



Vehicle Research and Test Center

1998-2003 Ford Windstar Rear Axle Beam Corrosion Failure

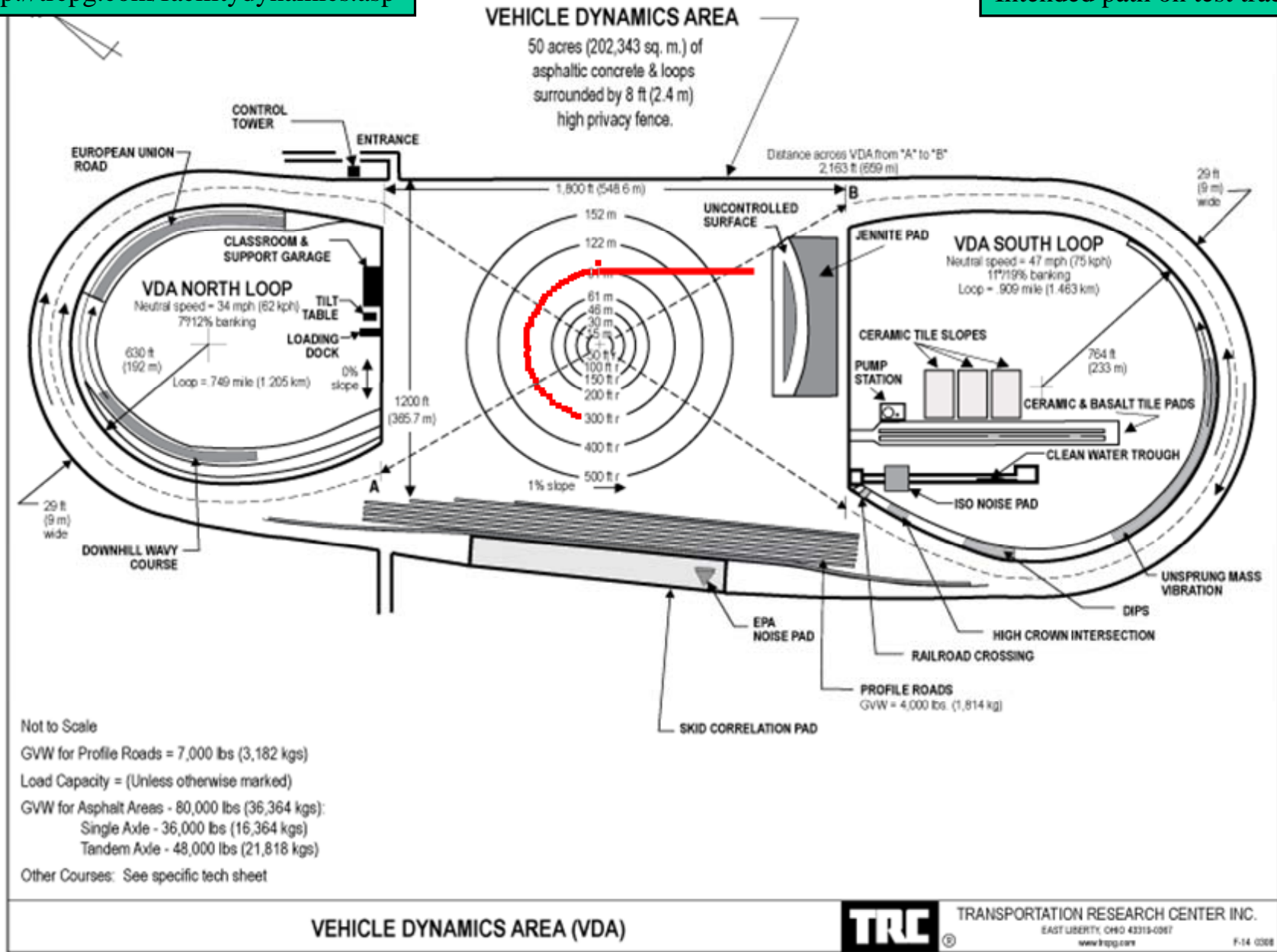
WebEx Presentation
to Ford Safety Office
07/21/2010

PE10-016



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



VRTC fork plate

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



play video Windstar_Rear_Axle_Test-2010-07-08-FINAL.wmv

Actual Windstar path from V-Box GPS data plotted in Google Earth



View from chase vehicle camera



View from chase vehicle camera



View from panning camera



View from underneath 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 view of right front



