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TECHNICAL ACCIDENT INVESTIGATION REPORT

County: [REDACTED]

Date: [REDACTED]

Time: 0845 hours

Location (include log point): Ir [REDACTED]

Driver(s): Matthew S. Sotelo [REDACTED]

Original Investigating Officer: Trooper Travis I. Goolsby

Reconstructionist: Corporal Joseph A. Pithan

Time Reconstructionist Notified: 0900

Date Reconstructionist Notified: 11/20/2005

Assisting Officer(s): None

Assisting Agencies: None

Date of Report: 12/16/2005

Reviewed By: *CPL. A.E. Pithan #1192*Reviewed Date: *12-27-2005*

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I. Synopsis

[REDACTED]

his head. He also received lacerations and contusions to his right arm and complained of pain in his right hip. [REDACTED] also had a tooth broken out during the collision. He was transported from the accident scene by Cameron Ambulance to Cameron Regional Medical Center in Cameron, Missouri. He received treatment for his injuries and was released that evening. The front seat passenger was [REDACTED] date [REDACTED]

[REDACTED]

behind the center console. [REDACTED] suffered a fractured vertebra in her neck and lower back. She had a fractured skull and a severe laceration to her forehead. She also suffered several broken ribs. Ms. [REDACTED] had to be extricated from the vehicle by rescue personnel. She was airlifted from the scene by Life Net Eagle One and transported to Heartland Regional Hospital in St. Joseph, Missouri. On November 21, 2005, she was transported by ambulance to University of Iowa Hospital in Iowa City, Iowa, for specialized treatment of her fractures. On December 5, 2005, she was transported to Genesis Hospital in Davenport, Iowa, for rehabilitation. [REDACTED] was sitting in the rear passenger seat behind [REDACTED] During the accident, the car windows were compromised, thus creating an ejection path from inside the vehicle. As the vehicle rolled [REDACTED] was ejected through the passenger side, rear window. When Emergency Medical Technicians arrived at the scene [REDACTED] was in cardiac arrest. She also had a severe abdominal injury. [REDACTED] was transported from the scene by Cameron Ambulance to Cameron Regional Medical Center. She was pronounced dead at 0959 hours by Dr. Kiehl.

II. Environmental Factors

Interstate 35 is a four-lane highway running primarily north and south. The roadway consists of two lanes running in each direction. The roadway is divided by an unprotected grass median. The driving portions of the roadway measure twenty-four feet. It is further divided into a twelve-foot wide driving lane and a twelve-foot wide passing lane. A broken white line divides these two lanes. A solid white line divides the driving lane and the east shoulder. These lanes are composed of asphalt and tar. It is well traveled and it has a polished look. The driving lane is uneven with two furrows running parallel to each other in the direction of travel. These furrows are presumably caused by the tires of commercial motor vehicles. The inside shoulder measures four feet and is composed of asphalt. The shoulder adjacent to the driving lane measures ten feet and is composed of asphalt. The shoulder does not have rumble strips. The driving lane and the adjacent shoulders do not have any measurable grade. The superelevation of the driving lane was .04 percent or 2.29 degrees. The drag factor or coefficient of friction for the roadway was determined through the use of a drag tire pulled in the direction of travel. The drag factor for the driving lane is .79. The drag factor for the east shoulder is .76. Adjacent to the shoulder is an embankment with a steep downgrade. The downgrade was figured to be .33 percent or 18.26 degrees. The embankment is composed of grass and other plant material. The drag factor for the grass embankment is .49. The roadway was dry at the time of the accident.

The roadway is maintained by the Missouri Department of Transportation located in Gallatin, Missouri. The speed limit on Interstate 35 is 70 miles per hour.

The temperature at the time of the accident ranged between the lower to mid thirties. The wind was out of the north, with an average speed of 10.2 miles per hour. The highest gust speed measured on this day was 20 miles per hour. There was no precipitation recorded for [REDACTED]. The weather conditions were not a factor in this accident. The sunrise for November [REDACTED] is 0709 hours.

III. Mechanical Factors

The vehicle was a 1998 Oldsmobile Intrigue, four door sedan with a retractable sunroof. The vehicle is front wheel drive with a four speed automatic transmission. The vehicle engine is a 3.8 liter, V6.

[REDACTED]
[REDACTED] May of 2005. I asked her if there was anything mechanically wrong with the vehicle prior to the accident. [REDACTED] stated the cruise control did not work and the rear, passenger side window would not roll down.

The vehicle's odometer was digital and could not be read following the accident. According to [REDACTED] there was over 100,000 miles on the vehicle.

The vehicle is equipped with front seat airbags on both the driver and passenger's side. Neither air bag deployed during the accident.

The examination of the seatbelts revealed the driver's seat was equipped with a three-point harness. The seatbelt was locked in the open position and unattached. The examination of the latch showed it was working properly. [REDACTED] stated he was wearing a seatbelt when the accident occurred. The examination of the seatbelt confirms his statement. The front passenger seat was equipped with a three-point harness. The seatbelt was locked in the open position and unattached. The examination of the latch showed it was working properly. The passenger, [REDACTED], stated she was wearing a seatbelt when the accident occurred. The examination of the seatbelt confirms her statement. The examination of the rear, passenger side seatbelt shows the three-point harness was locked in the closed or retracted position. This seatbelt was not used prior to the accident. The rear, center seatbelt consisted of a lap belt only. The seatbelt was unattached and lying freely in the seat. The rear, driver's side seatbelt was a three-point harness. The examination showed it was locked in the open position and unattached. The latching mechanism was intact and was working properly. Based upon the examination, which showed the seatbelt was unattached, and the position of final rest of the two rear passengers, the seatbelt could not have been used during the accident.

