Federal Railroad Administration
Office of Safety
Headquarters Assigned
Accident Investigation Report
HQ-2005-27

Amtrak (ATK)
Lyons, New York
April 3, 2005

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-2005-27

1.Name of Railroad Operating Train #1: Amtrak [ATK]	1a. Alphabetic Code: ATK	1b. Railroad Accident/Incident No.: 0906580001
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: CSX Transportation Intermodal [CSXT]	3a. Alphabetic Code: CSXT	3b. Railroad Accident/Incident No.: 0906580001
4. U.S. DOT_AAR Grade Crossing Identification Number:	5. Date of Accident/Incident: Month 04 / Day 03 / Year 2005	6. Time of Accident/Incident: 06:20: ☐ 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	N/A	N/A	0	Albany

13. Nearest City/Town	14. Milepost (to nearest tenth)	15. State Abbr	15. State Code	16. County
Lyons	334.9	N/A	NY	WAYNE

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
36 F		3		3		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
Main No. 2		4	41		4

OPERATING TRAIN #1

25. Type of Equipment Consist (single entry): 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; A. Spec. MoW Equip. Code: 2

26. Was Equipment Attended? 1. Yes 2. No: 1

27. Train Number/Symbol: ATK 287

28. Speed (recorded speed, if available) R - Recorded E - Estimated: 69 MPH; Code: R

29. Trailing Tons (gross tonnage, excluding power units): 0

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): e, f, l, 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	5	yes
(2) Causing (if mechanical cause reported)	0	0	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	1	0	0	0	0
(2) Total Derailed	0	0	0	0	0

35. Cars	Loade a. Freight	Loade b. Pass.	Empty c. Freight	Empty d. Pass.	e. Caboose
(1) Total in Equipment Consist	0	4	0	2	0
(2) Total Derailed	0	1	0	2	0

36. Equipment Damage This Consist	37. Track, Signal, Way, & Structure Damage	38. Primary Cause Code	39. Contributing Cause Code
90000	40000	T201	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	0	2	0	Hrs 6 Mi 50	Hrs 6 Mi 50

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

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

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

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

OPERATING TRAIN #2

52. Type of Equipment Consist (single entry): 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; A. Spec. MoW Equip. Code: N/A

53. Was Equipment Attended? 1. Yes 2. No: N/A

54. Train Number/Symbol: N/A

55. Speed (recorded speed, if available) R - Recorded E - Estimated: N/A 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)	N/A	N/A	N/A
(2) Causing (if mechanical cause reported)	N/A	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	N/A	N/A	N/A	N/A	N/A
(2) Total Derailed	N/A	N/A	N/A	N/A	N/A

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

63. Equipment Damage This Consist: N/A
64. Track, Signal, Way, & Structure Damage: N/A
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 N/A Mi N/A
72. Conductor: Hrs N/A Mi N/A

Casualties to:	73. Railroad Employees	74. Train Passengers	75. Other
Fatal	N/A	N/A	N/A
Nonfatal	N/A	N/A	N/A

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: N/A
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: N/A
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

