

National Transportation Safety Board
Office of Railroad, Pipeline and Hazardous Materials Investigations
Washington, D.C. 20594

Passenger Fatality BART

San Francisco, CA

September 13, 2021

Mechanical Group Factual Report

Accident

NTSB Accident Number: RRD21LR015
Date of Accident: September 13, 2021
Time of Accident: 1515 (PST)
Type of Trains: Passenger
Railroad Owner: BART
Train Operator: BART
Fatalities: 1
Location of Accident: San Francisco, CA

Mechanical Group Members

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Synopsis

On September 13, 2021, at about 15:15 pm local time, a passenger and a dog had boarded a Bay Area Rapid Transit (BART) train. After receiving a report of an incident between the train and a passenger at the Powell St. Station, the northbound blue line train was diverted to the yellow line and proceeded to the Concord Mechanical Facility for storage and inspection by investigators. Preliminary information indicates the dog was on a leash that was attached to the passenger's backpack. Seconds before the train's departure the passenger stepped out of the train from car #9 out of a 10 car consist and onto the platform while the dog was still on the train. The doors closed separating the passenger from the dog and had pinched the leash in the doors. The train departed, dragging the passenger along the platform. The distance from the operator's window to the rear door of car #9 where the subject passenger had exited was 611 feet. There were no visual indications on the dog that suggest it was a service animal. The dog was not injured and was returned to the passenger's boyfriend who was identified by police as a transient with no physical address.

Parties involved are BART, CPUC, FTA, and ATU.



Figure 1 Accident train located at Concord Mechanical Facility.

Equipment

Although the subject BART trains consisted of C1 and B2 cars, the BART fleet consists of a mix of Legacy car models C1, A2, B2, and new car models D and E. The new model D and E cars were manufactured by Bombardier (now acquired by Alstom) and started revenue service on January 2018. The C1 cars were manufactured in 1982 by Alstom and have DC-traction motors. They can be used as a lead, trail, or middle car for service. A/B cars were rehabbed in 1996 (by Bombardier) and became A2/B2 cars. The A2/B2 cars have AC-traction motors for the propulsion system. While A2 cars can be run as a lead or trail unit, B2 cars can only be run as middle cars. The A2 and C1 cars have a VATC (Vehicle Automatic Train Control) with operator controls while the B2 cars do not have VATC or operator control cabs and can only be used as middle cars in service.

Fleet Inventory

- A2 58 Cars
- B2 362 Cars
- C1 120 Cars
- D 112 Cars
- E 174 Cars

Total Cars 826

Railroad Equipment Involved

The subject train was made up of 10 cars which are 70 feet in length each. The lead and trailing cars were C1's and the middle (intermediate) cars were all B2 models. The consist is shown below.

- 0367 (C1) Lead Operating Car
- 1573 (B2)
- 1588 (B2)
- 1840 (B2)
- 1535 (B2)
- 1578 (B2)
- 1839 (B2)
- 1842 (B2)
- 1599 (B2) Incident Car
- 0366 (C1) Trailing Car

Legacy Car Door Operations

In VATC operations with the Legacy Fleet, doors automatically open in approximately 2 seconds after arriving at a station stop and the VATC logic receiving a zero-speed signal and a brakes on signal. The doors remain open until the operator receives an audio and visual indication in the controlling cab (station release signal) to manually shut the doors after verifying that it is safe by looking down the side of the train from the lead car window.

See Figures 2, 3, and 4 below depicting recorded train signals regarding this incident.

