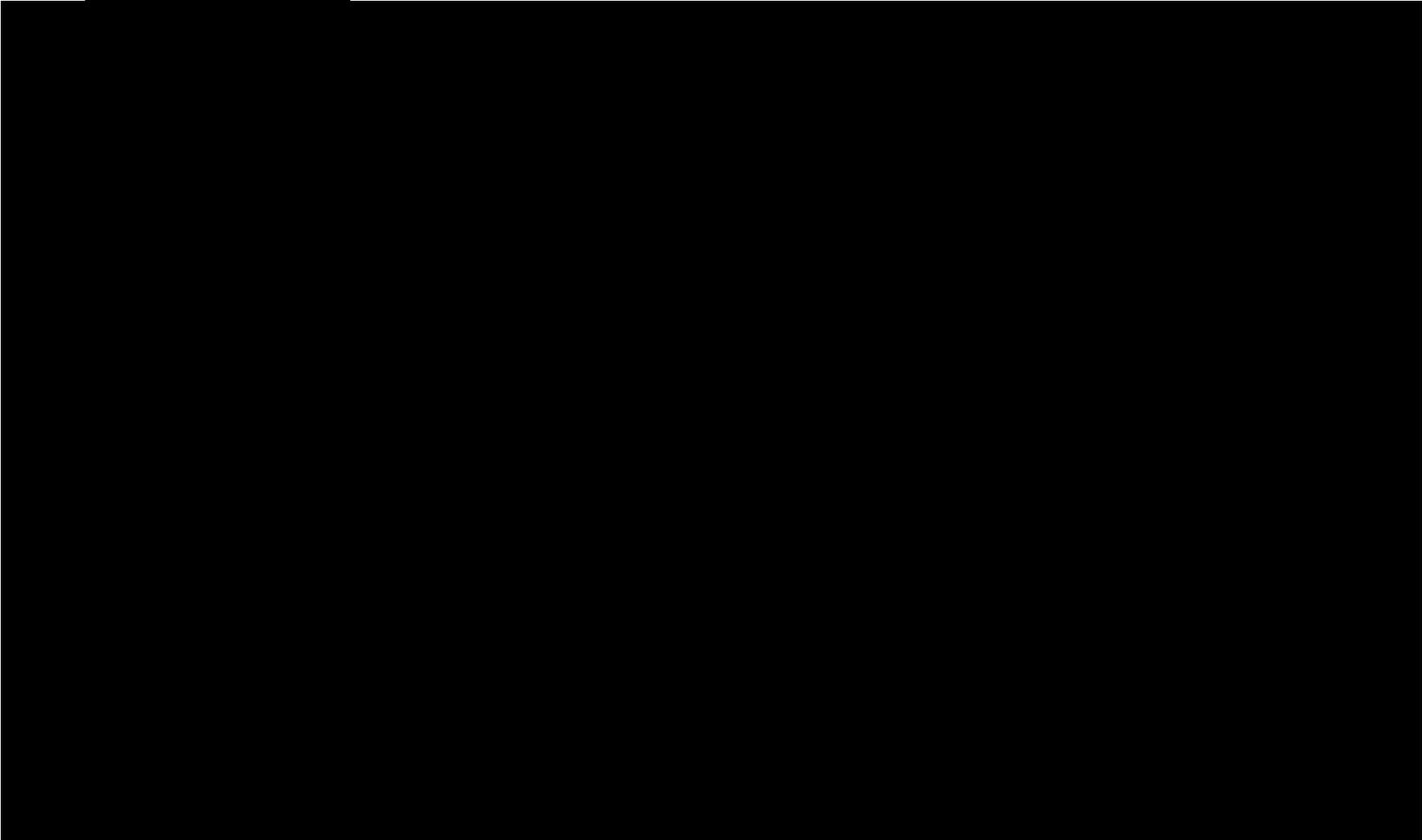


**MISSOURI STATE HIGHWAY PATROL  
MISSOURI UNIFORM CRASH REPORT  
TECHNICAL SUPPLEMENT**

|   |                               |                       |  |   |
|---|-------------------------------|-----------------------|--|---|
| CRASH DATE<br>[REDACTED]                        | SUPP RPT DATE<br>[REDACTED] 4 | TRP / DIST / PCT<br>A | COUNTY<br>Clay                                   | REPORT / CASE / INCIDENT NUMBER<br>[REDACTED] |
| SUPPLEMENT REPORTING OFFICER<br>Cpl. G. D. Ward |                               | DSN / BADGE<br>1189   | SUPPLEMENT REVIEWING OFFICER<br>Sgt. H. A. Sears |   |
|   |                               |                       | DSN / BADGE<br>1200                              |   |

**Section I - Synopsis**

On Friday, [REDACTED] at 1000 hours, I was notified of a fatality motor vehicle crash which had occurred in Clay County and necessitated a technical crash investigation per General Order. Trooper B. R. Sanson initiated the crash investigation and submitted the original crash report, indicating that it occurred on the [REDACTED] at approximately 0640 hours on southbound Interstate 35 [REDACTED] involving two vehicles and one fatality.



**Section II - Environmental Factors**

The crash occurred on the southbound lanes of Interstate 35, classified as part of the federal interstate highway system and designated a north-south route, which in the area consists of two separate concrete surface roadways, one in each direction, separated by a grass median. The southbound roadway where the crash occurred measures approximately 24 feet in width and is divided into two lanes of nearly equal width by white paint line segments aligned near the roadway centerline. The passing lane

is bordered on the outside by a continuous yellow paint line and a concrete shoulder measuring about 9 feet in width, and median cables. The driving lane is bordered on the outside by a continuous white paint line, a concrete shoulder measuring approximately 10 feet in width and grass terrain beyond.

In the area of the crash, the southbound motorists are presented with a virtually level roadway as they approach a right hand curve. The curve has a radius of about 4163 feet.

The crash occurred during the early morning hours approximately 54 minutes before official sunrise under clear skies on a dry roadway with no atmospheric conditions present which would adversely affect driver visibility.

Interstate 35 is maintained by the Missouri Department of Transportation, 105 W. Capital Avenue, Jefferson City, Missouri, and has a posted speed limit of 70 miles per hour.

Global positioning coordinates for the crash location as reported by Trooper Sanson on the original report are [REDACTED]

### **Section III - Mechanical Factors**

I examined Vehicle #1 at Wilde Auto and Recovery in Kansas City, Missouri, where it had been removed from the scene.

Vehicle #1 was equipped with integrated lap and shoulder belt restraints for the seat position occupied at the time of the crash. It was also equipped with front seat air bags which had not deployed. Driver #1's seat belt extended, latched and retracted when checked for operability.

Vehicle #1 exhibited damage to the right rear fender, right front door skin, right front fender, right front bumper cover and right front headlight assembly. An inspection of the headlight bulbs revealed tungsten deposits on the filament which indicates the headlights were activated at the time of the crash. The Vehicle #1 odometer displayed 150,262 miles at the time of the inspection.

Vehicle #2 exhibited rollover damage and extensive roof damage from a collision with the ground. The left, driver's side, door displayed extensive damage from a collision with the guardrail with the damage intruding into the space occupied by Driver #2.

Vehicle #2 was equipped with integrated lap and shoulder belt restraints for the seat positions occupied at the time of the crash. Driver #2 and Passenger #1 seat belts were locked in their fully

retracted position. The pretensioners had fired, locking the seat belts in the position where they were at the time of the crash. The Driver #2 and Passenger #1 seat belt buckles were located on the floorboard stuck between the front row seats. The buckles latched and unlatched when checked for operability. The Vehicle #2 odometer displayed 69,427 miles at the time of the inspection.

## Section IV - Human Factors

Two independent witnesses to the collision were identified and their statements are listed on Trooper Sanson's original crash report.

## Section V - Scene Investigation

On [REDACTED], I examined the crash scene and also charted the scene using assigned electronic mapping instruments.

The evidence at the crash scene indicated Vehicle #1 was traveling southbound on Interstate 35 partially in the left, passing, lane and partially in the right, driving, lane when it struck the left side of southbound Vehicle #2 in the driving lane. Vehicle #2 rotated clockwise, slid in a southwest direction, traveled of the right side of the driving lane, across the southbound shoulder, struck a guardrail end, overturned, struck the ground and came to rest facing north. Vehicle #1 remained partially in the driving and passing lane after impact and came to a controlled stop on the southbound shoulder.

## Section VI - Findings

Using computer generated graphics of the crash scene, along with evidence observed at the scene and damage to the vehicles, determinations were reached concerning the crash situation, also depicted in the attached scale diagram.

Tire mark evidence observed on the roadway indicates Vehicle #1 was facing south when it entered the driving lane, occupied by southbound Vehicle #2, and struck Vehicle #2. Vehicle #2 was facing west when it struck the guardrail end and facing northwest when it began to overturn.

Evidence at the scene along with computer graphic analysis, indicates Vehicle #2 overturned one full revolution and came to rest on its wheels in a north facing.

Vehicle #1 and Vehicle #2 were not equipped with supported ECM modules and could not be imaged.

## Section VII - Event Analysis

According to determination reached in this report, this crash occurred when Driver #1 failed to maintain the Vehicle #1 path of travel within the southbound passing lane. Vehicle #1 entered the driving lane as it was overtaking Vehicle #2 and struck the left side of Vehicle #2. Vehicle #2 rotated clockwise after the impact, slid off the right side of the roadway, struck a guardrail end, overturned and ultimately killed Driver #2.

That Driver #1 did survive the collision is attributable to her use of her seat belt restraints and her relative distance from the harshest of the direct collision engagement events.

That Driver #2 did not survive the collision is attributable to his close proximity to the harshest of direct collision engagements and the intrusion of the Vehicle #2 left door and guardrail into the space he occupied, considered in tandem with his lack of use of the seat belt restraint for his seat position.

That Passenger #1 did survive the collision is attributable to his relative distance from the harshest of the direct collision engagement events.

