

FINAL REPORT OF INVESTIGATION A&I E19188

April 16, 2019

Undesired uncoupling

W-0021

Adopted by the Washington Metrorail Safety Commission at its meeting on February 13, 2020.

Washington Metrorail Safety Commission
777 North Capitol Street, NE, Suite 402
Washington, DC 20002



FINAL REPORT OF INVESTIGATION A&I E19188

SMS 20190416#79241

Date of Event:	04/15/2019
Type of Event:	Undesired Uncoupling, O-19
Incident Time:	23:53 hrs.
Location:	Wiehle Reston (N06) Tail Track
Time and How received by SAFE:	01:36 hrs., On-call Phone
Safety Officer Response:	Yes
Time of Safety Officer Arrival:	01:30 hrs.
Time of Safety Officer Departure:	02:35 hrs.
Rail Vehicle:	Rail Cars (T3053.3052.3115- 3114.3100 -3101L)
Injuries:	None
Damage:	None
Emergency Responders:	SAFE, RTRA, CMNT

Executive Summary

On Monday, April 15, 2019 at 23:58 hrs., Rail Operations Control Center (ROCC) reported to SAFE that at approximately 23:53 hrs., non-revenue Train ID 702 experienced an Undesired Uncoupling on consist T3053.3052.3115-**3114.3100**-3101L between cars 3100 and 3114 in the Wiehle-Reston (N06) Terminal tail track.

The incident train, originally Train ID 602, just serviced the N06 station and offloaded customers as part of its scheduled last stop operation. The offloaded train was then operated into N06 tail track and the direction of travel was reversed inbound toward West Falls Church Yard (K99) with an out of service/non-revenue Train ID of 702.

Once the Train Operator (T/O) changed his operating position from the outbound to inbound cab and proceeded to N06 station (Track 1), two (2) cars (3100x3101) of the six (6) cars consist (T3053.3052.3115-**3114.3100**-3101L) uncoupled undesirably from the train, leaving behind the remaining four (4) cars in the N06 tail track.

Based on Vehicle Program (CENV) data it revealed the following information related Undesired Uncoupling Incident:

- The T/O keyed up car 3101, the brake pipe pressure dumped, the emergency brake was applied, and both cars 3114-3100 rotary switches changed from couple to uncouple position. The brake pipe pressure was recharged from lead car 3101 and start moving at about 10 mph, then stopped.
- The RH Electrical Coupler had moisture inside the pin box
- The FWD Train Line (T/L 15) was short circuited to the Uncouple Train Line (T/L 56), when T/L 15 was energized. This short circuit provided the positive feed path to the uncoupling solenoid valve.
- The negative path was provided when car 3101 was keyed up and the Brake Pipe Recharge button was depressed.
- When these two conditions were present, the uncoupling solenoid valve was activated and initiated the uncoupling.

Based on Interview and Audio Recording System (ARS) playback, The N06 Terminal Supervisor (T/S) stated, he first noticed only 2-cars of the 6-car train arriving on the platform from the tail track and immediately instructed the T/O to stop his train. ROCC was then notified of the incident.

Considering all the salient facts, SAFE concludes based on, ARS, CENV, CMNT data, SAFE is concurrence with CENV, The FWD T/L 15 was short circuited to the Uncouple Train Line (T/L 56), when T/L 15 was energized. This short circuit provided the positive feed path to the uncoupling solenoid valve. The negative path was provided when car 3101 was keyed up and the Brake Pipe Recharge button was depressed. When these two conditions were present, the uncoupling solenoid valve was activated and initiated the uncoupling. Moisture within the coupler pin box was identified during inspection and considered the main contributing factor to this incident

Notification

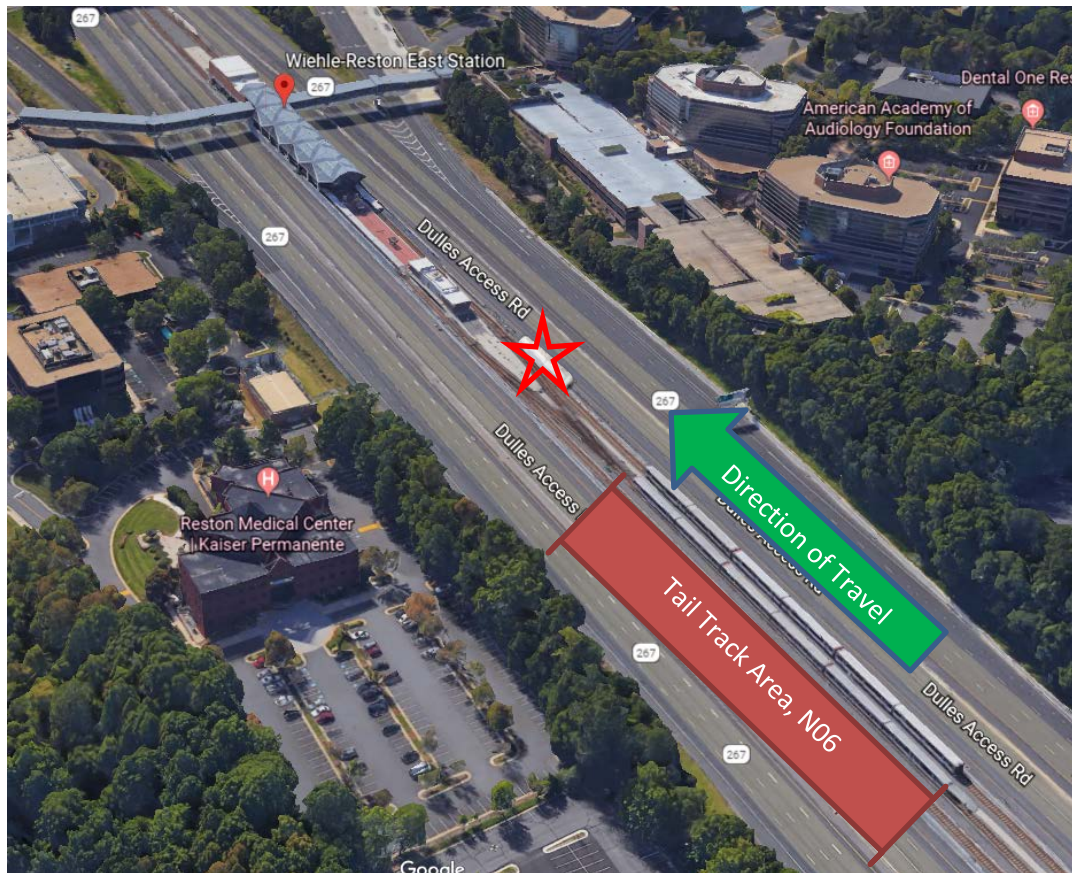
Title	Time	Comment:
FTA	01:43 hrs.	FWSO Email Notification
WMSC	01:43 hrs.	FWSO Email Notification

