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WMSC Commissioner Brief: W-0270 – Improper Door Operation – Green Line between U St. And Columbia Heights stations – March 26, 2023

Prepared for Washington Metrorail Safety Commission meeting on April 9, 2024

Safety event summary:

Improperly installed door systems allowed a pair of 3000 Series railcar doors to partially open while a train was carrying passengers between U Street and Columbia Heights Stations at 8:24 a.m. on March 26, 2023.

The train initially stopped in the tunnel due to a loss of speed commands due to a bobbing track circuit (a track circuit intermittently indicating as being occupied). The Train Operator initially believed this to be a power system issue. The Train Operator then could not move the train forward due to the train's safety systems recognizing that not all doors were closed and locked in the required position.

The Train Operator communicated with the Rail Traffic Controller, secured the operating cab, and investigated. The Train Operator identified that doors 9 and 10 on the second car of the train, car 3128, were not fully closed. The opening was estimated to be a few inches. The Train Operator stated in an investigative interview that riders in the car reported that no one had appeared to exit from the train, and that they had not noticed the gap between the train doors. The emergency door pull handle had not been activated.

The Train Operator reset the door system, communicated with the Rail Traffic Controller, and moved the train to the Columbia Heights Station platform where riders were safely offloaded. The train was then taken out of service and moved to a rail yard for further inspection and investigation.

Metrorail's Car Maintenance inspection identified that a door limit switch was installed in an incorrect position, a bump stop thread was damaged, a lock and close switch failed and stuck, and both doors at this opening were not centered in the door pocket as required. The improper installation of these door control systems meant that the doors would not properly remain closed.

Review of other events showed 6 reported instances (including this one) of doors opening with a train moving or not at the platform from January 2022 to April 2023 on 3000 Series or 6000 Series railcars. However, 3 of those events resulted in no trouble found by Metrorail. After the two remaining events, Metrorail replaced the master controller assembly on the relevant railcar.

As part of Metrorail's post-event inspection of the incident train, Office of Car Maintenance personnel verified that shunt straps were in place on the master controller, a mitigation Metrorail implemented following a May 2019 event near Dunn Loring Station where doors opened uncommanded while a passenger train was in motion.

Probable Cause:

The probable cause of this event was the improper installation and maintenance of door equipment on a 3000 Series railcar.

Corrective Actions:

Metrorail repaired the affected railcar.

WMSC staff observations:

The WMSC transmitted a draft report of the most recent WMSC Audit of Metrorail's Revenue Vehicles (Railcar) Programs to Metrorail for its 30-day technical review. The WMSC will consider any comments from Metrorail and incorporate them as appropriate, then issue a final report.

Washington Metropolitan Area Transit Authority
Department of Safety (SAFE)
Office of Safety Investigations (OSI)

FINAL REPORT OF INVESTIGATION A&I E23201

Date of Event:	March 26, 2023
Type of Event:	Uncommanded Train Door
Incident Time:	08:24 Hours
Location:	Between U Street and Columbia Heights Stations, track 1
Time and How received by SAFE:	08:25 Hours – SAFE/MAC
WMSC Notification Time:	09:11 Hours
Responding Safety Officers:	None
Rail Vehicle:	Train ID 507-L3129-3128, 3030-3031, 3117-3116T
Injuries:	None
Damage:	None
Emergency Responders:	None
SMS I/A Incident Number:	20230404#107412

Columbia Heights Station - Uncommanded Train Door

March 26, 2023

Table of Contents

Abbreviations and Acronyms

AIMS	Advanced Information Management System
ARS	Audio Recording System
CAP	Corrective Action Plan
CENV	Vehicle Program Services
CMNT	Office of Car Maintenance
CMOR	Office of Chief Mechanical Officer
COMR	Office of Radio Communications
DCKR	Door Closed Checked Relay
IIT	Incident Investigation Team
MSRPH	Metrorail Safety Rules and Procedures Handbook
NOAA	National Oceanic and Atmospheric Administration
REPA	Reliability Engineering and Performance Analysis
RTC	Rail Traffic Controller
RTRA	Office of Rail Transportation
ROCC	Rail Operations Control Center
SAFE	Department of Safety
SPOTS	System Performance On-Time Summary
SMS	Safety Measurement System
VDMS	Vehicle Monitoring and Diagnostic System
WMATA	Washington Metropolitan Area Transit Authority
WMSC	Washington Metrorail Safety Commission

Executive Summary

**Note that all times listed are approximate and may contain minor variations due to differences between systems of record. **

On Sunday, March 26, 2023, Train ID 507 (L3129-3128, 3030-3031, 3117-3116T) arrived at U Street Station on track 1 at 08:17 hours and serviced the station without incident. As the train was departing U Street Station, the train experienced intermittent loss of speed commands, causing the train to stop between U Street Station and Columbia Heights Station. At 08:24 hours the Train Operator contacted the Rail Operations Control Center (ROCC) and reported that they were located between U Street Station and Columbia Heights Station, track 1 and that the train was stuck in the tunnel. They also reported that they had no "All Doors Closed" indication. The Radio Rail Traffic Controller (RTC) instructed the Train Operator to perform a ground walkaround and walk through the consist to see if anyone exited the train.

The Train Operator exited the cab to investigate and reported that on rail car 3128, the number 9 and 10 doors appeared to have an approximate two-inch gap. Customers advised they did not see anyone exit or fall from the train. The Radio RTC instructed the Train Operator to secure the doors and attempt to get a brakes off indication from the nearest cab. The Train Operator reported that they were able to secure the doors and they received an All Doors Closed indication. The Radio RTC instructed the Train Operator to return to the lead cab and continue to Columbia Heights Station under restricted speed and offload the train on arrival. After the train was offloaded, Train ID 507 was operated in non-revenue service to Greenbelt Yard. There were no injuries as a result of this event.

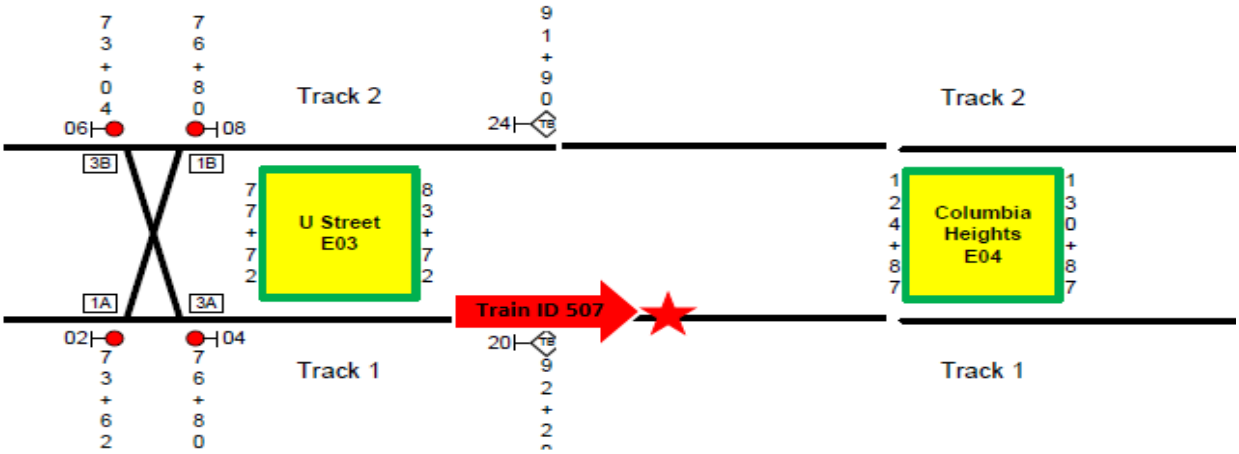
The train consist was removed from service for post-incident inspection. Analysis of the train's event recorder data showed that the train lost speed commands initially due to a bobbing track circuit. No specific electrical issue was identified. After coming to a stop, the All Doors Closed signal was lost. Post-incident inspection found several defects with the number 9 and 10 doors and associated components, which were repaired or replaced prior to releasing the car back to service.