## **Section VII - Attachments**

1. Photo log
2. Scale Diagram
3. Expert AutoStats Manufacture specifications for 1987 Ford Bronco II
4. Expert AutoStats Manufacture specifications for 2008 Mercury Mariner
5. Weather Data for Mosby, Missouri on [REDACTED]

## Photo Log

Digital images DSCN0058 through DSCN0088 were taken by Sergeant B. A. Kumpf at the crash scene.

58. View of Vehicle #2 at rest, looking south.
59. View of impact area and tire marks, looking south.
60. Progressive view from previous view.
61. Progressive view from previous view. Note: Vehicle #1 final rest location just ahead of emergency lights which are visible in the background.
62. View of damaged guardrail and Vehicle #2 at rest, looking south.
63. Progressive view from previous view.
64. Progressive view from previous view.
65. View of Vehicle #2 from front.
66. View of Vehicle #2 from right front.
67. View of Vehicle #2 from right.
68. View of Vehicle #2 from right rear.
69. View of Vehicle #2 from rear.
70. View of Vehicle #2 from left rear.
71. View of Vehicle #2 from left.
72. View of Vehicle #2 from left. Note: Driver #2 door was pushed inward as a result of impact with guardrail.
73. View of Vehicle #2 from left front.
74. View of Vehicle #2 left rear fender area and damaged paint.
75. View of Vehicle #2 left rear fender area and damaged paint.
76. View of Vehicle #2 from left. Note: Driver #2 door was pushed inward as a result of impact with guardrail.
77. View of damaged guardrail and tire marks, looking north.
78. Progressive view from previous view.
79. Progressive view from previous view.
80. Progressive view from previous view.
81. View of Vehicle #1 from left front.
82. View of Vehicle #1 from right front.
83. View of Vehicle #1 from right front.
84. View of Vehicle #1 right front door from right.
85. View of Vehicle #1 right rear fender from right. Note: Damage from impact with Vehicle #2.
86. View of Vehicle #1 right rear fender from right.

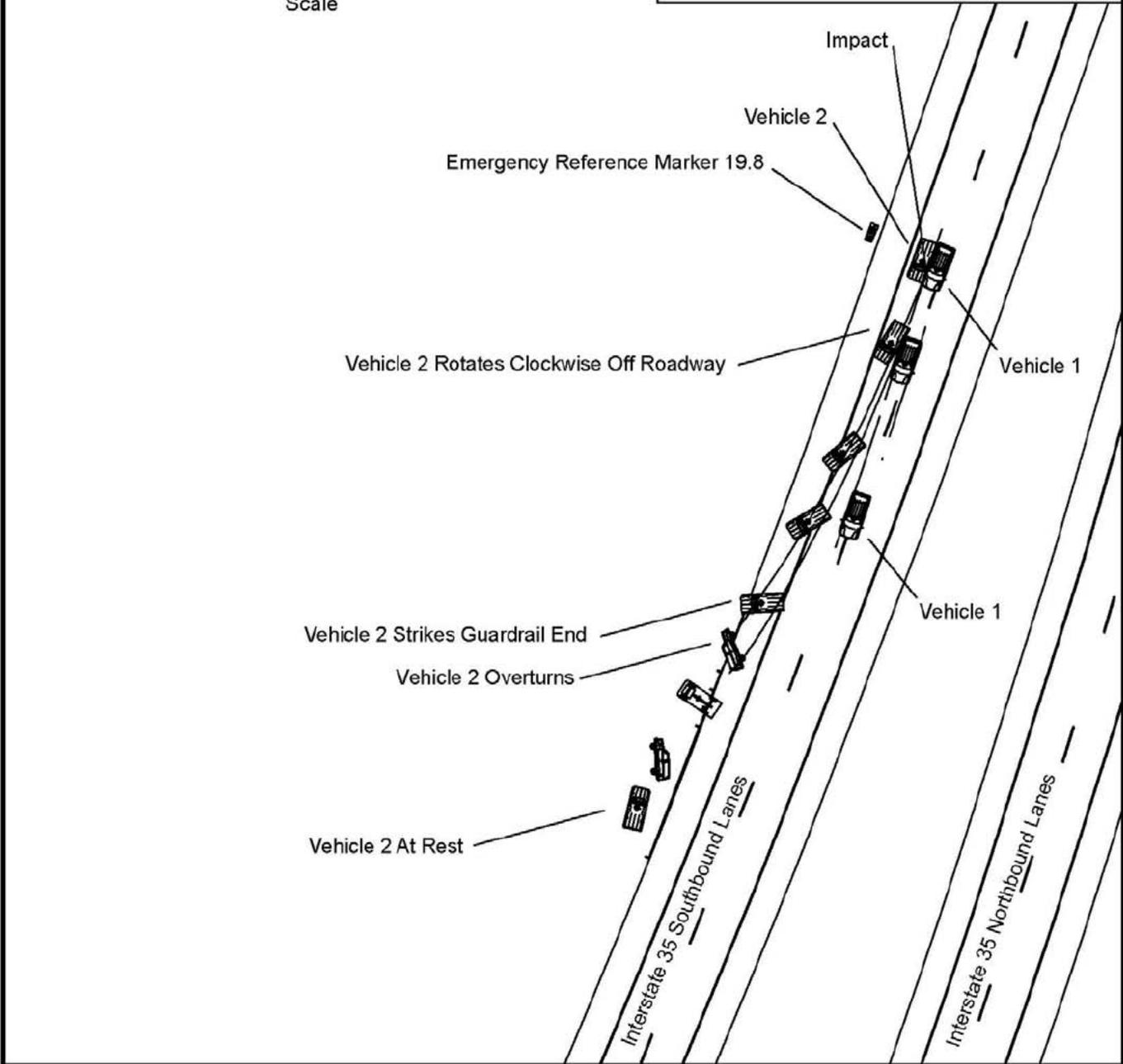
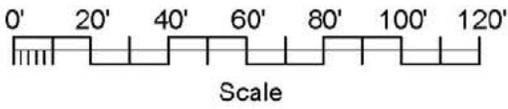
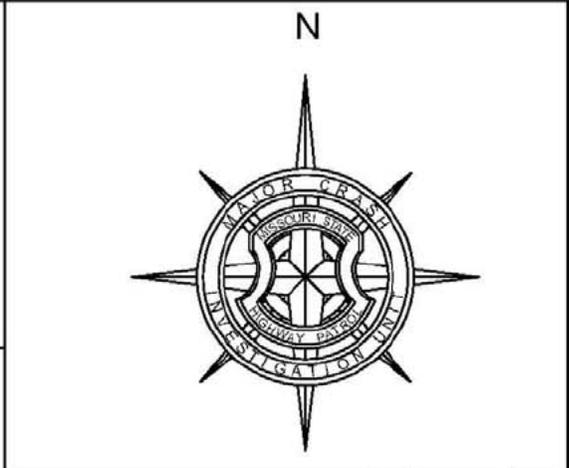
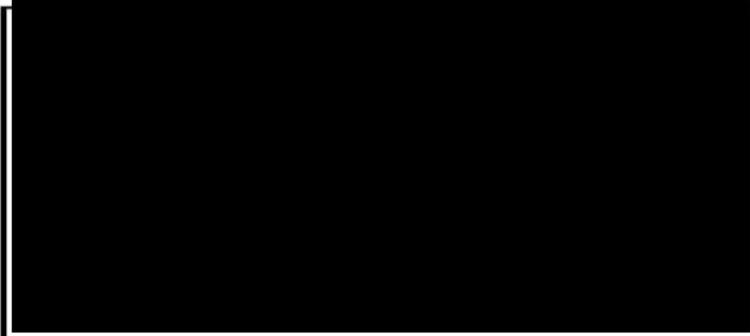
87. View of Vehicle #1 right front door from right. Note: Door skin is forced rearward.

88. View of Vehicle #1 from rear.

I took digital images DSC\_0001 through DSC\_0037 at Wilde Auto and Recovery in Kansas City, Missouri.

1. View of Vehicle #2 driver door from left.
2. View of Driver #2 seat belt and latch.
3. View of Vehicle #2 windshield from left.
4. View of Passenger #1 seat belt and latch.
5. View of Vehicle #2 interior from left. Note: Photograph taken by Trooper Sanson at my request. I am pointing at Driver #2 and Passenger #1 seat belt locations which are visible in next photograph.
6. View of Driver #2 and Passenger #1 seat belt buckles under seats. Note: Photograph taken from location of my hand in previous photograph.
7. View of Vehicle #2 odometer. Note: Odometer indicates 69427.5 miles.
8. View of Vehicle #2 left front headlight bulb.
9. View of Vehicle #2 left front headlight bulb. Note: Filament is stretched indicating the light was on at the time of the crash.
10. View of Vehicle #2 right front headlight bulb.
11. View of Vehicle #2 right front headlight bulb.
12. View of Vehicle #2 right front headlight bulb. Note: Filament is stretched indicating the light was on at the time of the crash.
13. View of Vehicle #2 right rear taillight bulb.
14. View of Vehicle #2 right rear taillight bulb.
15. View of Vehicle #2 left rear taillight bulb.
16. View of Vehicle #2 left rear taillight bulb.
17. View of Vehicle #2 vehicle identification number plate.
18. View of Vehicle #1 from front.
19. View of Vehicle #1 from left front.
20. View of Vehicle #1 from left.
21. View of Vehicle #1 from left rear.
22. View of Vehicle #1 from rear.
23. View of Vehicle #1 from right rear.
24. View of Vehicle #1 from right.
25. View of Vehicle #1 from right front.

26. View of Vehicle #1 vehicle identification number plate.
27. View of Vehicle #1 headlight switch.
28. View of Driver #1 seat belt, latch and buckle.
29. View of Driver #1 seat belt buckle.
30. View of Vehicle #1 right front headlight.
31. View of Vehicle #1 right front headlight. Note: Tungsten deposits on filament indicate light was activated at the time of crash.
32. View of Vehicle #1 left front headlight.
33. View of Vehicle #1 left front headlight. Note: Tungsten deposits on filament indicate light was activated at the time of crash.
34. View of Vehicle #1 left rear taillight bulb.
35. View of Vehicle #1 left rear taillight bulb.
36. View of Vehicle #1 right rear taillight bulb.
37. View of Vehicle #1 right rear taillight bulb.



