

# NATIONAL TRANSPORTATION SAFETY BOARD

Vehicle Recorder Division  
Washington, D.C. 20594

August 26, 2013

## Event Recorder

### Specialist's Factual Report

By Bill Tuccio

#### 1. EVENT SUMMARY

Location: New York, New York  
Date: July 18, 2013  
Operator: CSXT  
Train ID/Locomotive: CSXT Train Q 704/CSXT 8846  
NTSB Number: DCA13FR009

On July 18, 2013, at 08:29 p.m., northbound CSXT train Q 704, derailed at milepost 9.99 on the Metro-North Railroad Hudson Line. The train consisted of 2 locomotives and 24 modified flat cars. Each flat car carried 4 containers loaded with garbage. The train departed CSXT Oak Point Yard and was routed onto the Metro-North Railroad (MNCW) at Control Point (CP) 8.0 and derailed 72 feet 10 ¼ inches north of CP 10.

#### 2. EVENT RECORDER GROUP

An event recorder group was not convened.

#### 3. DETAILS OF RECORDER INVESTIGATION

The Quantum 1069 event recorder from the lead locomotive of CSXT Q704, CSXT 8846, was downloaded by CSX and the electronic file sent to the NTSB's Vehicle Recorder Division for evaluation.

##### 3.1. Event Recorder Recording Description and Wheel Sizes

For most event recorders, the actual speed and distance values are not recorded but rather the number of drive wheel rotations (or fraction thereof) is stored in memory. At the time the data is extracted, a wheel size is manually entered into the readout station or computer. Wheel size, number of rotations, and time are then used by the program to calculate distance traveled, where the derived distance traveled does not account for any wheel skidding or slipping that could have occurred. Then the calculated distance traveled and time data are used to calculate speed. On-scene investigators provided a wheel size of 37.75 inches for CSXT 8846.

Using the wheel size as provided by on-scene investigators, the event recorder data for CSXT 8846 were decoded using the Quantum Desktop Playback software. The decoded data has a sampling rate of one second. Therefore, the data has an accuracy of +/- 1 second.

### **3.1.1. Event Recorder Timing**

The times used in this report are expressed as eastern daylight time (EDT), based upon the time as recorded by the train video system<sup>1</sup>. The time at which CSXT 8846 came to a stop as recorded by the train video system was 20:29:16 EDT. The time at which CSXT 8846 came to a stop as recorded by the train event recorder was 20:11:26 EDT. Accordingly, 17 minutes and 50 seconds were added to train event recorder times to align with the time as recorded by the train video system.

### **3.1.2. Parameters**

Table A-1 lists the parameters from CSXT 8846's event recorder that were verified and provided in this report. Table A-2 contains the unit and discrete state abbreviations for the parameters.

#### **3.1.2.1. Distance Traveled and Speed**

The default output for the distance traveled is the distance increasing in time. The increasing distance was converted to decreasing distance by subtracting 2,348,592 feet from distance travelled. Therefore, the distance traveled began with a very large value and continually decreased to 0 feet when CSXT 8846 stopped after the derailment at the Spuyten Dival Station.

### **3.1.3. Plots and Corresponding Tabular Data**

Figure 1 and 2 contain CSXT 8846's event recorder parameters recorded during the July 18, 2013 event. Figure 1 covers approximately 15 minutes of data from 20:14:50 to 20:32:50 EDT. Figure 2 focuses on the derailment and covers the time period from 20:26:30 to 20:29:40 EDT.

Traction Motor Current shown on figures 1 and 2 contains a number of discrete spikes exceeding 900 amps. These spikes represent the receipt of signal information by CSXT 8846 that is recorded on the Traction Motor Current channel.

At 20:26:48 EDT, 3,008 feet before stopping after the derailment, CXST 8846 began to accelerate with increasing throttle positions until 20:27:23 EDT, when throttle positions began to decrease as the speed was about 15 mph.

At about 20:27:43 EDT, 2,111 feet before stopping after the derailment, CXST 8846 passed the southward home signal for CP 10 at a speed of about 18 mph.

At about 20:38:58 EDT, 197 feet before stopping after the derailment, the Traction Motor Current increased as the throttle increased to T3 and the speed decreased through 14 mph.

At 20:39:03 EDT, the Brake Pipe Pressure began to increase, followed shortly thereafter by an increase in the Independent Brake Pressure.

At 20:29:13 EDT, 5 feet before stopping after the derailment, the Pneumatic Control Switch (PCS) turned on as the speed was decreasing through 3 mph.