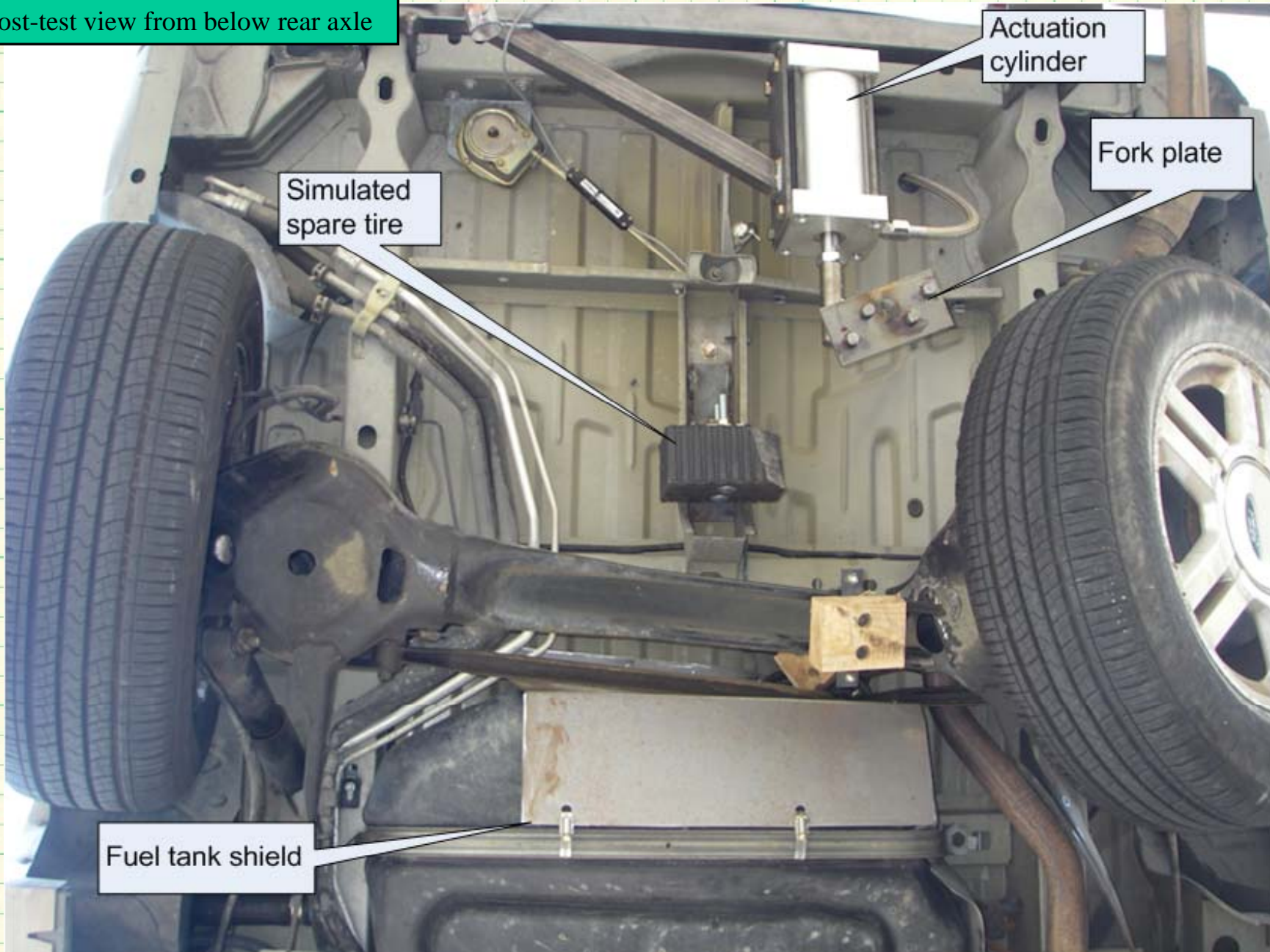
Post-test view from below rear axle

Simulated
spare tire

Actuation
cylinder

Fork plate

Fuel tank shield



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

VOQ 10334753



VOQ 10327329




VOQ 10327329




VOQ 10331092

Form Approved: O.M.B. No. 2127-0008

 U.S. Department of Transportation National Highway Traffic Safety Administration		DOT Auto Safety Hotline Vehicle Owner's Questionnaire To Report Vehicle Safety Defects 1-888-DASH-2-DOT (1-888-327-4236) INTERNET: www.nhtsa.dot.gov/hotline		FOR AGENCY USE ONLY 100148	
		Date Received 18-MAY-2010	Repository <input type="checkbox"/>	Reference No. 10331092	
OWNER INFORMATION (Type or Print)					
Name		Daytime Telephone Number		E-mail Address	
Address		Evening Telephone Number			
City	State	Zip Code			
CLEVELAND	OH				
The information you provide will be used to identify potential safety-related defects. We may share your information with the applicable vehicle manufacturer during an investigation or recall in accordance with the routine uses described in the agency's Privacy Act notice. See 49 FR 53971 (Sep. 3, 2004).					
VEHICLE INFORMATION					
17 digit Vehicle Identification Number Located at bottom of windshield on driver's side		Make	Model	Model Year	
2FMZA52401BA		FORD	WINDSTAR	2001	
Date Purchased	Dealer's Name and Telephone Number		Engine:	Fuel Type:	
			No: Cylinders		
Original Owner	Dealer's City	State	Zip Code		
<input type="checkbox"/>					
Transmission Type	<input type="checkbox"/> Antilock Brakes	Powertrain	Multiple Failure:	Incident Date(s)	
	<input type="checkbox"/> Cruise Control			07-MAY-2010	
FAILED COMPONENT(S)/PART(S) INFORMATION					
Vehicle Component Code: 022000 SUSPENSION: REAR			Failure Mileage	Failure Speed	
			110842	25	
ADDITIONAL ITEMS TO BE COMPLETED WHEN REPORTING A TIRE FAILURE					
Tire Make	Tire Model (Name or Number)		Tire Size (Example P215/65R15)		
