



***Federal Railroad Administration
Office of Safety
Headquarters Assigned
Accident Investigation Report
HQ-2012-05***

***Amtrak (ATK)
Grass Lake, MI
February 1, 2012***

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.

1. Name of Railroad Operating Train #1 Amtrak [ATK]		1a. Alphabetic Code ATK		1b. Railroad Accident/Incident No. 122696			
2. Name of Railroad Operating Train #2 N/A		2a. Alphabetic Code N/A		2b. Railroad Accident/Incident No. N/A			
3. Name of Railroad Operating Train #3 N/A		3a. Alphabetic Code N/A		3b. Railroad Accident/Incident No. N/A			
4. Name of Railroad Responsible for Track Maintenance: Norfolk Southern Corp. [NS]		4a. Alphabetic Code NS		4b. Railroad Accident/Incident No. 09788			
5. U.S. DOT_AAR Grade Crossing Identification Number 545271M		6. Date of Accident/Incident Month 02 Day 01 Year 2012		7. Time of Accident/Incident 08:19: <input checked="" type="checkbox"/> AM <input type="checkbox"/> PM			
8. Type of Accident/Incident (single entry in code box)							
1. Derailment		4. Side collision		7. Hwy-rail crossing			
2. Head on collision		5. Raking collision		10. Explosion-detonation			
3. Rear end collision		6. Broken Train collision		11. Fire/violent rupture			
		9. Obstruction		12. Other impacts			
				13. Other (describe in narrative) Code 07			
9. Cars Carrying HAZMAT 0		10. HAZMAT Cars Damaged/Derailed N/A		11. Cars Releasing HAZMAT N/A			
				12. People Evacuated 0			
				13. Division Dearborn			
14. Nearest City/Town Grass Lake		15. Milepost (to nearest tenth) 68.2		16. State Abbr Code MI 26			
				17. County JACKSON			
18. Temperature (F) (specify if minus) 37 F		19. Visibility (single entry) Code 1. Dawn 3. Dusk 2. Day 4. Dark 2		20. Weather (single entry) Code 1. Clear 3. Rain 5. Sleet 2. Cloudy 4. Fog 6. Snow 1			
				21. Type of Track Code 1. Main 3. Siding 2. Yard 4. Industry 1			
22. Track Name/Number Single Main Track		23. FRA Track Code Class (1-9, X) 4		24. Annual Track Density (gross tons in millions) 3			
				25. Time Table Direction Code 1. North 3. East 2. South 4. West 4			
OPERATING TRAIN #1							
26. Type of Equipment Consist (single entry)							
1. Freight train		4. Work train		7. Yard/switching			
2. Passenger train		5. Single car		8. Light loco(s).			
3. Commuter train		6. Cut of cars		9. Maint./inspect.car			
				A. Spec. MoW Equip. Code 2			
				27. Was Equipment Attended? Code 1. Yes 2. No 1			
				28. Train Number/Symbol ATK 351			
29. Speed (recorded speed, if available) Code R - Recorded E - Estimated 60 MPH R		31. Method(s) of Operation (enter code(s) that apply)			31a. Remotely Controlled Locomotive?		
		a. ATCS g. Automatic block m. Special instructions b. Auto train control h. Current of traffic n. Other than main track c. Auto train stop i. Time table/train orders o. Positive train control d. Cab j. Track warrant control p. Other (Specify in narrative) Code(s) e. Traffic k. Direct traffic control f. Interlocking l. Yard limits			0 = Not a remotely controlled 1 = Remote control portable 2 = Remote control tower 3 = Remote control transmitter - more than one remote control transmitter 0		
30. Trailing Tons (gross tonnage, excluding power units) N/A		e N/A N/A N/A N/A					
32. Principal Car/Unit		a. Initial and Number	b. Position in Train	c. Loaded (yes/no)	33. If railroad employee(s) tested for drug/alcohol use, enter the number that were positive in the appropriate box.		
(1) First involved (derailed, struck, etc)		ATK 128	1	N/A	Alcohol Drugs N/A N/A		
(2) Causing (if mechanical cause reported)		0	0	N/A	34. Was this consist transporting passengers? (Y/N) Y		
35. Locomotive Units		a. Head End	Mid Train		Rear End	36. Cars	
		b. Manual	c. Remote	d. Manual	c. Remote	a. Freight b. Pass. c. Freight d. Pass. e. Caboose	
(1) Total in Train		1	0	0	1	0	
(2) Total Derailed		1	0	0	0	0	
37. Equipment Damage		38. Track, Signal, Way, & Structure Damage		39. Primary Cause Code		40. Contributing Cause Code	
This Consist \$3,000,000.00		\$37,000.00		M304		N/A	
Number of Crew Members				Length of Time on Duty			
41. Engineer/Operators 1		42. Firemen 0		43. Conductors 1		44. Brakemen 2	
				45. Engineer/Operator Hrs 2 Mi 59		46. Conductor Hrs 2 Mi 59	
Casualties to:		47. Railroad Employees		48. Train Passengers		49. Other	
Fatal		0		0		0	
Nonfatal		3		6		1	
				50. EOT Device? 1. Yes 2. No 2		51. Was EOT Device Properly Armed? 1. Yes 2. No N/A	
				52. Caboose Occupied by Crew? 1. Yes 2. No		N/A	
OPERATING TRAIN #2							
53. Type of Equipment Consist (single entry)						54. Was Equipment Attended? Code	
1. Freight train		4. Work train		7. Yard/switching		A. Spec. MoW Equip. Code	
2. Passenger train		5. Single car		8. Light loco(s).		1. Yes 2. No N/A	
3. Commuter train		6. Cut of cars		9. Maint./inspect.car		N/A	
56. Speed (recorded speed, if available) Code R - Recorded E - Estimated N/A MPH N/A		58. Method(s) of Operation (enter code(s) that apply)			58a. Remotely Controlled Locomotive?		
		a. ATCS g. Automatic block m. Special instructions b. Auto train control h. Current of traffic n. Other than main track			0 = Not a remotely controlled 1 = Remote control portable		

