

**NATIONAL TRANSPORTATION SAFETY BOARD**  
Vehicle Recorder Division  
Washington, D.C. 20594

September 1, 2021

## **Locomotive Event Recorders**

### **Specialist's Factual Report By Cassandra Johnson**

#### **1. EVENT SUMMARY**

Location: La Mirada, CA  
Date: March 3, 2021  
Company: BNSF Railway  
Train ID: BARLAC103A  
Locomotives: BNSF 8156 (lead), BNSF 7226 (3<sup>rd</sup>), BNSF 7760 (near end of train)  
NTSB Number: RRD21FR008

#### **2. LOCOMOTIVE EVENT RECORDER GROUP**

A locomotive event recorder group was not convened.

#### **3. DETAILS OF RECORDER INVESTIGATION**

The National Transportation Safety Board (NTSB) Vehicle Recorder Division received event recorder files from BNSF 8156, BNSF 7226, and BNSF 7760.

##### **3.1. Locomotive Event Recorder Recording Description**

The wheel size for each locomotive was embedded in the event recorder data as entered by the operator. Using the wheel sizes of 41.75 inches for BNSF 8156, 39.50 inches for BNSF 7226, and 40.50 inches for BNSF 7760, the recorder data were extracted using the PowerView Playback Software. This software outputted the locomotive event recorder parameters including distance and speed. The exported data have a sampling rate of one second; therefore, the data have an accuracy of +/- 1 second. Only data relevant to this event are provided in this report.

##### **3.2. Parameters**

Table A-1 lists the parameters verified and provided in this report for BNSF 8156. Additionally, table A-2 contains the unit and discrete state abbreviations for the parameters.

###### **3.2.1. Distance Traveled**

The default output for the distance traveled is the distance decreasing in time. Therefore, the distance traveled began with a very large value and continually decreased to 0 feet.

##### **3.3. Event Recorder Timing**

The recorded times from BNSF 8156's locomotive event recorder data file are independently time stamped and, consequently, the times may not reflect the actual time of the day. Since no

other time source was available to correlate to the actual time of day, the event recorder times from BNSF 8156 will be used as the time base and is referenced as Pacific standard time (PST).

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

Figure 1 contains locomotive event recorder data from BNSF 8156 recorded during the event on March 3, 2021. The time covered is from 00:14:30 PST to 00:20:00 PST. All the parameters listed in table A-1 were plotted.

The event recorder data from BNSF 8156 indicated between 00:14:56 PST to 00:19:39 PST, the maximum speed was about 9 miles per hour (mph) and the train moved 2,586 feet. During this time, the Pneumatic Control Switch (PCS) and the Engineer Initiated Emergency (Emerg EIE) remained "Off". Additionally, the Train Line Emergency (Emerg TLE) remained "No".

All the corresponding tabular data used to create figure 1 are provided in electronic comma separated value (\*.csv) format as attachment 1 to this factual report.