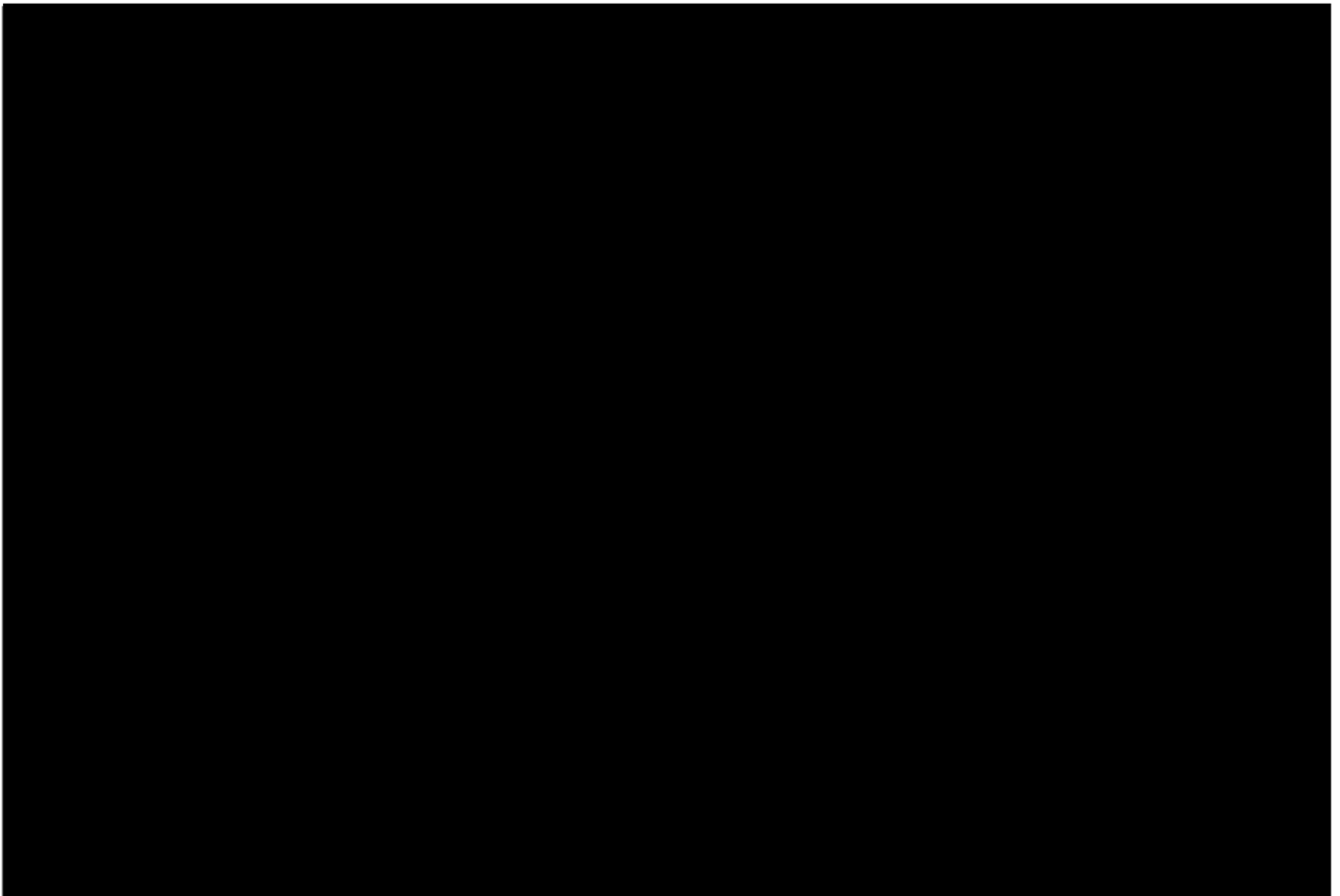
The examination of the tires show the left front tire was a Goodyear Viva, P-225/60 R16. The tread depth was 9-32nds or 8 mm. The bead on the tire was broken during the accident and thus contained no air pressure. The right front tire was an Astra II Sonic, P-225/60 R-16. The tread depth was 2-32nds or 2 mm. The bead was broken sometime during the accident. The outside edge of the tire showed a tread depth of 3-32nds or 3 mm. This showed evidence of over-inflation sometime prior to the accident. There is no evidence that over-inflation contributed to the accident. The left rear tire was a Goodyear Viva, P-225/60 R16. The tread depth was 11-32nds or 8 mm. The tire contained 17 lbs of pressure. The right rear tire was an Astra II Sonic, P-225/60 R-16. The tread depth was 3-32nd or 3 mm. The tire contained 27 lbs of