The probable cause of the Uncommanded Train Door event between U Street Station and Columbia Heights Station, track 1 on March 26, 2023, was a mechanical defect with rail car 3128 that led to the train losing an All Doors Closed indication.

Incident Site

Between U Street and Columbia Heights Stations, track 1

Field Sketch/Schematics



**Locations are approximate. Not to scale.*

Purpose and Scope

The purpose of this incident investigation and candid self-evaluation is to collect and analyze available facts, determine the probable cause(s) of the incident, identify contributing factors, and make recommendations to prevent a recurrence.

Investigation Methods

The investigative methodologies included the following:

- Site assessment through video and document review.
- Formal Interviews – SAFE interviewed one individual as part of this investigation. The interview included persons present at, during, and after the incident, those directly involved in the response process, and representatives from the Washington Metrorail Safety Commission (WMSC). SAFE interviewed the following individual:
  - Train Operator
- Documentation Review – A collection of relevant work history information and process documentation contained in Metro systems of record. These records include:
  - Metrorail Safety Rules and Procedures Handbook (MSRPH)
  - National Oceanic and Atmospheric Administration (NOAA)
  - Employee Training & Procedures
  - Employee 30-Day work history
  - Office of Chief Mechanical Officer (CMOR) / Incident Investigation Team (IIT) post-incident analysis data

- System Data Recording Review – A collection of information contained in Metro Data Recording Systems. This data includes:
  - Audio Recording System (ARS) playback
  - System Performance On-Time Summary (SPOTS)
  - Advanced Information Management System (AIMS)

Investigation

On Sunday, March 26, 2023, Train ID 507 (L3129-3128, 3030-3031, 3117-3116T) arrived at U Street Station on track 1 at 08:17 hours. As the train was departing U Street Station, the train experienced an intermittent loss of speeds commands causing the train to stop between U Street Station and Columbia Heights Station.

ROCS SPOTS REPORT

based on up-to-the-second operational performance data from the Rail Operations Control System

Current date/time: Mon Apr 10 18:58:58 2023

Select Platform: and/or Select ID: 507 Leave blank to remove criteria

and/or Select 4-digit car number: Leave blank to remove criteria

Select Date: Mar 26 2023 Select Times (0-24HRS): From 08:00 To 09:00

Generate Report

ID	Platform	length	dcode	Right door open	Right door close	dwell	Left door open	Left door close	dwell	Head Arrived	Tail cleared	cars	Travel Time door open to door open
507	F06-1	6	44				08:02:00	08:02:14	14	08:01:23	08:02:38	3116-3117 3031-3030 3128-3129	-
507	F05-1	6	44				08:04:33	08:04:48	15	08:03:57	08:05:11	3116-3117 3031-3030 3128-3129	2:33
507	F04-1	6	44				08:06:24	08:06:39	15	08:05:43	08:07:27	3116-3117 3031-3030 3128-3129	1:51
507	F03-1	6	44	08:09:09	08:09:26	17				08:08:26	08:09:48	3116-3117 3031-3030 3128-3129	2:45
507	F02-1	6	44				08:10:53	08:11:06	13	08:10:18	08:11:29	3116-3117 3031-3030 3128-3129	1:44
507	F01-1	6	44				08:12:17	08:12:33	16	08:11:41	08:12:57	3116-3117 3031-3030 3128-3129	1:24
507	E01-1	6	44				08:14:07	08:14:23	16	08:13:28	08:14:46	3116-3117 3031-3030 3128-3129	1:50
507	E02-1	6	44				08:15:58	08:16:13	15	08:15:16	08:16:36	3116-3117 3031-3030 3128-3129	1:51
507	E03-1	6	44				08:17:49	08:18:05	16	08:17:04	08:18:55	3116-3117 3031-3030 3128-3129	1:51
507	E03-1	6	44							08:18:59	08:19:00	3116-3117 3031-3030 3128-3129	-
507	E03-1	6	44							08:26:31	08:26:33	3116-3117 3031-3030 3128-3129	-
507	E03-1	6	44							08:26:35	08:26:36	3116-3117 3031-3030 3128-3129	-
507	E03-1	6	44							08:26:39	08:26:41	3116-3117 3031-3030 3128-3129	-
507	E03-1	6	44							08:26:57	08:26:59	3116-3117 3031-3030 3128-3129	-
507	E03-1	6	44							08:32:55	08:33:02	3116-3117 3031-3030 3128-3129	-

Table 1 – Spots Report depicting Train ID 507 arriving and departing U Street Station, track 1.

The Audio Recording System (ARS) revealed that at 08:24 hours, the Train Operator reported to ROCC that the train stopped in the tunnel and “All Doors Closed” was not illuminated on the train console.

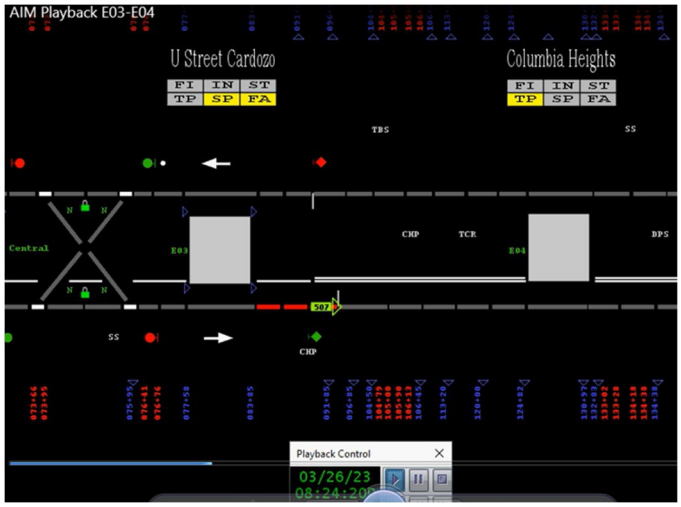


Figure 1 – AIMS Playback depicting Train ID 507 located between U Street and Columbia Heights Stations when the Train Operator reported the no all doors, non-illuminated.

The Radio RTC instructed the Train Operator to perform a ground walkaround by walking through the consist to see if anyone exited the train. The Train Operator exited the cab to investigate.