57. 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)	2 = Remote control tower 3 = Remote control transmitter - more than one remote control transmitter
				N/A N/A N/A N/A N/A	N/A

59. Principal Car/Unit	a. Initial and Number	b. Position in Train	c. Loaded(yes/no)	60. If railroad employee(s) tested for drug/alcohol use, enter the number that were positive in the appropriate box.	Alcohol N/A	Drugs N/A
(1) First involved (derailed, struck, etc)	N/A	N/A	N/A			
(2) Causing (if mechanical cause reported)	N/A	N/A	N/A	61. Was this consist transporting passengers? (Y/N)		N/A

62. Locomotive Units	a. Head End	Mid Train b. Manual c. Remote	Rear End d. Manual c. Remote	63. Cars	Loaded a. Freight b. Pass.	Empty c. Freight d. Pass.	e. Caboose
(1) Total in Train	N/A	N/A N/A	N/A N/A	(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	(2) Total Derailed	N/A N/A	N/A N/A	N/A

64. Equipment Damage This Consist	N/A	65. Track, Signal, Way, & Structure Damage	N/A	66. Primary Cause Code	N/A	67. Contributing Cause Code	N/A
Number of Crew Members				Length of Time on Duty			

68. Engineer/Operators	69. Firemen	70. Conductors	71. Brakemen	72. Engineer/Operator	73. Conductor
N/A	N/A	N/A	N/A	Hrs N/A Mi N/A	Hrs N/A Mi N/A
Casualties to:	74. Railroad Employees	75. Train Passengers	76. Other	77. EOT Device?	78. Was EOT Device Properly Armed?
Fatal	N/A	N/A	N/A	1. Yes 2. No N/A	1. Yes 2. No N/A
Nonfatal	N/A	N/A	N/A	79. Caboose Occupied by Crew?	
				1. Yes 2. No	N/A

