Federal Railroad Administration
Office of Safety
Headquarters Assigned
Accident Investigation Report
HQ-2006-01

Amtrak (ATK)
Quantico, Virginia
January 5, 2006

Note that 49 U.S.C. §20903 provides that no part of an accident or incident report made by the Secretary of Transportation/Federal Railroad Administration under 49 U.S.C. §20902 may be used in a civil action for damages resulting from a matter mentioned in the report.

DEPARTMENT OF TRANSPORTATION
FEDERAL RAILROAD ADMINISTRATION

FRA FACTUAL RAILROAD ACCIDENT REPORT

FRA File # HQ-2006-1

1.Name of Railroad Operating Train #1: Amtrak [ATK]	1a. Alphabetic Code: ATK	1b. Railroad Accident/Incident No.: 099442
2.Name of Railroad Operating Train #2: N/A	2a. Alphabetic Code: N/A	2b. Railroad Accident/Incident: N/A
3.Name of Railroad Responsible for Track Maintenance: Amtrak [ATK]	3a. Alphabetic Code: ATK	3b. Railroad Accident/Incident No.: 099442
4. U.S. DOT_AAR Grade Crossing Identification Number:	5. Date of Accident/Incident: Month 01 / Day 05 / Year 2006	6. Time of Accident/Incident: 06:44:00 ☑ AM ☐ PM

7. Type of Accident/Indicent (single entry in code box): 1. Derailment; 2. Head on collision; 3. Rear end collision; 4. Side collision; 5. Raking collision; 6. Broken Train collision; 7. Hwy-rail crossing; 8. RR grade crossing; 9. Obstruction; 10. Explosion-detonation; 11. Fire/violent rupture; 12. Other impacts; 13. Other (describe in narrative): 01

8. Cars Carrying HAZMAT	9. HAZMAT Cars Damaged/Derailed	10. Cars Releasing HAZMAT	11. People Evacuated	12. Division
0	0	0	0	Baltimore

13. Nearest City/Town	14. Milepost (to nearest tenth)	15. State Abbr	15. State Code	16. County
Quantico	79.7	N/A	VA	PRINCE WILLIAM

17. Temperature (F) (specify if minus)	18. Visibility (single entry) 1. Dawn 2. Day 3.Dusk 4.Dark	Code	19. Weather (single entry) 1. Clear 2. Cloudy 3. Rain 4. Fog 5.Sleet 6.Snow	Code	20. Type of Track 1. Main 2. Yard 3. Siding 4. Industry	Code
35 F		1		1		1

21. Track Name/Number	22. FRA Track Class (1-9, X)	Code	23. Annual Track Density (gross tons in millions)	24. Time Table Direction 1. North 3. East	Code
Track 2 Main		4	52.4		1

OPERATING TRAIN #1

25. Type of Equipment Consist (single entry)	A. Spec. MoW Equip.	Code	26. Was Equipment Attended? 1. Yes 2. No	Code	27. Train Number/Symbol
1. Freight train; 2. Passenger train; 3. Commuter train; 4. Work train; 5. Single car; 6. Cut of cars; 7. Yard/switching; 8. Light loco(s).; 9. Maint./inspect.car		3		1	P304-05/ N

28. Speed (recorded speed, if available) R - Recorded E - Estimated: 42 MPH; Code: R

29. Trailing Tons (gross tonnage, excluding power units): N/A

30. Method(s) of Operation (enter code(s) that apply): a. ATCS; b. Auto train control; c. Auto train stop; d. Cab; e. Traffic; f. Interlocking; g. Automatic block; h. Current of traffic; i. Time table/train orders; j.Track warrant control; k. Direct traffic control; l.Yard limits; m.Special instructions; n. Other than main track; o. Positive train control; p. Other (Specify in narrative) Code(s): d N/A N/A N/A N/A

30a. Remotely Controlled Locomotive? 0 = Not a remotely controlled; 1 = Remote control portable; 2 = Remote control tower; 3 = Remote control transmitter - more than one remote control transmitter: 0

31. Principal Car/Unit	a. Initial and Number	b. Position in Train	c. Loaded (yes/no)
(1) First involved (derailed, struck, etc)	N/A	4	yes
(2) Causing (if mechanical cause reported)	N/A	N/A	N/A

