



WMSA Commissioner Brief: W-0039 – Derailment in West Falls Church Yard September 26, 2019

Prepared for Washington Metrorail Safety Commission meeting on August 4, 2020

Safety event summary:

A contractor hi-rail vehicle derailed in the West Falls Church Yard at approximately 4:21 a.m. on September 26, 2019.

During overnight ultrasonic rail testing on mainline tracks, the work crew on board smelled burnt rubber and saw a road tire on the vehicle had become flat. The crew finished testing approximately 300 more feet of rail prior to moving the vehicle back to the West Falls Church Yard.

By the time of the derailment, the flat tire had been shredded and there was damage to the wheel rim. The flange on the hi-rail vehicle were found to be closed but under the condemning limit.

The rail at the point of derailment showed significant side wear.

There were no injuries reported, and no switch damage was reported. Weather conditions were excluded as a contributing factor.

Probable Cause:

The vehicle damage including a flat tire contributed to this derailment.

Corrective Actions:

As corrective actions, Metrorail will require a spare tire and rim be kept on the vehicle in the future so that a repair can be made immediately rather than continuing work or transporting the vehicle with damage back to a rail yard.

The damaged vehicle tire and rim were repaired, and the vehicle was inspected and approved in October 2019 to return to Metrorail property.

The worn rail was replaced.

Staff recommendation: Adopt final report.

FINAL REPORT OF INVESTIGATION A&I E19509

SMS 20190926#83215

Date of Event:	09/26/2019
Type of Event:	Derailment
Incident Time:	04:19 hrs.
Location:	West Falls Church Yard
Time and How received by SAFE:	04:21 hrs., SAFE On-Call Phone
Safety Officer Response:	Yes
Time of Safety Officer Arrival:	05:15 hrs.
Time of Safety Officer Departure:	07:00 hrs.
Rail Vehicle:	Hi-Rail Unit
Injuries:	None
Damage:	Tire Damage
Emergency Responders:	SAFE, TRST, ATC, CTEM, POWER

Executive Summary

On Thursday, September 26, 2019, at approximately 04:21 hrs., the Rail Operations Control Center (ROCC) notified SAFE that at approximately 04:19 hrs., a Contractor Hi-Rail Unit (HRU), derailed in West Falls Church Yard between switches 303 and 309. The Track and Structures (TRST) Supervisor reported that the HRU experienced a flat tire while on the mainline, and the crew attempted to return to the West Falls Church Yard when the unit derailed traversing through switches. The TRST department took measurements at the scene of the derailment and reported the track was within tolerance at the time of the event.

The Washington Metropolitan Area Transit Authority (WMATA) Pilot Operator (P/O) assigned to the HRU and the Contractor Equipment Operator (CE/O) were removed from service for post-incident testing and subsequently interviewed by SAFE personnel. There were no reported injuries as a result of this incident.

