1998-2003 Ford Windstar Rear Axle Beam Corrosion Failure
1998-2003 Ford Windstar Rear Axle Beam Corrosion Failure

The test vehicle was prepared by creating a release mechanism for the rear axle, installing two five-point harnesses, a V-Box III data collection system, and titanium outriggers. The front outrigger was set at 12 inches and the rear outrigger was set at 14 inches (puck clearance to ground). The test was conducted on the Vehicle Dynamics Area (VDA) at TRCPG by accelerating to 35 mph in a straight line and intercepting a 300-ft radius circle course, then releasing the rear axle “fork plate”.

Removed axle to modify for testing
Two of the dowel pins were drilled and fitted with spring-loaded plastic cotter pins.
Release mechanism and test setup as viewed from rear of vehicle

- **Simulated spare tire**
- **Fork plate**
- **Actuation cylinder**
- **Fuel tank shield**
- **Oak skid plate to protect asphalt**
VRTC rear axle release system – initial weld pattern

Original spot welds on rear axle

Original asphalt protecting skid puck

Actuating cylinder (before installation of the cable to the fork plate)

Two dowels have spring-loaded plastic “cotter” pins
VRTC rear axle release system – final weld pattern
Windstar and chase vehicle Freestar prior to test
Contour HD 1080P cameras
Actual Windstar path from V-Box GPS data plotted in Google Earth
View from chase vehicle camera
View from chase vehicle camera
Post-test view of left front
Post-test view of left rear
Post-test view of left-rear wheel well

Left rear tire marks in wheel well

Left rear tire marks in wheel well
Post-test view of right rear
Post-test view of right-rear wheel well
Post-test view of right-rear wheel from rear of vehicle
Post-test view of right-rear wheel from front
Post-test close-up view of right-side axle against floor pan
VOQs on the 1998-2003 Ford Windstar Rear Axle Beam Corrosion Failures

- 473 VOQs on rear axle failures
- 6 alleged crashes
- 2 alleged injuries
- Numerous loss of control incidents
- 1 rollover
**Vehicle Owner's Questionnaire**

**U.S. Department of Transportation**
National Highway Traffic Safety Administration

**DOT Auto Safety Hotline**

**Vehicle Identification Number**: 2FMDA32401B425133

**Model**: FORD

**Model Year**: 2001

**Date Purchased**: 10-MAY-2010

**Dealer Name**: [Redacted]

**Dealer City**: [Redacted]

**State**: OH

**Zip Code**: [Redacted]

**Transmission Type**: Automatic

**Brake System**: Disc

**Fuel Type**: Gas

**Component/Part Information**: Rear Suspension

**Failure Information**

**Failure Description**: On May 7, 2010, my 2000 Ford Windstar hit me coming from picking up the kids from school causing an accident with the Van flipping over two times.

**Incident Date(s)**: 10-MAY-2010

**Failure Mileage**: 110642

**Future Speed**: 25

**Additional Items to Be Completed When Reporting a Child Seat Failure**

Include a copy or photo of the child seat, seatbelt, fixture, and infant.

**Crash**

- [X] Yes
- [ ] No

**Issue**

- [X] Yes
- [ ] No

**Number of Persons Injured**: 1

**Number of Deaths**: 1

**Reported to Police**: Yes

**Incident Description**

- [X] Yes
- [ ] No

- [X] Yes
- [ ] No

**Injury Description**

- [X] Yes
- [ ] No

- [X] Yes
- [ ] No

**Additional Notes**

Include a copy or photo of the child seat, seatbelt, fixture, and infant.

