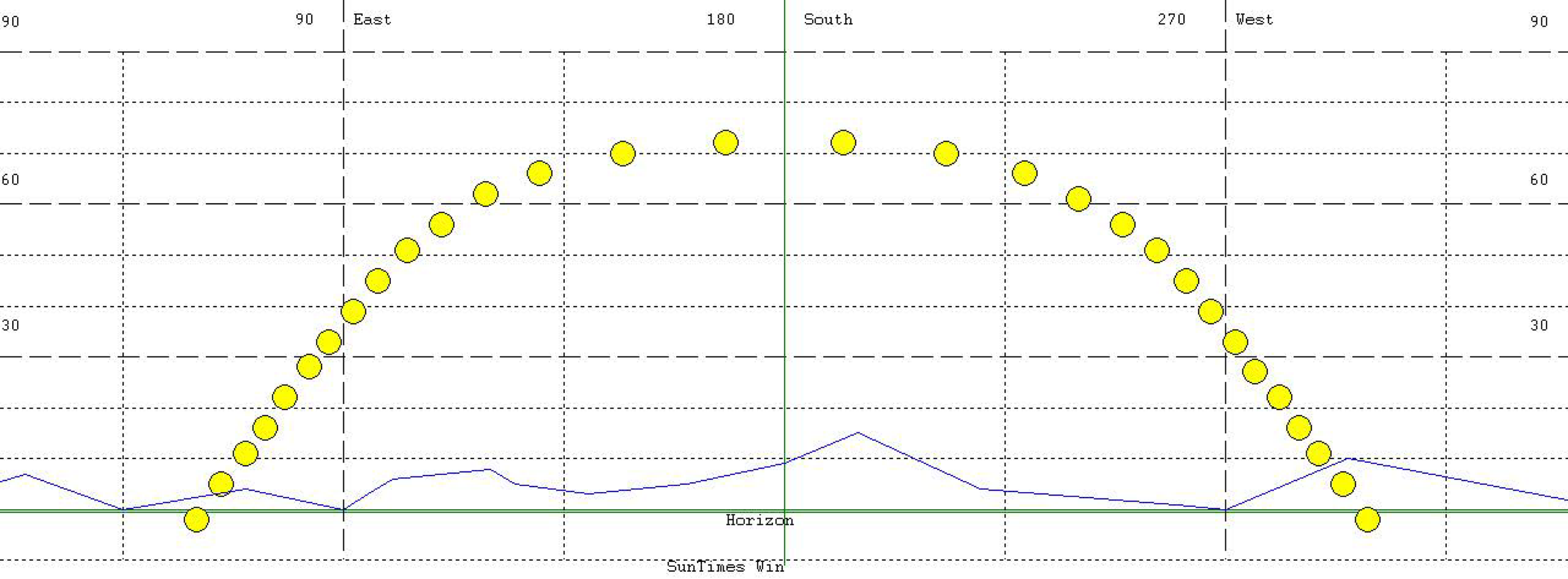


P[redacted]

Lat: 38°57' North

Lon: 92°19' West

Z=6

Rise: 04:52

Azm: 060°04'

Set: 19:37

Azm: 299°49'

Twilite: 04:20/20:08Civ

Hrs Sun: 14:45

Max Alt: 73.3° @ 12:14

Time	Alt	Azm
05:30	05.8	065.9
06:00	11.1	070.3
06:30	16.7	074.5
07:00	22.3	078.8
07:30	28.1	083.1
08:00	33.9	087.5
08:30	39.7	092.2
09:00	45.5	097.4
09:30	51.2	103.3
10:00	56.8	110.3
10:30	62.1	119.2
11:00	66.9	131.0
11:30	70.7	147.1
12:00	73.0	168.3
12:30	72.9	192.2
13:00	70.7	213.3
13:30	66.8	229.3
14:00	62.0	241.0
14:30	56.7	249.8
15:00	51.1	256.8
15:30	45.4	262.7
16:00	39.6	267.8
16:30	33.7	272.5
17:00	27.9	277.0
17:30	22.1	281.3
18:00	16.5	285.5
18:30	11.0	289.8
19:00	05.7	294.2

CDR File Information

Vehicle Identification Number	[redacted]
Investigator	
Case Number	
Investigation Date	
Crash Date	
Filename	
Saved on	
Data check information	
Collected with CDR version	
Collecting program verification numbe	
Reported with CDR version	
Reporting program verification number	B6B4FDF8
Interface information	Block number: 00 Interface version: 35 Date: 01-02-03 Checksum: 6200
Event(s) recovered	Deployment

SDM Data Limitations

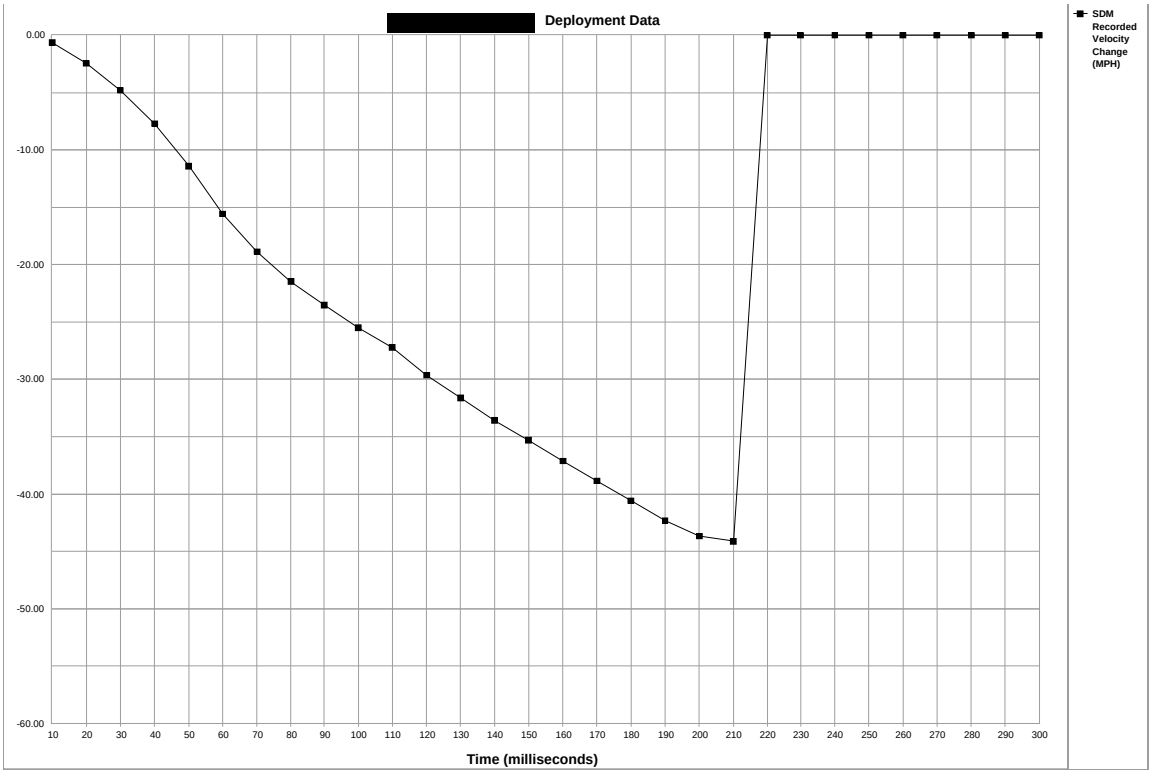
SDM Recorded Crash Events:
There are two types of SDM recorded crash events. The first is the Non-Deployment Event. A Non-Deployment Event is an event severe enough to "wake up" the sensing algorithm but not severe enough to deploy the air bag(s). The SDM can store up to one Non-Deployment Event. This event can be overwritten by an event that has a greater SDM recorded 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. The SDM can store up to two different Deployment Events, if they occur within five seconds of one another. Deployment events can not 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. 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. The SDM records the first 300 milliseconds of Vehicle Forward Velocity Change after Algorithm Enable. The maximum value that can be recorded for Vehicle Forward Velocity Change is 56 MPH.
-Driver's Belt Switch Circuit Status indicates the status of the driver's seat belt 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. An indication of a loss of power would be if the ignition cycles at Deployment or Non-Deployment is recorded as zero. Data recorded after that may not be reliable, such as Time Between Non-Deployment and Deployment Events, Driver Belt Switch Circuit Status, and Passenger SIR Suppression Switch Circuit Status.