DOT No. (Example: DOTM19ABC036)	<input type="checkbox"/> Original Equipment	Failure Location:			
	<input type="checkbox"/> Prior Repair				
Tire Component Code			Tire Failure Type:		
ADDITIONAL ITEMS TO BE COMPLETED WHEN REPORTING A CHILD SEAT FAILURE					
Make:	Date Manufactured:	Model No./Name:			
Seat Type:	Installation System:				
Child Seat Component Code:	Failed Part:				
APPLICABLE INCIDENT INFORMATION					
<i>(Please describe in detail the incident(s), failure(s), crash(es), and injury(ies).)</i>					
Crash	Fire	Number of Persons Injured	Number of Deaths	Reported to Police	
<input checked="" type="checkbox"/> Yes <input type="checkbox"/> No	<input type="checkbox"/> Yes <input checked="" type="checkbox"/> No	1		Y	
Narrative Description of Incident(s), Crash(es), and Injury(ies). Please describe (1) events leading up to the failure, (2) failure and its consequences, and (3) what was done to correct the failure; i.e. parts repaired or replaced (and if old part is available).					
ON MAY 7, 2010 MY 2001 FORD WINSTOL THE ALXE BROKE ON ME COMING FROM PICKING UP THE KIDS FOME SCHOOL CAUSING A ACCIDENT WITH THE VAN FILPPING OVER TWO TIMES					
Include, if available: Police/Fire Department Report, Photos, and Repair Invoice. ATTACH ADDITIONAL SHEETS IF NECESSARY					
The Privacy Act of 1974-Public Law 93-579 This information is requested pursuant to authority vested in the National Highway Traffic Safety Act and subsequent amendments. You are under no obligation to respond this questionnaire. Your response may be used to assist the NHTSA in determining whether a Manufacturer should take appropriate action to correct a safety defect. If the NHTSA proceeds with administrative enforcement or litigation against a manufacturer, your response, or a statistical summary thereof, may be used in support of the agency's action.					