**Additional Sheets If Necessary**

The Privacy Act of 1974 and the Paperwork Reduction Act of 1980 apply to this form. This information is required pursuant to authority vested in the National Highway Traffic Safety Administration. You may be required to provide this information to a manufacturer. Your response may be used to assist the NHTSA in determining whether a manufacturer should take action. Additionally, the NHTSA may use it to conduct research, with administrative enforcement or litigation against a manufacturer, your response, or a statistical survey, it may be used to support the agency's action.
Vehicle Owner's Questionnaire

Vehicle Information

Make: FORD
Model: WINDSTAR
Model Year: 2001

Date Purchased: 18-MAY-2010
Dealer's Name and Telephone Number: [Redacted]

Failed Component(s)/Part(s) Information

Vehicle Component Code: 022000 SUSPENSION: REAR

ADDITIONAL ITEMS TO BE COMPLETED WHEN REPORTING A TIRE FAILURE

ADDITIONAL ITEMS TO BE COMPLETED WHEN REPORTING A CHILD SEAT FAILURE

Number of Persons Injured: [Redacted]
Number of Deaths: [Redacted]

Reported to Police: [Redacted]

Crash: [Redacted]

date: [Redacted]
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The incident was 23 days and 2,291 miles after . . .

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NTB

MTN OMB AIRL HIRE & DMT

For: Date: 04/10/2010

Order Num: 1991

Date/Time In: 04/10/10 10:40:57

Date/Time Promised: 04/10/10 15:40:10

2001 FORD Windstar

Tag: E3356

St: 0

Mileage: 108551

Engine: VIN: 2FMPM524015

Customer:

Ship To:

Opening Salesperson: 2

Addl Repairs may be authorized by:

Home:

Work:

Phone:

---

Item Number | Item Description | Qty | Price Each | Extended
---|---|---|---|---
108470 | 7/10 THRU FRONT LABOR | 4 | 10.50 | 40.00
108700 | UNDERCARR LABOR | 4 | 10.50 | 40.00

CASH

Cash Payment

405.38

---

IF YOU HAVE A QUESTION OR NEEDS PLEASE TALK TO OUR STORE MANAGER, AT

We use both the state and county tax to calculate charges. All parts are new unless otherwise specified. U-C+U is no return or refund.

I certify that this vehicle has been tested and test driven when needed and that the work performed was performed as specified.

Manager's Signature

---

Special Credit: 346.21
Total Charges: 346.21
Total Credits: .00
Sub-Total: 346.21
New Tire Fees*: .00
Shop Fees*: 36.00
All Taxes: 25.17
Payments: 405.38
Net Amount: .00

PLEASE PAY ABOVE AMOUNT, THANK YOU! Closer: 12945589!

I have received and signed my name as authorized on this invoice. This charge represents costs and profit for the vehicle repair facility to miscellaneous shop supply or waste disposal.

Customer Signature:

IN PERFORMANCE OF THE AGREEMENT, WE ACCEPT PAYMENTS, CONDITIONS AND OTHER IMPORTANT INFORMATION.

35
Crash site along service roadway near freeway ramp
Post-crash view of left front
Post-test view of left rear
Post-crash view of left-rear wheel well
Post-crash view of left-rear wheel well
Post-crash view of right rear
Post-crash view of right-rear wheel well

Laboratory and cell-phone videos of key turn speed
Post-crash view of right front
Post-crash view underneath vehicle
Post-crash view underneath vehicle

Left side rear axle, notice contact marks with spare tire

Right side rear axle

The axle contacted the fuel tank at the strap

Mini-spare tire

Right rear wheel folded underneath vehicle

Longitudinal axis
Crash site along service roadway near freeway ramp
Crash site along service roadway near freeway ramp
Crash site along service roadway near freeway ramp
Crash site along service roadway near freeway ramp
Crash site along service roadway near freeway ramp
Post-crash view of right front.

Impression from fence post

Impression from fence post

Impression from fence post
Discussion
For more information contact:

Daniel Pearse
Transportation Safety Engineer
United States Department of Transportation
National Highway Traffic Safety Administration
Vehicle Research and Test Center
Defects Analysis Group
Post Office Box B37
10820 State Route 347
East Liberty, OH 43319-0337
937-666-4511 x267
dan.pearse@dot.gov