



NATIONAL TRANSPORTATION SAFETY BOARD

OFFICE OF RAILROAD, PIPELINE AND HAZARDOUS

MATERIALS INVESTIGATIONS

WASHINGTON, D. C. 20594

Track & Power Group Factual Addendum Report

Location: Commerce Street Grade Crossing on the Metro-North Harlem Line,
Valhalla, Westchester County, New York

Vehicle #1: 2011 Mercedes ML350

Vehicle #2: Metro-North passenger train 659

Operator #2: Metro-North Railroad

Date: February 3, 2015

Time: Approximately 06:26 p.m. EST

NTSB #: **DCA15MR006**

Configuration and Physical Characteristics of Railroads with 3rd Rail

A questionnaire was sent to the following railroad systems engineering departments in order to have a better understanding of their 3rd rail configuration properties and the railroad's physical characteristics:

- Long Island Railroad (LIRR)
- National Railroad Passenger Corporation (Amtrak)
- Port Authority of New York & New Jersey (PATH)
- Southeastern Pennsylvania Transportation Authority (SEPTA)

It should be noted, that besides the Metro-North Railroad, these four other railway systems are the only ones in this country that use a 3rd rail for electricity transmission to trains and are regulated by the Federal Railroad Administration.

LIRR:

1. 3rd rail centerline distance from the nearest running rail (gage face, field side, or centerline)
25 ¾ inches ± ¼ inch from the nearest running rail gage face
2. 3rd rail height above top of running rail
3 ½ inches ± ¼ inch
3. What is the weight and segment length of the 3rd rail
150 pounds per 3 feet of “H” beam rail and the segment length is 40 feet long
4. How are the 3rd rails joined together; as an example, 4-hole cast iron fish plates, welded, etc.
All new installations are huck-bolted through splice plates. These are permanent connections that must be cut off when removing.
5. Do train shoes contact the top or bottom of the 3rd rail
Top of shoe contacts bottom of 3rd rail
6. What is the 3rd rail protective cover material made of; as an example, plastic, fibered insulation material, non-flammable material, etc.
Fiberglass compound
7. Approximate miles of 3rd rail territory
328 miles
8. Approximate number of grade crossings in the 3rd rail territory
Approximately 90 crossings
9. In the last 5 years, how many grade crossing collisions occurred in 3rd rail territory
January 1, 2011 to present we had 43 grade crossing incidents in electrified territory.
10. During these grade crossing collisions, has a vehicle ever been shoved into the 3rd rail; and if so, did the 3rd rail penetrate the vehicle or rail car or just broke off the supporting brackets

The LIRR have had numerous instances of vehicles being hit at grade crossings, and had several car fires caused by impact. The LIRR never had an instance of 3rd rail penetrating a vehicle; typically the 3rd rail will be knocked off of the insulators.

Amtrak:

1. 3rd rail centerline distance from the nearest running rail (gage face, field side, or centerline)
26 ½ inches from the nearest running rail gage face
2. 3rd rail height above top of running rail
12 inches
3. What is the weight and segment length of the 3rd rail
Rail weight is 105 pounds per 3 feet of rail, and each segment is 39 feet long
4. How are the 3rd rails joined together; as an example, 4-hole cast iron fish plates, welded, etc.
Four-hole splice bars
5. Do train shoes contact the top or bottom of the 3rd rail
Top of Rail
6. What is the 3rd rail protective cover material made of; as an example, plastic, fibered insulation material, non-flammable material, etc.
Non-Flammable Fiberglass
7. Approximate miles of 3rd rail territory
27 total miles of 3rd rail, including Penn Station NY, 7 Tunnels, and SS Yard
8. Approximate number of grade crossings in the 3rd rail territory
There are no public at grade crossings. We have private crossings for railroad use only on the Empire Line and in SS Yard
9. In the last 5 years, how many grade crossing collisions occurred in 3rd rail territory
None
10. During these grade crossing collisions, has a vehicle ever been shoved into the 3rd rail; and if so, did the 3rd rail penetrate the vehicle or rail car or just broke off the supporting brackets
N/A

PATH

1. 3rd rail centerline distance from the nearest running rail (gage face, field side, or centerline)

Gauge face of third rail to gauge face of running rail is 26 inches

2. 3rd rail height above top of running rail
4.5 inches
3. What is the weight and segment length of the 3rd rail
PATH uses 75 pound umbrella rail in some of the tunnels, and are upgrading to 84 pound composite rail. Still have a lot of 150 pound rail throughout the system. The rail lengths are 39 feet long.
4. How are the 3rd rails joined together; as an example, 4-hole cast iron fish plates, welded, etc.
Some are welded. Some have fish plates. The 84 pound composite rail has aluminum joint bars.
5. Do train shoes contact the top or bottom of the 3rd rail
Shoes contact the top of the rail.
6. What is the 3rd rail protective cover material made of; as an example, plastic, fibered insulation material, non-flammable material, etc.
Mostly fiberglass board, and some still wooden.
7. Approximate miles of 3rd rail territory
All track is third rail territory. Approximately 47 miles mainline and yards.
8. Approximate number of grade crossings in the 3rd rail territory
There is one grade crossing.
9. In the last 5 years, how many grade crossing collisions occurred in 3rd rail territory
There was one collision.
10. During these grade crossing collisions, has a vehicle ever been shoved into the 3rd rail; and if so, did the 3rd rail penetrate the vehicle or rail car or just broke off the supporting brackets
Yes, the vehicle was shoved into the third rail. Knocked the third rail off of the insulators

SEPTA

1. 3rd rail centerline distance from the nearest running rail (gage face, field side, or centerline)
On the Broad Street Subway (BSS), Market Frankford Subway Elevated (MFSE) and Norristown High Speed Line (NHSL) the running rail gage face to the 3rd rail gage face is 26 inches

2. 3rd rail height above top of running rail
On the BSS and NHSL = 3-1/2 inches and MFSE = 6 inches
3. What is the weight and segment length of the 3rd rail
150lbs per 3 feet of rail and are in 39 foot lengths that are welded into CWR
4. How are the 3rd rails joined together; as an example, 4 hole cast iron fish plates, welded, etc.
SEPTA has many variations. Predominantly CWR with segments of 4-hole bolted territory and some 2-hole bolted territory.
5. Do train shoes contact the top or bottom of the 3rd rail
MFSE is under-running. BSS and NHSL are over-running.
6. What is the 3rd rail protective cover material made of; as an example, plastic, fibered insulation material, non-flammable material, etc.
Various; NHSL is fiberglass cover board, BSS is mostly wood cover board, and MFSE is covered with a snap-on plastic cover.
7. Approximate miles of 3rd rail territory
Approximately 96.6 miles (mainline and yard tracks combined)
8. Approximate number of grade crossings in the 3rd rail territory
None
9. In the last 5 years, how many grade crossing collisions occurred in 3rd rail territory
N/A
10. During these grade crossing collisions, has a vehicle ever been shoved into the 3rd rail; and if so, did the 3rd rail penetrate the vehicle or rail car or just broke off the supporting brackets
N/A