SDM Data Source:
All SDM recorded data is measured, calculated, and stored internally, except for the following:
-The Driver's Belt Switch Circuit is wired directly 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	0
Ignition Cycles At Investigation	8403
Time From Algorithm Enable To Deployment Command (msec)	13.75
Time Between Non-Deployment And Deployment Events (sec)	N/A



Time (milliseconds)	10	20	30	40	50	60	70	80	90	100	110	120	130	140	150
Recorded Velocity Change (MPH)	-0.66	-2.41	-4.83	-7.68	-11.41	-15 58	-18.87	-21 50	-23.48	-25.45	-27 21	-29.62	-31.59	-33.57	-35.32
Time (milliseconds)	160	170	180	190	200	210	220	230	240	250	260	270	280	290	300
Recorded Velocity Change (MPH)	-37 08	-38.83	-40 59	-42.34	-43.66	-44.10	0 00	0.00	0.00	0.00	0.00	0 00	0 00	0.00	0.00

[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.

```
B600:  20 40 48 00 00 00 00 AA
B608:  AA 00 00 00 00 00 00 AA
B610:  AA 00 00 00 00 21 F9 99
B618:  F9 F9 F9 F9 F9 F9 FF 00
B620:  AA AA 00 00 00 00 00 7D
B628:  00 00 40 0B 03 0B 16 23
B630:  34 47 56 62 6B 74 7C 87
B638:  90 99 A1 A9 B1 B9 C1 C7
B640:  C9 00 00 00 00 00 00 00
B648:  00 00 00 00 00 00 00 00
B650:  00 00 00 00 00 00 00 00
B658:  00 00 00 00 00 00 00 00
B660:  00 00 00 00 00 00 00 00
B668:  00 00 00 00 00 00 00 00
B670:  00 00 00 00 00 00 00 00
B678:  00 00 00 00 00 00 00 00
B680:  00 00 00 00 00 00 00 00
B688:  00 00 00 00 7D FA 00 00
B690:  7D FA 00 00 00 00 00 00
B698:  00 00 00 00 7D FA 00 00
B6A0:  7D FA 00 00 7D FA 00 00
B6A8:  7D FA 21 99 00 00 81 00
B6B0:  00 00 00 00 00 00 00 00
B6B8:  00 00 00 00 00 92 6E C6
B6C0:  34 4E 1A 01 00 64 02 00
B6C8:  00 AA 00 00 00 00 FF FF
B6D0:  BE B3 CB BE B3 B2 BE AC
B6D8:  FD BE B4 78 DD B0 00 00
B6E0:  00 00 FF FF AA 00 01 55
B6E8:  02 00 00 00 00 00 00 00
B6F0:  28 0E F0 05 50 0A 08 22
B6F8:  64 FF FF FF FF FF 32 34
B700:  42 4A 4C 4E 56 5B 5B 5B
B708:  5B 66 6F 72 75 7E 86 89
B710:  8F 9C A4 B2 B6 C5 CD DF
B718:  EA F4 41 44 47 4A 4E 50
B720:  53 56 57 5A 5C 5E 5F 60
B728:  61 62 62 62 63 63 63 63
B730:  63 63 63 63 63 63 63 63
B738:  63 63 63 63 63 63 63 63
B740:  63 63 63 63 63 63 63 63
B748:  63 63 63 63 63 63 63 63
B750:  63 63 63 63 63 63 63 63
B758:  63 63 63 63 63 00 3C 01
B760:  40 14 0E 50 23 20 10 02
B768:  06 AA 04 50 51 FF FF FF
B770:  FF FF 2A 2A 30 31 32 35
B778:  3A 3B 3B 3B 3B 3B 3B 3B
B780:  3B 3B 3B 3B 3B 3B 3B 3B
B788:  3B 3B 3B 3B 3B 3B 3B 3B
B790:  3B 3B 3B 3B 3B 3B 3B 3B
B798:  3B 3B 3B 3B 3B 3B 3B 3B
B7A0:  3B 3B 3B 3B 3B 3B 3B 3B
B7A8:  3B 3B 3B 3B 3B 3B 3B 3B
B7B0:  3B 3B 3B 3B 3B 3B 3B 3B
B7B8:  3B 3B 3B 3B 3B 00 00 00
B7C0:  00 00 9F 17 00 00 00 00
B7C8:  00 00 00 00 00 00 00 00
B7D0:  00 00 00 00 00 00 00 00
B7D8:  00 00 00 00 00 00 00 00
B7E0:  00 00 00 00 00 00 00 00
B7E8:  00 00 00 00 00 00 00 00
```

```
B7F0:  00 00 00 00 00 00 00 00
B7F8:  00 00 A5 A5 A5 A5 75 01
```

[redacted]

Comments

Sensing Diagnostic Module removed from the vehicle. Bench tested at the Columbia Zone Office. Sergeant Leitman, #234

Missouri State Highway Patrol
Commercial Vehicle Enforcement Division
Post Office Box 568
Jefferson City, MO 65102-0568
Phone: (573)751-4653

DRIVER VEHICLE INSPECTION REPORT

Report #: [redacted]
Date: 07/13/2003
Start Time: 11:04 AM **End Time:** 01:39 PM
Insp. Level: 1-Full,

[redacted]

Driver: [redacted]
License #: [redacted] **State:** MO
DOB: [redacted]

USDOT #: **ICC #:**
State #:
Phone #: [redacted] **Fax #:**

CoDriver:
License #: **State:**
DOB:

Inspection Notes

The truck was checked on 7/11/2003 a[redacted] I checked all 4 axles. I was not able to determine if #2 axle was up or down at the time of the accident. The truck was unloaded when I inspected it.

The following damaged to the truck appeared to be the result of the accident. Left rear drive axle inside tire flat, left side drive axle suspenion broke loose from the frame at the front, left rear drive axle brake canister torn off, left and right brake lights. left and right turn signals ,left and right tail lights,and all 3 marker lights

I clamped off the left rear drive axle air line to allow during the inspection to allow me to check the other brakes.