VOQ 10331092

Form Approved: O.M.B. No. 2127-0008

 <p style="text-align: center;">DOT Auto Safety Hotline Vehicle Owner's Questionnaire To Report Vehicle Safety Defects 1-888-DASH-2-DOT (1-888-327-4236) INTERNET: www.nhtsa.dot.gov/hotline</p>		FOR AGENCY USE ONLY 100148	
		Date Received 18-MAY-2010	Repository <input type="checkbox"/> Reference No. 10331092
OWNER INFORMATION (Type or Print)			
Name		Daytime Telephone Number	E-mail Address
Address		Evening Telephone Number	
City CLEVELAND	State OH	Zip Code	
<p><i>The information you provide will be used to identify potential safety-related defects. We may share your information with the applicable vehicle manufacturer during an investigation or recall in accordance with the routine uses described in the agency's Privacy Act notice. See 49 FR 53971 (Sep. 3, 2004).</i></p>			
VEHICLE INFORMATION			
17 digit Vehicle Identification Number Located at bottom of windshield on driver's side 2FMZA52401BA		Make FORD	Model Year 2001
Date Purchased	Dealer's Name and Telephone Number	Engine: No: Cylinders	Fuel Type:
Original Owner <input type="checkbox"/>	Dealer's City	State	Zip Code
Transmission Type <input type="checkbox"/> Antilock Brakes <input type="checkbox"/> Cruise Control	Powertrain	Multiple Failure:	Incident Date(s) 07-MAY-2010
FAILED COMPONENT(S)/PART(S) INFORMATION			
Vehicle Component Code: 022000 SUSPENSION: REAR		Failure Mileage 110842	Failure Speed 25
ADDITIONAL ITEMS TO BE COMPLETED WHEN REPORTING A TIRE FAILURE			
Tire Make	Tire Model (Name or Number)	Tire Size (Example P215/65R15)	
DOT No. (Example: DOTM19ABC036)	<input type="checkbox"/> Original Equipment <input type="checkbox"/> Prior Repair	Failure Location:	
Tire Component Code		Tire Failure Type:	
ADDITIONAL ITEMS TO BE COMPLETED WHEN REPORTING A CHILD SEAT FAILURE			
Make:	Date Manufactured:	Model No./Name:	
Seat Type:	Installation System:		
Child Seat Component Code:	Failed Part:		
APPLICABLE INCIDENT INFORMATION <i>(Please describe in detail the incident(s), failure(s), crash(es), and injury(ies).)</i>			
Crash <input checked="" type="checkbox"/> Yes <input type="checkbox"/> No	Fire <input type="checkbox"/> Yes <input checked="" type="checkbox"/> No	Number of Persons Injured 1	Number of Deaths 0
		Reported to Police Y	
<p>Narrative Description of Incident(s), Crash(es), and Injury(ies). Please describe (1) events leading up to the failure, (2) failure and its consequences, and (3) what was done to correct the failure; i.e. parts repaired or replaced (and if old part is available).</p>			
<p>ON MAY 7, 2010 MY 2001 FORD WINSTAR THE ALXE BROKE ON ME COMING FROM PICKING UP THE KIDS FOME SCHOOL CAUSING A ACCIDENT WITH THE VAN FILPPING OVER TWO TIMES</p>			
<p>Include, if available: Police/Fire Department Report, Photos, and Repair Invoice. ATTACH ADDITIONAL SHEETS IF NECESSARY</p> <p><small>The Privacy Act of 1974-Public Law 93-579 This information is requested pursuant to authority vested in the National Highway Traffic Safety Act and subsequent amendments. You are under no obligation to respond this questionnaire. Your response may be used to assist the NHTSA in determining whether a Manufacturer should take appropriate action to correct a safety defect. If the NHTSA proceeds with administrative enforcement or litigation against a manufacturer, your response, or a statistical summary thereof, may be used in support of the agency's action.</small></p>			

VOQ 10331092



For Dan Pease

ND1 OH NAIL TIRE & BAT

* FINAL BILL - INVOICE** Page 1
Invoice# - RI
Order Num - WI
Date/Time In..... 04/14/10 10:04:57
Date/Time Promised.. 04/14/10 15:47:10

2001 FORD #indstar
Tag: St: OH Mileage: 108551
Engine: VIN# 2FNZA52401

Customer: PO#:

Ship To:

Opening Salesperson Home# Work#
Addl Repairs may be authorized by Phone#

Table with columns: Item Number, Description, Qty, Price Each, Extended. Rows include: VCA VEHICLE INSPECTION 7 POINT 1; WAP PROGRAM WHEEL ALIGNMENT 1; XPER LEFT HUB ASSEMBLY OUTSIDE PURCHASE BRAKE New 1 138.66 138.66; BRLAB /10TH HOUR BRAKE LABOR 10 8.50 85.00; XPER R/OUTER TIE ROD OUTSIDE PURCHASE FRONT END New 1 37.55 37.55

The incident was 23 days and 2,291 miles after . . .

Date/Time In..... 04/14/10 10:04:57
Date/Time Promised.. 04/14/10 15:47:10

2001 FORD Windstar
Tag: [REDACTED] St: [REDACTED] Mileage: 108551
Engine: [REDACTED] VIN# 2FMZA52401 [REDACTED]

Customer: [REDACTED] PO#:

Ship To:

Opening Salesperson [REDACTED]
Addl Repairs may be authorized by

Home# [REDACTED]; Work# [REDACTED]
Phone# [REDACTED]

Item Number	Description	Qty	Price Each	Extended
VCA	VEHICLE INSPECTION 7 POINT	1		
	front end shakes hub bearing outer tie rod end			
WAP	PROGRAM WHEEL ALIGNMENT	1		
XPER	LEFT HUB ASSEMBLY OUTSIDE PURCHASE BRAKE New	1	138.66	138.66
BRLAB	/10TH HOUR BRAKE LABOR	10	8.50	85.00
XPFE	R/OUTER TIE ROD OUTSIDE PURCHASE FRONT END New	1	37.55	37.55