At 08:27 hours, the Radio RTC instructed a Rail Supervisor located at Gallery Place Station and an Office of Car Maintenance (CMNT) Road Mechanic located at Fort Totten Station to report to Columbia Heights Station. At 08:28 hours, the Train Operator reported that on rail car 3128, the number 9 door was open by about two inches and the customers advised they did not see anyone exit the train. The Radio RTC instructed the Train Operator to secure the doors and attempt to get a brakes-off indication from the nearest cab.

At 08:31 hours, the Train Operator reported the doors were secured and they received an All Doors Closed indication. The Radio RTC instructed the Train Operator to return to the lead cab, continue to Columbia Heights Station, and operate the train at restricted speed, then offload the train at Columbia Heights Station.

At 08:33 hours, Train ID 507 arrived at Columbia Heights Station and the train was offloaded. At 08:36 hours, the Train Operator was instructed to operate the train in non-revenue service to Greenbelt Yard. At 08:50 hours, Train ID 507 arrived at Greenbelt Station and was secured on the platform.

At 08:54 hours, CMNT inspected the doors on rail car 3128 and reported no visual damage. The emergency door release was not activated, and the seal on the emergency release was not broken.

The Office of Chief Mechanical Officer Incident Investigation Team (IIT) performed an inspection on the consist and determined that the root cause of the train experiencing intermittent speed commands when departing U Street Station was due to a Bobbing Track Circuit between, CM E1 92+00 to E1-99+00. After a few moving attempts, the lead car 3129 Door Closed Check Relay (DCKR) de-energized. On the second rail car 3128, door #10 lost the Doors Closed signal and the train was unable to move. This inability to move without a Doors Closed signal is a safety feature to prevent the train from moving with an open passenger door.

CMNT personnel performed an inspection on rail car 3128 and reported the S1 Door Limit Switch was installed in an incorrect position, Door #9's lower bump stop thread was damaged, Door #10 experienced a lock switch failure and sticking, and both doors were not centered in the door pocket. The S1 Switch Actuator lever assembly was replaced. The lower bump stop thread was replaced, the doors were recentered and both doors were recentered and adjusted. The lock and close switches on Door #10 were replaced.

Chronological Event Timeline

A review of ARS playback, i.e., phone and radio communications, revealed the following timeline:

Time	Description
08:31:11 hours	Train ID 507: Reported able to get an "All Doors Closed." ROCC Radio RTC: Acknowledged and repeated. Instructed the Train Operator to go back to the lead cab, granted a permissive block to Columbia Heights, track 1 with restricted speed 15MPH, offload at Columbia Heights Station. Train ID 507: Acknowledged and repeated. [Radio Ops 3]
08:33:58 hours	Train ID 507 arrived at Columbia Heights Station. [Spots]
08:35:41 hours	Train ID 507: Reported train offloading at Columbia Heights Station. [Radio Ops 3]
08:36:01 hours	CMNT: Reported train clear of customers. ROCC Radio RTC: Acknowledged and repeated. [Radio Ops 3]
08:36:32 hours	ROCC Radio RTC: Permission to Train ID 507 to lite to Greenbelt Station. Train ID 507: Acknowledged and repeated. [Radio Ops 3]
08:50:05 hours	Train ID 507 arrived at Greenbelt Station and secured on the platform. [Radio GB-YD1]
08:54:27 hours	CMNT: Inspected the doors on rail car 3128 and reported no visual damage and the emergency door release was not activated. The seal was not removed. [Radio GB-YD1]

***Note: Times above may vary from other system's timelines based on clock settings and reporting source.*

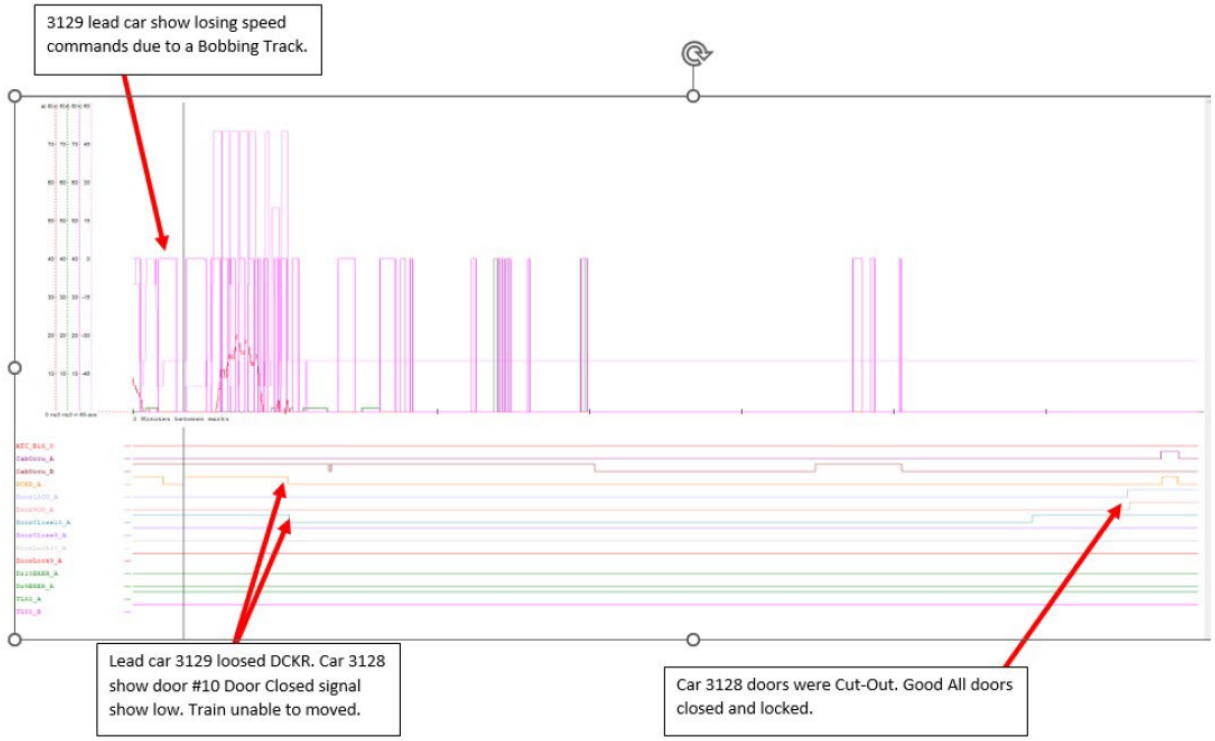
The Office of Chief Mechanical Officer (CMOR) / Incident Investigation Team (IIT)

Adopted from CMOR IIT report with minor formatting and grammatical edits:

"Based on the VMS data, Lead car 3129 showed losing speed commands [intermittently] causing the train to come to a complete stop after [traveling] **672 Feet** from platform limits of "E03" U Street. The root cause of the intermittent speed commands was a Bobbing track circuit between, E03-E1-92 665 feet to E04-E1-99 686 feet. After coming to a complete stop and when attempting to move, the DCKR on lead car 3128 de-energized. VMS data shows Door #10 on car 3128 lose Door Closed signal preventing train from moving. Door #10 did not show any failure during the incident time. Doors 9&10 were Cut-Out, DCKR energized, and train continued to the next station. NOTE: DCKR on lead car 3129 remain energized while train was moving during the incident."