OPERATING TRAIN #3

80. 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	81. Was Equipment Attended?	82. Train Number/Symbol
				N/A	1. Yes 2. No N/A	N/A

83. Speed (recorded speed, if available)	R - Recorded E - Estimated	Code N/A MPH 0	85. Method(s) of Operation (enter code(s) that apply)	85a. Remotely Controlled Locomotive?
84. Trailing Tons (gross tonnage, excluding power units)	N/A		a. ATCS b. Auto train control c. Auto train stop d. Cab e. Traffic f. Interlocking	0 = Not a remotely controlled 1 = Remote control portable 2 = Remote control tower 3 = Remote control transmitter - more than one remote control transmitter
			g. Automatic block h. Current of traffic i. Time table/train orders j. Track warrant control k. Direct traffic control l. Yard limits	N/A
			m. Special instructions n. Other than main track o. Positive train control p. Other (Specify in narrative) Code(s)	N/A

86. Principal Car/Unit	a. Initial and Number	b. Position in Train	c. Loaded(yes/no)	87. If railroad employee(s) tested for drug/alcohol use, enter the number that were positive in the appropriate box.	Alcohol N/A	Drugs N/A
(1) First involved (derailed, struck, etc)	0	0	N/A			
(2) Causing (if mechanical cause reported)	0	0	N/A	88. Was this consist transporting passengers? (Y/N)		N/A

89. Locomotive Units	a. Head End	Mid Train b. Manual c. Remote	Rear End d. Manual c. Remote	90. Cars	Loaded a. Freight b. Pass.	Empty c. Freight d. Pass.	e. Caboose
(1) Total in Train	0	0 0	0 0	(1) Total in Equipment Consist	0 0	0 0	0
(2) Total Derailed	0	0 0	0 0	(2) Total Derailed	0 0	0 0	0

91. Equipment Damage This Consist	\$0.00	92. Track, Signal, Way, & Structure Damage	\$0.00	93. Primary Cause Code	N/A	94. Contributing Cause Code	N/A
Number of Crew Members				Length of Time on Duty			

95. Engineer/Operators	96. Firemen	97. Conductors	98. Brakemen	99. Engineer/Operator	100. Conductor
0	0	0	0	Hrs 0 Mi 0	Hrs 0 Mi 0
Casualties to:	101. Railroad Employees	102. Train	103. Other	104. EOT	105. Was EOT Device Properly
Fatal	0	0	0	1. Yes 2. No N/A	1. Yes 2. No N/A
Nonfatal	0	0	0	106. Caboose Occupied by Crew?	
				1. Yes 2. No	N/A

Highway User Involved				Rail Equipment Involved				
107. C. Truck-Trailer A. Auto B. Truck	F. Bus D. Pick-Up Truck E. Van	J. Other Motor Vehicle G. School Bus H. Motorcycle	K. Pedestrian M. Other (spec. in narrative)	Code C	111. 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 1
108. Vehicle Speed (est. MPH at impact)	N/A	109. geographical	Code 2	112. Position of Car Unit in	1			
		1. North 2. South 3. East 4. West						