Notification

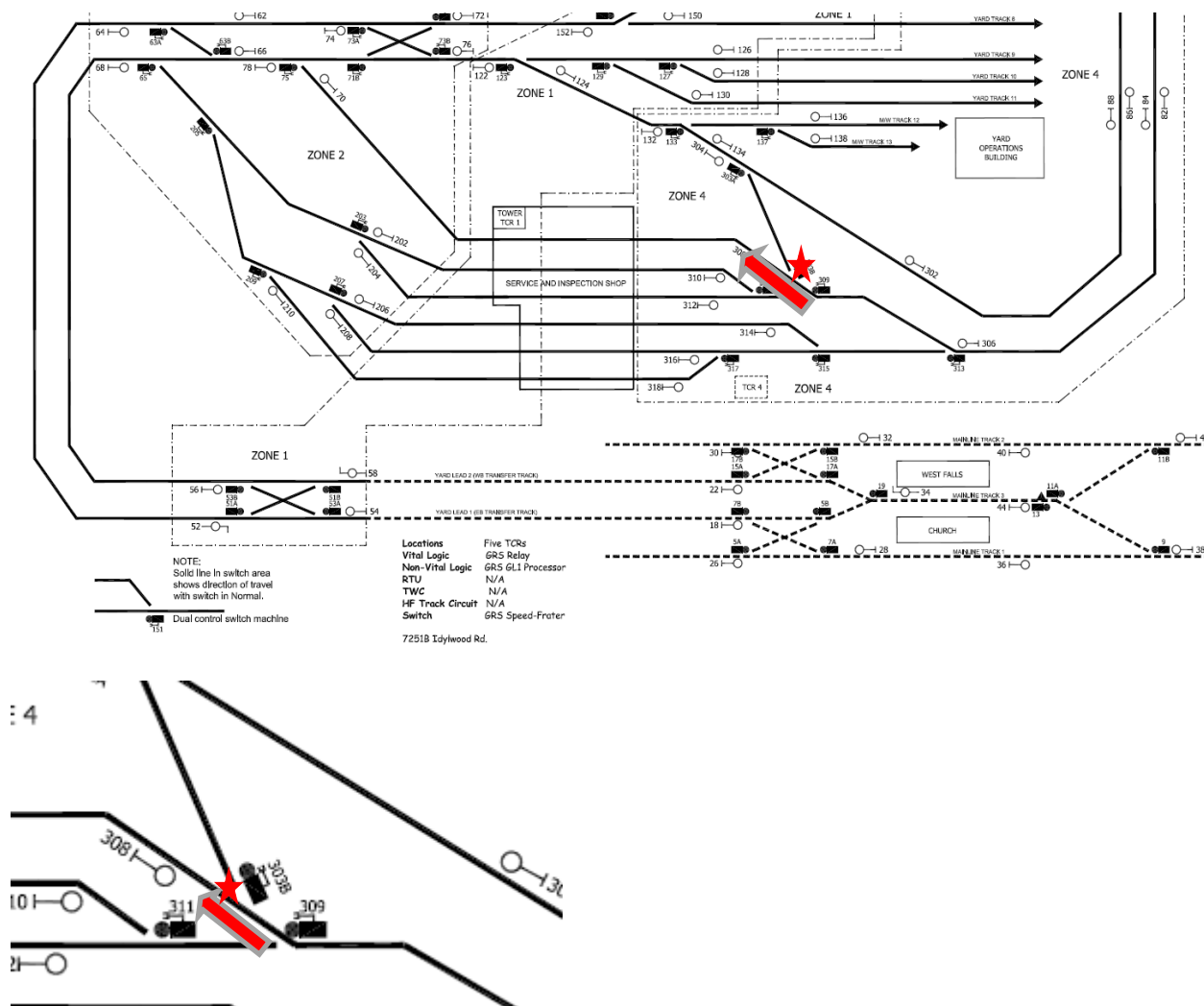
Title	Time	Comment:
Phone	05:29 hrs.	WMSC
FTA	05:41 hrs.	Email Notification
WMSC	05:41 hrs.	Email Notification

Incident Site

The incident area was located at West Falls Church Yard. The area is described as a:

- Ballast track

Field Sketch/Schematics



Investigation

Contractor Equipment Operator (CE/O) and Pilot Operator (P/O)

Per CE/O and P/O's Interview Statement, while conducting rail track inspection using ultrasonic testing, they smelled burnt rubber on the HRU. The CE/O noticed that the front operator side tire was flat once they completed the last 300 ft of testing. The CE/O and P/O proceeded back to West Falls Church Yard and reportedly monitored the flat tire during the operation back to the yard. Once the HRU cleared the mainline tracks, the crew proceeded with their block to clear West Falls Church 74 signal as directed by the Interlocking Operator. In the process of clearing the signal, the CE/O reported that he noticed that the flat tire had shredded apart. The Unit was traveling forward at this time. The HRU cleared West Falls Church Yard switch 306. While attempting to traverse between switches 303 and 309, the HRU derailed. TRST personnel responded to the scene with a Prime Mover (PM) and was able to lift the front of the vehicle and set it back on the running rails without further incident.

The HRU WMATA inspection expires 12/2019.

Automatic Train Control (ATC)

ATC inspected the track component, and no damage was reported.

TRST

The TRST department took measurements at the scene of the derailment and reported the track was within tolerance at the time of the event.

SRS

A re-inspection was conducted on 10/22/2019 for the SRS HRU. The SRS HRU passed WMATA's requirements, and sticker 015 was issued. See photo 6.

Weather

At the time of the incident, the temperature was 55°F and clear. SAFE has concluded that weather was not a contributing factor in this incident (Weather source: National Oceanic Atmospheric Administration (NOAA) – Location: Falls Church, VA.)