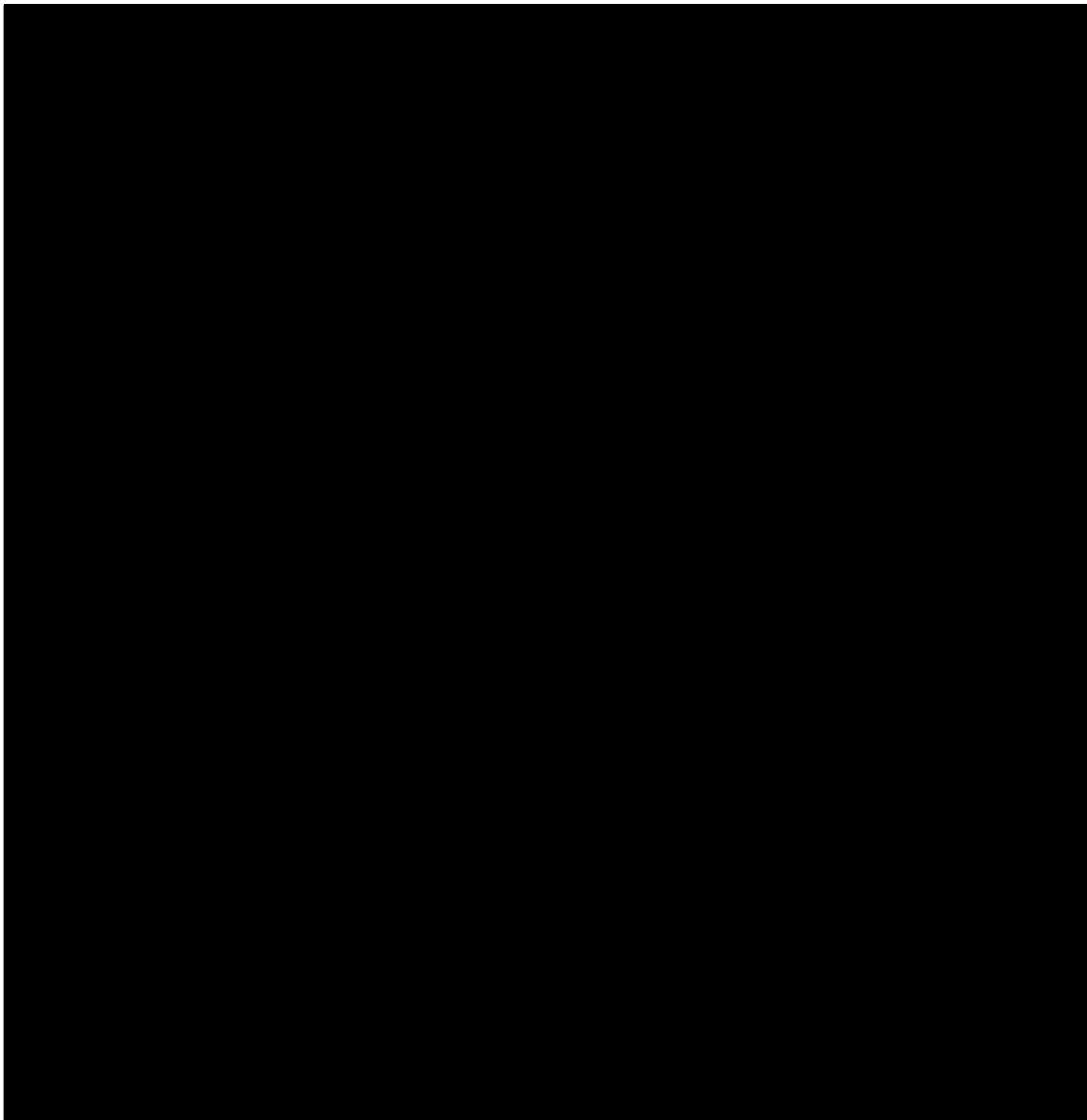
pressure. The examination of the tires found no structural failure in the form of punctures, tears or tread separation. There were no tire markings on the roadway prior to the vehicle leaving the roadway. According to Autostats, the recommended tire size for this particular vehicle is P225/60SR16. There is no evidence to show tire failure caused or contributed to this accident.

The examination of the vehicle showed damage to the undercarriage caused by the guardrail and its metal support posts. There is a gouge mark running down the center of the vehicle. The oil pan was destroyed and the gas tank was torn open. The loss of fluids from these reservoirs caused the fluid trails at the accident scene. The vehicle became airborne after leaving the guardrail. The vehicle impacted with an embankment causing the right front quarterpanel and right front bumper to be pushed back towards the passenger compartment. In addition, the hood release was compromised and the hood flew open. The rear of the vehicle received extensive damage after it landed on the right rear bumper and taillight assembly. This impact also compromised the roof and side windows. When the vehicle landed on its top, the hood was folded up against the windshield. The A pillar on the driver's side remained intact. The A pillar on the passenger side was collapsed inward. The B pillar on the driver's side remained intact. The B pillar on the passenger side was pushed forward and inward. The roof, just behind the B pillars, collapsed and came to rest on top of the rear passenger seat headrests. The passenger side, rear door was removed during extrication.

The vehicle was removed from the scene by Bridgeman's Towing, P.O. Box 17, Altamont, Missouri, 64620, and stored on their tow lot.

IV. Human Factors





V. Scene Investigation

As you approach the scene from the south, there are no skid marks or yaw marks on the roadway prior to the vehicle driving off the east side of the roadway. Seventy-one feet south of the guardrail, the right front tire left the roadway and traveled upon the grass. The grass was matted down and broken off. There were no slide or plow marks in the grass. This indicates the wheel was rotating as it continued north. The vehicle traveled for seventy-one feet before striking the guardrail. The vehicle continued to slide up the guardrail for twenty-seven feet before it became airborne. If you travel one hundred and forty-one feet north from

for twenty-seven feet before it became airborne. If you travel one hundred and forty-one feet north from this point, a gouge mark begins just ten feet east of the guardrail. This is where the right front bumper impacted with the embankment. This gouge mark measures twenty-five feet long. Just above the gouge mark, a fluid trail can be seen. It starts fourteen feet after the gouge marks begins and continues thirty feet beyond the end of the gouge mark. Eighty-five feet northwest of the end of the gouge mark, the third area of impact begins. This area covers approximately seventy-four square feet. The area contains gouge marks and matted grass. The [REDACTED] was ejected from the vehicle following this impact. A debris field can be located north of the area of impact. If you continue for ninety feet from the area of impact in a northeasterly direction, there are four gouge marks within this area where the vehicle is rolling and tumbling. At ninety-five feet from the third area of impact, the body of Bianca Luna came to rest. The vehicle came to rest on its wheels, ten feet north of this location, facing southwest. The vehicle covered four hundred and eighty feet from the time it left the roadway on Interstate 35 and where it came to rest.

VI. Findings

Based on my investigation, I found M [REDACTED]'s physical condition was the major contributing factor in this accident. There were no skidmarks or yaw marks located on the pavement prior to the vehicle leaving the roadway. This indicates no steering or braking input. It appears [REDACTED] fell asleep prior to driving off the roadway. He had been either driving or riding in the vehicle for nineteen out of twenty-one hours, prior to the accident. In his statement on the original accident report, he mentioned he was taking caffeine pills to help him stay awake. By his own statement, he was having difficulties fighting drowsiness and fatigue. His misuse of caffeine pills could have possibly contributed to his fatigue. During the course of the five hours prior to the accident, [REDACTED] consumed the caffeine equivalent of nine cups of coffee or thirty-four eight-ounce bottles of Dr. Pepper. When caffeine is introduced into the body, it blocks the neural receptors in the brain that trigger drowsiness and fatigue. When this occurs, adrenaline is released by your adrenal gland and sugar is introduced into the blood stream by the liver. This causes your pupils to dilate and your muscles to tighten up. It causes your heart to beat faster and your blood pressure to rise. Once the stimulant effects of the caffeine wears off, the neural receptors that trigger drowsiness become active again. A person is more likely to experience greater fatigue or drowsiness than he/she experienced prior to taking the caffeine pills. This increased fatigue can be caused by the increased cardiac and muscular activity related to the release of adrenaline and sugar.