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Version 5.3.0

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MISSOURI STATE HIGHWAY PATROL - CRASH TEAM 1  
 HHC P.O. BOX 517  
 HIGGINSVILLE MO 64037

**1987 FORD BRONCO II 2 DOOR 4X4 UTILITY**

Curb Weight:  lbs.  kg.  
 Curb Weight Distribution - Front:  % Rear:  %  
 Gross Vehicle Weight Rating:  lbs.  kg.  
 Number of Tires on Vehicle:   
 Drive wheels:

**Horizontal Dimensions**

|                                      | Inches                           | Feet                               | Meters                            |
|--------------------------------------|----------------------------------|------------------------------------|-----------------------------------|
| Total Length                         | <input type="text" value="158"/> | <input type="text" value="13.17"/> | <input type="text" value="4.01"/> |
| Wheelbase:                           | <input type="text" value="94"/>  | <input type="text" value="7.83"/>  | <input type="text" value="2.39"/> |
| Front Bumper to Front Axle:          | <input type="text" value="28"/>  | <input type="text" value="2.33"/>  | <input type="text" value="0.71"/> |
| Front Bumper to Front of Front well: | <input type="text" value="12"/>  | <input type="text" value="1.00"/>  | <input type="text" value="0.30"/> |
| Front Bumper to Front of Hood:       | <input type="text" value="2"/>   | <input type="text" value="0.17"/>  | <input type="text" value="0.05"/> |
| Front Bumper to Base of windshield:  | <input type="text" value="43"/>  | <input type="text" value="3.58"/>  | <input type="text" value="1.09"/> |
| Front Bumper to Top of Windshield:   | <input type="text" value="63"/>  | <input type="text" value="5.25"/>  | <input type="text" value="1.60"/> |
| Rear Bumper to Rear Axle:            | <input type="text" value="36"/>  | <input type="text" value="3.00"/>  | <input type="text" value="0.91"/> |
| Rear Bumper to Rear of Rear Well:    | <input type="text" value="20"/>  | <input type="text" value="1.67"/>  | <input type="text" value="0.51"/> |
| Rear Bumper to Rear of Trunk:        | <input type="text" value="3"/>   | <input type="text" value="0.25"/>  | <input type="text" value="0.08"/> |
| Rear Bumper to Base of Rear Window:  | <input type="text" value="3"/>   | <input type="text" value="0.25"/>  | <input type="text" value="0.08"/> |

**Width Dimensions**

|                |                                 |                                   |                                   |
|----------------|---------------------------------|-----------------------------------|-----------------------------------|
| Maximum width: | <input type="text" value="68"/> | <input type="text" value="5.67"/> | <input type="text" value="1.73"/> |
| Front Track:   | <input type="text" value="57"/> | <input type="text" value="4.75"/> | <input type="text" value="1.45"/> |
| Rear Track:    | <input type="text" value="57"/> | <input type="text" value="4.75"/> | <input type="text" value="1.45"/> |

**Vertical Dimensions**

|                      |                                 |                                   |                                   |
|----------------------|---------------------------------|-----------------------------------|-----------------------------------|
| Height:              | <input type="text" value="68"/> | <input type="text" value="5.67"/> | <input type="text" value="1.73"/> |
| Ground to -          |                                 |                                   |                                   |
| Front Bumper (Top)   | <input type="text" value="21"/> | <input type="text" value="1.75"/> | <input type="text" value="0.53"/> |
| Headlight - center   | <input type="text" value="33"/> | <input type="text" value="2.75"/> | <input type="text" value="0.84"/> |
| Hood - top front:    | <input type="text" value="40"/> | <input type="text" value="3.33"/> | <input type="text" value="1.02"/> |
| Base of Windshield   | <input type="text" value="45"/> | <input type="text" value="3.75"/> | <input type="text" value="1.14"/> |
| Rear Bumper - top:   | <input type="text" value="25"/> | <input type="text" value="2.08"/> | <input type="text" value="0.64"/> |
| Trunk - top rear:    | <input type="text" value=""/>   | <input type="text" value=""/>     | <input type="text" value=""/>     |
| Base of Rear Window: | <input type="text" value="48"/> | <input type="text" value="4.00"/> | <input type="text" value="1.22"/> |



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1987 FORD BRONCO II 2 DOOR 4X4 UTILITY

Interior Dimensions

|  | Inches | Feet | Meters |
|--|--------|------|--------|
| Front Seat Shoulder Width                | 55     | 4.58 | 1.40   |
| Front Seat to Headliner                  | 40     | 3.33 | 1.02   |
| Front Leg Room - seatback to floor (max) | 44     | 3.67 | 1.12   |
| Rear Seat Shoulder Width                 | 56     | 4.67 | 1.42   |
| Rear Seat to Headliner                   | 39     | 3.25 | 0.99   |
| Front Leg Room - seatback to floor (min) | 35     | 2.92 | 0.89   |

Seatbelts: **3pt front, 2pt rear**  
 Airbags: **NO AIRBAGS**

Steering Data

|                           |           |       |       |
|---------------------------|-----------|-------|-------|
| Turning circle (Diameter) | 396       | 33.00 | 10.06 |
| Steering Ratio:           | 17.00:1   |       |       |
| Wheel Radius:             | 13        | 1.08  | 0.33  |
| Tire Size (OEM):          | 205-75R15 |       |       |

Acceleration & Braking Information

Brake Type: **FRONT DISC - REAR DRUM**  
 ABS System: **ABS UNKNOWN**

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

d = **205.0** ft    t = **4.7** sec    a = **-18.8** ft/sec<sup>2</sup>    G-force = **-0.59**

Acceleration:

|             |                     |                                    |                       |
|-------------|---------------------|------------------------------------|-----------------------|
| 0 to 30mph  | t = <b>5.1</b> sec  | a = <b>8.6</b> ft/sec <sup>2</sup> | G-force = <b>0.27</b> |
| 0 to 60mph  | t = <b>16.3</b> sec | a = <b>5.4</b> ft/sec <sup>2</sup> | G-force = <b>0.17</b> |
| 45 to 65mph | t = <b>10.5</b> sec | a = <b>2.8</b> ft/sec <sup>2</sup> | G-force = <b>0.09</b> |

Transmission Type: **5spd MANUAL**

Notes:

Federal Bumper Standard Requirements: **No Requirement**  
 This vehicles Rated Bumper Strength: **5** mph

N.S.D.C = **1984 - 1988**

Expert AutoStats®

1987 FORD BRONCO II 2 DOOR 4X4 UTILITY

**Other Information**

Tip-Over Stability Ratio = 1.05      Reasonably Stable  
 NHTSA Star Rating (calculated)      \*\*

**Center of Gravity (No Load):**

|                              |   |   |
|------------------------------|---|---|
| Inches behind front axle     | = | <span style="border: 1px solid black; padding: 2px;">47.00</span> |
| Inches in front of rear axle | = | <span style="border: 1px solid black; padding: 2px;">47.00</span> |
| Inches from side of vehicle  | = | <span style="border: 1px solid black; padding: 2px;">34.00</span> |
| Inches from ground           | = | <span style="border: 1px solid black; padding: 2px;">27.13</span> |
| Inches from front corner     | = | <span style="border: 1px solid black; padding: 2px;">82.35</span> |
| Inches from rear corner      | = | <span style="border: 1px solid black; padding: 2px;">89.69</span> |
| Inches from front bumper     | = | <span style="border: 1px solid black; padding: 2px;">75.00</span> |
| Inches from rear bumper      | = | <span style="border: 1px solid black; padding: 2px;">83.00</span> |

**Moments of Inertia Approximations (No Load):**

|                         |   |  |
|-------------------------|---|--|
| Yaw Moment of Inertia   | = | <span style="border: 1px solid black; padding: 2px;">2033.34</span> lb*ft*sec <sup>2</sup> |
| Pitch Moment of Inertia | = | <span style="border: 1px solid black; padding: 2px;">2014.36</span> lb*ft*sec <sup>2</sup> |
| Roll Moment of Inertia  | = | <span style="border: 1px solid black; padding: 2px;">486.16</span> lb*ft*sec <sup>2</sup>  |

**Front Profile Information**

|  |   |  |
|--|---|--|
| Angle Front Bumper to Hood Front       | = | <span style="border: 1px solid black; padding: 2px;">84.0</span> deg |
| Angle Front of Hood to windshield Base | = | <span style="border: 1px solid black; padding: 2px;">7.0</span> deg  |
| Angle Front of Hood to Windshield Top  | = | <span style="border: 1px solid black; padding: 2px;">23.1</span> deg |
| Angle of Windshield                    | = | <span style="border: 1px solid black; padding: 2px;">46.4</span> deg |
| Angle of Steering Tires at Max Turn    | = | <span style="border: 1px solid black; padding: 2px;">27.2</span> deg |

**First Approximation Crush Factors:**

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

$$V(\text{mph}) = \sqrt{(30 * CF * MID)}$$

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 independant evaluation of speed was possible. (These are NOT 'A', 'B', 'C', or 'G' values)

The rear Impact data with more then 2-3 inches of crush damage should be looked at carefully, since some vehicles have very weak trunk & fender strength. Therefore, on some cars, especially GM, you 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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Version 5.3.0

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MISSOURI STATE HIGHWAY PATROL - CRASH TEAM 1  
 HHC P.O. BOX 517  
 HIGGINSVILLE MO 64037



**2008 MERCURY MARINER 4 DOOR 4X4 UTILITY**

Curb Weight:  lbs.  kg.  
 Curb Weight Distribution - Front:  % Rear:  %  
 Gross Vehicle Weight Rating:  lbs.  kg.  
 Number of Tires on Vehicle:   
 Drive wheels:

**Horizontal Dimensions**

|                                      | Inches                           | Feet                               | Meters                            |
|--------------------------------------|----------------------------------|------------------------------------|-----------------------------------|
| Total Length                         | <input type="text" value="175"/> | <input type="text" value="14.58"/> | <input type="text" value="4.44"/> |
| Wheelbase:                           | <input type="text" value="103"/> | <input type="text" value="8.58"/>  | <input type="text" value="2.62"/> |
| Front Bumper to Front Axle:          | <input type="text" value="33"/>  | <input type="text" value="2.75"/>  | <input type="text" value="0.84"/> |
| Front Bumper to Front of Front well: | <input type="text" value="16"/>  | <input type="text" value="1.33"/>  | <input type="text" value="0.41"/> |
| Front Bumper to Front of Hood:       | <input type="text" value="7"/>   | <input type="text" value="0.58"/>  | <input type="text" value="0.18"/> |
| Front Bumper to Base of windshield:  | <input type="text" value="46"/>  | <input type="text" value="3.83"/>  | <input type="text" value="1.17"/> |
| Front Bumper to Top of Windshield:   | <input type="text" value="71"/>  | <input type="text" value="5.92"/>  | <input type="text" value="1.80"/> |
| Rear Bumper to Rear Axle:            | <input type="text" value="39"/>  | <input type="text" value="3.25"/>  | <input type="text" value="0.99"/> |
| Rear Bumper to Rear of Rear Well:    | <input type="text" value="22"/>  | <input type="text" value="1.83"/>  | <input type="text" value="0.56"/> |
| Rear Bumper to Rear of Trunk:        | <input type="text" value="5"/>   | <input type="text" value="0.42"/>  | <input type="text" value="0.13"/> |
| Rear Bumper to Base of Rear Window:  | <input type="text" value="6"/>   | <input type="text" value="0.50"/>  | <input type="text" value="0.15"/> |

**Width Dimensions**

|                |                                 |                                   |                                   |
|----------------|---------------------------------|-----------------------------------|-----------------------------------|
| Maximum width: | <input type="text" value="71"/> | <input type="text" value="5.92"/> | <input type="text" value="1.80"/> |
| Front Track:   | <input type="text" value="61"/> | <input type="text" value="5.08"/> | <input type="text" value="1.55"/> |
| Rear Track:    | <input type="text" value="60"/> | <input type="text" value="5.00"/> | <input type="text" value="1.52"/> |

**Vertical Dimensions**

|                      |                                 |                                   |                                   |
|----------------------|---------------------------------|-----------------------------------|-----------------------------------|
| Height:              | <input type="text" value="68"/> | <input type="text" value="5.67"/> | <input type="text" value="1.73"/> |
| Ground to -          |                                 |                                   |                                   |
| Front Bumper (Top)   | <input type="text" value="28"/> | <input type="text" value="2.33"/> | <input type="text" value="0.71"/> |
| Headlight - center   | <input type="text" value="33"/> | <input type="text" value="2.75"/> | <input type="text" value="0.84"/> |
| Hood - top front:    | <input type="text" value="40"/> | <input type="text" value="3.33"/> | <input type="text" value="1.02"/> |
| Base of Windshield   | <input type="text" value="45"/> | <input type="text" value="3.75"/> | <input type="text" value="1.14"/> |
| Rear Bumper - top:   | <input type="text" value="27"/> | <input type="text" value="2.25"/> | <input type="text" value="0.69"/> |
| Trunk - top rear:    | <input type="text" value="44"/> | <input type="text" value="3.67"/> | <input type="text" value="1.12"/> |
| Base of Rear Window: | <input type="text" value="46"/> | <input type="text" value="3.83"/> | <input type="text" value="1.17"/> |



## Expert AutoStats®

## 2008 MERCURY MARINER 4 DOOR 4X4 UTILITY

## Interior Dimensions

|  | Inches                            | Feet | Meters |
|--|-----------------------------------|------|--------|
| Front Seat Shoulder Width                | 57                                | 4.75 | 1.45   |
| Front Seat to Headliner                  | 40                                | 3.33 | 1.02   |
| Front Leg Room - seatback to floor (max) | 42                                | 3.50 | 1.07   |
| Rear Seat Shoulder Width                 | 56                                | 4.67 | 1.42   |
| Rear Seat to Headliner                   | 39                                | 3.25 | 0.99   |
| Front Leg Room - seatback to floor (min) | 36                                | 3.00 | 0.91   |
| Seatbelts:                               | 3pt - front and rear              |      |        |
| Airbags:                                 | FRONT SEAT AIRBAGS + SIDE AIRBAGS |      |        |

## Steering Data

|                           |            |       |       |
|---------------------------|------------|-------|-------|
| Turning circle (Diameter) | 468        | 39.00 | 11.89 |
| Steering Ratio:           | :1         |       |       |
| Wheel Radius:             | 14         | 1.17  | 0.36  |
| Tire Size (OEM):          | P235/70R16 |       |       |

## Acceleration &amp; Braking Information

|             |               |
|-------------|---------------|
| Brake Type: | ALL DISC      |
| ABS System: | ALL WHEEL ABS |

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

d = 161.0 ft    t = 3.7 sec    a = -24.0 ft/sec<sup>2</sup>    G-force = -0.75

Acceleration:

|             |     |      |     |                     |           |                     |           |      |
|-------------|-----|------|-----|---------------------|-----------|---------------------|-----------|------|
| 0 to 30mph  | t = | sec  | a = | ft/sec <sup>2</sup> | G-force = |                     |           |      |
| 0 to 60mph  | t = | 10.5 | sec | a =                 | 8.4       | ft/sec <sup>2</sup> | G-force = | 0.26 |
| 45 to 65mph | t = | sec  | a = | ft/sec <sup>2</sup> | G-force = |                     |           |      |

Transmission Type: 4spd AUTOMATIC

Notes:

Federal Bumper Standard Requirements: No Requirement

N.S.D.C = 2008 - 2011

Expert AutoStats®

2008 MERCURY MARINER 4 DOOR 4X4 UTILITY

Other Information

|                                |      |                   |
|--------------------------------|------|-------------------|
| Tip-Over Stability Ratio =     | 1.12 | Reasonably Stable |
| NHTSA Star Rating (calculated) |      | **                |

Center of Gravity (No Load):

|                              |   |        |
|------------------------------|---|--------|
| Inches behind front axle     | = | 44.29  |
| Inches in front of rear axle | = | 58.71  |
| Inches from side of vehicle  | = | 35.50  |
| Inches from ground           | = | 27.13  |
| Inches from front corner     | = | 85.05  |
| Inches from rear corner      | = | 103.96 |
| Inches from front bumper     | = | 77.29  |
| Inches from rear bumper      | = | 97.71  |

Moments of Inertia Approximations (No Load):

|                         |   |         |                        |
|-------------------------|---|---------|------------------------|
| Yaw Moment of Inertia   | = | 2262.00 | lb*ft*sec <sup>2</sup> |
| Pitch Moment of Inertia | = | 2263.00 | lb*ft*sec <sup>2</sup> |
| Roll Moment of Inertia  | = | 535.00  | lb*ft*sec <sup>2</sup> |

Front Profile Information

|  |   |      |     |
|--|---|------|-----|
| Angle Front Bumper to Hood Front       | = | 59.7 | deg |
| Angle Front of Hood to windshield Base | = | 7.3  | deg |
| Angle Front of Hood to Windshield Top  | = | 22.1 | deg |
| Angle of Windshield                    | = | 40.0 | deg |
| Angle of Steering Tires at Max Turn    | = | 25.2 | deg |

First Approximation Crush Factors:

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

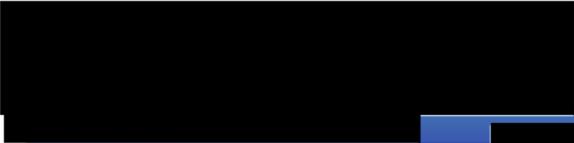
$$V(\text{mph}) = \sqrt{(30 * CF * MID)}$$

|   |   |    |    |
|---|---|----|----|
| KE Equivalent Speed (Front/Rear/Side)   | = | 21 | CF |
| Bullet vehicle IMPACT SPEED estimation based on TARGET VEHICLE damage ONLY (Tested for Rear/Side Impact only) | = | 27 | CF |

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

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





« Previous Day

Next Day »

|                           | Actual      | Average (KMKC) | Record (KMKC) |
|---------------------------|-------------|----------------|---------------|
| <b>Temperature</b>        |             |                |               |
| Mean Temperature          | 24 °F       | -              |               |
| Max Temperature           | 32 °F       | 37 °F          | 48 °F (1998)  |
| Min Temperature           | 17 °F       | 21 °F          | 3 °F (2003)   |
| <b>Degree Days</b>        |             |                |               |
| Heating Degree Days       | 40          |                |               |
| <b>Moisture</b>           |             |                |               |
| Dew Point                 | 6 °F        |                |               |
| Average Humidity          | 52          |                |               |
| Maximum Humidity          | 80          |                |               |
| Minimum Humidity          | 21          |                |               |
| <b>Precipitation</b>      |             |                |               |
| Precipitation             | 0.00 in     | -              | - ()          |
| <b>Sea Level Pressure</b> |             |                |               |
| Sea Level Pressure        | 30.10 in    |                |               |
| <b>Wind</b>               |             |                |               |
| Wind Speed                | 13 mph (NW) |                |               |
| Max Wind Speed            | 21 mph      |                |               |
| Max Gust Speed            | 30 mph      |                |               |
| Visibility                | 10 miles    |                |               |
| Events                    | Snow        |                |               |