[redacted]

Report Prepared By:
D CRAIGHEAD

Badge #:
W063

X_____

[redacted]

X_____

MO1512000288

Missouri State Highway Patrol
Commercial Vehicle Enforcement Division
Post Office Box 568
Jefferson City, MO 65102-0568
Phone: (573)751-4653

DRIVER VEHICLE EXAMINATION REPORT
Report Number: [redacted]
Inspection Date: [redacted]
Start Time: [redacted]
Insp. Level: 1-Full,

[redacted]

Driver: [redacted]
Licens
Date o
CoDriver:
License#: **State:**
Date of Birth:

USDOT#: **ICC#:**
State#:

Location: HWY 63
Highway: 63
County: BOONE

MilePost:
Origin: MO
Destination: MO

Shipper: MID MISSOURI LIMESTONE
Bill of Lading: 53245
Cargo: ROCK

VEHICLE IDENTIFICATION

Unit	Type	Make	Year	State	License #	Company #	Vin #	GVWR	CVSA #	OOS#
[redacted]										

BRAKE ADJUSTMENTS

Axle #	1	2	3	4
Right	2 1/4	1 5/8	1 5/8	2 3/8
Left	1 1/4	1 5/8	1 5/8	INOP
Chamber	C-12	C-30	C-30	C-30

VIOLATIONS: No Violations Were Discovered.

Haz Mat: No HM Transported. **Placard:** No **Cargo Tank:**

Special Checks: Post Crash

Miscellaneous:
AGENCY: MSHP;

I certify that the above violation(s) was/were corrected.
Signature Of Repairer X:_____ Facility:_____ Date:_____

NOTICE TO DRIVER/MOTOR CARRIER: This report must be furnished to the motor carrier whose name appears at the top of this report. Please sign the certification below and return to Missouri State Highway Patrol, Commercial Vehicle Enforcement Division, Post Office Box 568, Jefferson City, Missouri, 65102-0568 within 15 days.

DO NOT send fine payment with the return of this report. Payments for citations must be sent to the court of record that is shown on the bottom of any Uniform Complaint/Summons issued to the driver.

The undersigned certifies that all violations noted on this report have been corrected and action taken to assure compliance with Federal/State Motor Carrier Safety and Hazardous Materials Regulations insofar as they are applicable to the motor carriers and drivers.

I certify that I have received this report and have corrected any violations noted.
Signature Of Motor Carrier X:_____ Date:_____

Report Prepared By: D CRAIGHEAD
Badge #: W063
X_____

[redacted]
0288

Report # 003-350-519

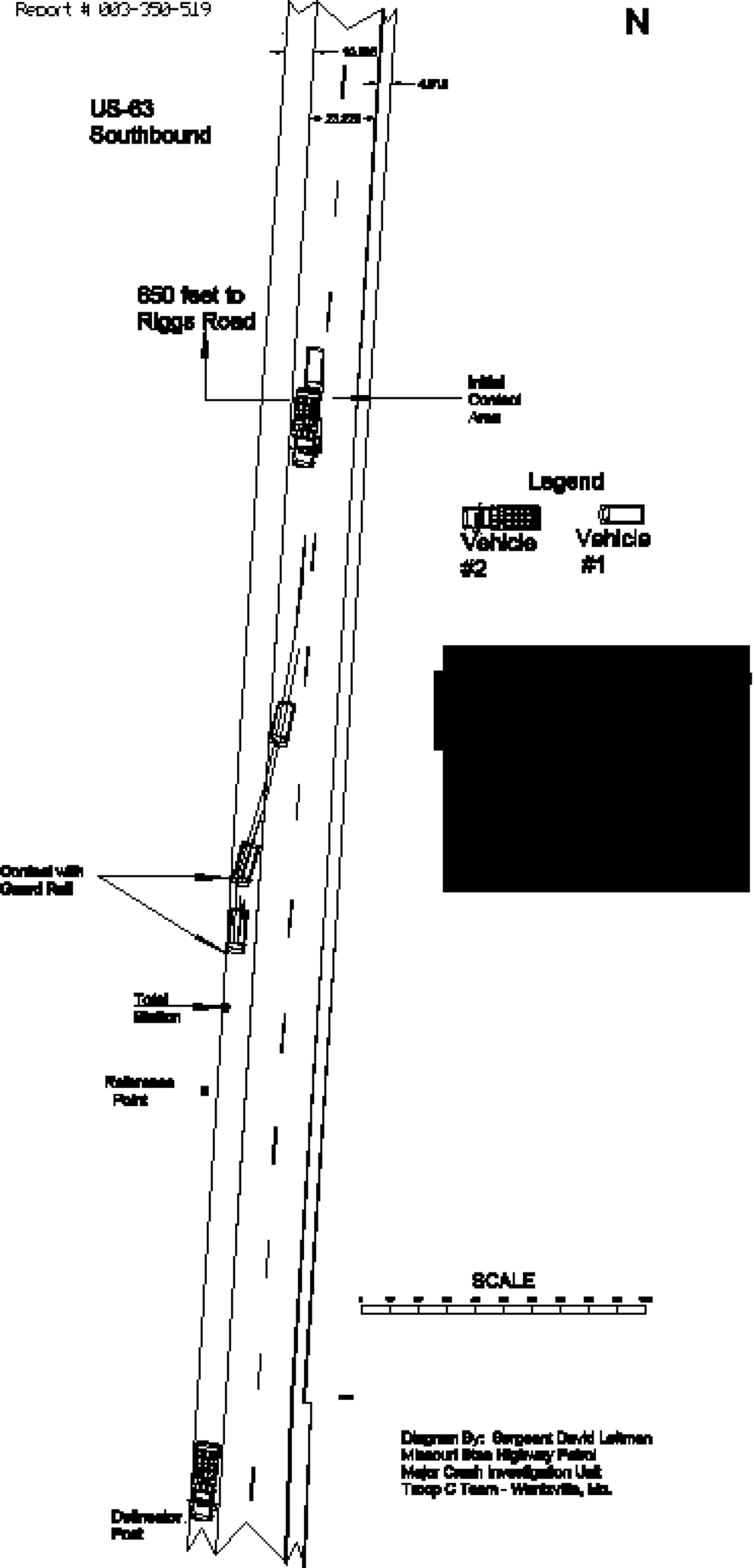


Diagram By: Sergeant David Lehman
Missouri State Highway Patrol
Major Crash Investigation Unit
Troop C Team - Wentzville, Mo.

C:_2003 DATA\0710F010\MAP Job Description: measurement data base
18:39:09 07/19/03 Page No.: 1

==========

Traverse Print Out

==========

Job Description: Crew: Inst: Temp: Press:

13CPSea level crn: N
13CPC and R crn: N
13CPAtmos crn: N
13DU3:US Feet:
13OOCurrent view
13TSJul-19-03 14:34
13JS10000
13NM-234 STATION 1183 POLE
13NM-38.49.582 090.50.615
13TSJul-19-03 14:36
13PCP.C. mm Applied: 0.000

Setup	Backsight	BS Azimuth	BS Reading	Instrument Height
1	0	193.3839	193.3855	5.300