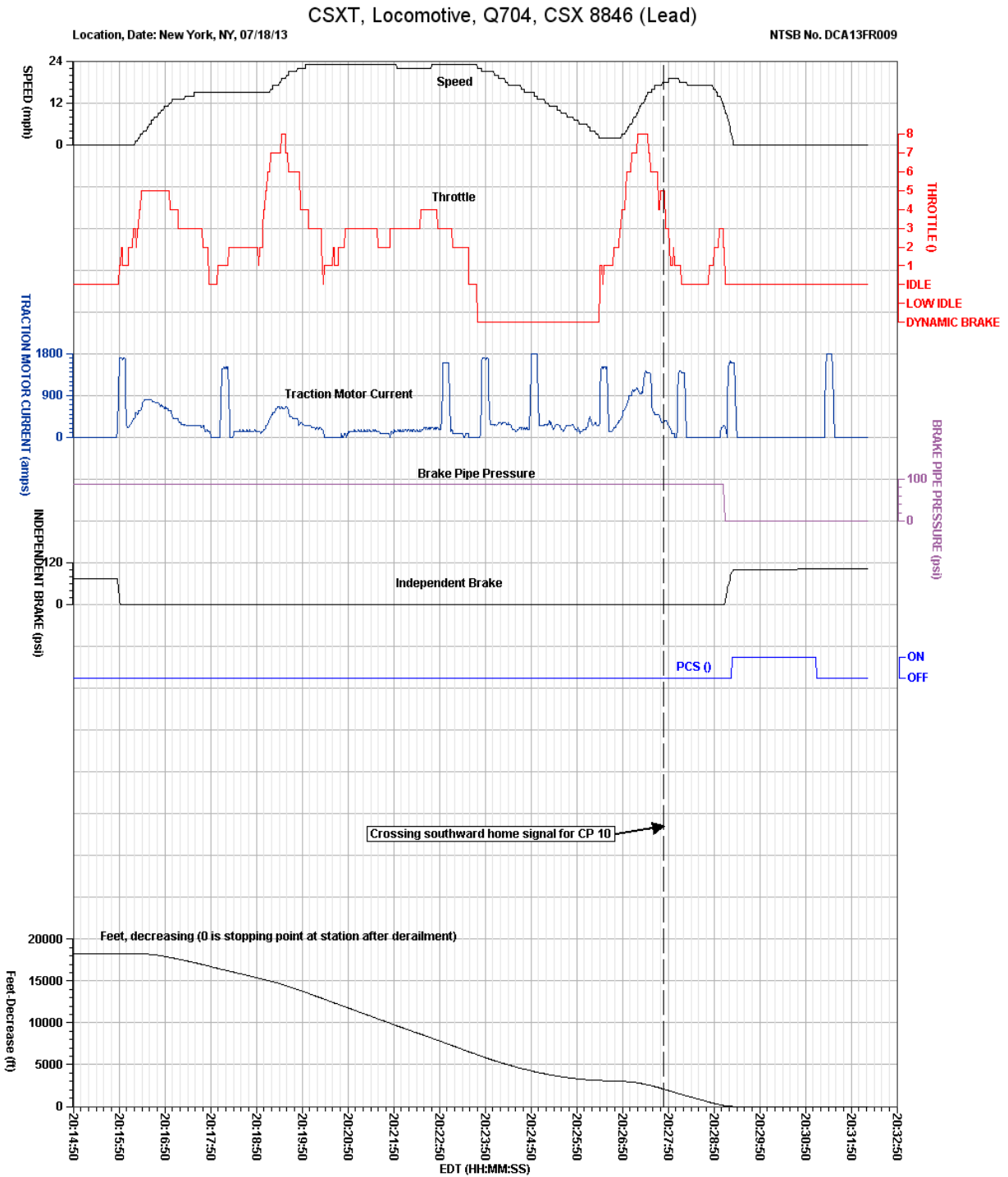
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<sup>1</sup> Refer to the National Transportation Safety Board's On-Board Video Recorder Factual Report.

CSXT 8846 came to a stop at 20:29:16 EDT.

All of the corresponding tabular data from CSXT 8846's event recorder used to create figures 1 and 2, are provided in electronic comma separated value (\*.csv) format as attachment 1 to this factual report.