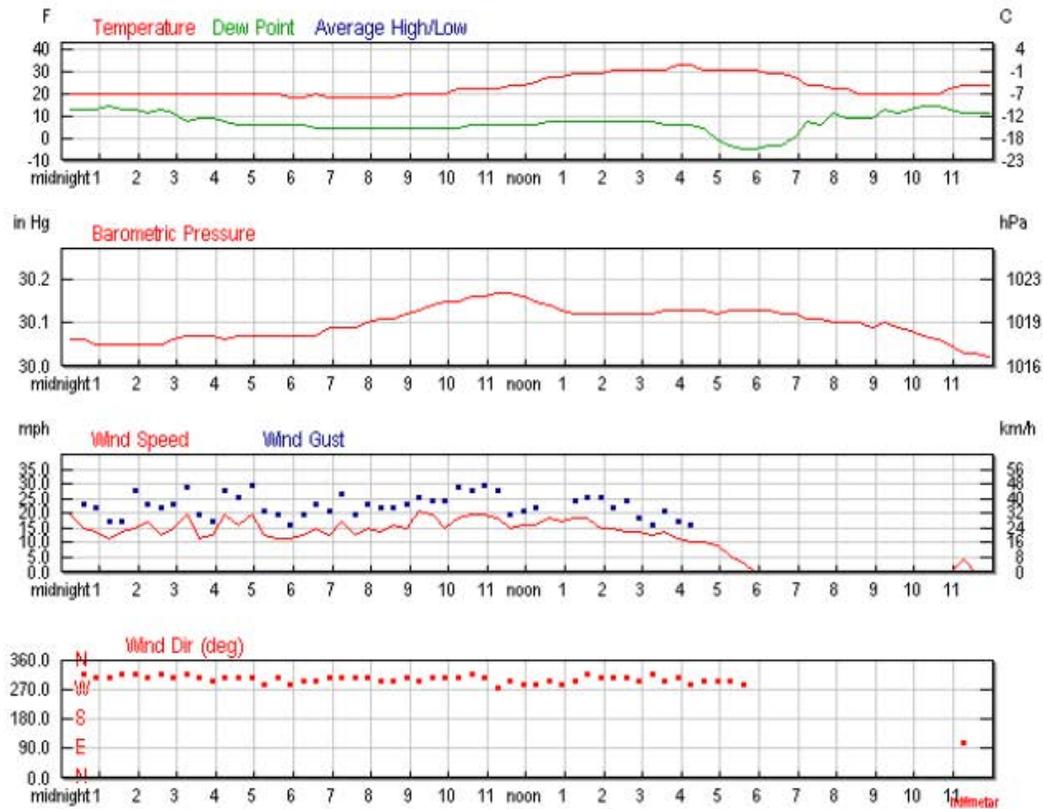
**Averages and records for this station are not official NWS values.**

Click here for data from the nearest station with official NWS data (KMC).

T = Trace of Precipitation, MM = Missing Value

Source: NWS Daily Summary

Seasonal Weather Averages



[Certify This Report](#)

### Hourly Weather History & Observations

| Time (CST) | Temp.   | Windchill | Dew Point | Humidity | Pressure | Visibility | Wind Dir | Wind Speed | Gust Speed | Precip | Et |
|------------|---------|-----------|-----------|----------|----------|------------|----------|------------|------------|--------|----|
| 12:15 AM   | 19.4 °F | 3.6 °F    | 12.2 °F   | 74%      | 30.06 in | 7.0 mi     | NW       | 19.6 mph   | 26.5 mph   | N/A    |    |
| 12:35 AM   | 19.4 °F | 5.5 °F    | 12.2 °F   | 74%      | 30.06 in | 5.0 mi     | NW       | 15.0 mph   | 23.0 mph   | N/A    | Si |
| 12:55 AM   | 19.4 °F | 6.0 °F    | 12.2 °F   | 74%      | 30.05 in | 7.0 mi     | NW       | 13.8 mph   | 21.9 mph   | N/A    | Si |
| 1:15 AM    | 19.4 °F | 7.2 °F    | 14.0 °F   | 80%      | 30.05 in | 10.0 mi    | NW       | 11.5 mph   | 17.3 mph   | N/A    |    |
| 1:35 AM    | 19.4 °F | 6.0 °F    | 12.2 °F   | 74%      | 30.05 in | 10.0 mi    | NW       | 13.8 mph   | 17.3 mph   | N/A    |    |
| 1:55 AM    | 19.4 °F | 5.5 °F    | 12.2 °F   | 74%      | 30.05 in | 10.0 mi    | NW       | 15.0 mph   | 27.6 mph   | N/A    |    |
| 2:15 AM    | 19.4 °F | 4.5 °F    | 10.4 °F   | 68%      | 30.05 in | 10.0 mi    | NW       | 17.3 mph   | 23.0 mph   | N/A    |    |
| 2:35 AM    | 19.4 °F | 6.6 °F    | 12.2 °F   | 74%      | 30.05 in | 10.0 mi    | NW       | 12.7 mph   | 21.9 mph   | N/A    |    |
| 2:55 AM    | 19.4 °F | 5.5 °F    | 10.4 °F   | 68%      | 30.06 in | 10.0 mi    | NW       | 15.0 mph   | 23.0 mph   | N/A    |    |

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| Time (CST) | Temp.   | Windchill | Dew Point | Humidity | Pressure | Visibility | Wind Dir | Wind Speed | Gust Speed | Precip | E |
|------------|---------|-----------|-----------|----------|----------|------------|----------|------------|------------|--------|---|
| 3:15 AM    | 19.4 °F | 3.6 °F    | 6.8 °F    | 58%      | 30.07 in | 10.0 mi    | NW       | 19.6 mph   | 28.8 mph   | N/A    |   |
| 3:35 AM    | 19.4 °F | 7.2 °F    | 8.6 °F    | 63%      | 30.07 in | 10.0 mi    | NW       | 11.5 mph   | 19.6 mph   | N/A    |   |
| 3:55 AM    | 19.4 °F | 6.6 °F    | 8.6 °F    | 63%      | 30.07 in | 10.0 mi    | WNW      | 12.7 mph   | 17.3 mph   | N/A    |   |
| 4:15 AM    | 19.4 °F | 3.6 °F    | 6.8 °F    | 58%      | 30.06 in | 10.0 mi    | NW       | 19.6 mph   | 27.6 mph   | N/A    |   |
| 4:35 AM    | 19.4 °F | 5.0 °F    | 5.0 °F    | 54%      | 30.07 in | 10.0 mi    | NW       | 16.1 mph   | 25.3 mph   | N/A    |   |
| 4:55 AM    | 19.4 °F | 3.6 °F    | 5.0 °F    | 54%      | 30.07 in | 10.0 mi    | NW       | 19.6 mph   | 29.9 mph   | N/A    |   |
| 5:15 AM    | 19.4 °F | 6.6 °F    | 5.0 °F    | 54%      | 30.07 in | 10.0 mi    | WNW      | 12.7 mph   | 20.7 mph   | N/A    |   |
| 5:35 AM    | 19.4 °F | 7.2 °F    | 5.0 °F    | 54%      | 30.07 in | 10.0 mi    | NW       | 11.5 mph   | 19.6 mph   | N/A    |   |
| 5:55 AM    | 17.6 °F | 5.0 °F    | 5.0 °F    | 58%      | 30.07 in | 10.0 mi    | WNW      | 11.5 mph   | 16.1 mph   | N/A    |   |
| 6:15 AM    | 17.6 °F | 4.3 °F    | 5.0 °F    | 58%      | 30.07 in | 10.0 mi    | WNW      | 12.7 mph   | 19.6 mph   | N/A    |   |
| 6:35 AM    | 19.4 °F | 5.5 °F    | 3.2 °F    | 49%      | 30.07 in | 10.0 mi    | WNW      | 15.0 mph   | 23.0 mph   | N/A    |   |
| 6:55 AM    | 17.6 °F | 4.3 °F    | 3.2 °F    | 53%      | 30.09 in | 10.0 mi    | NW       | 12.7 mph   | 20.7 mph   | N/A    |   |
| 7:15 AM    | 17.6 °F | 2.2 °F    | 3.2 °F    | 53%      | 30.09 in | 10.0 mi    | NW       | 17.3 mph   | 26.5 mph   | N/A    |   |
| 7:35 AM    | 17.6 °F | 4.3 °F    | 3.2 °F    | 53%      | 30.09 in | 10.0 mi    | NW       | 12.7 mph   | 19.6 mph   | N/A    |   |
| 7:55 AM    | 17.6 °F | 3.2 °F    | 3.2 °F    | 53%      | 30.10 in | 10.0 mi    | NW       | 15.0 mph   | 23.0 mph   | N/A    |   |
| 8:15 AM    | 17.6 °F | 3.7 °F    | 3.2 °F    | 53%      | 30.11 in | 10.0 mi    | WNW      | 13.8 mph   | 21.9 mph   | N/A    |   |
| 8:35 AM    | 17.6 °F | 2.7 °F    | 3.2 °F    | 53%      | 30.11 in | 10.0 mi    | WNW      | 16.1 mph   | 21.9 mph   | N/A    |   |
| 8:55 AM    | 19.4 °F | 5.5 °F    | 3.2 °F    | 49%      | 30.12 in | 10.0 mi    | NW       | 15.0 mph   | 23.0 mph   | N/A    |   |
| 9:15 AM    | 19.4 °F | 3.2 °F    | 3.2 °F    | 49%      | 30.13 in | 10.0 mi    | WNW      | 20.7 mph   | 25.3 mph   | N/A    |   |
| 9:35 AM    | 19.4 °F | 3.6 °F    | 3.2 °F    | 49%      | 30.14 in | 10.0 mi    | NW       | 19.6 mph   | 24.2 mph   | N/A    |   |
| 9:55 AM    | 19.4 °F | 5.5 °F    | 3.2 °F    | 49%      | 30.15 in | 10.0 mi    | NW       | 15.0 mph   | 24.2 mph   | N/A    |   |
| 10:15 AM   | 21.2 °F | 6.4 °F    | 3.2 °F    | 46%      | 30.15 in | 10.0 mi    | NW       | 18.4 mph   | 28.8 mph   | N/A    |   |
| 10:35 AM   | 21.2 °F | 6.0 °F    | 5.0 °F    | 50%      | 30.16 in | 10.0 mi    | NW       | 19.6 mph   | 27.6 mph   | N/A    |   |
| 10:55 AM   | 21.2 °F | 6.0 °F    | 5.0 °F    | 50%      | 30.16 in | 10.0 mi    | NW       | 19.6 mph   | 29.9 mph   | N/A    |   |
| 11:15 AM   | 21.2 °F | 6.4 °F    | 5.0 °F    | 50%      | 30.17 in | 10.0 mi    | West     | 18.4 mph   | 27.6 mph   | N/A    |   |
| 11:35 AM   | 23.0 °F | 10.1 °F   | 5.0 °F    | 46%      | 30.17 in | 10.0 mi    | WNW      | 15.0 mph   | 19.6 mph   | N/A    |   |
| 11:55 AM   | 23.0 °F | 9.6 °F    | 5.0 °F    | 46%      | 30.16 in | 10.0 mi    | WNW      | 16.1 mph   | 20.7 mph   | N/A    |   |
| 12:15 PM   | 24.8 °F | 11.9 °F   | 5.0 °F    | 43%      | 30.15 in | 10.0 mi    | WNW      | 16.1 mph   | 21.9 mph   | N/A    |   |
| 12:35 PM   | 26.6 °F | 13.4 °F   | 6.8 °F    | 43%      | 30.14 in | 10.0 mi    | WNW      | 18.4 mph   | -          | N/A    |   |
| 12:55 PM   | 26.6 °F | 13.8 °F   | 6.8 °F    | 43%      | 30.13 in | 10.0 mi    | WNW      | 17.3 mph   | 25.3 mph   | N/A    |   |
| 1:15 PM    | 28.4 °F | 15.8 °F   | 6.8 °F    | 40%      | 30.12 in | 10.0 mi    | WNW      | 18.4 mph   | 24.2 mph   | N/A    |   |
| 1:35 PM    | 28.4 °F | 15.8 °F   | 6.8 °F    | 40%      | 30.12 in | 10.0 mi    | NW       | 18.4 mph   | 25.3 mph   | N/A    |   |
| 1:55 PM    | 28.4 °F | 17.0 °F   | 6.8 °F    | 40%      | 30.12 in | 10.0 mi    | NW       | 15.0 mph   | 25.3 mph   | N/A    |   |