110. Position 1. Stalled on Crossing 2. Stopped on Crossing 3. Moving Over Crossing 4. Trapped				Code 4	113. Circumstance 1. Rail Equipment Struck Highway User 2. Rail Equipment Struck by Highway User				Code 1				
114a. 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 4	114b. Was there a hazardous materials release 1. Highway User 2. Rail Equipment 3. Both 4. Neither				Code 4				
114c. State here the name and quantity of the hazardous materials released, if any. N/A													
115. Type Crossing 1. Gates 2. Cantilever FLS 3. Standard FLS 4. Wig Wags 5. Hwy. traffic signals 6. Audible Warning 7. Crossbucks 8. Stop signs 9. Watchman 10. Flagged by crew 11. Other (spec. in narr.) 12. None				Code 01	116. Signaled Crossing (See instructions for codes)				Code 01	117. Whistle Ban 1. Yes 2. No 3. Unknown		Code 2	
118. Location of Warning 1. Both Sides 2. Side of Vehicle Approach 3. Opposite Side of Vehicle Approach				Code 1	119. Crossing Warning with Highway Signals 1. Yes 2. No 3. Unknown				Code 2	120. Crossing Illuminated by Street Lights or Special Lights 1. Yes 2. No 3. Unknown			Code 2
121. Age 68		122. Driver's Gender 1. Male 2. Female		Code 1	123. Driver Drove Behind or in Front of and Struck or was Struck by Second Train 1. Yes 2. No 3. Unknown				Code 2	124. 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 4
125. Driver Passed Highway Vehicle 1. Yes 2. No 3. Unknown				Code 2	126. 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 8				
Casualties to:			Killed	Injured	127. Driver 1. Killed 2. Injured 3. Uninjured				Code 2	128. Was Driver in the Vehicle? 1. Yes 2. No			Code 1
129. Highway-Rail Crossing Users			0	1	130. Highway Vehicle Property Damage (est. dollar damage) 50000				131. Total Number of Highway-Rail Crossing Users (include driver) 1				
132. Locomotive Auxiliary Lights? 1. Yes 2. No				Code 1	133. Locomotive Auxiliary Lights Operational? 1. Yes 2. No				Code 1				
134. Locomotive Headlight Illuminated? 1. Yes 2. No				Code 1	135. Locomotive Audible Warning Sounded? 1. Yes 2. No				Code 1				

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

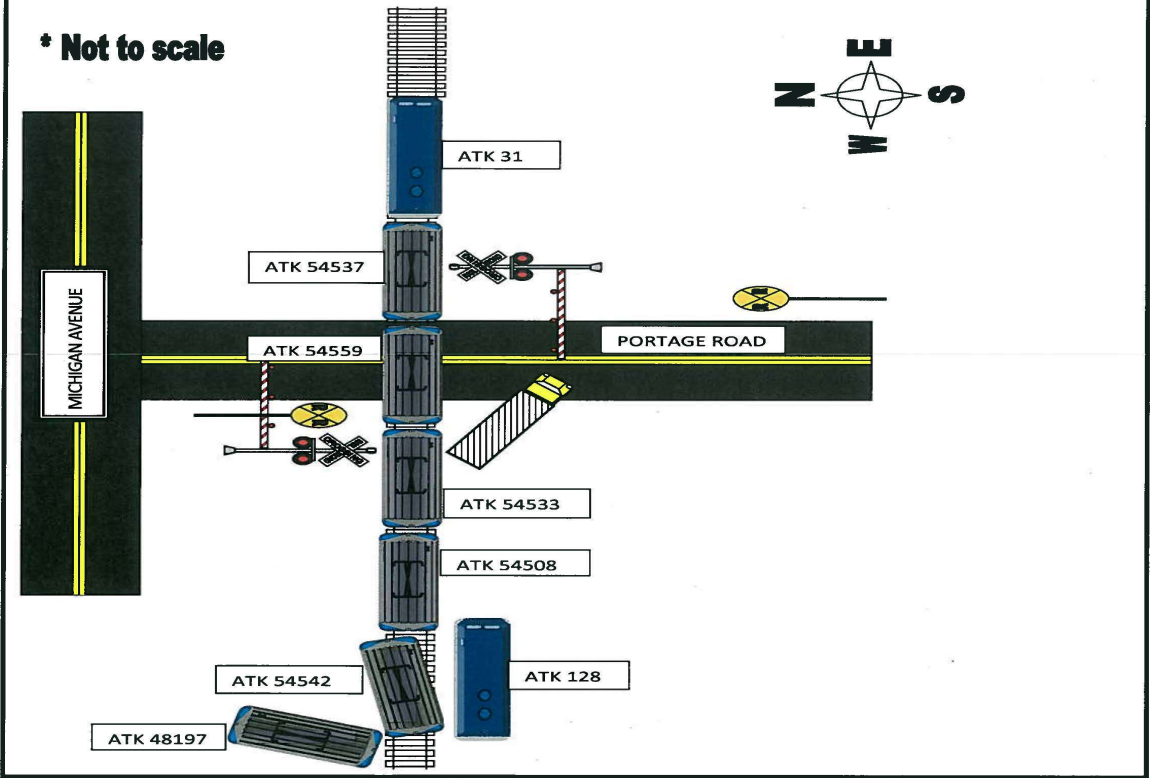
U.S. Department of Transportation Federal Railroad Administration	FRA FACTUAL RAILROAD ACCIDENT REPORT	FRA File #
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108. DRAW A SKETCH OF ACCIDENT AREA INCLUDING ALL TRACKS, SIGNALS, SWITCHES, STRUCTURES, OBJECTS, ETC. INVOLVED.