[REDACTED]
would have remained secured against the passenger seat. The injuries she sustained can be contributed to her tumbling inside of the vehicle while it was overturning. There was some intrusion of the roof into the [REDACTED]

Based upon my mathematical computations, I determine the vehicle was traveling 53 miles per hour when it left the east side of the roadway. When the vehicle vaulted from the guardrail, it was traveling 52 miles per hour. [REDACTED] the cruise control was not operational. It is possible [REDACTED] off of the accelerator pedal when he fell asleep. Additional speed loss would have occurred due to the rolling resistance of the tires upon the roadway.

VII. Event Analysis

This accident occurred as the vehicle traveled northbound on Interstate 35, on [REDACTED]. The driver, [REDACTED], apparently fell asleep, which caused the vehicle to drift towards the east shoulder. The right side tires left the east side of the roadway. The vehicle traveled partially on the shoulder and partially off the roadway as it continued northbound for seventy-one feet before striking a metal guardrail. The vehicle straddled the guardrail as the undercarriage slid across the top for twenty-seven feet. At this time, the vehicle became airborne. As the vehicle continued northbound through the air, it rotated clockwise, one-quarter of a revolution. The right front bumper and quarterpanel impacted with the embankment, just ten feet east of the guardrail. After impact, the vehicle again became airborne. The vehicle rotated one-quarter revolution and traveled eighty-five feet before coming down upside down. The majority of the impact occurred towards the rear of the vehicle. The impact compromised most of the windows in the vehicle. The vehicle continued to roll three times as the front of the vehicle began to rotate around approximately 180 degrees. During one of these rollovers, [REDACTED] was ejected out of the vehicle through the rear, passenger-side window. The vehicle came to rest on its wheels facing southwest. [REDACTED] came to rest ten feet south of the vehicle.

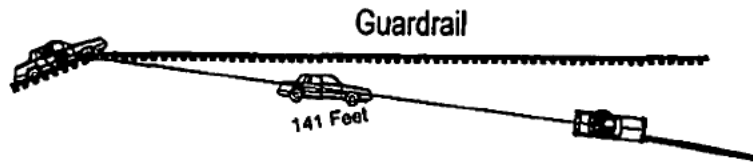
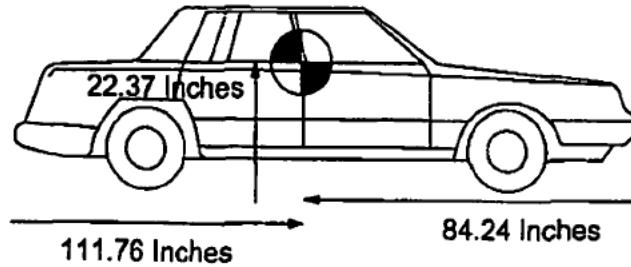
VIII. Attachments

- A. Mathematical Equations Worksheets
- B. Scale Diagram
- C. Photographs, Negatives and Photo Log
- D. Autostats Printout for Vehicle
- E. Product Information for Swarm Extreme Energizer
- F. Printout Pertaining to the Effects of Caffeine

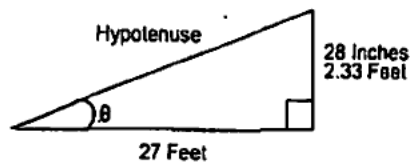
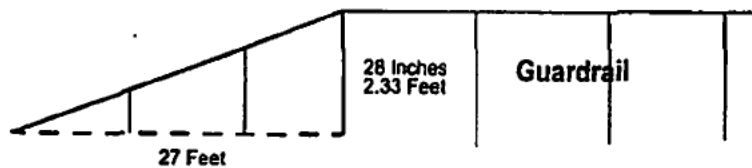
MATHEMATICAL EQUATIONS

ACCIDENT RECONSTRUCTION

Center of Mass



Take-off Angle



θ or Theta = Take-Off Angle

$$A^2 + B^2 = C^2$$

$$27^2 + 2.33^2 = C^2$$

$$729 + 5.4289 = 734.4289$$

$$C = 27.10034871 \text{ Hypotenuse}$$

Take-Off Angle

$$\text{Cosine } \theta = \frac{\text{adjacent}}{\text{hypotenuse}}$$

$$\text{Cosine } \theta = \frac{27}{27.10034871}$$

$$\text{Cosine } \theta = .996297143$$

$$\text{Take-Off Angle} = 4.932194443$$

Mathematic Equations

Accident Reconstruction # [REDACTED]

Superelevation

A two foot level was laid across the northbound driving lane

$$\begin{array}{l} h = \text{Rise} = 1 \text{ inch} \\ D = \text{Run} = 24 \text{ inches} \end{array} \quad e = \frac{h (\text{rise})}{D (\text{run})} = \frac{1}{24} = e = .041666667$$

Grade (Embankment)

A two foot level was laid with the grade of the embankment

$$\begin{array}{l} h = \text{Rise} = 8 \text{ inches} \\ D = \text{Run} = 24 \text{ inches} \end{array} \quad m = \frac{h (\text{rise})}{D (\text{run})} = \frac{8}{24} = m = .333333333$$

Drag Factor or Coefficient of Friction (Roadway-asphalt)

A 33 lbs drag tire was pulled across the roadway in the direction of travel

$$\begin{array}{l} 1\text{st pull} = 26 \text{ lbs} \\ 2\text{nd pull} = 26 \text{ lbs} \\ 3\text{rd pull} = 27 \text{ lbs} \end{array} \quad \begin{array}{l} F = \text{Force} \\ W = \text{Weight} \end{array}$$

Average of three pulls = 26.33333333

$$f = \frac{F}{W} = \frac{26.33333333}{33} \quad f = .797979798 \text{ drag factor for roadway}$$

Drag Factor or Coefficient of Friction (Embankment-grass)

A 33 lbs drag tire was pulled across the embankment in the direction of travel

$$\begin{array}{l} 1\text{st pull} = 17 \text{ lbs} \\ 2\text{nd pull} = 15 \text{ lbs} \\ 3\text{rd pull} = 17 \text{ lbs} \end{array} \quad \begin{array}{l} F = \text{Force} \\ W = \text{Weight} \end{array}$$