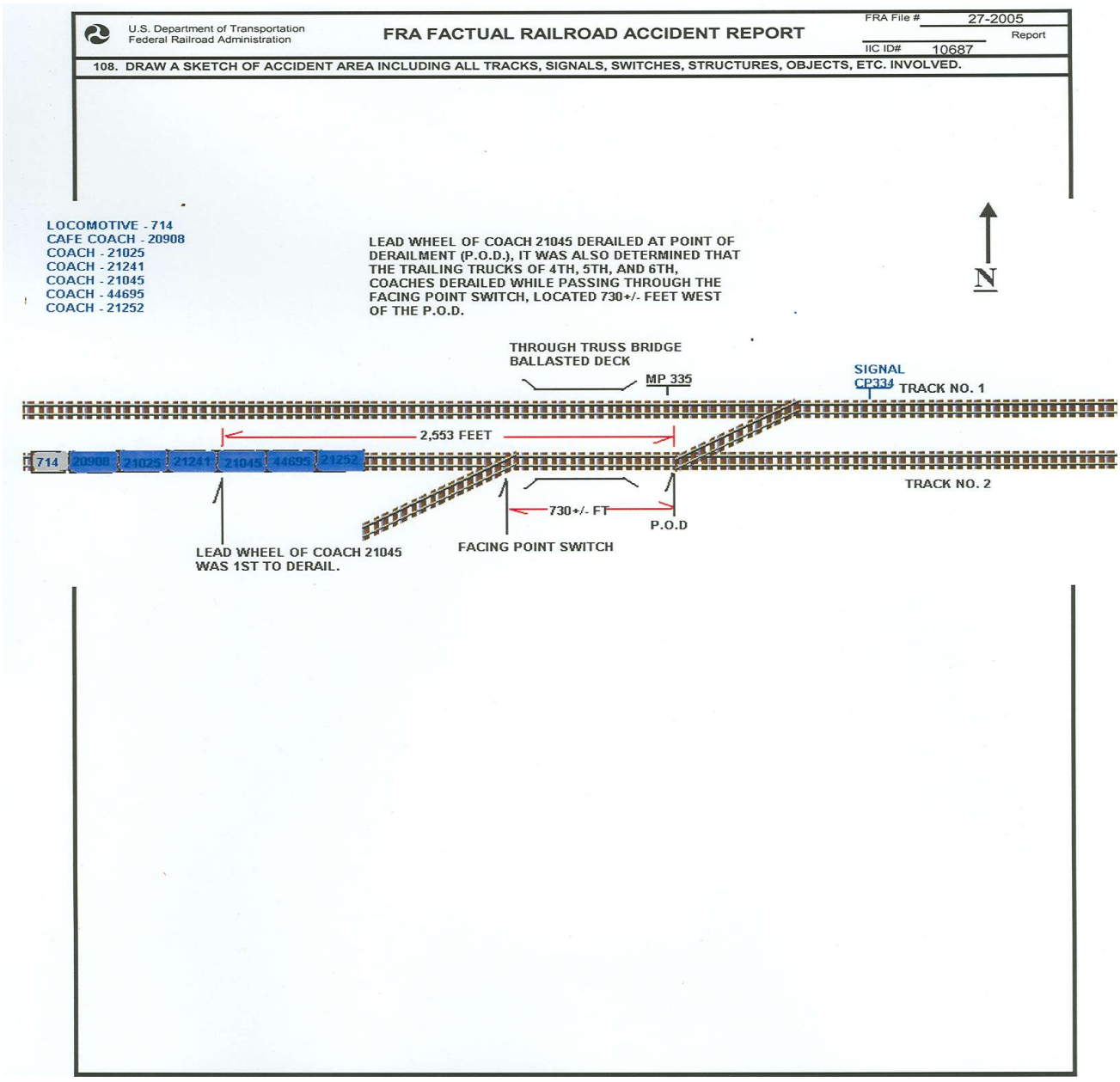
101. Casulties to Highway-Rail Crossing Users	Killed	Injured
	N/A	N/A

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): N/A
103. Total Number of Highway-Rail Crossing Users (include driver): N/A

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-27-2005.jpg



109. SYNOPSIS OF THE ACCIDENT

A westbound Amtrak (ATK) passenger train derailed one occupied and two empty passenger coaches on CSX Transportation's (CSX) Albany Division on Sunday, April 3, 2005, at 6:20 p.m., eastern standard time (EST). The accident occurred in Lyons, New York, at CSX Milepost 334.9, on the Rochester Subdivision, Main Track No.2.

There were no injuries to the passengers or to the train crew. The equipment damage is estimated at $90,000. Track damage is estimated at $40,000.

At the time of the accident, it was dusk. There were heavy winds and rain. The temperature was 36 F.
The accident was caused by a bolt hole crack breakout in the insert rail at the heel of an RBM frog casting. An RBM (Rail bound Manganese) frog is one consisting essentially of a manganese steel body casting fitted into and between rolled rails and held together with bolts. This was a standard RBM frog that is in service throughout CSX.