Incident Site

The incident area was located at N06 Tail Track. The area is described as a:

- Ballasted Track
- Approximately 634 feet inbound of N06 platform limits
- Blind Spot as defined in Roadway Access Guide

Field Sketch/Schematics



Investigation

Vehicle Program Services (CENV)

Based on CENV's investigative reported, the FWD Train Line (T/L 15) was short circuited to the Uncouple Train Line (T/L 56), when T/L 15 was energized. This short circuit provided the positive feed path to the uncoupling solenoid valve. The negative path was provided when car 3101 was keyed up and the Brake Pipe Recharge button was depressed. When these two conditions were present, the uncoupling solenoid valve was activated and initiated the uncoupling. CENV successfully simulated the incident, by short circuiting the FWD T/L 15 to the Uncouple T/L 56 and depressing the Brake Pipe Recharge button, thereby confirming the root cause. It must be noted, that based on the VMS data, the reason for the de-energization of the Emergency Brake trainline (T/L 82) was likely caused by T/O manipulation of the Master Controller. The short circuit condition was no longer present after the undesired uncoupling incident. Refer to attachment 1 pages 1-11.

Office of Car Maintenance (CMNT)

CMNT personnel removed and replaced mechanical coupler, electrical coupler, S1 switch and other related components on Car 3114 and 3100. Refer to attachment 2 page 1-3 and attachment 3 page 1-4.

Communication Section (COMM)

COMM technicians reported to N06 and replaced the old Yagi antenna on the blockhouse with an Omni directional antenna to improve radio communications, all radio checks were loud and clear.

Human Factors

Post-Incident Testing

After reviewing the T/O's post-incident testing results, it was determined that the T/O was not in violation of the Drug and Alcohol Policy and Testing Program 7.7.3/5, therefore, being under the influence of a controlled substance has been excluded as a contributing factor.

Based on SAFE review of employee's 30-day work history, it was determined, employee hours of service were in accordance with WMATA's *Fatigue Risk Management Policy 10.6* and *Hours of Service Limitations for Prevention of Fatigue Policy 10.7*

Weather

At the time of the incident, the temperature was 65°F, and SAFE has concluded that weather was not a contributing factor in this incident (Weather source: National Oceanic Atmospheric Administration (NOAA) – Location: Washington, DC.)

Findings

- The T/O keyed up car 3101, the brake pipe pressure dumped, the emergency brake was applied, and both cars 3114-3100 rotary switches changed from couple to uncouple position. The brake pipe pressure was recharged from lead car 3101 and start moving at about 10 mph, then stopped.
- The RH Electrical Coupler had moisture inside the pin box resulting in corrosion and flashed T/L pin
- The FWD T/L 15 was short circuited to the Uncouple Train Line (T/L 56), when T/L 15 was energized. This short circuit provided the positive feed path to the uncoupling solenoid valve.
- Moisture and corrosion identified in the coupler pin box during inspection

Conclusion

Based on salient facts as part of this investigation, ARS, CENV, CMNT data, SAFE is concurrence with CENV, The FWD T/L 15 was short circuited to the Uncouple Train Line (T/L 56), when T/L 15 was energized. This short circuit provided the positive feed path to the uncoupling solenoid valve. The negative path was provided when car 3101 was keyed up and the Brake Pipe Recharge button was depressed. When these two conditions were present, the uncoupling solenoid valve was activated and initiated the uncoupling.

SAFE further concludes, moisture and corrosion identified within the coupler pin box during CENV inspection was considered as a contributing factor to this incident.

SAFE has no additional information regarding E19188 and recommends its closure.

Immediate Mitigation to Prevent Recurrence

- The affected consist (T3053.3052.3115-3114.3100-3101L) was removed from service and transported to K99 for post-incident inspection and subsequent VMS download/analysis
- RTRA removed the T/O from service for post-incident testing
- CENV downloaded VMS data from all affected cars within the consist for analyzation
- CMNT will perform testing, inspection of car 3101, and 3114 and will perform the necessary repairs to prevent reoccurrence of similar event see table below:

Car Number	Component	Action Taken
3101	Master Controller	The original Master Controller was removed, send to the Overhaul Shop to be bench tested. The MC was disassembled for internal inspection of the components and connections, no discrepancies were found
3101	Left and Right Electrical Coupler brackets	The left and Right Electrical Coupler Brackets were inspected for proper alignment, no discrepancies found
Car Number	Component	Action Taken
3101	Right Electrical Coupler Assembly	The Right Electrical Coupler Assembly was inspected and found wet gasket and

		moisture inside the assembly, the defective Electrical Coupler Assembly was replaced
3101	Right Electrical Coupler Assembly	The Right Electrical Coupler Assembly was inspected, no discrepancies found
3101	Left and Right Electrical Coupler assemblies	Left and Right Electrical Coupler were replaced per CENV recommendations
3114	Left and Right Electrical Coupler brackets	The left and Right Electrical Coupler Brackets were inspected for proper alignment, no discrepancies found
3114	Left Electrical Coupler Assembly	The Left Electrical Coupler Assembly was inspected, no discrepancies found
3114	Front Mechanical Coupler	The Front Mechanical Coupler was inspected and verified, Go and No-Go gauge limits were within specifications The Hook tension was tested at 35 lbs.
3114	Left and Right Electrical Coupler assemblies	Left and Right Electrical Coupler were replaced per CENV recommendations

- All the necessary inspections and repairs were completed on May 7, 2019 (refer to attachments 2 and 3).