1 N: 0.000 E: 0.000 El: 0.000 D: TS

Pt#	HZAngle	SlpDist	VTAng	ParOff	PerpOff	TgtHt	Description
100	193.3855	30.470	91.5212	0.000	0.000	4.900	RP
1000	3.2635	343.720	90.0447	0.000	0.000	5.250	DP
1001	3.3650	355.960	90.0251	0.000	0.000	5.250	ZGR1
1002	5.1456	356.070	90.0014	0.000	0.000	5.250	ZWL1
1003	8.5903	356.130	89.5922	0.000	0.000	5.250	ZFL1
1004	9.4259	356.760	90.0113	0.000	0.000	5.250	ZEP1
1005	14.1718	201.320	90.1017	0.000	0.000	5.250	ZEP1
1006	13.0330	200.560	90.0646	0.000	0.000	5.250	ZFL1
1007	6.3150	197.660	90.0722	0.000	0.000	5.250	ZWL1
1008	3.2708	196.690	90.1355	0.000	0.000	5.250	ZGR1
1009	2.2217	39.800	90.2502	0.000	0.000	5.250	ZGR1
1010	16.4507	41.130	89.5206	0.000	0.000	5.250	ZWL1
1011	43.4027	50.860	89.5212	0.000	0.000	5.250	ZFL1
1012	47.3408	53.500	90.0418	0.000	0.000	5.250	ZEP1
1013	170.2336	141.070	88.2618	0.000	0.000	7.600	ZFL1
1014	168.4452	141.960	88.2900	0.000	0.000	7.600	ZEP1
1015	167.4851	142.810	88.3237	0.000	0.000	7.600	ZEP1
1016	171.5917	199.250	88.5125	0.000	0.000	7.600	ZEP1
1017	173.4549	197.410	88.4545	0.000	0.000	7.600	FL1

13TSJul-19-03 14:51

1018	180.5753	192.990	89.2526	0.000	0.000	5.250	WL1
1019	184.0206	191.800	89.3139	0.000	0.000	5.250	GR1
1020	184.2151	181.930	89.3437	0.000	0.000	5.250	DP
1021	1.0802	19.150	90.2852	0.000	0.000	5.250	MP1
1022	2.2727	45.570	90.2232	0.000	0.000	5.250	MP1
1023	7.1443	23.370	90.1455	0.000	0.000	5.250	ZSC1
1024	6.3104	29.320	90.1449	0.000	0.000	5.250	ZSC1
1025	6.3622	35.290	90.1448	0.000	0.000	5.250	ZSC1
1026	4.4423	44.050	90.1440	0.000	0.000	5.250	ZSC1
1027	10.2052	82.010	90.0348	0.000	0.000	5.250	ZSC1

1028 10.5015 70.020 90.0343 0.000 0.000 5.250 ZSC2
1029 7.0426 45.440 90.1052 0.000 0.000 5.250 SC2
1030 8.0227 39.540 90.1054 0.000 0.000 5.250 ZSC2
1031 9.2522 34.300 90.0736 0.000 0.000 5.250 ZSC2
1032 11.0211 22.670 90.0738 0.000 0.000 5.250 SC2
1033 17.5047 20.120 89.5324 0.000 0.000 5.250 ZSC3C:_2003 DATA\0710F010\MAP Job Description:
18:39:10 07/19/03 Page No.: 2

1034 14.0738 26.710 89.5847 0.000 0.000 5.250 ZSC3
1035 13.0926 31.130 90.0207 0.000 0.000 5.250 ZSC3
1036 9.5048 37.940 90.0647 0.000 0.000 5.250 ZSC3
13TSJul-19-03 15:22
1037 10.4954 101.440 90.0303 0.000 0.000 5.250 ZSC1
1038 10.3811 133.550 90.0605 0.000 0.000 5.250 ZSC1
1039 10.0810 153.400 90.0653 0.000 0.000 5.250 SC1
1040 10.0810 153.380 90.0653 0.000 0.000 5.250 ZGM1
1041 9.4229 168.170 90.0615 0.000 0.000 5.250 GM1
1042 8.5929 197.870 90.0416 0.000 0.000 5.250 ZS1
1043 8.5619 200.320 90.0415 0.000 0.000 5.250 S1
1044 8.3717 209.300 90.0414 0.000 0.000 5.250 ZS2
1045 8.2102 212.480 90.0412 0.000 0.000 5.250 ZS2
1046 8.1719 215.420 90.0355 0.000 0.000 5.250 S2
1047 8.3352 216.640 90.0304 0.000 0.000 5.250 ZS3
1048 8.3706 212.870 90.0350 0.000 0.000 5.250 ZS3
1049 8.5601 208.120 90.0351 0.000 0.000 5.250 S3
1050 9.1451 200.520 90.0431 0.000 0.000 5.250 ZS4
1051 9.1809 197.060 90.0431 0.000 0.000 5.250 S4
1052 11.3042 129.000 90.0434 0.000 0.000 5.250 ZSC4
1053 11.3726 110.610 90.0328 0.000 0.000 5.250 ZSC4
1054 11.1636 74.800 90.0327 0.000 0.000 5.250 SC4
1055 176.5801 173.800 89.2241 0.000 0.000 5.250 ZLL1
1056 176.2822 162.670 89.2145 0.000 0.000 5.250 LL1
1057 175.0102 135.310 89.1935 0.000 0.000 5.250 ZLL1
1058 174.0749 122.830 89.1836 0.000 0.000 5.250 LL1
1059 171.2242 96.330 89.1423 0.000 0.000 5.250 ZLL1
1060 169.3522 83.790 89.1227 0.000 0.000 5.250 LL1
1061 162.5600 57.990 89.0303 0.000 0.000 5.250 ZLL1
1062 157.1426 45.960 88.5750 0.000 0.000 5.250 LL1
1063 128.4844 25.350 88.4029 0.000 0.000 5.250 ZLL1
1064 96.3647 20.990 88.4035 0.000 0.000 5.250 LL1
1065 42.2801 33.460 89.2452 0.000 0.000 5.250 ZLL1
1066 31.5624 44.080 89.3856 0.000 0.000 5.250 LL1
1067 20.5025 70.870 89.5220 0.000 0.000 5.250 ZLL1
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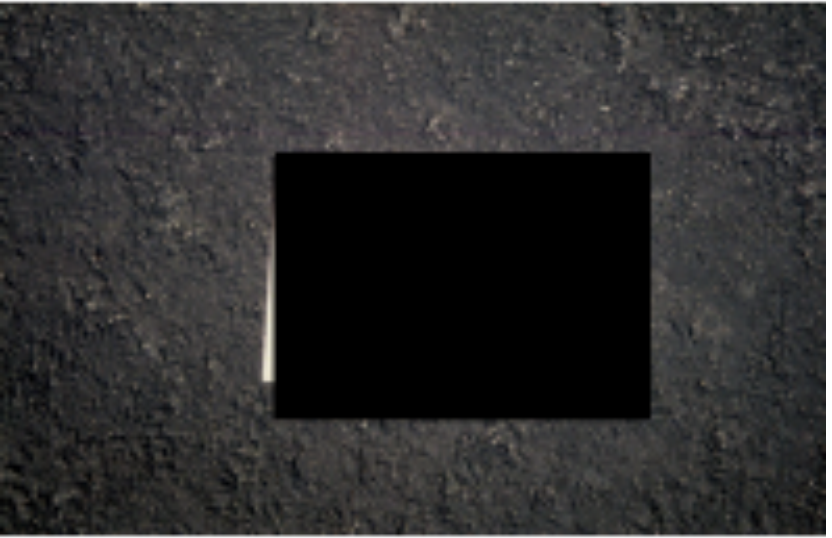
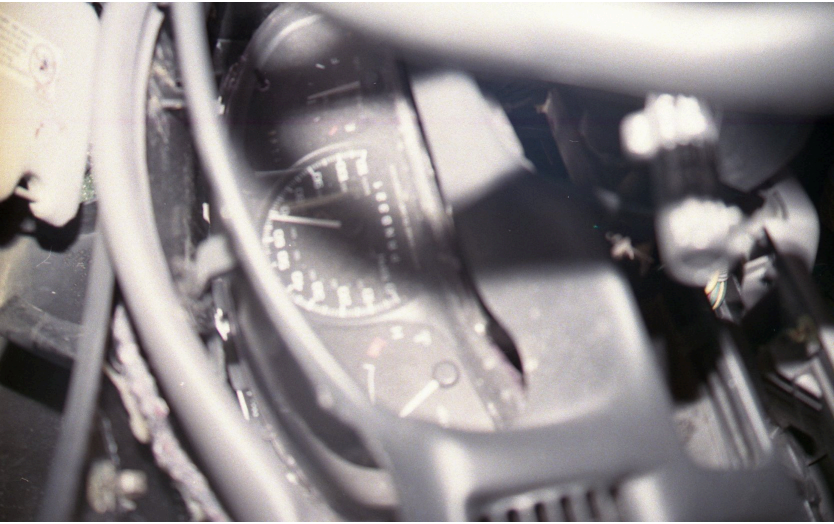