MISSOURI UNIFORM CRASH REPORT - TECHNICAL SUPPLEMENT

, Clay COUNTY

| Time (CST) | Temp.   | Windchill | Dew Point | Humidity | Pressure | Visibility | Wind Dir | Wind Speed | Gust Speed | Precip | E |
|------------|---------|-----------|-----------|----------|----------|------------|----------|------------|------------|--------|---|
| 2:15 PM    | 30.2 °F | 19.3 °F   | 6.8 °F    | 37%      | 30.12 in | 10.0 mi    | NW       | 15.0 mph   | 21.9 mph   | N/A    |   |
| 2:35 PM    | 30.2 °F | 19.8 °F   | 6.8 °F    | 37%      | 30.12 in | 10.0 mi    | NW       | 13.8 mph   | 24.2 mph   | N/A    |   |
| 2:55 PM    | 30.2 °F | 19.8 °F   | 6.8 °F    | 37%      | 30.12 in | 10.0 mi    | WNW      | 13.8 mph   | 18.4 mph   | N/A    |   |
| 3:15 PM    | 30.2 °F | 20.2 °F   | 6.8 °F    | 37%      | 30.12 in | 10.0 mi    | NW       | 12.7 mph   | 16.1 mph   | N/A    |   |
| 3:35 PM    | 30.2 °F | 19.8 °F   | 5.0 °F    | 34%      | 30.13 in | 10.0 mi    | WNW      | 13.8 mph   | 20.7 mph   | N/A    |   |
| 3:55 PM    | 32.0 °F | 23.0 °F   | 5.0 °F    | 32%      | 30.13 in | 10.0 mi    | NW       | 11.5 mph   | 17.3 mph   | N/A    |   |
| 4:15 PM    | 32.0 °F | 23.6 °F   | 5.0 °F    | 32%      | 30.13 in | 10.0 mi    | WNW      | 10.4 mph   | 16.1 mph   | N/A    |   |
| 4:35 PM    | 30.2 °F | 21.3 °F   | 3.2 °F    | 32%      | 30.13 in | 10.0 mi    | WNW      | 10.4 mph   | -          | N/A    |   |
| 4:55 PM    | 30.2 °F | 21.9 °F   | -2.2 °F   | 25%      | 30.12 in | 10.0 mi    | WNW      | 9.2 mph    | -          | N/A    |   |
| 5:15 PM    | 30.2 °F | 24.3 °F   | -4.0 °F   | 23%      | 30.13 in | 10.0 mi    | WNW      | 5.8 mph    | -          | N/A    |   |
| 5:35 PM    | 30.2 °F | 26.7 °F   | -5.8 °F   | 21%      | 30.13 in | 10.0 mi    | WNW      | 3.5 mph    | -          | N/A    |   |
| 5:55 PM    | 30.2 °F | -         | -5.8 °F   | 21%      | 30.13 in | 10.0 mi    | Calm     | Calm       | -          | N/A    |   |
| 6:15 PM    | 28.4 °F | -         | -4.0 °F   | 25%      | 30.13 in | 10.0 mi    | Calm     | Calm       | -          | N/A    |   |
| 6:35 PM    | 28.4 °F | -         | -4.0 °F   | 25%      | 30.12 in | 10.0 mi    | Calm     | Calm       | -          | N/A    |   |
| 6:55 PM    | 26.6 °F | -         | -0.4 °F   | 31%      | 30.12 in | 10.0 mi    | Calm     | Calm       | -          | N/A    |   |
| 7:15 PM    | 23.0 °F | -         | 6.8 °F    | 50%      | 30.11 in | 10.0 mi    | Calm     | Calm       | -          | N/A    |   |
| 7:35 PM    | 23.0 °F | -         | 5.0 °F    | 46%      | 30.11 in | 10.0 mi    | Calm     | Calm       | -          | N/A    |   |
| 7:55 PM    | 21.2 °F | -         | 10.4 °F   | 63%      | 30.10 in | 10.0 mi    | Calm     | Calm       | -          | N/A    |   |
| 8:15 PM    | 21.2 °F | -         | 8.6 °F    | 58%      | 30.10 in | 10.0 mi    | Calm     | Calm       | -          | N/A    |   |
| 8:35 PM    | 19.4 °F | -         | 8.6 °F    | 63%      | 30.10 in | 10.0 mi    | Calm     | Calm       | -          | N/A    |   |
| 8:55 PM    | 19.4 °F | -         | 8.6 °F    | 63%      | 30.09 in | 10.0 mi    | Calm     | Calm       | -          | N/A    |   |
| 9:15 PM    | 19.4 °F | -         | 12.2 °F   | 74%      | 30.10 in | 10.0 mi    | Calm     | Calm       | -          | N/A    |   |
| 9:35 PM    | 19.4 °F | -         | 10.4 °F   | 68%      | 30.09 in | 10.0 mi    | Calm     | Calm       | -          | N/A    |   |
| 9:55 PM    | 19.4 °F | -         | 12.2 °F   | 74%      | 30.08 in | 10.0 mi    | Calm     | Calm       | -          | N/A    |   |
| 10:15 PM   | 19.4 °F | -         | 14.0 °F   | 80%      | 30.07 in | 10.0 mi    | Calm     | Calm       | -          | N/A    |   |
| 10:35 PM   | 19.4 °F | -         | 14.0 °F   | 80%      | 30.06 in | 10.0 mi    | Calm     | Calm       | -          | N/A    |   |
| 10:55 PM   | 21.2 °F | -         | 12.2 °F   | 68%      | 30.05 in | 10.0 mi    | Calm     | Calm       | -          | N/A    |   |
| 11:15 PM   | 23.0 °F | 17.0 °F   | 10.4 °F   | 59%      | 30.03 in | 10.0 mi    | ESE      | 4.6 mph    | -          | N/A    |   |
| 11:35 PM   | 23.0 °F | -         | 10.4 °F   | 59%      | 30.03 in | 10.0 mi    | Calm     | Calm       | -          | N/A    |   |
| 11:55 PM   | 23.0 °F | -         | 10.4 °F   | 59%      | 30.02 in | 10.0 mi    | Calm     | Calm       | -          | N/A    |   |

