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

July 6, 2021

Locomotive Event Recorder

Specialist's Factual Report
By W. Deven Chen

1. EVENT SUMMARY

Location:	Prichard, Alabama
Date:	November 17, 2020
Vehicle:	FRA regulated freight A-MEMOB1-16
Operator:	Alabama Export Railroad (ALE)
NTSB Number:	RRD21LR005

2. LOCOMOTIVE EVENT RECORDER GROUP

A locomotive event recorder group was not convened.

3. DETAILS OF INVESTIGATION

On April 15, 2021, the National Transportation Safety Board (NTSB) Vehicle Recorder Division received the following event recorder data files electronically:

File Name:	**ALE_0968 [20201117CN3195].sdl**
Locomotive ID:	**3195 (lead)**
File Name:	**ALE_0967 [20201117CN2903].sdl**
Locomotive ID:	**2903 (trailing)**

3.1. Locomotive Event Recorder Data Files

The files were parsed using GE LDARS Viewer. Using the wheel size of 42.9 inches as provided by the investigator-in-charge (IIC), the software outputted the locomotive event recorder parameters except distance.

3.2. Locomotive Event Recorder Data Description

The exported data have a sampling rate of 1 sample per second; therefore, the data have an accuracy of +/- 1 second. The files from the lead and trailing locomotives stored data for the same parameters. Only data from the lead locomotive are included in this report. Table 1 lists the parameters verified and plotted in this report. Table 2 lists the discrete abbreviations for the parameters.

Table 1: Verified and provided locomotive event recorder parameters.

Parameter Name	Parameter Description
TIME	Central standard time (CST) for recorded data point (HH:MM:SS)
DISTANCE (miles)	Calculated Traveling Distance in Time (miles)
SPEED (mph)	Speed (miles per hour)
DIR CALL (discrete)	Direction of Travel (Fwd, Rvs, Ctr)
THROTTLE (discrete)	Throttle Position (Idle, N1-N3)
BELL (discrete)	Bell Active (On or Off)
HORN (discrete)	Horn Active (On or Off)
ALERTER PEN CMD (discrete)	Alerter Penalty Command (True/False)
EFFORT (klbs)	Locomotive Tractive Effort (kilo pounds)
PCS OPEN (discrete)	Pneumatic Control Switch Open (True/False)
EAB BC (PSI)	Electronic Air Brake - Brake Cylinder Pressure (pounds per square inch)
EAB BP (PSI)	Electronic Air Brake - Brake Pipe Pressure (pounds per square inch)
EAB CVE (discrete)	Electronic Air Brake - Conductors Valve Emergency Enabled (True/False)
EAB ER (PSI)	Electronic Air Brake – Equalizing Reservoir Pressure (pounds per square inch)
EAB FLOW (CFM)	Electronic Air Brake – Air Flow (cubic feet per minute)
EAB EMER (discrete)	Electronic Air Brake - Emergency Enabled (True/False)
EAB TLE (discrete)	Electronic Air Brake - Trainline Emergency Enabled (True/False)
EAB PEN (discrete)	Electronic Air Brake Penalty (True/False)
EAB EIE (discrete)	Electronic Air Brake - Engineer Initiated Emergency (True or False)
DB START (discrete)	Dynamic Braking Start (On/Off)
DB SETUP (discrete)	Dynamic Braking Setup (On/Off)
DB CALL (%)	Dynamic Braking Handle Position (%)
DB NOTCH (discrete)	Dynamic Braking Notch Position (On/Off)
EOT EMER ENABLE (discrete)	End of Train Emergency Enabled (True/False)
EOT BP (PSI)	End of Train Brake Pressure (pounds per square inch)
EOT EMER DUMP (discrete)	End of Train Emergency Dump (True/False)
EOT ARMED (discrete)	End of Train Armed Status (True/False)

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.

Table 2: Discrete State Abbreviations

Discrete Abbreviation	Description
Ctr	Center
Rvs	Reverse
Fwd	Forward
N1	Notch 1
N2	Notch 2
N3	Notch 3

3.3. Time Correlation

The recorded timestamps were in Coordinated Universal Time (UTC), and the timestamps were converted to the local time, central standard time (CST). The difference between UTC and CST is 6 hours. Only data recorded between14:10:00 – 14:30:00 CST on November 11, 2020 were included in this report. The train started moving around 14:13 CST, and the event occurred around 14:27 CST.