Proposed Corrective Action Plan

1. CMNT shall perform a onetime post Preventative Maintenance Inspection audit of the inspection process to ensure compliance with 2K, 3K, and 6K Periodic "C" Inspection Manual Section 30 Subsection 30.10 **(Completed 10/28/2019)**

Attachments



Washington Metropolitan Area Transit Authority

CENV

Incident Report

Wiehle-Reston Undesired Uncoupling

April 15, 2019

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Attachment 1 – CENV investigative report page 1 of 11



Washington Area Metropolitan Transit Authority

Incident Summary Report

Table of Contents

Investigation Team Members	3
Executive Summary	4
Investigation.....	4
VMS Analysis.....	7
Overhaul Shop Inspection and Testing	8
Additional Findings.....	8
Actions Taken/Recommendations	10
Conclusion.....	11

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Attachment 1 – CENV investigative report page 2 of 11

LOCATION: Wiehle-Reston Station
INCIDENT #: 14972324 & 14972325
DATE: 04/15/2019
TIME: 11:45 PM

Investigation Team Members



Rail Vehicle Engineer - CENV
Rail Vehicle Engineer – CENV
Rail Vehicle Engineer - CMNT
[Redacted] Rail Vehicle Engineering - CENV

Report Prepared By:



Report Approved By:



Page 3 of 11

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Attachment 1 – CENV investigative report page 3 of 11

Executive Summary

On April 15, 2019; at approximately 11:45 p.m., revenue Train ID # 702 (L3101-3100 x 3014-3015 x 3053-3052T) serviced the Wiehle-Reston Station (on track 2) with lead car 3053. The empty train, then crossed over the interlocking into pocket track 3 and came to a stop. The Train Operator reversed ends, keyed up car 3101, crossed back over the interlock onto track 1, and headed inbound. Cars 3101-3100 continued through the Wiehle-Reston station (N06), and came to stop, with car 3100 approximately 40 ft. beyond the end of the platform, prior to entering the ATC mainline area. Cars 3114-15 x 3052-53 remained behind in the pocket track. The undesired uncoupling took place between cars 3100 and 3114, in the pocket track near CM1087+00.

CMNT, SAFE, RTRA and CENV responded to the incident.

The root cause of the undesired uncoupling was not apparent from the initial observations. After the on-site inspection was completed, the cars were recoupled in their original configuration and a rolling/brake test was performed. Train consist was then transported to the West Falls Church yard, at a speed of 15 mph, with car 3101 in the lead.

VMS data was downloaded and analyzed (see page 6 for results of the analysis). The on-car inspection/testing of the Front couplers (of cars 3100 & 3114) began the afternoon of 4/15 and was completed on 4/19. The front couplers were then removed from the cars and sent to the Greenbelt MRO shop for additional inspection.

Based on the investigation, it was determined that the root cause of the undesired uncouple, was the result of two conditions... 1) the 'Uncouple' signal being short circuited to another signal and 2) the activation of the Brake Pipe Recharge button on car 3101. When these two conditions were present, the uncoupling solenoid valve was activated and initiated the uncoupling.

Investigation

Upon notification, CENV responded to the incident.

An overview of steps performed during CENV investigation is listed below:

- 1- Visual inspection of Front Couplers (Electrical & Mechanical portions). See Figures 1.
- 2- Downloaded the Vehicle Monitoring System data from all the cars of the train consist for analysis.
- 3- Verification of Electric coupler head pin alignment (visual inspection).
- 4- Inspected & Tested Solenoid valves of Uncouple switch, Airline Couple, KAS1 Rotary Switch Coupling Hook to ensure correct functionality. During testing of the KAS1 rotary switch (on car 3114), it was noticed that the valve rotor would consistently get stuck in between the Couple & Uncouple positions. See Figure 2.
- 5- Visual inspection of electrical terminal connections of the Solenoid Valves (Uncouple, Couple, Rotary switch, Coupler hook).
- 6- Successfully verified functionality of Couple/uncouple circuit diodes.
- 7- Successfully verified activation status of Uncouple/Couple Train Lines.

Page 4 of 11

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Attachment 1 – CENV investigative report page 4 of 11

- 8- Visual inspection Cab Bus Relay.
- 9- Visual inspection of Time Delay Couple Relay.
- 10-Performed analysis of Uncouple/Couple Trainline circuit. Inspected and tested trainline and electrical components. Trainlines functioned as expected, no problems found.
- 11-Checked couplers hook spring force (Spring force of Car 3114 measured 35lbs (approximately 3lbs below specified force).
- 12-With train in its original configuration, performed static & dynamic yard tests to simulate incident. No discrepancies observed.
- 13-In the yard track, performed pull test with couplers hooks of cars 3114 and 3100 fully engaged and partially engaged. Successfully confirmed integrity of couplers hooks.
- 14-CENV simulated the incident by providing short between pins 2-33 (FWD-REV TL) and 2-37 (Uncouple TL), then keyed up car 3101 and pushed the recharged button (See Figure 3).

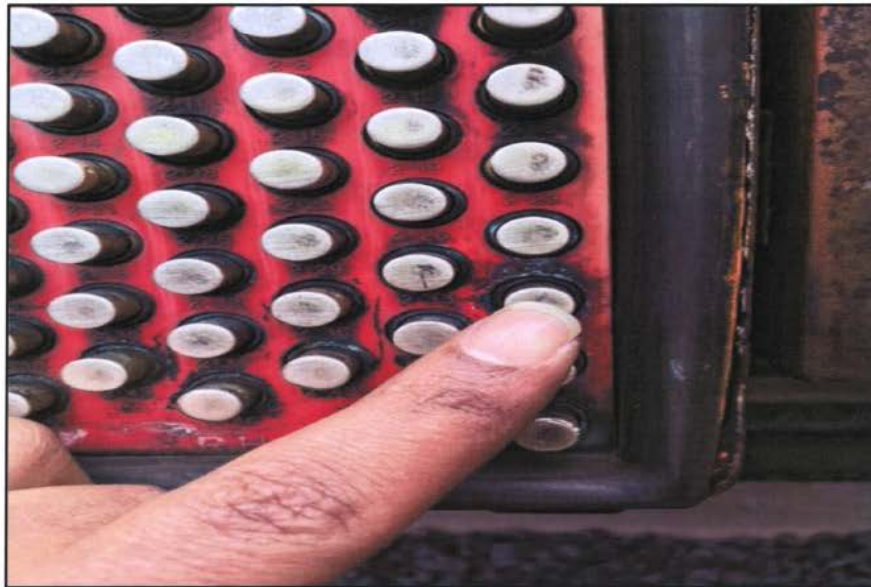


Figure 1. Car 3100 TL 56 Uncouple Pin

Coupler pin 2-37 (T/L 56 uncouple), of the right-hand coupler on Car 3100, showed signs of humidity and corrosion.