VENTURE




McCray
FARMS
& TRUCKING
COLUMBIA, MO.
GVW 80,000


McCray
FARMS
& TRUCKING
COLUMBIA, MO.
GVW 60,000

Reconstruction Report

[redacted]

Missouri State Highway Patrol
Reconstruction Report

County: [redacted]

Date:

Time:

Location:

Driver:

Original Investigating Officer: Trooper Demond Tauber, #1169

Troop Reconstructionist: Trooper Paul Meyers, #1183

Assisting Officer: Commercial Vehicle Officer David Craighead, #W063

Assisting Agencies: None

Level IV Reconstruction: Sergeant David Leitman, #234 C-SS
Major Crash Investigation Team
Troop C
St. Louis, Missouri

Date of Report: October 27, 2003

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Findings	Page 15
Event Analysis	Page 16

Appendices

Photo log	Page 17
Math calculations	Page 18
Astronomical data	Page 20
Forensic map	Page 21

Attachments:

Copy- Original Accident Report
CDR File Information

[redacted]

Synopsis

On Thursday [redacted] Trooper Paul Meyers, #1183, contacted me about a commercial motor vehicle that had occurred on Thursday afternoon [redacted]. Trooper Meyers had assisted the original investigating officer Trooper Demond Tauber, #1169 with the investigation. Since the driver of the passenger vehicle involved in the crash had succumbed to her injuries, the crash met the criteria of a level four investigation. Trooper Meyers was notifying me of the pending level four investigation. Due to other assignments I was the only crash team member available. I arranged to meet him on Saturday afternoon, July 18, 2003, to begin the reconstruction.

I met Trooper Meyers at approximately 1415 hours on US-63 at the crash scene [redacted] He identified the scene evidence and provided me with pictures he had taken of the scene and vehicles. We documented the scene with a total station.

Trooper Meyers indicated the crash occurred as Vehicle #2 had entered the roadway at the intersection [redacted] was accelerating up to speed when it was struck in the rear by Vehicle #1. Vehicle #1 continued to an uncontrolled stop on the shoulder and an impact with the guardrail. Vehicle #2 continued to a controlled stop on the shoulder.

Briefly, the vehicles and their occupants are described as:

Vehicle #1

[redacted] Mary Pennington of Moberly, Missouri, operated Vehicle #1. [redacted].

[redacted] Towing of Columbia removed Vehicle #1 from the scene.

Vehicle #2

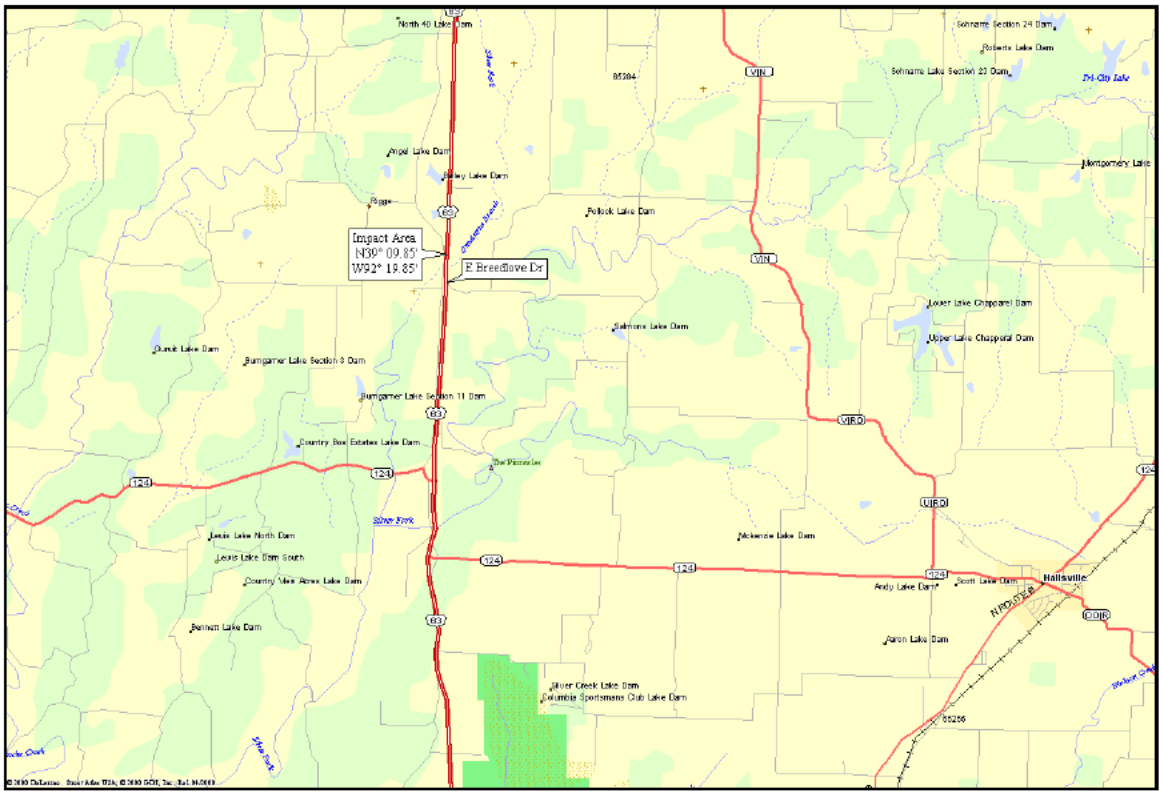
Vehicle #2 was an International dump truck traveling [redacted]. [redacted]. He was not injured in the crash. [redacted] Towing of Columbia, Missouri removed Vehicle #2 from the scene.

[redacted]

Environmental Factors

[redacted] US-63 is part of the Federal Highway System and is maintained by the Missouri Department of Transportation. Below is a graphic depiction of the crash area.

North is to the top of the map



US-63 is a divided highway consisting of two roadways that measured approximately 24 feet in width. Each of the roadways is divided into two lanes of travel by standard segmented lane lines. The roadways are separated by a grassy median. Asphalt shoulders border the driving lanes. The outer shoulders measured approximately ten feet wide and the inner or median shoulders measured approximately 4.5 feet wide.