3.4. Plots and Corresponding Tabular Data

Figures 1 to 3 contain locomotive event recorder data recorded from 14:10:00 to 14:30:00 CST during the event on November 17, 2020. All the parameters listed in Table 1 were plotted and displayed in three plots.

All of the corresponding tabular data used to create figures 1 to 3 are provided in electronic comma separated value (.csv) format as attachment 1 to this report.

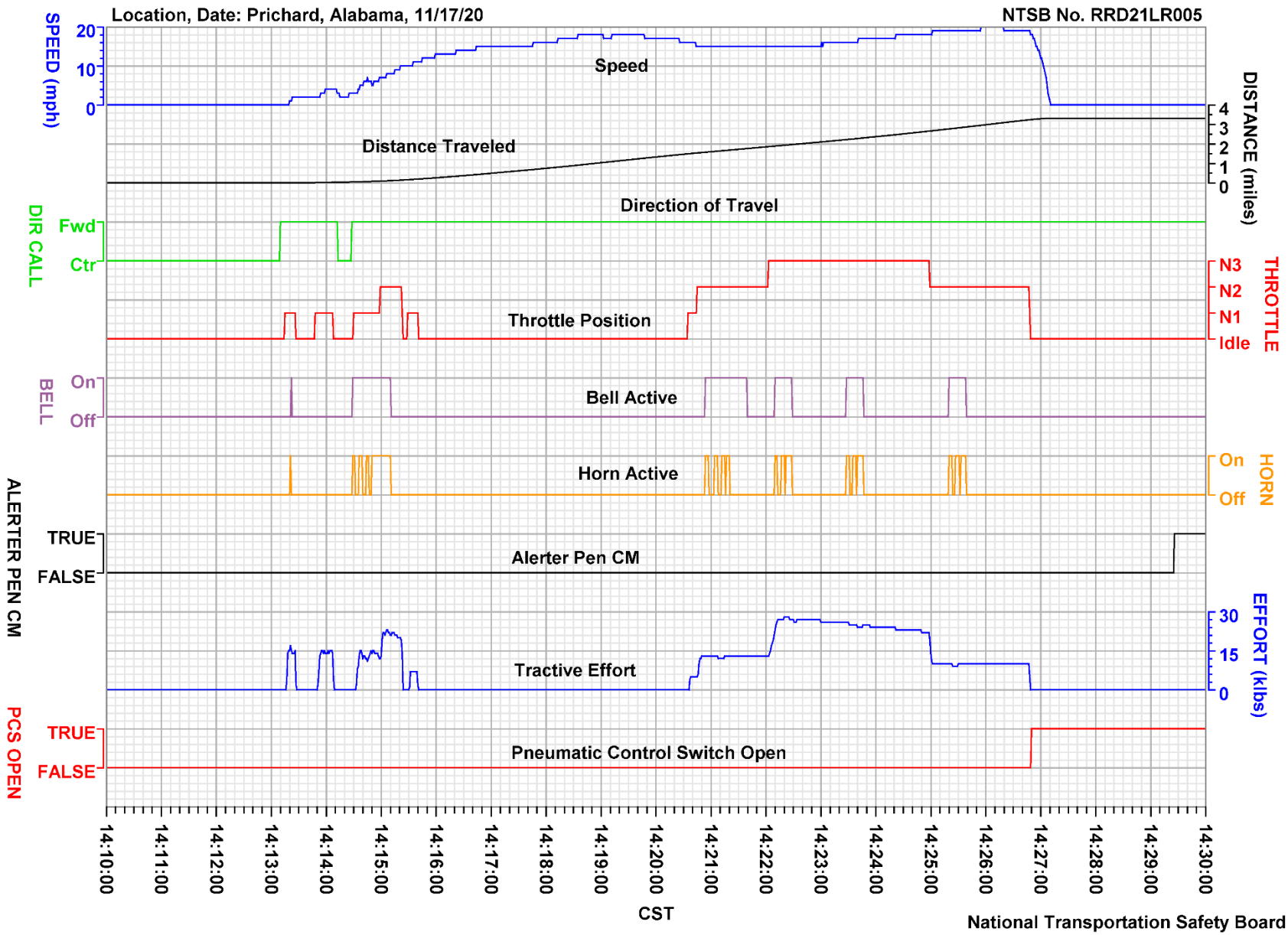

Figure 1: Plot #1 of parameters recorded on November 17, 2020.