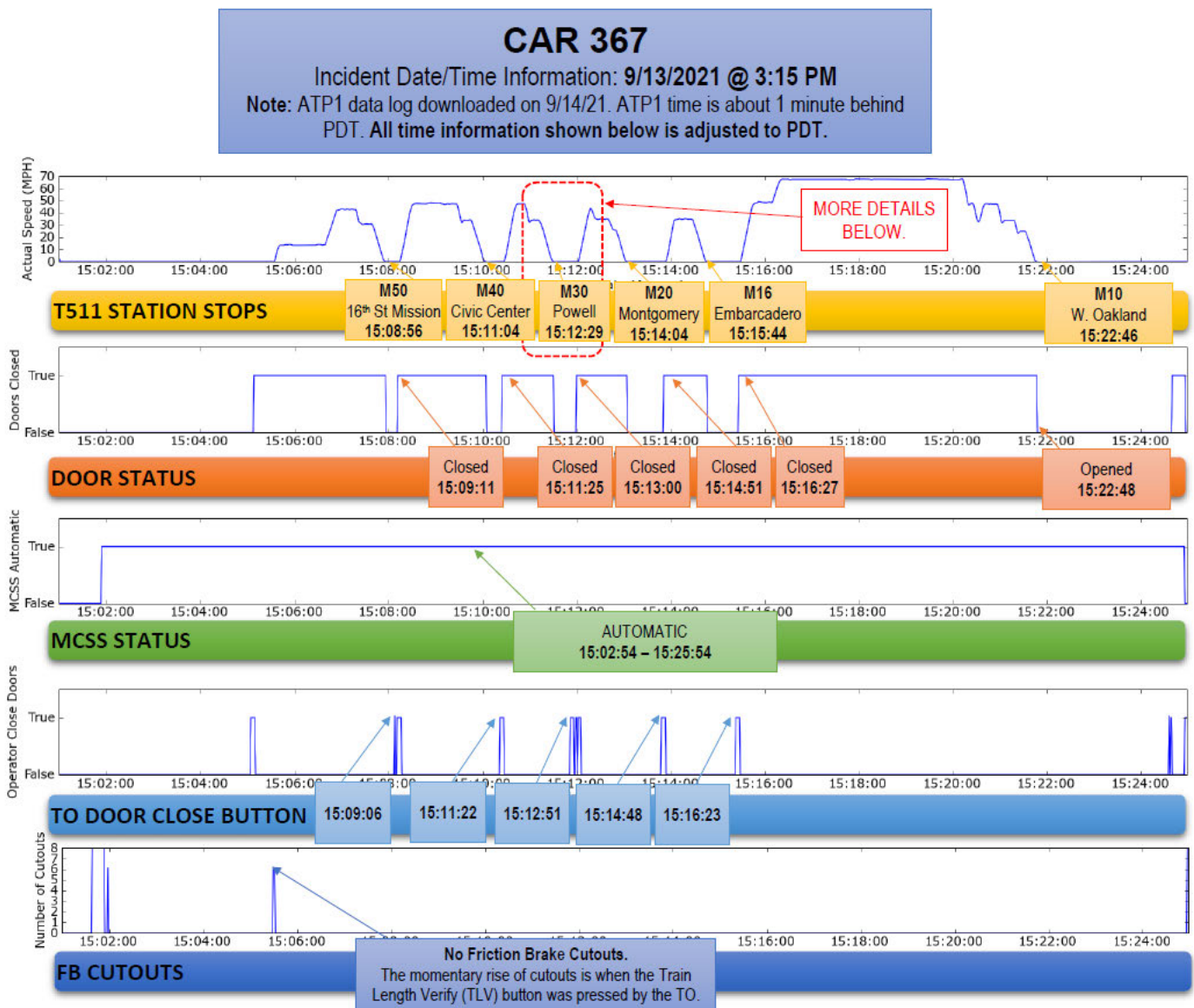


Figure 2 Data recorder showing station stops and door dwell times for the subject train.