Figure 2. Car 3114 KAS 1 Rotary Switch

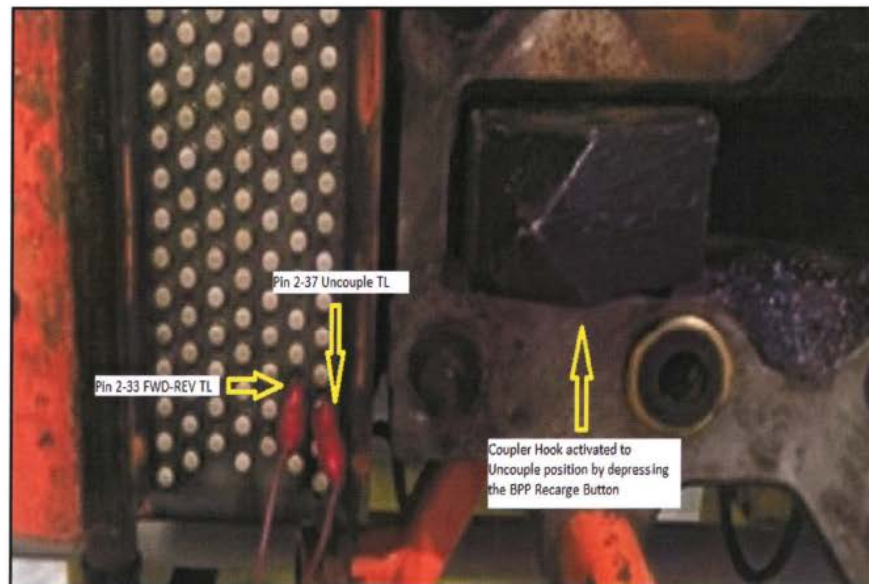


Figure 3. Short circuit, between Pin 2-33 and Pin 2-37, simulation

VMS Analysis

The VMS data shows that cars 3100 and 3114 had previously been electrically uncoupled. This occurred two times, while in the West Falls Church yard, the night before the main line incident.

At the time of the main line incident, car 3101 was keyed up and the train length indicated a 6 car consist. The reverse and uncouple TLs (of car 3100) dropped momentarily, followed by the release of the MC Deadman and de-energization of the Emergency Brake TL (82), which caused the Brake Pipe to drop to 0 PSI.

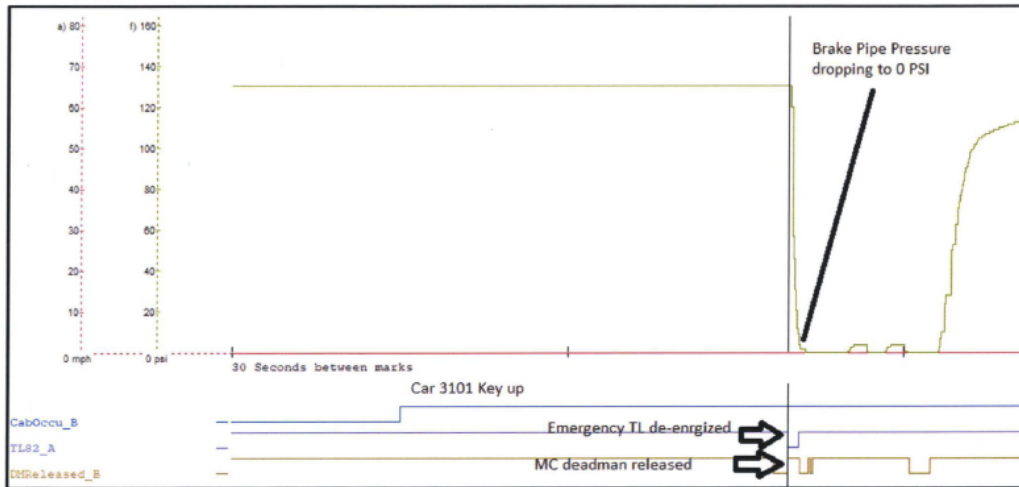


Figure 4. BPP dumping to 0 PSI

Consequently, the Brake Pipe recharge button was depressed (from lead car 3101) and the KAS1 rotary switches of cars 3100 and 3114 moved to the uncoupled position. The Master Controller, from lead car 3101, was then commanded to the P5 rate and the train began to move toward the Wiehle-Reston station platform.

Once the train started to move, the cars were separated, and the train length changed from 6 cars to 2 cars. Approximately 2.5 minutes after the undesired uncouple, cars 3101-00 stopped just beyond the Wiehle-Reston station.