32. If railroad employee(s) tested for drug/alcohol use, enter the number that were positive in the appropriate box.

Alcohol	Drugs
N/A	N/A

33. Was this consist transporting passengers? (Y/N): Y

34. Locomotive Units	a. Head End	Mid Train b. Manual	Mid Train c. Remote	Rear End d. Manual	Rear End c. Remote
(1) Total in Train	0	0	0	1	0
(2) Total Derailed	0	0	0	1	0

35. Cars	Loade a. Freight	Loade b. Pass.	Empty c. Freight	Empty d. Pass.	e. Caboose
(1) Total in Equipment Consist	0	6	0	0	0
(2) Total Derailed	0	3	0	0	0

36. Equipment Damage This Consist	37. Track, Signal, Way, & Structure Damage	38. Primary Cause Code	39. Contributing Cause Code
400000	25000	T310	N/A

Number of Crew Members / Length of Time on Duty

40. Engineer/ Operators	41. Firemen	42. Conductors	43. Brakemen	44. Engineer/Operator	45. Conductor
N/A	N/A	2	0	Hrs 1 Mi 28	Hrs 1 Mi 28

Casualties to:	46. Railroad Employees	47. Train Passengers	48. Other
Fatal	0	0	0
Nonfatal	N/A	04	0

49. EOT Device? 1. Yes 2. No: 2

50. Was EOT Device Properly Armed? 1. Yes 2. No: 2

51. Caboose Occupied by Crew? 1. Yes 2. No: 2

OPERATING TRAIN #2

52. Type of Equipment Consist (single entry)	A. Spec. MoW Equip.	Code	53. Was Equipment Attended? 1. Yes 2. No	Code	54. Train Number/Symbol
1. Freight train; 2. Passenger train; 3. Commuter train; 4. Work train; 5. Single car; 6. Cut of cars; 7. Yard/switching; 8. Light loco(s).; 9. Maint./inspect.car		N/A		N/A	N/A

55. Speed (recorded speed, if available) R - Recorded E - Estimated: 0 MPH; Code: N/A

57. Method(s) of Operation (enter code(s) that apply): a. ATCS; b. Auto train control; g. Automatic block; h. Current of traffic; m.Special instructions; n. Other than main track

57a. Remotely Controlled Locomotive? 0 = Not a remotely controlled; 1 = Remote control portable

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56. Trailing Tons (gross tonnage, excluding power units): N/A

c. Auto train stop; d. Cab; e. Traffic; f. Interlocking; i. Time table/train orders; j.Track warrant control; k. Direct traffic control; l.Yard limits; o. Positive train control; p. Other (Specify in narrative)

Code(s): N/A | N/A | N/A | N/A | N/A

2 = Remote control tower
3 = Remote control transmitter - more than one remote control transmitter: N/A

58. Principal Car/Unit	a. Initial and Number	b. Position in Train	c. Loaded (yes/no)
(1) First involved (derailed, struck, etc)	0	N/A	N/A
(2) Causing (if mechanical cause reported)	0	N/A	N/A

59. If railroad employee(s) tested for drug/alcohol use, enter the number that were positive in the appropriate box.

Alcohol	Drugs
N/A	N/A

60. Was this consist transporting passengers? (Y/N): N/A

61. Locomotive Units	a. Head End	Mid Train b. Manual	Mid Train c. Remote	Rear End d. Manual	Rear End c. Remote
(1) Total in Train	0	0	0	0	0
(2) Total Derailed	0	0	0	0	0

62. Cars	Loade a. Freight	Loade b. Pass.	Empty c. Freight	Empty d. Pass.	e. Caboose
(1) Total in Equipment Consist	0	0	0	0	0
(2) Total Derailed	0	0	0	0	0

63. Equipment Damage This Consist: 0

64. Track, Signal, Way, & Structure Damage: 0

65. Primary Cause Code: N/A

66. Contributing Cause Code: N/A

Number of Crew Members

67. Engineer/ Operators	68. Firemen	69. Conductors	70. Brakemen
N/A	N/A	N/A	N/A

Length of Time on Duty

71. Engineer/Operator: Hrs 0 Mi 0

72. Conductor: Hrs 0 Mi 0

Casualties to:	73. Railroad Employees	74. Train Passengers	75. Other
Fatal	0	0	0
Nonfatal	0	0	0