Average of three pulls = 16.33333333

$$f = \frac{F}{W} = \frac{16.33333333}{33} \quad f = .494949495 \text{ Drag factor for grass embankment}$$

Drag Factor or Coefficient of Friction (Shoulder-Asphalt)

A 33 lbs drag tire was pulled across the shoulder in the direction of travel

$$\begin{array}{l} 1\text{st pull} = 25 \text{ lbs} \\ 2\text{nd pull} = 25 \text{ lbs} \\ 3\text{rd pull} = 26 \text{ lbs} \end{array} \quad \begin{array}{l} F = \text{Force} \\ W = \text{Weight} \end{array}$$

Average of three pulls = 25.33333333

$$f = \frac{F}{W} = \frac{25.33333333}{33} \quad f = .767676768 \text{ Drag factor for shoulder}$$

Mathamatical Equations

Accident Reconstruction

Vault Equation

$$S = \frac{2.73 \times D}{\cos \theta \sqrt{h + (D \times m)}}$$

$D = 141$
 $\cos \theta = .996297143$
 $h = 6.25$
 $m = .333333333$

$$S = \frac{2.73 \times 141}{.996297143 \sqrt{6.25 + (141 \times .333333333)}}$$

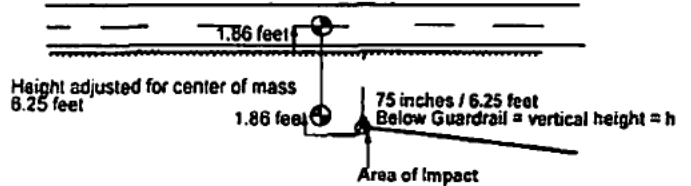
$$S = \frac{384.93}{.996297143 \sqrt{6.25 + 46.99999995}}$$

$$\frac{384.93}{.996297143 \sqrt{53.24999995}}$$

$$S = \frac{384.93}{.996297143 (7.297259756)}$$

$$S = \frac{384.93}{7.270239047}$$

$S = 52.94598947$ Vehicle's vault speed



Speed Loss Equation

$$S = \sqrt{30 \times D \times f}$$

$D = 71$ feet
 $f = .05$ Drag factor for four, free-rolling wheels

$$S = \sqrt{30 \times 71 \times .05}$$

$$S = \sqrt{106.5}$$

$S = 10.31988372$ Speed loss when vehicle leaves roadway

Combined Speed Equation

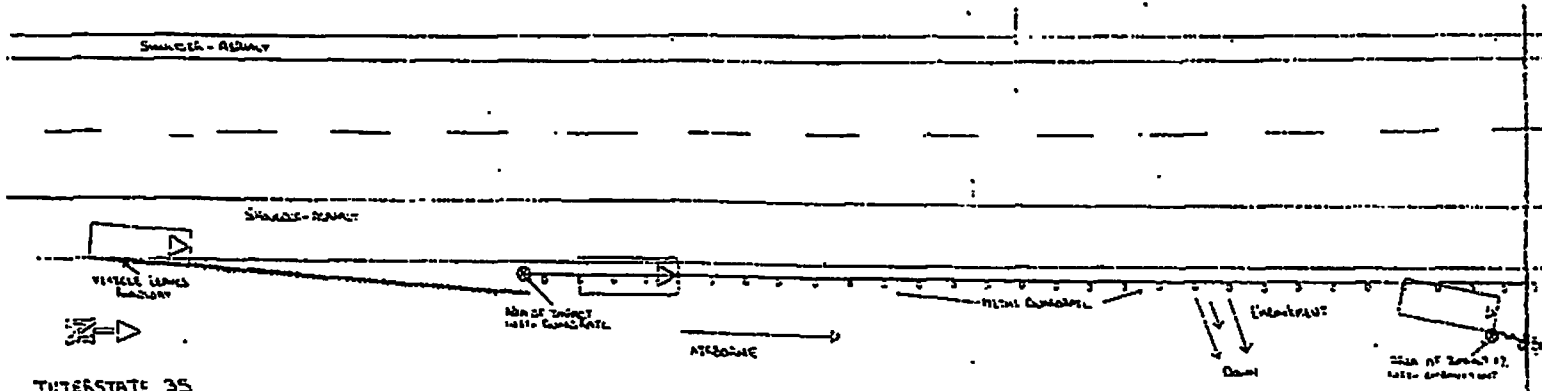
$$S = \sqrt{S_1^2 + S_2^2}$$

$$S = \sqrt{52.94598947^2 + 10.31988372^2}$$

$$S = \sqrt{2803.277801 + 106.5}$$

$$S = \sqrt{2909.777801}$$

$S = 53.94235628$ Vehicle speed when it leaves roadway



INTERSTATE 35
(MICHIGAN STATE ROAD)

NEAREST AIRPORT: B.S. DOWNS AIRPORT
OF THE STATE
COUNTY: WASHINGTON
PRESIDENT DATE: NOVEMBER 19, 1968
PRESIDENT NAME: GEORGE W. BUSH
STATE: MICHIGAN & SOUTHWEST
EPA: 1130 COLUMBIA UNIVERSITY

SCHEMATIC DIAGRAM
[REDACTED]
SEE PLAN & THE PLAN

CONDUCTED BY RESIDENT RECONSTRUCTION CO. (L. JAMES A. STONE)