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Descripti

11:30:09

-----

|     |    |         |    |          |    |        |    |                |
|-----|----|---------|----|----------|----|--------|----|----------------|
| 1   | X: | 0.000   | Y: | 0.000    | Z: | 0.000  | D: | RP             |
| 99  | X: | 2.978   | Y: | 19.763   | Z: | 6.469  | D: | RM             |
| 100 | X: | 21.076  | Y: | 49.871   | Z: | 1.224  | D: | 19.8MM         |
| 101 | X: | 125.482 | Y: | 315.772  | Z: | 3.110  | D: | WL             |
| 102 | X: | 29.781  | Y: | 34.847   | Z: | 1.201  | D: | WL             |
| 103 | X: | 10.572  | Y: | -19.975  | Z: | 0.723  | D: | WL             |
| 104 | X: | 7.020   | Y: | -29.735  | Z: | 0.617  | D: | WL SKID ACROSS |
| 105 | X: | -25.091 | Y: | -114.847 | Z: | 0.097  | D: | WL             |
| 106 | X: | -67.592 | Y: | -219.575 | Z: | -0.440 | D: | WL             |
| 107 | X: | -1.875  | Y: | -23.992  | Z: | 0.209  | D: | EOA            |
| 108 | X: | 17.578  | Y: | 31.034   | Z: | 0.685  | D: | EOA            |
| 109 | X: | 69.534  | Y: | 116.166  | Z: | 2.064  | D: | LL             |
| 110 | X: | 66.125  | Y: | 105.063  | Z: | 1.985  | D: | LL             |
| 111 | X: | 56.239  | Y: | 75.840   | Z: | 1.791  | D: | LL             |
| 112 | X: | 53.121  | Y: | 66.837   | Z: | 1.700  | D: | LL             |
| 113 | X: | 99.168  | Y: | 165.055  | Z: | 2.430  | D: | YL             |
| 114 | X: | 41.594  | Y: | -2.178   | Z: | 1.630  | D: | YL             |
| 115 | X: | 11.259  | Y: | -85.546  | Z: | 1.226  | D: | YL             |
| 116 | X: | 147.689 | Y: | 277.710  | Z: | 6.087  | D: | CBL            |
| 117 | X: | 96.238  | Y: | 126.491  | Z: | 5.396  | D: | CBL            |
| 118 | X: | 57.420  | Y: | 12.887   | Z: | 5.127  | D: | CBL            |
| 119 | X: | -12.591 | Y: | -173.255 | Z: | 3.916  | D: | CBL            |
| 120 | X: | -12.591 | Y: | -173.256 | Z: | 3.917  | D: | CBL            |
| 121 | X: | 38.028  | Y: | 20.538   | Z: | 1.442  | D: | S              |
| 122 | X: | 32.823  | Y: | 4.992    | Z: | 1.339  | D: | S              |
| 123 | X: | 26.688  | Y: | -13.606  | Z: | 1.226  | D: | S              |
| 124 | X: | 24.597  | Y: | -20.311  | Z: | 1.183  | D: | S              |
| 125 | X: | 24.449  | Y: | -20.941  | Z: | 1.183  | D: | S              |
| 126 | X: | 43.036  | Y: | 51.221   | Z: | 1.497  | D: | S              |
| 127 | X: | 37.791  | Y: | 36.703   | Z: | 1.402  | D: | S              |
| 128 | X: | 30.613  | Y: | 19.366   | Z: | 1.269  | D: | S              |
| 129 | X: | 19.250  | Y: | -6.982   | Z: | 0.980  | D: | S              |
| 130 | X: | 10.641  | Y: | -23.439  | Z: | 0.730  | D: | S              |
| 131 | X: | 7.196   | Y: | -29.736  | Z: | 0.628  | D: | S              |
| 132 | X: | -3.015  | Y: | -47.696  | Z: | 0.332  | D: | S              |
| 133 | X: | 31.144  | Y: | 17.722   | Z: | 1.289  | D: | S              |
| 134 | X: | 25.695  | Y: | 3.480    | Z: | 1.161  | D: | S              |
| 135 | X: | 16.721  | Y: | -18.028  | Z: | 0.929  | D: | S              |
| 136 | X: | 10.492  | Y: | -31.160  | Z: | 0.754  | D: | S              |
| 137 | X: | 5.728   | Y: | -40.191  | Z: | 0.619  | D: | S              |
| 138 | X: | -0.689  | Y: | -52.445  | Z: | 0.474  | D: | S              |
| 139 | X: | -2.620  | Y: | -56.040  | Z: | 0.431  | D: | S WL           |
| 140 | X: | -11.716 | Y: | -72.019  | Z: | 0.171  | D: | S              |
| 141 | X: | -17.536 | Y: | -80.838  | Z: | 0.019  | D: | S              |
| 142 | X: | -23.271 | Y: | -87.461  | Z: | -0.150 | D: | S              |
| 143 | X: | 35.772  | Y: | 30.344   | Z: | 1.372  | D: | S              |
| 144 | X: | 33.381  | Y: | 22.962   | Z: | 1.331  | D: | S              |
| 145 | X: | 32.827  | Y: | 21.494   | Z: | 1.318  | D: | S              |
| 146 | X: | 28.053  | Y: | 6.536    | Z: | 1.222  | D: | S              |
| 147 | X: | 25.384  | Y: | -1.865   | Z: | 1.161  | D: | S              |
| 148 | X: | 23.751  | Y: | -7.229   | Z: | 1.123  | D: | S              |
| 149 | X: | 18.975  | Y: | -21.723  | Z: | 1.015  | D: | S              |

150 X: 14.891 Y: -33.659 Z: 0.914 D: S  
151 X: 9.841 Y: -48.152 Z: 0.821 D: S  
152 X: -9.064 Y: -56.908 Z: 0.176 D: S  
153 X: -15.511 Y: -66.283 Z: -0.030 D: S

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154 X: -20.013 Y: -72.892 Z: -0.235 D: S  
155 X: -22.028 Y: -75.349 Z: -0.462 D: GPOST  
156 X: -24.295 Y: -81.283 Z: -0.734 D: GPOST  
157 X: -26.703 Y: -86.762 Z: -1.006 D: GPOST  
158 X: -29.005 Y: -92.540 Z: -1.014 D: GPOST  
159 X: -31.205 Y: -98.137 Z: -0.923 D: GPOST  
160 X: -33.443 Y: -103.951 Z: -0.814 D: GPOST  
161 X: -49.180 Y: -144.900 Z: -0.964 D: GPOST  
162 X: -55.780 Y: -132.431 Z: -1.870 D: LR  
163 X: -50.143 Y: -133.696 Z: -1.191 D: RR  
164 X: -48.525 Y: -126.651 Z: -1.079 D: RF  
165 X: -53.340 Y: -125.179 Z: -1.710 D: LF  
166 X: -45.103 Y: -108.271 Z: -1.615 D: IMP TL DEBRIS  
167 X: -18.994 Y: -69.079 Z: -0.465 D: END  
168 X: 2.867 Y: 19.785 Z: -0.643 D: RM2  
169 X: 88.143 Y: -14.788 Z: 0.770 D: EOA  
170 X: 63.621 Y: -95.933 Z: 0.285 D: EOA



























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816-296-3255

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Grain

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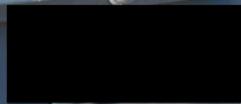




MARINER



MARINER  
4x4



M E R C U R Y



MARINER

100EN



4WD V6  
North Country  
Camden, NJ

M E R C U R Y



4WD V6  
North Country  
Cameron, NY











VOGA



























STATE TROOPER



















[Redacted license plate area]













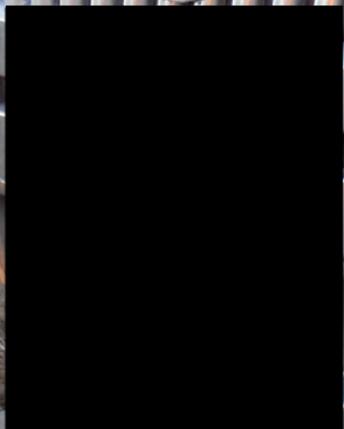












MARINER

Rout

40





MARIN

LOCAL

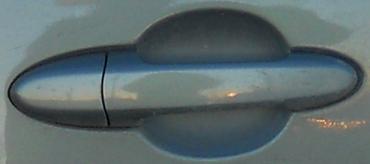


QuikTrip

Candy Cane

MARINER

MOGA



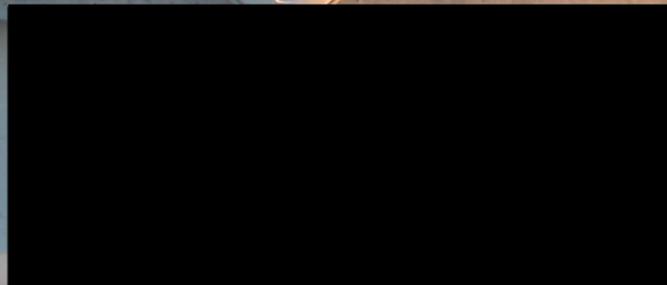


MARINE





MARINER  
VOGA



4WD V6  
North Country  
FORD/MERCURY  
Cameron No.

M E R C U R Y

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Traverse Print Out

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Job Description: Crew: Inst: Temp: Press:

--Evidence Recorder v 9.0.3.5 (2012-11-02)  
--Evidence Recorder v 9.0.3.5 (2012-11-02)  
JB,NM14-0117ACLAY-1,DT01-17-2014,TM14:24:42  
MO,AD0,UN2,SF1.000000,EC0,EO0.0,AU0

--Instrument Selected: Type=Total Station,Profile=SRX,Model=SRX  
--Instrument Selected: Type=Total Station,Profile=SRX,Model=SRX  
SP,PN1,N 0.0000,E 0.0000,EL0.0000,--RP

Store Point record, pt num = 1  
x=0.000000, y=0.000000, z=0.000000, desc=RP

--EDM Mode: RL Rapid  
--EDM Mode: RL Rapid

--Application Prism: 0.0mm Instrument Prism: 0.0mm  
--Application Prism: 0.0mm Instrument Prism: 0.0mm

--Orientation  
--Orientation

LS,HI5.500,HR0.000  
OC,OP1,N 0.0000,E 0.0000,EL0.0000,--RP

BK,OP1,BP0,BS8.34110,BC8.34110

| Setup | Backsight | BS Azimuth | BS Reading | Instrument Height |
|-------|-----------|------------|------------|-------------------|
| 1     | 0         | 8.3411     | 8.3411     | 5.500             |

1 X: 0.000 Y: 0.000 Z: 0.000 D: RP

BR,OP1,BP0,AR8.34110,ZE87.13320,SD20.0100

SS,OP1,FP99,AR8.34110,ZE87.13320,SD20.0100,--RM

| Pt# | HZAngle | SlpDist | VTAng   | ParOff | PerpOff | TgtHt | Description |
|-----|---------|---------|---------|--------|---------|-------|-------------|
| 99  | 8.3411  | 20.010  | 87.1332 | 0.000  | 0.000   | 0.000 | RM          |

LS,HI5.500,HR0.000

OC,OP1,N 0.0000,E 0.0000,EL0.0000,--RP

BK,OP1,BP99,BS8.34110,BC8.34110

| Setup | Backsight | BS Azimuth | BS Reading | Instrument Height |
|-------|-----------|------------|------------|-------------------|
| 1     | 99        | N/A        | 8.3411     | 5.500             |

1 X: 0.000 Y: 0.000 Z: 0.000 D: RP

99 X: 2.978 Y: 19.763 Z: 6.469 D: RM

BR,OP1,BP99,AR8.34110,ZE87.13320,SD20.0100

--Orientation Notes

--Orientation Notes

-- Observed Values: HA 8°34'11" VA 87°13'32" SD 20.01' HD 19.99' HR 0.00'