76. EOT Device? 1. Yes 2. No: N/A

77. Was EOT Device Properly Armed? 1. Yes 2. No: N/A

78. Caboose Occupied by Crew? 1. Yes 2. No: N/A

Highway User Involved

79. Type: A. Auto; B. Truck; C. Truck-Trailer.; D. Pick-Up Truck; E. Van; F. Bus; G. School Bus; H. Motorcycle; J. Other Motor Vehicle; K. Pedestrian; M. Other (spec. in narrative) — Code: N/A

80. Vehicle Speed (est. MPH at impact): N/A

81. Direction geographical) 1.North 2.South 3.East 4.West — Code: N/A

82. Position: 1.Stalled on Crossing 2.Stopped on Crossing 3.Moving Over Crossing 4. Trapped — Code: N/A

86a. Was the highway user and/or rail equipment involved in the impact transporting hazardous materials? 1. Highway User 2. Rail Equipment 3. Both 4. Neither — Code: N/A

Rail Equipment Involved

83. Equipment: 1.Train(units pulling); 2.Train(units pushing); 3.Train (standing); 4.Car(s) (moving); 5.Car(s) (standing); 6.Light Loco(s) (moving); 7.Light(s) (standing); 8.Other (specify in narrative) — Code: N/A

84. Position of Car Unit in Train: N/A

85. Circumstance: 1. Rail Equipment Struck Highway User; 2. Rail Equipment Struck by Highway User — Code: N/A

86b. Was there a hazardous materials release by 1. Highway User 2. Rail Equipment 3. Both 4. Neither — Code: N/A

86c. State here the name and quantity of the hazardous materials released, if any.: N/A

87. Type of Crossing Warning: 1.Gates; 2.Cantilever FLS; 3.Standard FLS; 4.Wig Wags; 5.Hwy. traffic signals; 6.Audible; 7.Crossbucks; 8.Stop signs; 9.Watchman; 10.Flagged by crew; 11.Other (spec. in narr.); 12.None

Code(s)							
N/A	N/A	N/A	N/A	N/A	N/A	N/A	N/A

88. Signaled Crossing Warning (See instructions for codes) Code:

89. Whistle Ban 1. Yes 2. No 3. Unknown — Code: N/A

90. Location of Warning 1. Both Sides 2. Side of Vehicle Approach 3. Opposite Side of Vehicle Approach — Code: N/A

91. Crossing Warning Interconnected with Highway Signals 1. Yes 2. No 3. Unknown — Code: N/A

92. Crossing Illuminated by Street Lights or Special Lights 1. Yes 2. No 3. Unknown — Code: N/A

93. Driver's Age: 0

94. Driver's Gender 1. Male 2. Female — Code: N/A

95. Driver Drove Behind or in Front of Train and Struck or was Struck by Second Train 1. Yes 2. No 3. Unknown — Code: N/A

96. Driver 1. Drove around or thru the Gate 2. Stopped and then Proceeded 3. Did not Stop 4. Stopped on Crossing 5. Other (specify in narrative) — Code: N/A

97. Driver Passed Standing Highway Vehicle 1. Yes 2. No 3. Unknown — Code: N/A

98. View of Track Obscured by (primary obstruction) 1. Permanent Structure 2. Standing Railroad Equipment 3. Passing Train 4. Topography 5. Vegetation 6. Highway Vehicle 7. Other (specify in narrative) 8. Not obstructed — Code: N/A