b

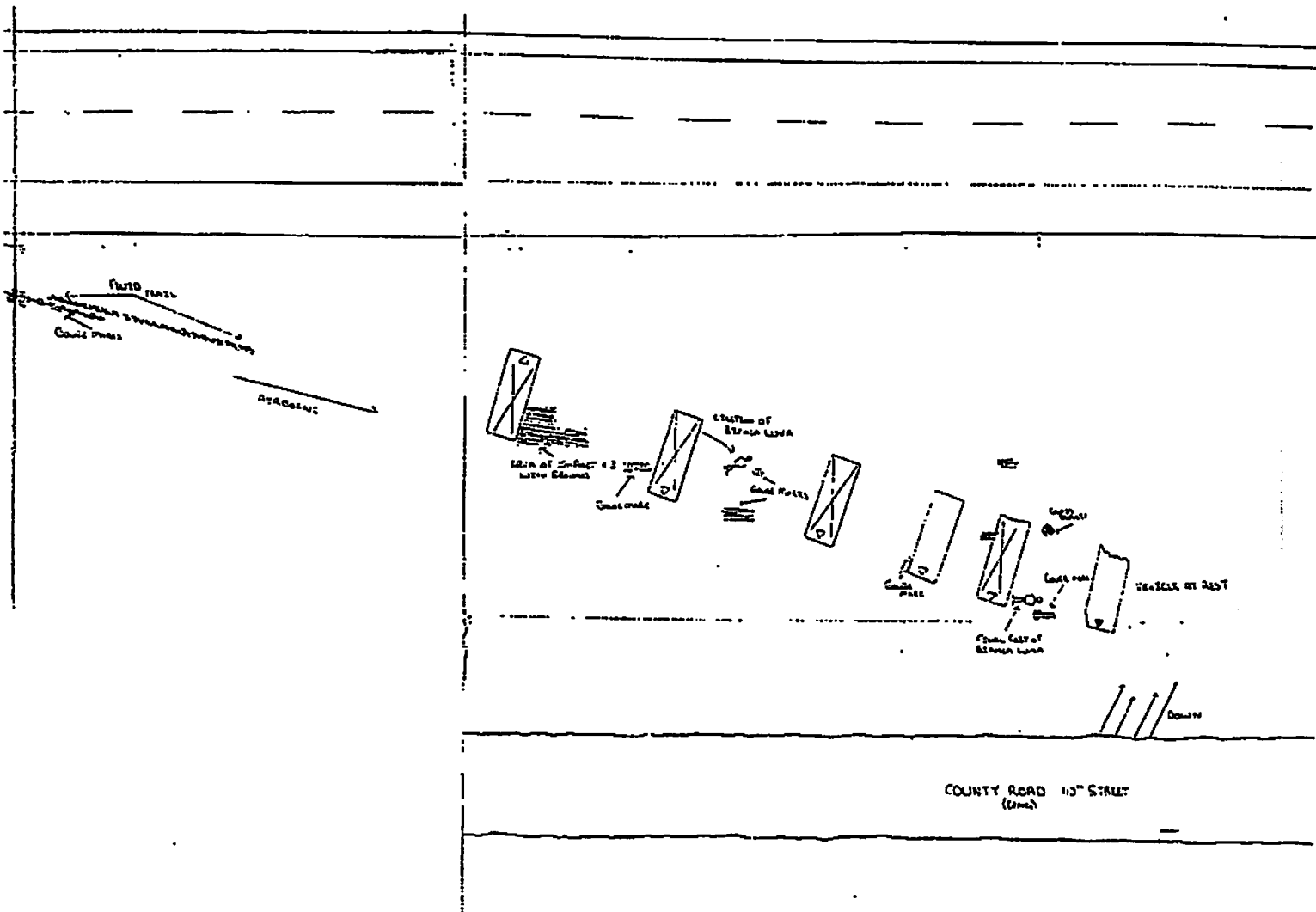


PHOTO LOG--VEHICLE

ACCIDENT RECONSTRUCTION [REDACTED]

This vehicle is a 1998 Oldsmobile Intrigue.
The photographs were taken on November 21, 2005 by Accident Reconstructionist
Corporal Joseph A. Pithan.

Roll # 1

- 1). Damage to undercarriage--damaged oil pan.
- 2). Damage to undercarriage--scrape down center of vehicle caused by guardrail.
- 3). Damage to undercarriage--damaged gas tank.
- 4). Damage to undercarriage--damaged oil pan.
- 5). Damage to undercarriage--damaged exhaust system.
- 6). View of front end damage.
- 7). View of front end and front, driver's side quarterpanel.
- 8). View of driver's side of vehicle.
- 9). View of driver's side front quarterpanel and driver's door.
- 10). View of driver's side rear passenger door and rear quarterpanel.
- 11). View of rear end damage.
- 12). View of passenger side of vehicle.
- 13). View of top of vehicle.
- 14). View of rear window.
- 15). View of passenger side of vehicle.
- 16). View of windshield and hood.
- 17). View of driver's side rear passenger window.
- 18). View of driver's compartment and front passenger compartment.
- 19). View of rear passenger compartment.
- 20). View of rear end damage.
- 21). View of engine compartment.
- 22). View of driver's side front tire and quarterpanel.
- 23). View of the top of the vehicle.
- 24). View of the front end and passenger side door.
- 25). View of the center console.

PHOTO LOG—ACCIDENT SCENE
ACCIDENT RECONSTRUCTION #11190500371

Photographs were taken on November 26, 2005 by Accident Reconstructionist, Corporal Joseph A. Pithan.

Roll # 2

The accident scene is located on Interstate 35 [REDACTED]

- 1). View of accident scene from the north.
- 2). View of the northbound lanes of Interstate 35.
- 3). View of the accident scene from the south.
- 4). View of the northbound lanes and east shoulder of Interstate 35.
- 5). View of the guardrail struck during the accident.
- 6). View of the guardrail from the east.
- 7). View of the damage caused to the guardrail.
- 8). View of markings and damage caused to the guardrail.
- 9). View of the damage caused to the guardrail and metal support posts.
- 10). View of engine fluid deposited on guardrail. Linear post with tire marking.
- 11). Closer view of tire marking on linear post.
- 12). View of damage caused to guardrail.
- 13). View of end of markings on guardrail caused by the undercarriage of the vehicle.
- 14). View of the guardrail from the west.
- 15). View of the second impact with the ground. The darker area above the gouge mark is a fluid trail from engine fluids.
- 16). View of the guardrail from the northeast.
- 17). View of the gouge mark and adjacent fluid trail.
- 18). View of the third area of impact. Vehicle lands on its top. Picture shows scarring of the ground and debris field.
- 19). View of the third area of impact from the north.
- 20). View of gouge marks just north of the third area of impact.
- 21). View of gouge marks.
- 22). View of gouge marks.
- 23). View of the accident scene from the north.
- 24). View of the accident scene from County Road 110th Street.
- 25). View of the debris field just north of the third area of impact.