110. NARRATIVE

The following information was obtained from an investigation that was conducted by the Federal Railroad Administration.

Circumstances Prior to the Accident

The crew of ATK 287 West included a locomotive engineer, a conductor, and an assistant conductor. The conductor and assistant conductor went on duty at 11 :30 a.m., EST, on April 3, 2005 at the A TK Station in Rensselaer, NY. This was the home terminal for the conductor and the assistant conductor, and they received more than the statutory off duty period prior to reporting for duty.

The engineer went on duty at 7:30 am, EST, April 3, 2005, at the ATK Station in Niagara Falls, NY. This was the home terminal for the engineer, and he received more than the statutory off duty period prior to reporting for duty. On April 3, the engineer began his tour as the engineer on train ATK 282 East from Niagara Falls, NY to Syracuse, NY. He went off duty at 11 :40 a.m. at Syracuse, which qualifies as a designated terminal, where he received a 4-hour rest period. The engineer went back on duty at 3:40 p.m. as the engineer on train ATK 287 West.

Locomotive engineers with a home terminal in Rensselaer, NY operate trains between Rensselaer, NY and Syracuse, NY. Locomotive engineers with a home terminal in Niagara Falls, NY operate trains between Niagara Falls, NY and Syracuse, NY.

ATK 287 West passenger train consisted of (from west to east) one locomotive (714), one loaded cafe lounge coach (20908), three loaded passenger coaches (21025, 21241, and 21045), and two empty passenger coaches (44695 and 21252). The train crew was scheduled to operate to Niagara Falls with passengers boarding and de-boarding at three locations en-route. The train departed the A TK Station at Syracuse at 5:39 p.m. with 102 passengers.

As the westbound passenger train approached the accident area, the locomotive engineer was seated at the controls on the north side of the locomotive. The conductor and the assistant conductor were seated in the rear of the cafe coach.

The engineer had an unobstructed view of the east absolute signal at the interlocking at CP 334 and CP 335 and reported a clear signal indication at both locations. The conductor acknowledged the reported signal indications.

In this area of the railroad there is, in succession, a 1-degree 30-minute curve to the right of about 2,640 feet, followed by an interlocking (CP 334) with a trailing point crossover switch about 200 feet west of the curve, a ballasted deck Through Truss Bridge, and a facing point left-hand switch on tangent track. The tangent is about 45 feet in length. There is a .05 percent ascending grade.

The railroad timetable direction of the train was west. The geographical direction was west. Timetable directions are used throughout this report.

The Accident

Approaching the accident and at the time of the accident, A TK Train 287 was being operated at 69 mph. The speed was recorded by the event recorder on the controlling locomotive. The maximum authorized speed for passenger trains is 70 mph, as designated in the current CSX Timetable No.4, effective November 1, 2004.

The train was moving west on CSX's Rochester Subdivision, Main Track No.2, through the interlocking limits of CP 334, at Milepost 334.9. The train was moving over a NO.15 trailing point crossover switch, a Through Truss Bridge with a ballasted deck, and a No.15 left-hand facing point switch, when the locomotive engineer

noticed the train beginning to slow. He looked at the control panel and took no exception to the information displayed and then looked into the mirror and noticed dust, smoke, and ballast coming from under the north side of the train. The locomotive engineer made a full service reduction in an attempt to bring the train to a stop, when an emergency application of the train brakes occurred. The train was traveling at about 53 mph when the emergency application of the brakes occurred.

After the train came to a stop, the locomotive engineer stayed on the locomotive to establish radio communications by sending an emergency transmission. CSX's Rochester Subdivision Train Dispatcher acknowledged the emergency transmission.

The conductor dismounted the train to make an inspection of the train and found the 4th, 5th, and the 6th passenger coaches derailed and resting in an upright position. The 4th passenger coach was occupied, the 5th and 6th passenger coaches was not occupied. Passengers on the derailed coach were moved to the coaches that had not derailed.

The conductor and the assistant conductor surveyed the passengers to determine if anyone was injured and if medical attention was required. There was no injuries reported by the passengers or the train crew.
Eventually passengers was transferred from train ATK 287 West onto train ATK 283 West, which departed the derailment area at about 9:37 p.m.