101. Casulties to Highway-Rail Crossing Users	Killed	Injured
	0	0

99. Driver Was 1. Killed 2.Injured 3. Uninjured — Code: N/A

100. Was Driver in the Vehicle? 1. Yes 2. No — Code: N/A

102. Highway Vehicle Property Damage (est. dollar damage): 0

103. Total Number of Highway-Rail Crossing Users (include driver): 0

104. Locomotive Auxiliary Lights? 1. Yes 2. No — Code: N/A

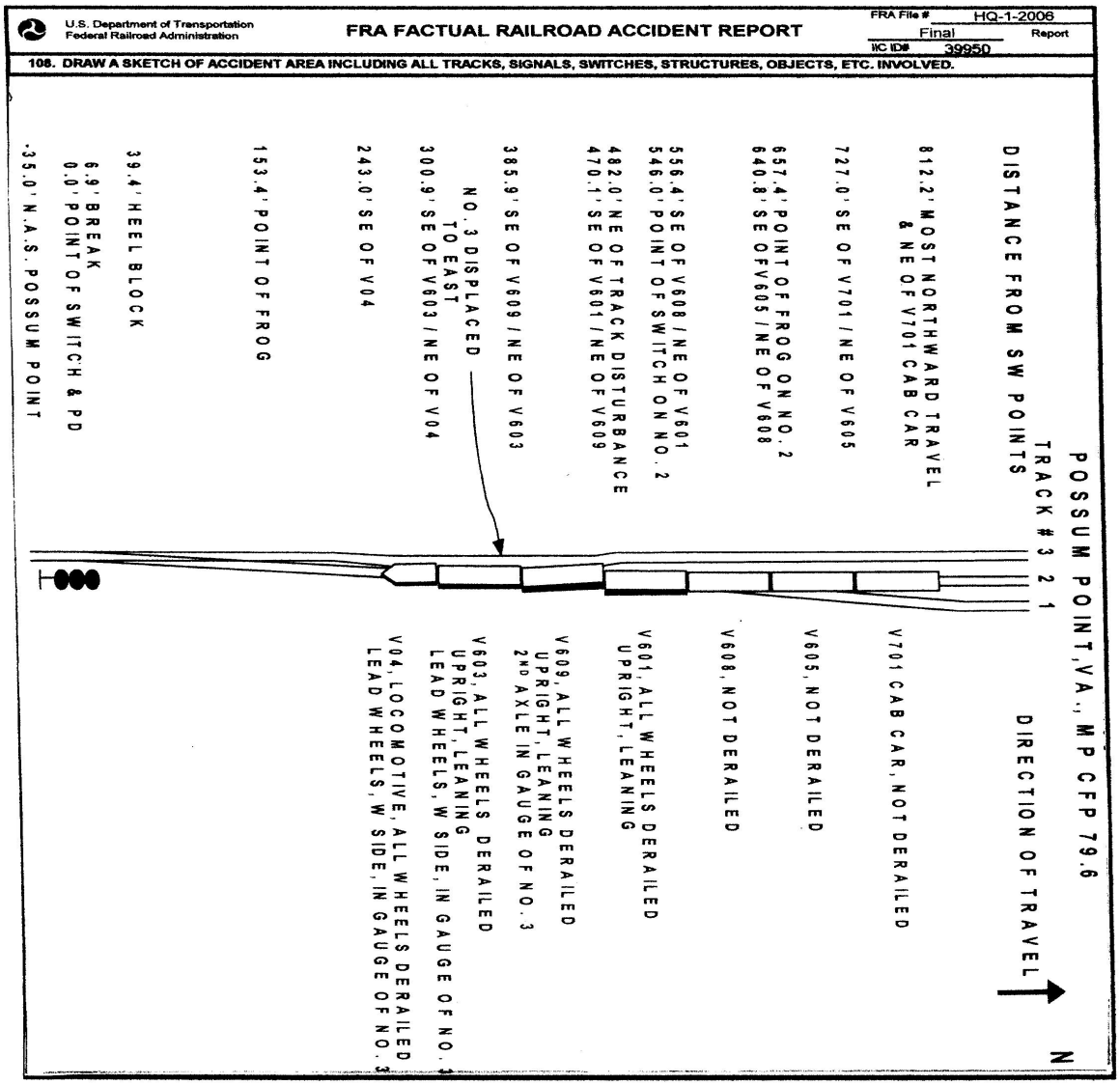
105. Locomotive Auxiliary Lights Operational? 1. Yes 2. No — Code: N/A

106. Locomotive Headlight Illuminated? 1. Yes 2. No — Code: N/A

107. Locomotive Audible Warning Sounded? 1. Yes 2. No — Code: N/A

108. DRAW A SKETCH OF ACCIDENT AREA INCLUDING ALL TRACKS, SIGNALS, SWITCHES, STRUCTURES, OBJECTS, ETC., INVOLVED.

HQ-01-
2006
SKETCH.
jpg



109. SYNOPSIS OF THE ACCIDENT

On January 05, 2006, at 6:44 a.m., EST a northbound Virginia Rail Express Train (VRE) commuter train No. P304-05 derailed at Quantico, Va. The incident occurred at milepost CFP 79.9 on CSX Transportation's (CSXT) Baltimore Division, RF&P Subdivision. The VRE service is operated under contract by Amtrak.