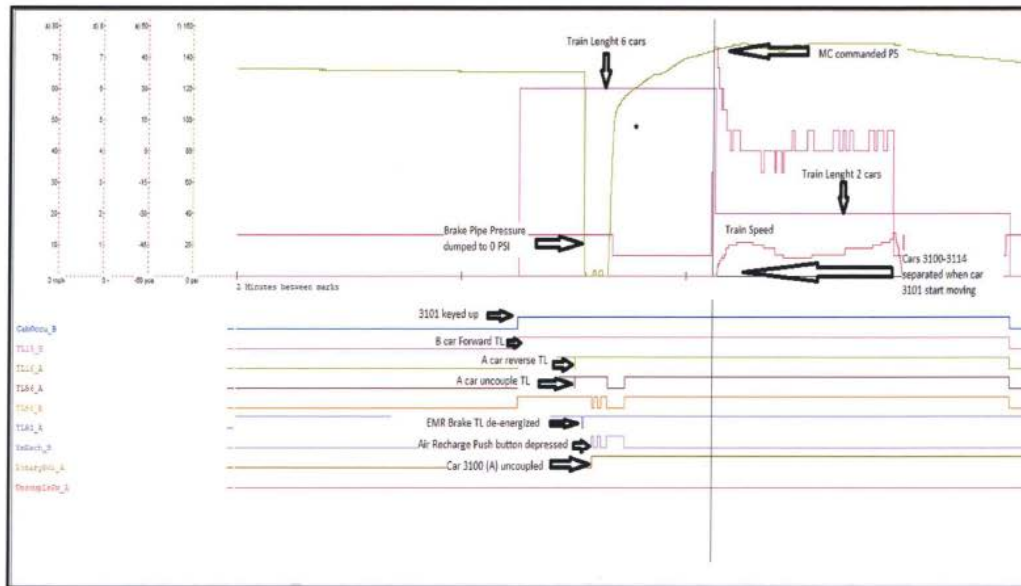


Figure 5. VMS Graph Analysis

Overhaul Shop Inspection and Testing

Additional Findings

Car 3100

The original Master Controller was tested on the bench tester. All handle positions and dead man switch operated correctly. Auto/Store, FWD-manual and REV-manual selector switch responded properly in each position.

Disassembled MC from car 3101 for internal inspection of components and connections, no discrepancies were found. Re-assembled MC and successfully tested on the BTE.

Verified that the RH and LH Electrical Couplers pins and mounting bracket alignments were within specification.

Removed RH Electrical Coupler contact housing for inspection and found wet gasket and moisture inside the coupler pin box. The bottom pins were corroded with signs of flashing (see figure 4).

Removed side cover of LH electrical cover for inspection, the pins were dry with no signs of corrosion. The wire terminals were tight and isolated.

Page 8 of 11

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Attachment 1 – CENV investigative report page 8 of 11

The hook height and width check OK. The hook tension measured 39 lbs. (Spec = 38-44lbs). Inspected guide pins and bushings with no anomalies found.



Additional Pertinent Information:

On Sunday, April 14, 2019 (the night before the mainline incident), a CMNT supervisor reported to the West Falls Tower Interlocking Operator that cars 3114 & 3100 were not fully coupled. Specifically, the cars were mechanically engaged, but electrically isolated. The Interlocking Operator requested the cars to be uncoupled and re-coupled. Once completed, the Yard Train Operator confirmed good train line connections, along with normal operation of the train consist.

NOTE: Based on VMS data, the two conditions (FWD T/L short circuited to the Uncouple T/L and activation of Brake Pipe Recharge button) required for an unintended activation of the Uncoupling solenoid valve to occur, were also present during the events mentioned above.

NOTE: Train ID 702 had been in revenue service, since 5 am on 4/15/19.

NOTE: Both cars (3100 and 3114) had Periodic Inspections performed in March of 2019.

Actions Taken/Recommendations

- Replaced both electrical and mechanical F-end couplers on cars 3100 and 3114.
- Replaced master controller on lead car 3101.
- Inspected and repaired the KAS1 rotary switch from car 3114.
- The MC from car 3101 was overhauled, cleaned and lubricated. This asset can be used as a spare part or be reinstalled on the car.
- The RH electrical coupler from car 3100 must be overhauled. The remaining electrical couplers (from 3100 and 3114) must be cleaned before reinstallation on the cars.
- Performed hook tension adjustment on the front-end mechanical coupler (car 3114).

NOTE: Inspection revealed that the front-end mechanical couplers are good for use.

Once all tasks have been completed by CMNT and the removed parts have been replaced (and/or re-installed), CENV recommends that cars 3114 and 3100 be coupled, and a yard test performed. Yard test shall include depressing the recharge push button from both end cars along with the confirmation of good coupling.

Conclusion

Based on the data analysis and the results of the investigation, the root cause of the incident is as follows:

The FWD Train Line (T/L15) was short circuited to the Uncouple Train Line (T/L 56), when T/L 15 was energized. This short circuit provided the positive feed path to the uncoupling solenoid valve.

The negative path was provided when car 3101 was keyed up and the Brake Pipe Recharge button was depressed.

When these two conditions were present, the uncoupling solenoid valve was activated and initiated the uncoupling. CENV successfully simulated the incident, by short circuiting the FWD TL to the Uncouple TL and depressing the Brake Pipe Recharge button, thereby confirming the root cause. It must be noted, that based on the VMS data, the reason for the de-energization of the Emergency Brake trainline (T/L 82) was likely caused by train operator manipulation of the Master Controller.

The short circuit condition was no longer present after the undesired uncoupling incident.

Page 11 of 11

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Attachment 1 – CENV investigative report page 11 of 11



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

Page 1 of 3
MX76PROD

Work Order #: 14972325
Type: CM



Status: COMP
05/07/2019 13:33

Work Description: REPORT OF UNDESIREDCOUPLING (3114> <3100), 0/0, N06, CMD, CUPL, 702

Job Plan Description:

3053-3052.3115-3114.3100-3101

Work Information						
Asset: R3114	3114, RAIL CAR, BRED A, 3000 AC, A CAR	Owning Office: CMNT-CMNT-CMNT	Parent:			
Asset Tag: R3114		Maintenance Office: CMNT-WFCH-INSP	Create Date: 04/16/2019 04:48			
Asset S/N: 3114		Labor Group: CMNT	Actual Start: 04/16/2019 04:51			
Location: 2494	K99, WEST FALLS CHURCH YARD	Crew:	Actual Comp: 05/07/2019 13:33			
Work Location: SHOP551	GREENBELT TRUCK SHOP	Lead:	Item: L18050002			
Failure Class: CMNT012	COUPLER	GL Account: WMATA-02-33370-50499160-041-*****-OPR**	Target Start:			
Problem Code: 3303	UNDESIREDCOUPLING	Supervisor: [REDACTED]	Target Comp:			
Requested By:		Requestor Phone: [REDACTED]	Scheduled Start:			
Chain Mark Start:		Chain Mark End:				
Create-Mileage: 2217496.0		Complete-Mileage: 2217598.0				
Task IDs						
Task ID						
10	INSPECTED FRONT COUPLE FOR DAMAGE, NONE FOUND. COUPLED 3100 BACK TO 3114 THEN TRANSPORT BACK TO WFC RAILYARD. NO PROBLEMS FOUND DURING TRANSPORT. CARS STAYED COUPLED DURING TRANSPORT. COUPLER THROAT SHOW SIGNS OF WEAR					
Component:	FRONT; 2K/3K	Work Accomplished:	INSPECTED	Reason:	INCIDENT//ACCIDENT	Status: COMP Position: 1 Warranty?: N
20	REMOVE FRONT COUPLER REMOVED FRONT COUPLER S/N: 180801 (AST# 436483). FRONT COUPLER WRAPPED, LABELED AND MOVED TO ANNEX FOR FURTHER INSEPCION BY MR. ARAUJO AND ENGINEERING.					
Component:	FRONT; 2K/3K	Work Accomplished:	REMOVED	Reason:	INCIDENT//ACCIDENT	Status: COMP Position: 213 Warranty?: N
30	INSTALL FRONT COUPLER INSTALLED FRONT COUPLER S/N: 319 (AST# 436525). TORQUED ALL BOLTS TO SPECS. MADE SURE EVERYTHING WAS INSTALLED PROPERLY.					
Component:	FRONT; 2K/3K	Work Accomplished:	INSTALLED	Reason:	INCIDENT//ACCIDENT	Status: COMP Position: 213 Warranty?: N
40	LH/RH ELECTRICAL COUPLERS REMOVED. INSTALLED RIGHT AND LEFT ELECTRICAL COUPLERS TO THE COUPLER. SEE DETAILS. CLEET BLOCKS NEED TO BE INSTALLED, HARDWARE NEEDS TO BE OBTAINED, AND THE ELECTRICAL COUPLERS NEED TO BE PLUGGED IN AND SECURED TO SOCKETS. HAD TO FIND AND/OR MAKE SOME HARDWARE.					
Component:	GROUP; (FRONT END)	Work Accomplished:	INSTALLED	Reason:	NO TROUBLE FOUND	Status: COMP Position: Warranty?: N
50	CONNECTED, SECURED, AND SAFETY WIRED CANNON PLUGS OF THE ELECTRICAL COUPLERS. PLUGGED IN COUPLER CANNON PLUGS, SECURED, AND SAFETY WIRED. OBTAINED HARDWARE TO CONNECT ALL THE ASSOCIATED CLEET BLOCKS AND BRACKETS SUPPORTING THE WIRE LOOMS OF THE RIGHT AND LEFT ELECTRICAL COUPLERS. REINSTALLED THE TWO ANTENNA. OPS CHECK GOOD.					
Component:	GROUP; (FRONT END)	Work Accomplished:	INSTALLED	Reason:	NO TROUBLE FOUND	Status: COMP Position: Warranty?: N
WT_plust_woprnt.rptdesign						
05/9/2019 20:09						

Attachment 2 – CMNT repair work-order for car 3114 page 1 of 3



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

Page 2 of 3
MX76PROD

Work Order #: 14972325
Type: CM



Status: COMP
05/07/2019 13:33

Work Description: REPORT OF UNDESIREDCOUPLING (3114> <3100), 0/0, N06, CMD, CUPL, 702

Job Plan Description:

Planned Materials						
Task ID	Item	Description	Storeroom	Issue Unit	Quantity	
	L18363080	SHIM:TAIL EYE,2K, 3K,MECHANICAL COUPLER	200	EA	2	
	A18357046	CLAMP, CONDUIT: PMA STACKABLE, SIZE 48, FITS: ALSTOM 2K 3K 6K	251	EA	5	
	L18363087	SCREW:CAP, HEX HD, 1-1/4-7 UNC, STL, ZINC PLD	200	EA	7	
	L18363011	SEAL:2K, 3K,CAR	251	EA	2	
					Total Planned Materials:	

Actual Labor									
Task ID	Labor	Start Date	End Date	Start Time	End Time	Approved?	Regular Hours	Premium Hours	
10		04/16/2019	04/16/2019	00:00	02:00	Y	02:00	00:00	
10		04/16/2019	04/16/2019	00:00	02:00	Y	02:00	00:00	
20		04/22/2019	04/22/2019	15:00	19:00	Y	04:00	00:00	
20		04/22/2019	04/22/2019	15:00	19:00	Y	04:00	00:00	
20		04/22/2019	04/22/2019	15:00	19:00	Y	04:00	00:00	
30		04/23/2019	04/23/2019	08:00	11:00	Y	03:00	00:00	
30		04/22/2019	04/22/2019	19:00	23:00	Y	04:00	00:00	
30		04/22/2019	04/22/2019	19:00	23:00	Y	04:00	00:00	
30		04/22/2019	04/22/2019	19:00	23:00	Y	04:00	00:00	
30		04/23/2019	04/23/2019	08:00	11:00	Y	03:00	00:00	
40		05/01/2019	05/01/2019	07:00	14:30	Y	07:30	00:00	
40		05/01/2019	05/01/2019	07:00	14:30	Y	07:30	00:00	
50		05/02/2019	05/02/2019	09:00	14:30	Y	05:30	00:00	
50		05/02/2019	05/02/2019	09:00	14:30	Y	05:30	00:00	
							Total Actual Hour/Labor:	60:00	00:00

Actual Materials						
Task ID	Item	Assetnum	Description	Storeroom	Trans Date	Issue Unit
	L18363011		SEAL:2K, 3K,CAR	251	04/22/2019	EA
	L18363087		SCREW:CAP, HEX HD, 1-1/4-7 UNC, STL, ZINC PLD	200	04/22/2019	EA
	M18363073		CONNECTOR,ELECTRICAL:LEFT HAND,2K, 3K,CAR	251	05/06/2019	EA
	L18363080		SHIM:TAIL EYE,2K, 3K,MECHANICAL COUPLER	200	04/22/2019	EA
	M18363076	436525	COUPLER:FRONT MECHANICAL,2K, 3K	559	04/22/2019	EA
	A18357046		CLAMP, CONDUIT: PMA STACKABLE, SIZE 48, FITS: ALSTOM 2K 3K 6K	251	05/03/2019	EA