-- Observed Values: HA 8°34'11" VA 87°13'32" SD 20.01' HD 19.99' HR 0.00'

-- Observed Reference: Direction (Point Stored)

-- Observed Reference: Direction (Point Stored)

SS,OP1,FP100,AR22.54350,ZE94.30560,SD54.3099,--19.8MM

| Pt# | HZAngle | SlpDist | VTAng   | ParOff | PerpOff | TgtHt | Description |
|-----|---------|---------|---------|--------|---------|-------|-------------|
| 100 | 22.5435 | 54.310  | 94.3056 | 0.000  | 0.000   | 0.000 | 19.8MM      |

SS,OP1,FP101,AR21.40190,ZE90.24110,SD339.7993,--WL

101 21.4019 339.799 90.2411 0.000 0.000 0.000 WL

SS,OP1,FP102,AR40.31030,ZE95.21260,SD46.0399,--WL

102 40.3103 46.040 95.2126 0.000 0.000 0.000 WL

SS,OP1,FP103,AR152.06340,ZE101.56080,SD23.1000,--WL

103 152.0634 23.100 101.5608 0.000 0.000 0.000 WL  
SS,OP1,FP104,AR166.43010,ZE99.04530,SD30.9399,--WL  
104 166.4301 30.940 99.0453 0.000 0.000 0.000 WL  
SS,OP1,FP105,AR192.19270,ZE92.37540,SD117.6798,--WL

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105 192.1927 117.680 92.3754 0.000 0.000 0.000 WL  
SS,OP1,FP106,AR197.06360,ZE91.28520,SD229.8195,--WL  
106 197.0636 229.820 91.2852 0.000 0.000 0.000 WL  
SS,OP1,FP107,AR184.28060,ZE102.23590,SD24.6400,--EOA  
107 184.2806 24.640 102.2359 0.000 0.000 0.000 EOA  
SS,OP1,FP108,AR29.31410,ZE97.41170,SD35.9899,--EOA  
108 29.3141 35.990 97.4117 0.000 0.000 0.000 EOA  
SS,OP1,FP109,AR30.54130,ZE91.27140,SD135.4297,--LL  
109 30.5413 135.430 91.2714 0.000 0.000 0.000 LL  
SS,OP1,FP110,AR32.11080,ZE91.37180,SD124.1898,--LL  
110 32.1108 124.190 91.3718 0.000 0.000 0.000 LL  
SS,OP1,FP111,AR36.33310,ZE92.14580,SD94.4898,--LL  
111 36.3331 94.490 92.1458 0.000 0.000 0.000 LL  
SS,OP1,FP112,AR38.28380,ZE92.32550,SD85.4598,--LL  
112 38.2838 85.460 92.3255 0.000 0.000 0.000 LL  
SS,OP1,FP113,AR30.59530,ZE90.54480,SD192.5796,--YL  
113 30.5953 192.580 90.5448 0.000 0.000 0.000 YL  
SS,OP1,FP114,AR92.59490,ZE95.18290,SD41.8299,--YL  
114 92.5949 41.830 95.1829 0.000 0.000 0.000 YL  
SS,OP1,FP115,AR172.30070,ZE92.50090,SD86.3898,--YL  
115 172.3007 86.390 92.5009 0.000 0.000 0.000 YL  
SS,OP1,FP116,AR28.00160,ZE89.53350,SD314.5394,--CBL  
116 28.0016 314.539 89.5335 0.000 0.000 0.000 CBL  
SS,OP1,FP117,AR37.15540,ZE90.02150,SD158.9397,--CBL  
117 37.1554 158.940 90.0215 0.000 0.000 0.000 CBL  
SS,OP1,FP118,AR77.21020,ZE90.21470,SD58.8499,--CBL  
118 77.2102 58.850 90.2147 0.000 0.000 0.000 CBL  
SS,OP1,FP119,AR184.09240,ZE90.31210,SD173.7197,--CBL  
119 184.0924 173.720 90.3121 0.000 0.000 0.000 CBL  
SS,OP1,FP120,AR184.09230,ZE90.31190,SD173.7197,--CBL  
120 184.0923 173.720 90.3119 0.000 0.000 0.000 CBL  
SS,OP1,FP121,AR61.37400,ZE95.21520,SD43.4099,--S  
121 61.3740 43.410 95.2152 0.000 0.000 0.000 S  
SS,OP1,FP122,AR81.21060,ZE97.08360,SD33.4599,--S  
122 81.2106 33.460 97.0836 0.000 0.000 0.000 S  
SS,OP1,FP123,AR117.00480,ZE98.07140,SD30.2599,--S  
123 117.0048 30.260 98.0714 0.000 0.000 0.000 S  
SS,OP1,FP124,AR129.32540,ZE97.42290,SD32.1899,--S  
124 129.3254 32.190 97.4229 0.000 0.000 0.000 S  
SS,OP1,FP125,AR130.34510,ZE97.38160,SD32.4799,--S  
125 130.3451 32.480 97.3816 0.000 0.000 0.000 S  
SS,OP1,FP126,AR40.02140,ZE93.25270,SD67.0199,--S  
126 40.0214 67.020 93.2527 0.000 0.000 0.000 S  
SS,OP1,FP127,AR45.50130,ZE94.26510,SD52.8399,--S  
127 45.5013 52.840 94.2651 0.000 0.000 0.000 S  
SS,OP1,FP128,AR57.40570,ZE96.39420,SD36.4699,--S  
128 57.4057 36.470 96.3942 0.000 0.000 0.000 S  
SS,OP1,FP129,AR109.56140,ZE102.26520,SD20.9700,--S  
129 109.5614 20.970 102.2652 0.000 0.000 0.000 S

SS,OP1,FP130,AR155.34590,ZE100.29550,SD26.1799,--S  
130 155.3459 26.180 100.2955 0.000 0.000 0.000 S  
SS,OP1,FP131,AR166.23480,ZE99.02500,SD30.9799,--S  
131 166.2348 30.980 99.0250 0.000 0.000 0.000 S  
SS,OP1,FP132,AR183.37020,ZE96.10190,SD48.0699,--S  
132 183.3702 48.070 96.1019 0.000 0.000 0.000 S  
SS,OP1,FP133,AR60.21290,ZE96.42110,SD36.0799,--S  
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133 60.2129 36.080 96.4211 0.000 0.000 0.000 S  
SS,OP1,FP134,AR82.17100,ZE99.29580,SD26.2899,--S  
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135 137.0912 25.010 100.3150 0.000 0.000 0.000 S  
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139 182.4036 56.330 95.0947 0.000 0.000 0.000 S  
SS,OP1,FP140,AR189.14230,ZE94.10390,SD73.1599,--S  
140 189.1423 73.160 94.1039 0.000 0.000 0.000 S  
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141 192.1422 82.900 93.4728 0.000 0.000 0.000 S  
SS,OP1,FP142,AR194.54000,ZE93.34210,SD90.6798,--S  
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143 49.4137 47.090 95.0143 0.000 0.000 0.000 S  
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145 56.4702 39.460 96.0503 0.000 0.000 0.000 S  
SS,OP1,FP146,AR76.53040,ZE98.26530,SD29.1199,--S  
146 76.5304 29.120 98.2653 0.000 0.000 0.000 S  
SS,OP1,FP147,AR94.12050,ZE99.40300,SD25.8199,--S  
147 94.1205 25.820 99.4030 0.000 0.000 0.000 S  
SS,OP1,FP148,AR106.55410,ZE99.59520,SD25.2099,--S  
148 106.5541 25.210 99.5952 0.000 0.000 0.000 S  
SS,OP1,FP149,AR138.51420,ZE98.50180,SD29.1899,--S  
149 138.5142 29.190 98.5018 0.000 0.000 0.000 S  
SS,OP1,FP150,AR156.08060,ZE97.06090,SD37.0899,--S  
150 156.0806 37.090 97.0609 0.000 0.000 0.000 S  
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153 193.1016 68.090 88.4548 0.000 0.000 7.000 S  
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154 195.2110 75.600 89.0229 0.000 0.000 7.000 S

SS,OP1,FP155,AR196.17460,ZE89.14320,SD78.5098,--GPOST  
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159 197.3821 102.980 89.4045 0.000 0.000 7.000 GPOST  
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SS,OP1,FP160,AR197.50020,ZE89.38240,SD109.1998,--GPOST  
160 197.5002 109.200 89.3824 0.000 0.000 7.000 GPOST  
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161 198.4451 153.020 89.4757 0.000 0.000 7.000 GPOST  
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162 202.5027 143.700 90.0851 0.000 0.000 7.000 LR  
SS,OP1,FP163,AR200.33310,ZE89.52340,SD142.7897,--RR  
163 200.3331 142.790 89.5234 0.000 0.000 7.000 RR  
SS,OP1,FP164,AR200.57500,ZE89.49190,SD135.6297,--RF  
164 200.5750 135.630 89.4919 0.000 0.000 7.000 RF  
SS,OP1,FP165,AR203.04460,ZE90.05190,SD136.0697,--LF  
165 203.0446 136.070 90.0519 0.000 0.000 7.000 LF  
SS,OP1,FP166,AR202.36550,ZE90.03230,SD117.2898,--IMP  
166 202.3655 117.290 90.0323 0.000 0.000 7.000 IMP  
SS,OP1,FP167,AR195.22270,ZE89.10210,SD71.6499,--END  
167 195.2227 71.650 89.1021 0.000 0.000 7.000 END  
SS,OP1,FP168,AR8.14380,ZE87.32430,SD20.0100,--RM2  
168 8.1438 20.010 87.3243 0.000 0.000 7.000 RM2  
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LS,HI5.500,HR0.000  
SS,OP1,FP169,AR99.31270,ZE93.01460,SD89.4998,--EOA  
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SS,OP1,FP170,AR146.26540,ZE92.35380,SD115.2298,--EOA  
170 146.2654 115.230 92.3538 0.000 0.000 0.000 EOA