Click here to add a note about your sketch. If there is no sketch, please note it here. Click center of box below to add you sketch file.

AMTRAK #351 DERAILMENT 2-1-12 LEONI TWP NEAR GRASS LAKE, MI

*** Not to scale**



137. SYNOPSIS OF THE ACCIDENT

On February 1, 2012, at approximately 8:19 a.m., e.s.t., Amtrak Passenger Train No. 351 (Train 351) operating west collided with a tractor trailer that was on the tracks at a highway-rail grade crossing Portage Road, milepost 68.2. The lead locomotive, one lounge car, and one passenger car were derailed. The accident occurred in Leoni Township, Michigan, on the Norfolk Southern Corporation's (NS) Michigan Line, Dearborn Division's Single Main Track

The driver of the truck, three members of the crew, and six passengers sustained injuries and were transported to Allegiance Hospital in Jackson, Michigan. Amtrak estimates damage to their equipment to be approximately \$3 million. NS estimates damages of \$37,000 to signal and track. The tractor trailer was destroyed.

At the time of the accident it was partly cloudy, daylight, and the temperature was 37 °F.

The probable cause of the accident was the truck driver failed to ascertain that his vehicle could completely traverse the highway-rail grade crossing.

138. NARRATIVE

Circumstances Prior to the Accident

The crew of Train 351 included a locomotive engineer, a conductor, and two assistant conductors. All crew members went on duty at 5:20 a.m., e.s.t., February 1, 2012, at Pontiac, Michigan. Prior to reporting for duty the engineer was off duty 37 hours and 53 minutes; the conductor was off duty 13 hours and 30 minutes; one assistant conductor was off duty for 37 hours and 55 minutes; the other assistant conductor was off duty 13 hours and 31 minutes. Pontiac is the home terminal for all crew members.

Train 351 consisted of a lead locomotive ATK 128 followed by lounge car ATK 48197 and five passenger cars with trailing locomotive unit ATK 31.

Train 351, a westbound, originated in Pontiac, destined for Chicago, Illinois. The train received an initial terminal air brake test in Pontiac, at 1:30 a.m., on February 1, 2012. After a job briefing between the crew members, the train departed Pontiac at 6:05 a.m. The engineer performed a running air brake test without exception.

Train 351 stopped at five stations to pick up and drop off passengers between Pontiac and the accident location. At the time of the accident there were 68 passengers on board.

Approaching the accident location there is a 1-degree 7 minute curve to the right for .3 miles that includes Portage Road crossing. The track descends at .38 percent for .9 miles up to the accident location.

The maximum authorized speed for the Single Main Track for Train 351 at the location of the accident was 60 mph.