The train was making a facing point movement, diverting from the single main track to track No. 2. over a No. 20 turnout. The six car train was operating in a push pull mode with the cab control car in the lead. The entire consist remained upright and within the limits of the interlocking.

As a result of the accident, three passengers were transported for medical treatment after complaining of minor symptoms, and the assistant conductor was transported to have a twisted knee treated. There were no major injuries and no fatalities reported.

The visibility was good and pre-dawn dark. The temperature was 35°F.

The probable cause of this accident was a broken switch point.

110. NARRATIVE

Circumstances Prior to the Accident

The crew of VRE train P304-05 included a engineer, conductor, and assistant conductor. They first went on duty at Crossroads Yard in Fredericksburg, Virginia at 5:15 a.m., EST, January 05, 2006. All crew members received more than the statutory off-duty period, reporting for duty with 10 hours 55 minutes rest.

Northbound VRE Train P304-05; push-pull consist: cab car 701,coaches 605, 608, 601, 609, 603 and locomotive V04. The consist was equipped with functioning cab signal and automatic train control apparatus that was tested in accordance with 49CFR236 prior to departure. A Class 1 Air Brake Test and Inspection was successfully completed before departing Crossroads Yard and a running air brake test was successfully completed after entering the main track.

Train 304 operated North on the CSX Baltimore Division RF&P Subdivision on Track 2 under Automatic Block Signal and Control Point Signal Rules with a maximum authorized speed of 70 mph. Train P304-05 departed Crossroads Yard and made it's initial station stop at Fredericksburg, departing there at 6:10 a.m.

After making a scheduled station stop at Quantico milepost 78.5, train P304-05 passed an absolute signal displaying "Limited Clear" (Red over Flashing Green over Red) and accelerated north onto the single track section crossing the Quantico Creek Bridge reaching approximately 42 mph.

At the north end of the bridge the track curves to the left and then after approximately 100 Feet of tangent track at milepost 79.7 (Railroad Location Possum Point), Train P304-05 passed an absolute signal that displayed "Limited Clear" and entered the Interlocked right-hand turnout onto Main Track No. 2. The maximum speed through the turnout after passing a "Limited Clear" signal was 45 mph and Train P304-05 was recorded at 42 mph.

The Engineer Was at the Controls in Cab Car 701, the conductor was standing at the opposite side of the same vestibule observing conditions forward, and the assistant conductor was in the upper level of the fourth car (601).

The railroad timetable direction of VRE train P304-05 was northward. The milepost numbering increases in the northward timetable direction. Timetable directions are used throughout this report.

The Accident

Train VRE P304-05 North
The train was operating at 42 mph approaching the accident area. The timetable authorized speed for the single main track approach is 45 mph and throughout the turnout it is 45 mph. The engineer stated that he observed a "Limited Clear" signal while taking a diverging route leaving No. 2 main track before entering the single main track going north over the bridge. He observed another "Limited Clear" signal before taking a diverging route from the single main onto No. 2 main track. He also indicated that he did not see, feel or hear anything abnormal going over the switch.

The engineer did not make any abnormal change in speed or apply the brakes while entering the switch. The engineer stated he did not place the train in emergency, but the train did experience an undesired emergency brake application and that the train came to a stop. The train had not been placed into emergency brake application at anytime prior that day.

Immediately after the train stopped the engineer made an emergency radio transmission to protect the train and called to notify Amtrak supervision of the accident. The conductor was present in the lead end of the cab control car as the train went over the switch at Possum Point and stated he did not see, feel or hear anything abnormal prior to the emergency brake application.

The assistant conductor was in the upper level of the fourth car when he felt the car go on the ground, where upon he grabbed a railing and braced himself. After the train stopped he asked passengers about any injuries and determined that three passengers required some medical assistance. He communicated with the conductor and complied with his instructions to protect the train and the passengers while awaiting emergency responders.

The Conductor went north with proper flagging equipment to protect the head-end, and the Assistant Conductor went south to protect the rear of the train. When they realized that the consist was completely within Interlocking limits they all turned to passenger emergency response. He checked the condition of the equipment and assisted the passengers by telling them to remain calm and to stay on the train until emergency responders arrived. Eventually, he assisted with the evacuation of the passengers to the rescue train, which arrived about two hours after the incident. After assisting with the evacuation of the passengers, he went to the hospital to receive medical treatment.