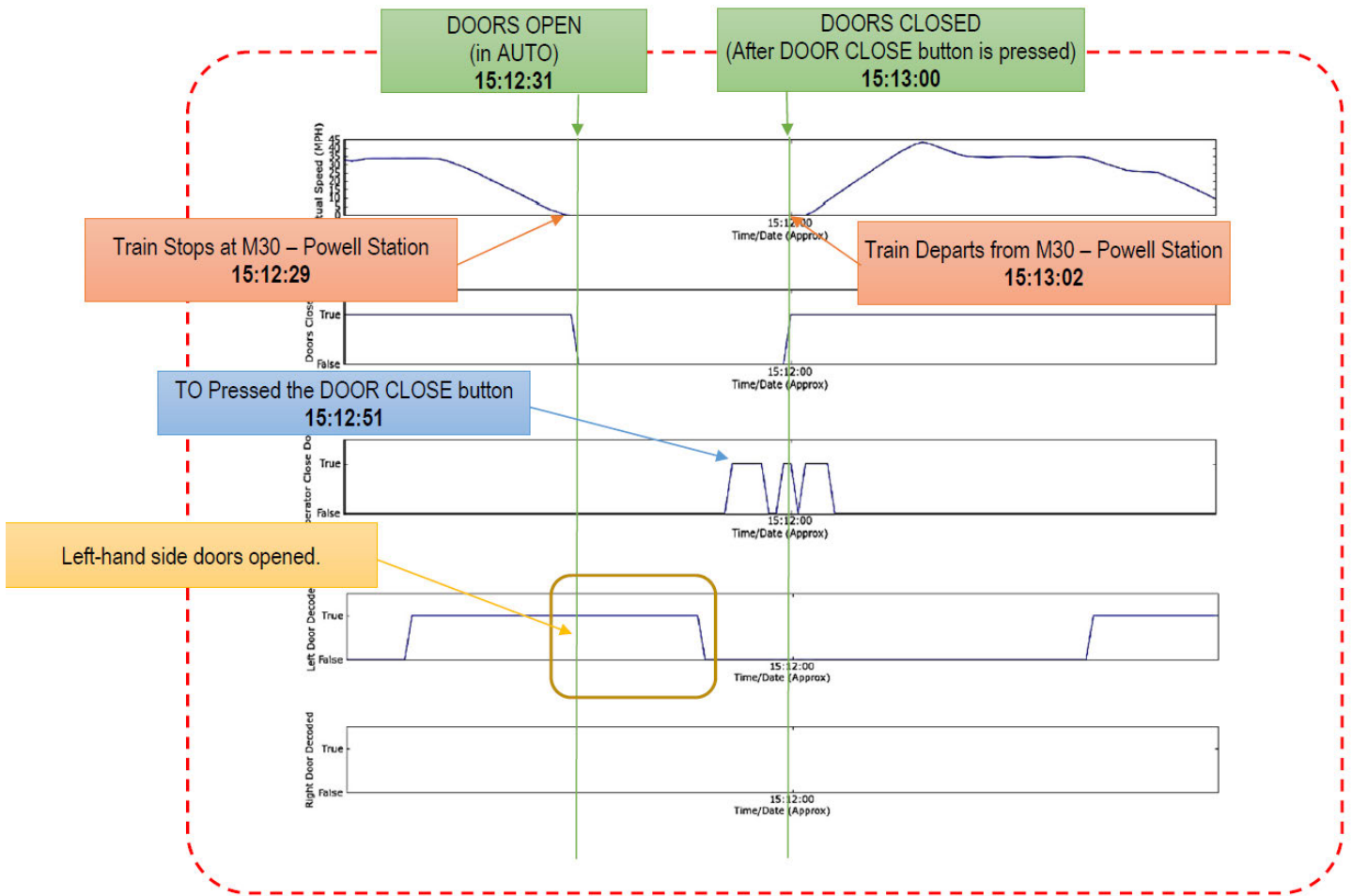


Figure 3 Enlarged view of the data recorder from the Powell Station stop.

	16th St Mission	Civic Center	Powell (Incident Location)	Montgomery	Embarcadero	W. Oakland
Stopped At Station	15:08:56	15:11:04	15:12:29	15:14:04	15:15:44	15:22:46
TO Pushed Door Close Button	15:09:06	15:11:22	15:12:51	15:14:48	15:16:23	
Door Closed	15:09:11	15:11:25	15:13:00	15:14:51	15:16:27	
Stop to Close (Seconds)	15	21	31	47	43	
Stop to Push Stop Button (Seconds)	10	18	22	44	39	
Push Stop Button to Close (Seconds)	5	3	9	3	4	

Figure 4 Table depicting door dwell time data two stations previous, incident location, and two stations post incident including the stop time at W. Oakland where the subject train was removed from revenue service.

Physical door closure may not be equivalent to the electrical doors-closed-and-locked signal. Activation of electrical doors-closed-and-locked signal is indication of all doors closed but door closure does not mean activation of electrical doors-closed-and-locked signal. Electrical doors-closed-and-locked signal is used to tell the Vehicle Automatic Train Control, along with other required signals, that movement is permitted.

Equipment Post Accident Inspections

The subject train was removed from service and brought to the Concord Mechanical Facility for testing. On September 15, 2021, the Mechanical Working Group met at BART's Concord Mechanical Facility to observe procedural door testing of the incident door (#5/7) on car 1599 and cab car controls of the door open and close systems. The following door test procedures were completed with no exceptions noted by the group:

- Procedure No. 10-12 Door ¾" Rod Safety Check
- Procedure No. 10-14 Side Door Operation, Loose, Chattering, Biding Open/Close Timing
- Procedure No. 10-21 Side Door Preload Check

The working group also verified the operation of the "Close door" button operation from the lead control cab, the door closed indicator from the operators control stand, and verified that the door circuit bypass switch was in the proper position, sealed, and untampered with. No exceptions were taken.

Documentation Received

- Door Testing Procedures
- Car Characteristics
- Maintenance History
- Data Log Downloads
- Train Consist Information
- VATC Functionality Description

Group Member to the Investigation - Acknowledgment Signatures

The undersigned designated *Group Member to the Investigation* representatives attest that the information contained in this report is a factually accurate representation of the information collected during the on scene phase of this investigation, to the extent of their best knowledge and contribution in this investigation.

_____ Date _____
Joey Rhine, NTSB

_____ Date _____
Laura Espinoza, CPUC

_____ Date _____
Zelalem Akalewold, BART