EXPERT AUTOSTATS
Ver. 4.4.1w
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MISSOURI STATE HIGHWAY PATROL - TROOP E
1510 EAST ELM
JEFFERSON CITY MO 65101

1998 OLDSMOBILE INTRIGUE 4DR SEDAN

CURB WEIGHT: 3455 lbs. 1567 kg.
Curb Weight Distribution - Front: 64 % Rear: 36 %
Gross Vehicle Weight Rating: 4387 lbs. 1990 kg.
Number of Tires on Vehicle: 4
Drive Wheels: FRONT

HORIZONTAL DIMENSIONS

	Inches	Feet	Meters
Total Length	196	16.33	4.98
Wheelbase:	109	9.08	2.77
Front Bumper to Front Axle	45	3.75	1.14
Front Bumper to Front of Front Well	29	2.42	0.74
Front Bumper to Front of Hood	4	0.33	0.10
Front Bumper to Base of Windshield	51	4.25	1.30
Front Bumper to Top of Windshield	85	7.08	2.16
Rear Bumper to Rear Axle	42	3.50	1.07
Rear Bumper to Rear of Rear Well	28	2.33	0.71
Rear Bumper to Rear of Trunk	5	0.42	0.13
Rear Bumper to Base of Rear Window	27	2.25	0.69

WIDTH DIMENSIONS

Maximum Width	74	6.17	1.88
Front Track	62	5.17	1.57
Rear Track	61	5.08	1.55

VERTICAL DIMENSIONS

	Inches	Feet	Meters
Height	57	4.75	1.45
Ground to:			
Front Bumper (Top)	23	1.92	0.58
Headlight - center	25	2.08	0.63
Hood - top front	26	2.17	0.66
Base of windshield	61	5.08	1.55
Rear Bumper - top	27	2.25	0.69
Trunk - top rear	40	3.33	1.02
Base of rear window	43	3.58	1.09

1998 OLDSMOBILE INTRIGUE 4DR SEDAN

INTERIOR DIMENSIONS

	Inches	Feet	Meters
Front Seat Shoulder Width	58	4.83	1.47
Front Seat to Headliner	39	3.25	0.99
Front Leg - seatback to floor (max)	42	3.50	1.07
Rear Seat Shoulder Width	57	4.75	1.45
Rear Seat to Headliner	37	3.08	0.94
Rear Leg - seatback to floor (min)	37	3.08	0.94

Seatbelts: 3pt - front and rear

Airbags: FRONT SEAT AIRBAGS

STEERING DATA

Turning Circle (Diameter)	480	40.00	12.19
Steering Ratio:	___:1		
Wheel Radius:	12	1.00	0.30
Tire Size (OEM):	P225/60SR16		

ACCELERATION & BRAKING INFORMATION

Brake Type: ALL DISC

ABS System: ABS

Braking, 60 mph -> 0 (Hard pedal, no skid, dry pavement):

d = 133 ft t = 3.0 sec. a = -29.1 ft/sec/sec G-force = -0.90

ACCELERATION:

0->30 mph	t = 2.7 sec.	a = 16.3 ft/sec/sec	G-force = 0.51
0->60 mph	t = 7.9 sec.	a = 11.1 ft/sec/sec	G-force = 0.35
45->65 mph	t = 4.4 sec.	a = 6.7 ft/sec/sec	G-force = 0.21

Transmission Type: 4spd AUTOMATIC

NOTES:

Federal Bumper Standard Requirements = 2.5 MPH
 This vehicles Rated Bumper Strength: 2.5 mph

1998 OLDSMOBILE INTRIGUE 4DR SEDAN

OTHER INFORMATION

TIP-OVER STABILITY RATIO = 1.38 STABLE
 NHTSA Star Rating (calculated) ****

CENTER OF GRAVITY (No Load):

Inches behind front axle = 39.24
 Inches in front of rear axle = 69.76
 Inches from side of vehicle = 37.00
 Inches from ground = 22.37
 Inches from front corner = 92.01
 Inches from rear corner = 117.73
 Inches from front bumper = 84.24
 Inches from rear bumper = 111.76

MOMENTS OF INERTIA APPROXIMATIONS (No Load):

YAW MOMENT OF INERTIA = 2352.65 lb-ft-sec²
 PITCH MOMENT OF INERTIA = 2271.45 lb-ft-sec²
 ROLL MOMENT OF INERTIA = 471.90 lb-ft-sec²

FRONT PROFILE INFORMATION

ANGLE FRONT BUMPER TO HOOD FRONT = 36.9 deg
 ANGLE FRONT OF HOOD TO WINDSHIELD BASE = 36.7 deg
 ANGLE FRONT OF HOOD TO WINDSHIELD TOP = 19.7 deg
 ANGLE OF WINDSHIELD = -10.0 deg
 ANGLE OF STEERING TIRES AT MAX TURN = 26.0 deg

FIRST APPROXIMATION CRUSH FACTORS:

Speed Equivalent (mph) of Kinetic Energy (KE) used in causing crush or indentation may be evaluated using the following formula, the appropriate Crush Factor (CF), and Maximum Indentation Depth (MID), in feet:

$$V(\text{mph}) = \text{Sqr root of } (30 * \text{CF} * \text{MID})$$

KE Equivalent Speed (Front/Rear/Side) = 21 CF

Bullet vehicle IMPACT SPEED estimation
 based on TARGET VEHICLE damage ONLY = 27 CF
 (Tested for Rear/Side Impact only)

These CF values are based upon analysis of NHTSA Barrier Crash data, and from over 1000 vehicle accidents where independent evaluation of speed was possible. (These are NOT 'A', 'B', 'C', or 'G' values)

The Rear Impact data with more than 2-3 inches of crush damage should be looked at carefully, since some vehicles have very weak trunk & fender strength. Therefore, on some cars, esp. GM, your estimate from the rear crush data may be high by as much as 4-5 mph (on a crush of 18 inches).

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PRODUCTS

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SWARM EPHEDRA-FREE



Swarm Ephedra-Free

Totally Ephedra Free, Swarm Extreme Energizer has a proprietary blend of herbs that combines Green Tea Extract, Yerba Mate, Guarana, Capsaicum and Kola Nut! Swarm provides you with an extreme boost of energy that is associated with the famous Stacker 2 brand of products. †

Keep Out of Reach of Children
Sale to Minors is Not Recommended
No international shipments.