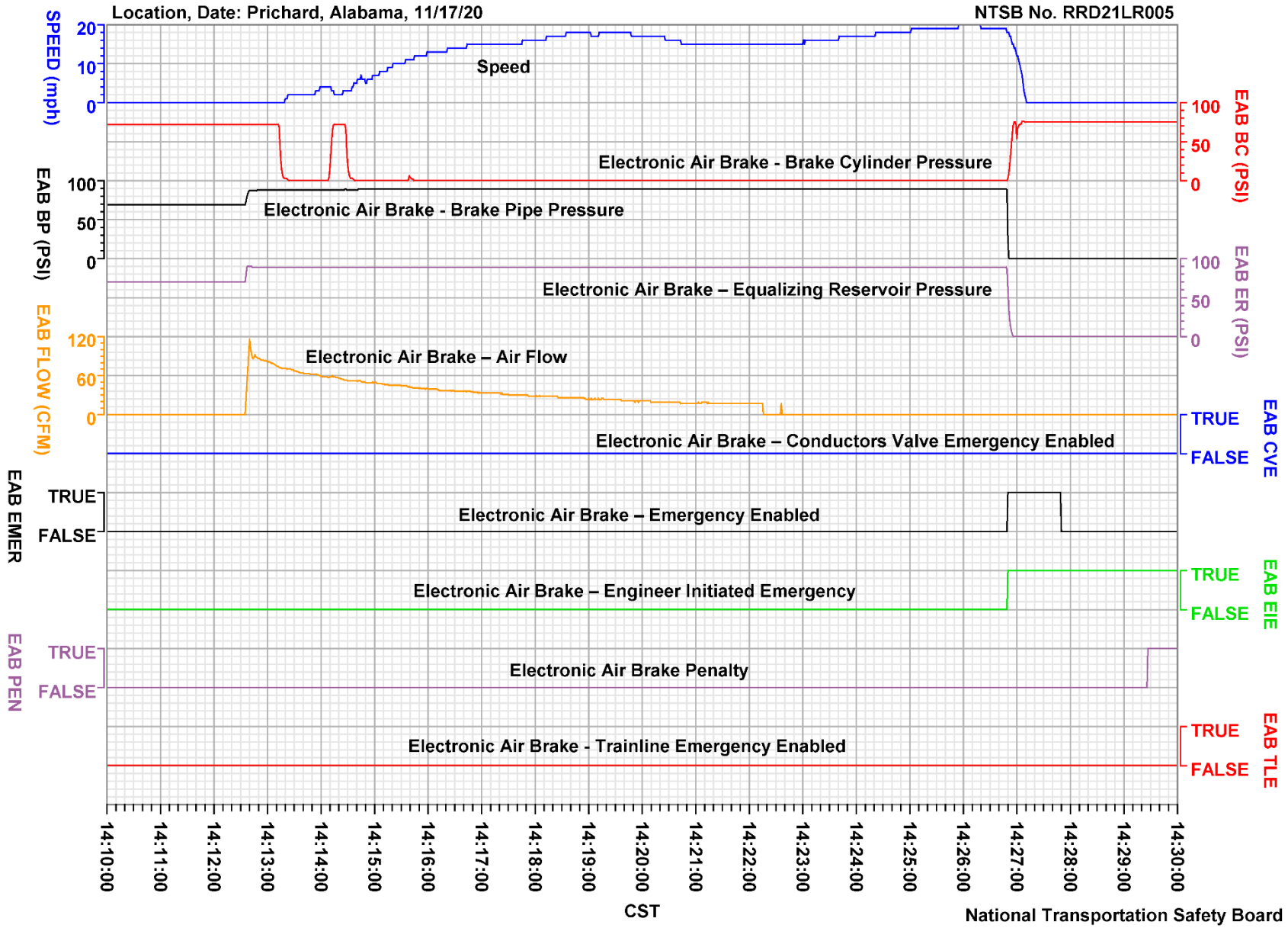

Figure 2: Plot #2 of parameters recorded on November 17, 2020.