VOQ 10331092



For Dan Keaser

MD1 OH NATL TIRE & BAT #

* FINAL BILL - INVOICE** Page 2
Invoice#
Order Num
Date/Time In..... 04/14/10 10:04:57
Date/Time Promised.. 04/14/10 15:47:10

2001 FORD Windstar
Tag: E St: C Mileage: 108551
Engine: VIN# 2FMZA52401B

Customer: PO#:

Ship To:

Opening Salesperson 1
Add Repairs may be authorized by

Home# Work#
Phone#

Item Number	Item Description	Qty	Price Each	Extended
UCLAL	7/10TH HOUR LABOR UNDERCAR	10	8.50	85.00

CASH

Cash Payment

405.38-

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

We use both flat rate and hourly rate to calculate charges. All parts are new unless otherwise specified U-Used or R-Rebuilt.

I Certify that this vehicle has been tested or test driven when needed and that the mechanic's work was performed satisfactorily.

Manager's Signature

Special Credit:
Total Charges.. 346.21
Total Credits.. .00
Sub-Total..... 346.21
New Tire Fees** .00
Shop Fees(*) 30.00
All Taxes..... 29.17

Payments..... 405.38-

Net Amount..... .00

PLEASE PAY ABOVE AMOUNT.

THANK YOU! Closer:1294589!

NTB is a participant in the National Highway Traffic Safety Administration (NHTSA) recall program. For more information on this recall, please visit the NHTSA website at www.safercar.gov. You may also contact the manufacturer or NHTSA. In addition, certain consumer publications or organizations provide this information, which may be available for a fee or free.

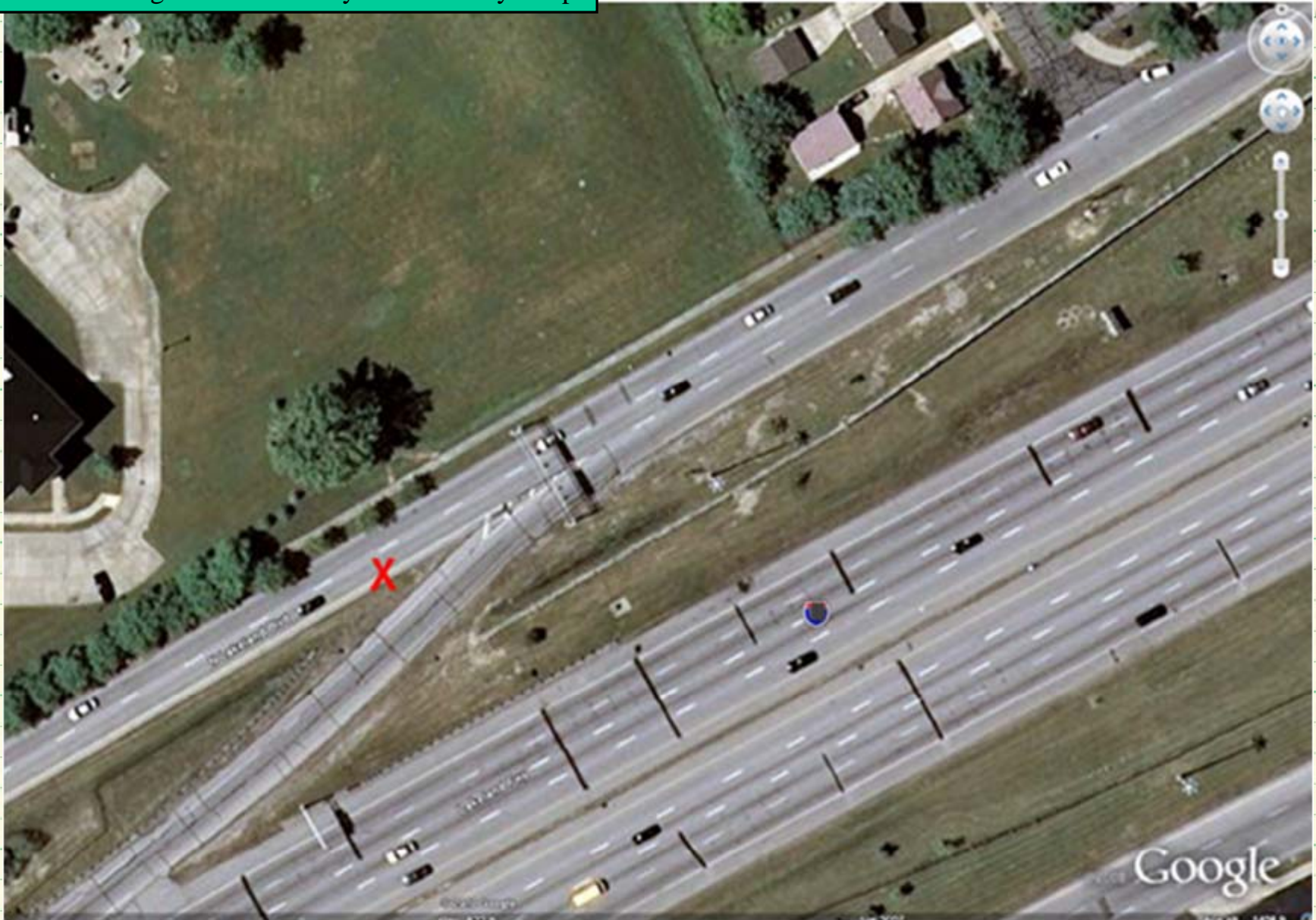
I have received the goods and services as represented on this invoice. If this is a credit card purchase I agree to pay and comply with the cardholders agreement with the issuer. *This charge represents costs and profits to the vehicle repair facility for miscellaneous Shop Supply or Waste disposal.