Free UPS Ground shipping on all orders.

Free product specials are available for most of our products. Click the View Specials links to find out more.



SUPPLEMENT FACTS

Serving Size: 1 Capsule

Proprietary Blend 211mg*



Green Tea Extract 60% (Leaves)(4.5 mg Caffeine Alkaloids), Yerba Mate (leaves), Guarana (Seeds), Capsaicum Annuun (Whole Pepper), Kola Nut (seeds)(<1 mg Caffeine Group Alkaloids), Ginseng (Root)

Caffeine (anhydrous) 300mg*

* Daily value not established

Other Ingredients: Gelatin, Stearic Acid, Magnesium Stearate, Titanium Dioxide, FD&C Yellow #5, FD&C Yellow #6

Suggested Use: One capsule after meals. Do not exceed three daily.

Item	Size	Price	Qty	Add To Cart
	20-capsule bottle	\$7.99	1	ADD TO CART VIEW SPECIALS
	4-capsule blister pak	\$1.99	1	ADD TO CART VIEW SPECIALS

WARNING: Not recommended for use by minors. Consult a physician or licensed qualified health care professional before

using this product if you have, are at risk for, or have a family history of stroke, heart disease, thyroid disease, liver disease, kidney disease, ulcer, diabetes, high blood pressure, caffeine sensitivity, recurrent headaches, anxiety, depression or other psychiatric condition, glaucoma, difficulty urinating, prostate enlargement, seizure disorder, or if you are using any other dietary supplement, or a monoamine oxidase inhibitor (maoi), prescription drug or over-the-counter drug containing ephedrine or pseudoephedrine (found in some allergy, asthma, and cough/cold products). Do not exceed recommended serving. Individuals who exceed the recommended serving or consume caffeine with this product may experience serious adverse health effects, including muscle function loss, chills and vertigo. Stop use and call a physician or licensed qualified health care professional immediately if you experience rapid heartbeat, nausea, insomnia, dizziness, severe headache, shortness of breath, or similar symptoms. In case of overdose seek professional assistance or contact a poison control center immediately. Avoid alcohol and foods with tyramine (such as cheese, red wine and liver) while taking this product.
† These statements have not been evaluated by the Food & Drug Administration. This Product is not intended to diagnose, treat, cure or prevent any disease.

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How Caffeine Works

by [Marshall Brain](#)

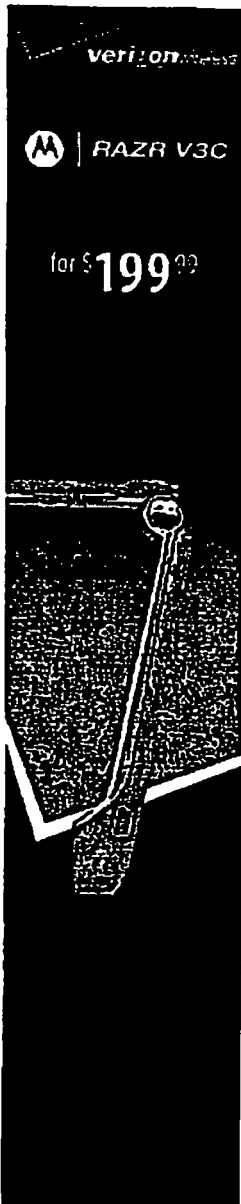


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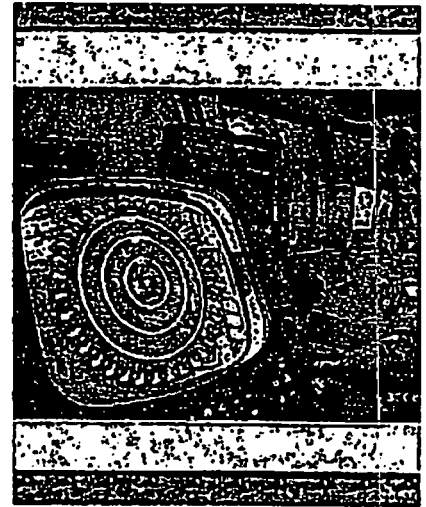
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Table of Contents

- Introduction to How Caffeine Works
- What is Caffeine?
- Caffeine in the Diet

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Caffeine and Adenosine

Why do so many people consume so much caffeine? Why does caffeine wake you up? By understanding the drug's actions inside the body you can see why people use it so much.

In the HowStuffWorks article [How Sleep Works](#), the action of adenosine is discussed. As adenosine is created in the brain, it binds to adenosine receptors. The binding of adenosine causes drowsiness by slowing down nerve cell activity. In the brain, adenosine binding also causes blood vessels to dilate (presumably to let more oxygen in during sleep).

To a nerve cell, caffeine looks like adenosine. Caffeine therefore binds to the adenosine receptor. However, it doesn't slow down the cell's activity like adenosine would. So the cell cannot "see" adenosine anymore because caffeine is taking up all the receptors adenosine binds to. So instead of slowing down because of the adenosine level, the cells speed up. You can see that caffeine also causes the brain's blood vessels to constrict, because it blocks adenosine's ability to open them up. This effect is why some headache medicines like Anacin contain caffeine – if you have a vascular headache, the caffeine will close down the blood vessels and relieve it.

So now you have increased neuron firing in the brain. The pituitary gland sees all of the activity and thinks some sort of emergency must be occurring, so it releases hormones that tell the adrenal glands to produce adrenaline (epinephrine). Adrenaline is the "fight or flight" hormone, and it has a number of effects on your body:

- Your pupils dilate.
- Your breathing tubes open up (this is why people suffering from severe asthma attacks are sometimes injected with epinephrine).
- Your heart beats faster.
- Blood vessels on the surface constrict to slow blood flow from cuts and also to increase blood flow to muscles. Blood pressure rises.
- Blood flow to the stomach slows.
- The liver releases sugar into the bloodstream for extra energy.
- Muscles tighten up, ready for action.

Related Ad Categories

- > Caffeine Candy
- > Caffeine Pills
- > Headache
- > Caffeine Candies

This explains why, after consuming a big cup of coffee, your hands get cold, your muscles tense up, you feel excited and you can feel your heart beat increasing.

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