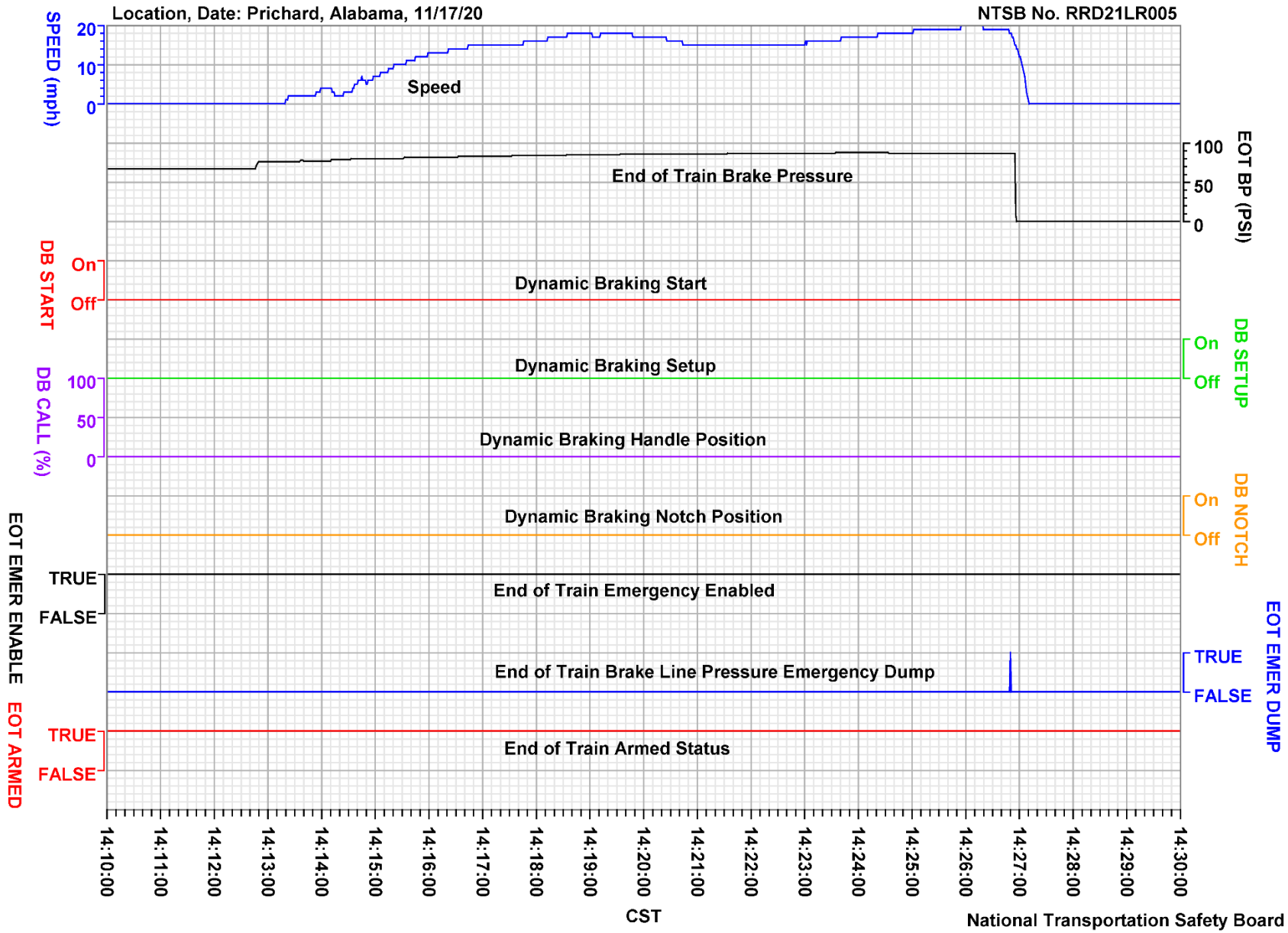

Figure 3: Plot #3 of parameters recorded on November 17, 2020.