See Timeline below:

TIME	SEQUENCE OF EVENTS	MC Position	Train Speed	Distance Form 8-Car Marker
08:16:16.656	Train ID 507, Lead car 3129, arrived 13feet short at the 8-Car Marker, U street "E03".			**13ft short**
08:16:21.132	Left Door Open Push Button is activated. Doors are open platform side.			
08:16:30.149	Left Door Closed Push Button is activated. Doors are closing.			
08:16:37.884	DCKR energized. Doors are Closed and Locked.			
08:17:01.000	MC is placed in P5 power mode. Train procced to the next station "E04" Columbia Heights.	"P5"	0MPH	
08:17:07.774	Train start losing speed commands intermittent. B4 is applied. FSBR is de-energized.	"B4"	8Mph	24ft
08:17:39.684	Train comes to completed stop after travel **672feet** from platform limits. Speed commands show 0Mph.	"B4"	0Mph	**672ft**
08:18:00.111	3129. DCKR de-energized after few moving attempts. Train was stop when DCKR de-energized. 3128 Door#10 loss Door closed(S4) switch signal.	"B4"	0Mph	**679ft**
08:27:45.520	3128 Door #10 closed signal show high. Door is closed.			
08:29:01.803	Both doors 9 and 10 are Cut-Out.			
08:22:01.327	Car 3129 is keyed down. DCKR show de-energized. Door shows not closed or locked.			
08:29:27.252	Car 3128 is keyed. DCKR is energized. Doors show closed and locked.			
08:29:40.040	Car 3128 is keyed down.			
08:30:53.380	Lead car 3129 is keyed up. DCKR is energized. Doors are closed and locked. Train procced to the next station.	"P3"	0MPh	



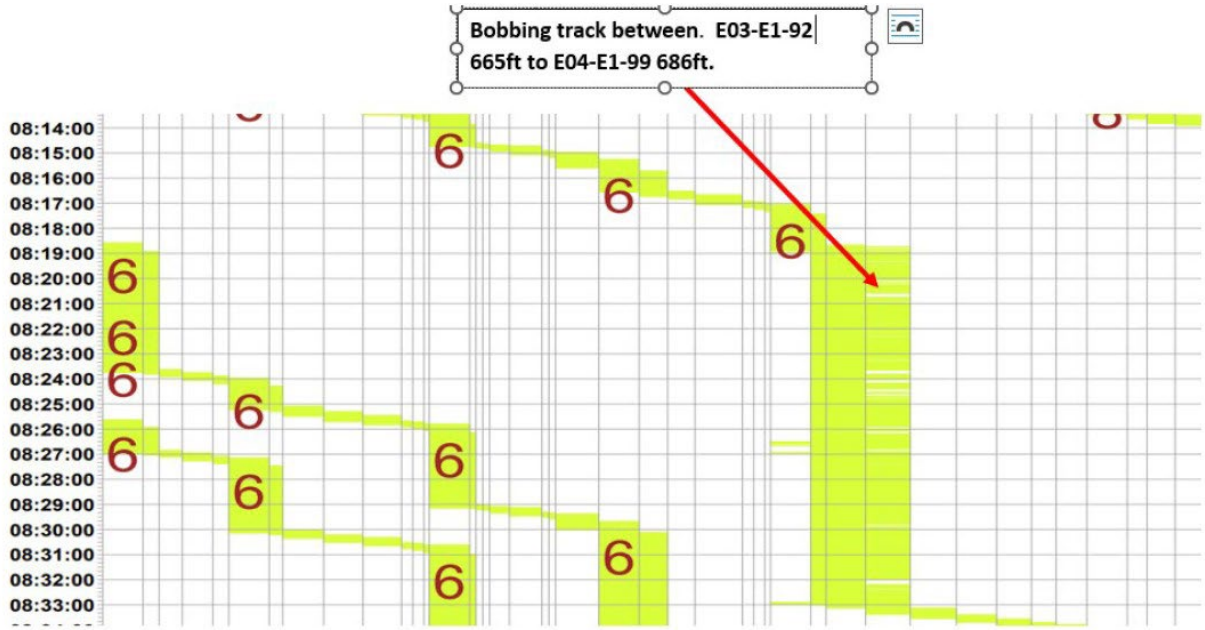


Figure 2 - Cars 3129 and 3128 ER Data Analysis

Office of Car Maintenance (CMNT)

CMNT personnel performed inspections and repairs of railcar 3128 in accordance with recommendations from IIT and the Office of Vehicle Program Services (CENV). Their inspections and repairs identified the following (See Appendix B for Work Orders):

- "Replaced lock and close switches for door 10, door fails with code 552 lock switch failure now."
- "S1 limit switch was installed in the wrong position, adjusted S1 and S4 limit switch and upper bump stop inspected door levers, limited switches, door brake unit for clearance as per pi task 90c inspection. Ops check good"
- "Door's obstruction and pushback test performed per pi task 100c inspection 100.7. Door #10 sticked during push back test. Suggest mechanics to check the spindle."
- "Performed task 90c inspection on doors #9 and #10 found lower bump stop thread damaged on door #9 and the doors were not centered in the door pocket. Replaced lower bump stop and recentered doors and adjusted S1 and S4 on both door leaves. Performed door obstruction and cycled doors numerous times without fault."
- "Removed and replaced S1 switch actuator lever assembly for fault isolation, checked and adjust S1 & S4 switches and recycled door several times without failure."

Reliability Engineering and Performance Analysis

Reliability Engineering and Performance Analysis (REPA) reviewed to determine the scope of similar reported switch failures. They reported, "in the scope (Jan. 2022 to April 2023) there were 6 events where it was reported the doors opened while the train was in motion or not at the platform. The data has been pivoted to show the maintenance remedial action (i.e., repair/replaced/etc.) for the listed failed component. Just for awareness, 3 of these events

resulted in no trouble found by the maintenance team, and this failure mode was only reported on 3K and 6K cars during this scope of data."

Count of COMPONENT DESCRIPTION	DATE				
	2022			2023	Grand Total
Failed Component Description	Feb	Apr	Dec	Mar	
LIMIT SWITCH; DOOR OPERATOR; 2K/3K/6K				**1**	**1**
Repair				**1**	**1**
3128				1	1
MASTER CONTROLLER ASSY; 2K/3K	**2**				**2**
Replace	**2**				**2**
3114	1				1
3230	1				1
SYSTEM; DOOR CONTROL (SIDE DOOR)		**2**	**1**		**3**
No Trouble Found		**2**	**1**		**3**
6042		1			1
6093			1		1
6173		1			1
Grand Total	**2**	**2**	**1**	**1**	**6**

Table 2– Reliability Engineering and Performance Evaluation Analysis of similar switch issues Jan 2022-Apr 2023.

Office of Systems Maintenance, Office of Radio Communications (COMR)

COMR inspected the Radio System and did not identify any issues.

Interview Findings

As part of the investigation launched into the event, SAFE interviewed the Train Operator. The interview identified the following key findings associated with this event. Findings detailed below include reported information from involved personnel and may conflict with other data sources contained in the report.

