous SS Bad

Standard Sideshot

ID :114
Desc:WL
Fig :3
HAng:281.45370 SDist: 152.49
HzDst: 152.49 VtDst: -1.15
VAng: 90.25570   TH: 6.80
Angle RT:194.5029

 Standard Sideshot

ID :115
Desc:LL
Fig :7
HAng:277.50080 SDist: 146.36
HzDst: 146.36 VtDst: -0.98
VAng: 90.22580   TH: 6.80
Angle RT:190.5500

 Standard Sideshot

ID :116
Desc:WL
Fig :6
HAng:273.48390 SDist: 141.33
HzDst: 141.32 VtDst: -1.22
VAng: 90.29440   TH: 6.80
Angle RT:186.5331

 Standard Sideshot

ID :117
Desc:EP
Fig :4
HAng:269.35180 SDist: 137.70
HzDst: 137.69 VtDst: -1.41
VAng: 90.35080   TH: 6.80
Angle RT:182.4010

 Standard Sideshot

ID :118
Desc:LL
Fig :7
HAng: 31.33140 SDist: 81.93
HzDst: 81.92 VtDst: -1.20
VAng: 90.50090   TH: 6.80
Angle RT:304.3806

Standard Sideshot

ID :119
Desc:VB
Fig :8
HAng: 32.28320 SDist: 91.79
HzDst: 91.74 VtDst: -2.92
VAng: 91.49230 TH: 5.10
Angle RT:305.3324

Standard Sideshot

ID :120
Desc:VB
Fig :8
HAng: 31.09370 SDist: 87.23
HzDst: 87.18 VtDst: -2.92
VAng: 91.54590 TH: 5.10
Angle RT:304.1429

Standard Sideshot

ID :121
Desc:11R
Fig :8
HAng: 33.11120 SDist: 85.76
HzDst: 85.71 VtDst: -2.87
VAng: 91.55000 TH: 5.10
Angle RT:306.1604

Standard Sideshot

ID :122
Desc:11R
Fig :8
HAng: 34.20120 SDist: 91.16
HzDst: 91.11 VtDst: -2.94
VAng: 91.51000 TH: 5.10
Angle RT:307.2504

Standard Sideshot

ID :123
Desc:11R
Fig :8
HAng: 38.08350 SDist: 89.27
HzDst: 89.22 VtDst: -2.95
VAng: 91.53310 TH: 5.10
Angle RT:311.1327

Standard Sideshot

ID :124
Desc:11R
Fig :8
HAng: 39.23310 SDist: 83.66
HzDst: 83.61 VtDst: -3.02
VAng: 92.04000 TH: 5.10
Angle RT:312.2823

Standard Sideshot

ID :125
Desc:VB
Fig :8
HAng: 40.20250 SDist: 84.24
HzDst: 84.19 VtDst: -3.04
VAng: 92.04010 TH: 5.10
Angle RT:313.2517

Standard Sideshot

ID :126
Desc:VB
Fig :8
HAng: 39.26490 SDist: 89.68
HzDst: 89.63 VtDst: -2.97
VAng: 91.53510 TH: 5.10
Angle RT:312.3141

Standard Sideshot

ID :127
Desc:S1
Fig :9
HAng: 44.42330 SDist: 88.25
HzDst: 88.19 VtDst: -3.17
VAng: 92.03390 TH: 5.10
Angle RT:317.4725

Standard Sideshot

ID :128
Desc:S1
Fig :9
HAng: 49.01250 SDist: 106.77
HzDst: 106.72 VtDst: -3.11
VAng: 91.40110 TH: 5.10
Angle RT:322.0617

Standard Sideshot

ID :129
Desc:GM
Fig :10
HAng: 41.52510 SDist: 88.83
HzDst: 88.78 VtDst: -3.02
VAng: 91.56500 TH: 5.10
Angle RT:314.5743

Standard Sideshot

ID :130
Desc:GM
Fig :10
HAng: 42.12290 SDist: 89.74
HzDst: 89.69 VtDst: -3.05
VAng: 91.56510 TH: 5.10
Angle RT:315.1721

Standard Sideshot

ID :131
Desc:GM
Fig :10
HAng: 43.20570 SDist: 90.66
HzDst: 90.61 VtDst: -3.08
VAng: 91.56540 TH: 5.10
Angle RT:316.2549

Continue File 05-0803C036 2-10.raw 11:05 [redacted]

Parameters

Display Format : N Azimuth
Surface to Grid: 1.000000000
Angle Sets Tolerance 0.0"
Reciprocal Angles OFF
Correct Curv. & Refract. OFF
Distance Units FEET

Standard Sideshot

ID :132
Desc:SC
Fig :11

HAng: 43.45500 SDist: 87.25
HzDst: 87.19 VtDst: -3.11
VAng: 92.02360 TH: 5.10
Angle RT:316.5042

Standard Sideshot

ID :133
Desc:SC
Fig :11
HAng: 43.51430 SDist: 88.01
HzDst: 87.96 VtDst: -3.10
VAng: 92.00570 TH: 5.10
Angle RT:316.5635

Standard Sideshot

ID :134
Desc:SC
Fig :11
HAng: 44.13230 SDist: 88.71
HzDst: 88.66 VtDst: -3.09
VAng: 91.59450 TH: 5.10
Angle RT:317.1815

Standard Sideshot

ID :135
Desc:SC
Fig :12
HAng: 43.01160 SDist: 90.16
HzDst: 90.11 VtDst: -3.06
VAng: 91.56490 TH: 5.10
Angle RT:316.0608