**Figure 1: CSXT 8846 event recorder parameters – approximate 15-minute period.**

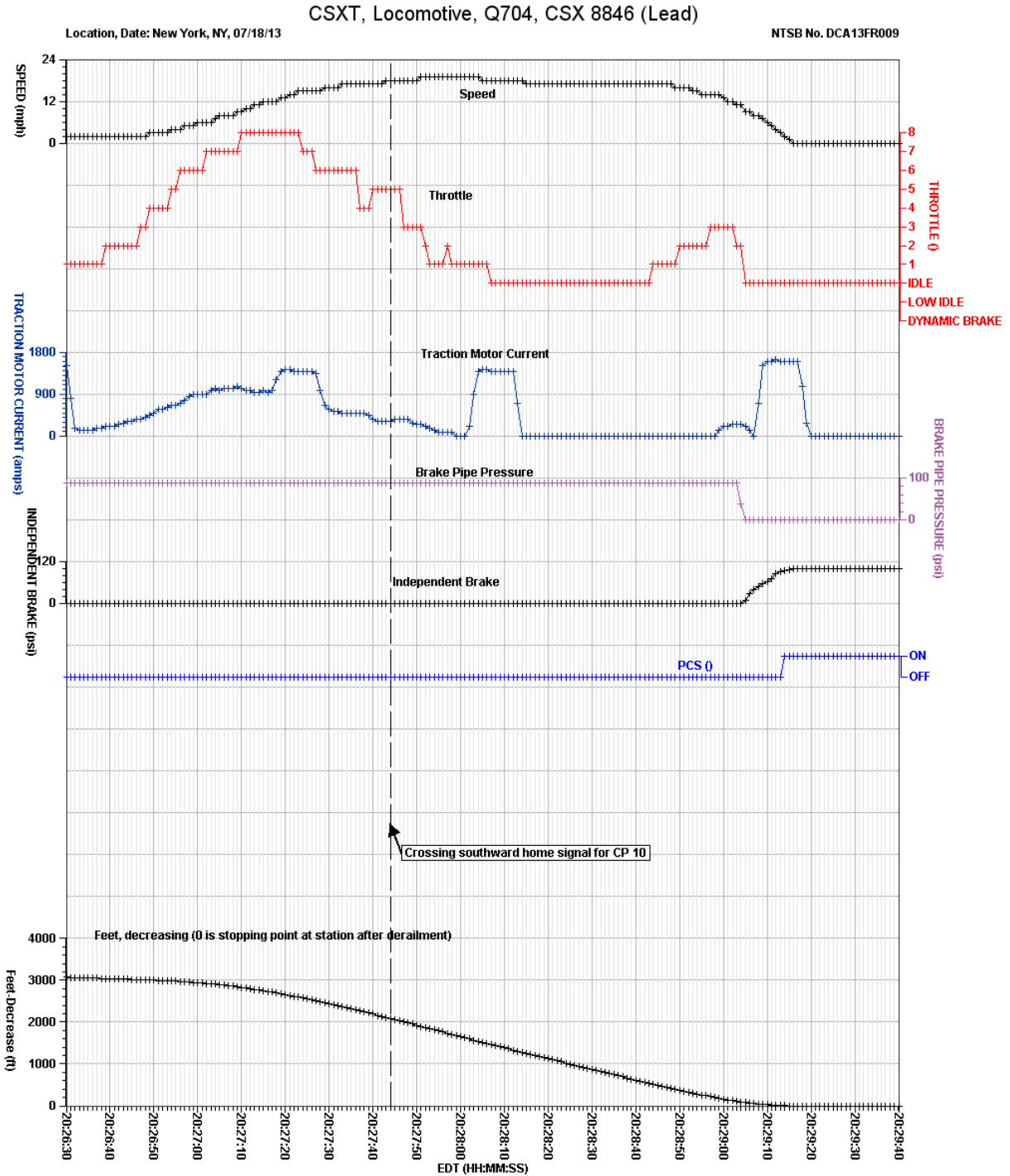


Revised: 13 August 2013

15-Minute Period Around Derailment

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**Figure 2: CSXT 8846 event recorder parameters – focus on time of derailment.**



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Focus on Derailment

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## APPENDIX A

This appendix describes the parameters provided and verified in this report. Table A-1 lists the parameters from CSXT 8846. Table A-2 describes the unit abbreviations.

**Table A-1. CSXT 8846 verified and provided event recorder parameters.**

Parameter Name	Parameter Description
1. Independent Brake (psi)	Independent Brake
2. Brake Pipe Pressure (psi)	Brake Pipe Pressure
3. PCS (discrete)	Pneumatic Control Switch
4. Speed (mph)	Speed
5. Throttle (discrete)	Throttle Position
6. Feet-Decrease (ft)	Decreasing Feet Travelled
7. Traction Motor Current (amps)	Traction Motor Current

**Table A-3. Unit and discrete state abbreviations.**

Unit and Discrete State Abbreviations	Description
discrete	discrete
ft	feet
amps	amps
mph	miles per hour
psi	pounds per square inch
1	Throttle 1
2	Throttle 2
3	Throttle 3
4	Throttle 4
5	Throttle 5
6	Throttle 6
7	Throttle 7
8	Throttle 8

NOTE: For parameters with a unit description of discrete, a discrete is typically a 1-bit parameter that is either a 0 state or a 1 state where each state is uniquely defined for each parameter.