Main Track NO.1 was not damaged or fouled by the derailed equipment.

Analysis and Conclusions

Analysis

The locomotive was equipped with a speed indicator and an event recorder as required. The event recorder data was downloaded by an ATK Road Foreman of Engines and an A TK General Foreman from Niagara Falls, NY. The train crew was interviewed by ATK and CSX officials. No exception was taken to the operation of the train.

The train crew was not tested for Alcohol and Drug use.

The locomotive and passenger coaches were inspected by representatives from A TK and CSX's Mechanical Department. Inspection of the train disclosed that the damages to the derailed equipment were a result of the accident and did not cause or contribute to the accident.

An inspection was conducted of the CSX Track Inspection Records, Automated Track Geometry Inspection Records, and the Internal Rail Inspection Records. Track Inspection Records disclosed the last inspection was made on April 1, 2005. The inspection of Main Track No.2 was made from a hi-rail vehicle traversing Main Track No.2. There were no exceptions noted on the inspection record. CSX's TGC-2 Automated Track Inspection Train made an automated track inspection of Main Track No.2 on November 2, 2004. There were no exceptions noted in the area of the accident. CSX employs a contractor to make internal inspections of the rail. The last internal rail inspection of Main Track No.2 was completed on March 1, 2005. The internal rail inspection records disclosed no exceptions to the rails in area of the accident.

The train accident investigation committee determined the lead wheel of the 4th car was the first to derail. Inspection of the rail and ties disclosed the marks on the rail and ties extended from the point of derailment (POD) to a point where the lead wheel of the 4th car came to a rest about 2,553 feet west of the POD. The wheel marks on the rail and ties extended from the heel of the frog to the point where the lead wheel of the 4th car came to a rest. It was also determined the trailing truck of the 4th passenger coach and the 5th and 6th passenger coaches derailed while moving through the facing point switch located about 730 feet west of the POD.

An inspection of the main track and turnouts was conducted by representatives from A TK and CSX's Engineering Department. These inspections disclosed a 9 3/4 inch bolt hole crack breakout in the insert rail at the heel of the frog casting in the No.15 trailing point crossover switch. The bolt hole crack extended longitudinally through three bolt holes and then up through the rail head. Wheel marks found on the frog and the piece of the broken rail indicated the piece of rail raised up and fouled the flange way of the frog. The marks on the piece of rail disclosed a wheel flange rode up and over the piece of rail. A short mark from a wheel flange was found on the opposite rail indicating a wheel crossed from the gage side to the field side of the rail.

A TK and CSX determined the probable cause of the accident as a bolt hole crack breakout in the rail head at the heel of the frog. FRA also conducted a visual inspection of the accident site, track inspection records, automated track inspection records, train accident track notes, and the internal rail inspection records and concurred with the results of the A TK/CSX investigation.

Conclusions

The investigation disclosed the 9 3/4 inch piece of the bolt hole crack breakout in the insert rail lifted up and obstructed the path of the wheel flange in the frog. The lead wheel on the lead truck of the 4th passenger coach derailed when the wheel struckJ climbed over the broken rail. The wheel then crossed over the gage side of the wrap rail around the frog casting. Wheel marks on the opposite rail revealed the location where a wheel crossed from the gage side to the field side of the south rail. There were wheel marks on the rail and ties extending .from the heel of the frog (POD) in a west direction about 2,553 feet to the location where the lead wheel of the 4th passenger coach rested. There were wheel marks extending west from the facing point switch on Main Track No.2 to the locations where the trailing end of the 4th coach, and the wheels on the 5th and 6th passenger coaches came to rest.

Probable Cause & Contributing Factors

The FRA determined that the accident was caused by a bolt hole crack breakout in the insert rail at the heel of an RBM frog casting. An RBM (Railbound Manganese) frog is one consisting essentially of a manganese steel body casting fitted into and between rolled rails and held together with bolts. This was a standard RBM frog that is in service throughout CSX.