WT_plust_woprnt.rptdesign

05/9/2019 20:09

Attachment 2 – CMNT repair work-order for car 3114 page 2 of 3



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

Page 3 of 3
MX76PROD

Work Order #: 14972325
Type: CM



Status: COMP
05/07/2019 13:33

Work Description: REPORT OF UNDESIREDCOUPLING (3114> <3100), 0/0, N06, CMD, CUPL, 702

Job Plan Description:

Actual Materials									
Task ID	Item	Assetnum	Description	Storeroom	Trans Date	Issue Unit	Quantity		
	L18363087		SCREW:CAP, HEX HD, 1-1/4-7 UNC, STL, ZINC PLD	200	04/22/2019	EA	7		
	M18363074		CONNECTOR,ELECTRICAL:RIGHT HAND,2K, 3K,CAR	259	05/06/2019	EA	1		
								Total Actual Materials:	
Related Incidents									
Ticket	Description			Class	Status		Relationship		
8410662	REPORT OF UNDESIREDCOUPLING (3114> <3100), 0/0, N06, CMD, CUPL, 702			SR	PENDING		ORIGINATOR		
Failure Reporting									
Cause	Remedy			Supervisor			Remark Date		
2509	NOT APPARENT AT THIS LEVEL OF MAINTENANCE			0004	REPLACED		05/07/2019		
Remarks: REMOVED AND REPLACED ELECTRIC COUPLER FACES AND MECHANIC COUPLER. AS RECOMMENDED BY CENV									

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Attachment 2 – CMNT repair work-order for car 3114 page 3 of 3

Date: 04/15/2019 Time 23:53 hrs.
Final Report – Undesired Uncoupling
E19188

Drafted By: SAFE 704 – 08/20/2019
Reviewed By: SAFE 701 – 08/21/2019
Approved By: SAFE 70 – 08/21/2019

Page 20



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

Page 1 of 4
MX76PROD

Work Order #: 14972324
Type: CM



Status: COMP
05/07/2019 13:38

Work Description: REPORT OF UNDESIREDCOUPPLING (3114> <3100), 0/0, N06, CMD, CUPL, 702

Job Plan Description:

3053-3052.3115-3114.3100-3101

Task IDs						
Task ID						
10	INSPECTED FRONT COUPLER FOR DAMAGE, NONE FOUND. COUPLED 3100 BACK TO 3114 THEN TRANSPORT BACK TO WFC RAILYARD. NO PROBLEMS FOUND DURING TRANSPORT.					
Component:	000-300-L03-001 MECHANICAL COUPLER ASSY; FRONT; 2K/3K	Work Accomp:	INSPECTED	Reason:	INCIDENT//ACCIDENT	Status: COMP
20	SEE DETAILS: IN SHOP, ENGINEERING AND CMNT CHECKED DUPLEX VALVES, GOOD. CHECKED TDR, SWAPPED WITH OTHER END, GOOD. SWAPPED BACK TO ORIG. FOUND KAS1 ROTARY SWITCH VERY STIFF TO MANUALLY THROW. NEEDS MORE WORK.					
Component:	000-300-L01 COUPLER: ELECTRICAL COUPLING GROUP; (FRONT END)	Work Accomp:	CHECKED	Reason:	INTERMITTENT	Status: COMP
30	REMOVE FRONT COUPLER REMOVED FRONT COUPLER S/N: 180702 (AST# 403490). FRONT COUPLER WRAPPED, LABELED AND MOVED TO ANNEX FOR FURTHER INSEPCION BY MR. ARAUJO AND ENGINEERING.					
Component:	000-300-L03-001 MECHANICAL COUPLER ASSY; FRONT; 2K/3K	Work Accomp:	REMOVED	Reason:	INCIDENT//ACCIDENT	Status: COMP
40	INSTALL FRONT COUPLER INSTALLED FRONT COUPLER S/N: 380802 (AST# 403561). TORQUED ALL BOLTS TO SPECS.					
Component:	000-300-L03-001 MECHANICAL COUPLER ASSY; FRONT; 2K/3K	Work Accomp:	INSTALLED	Reason:	INCIDENT//ACCIDENT	Status: COMP
50	LHRH ELECTRICAL COUPLERS REMOVED.					
Component:	000-300-L01 COUPLER: ELECTRICAL COUPLING GROUP; (FRONT END)	Work Accomp:	REMOVED	Reason:	INCIDENT//ACCIDENT	Status: COMP
60	FABRICATE AND MODIFY PARTS Machine Shop general labor					

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Attachment 3 – CMNT repair work-order for car 3100 page 1 of 4



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

Page 2 of 4
MX76PROD

Work Order #: 14972324
Type: CM



Status: COMP
05/07/2019 13:38

Work Description: REPORT OF UNDESIREDCOUPLING (3114> <3100), 0/0, N06, CMD, CUPL, 702
Job Plan Description:

Task IDs									
Task ID									
Component:	000-300-L03-001 MECHANICAL COUPLER ASSY; FRONT; 2K/3K	Work Accomp:	FABRICATED	Reason:	MISSING	Status:	COMP	Position:	Warranty?: N
70	INSTALLED LH/RH ELECTRICAL COUPLERS. Installed RH and LH pin box connections and mounted cables. Unable to finish due to parts not available. NFW. C.Hooper-424891/S.Hawkins-002566								
Component:	000-300-L01 COUPLER: ELECTRICAL COUPLING GROUP; (FRONT END)	Work Accomp:	INSTALLED	Reason:	MISSING	Status:	COMP	Position:	Warranty?: N
80	disconnect the switch from rotary actuator s-1 switch and found rotary actuator is binding. r/r s-1 rotary switch and actuator. only one side of switch wires are in . still need one more side of switch are need work.								
Component:	000-300-L02-004-001 AIRLINE ROTARY ACTUATOR; COUPLER CONTROL; 2K-6K	Work Accomp:	REPLACED NEW	Reason:	BINDING	Status:	COMP	Position:	Warranty?: N
90	finish connecting all the wires on to S-1 switch. check the operation on rotary and switch . ops check good.								
Component:	000-300-L02 COUPLER: COUPLER CONTROL GROUP; (FRONT END)	Work Accomp:	REWIRED	Reason:	INTERMITTENT	Status:	COMP	Position:	Warranty?: N
100	FINISHED INSTALLATION OF ELECTRICAL COUPLERS. OPS CHECK GOOD.								
Component:	000-300-L01 COUPLER: ELECTRICAL COUPLING GROUP; (FRONT END)	Work Accomp:	INSTALLED	Reason:	LOOSE	Status:	COMP	Position:	Warranty?: N
110	PERFORMED MECHANICAL COUPLER SPRING CHECK AND CLEVIS PI CHECK SPRING AND CLEVIS PIN CHECK GOOD. OK FOR SERVICE								
Component:	000-300-L03-001 MECHANICAL COUPLER ASSY; FRONT; 2K/3K	Work Accomp:	INSPECTED	Reason:	INSPECTION	Status:	APPR	Position:	Warranty?: N
Planned Materials									
Task ID	Item	Description	Storeroom	Issue Unit	Quantity				
	L18363087	SCREW:CAP, HEX HD, 1-1/4-7 UNC, STL, ZINC PLD	200	EA	7				
	L18333114	SWITCH,SELECTOR:AIR OPERATED,2K/3K	251	EA	1				
	L18363011	SEAL:2K, 3K,CAR	251	EA	2				
	L18363080	SHIM:TAIL EYE,2K, 3K,MECHANICAL COUPLER	200	EA	2				
						Total Planned Materials:			
Actual Labor									
Task ID	Labor	Start Date	End Date	Start Time	End Time	Approved?	Regular Hours	Premium Hours	
10		04/15/2019	04/16/2019	22:00	00:00	Y	02:00	00:00	
10		04/15/2019	04/16/2019	22:00	00:00	Y	02:00	00:00	
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05/9/2019 20:14									

Attachment 3 – CMNT repair work-order for car 3100 page 2 of 4



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

Page 3 of 4
MX76PROD

Work Order #: 14972324
Type: CM



Status: COMP
05/07/2019 13:38

Work Description: REPORT OF UNDESIREDCOUPLING (3114> <3100), 0/0, N06, CMD, CUPL, 702

Job Plan Description:

Actual Labor									
Task ID	Labor	Start Date	End Date	Start Time	End Time	Approved?	Regular Hours	Premium Hours	
20		04/18/2019	04/18/2019	08:30	14:30	Y	08:00	00:00	
30		04/22/2019	04/22/2019	15:00	23:00	Y	08:00	00:00	
30		04/22/2019	04/22/2019	15:00	19:00	Y	04:00	00:00	
30		04/22/2019	04/22/2019	15:00	23:00	Y	08:00	00:00	
40		04/23/2019	04/23/2019	11:00	14:00	Y	03:00	00:00	
40		04/22/2019	04/23/2019	22:00	06:00	Y	08:00	00:00	
40		04/22/2019	04/23/2019	22:00	06:00	Y	08:00	00:00	
40		04/22/2019	04/23/2019	22:00	06:00	Y	08:00	00:00	
40		04/23/2019	04/23/2019	11:00	14:00	Y	03:00	00:00	
50		04/22/2019	04/22/2019	22:00	22:30	Y	00:30	00:00	
60		04/30/2019	04/30/2019	08:00	14:00	Y	06:00	00:00	
60		04/30/2019	04/30/2019	06:30	09:30	Y	03:00	00:00	
60		05/02/2019	05/02/2019	06:00	14:00	Y	08:00	00:00	
70		04/30/2019	04/30/2019	13:00	14:30	Y	01:30	00:00	
70		04/30/2019	04/30/2019	13:00	14:30	Y	01:30	00:00	
80		04/30/2019	04/30/2019	08:00	14:00	Y	06:00	00:00	
90		05/01/2019	05/01/2019	06:30	08:30	Y	02:00	00:00	
100		04/30/2019	04/30/2019	16:30	19:00	Y	02:30	00:00	
100		04/30/2019	04/30/2019	16:30	19:00	Y	02:30	00:00	
100		05/01/2019	05/01/2019	08:30	14:00	Y	05:30	00:00	
100		05/01/2019	05/01/2019	09:00	14:00	Y	05:00	00:00	
110		05/08/2019	05/08/2019	06:30	07:30	Y	01:00	00:00	
Total Actual Hour/Labor:							107:00	00:00	
Actual Materials									
Task ID	Item	Assetnum	Description	Storeroom	Trans Date	Issue Unit	Quantity		
	M18363073		CONNECTOR,ELECTRICAL:LEFT HAND,2K, 3K,CAR	251	05/06/2019	EA	1		
	L18333114		SWITCH,SELECTOR:AIR OPERATED,2K/3K	251	04/30/2019	EA	1		
	M18363074		CONNECTOR,ELECTRICAL:RIGHT HAND,2K, 3K,CAR	259	05/06/2019	EA	1		
	L18363011		SEAL,2K, 3K,CAR	251	04/22/2019	EA	2		
Total Actual Materials:									

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05/9/2019 20:14

Attachment 3 – CMNT repair work-order for car 3100 page 3 of 4



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

Page 4 of 4
MX76PROD

Work Order #: 14972324
Type: CM



Status: COMP
05/07/2019 13:38

Work Description: REPORT OF UNDESIREDCOUPLING (3114> <3100), 0/0, N06, CMD, CUPL, 702

Job Plan Description:

Related Incidents				
Ticket	Description	Class	Status	Relationship
8410662	REPORT OF UNDESIREDCOUPLING (3114> <3100), 0/0, N06, CMD, CUPL, 702	SR	PENDING	ORIGINATOR
Failure Reporting				
Cause	Remedy		Supervisor	Remark Date
2349 MATERIAL FAILURE	0004	REPLACED		05/07/2019
Remarks: REPLACED MECHANICAL COUPLER, ELECTRIC COUPLER FACES AND S1 SWITCH WITH ROTARY ACTUATOR PER CENV RECOMMENDATIONS, GOOD FOR SERVICE				

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05/9/2019 20:14

Attachment 3 – CMNT repair work-order for car 3100 page 4 of 4

Date: 04/15/2019 Time 23:53 hrs.
Final Report – Undesired Uncoupling
E19188

Drafted By: SAFE 704 – 08/20/2019
Reviewed By: SAFE 701 – 08/21/2019
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Page 24