The Train Operator reported experiencing power issues on leaving the U Street Station. The Train Operator reported repeatedly recycling the package however the train eventually stopped. The Train Operator notified the Radio RTC of the train's loss of power via radio. The panel indicated a loss of an "All Doors Closed" Signal. The Radio RTC instructed the Train Operator to key down and perform a radio check before walking through the consist to check on the door status.

The Train Operator completed the key down and radio check and walked the consist. In Car 3128, doors 9 and 10 appeared open by an approximate 2-inch gap. The Train Operator confirmed with passengers in that car no one had appeared to exit the train. The passengers had been unaware of the gap in the doors. The Train Operator advised the emergency door pull did not appear to have been deployed. The Train Operator reset the doors from an adjacent car and notified the Radio RTC.

The Radio RTC instructed the Train Operator to proceed with a permissive block to Columbia Heights where the train passengers were offloaded. CMNT staff met the train at Columbia Heights platform. The Train Operator than proceeded to Greenbelt Yard and the entire consist was left for further inspection. The Train Operator then returned to service operating another consist.

Weather

On March 26, 2023, at the time of the incident, NOAA recorded the temperature as 51° F, with clear skies and winds at 10 mph. This event occurred within a tunneled section of the rail system. Weather was not a contributing factor in this incident. (Weather source: NOAA – Location: Washington, DC).

Related Rules and Procedures

SOP # 34 Defective Trains

Human Factors

Fatigue

Signs and Symptoms of Fatigue

We evaluated conditions at the time of the incident to distinguish whether evidence of fatigue was present. No video of the Train Operator was available to ascertain whether evidence of fatigue was present. Train Operator reported feeling fully alert at the time of the incident. Train Operator reported experiencing no symptoms of fatigue in the time leading up to the incident.

Fatigue Risk

We evaluated incident data for fatigue risk factors. Risk factors for fatigue were not present. The incident time of day did not suggest an increased risk of fatigue-related impairment. Train Operator reported keeping a regular sleep schedule in the days leading up to the incident. The employee worked day shifts in the days leading up to the incident. The employee was awake for 3 hours at the time of the incident. The employee reported 9 hours sleep duration in the 24 hours leading up to the incident. The off-duty period was 15.28 hours in duration which provides an opportunity for 7-9 hours of sleep. This was more than the employee's usual workday sleep durations. The employee reported no issues with sleep. The employee worked day shifts in the days leading up to the incident.

Post-Incident Toxicology Testing

Post-Incident Toxicology Testing was not conducted for this event.

Findings

- Train ID 507 experienced an intermittent loss of speed commands after departing U Street Station and reported repeatedly recycling their consist.
- After coming to a complete stop, the Train Operator reported a loss of All Doors Closed indication.
- On inspection, the Train Operator reported a gap between train doors 9 and 10 approximately two inches wide.
- Multiple door components were adjusted and replaced on doors 9 and 10 following a post-incident inspection.
- Including this event, there were three verified door failures of a similar nature since January 2022.

Immediate Mitigation to Prevent Recurrence

- The Train Operator performed a ground walk around.
- The Train Operator secured the train doors.
- The train was offloaded at Columbia Heights Station.
- The train was removed from service.

Probable Cause Statement

The probable cause of the Uncommanded Train Door event between U Street Station and Columbia Heights Station, track 1 on March 26, 2023, was a mechanical defect with rail car 3128 that led to the train losing an All Doors Closed indication.

Recommended Corrective Actions

Corrective Action Code	Description	Responsible Party	Estimated Completion Date
107412_SAFECAPS_CMNT_001	Repair/Replace failed components in car 3128 and evaluate frequency of failure type.	CMNT/REPA	Completed

Appendices

Appendix A – Interview Summary

*The below narratives summarize the incident and represent the statements made by the inv**olved individual. As such, times and details may present a conflict with the data contained in systems of record.***

RTRA

Train Operator

The Train Operator is a WMATA employee with six years of service and three months of experience as a Train Operator. The Train Operator holds a Roadway Worker Protection (RWP) Level 2 certification that expires in August 2023.

During the formal interview, the Train Operator stated that they reported experiencing traction issues on leaving the U Street Station. The Train Operator reported repeatedly recycling the package however the train eventually stopped. The Train Operator notified the Radio Rail Traffic Controller (RTC) of the train's loss of power via radio. The panel indicated a No "All Doors Closed" Signal. The Radio RTC instructed the Train Operator to key down and perform a radio check before walking through the consist to check on the door status.

The Train Operator completed the key down and radio check and walked the consist. The Train Operator stated that in car 3128, doors 9 and 10 appeared open by an approximate two-inch gap. The Train Operator confirmed with passengers in that car no one had appeared to exit the train. The passengers had been unaware of the gap in the doors. The Train Operator advised the emergency door pull did not appear to have been deployed. The Train Operator reset the doors from an adjacent car and notified the Radio RTC.

The Train Operator stated that the Radio RTC instructed the Train Operator to proceed with a permissive block to Columbia Heights where the train passengers were offloaded. CMNT staff met the train at Columbia Heights platform. The Train Operator then proceeded to Greenbelt Yard and the entire consist was left for further inspection. The Train Operator then returned to service operating another consist.

Appendix B – Maximo Work Orders

Washington Metropolitan Area Transit Authority
Maintenance and Material Management System
Work Order Details

Work Order #: 17762410
Type: CM

Status: COMP
03/29/2023 22:14

Work Description: REPORT DOOR # 9 OPENED WHILE MOVING, 14/7, E03, CMD, DOOR, 507
Job Plan Description:

Work Information

Asset: R3128	3128, RAIL CAR, BREDA, 3000 AC, A CAR	**Owning Office:** CMNT-CMNT-CMNT		**Parent:**	
Asset Tag: R3128		**Maintenance Office:** CMNT-GRBT-INSP		**Create Date:**	03/26/2023 09:24
Asset S/N: 3128		**Labor Group:**		**Actual Start:**	03/26/2023 09:26
Location: 1437	E99, GREENBELT YARD	**Crew:**		**Actual Comp:**	03/29/2023 22:14
Work Location: 1437	E99, GREENBELT YARD	**Lead:**		**Item:**	L18050002
Failure Class: CMNT014	DOOR	**GL Account:**	WMATA-02-33392-50499160-041-**********-*****-OPR**		
Problem Code: 2438	N/A CODE (DOOR SYSTEM)	**Supervisor:**	[redacted]	**Target Start:**	
Requested By:		**Requestor Phone:**		**Target Comp:**	
Chain Mark Start:		**Chain Mark End:**		**Scheduled Start:**	
Create-Mileage: 2685524.0		**Complete-Mileage:** 2685660.0			