Since this crash is limited to the southbound roadway the remainder of the information will only be applicable to the southbound roadway.

[redacted]

Grade

The surface of US-63 in the crash area appears level. There is however, a slight downgrade from north to south of 0.34 percent.

Super Elevation

The roadway is straight. It has a slight super elevation to enhance drainage. The super elevation measured in the impact area was 1.6 percent with the center stripe as the apex and the fog lines serving as the nadirs.

Drag Factor

I determined a drag factor for the asphalt surface of 0.78. This was accomplished by averaging the force required to pull a twenty-two pound drag sled in three locations adjacent to the impact area.

Road Surface Conditions

The asphalt surface of the roadway had multiple fissure lines and cracks. This is typical of an asphalt surface. It was free of potholes and other irregularities. The condition of the surface is not contributing factor to this crash.

Traffic Control

The speed limit is posted at 70 miles per hour. There are not any other traffic control devices in the area

Vision Obstruction

There are not any permanent vision obstructions in the area. The investigation by Trooper Tauber did not reveal the existence of any temporary obstructions.

Light Conditions

This crash occurred at approximately 1449 hours, Thursday afternoon, July 10, 2003, during daylight conditions. At that time and date, the sun was on an azimuth of approximately 253 degrees and at an altitude of approximately 52 degrees.

[redacted]

Weather Conditions

Weather information recorded by the automated recording system at the Columbia Regional Airport, south of Columbia, Missouri, and maintained by the web site Weather Underground, indicated the following conditions existed at 1454 hours, just after the crash had occurred. The temperature was 82 degrees with light rain. Visibility was set at 10 miles and there was a thirteen-mile per hour wind. The barometric pressure was falling from 29.92 inches of mercury. Trooper Tauber indicated it was dry at the scene.

[redacted]

Vehicle #1

[redacted]

Vehicle #1 was destroyed at impact as it traveled into the rear of Vehicle #2. The adjacent photographs depict the severe devastation caused by impact.

[redacted] Towing of Columbia, Missouri towed Vehicle #1 from the scene. The vehicle was examined and photographed by Trooper Meyers at their impound yard in Columbia. On July 19, 2003, Trooper Meyers and I traveled to the impound yard to collect the data available from the sensing diagnostic module.

The data in the module indicated the vehicle had sustained a 44 miles per hour change in velocity at impact.

[redacted]

[redacted]

Vehicle #2

[redacted]

Vehicle #2 was inspected by Commercial Vehicle Officer David Craighead, #W063, on Sunday morning, October 13, 2003. During his inspection, he noted two brakes were out of adjustment, axle one right, and axle four right. The brake chamber on axle four left was damaged by impact. He also noted several other damaged components that were the result of the impact. A copy of Officer Craighead's inspection is embedded as the next two pages of this report.

The only observable damage to Vehicle #2 was to the left rear as depicted in the adjacent photograph. The damage includes a flat left rear inside tire, broken axle suspension, damaged tail lamps and marker lamps and the left rear brake canister was destroyed.

[redacted] Towing of Columbia, Missouri removed Vehicle #2 from the scene and conveyed it the owner's residence where Officer Craighead inspected it on Sunday morning.

[redacted]

[redacted]

Inspection Report

Missouri State Highway Patrol
Commercial Vehicle Enforcement Division
Post Office Box 568
Jefferson City, MO 65102-0568
Phone: (573)751-4653

[redacted]

[redacted]

Phone#: (573)449-7325 Fax#:
USDOT#: ICC#: License#: State:
State#: Date of Birth:

Location: HWY 63 MilePost: Shipper: MID MISSOURI LIMESTONE
Highway: 63 Origin: MO Bill of Lading: 53245
County: BOONE Destination: MO Cargo: ROCK

VEHICLE IDENTIFICATION

Unit	Type	Make	Year	State	License #	Company #	Vin #	GVWR	CVSA #	OOS#

[redacted]

BRAKE ADJUSTMENTS

Axle #	1	2	3	4
Right	2 1/4	1 5/8	1 5/8	2 3/8
Left	1 1/4	1 5/8	1 5/8	INOP
Chamber	C-12	C-30	C-30	C-30

VIOLATIONS: No Violations Were Discovered.

Haz Mat: No HM Transported. **Placard:** No **Cargo Tank:**

Special Checks: Post Crash

Miscellaneous:
AGENCY: MSHP;

I certify that the above violation(s) was/were corrected.
Signature Of Repairer X:_____ Facility:_____ Date:_____

NOTICE TO DRIVER/MOTOR CARRIER: This report must be furnished to the motor carrier whose name appears at the top of this report. Please sign the certification below and return to Missouri State Highway Patrol, Commercial Vehicle Enforcement Division, Post Office Box 568, Jefferson City, Missouri, 65102-0568 within 15 days.

DO NOT send fine payment with the return of this report. Payments for citations must be sent to the court of record that is shown on the bottom of any Uniform Complaint/Summons issued to the driver.

The undersigned certifies that all violations noted on this report have been corrected and action taken to assure compliance with Federal/State Motor Carrier Safety and Hazardous Materials Regulations insofar as they are applicable to the motor carriers and drivers.

I certify that I have received this report and have corrected any violations noted.
Signature Of Motor Carrier X:_____ Date:_____

Report Prepared By: D CRAIGHEAD
X_____

Badge #: W063

[redacted]

MO1512000288

Missouri State Highway Patrol
Commercial Vehicle Enforcement Division
Post Office Box 568
Jefferson City, MO 65102-0568
Phone: (573)751-4653

[redacted]

[redacted]

[redacted]

USDOT #: **ICC #:** **CoDriver:**
State #: **License #:** **State:**
Phone #: (573)449-7325 **Fax #:** **DOB:**

Inspection Notes

[redacted]
checked all 4 axles. I was not able to determine if #2 axle was up or down at the time of the accident. The truck was unloaded when I inspected it.

The following damaged to the truck appeared to be the result of the accident. Left rear drive axle inside tire flat, left side drive axle suspenion broke loose from the frame at the front, left rear drive axle brake canister torn off, left and right brake lights. left and right turn signals ,left and right tail lights,and all 3 marker lights

I clamped off the left rear drive axle air line to allow during the inspection to allow me to check the other brakes.

[redacted]

Report Prepared By: D CRAIGHEAD
X_____

Badge #: W063

Copy Received By: Page 1 of 1
MC CRAY, JAMES C
X_____

MO1512000288

[redacted]

[redacted]

Human Factors

Driver #1

[redacted]

There was not any evidence to indicate [redacted] was under the influence of intoxicants at the time of the crash. Trooper Tauber determined [redacted] had a history of narcolepsy. It is possible that she nodded off. That would explain why there are not any pre-impact maneuvers.

It is unknown exactly how familiar [redacted] was with the area. Familiarity notwithstanding, there is nothing about the design or construction of the roadway that requires a special knowledge or ability to navigate safely.

[redacted] was not interviewed at the scene and died a few hours later. Therefore, it was not possible to collect a statement from her.

Trooper Tauber's investigation indicated [redacted] was not wearing a shoulder and lap belt at the time of the collision. The airbag system of the vehicle did deploy.

[redacted]

Driver #2

[redacted]

There was not any evidence to indicate [redacted] was under the influence of intoxicants at the time of the crash. There was not any information available to indicate he had a pre-existing medical condition that would have contributed to the crash.