As a result of the accident, three passengers were transported for medical treatment after complaining of minor symptoms, and the assistant conductor was transported to have a twisted knee treated. There were no major injuries and no fatalities reported.

EMS arrived on scene at 6:59 a.m. and reported four minor injuries that were treated at local hospitals and released.

Equipment Damage: $400,000, Track $25,000.

NTSB was present and is conducting an investigation. Virginia State Corporation Commission assisted with the NTSB's Preliminary investigation. NTSB File: DCA-06-FR-003.

Analysis and Conclusion

Post - Accident Inspection - Track
FRA and NTSB Investigators documented wheel markings between the field side of the switch point and the gage side of the west stock rail. The wheel markings continued northward to the frog area. Corresponding wheel markings were evident on the gage side of the east turnout rail in the area outside of the straight closure rail to the frog - the wheel markings continued north to the frog area. Investigators found multiple sets of wheel markings from the frog area north to where the equipment came to rest. At a point 21 inches north of the switch point, the switch point measured 1 inch below the top of the stock rail: the same location on the switch point measured 7/16 wide. 36 inches north of the end of the switch point, the switch measured below the stock rail. At the agreed point of derailment, the switch point area was worn and broken out and measured 1 inch below the top of the stock rail and at 24 inches north.

Prior to January 5, 2006, the RF&P Subdivision main tracks were inspected on January 2, 2006, by CSXT employees. One exception was noted on the record for the accident area, which detailed a worn switch point and that a 10 mph slow order was placed on the track for that condition. As part of this investigation 1024 records were reviewed for the period from the first week of January 2006 and the 12 months of 2005. The records inspection was for the north half of the RF&P Subdivision, which includes Possum Point interlocking. The records reveled that CSXT had taken exception to the switch point condition at Possum Point on six different occasions: 01/02/06; 12/19/05; 10/14/05; 05/02/05; 04/04/05; and 02/28/05.

On December 21, 2005 during a routine inspection of the RF&P which included the Possum Point interlocking switch the FRA inspector took no exceptions to the condition of the switch point.

On March 20, 2006, CSX was issused an inspection report recommending civil pentilies be the carrier¡¯s non compliance with 49CFR213.135.11

On January 7, 2006, an investigator from the NTSB¡¯s Office of Research and Engineering accompanied the investigative group on-scene to photograph, measure and examine the switch point and stock rail, which was removed from the track.

Post - Accident Inspection - SignalAll CSX signal inspection and test records for Possum Point. On January 07, 2006, the signal-working group conducted an inspection of the signal system installed at Possum Point.

All records of test and inspection were found to be in compliance with the requirements of 49 CFR 236, Rules and Regulations Governing Railroad Signal and Train Control Systems. Nothing remarkable was found

Post-Accident Inspection - Equipment
The NTSB documented key controls in the cab car, which corresponded to later event recorder data and statements by the engineer. NTSB personnel removed solid-state electronic data event recorder data cards from the cab car and the locomotive for download and later analysis. Wheel measurements of all wheels were taken and recorded. None of the measured dimensions for wheel flange height or thickness, or rim thickness exceeded the Amtrak or FRA condemning limits.

On Friday, January 6, 2006, the non - derailed cars V 701, V 605, and V 608 were taken to Union Station , Washington, DC for inspection by FRA and NTSB. All wheels exhibited good contour with no indication of unusual wear, overheating discoloration, flat spots, shelling, or other defective indications or conditions.

On Saturday, January 7, 2006, at VRE Crossroads Yard the three accident derailed cars and the locomotive were inspected by FRA and NTSB. Wheels had good contour with no unusual wear, as on the non-derailed cars or any defective indications or conditions. The lead truck of car V 609 had been replaced for movement. The damaged truck was examined and measured. Particular attention was given to places of attachment and connection to the car body and truck components. Nothing unusual was noted beyond derailment damage.

On January 18, 2006, at VRE Crossroads Yard FRA and NTSB removed and examined the lead truck (B-end) of the 4th passenger car, V 601, which is believed to be the first to derail. The inspection focused on the truck center pin connection for any malfunction. Nothing unusual was noted.

Conclusion
The Federal Railroad Adminstration's Investigation of HQ-2006-1 found the probable cause to be a broken switch point.