Standard Sideshot

ID :136
Desc:SC
Fig :12
HAng: 43.25340 SDist: 90.52
HzDst: 90.47 VtDst: -3.07
VAng: 91.56470 TH: 5.10
Angle RT:316.3026

Standard Sideshot

ID :137
Desc:SC

Fig :13
HAng: 43.19120 SDist: 91.03
HzDst: 90.98 VtDst: -3.09
VAng: 91.56470 TH: 5.10
Angle RT:316.2404

Standard Sideshot

ID :138
Desc:SC
Fig :13
HAng: 43.31350 SDist: 91.14
HzDst: 91.09 VtDst: -3.07
VAng: 91.55430 TH: 5.10
Angle RT:316.3627

Standard Sideshot

ID :139
Desc:SC
Fig :14
HAng: 43.30590 SDist: 85.52
HzDst: 85.46 VtDst: -3.12
VAng: 92.05250 TH: 5.10
Angle RT:316.3551

Standard Sideshot

ID :140
Desc:SC
Fig :14
HAng: 44.12250 SDist: 85.78
HzDst: 85.72 VtDst: -3.13
VAng: 92.05270 TH: 5.10
Angle RT:317.1717

Standard Sideshot

ID :141
Desc:SC
Fig :15
HAng: 51.21050 SDist: 91.86
HzDst: 91.80 VtDst: -3.32
VAng: 92.04100 TH: 5.10
Angle RT:324.2557

Standard Sideshot

ID :142

Desc:SC
Fig :15
HAng: 52.35470 SDist: 93.60
HzDst: 93.54 VtDst: -3.35
VAng: 92.03110 TH: 5.10
Angle RT:325.4039

Standard Sideshot

ID :143
Desc:S1
Fig :16
HAng: 53.15130 SDist: 95.33
HzDst: 95.27 VtDst: -3.30
VAng: 91.59120 TH: 5.10
Angle RT:326.2005

Standard Sideshot

ID :144
Desc:S1
Fig :16
HAng: 50.01580 SDist: 90.09
HzDst: 90.03 VtDst: -3.28
VAng: 92.05100 TH: 5.10
Angle RT:323.0650

Standard Sideshot

ID :145
Desc:LL
Fig :7
HAng: 64.07410 SDist: 295.89
HzDst: 295.87 VtDst: -3.26
VAng: 90.37520 TH: 5.10
Angle RT:337.1233

Standard Sideshot

ID :146
Desc:LL
Fig :7
HAng: 65.22120 SDist: 334.77
HzDst: 334.75 VtDst: -3.33
VAng: 90.34140 TH: 5.10
Angle RT:338.2704

Standard Sideshot

ID :147
Desc:VB
Fig :17
HAng: 66.22180 SDist: 95.77
HzDst: 95.38 VtDst: -8.61
VAng: 95.09360 TH: 5.10
Angle RT:339.2710

Standard Sideshot

ID :148
Desc:VB
Fig :17
HAng: 64.37230 SDist: 100.09
HzDst: 99.72 VtDst: -8.58
VAng: 94.54540 TH: 5.10
Angle RT:337.4215

Standard Sideshot

ID :149
Desc:VB
Fig :17
HAng: 59.17330 SDist: 93.99
HzDst: 93.78 VtDst: -6.29
VAng: 93.50210 TH: 5.10
Angle RT:332.2225

Standard Sideshot

ID :150
Desc:VB
Fig :17
HAng: 58.36280 SDist: 93.14
HzDst: 92.95 VtDst: -5.93
VAng: 93.39030 TH: 5.10
Angle RT:331.4120

Standard Sideshot

ID :151
Desc:VB
Fig :17
HAng: 57.35410 SDist: 89.38
HzDst: 89.20 VtDst: -5.65
VAng: 93.37380 TH: 5.10
Angle RT:330.4033

Standard Sideshot

ID :152
Desc:VB
Fig :17
HAng: 59.16270 SDist: 88.73
HzDst: 88.48 VtDst: -6.69
VAng: 94.19370 TH: 5.10
Angle RT:332.2119

Standard Sideshot

ID :153
Desc:VB
Fig :17
HAng: 61.35150 SDist: 88.74
HzDst: 88.42 VtDst: -7.53
VAng: 94.52090 TH: 5.10
Angle RT:334.4007

Standard Sideshot

ID :154
Desc:11L
Fig :17
HAng: 64.46370 SDist: 93.80
HzDst: 93.42 VtDst: -8.45
VAng: 95.09590 TH: 5.10
Angle RT:337.5129

Standard Sideshot

ID :155
Desc:11L
Fig :17
HAng: 62.48210 SDist: 98.25
HzDst: 97.93 VtDst: -7.87
VAng: 94.35330 TH: 5.10
Angle RT:335.5313

Standard Sideshot

ID :156
Desc:11L
Fig :17
HAng: 58.27430 SDist: 92.93
HzDst: 92.74 VtDst: -5.97
VAng: 93.40530 TH: 5.10
Angle RT:331.3235

Standard Sideshot

ID :157
Desc:11L
Fig :17
HAng: 61.17170 SDist: 91.81
HzDst: 91.50 VtDst: -7.57
VAng: 94.43410 TH: 5.10
Angle RT:334.2209

Standard Sideshot

ID :158
Desc:RM
Fig :17
HAng: 86.55560 SDist: 23.51
HzDst: 23.46 VtDst: -1.55
VAng: 93.46070 TH: 5.10
Angle RT:0.0048

ET- PLUS

Not Caused

Head-on collision w/2 cars