[redacted] is quite familiar with the area. Familiarity notwithstanding, there is nothing about the design or construction of the roadway that requires a special knowledge or ability to navigate safely.

[redacted] was wearing a shoulder and lap belt at the time of the collision. He was not injured. He indicated to Trooper Tauber that he had just entered US-63 at Old 63. The crash occurred as he was accelerating in the driving lane. He stated he had accelerated to around 40 miles per hour when he was struck in the rear.

NOTE: There is an address conflict in the Department of Revenue records. It appears to be a simple typographical error in the street name of M[redacted] [redacted] It [redacted].

[redacted]

Passengers

There were not any passengers in either vehicle.

Witnesses

There is one known witness to this crash.

Witness #1

[redacted]

We were headed south to Columbia in the driving lane, approximately 10 car lengths behind the van. We had been directly behind the van for at least five miles. The crash occurred as the van overtook a slower moving dump truck and drove right into the rear of it. I did not see any brake lights at all. The driver of the van may have attempted to swerve left just before the crash. The crash lifted the rear of the dump truck off the ground.

When asked, [redacted] stated she must have had her cruise set as we did since were traveling nearly identical speeds, the speed limit, 70 miles per hour, for last several miles. Specifically, he stated, "She must have dozed off with her cruise set."

[redacted]

Investigation

On [redacted], Trooper Paul Meyers, #1183, contacted me about a commercial motor vehicle that had occurred on T[redacted] The crash occurred on [redacted]. Trooper Meyers had assisted the original investigating officer, Trooper Demond Tauber, #1169, with the investigation. [redacted].

I met Trooper Meyers at approximately 1415 hours, Saturday July 18, 2003, on US-63 at the crash scene just [redacted]. He identified the scene evidence and provided me with pictures he had taken of the scene and vehicles.

While at the scene, I prepared a Sokkia Set 5oo total station for use in mapping the roadway and scene evidence. To ensure the accuracy of the measurement I complied with the reference measure protocol by establishing a fixed reference point. The reference point was utilized as the first and last measured location of the mapping file. With Trooper Meyers assistance, we mapped the scene evidence. The data collected was utilized to prepare the map attached to this report.

Data was collected to calculate the drag factor for the roadway. I pulled a twenty-two pound drag sled in three locations adjacent to the impact area and scrape mark left by Vehicle #1.

Following the scene investigation, Trooper Meyers took me to the [redacted]o view the Dump Truck. I viewed the truck and did not observe any damage other than that previously noted during Officer Craighead's inspection.

On Wednesday July 23, 2003, I returned to the Columbia area and met with Trooper Meyers. He escorted me to the impound facility to look at Vehicle #1. We viewed the

damaged vehicle and removed the sensing diagnostic module from under the right front seat. We took it the Columbia Zone Office to download the data with a crash data retrieval tool. A copy the retrieved information is attached to the hard copy version of this report and appears as a "PDF" file on the compact disk.

[redacted]

Findings

The findings, determinations, and conclusions described in this report are based on the result of the field investigation, the damage to the vehicles, roadway evidence and statements collected from the witness and Driver #2. Changes in any of the underlying information could affect the results and findings of this report.

This crash is a simple two-vehicle crash. [redacted] The chain of events that lead to the crash follow this sequence.

Apparently, Vehicle #2 had just entered so[redacted] while Vehicle #1 was traveling south on US-63. The collision occurred as Vehicle #1 overtook and collided with the rear of Vehicle #2. Following impact Vehicle #2 drove to its final resting position on the west shoulder of southbound US-63. Vehicle #1 traveled southwesterly and collided with the guardrail as it came to rest on the west shoulder.

Driver #2 estimated his speed at approximately 40 miles per hour when the impact occurred. If one relies on that speed as accurate and knowing the crash occurred 650 feet south of where Vehicle #2 entered the roadway, an average acceleration of 0.08 for Vehicle #2 could be calculated. Given the previously mentioned information and applying a time equation, Vehicle #2 would have been on the roadway for approximately twenty-two seconds. This should be more than enough time for an alert driver to notice the presence of the Vehicle #2 and respond.

[redacted]

[redacted]

Event Analysis

This crash is result of Driver #1's failure to realize Vehicle #2 was traveling at a slower rate of speed and thereby overtaking and colliding with the rear of it. The crash resulted in the death of Driver #1, [redacted]

Reporting Officer
Sgt. David Leitman, #234, C-SS
Reconstructionist, ACTAR #1052

Reviewing Officer
Cpl. A. A. Mallery, #533, C-SS
Reconstructionist, ACTAR #1055

Photo Log

Photographer: Trooper Paul Meyers, 1183

The following is a log of photos taken at the crash scene and the tow yard. The negatives are stored at Missouri State Highway Patrol, General Headquarters, Traffic Division, Accident Records, 1510 East Elm, Jefferson City, Missouri.

Roll # 0928
Neg. #
Xa. Film advance
00a. Film advance
0a. Identification card
1a. Impact area from west shoulder looking south
2a. Impact area from median looking south
3a. Impact area from southbound driving lane
4a. Similar to previous
5a. Scrapes from Vehicle #1 traveling off roadway
6a. Similar to previous - close-up
7a. Origin of scrape south of initial contact area
8a. Initial contact area
9a. Close-up of impact area

Tow yard
10a. Front of Vehicle #1
11a. Left side of Vehicle #1
12a. Left side of Vehicle #1
13a. Driver's position Vehicle #1
14a. Speedometer / odometer Vehicle #1
15a. Right front corner of Vehicle #1
16a. Close-up of front end of Vehicle#1
17a. Similar to previous

Owner's Property
18a. Front of Vehicle #2
19a. Left side of Vehicle #2
20a. Rear of Vehicle #2
21a. Right side of Vehicle #2
22a. Close-up rear of Vehicle #2
23a. Under-carriage / impact area Vehicle #2
24a Close-up left rear brake chamber

[redacted]

Math Calculations

Grade

Percent (%) of grade or slope along the path of travel of a roadway

$$m = \frac{h}{D}$$

m = *percent grade*

h = *rise*

D = *run*

$$m = \frac{h}{D}$$

$$m = \frac{1.9}{547}$$

$$m = 0.0034$$

m = *0.34 percent grade*

Super elevation

Percent (%) of super - elevation or slope across a roadway

$$e = \frac{h}{D}$$

e = *super - elevation*

h = *rise*

D = *run*

$$e = \frac{h}{D}$$

$$e = \frac{.2}{12}$$

$$e = 0.0166$$

e = *1.6 percent of super - elevation*

Acceleration Factor

1. Drag factor when speed and distance are known

$$f = \frac{S^2}{30 \times D}$$

f = *drag factor*

S = *speed*

30 = *math constant*

D = *length of skid*

$$f = \frac{40^2}{30 \times 650}$$

$$f = \frac{1600}{19500}$$

$$f = 0.082$$

Drag Factor

2. Drag factor when force and weight are known

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

f = *drag factor*

F = *force in pounds*

W = *weight of drag tire*

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

$$f = \frac{17 + 17 + 18}{22 + 22 + 22}$$

$$f = \frac{52}{66}$$

$$f = 0.78$$

[redacted]