Customer Signature

IN ORDER TO RECEIVE THE BEST SERVICE, PLEASE READ THE TERMS, CONDITIONS AND OTHER IMPORTANT INFORMATION

CUSTOMER CO

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

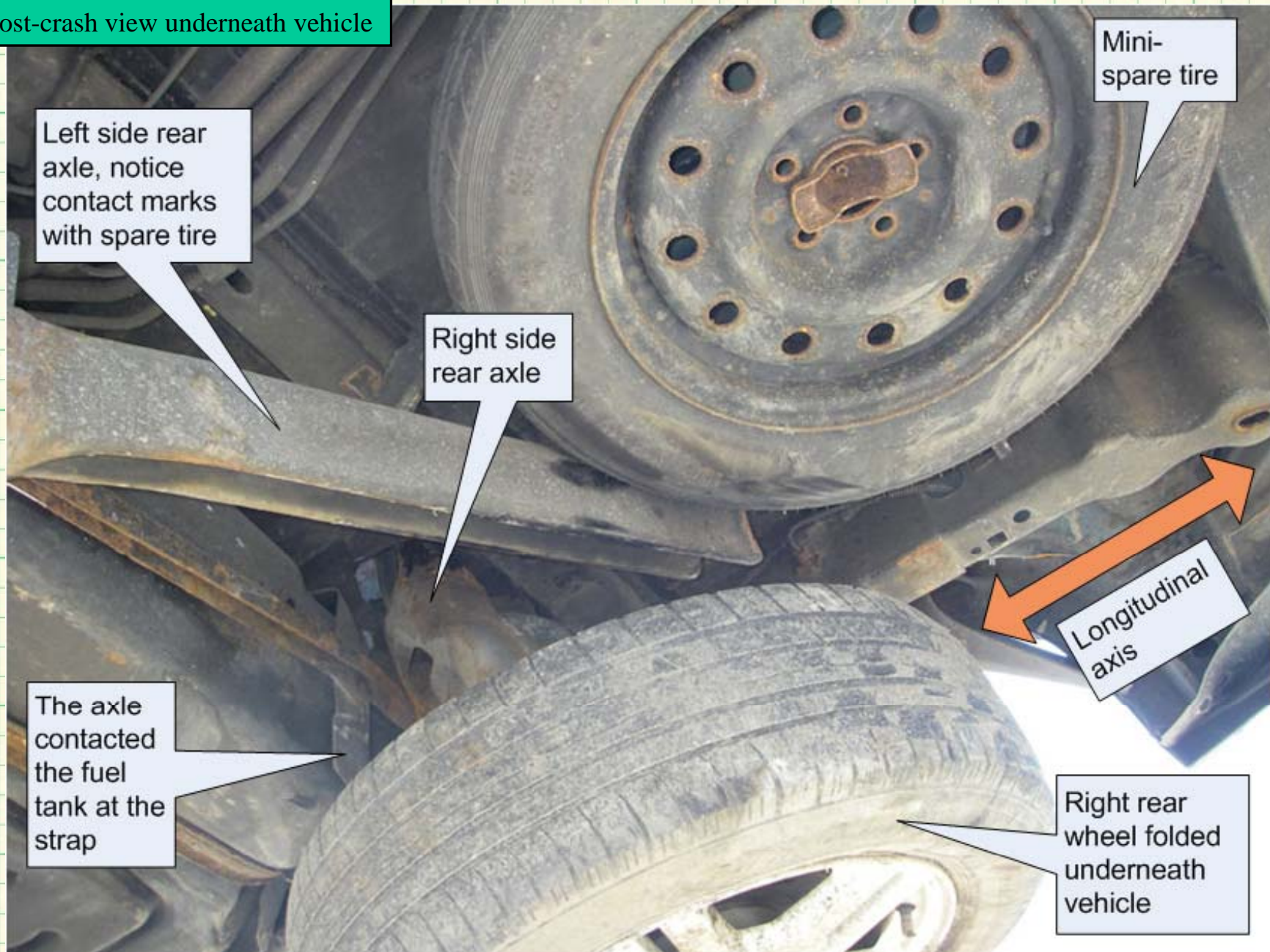
Post-crash view of right front