Task IDs

Task ID						
10	IIT RECOMMENDATIONS COMPLIED WITH					
	COMPLIED WITH BTP:009 SUCCESSFULLY. INSPECT FOR LOOSE WIRING AND CONNECTION AROUND LDCU, GOOD. COMMUNICATION RE-ESTABLISHED SUBSYSTEMS WITH VMS AND PERFORMED DI.					
Component:	000-300-M00 SUBSYSTEM; DOOR CONTROL (SIDE DOOR); 2K/3K/6K/7K	**Work Accomp:** CHECKED	**Reason:** NO TROUBLE FOUND	**Status:** COMP	**Position:**	**Warranty?:** N
20	Followed iit suggestion to replace lock and close switches for door 10. Door fails with code 552 lock switch failure now. Probably just needs mechanical adjustment. NFW					
Component:	000-300-M03-002-009 LIMIT SWITCH; DOOR OPERATOR; 2K/3K/6K	**Work Accomp:** INSTALLED	**Reason:** INTERMITTENT	**Status:** COMP	**Position:** 213	**Warranty?:** N
30	SEE DETAILS ON D00R #10					
	S1 LIMIT SWITCH WAS INSTALLED IN THE WRONG POSITION, ADJUSTED S1 AND S4 LIMIT SWITH AND UPPER BUMP STOP .INSPECTED DOOR LEVERS,LIMITED SWITCHES ,DOOR BRAKE UNIT FOR CLEARANCE AS PER PI TASK 90 C INSPECTION . OPS CHECK GOOD .					
Component:	000-300-M03-002 DOOR OPERATOR ASSY; 2K/3K/6K	**Work Accomp:** ADJUSTED	**Reason:** INTERMITTENT	**Status:** COMP	**Position:** 10	**Warranty?:** N
40	PER TASK 100 PI PROCEDURE, PERFORM THE EMERGENCY SOLENOID CHECK WHILE TRAIN MOVE. ALL THE EMERGENCY DOOR CHECK GOOD. OPS CHECK GOOD.					
Component:	000-300-M05-001 EMERGENCY SOLENOID; EMERGENCY DOOR RELEASE; 2K/3K/6K	**Work Accomp:** TESTED	**Reason:** NO TROUBLE FOUND	**Status:** COMP	**Position:** 232	**Warranty?:** N
50	DOOR OBSTRUCTION AND PUSHBACK TEST					
	DOORS OBSTRUCTION AND PUSHBACK TEST PERFORMED PER PI TASK100 C INSPECTION 100.7. DOOR #10 STUCKED DURING PUSH BACK TEST.SUGGEST MECHANICS TO CHECK THE SPINDLE.NFW.					
Component:	000-300-B07-001 SIDE DOOR LEAF; 2K/3K/6K/7K	**Work Accomp:** CHECKED	**Reason:** INOPERATIVE	**Status:** COMP	**Position:** 10	**Warranty?:** N

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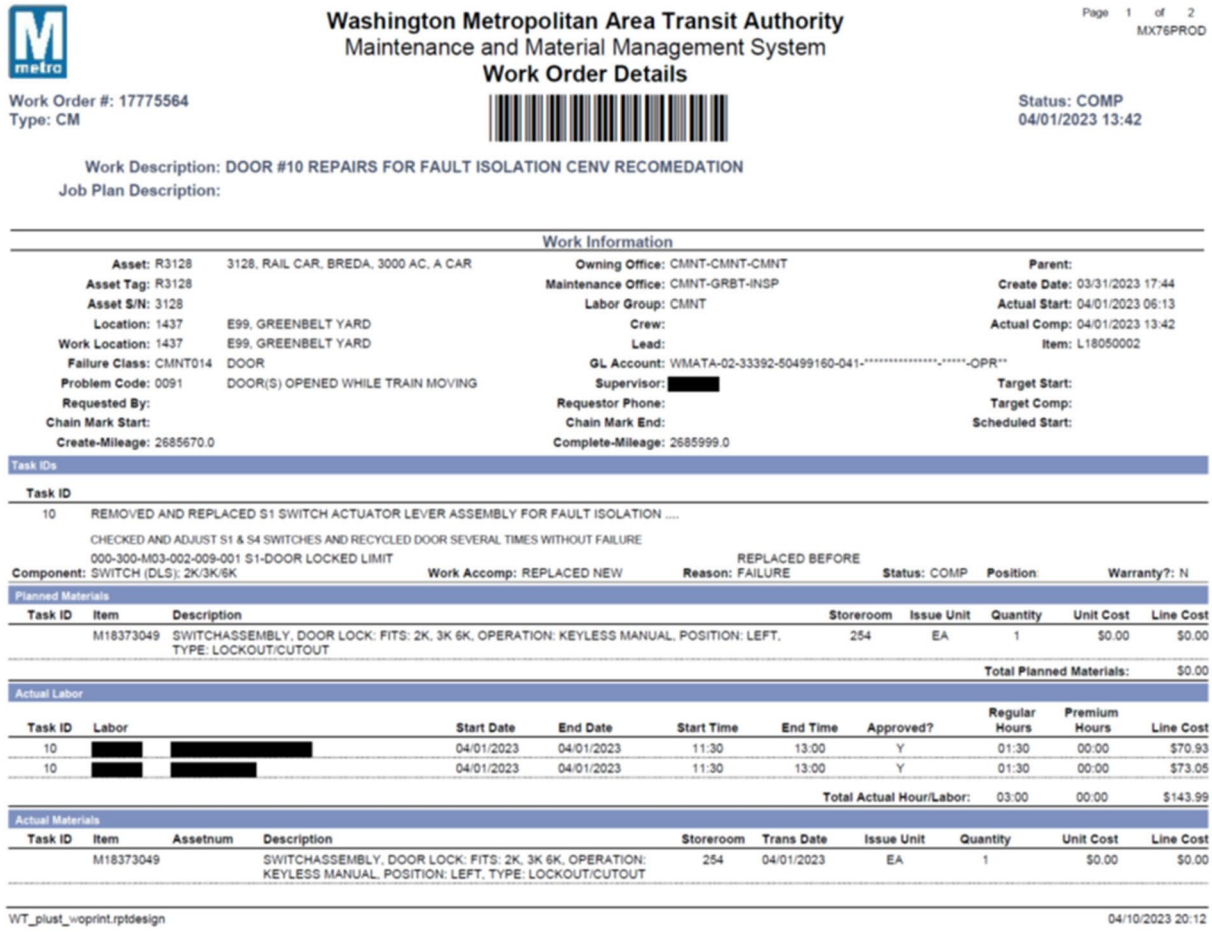

Washington Metropolitan Area Transit Authority
Maintenance and Material Management System
Work Order Details

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MX76PROD

Work Order #: 17775564
Type: CM

Status: COMP
04/01/2023 13:42

Work Description: DOOR #10 REPAIRS FOR FAULT ISOLATION CENV RECOMEDATION
Job Plan Description:

Work Information

Asset: R3128	3128, RAIL CAR, BREDA, 3000 AC, A CAR	**Owning Office:** CMNT-CMNT-CMNT		**Parent:**	
Asset Tag: R3128		**Maintenance Office:** CMNT-GRBT-INSP		**Create Date:**	03/31/2023 17:44
Asset S/N: 3128		**Labor Group:** CMNT		**Actual Start:**	04/01/2023 06:13
Location: 1437	E99, GREENBELT YARD	**Crew:**		**Actual Comp:**	04/01/2023 13:42
Work Location: 1437	E99, GREENBELT YARD	**Lead:**		**Item:**	L18050002
Failure Class: CMNT014	DOOR	**GL Account:**	WMATA-02-33392-50499160-041-**********-*****-OPR**		
Problem Code: 0091	DOOR(S) OPENED WHILE TRAIN MOVING	**Supervisor:**	[redacted]	**Target Start:**	
Requested By:		**Requestor Phone:**		**Target Comp:**	
Chain Mark Start:		**Chain Mark End:**		**Scheduled Start:**	
Create-Mileage: 2685670.0		**Complete-Mileage:**	2685999.0		

Task IDs

Task ID	
10	REMOVED AND REPLACED S1 SWITCH ACTUATOR LEVER ASSEMBLY FOR FAULT ISOLATION ....
	CHECKED AND ADJUST S1 & S4 SWITCHES AND RECYCLED DOOR SEVERAL TIMES WITHOUT FAILURE
	000-300-M03-002-009-001 S1-DOOR LOCKED LIMIT REPLACED BEFORE
Component:	SWITCH (DLS); 2K/3K/6K **Work Accomp:** REPLACED NEW **Reason:** FAILURE **Status:** COMP **Position:** **Warranty?:** N

Planned Materials

Task ID	Item	Description	Storeroom	Issue Unit	Quantity	Unit Cost	Line Cost
	M18373049	SWITCHASSEMBLY, DOOR LOCK: FITS: 2K, 3K 6K, OPERATION: KEYLESS MANUAL, POSITION: LEFT, TYPE: LOCKOUT/CUTOUT	254	EA	1	$0.00	$0.00
					Total Planned Materials:		$0.00

Actual Labor

Task ID	Labor		Start Date	End Date	Start Time	End Time	Approved?	Regular Hours	Premium Hours	Line Cost
10	[redacted]	[redacted]	04/01/2023	04/01/2023	11:30	13:00	Y	01:30	00:00	$70.93
10	[redacted]	[redacted]	04/01/2023	04/01/2023	11:30	13:00	Y	01:30	00:00	$73.05
							Total Actual Hour/Labor:	03:00	00:00	$143.99

Actual Materials

Task ID	Item	Assetnum	Description	Storeroom	Trans Date	Issue Unit	Quantity	Unit Cost	Line Cost
	M18373049		SWITCHASSEMBLY, DOOR LOCK: FITS: 2K, 3K 6K, OPERATION: KEYLESS MANUAL, POSITION: LEFT, TYPE: LOCKOUT/CUTOUT	254	04/01/2023	EA	1	$0.00	$0.00

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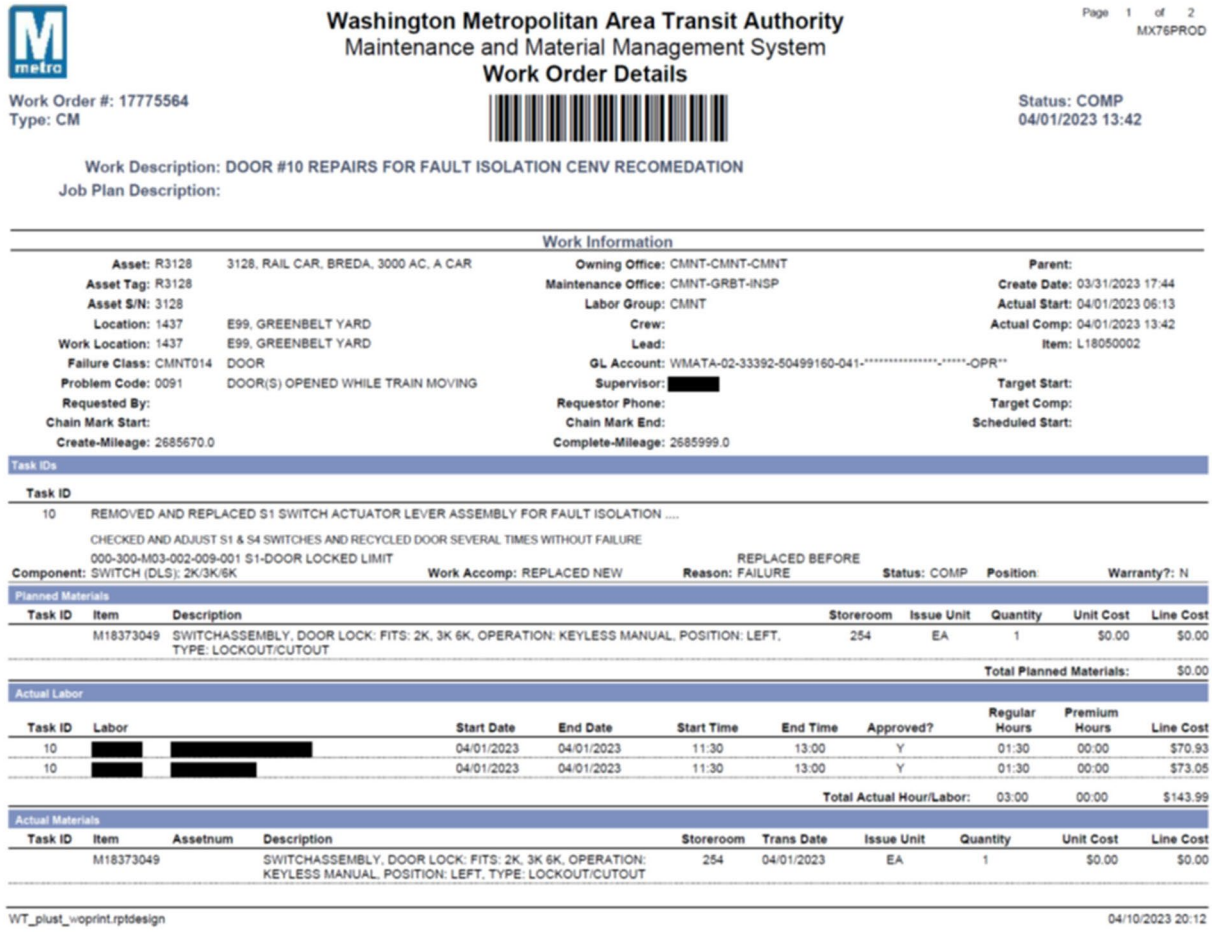

Washington Metropolitan Area Transit Authority
Maintenance and Material Management System
Work Order Details

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MX76PROD

Work Order #: 17775564
Type: CM

Status: COMP
04/01/2023 13:42

Work Description: DOOR #10 REPAIRS FOR FAULT ISOLATION CENV RECOMEDATION
Job Plan Description:

Work Information

Asset:	R3128 3128, RAIL CAR, BREDA, 3000 AC, A CAR	**Owning Office:**	CMNT-CMNT-CMNT	**Parent:**	
Asset Tag:	R3128	**Maintenance Office:**	CMNT-GRBT-INSP	**Create Date:**	03/31/2023 17:44
Asset S/N:	3128	**Labor Group:**	CMNT	**Actual Start:**	04/01/2023 06:13
Location:	1437 E99, GREENBELT YARD	**Crew:**		**Actual Comp:**	04/01/2023 13:42
Work Location:	1437 E99, GREENBELT YARD	**Lead:**		**Item:**	L18050002
Failure Class:	CMNT014 DOOR	**GL Account:**	WMATA-02-33392-50499160-041-**********-*****-OPR**		
Problem Code:	0091 DOOR(S) OPENED WHILE TRAIN MOVING	**Supervisor:**	[redacted]	**Target Start:**	
Requested By:		**Requestor Phone:**		**Target Comp:**	
Chain Mark Start:		**Chain Mark End:**		**Scheduled Start:**	
Create-Mileage:	2685670.0	**Complete-Mileage:**	2685999.0		

Task IDs

Task ID	
10	REMOVED AND REPLACED S1 SWITCH ACTUATOR LEVER ASSEMBLY FOR FAULT ISOLATION ....
	CHECKED AND ADJUST S1 & S4 SWITCHES AND RECYCLED DOOR SEVERAL TIMES WITHOUT FAILURE
	000-300-M03-002-009-001 S1-DOOR LOCKED LIMIT REPLACED BEFORE
Component:	SWITCH (DLS); 2K/3K/6K **Work Accomp:** REPLACED NEW **Reason:** FAILURE **Status:** COMP **Position:** **Warranty?:** N

Planned Materials

Task ID	Item	Description	Storeroom	Issue Unit	Quantity	Unit Cost	Line Cost
	M18373049	SWITCHASSEMBLY, DOOR LOCK: FITS: 2K, 3K 6K, OPERATION: KEYLESS MANUAL, POSITION: LEFT, TYPE: LOCKOUT/CUTOUT	254	EA	1	$0.00	$0.00
					Total Planned Materials:		$0.00

Actual Labor

Task ID	Labor		Start Date	End Date	Start Time	End Time	Approved?	Regular Hours	Premium Hours	Line Cost
10	[redacted]	[redacted]	04/01/2023	04/01/2023	11:30	13:00	Y	01:30	00:00	$70.93
10	[redacted]	[redacted]	04/01/2023	04/01/2023	11:30	13:00	Y	01:30	00:00	$73.05
							Total Actual Hour/Labor:	03:00	00:00	$143.99

Actual Materials

Task ID	Item	Assetnum	Description	Storeroom	Trans Date	Issue Unit	Quantity	Unit Cost	Line Cost
	M18373049		SWITCHASSEMBLY, DOOR LOCK: FITS: 2K, 3K 6K, OPERATION: KEYLESS MANUAL, POSITION: LEFT, TYPE: LOCKOUT/CUTOUT	254	04/01/2023	EA	1	$0.00	$0.00

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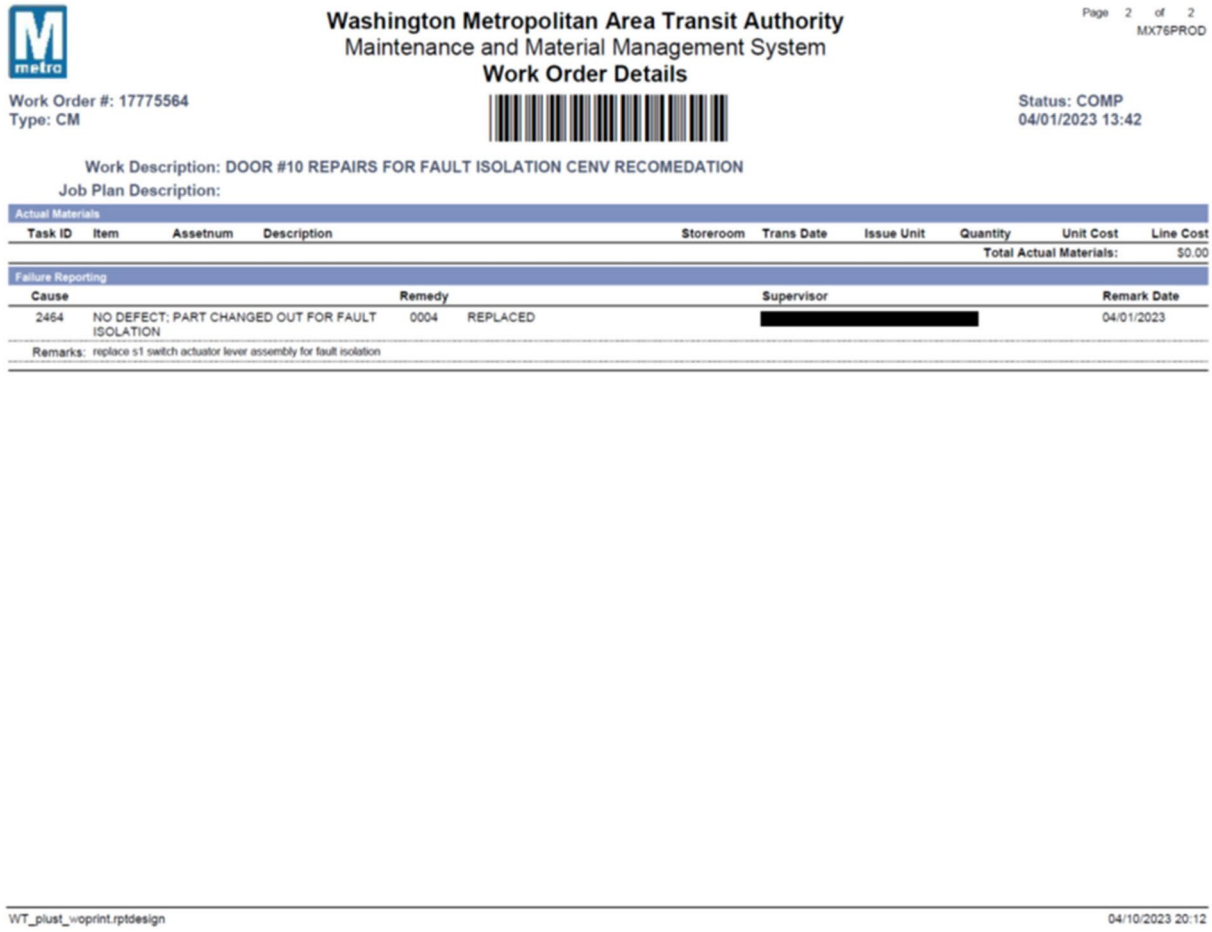

Washington Metropolitan Area Transit Authority
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Work Order Details

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MX76PROD

Work Order #: 17775564
Type: CM

Status: COMP
04/01/2023 13:42

Work Description: DOOR #10 REPAIRS FOR FAULT ISOLATION CENV RECOMEDATION
Job Plan Description:

Actual Materials

Task ID	Item	Assetnum	Description	Storeroom	Trans Date	Issue Unit	Quantity	Unit Cost	Line Cost
								Total Actual Materials:	$0.00

Failure Reporting

Cause		Remedy		Supervisor	Remark Date
2464	NO DEFECT; PART CHANGED OUT FOR FAULT ISOLATION	0004	REPLACED	[redacted]	04/01/2023

Remarks: replace s1 switch actuator lever assembly for fault isolation

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Appendix C – Why-Tree Analysis