Math Calculations

Acceleration Time

Time to accelerate or decelerate to or from a stop when the distance and acceleration/deceleration factor are known

$$t = 0.249\sqrt{\frac{D}{f \times n}}$$

t = time

0.249 = math constant

D = distance

f = acceleration or deceleration factor

n = braking efficiency

$$t = 0.249\sqrt{\frac{D}{f \times n}}$$

$$t = 0.249\sqrt{\frac{650}{0.082 \times 1}}$$

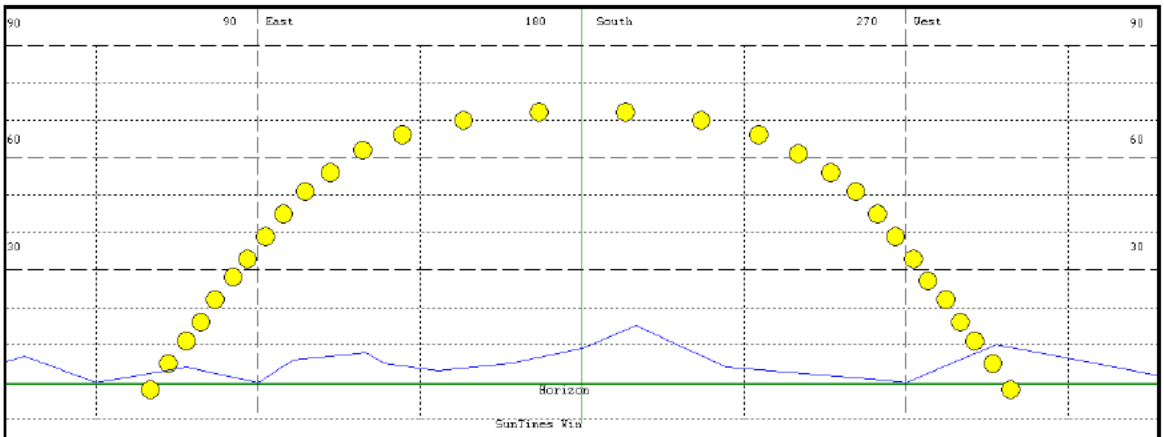
$$t = 0.249\sqrt{\frac{650}{0.082}}$$

$$t = 0.249\sqrt{7926.82}$$

$$t = 0.249 \times 89.03$$

$$t = 22.16 \text{ seconds}$$

Astronomical Data



[redacted]

Lat: 38°57' North
Lon: 92°19' West
Z-6
Rise: 04:52
Azm: 060°04'

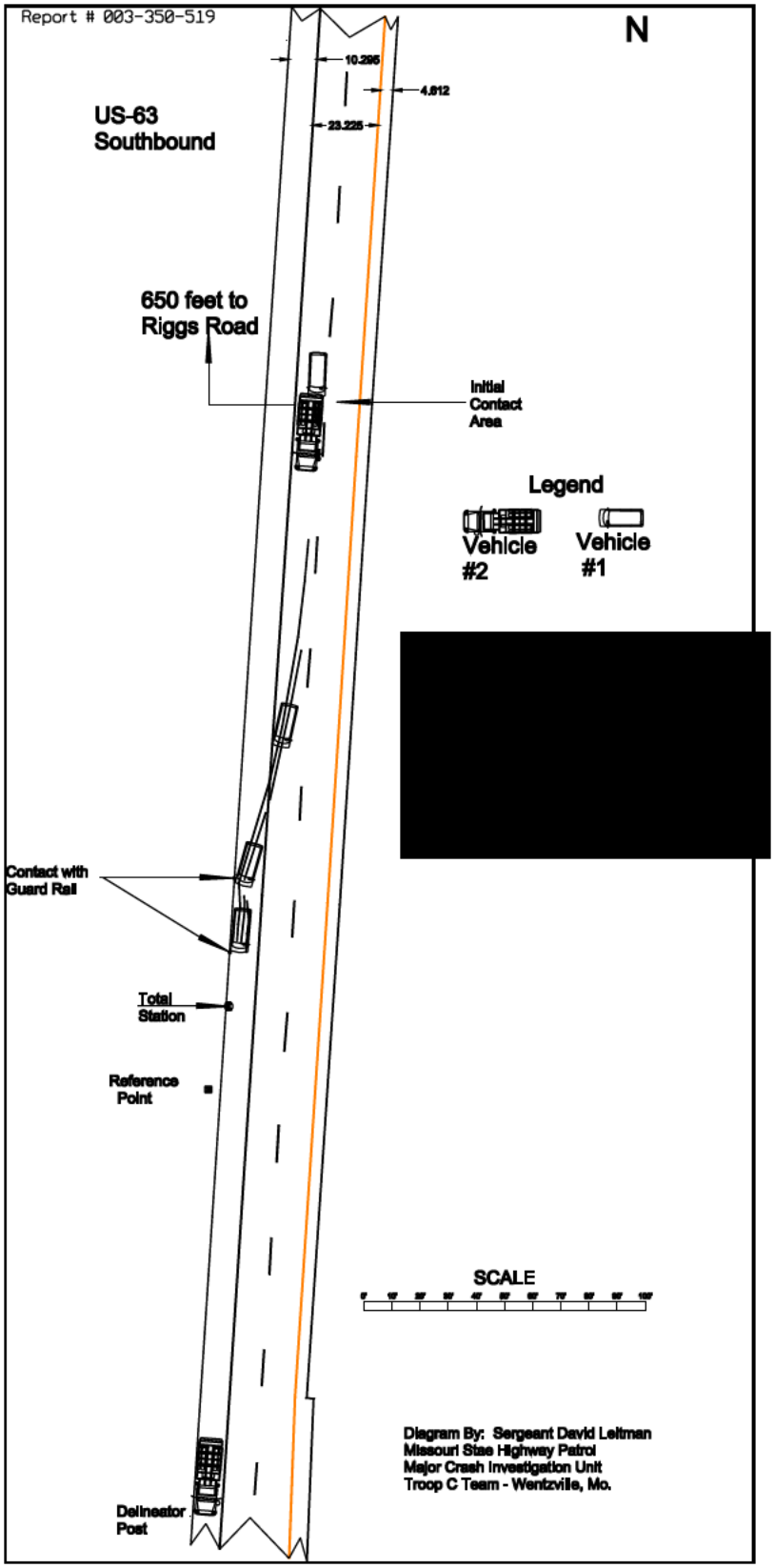
Set: 19:37
Azm: 299°49'

Twilite: 04:20/20:08Civ
Hrs Sun: 14:45
Max Alt: 73.3° @ 12:14

Time	Alt	Azm
05:30	05.8	065.9
06:00	11.1	070.3
06:30	16.7	074.5
07:00	22.3	078.8
07:30	28.1	083.1
08:00	33.9	087.5
08:30	39.7	092.2
09:00	45.5	097.4
09:30	51.2	103.3
10:00	56.8	110.3
10:30	62.1	119.2
11:00	66.9	131.0
11:30	70.7	147.1
12:00	73.0	168.3
12:30	72.9	192.2
13:00	70.7	213.3
13:30	66.8	229.3
14:00	62.0	241.0
14:30	56.7	249.8
15:00	51.1	256.8
15:30	45.4	262.7
16:00	39.6	267.8
16:30	33.7	272.5
17:00	27.9	277.0
17:30	22.1	281.3
18:00	16.5	285.5
18:30	11.0	289.8
19:00	05.7	294.2

[redacted]

Map



Unknown

Not Caused

Severe collision w/ rear end of a dump truck.