Post-crash view underneath vehicle



Post-crash view underneath vehicle



Left side rear axle, notice contact marks with spare tire

Mini-spare tire

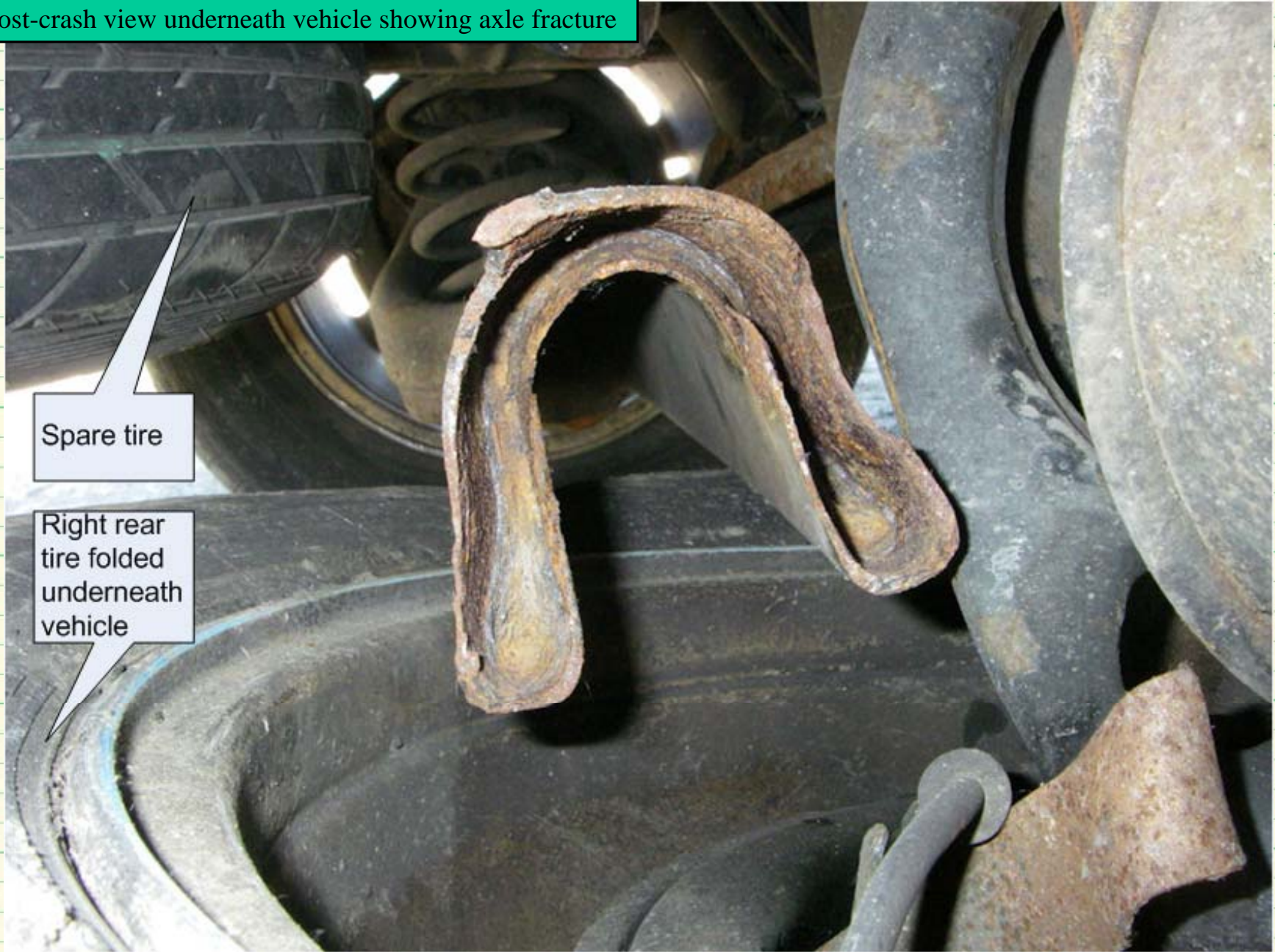
Right side rear axle

Longitudinal axis

The axle contacted the fuel tank at the strap

Right rear wheel folded underneath vehicle