Highway Vehicle

The 68 year old driver of the tractor trailer was operating from north to south on Portage Road. The driver of

the truck was pulling a loaded low-boy trailer. The truck's trailer became stuck on the highway-rail/grade crossing at Portage Road, due to insufficient under carriage clearance.

The Accident

Train 351 was operating west on a clear signal at MH 67W at a recorded speed of 60 mph. The engineer stated he saw the tractor trailer on the crossing at Portage Road when he was approximately 800 feet east of Portage Road.

The engineer stated that he made an initial full service brake application of the train brakes, but then he realized the tractor trailer was not going to clear the crossing. He then made an emergency brake application of the train brakes and braced himself against the brakeman's seat while sounding the horn and ringing the bell.

Train 351 struck the trailer at approximately 47 mph. Locomotive ATK 128 derailed after impact with the trailer and came to rest approximately 240 feet west of the crossing and on the south side of the track, and laying on the right side. The trailer came to rest approximately 220 feet west of the crossing and on the south side of the track.

The locomotive engineer stated that after the train came to a stop, he was trapped inside the locomotive for approximately 15 minutes. He communicated with the NS Dearborn Division Dispatcher and the conductor of the train via the radio. The engineer was extricated from the locomotive by emergency responders. The locomotive engineer was subsequently transferred via emergency responders to Jackson Allegiance hospital.

The driver of the tractor trailer said reported to the police officer that when he saw Portage Road and thought he would be able to clear the crossing. The driver sustained injuries and was transported to Allegiance Hospital in Jackson by emergency responders.

The driver of the tractor trailer was cited for Michigan Motor code statue 257.669a(3)

Analysis and Conclusion

Analysis: Fatigue analysis

FRA uses an overall effectiveness rate of 77.5 percent as the baseline for fatigue analysis, which is equivalent to blood alcohol content (BAC) of 0.05. At or above this baseline, we do not consider fatigue as probable for any employee. Software sleep settings vary according to information obtained from each employee. If an employee does not provide sleep information, FRA uses the default software settings.

FRA obtained fatigue related information, for the ten-day period preceding this incident including the 10-day work history for all the employees involved. The employees were the locomotive engineer and the conductor of Train 351.

Conclusion:

Fatigue was not evident for any of the crew members.

Analysis: Toxicological testing

This accident did not meet the criteria for 49 CFR Part 219 Subpart C Post Accident Toxicological Testing. Amtrak elected not to test under their post accident toxicological testing authority, since it also failed to meet their prescribed testing criteria.

Conclusion: Toxicological testing was not performed on the crew of Train 351.

Analysis: Motive power and equipment

Conclusion:

The lead locomotive was equipped with a headlight, ditch lights, a bell, and horn. The engineer stated that all of the locomotive safety devices were working properly prior to departing Pontiac.

Analysis: Locomotive engineer operational performance

FRA and Amtrak analyzed the data from the event recorder from lead locomotive ATK 128.

Conclusion:

Neither FRA or Amtrak took exceptions with the operating performance of the locomotive engineer.

Analysis: Active warning devices

The Portage Road highway-rail crossing at grade is equipped with gates, warning lights and bells. There is an advance warning sign posted on the North side of the crossing within 150 feet of the crossing. There are also pavement markings which are clearly distinguishable within 100 feet of the crossing.

The Portage Road crossing active warning device was tested and found to be working properly. The north side active warning device was totally destroyed during the derailment. A FRA signal inspector inspected the signal records for Portage Road crossing dating back one year from the date of the accident and found no exceptions.

The truck driver and the locomotive engineer told a police officer who responded to the accident, that the warning devices were activated prior to the accident.

Conclusion:

Active warning devices were not a cause of the accident.

Probable Cause & Contributing Factors

The probable cause of the accident was that the truck driver failed to ascertain that his vehicle could completely traverse the highway-rail grade crossing.

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