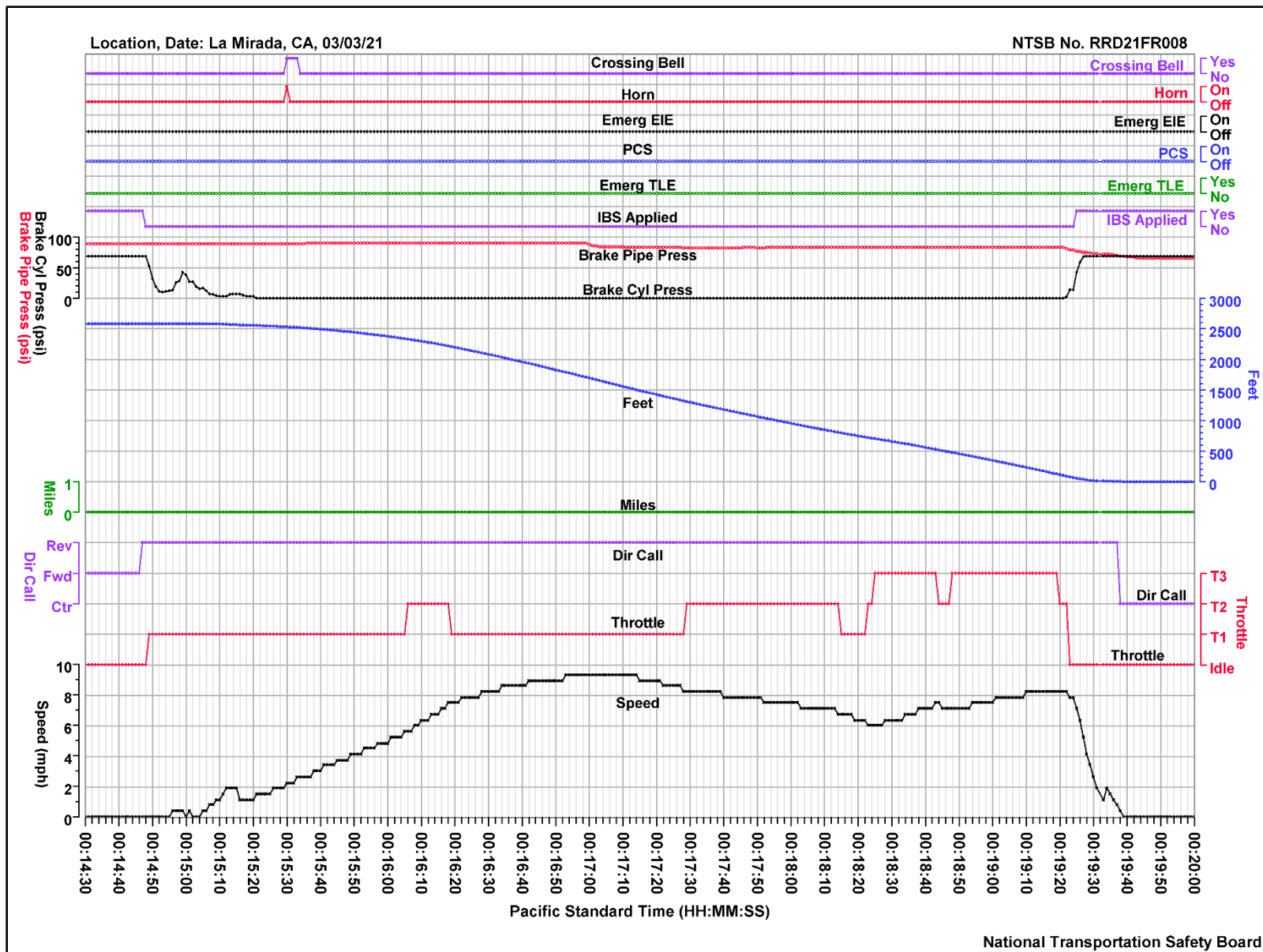


Figure 1. BNSF 8156's locomotive event recorder parameters.

## APPENDIX A

This appendix describes the locomotive event recorder parameters provided and verified in this report for BSNF 8156. Table A-1 lists the plot labels and parameter descriptions. Table A-2 contains the unit and discrete state abbreviations for the parameters.

**Table A-1.** Verified and provided locomotive event recorder parameters for BNSF 8156.

Plot Labels	Parameter Descriptions
Brake Cyl Press (psi)	Brake Cylinder Pressure
Brake Pipe Press (psi)	Brake Pipe Pressure
Crossing Bell	Crossing Bell
Dir Call	Direction of Travel
Emerg EIE	Engineer Initiated Emergency
Emerg TLE	Train Line Emergency
Feet	Feet Traveled
Horn	Horn
IBS Applied	Independent Brake System Applied
Miles	Miles Traveled
PCS	Pneumatic Control Switch
Speed (mph)	Speed
Throttle	Throttle Position

Note: Parameters with a blank unit description in table A-1 are discrettes. 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.

**Table A-2.** Unit and discrete state abbreviations.

Unit and Discrete Abbreviation	Description
Ctr	Center
Fwd	Forward
mph	miles per hour
psi	pounds per square inch
Rev	Reverse
T1	Throttle Position 1
T2	Throttle Position 2
T3	Throttle Position 3