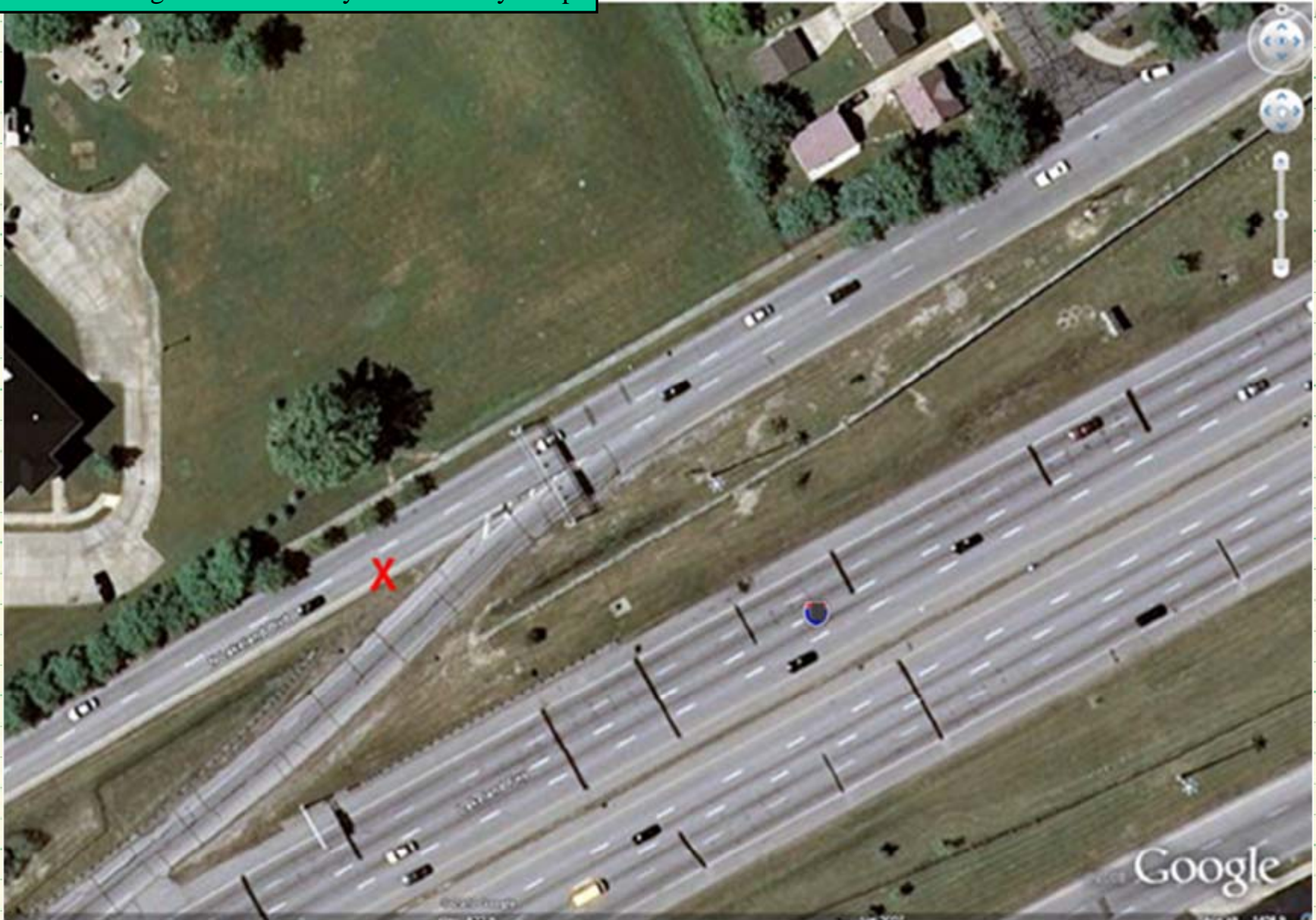
Post-crash view underneath vehicle showing axle fracture



Spare tire

Right rear
tire folded
underneath
vehicle

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



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