Findings

- Contractor HRU SRS701 was removed from service for post-incident inspection
- ATC and TRST inspected the track component, and no damage was reported.

Immediate Mitigation

- CE/O and P/O removed from service for post-incident testing and interview
- SRS HRU removed from service for post-incident inspection
- TRST inspected the track and reported all track measurements were within tolerance
- ATC inspected the track component; no damage was reported.

Conclusion

Based on salient facts as part of this investigation, HRU inspections, interviews, and written statements, SAFE concludes the following:

1. The HRU experienced a flat tire for an unknown reason while on the mainline, which caused the derailment. The work crew and the responding SAFE personnel inspected the area scene of the derailment. The flat tire was determined to be within the manufacturer and WMATA's specification. Reportedly, the Track Supervisor indicated that they did not remove personnel from service due to them having to monitor the flat tire during operation back to the yard. There was no operation corrective action required.
2. Additionally, the point of derailment showed significant side wear of the rail, which was also a contributing factor to the derailment. The defective rail was replaced.

Contractor has replaced the damaged rim and the flat tire. A re-inspection was conducted on 10/21/2019 for the SRS HRU. The vehicle passed Washington Metropolitan Area Transit Authority (WMATA) requirements, and sticker# 015 was issued. This sticker was placed on the operator's side. See photo 6. The flange was measured by Vehicle Program Services (CENV) prior to the post-incident Federal Railroad Administration (FRA) inspection and found to be closed but under the condemning limit. These measurements had to be done with calipers, and it was CENV's determination that the FRA inspection (performed by an authorized 3rd party) would validate that the wheel, as well as the rest of the rail gear, was indeed within tolerance. The tolerance sheet for the Zargo rail gear from their manual is attached (Attachment #2).

Additionally, a spare tire and rim were ordered to remain on the HRU in the event this type of event transpires again. A qualified mechanic will be dispatched to handle changing the tire in the field prior to moving the unit. Considering all the facts gathered from this investigation, SAFE has no further information regarding E19509 and recommends its closure.

Corrective Action

1. Contractor will implement the following measures to support the prevention of recurrence.
 - a. A hi-rail inspection by a qualified Contractor inspector. This process should be documented in accordance with Contractor inspection procedure as it differs from the standard procedure used by most US distributors. See attachment 1.
 - b. This inspection must include inspection of the hi-rail wheels to validate they are within specification.
 - c. Repaired Oil leak(s)

Attachments

Annual Hi-Rail Safety Inspection Checklist FRA § 214.523

Owner: Sperry Rail Inc Date: 10-18-19
Vehicle Make: Freightliner Model: Sprinter Year: 2012
VIN: [REDACTED] License Tag - State & Number: [REDACTED] Mileage: 123500
Hi-Rail gear installed (Make & Model) Front Zagro
Rear Zagro

☒ Manufacturers Installation and/or Maintenance Manual (as applicable) Available

☒ Inspect Hi-Rail Assemblies for loose or missing parts.

☒ Inspect guide wheels wear per manufacturer's limits

☒ Inspect Tram or Alignment in accordance with manufacturer's limits & procedures

☒ Guide wheel gage within manufacturer's limits

Gage Front Axle: 56.5 Gage Rear Axle: 56.5

Sat Unsot

✓

✓

✓

✓

REQUIRED ON NEW HI-RAIL VEHICLES

FRA § 214.7 Definitions

Hi-Rail vehicle, new means a hi-rail vehicle that is ordered after December 26, 2003 or that is completed after September 26, 2004.

☒ Back up alarm meeting FRA § 214.523 (c)(1) Installed.

☒ Warning light or Beacon meeting FRA § 214.523 (c)(1) Installed

Comments:

Signature: [REDACTED]

1. A copy of this inspection report shall be kept on the hi-rail vehicle.

2. The hi-rail gear of this vehicle shall be inspected for safety at least annually and with no more than 14 months between inspections.



Sperry Rail Annual Hi-Rail Measurements

Vehicle Number: 701

Inspector: [REDACTED]

Mileage: 123600

Date: 18-Sep-19

Company: Sperry Rail Service

Location: Shelton CT.

Measurements

Cross

				Diff.	Max
FL to RR	200 7/8	FR to LR	200 7/8	0	3/16

Front to Back

Driver 194.5 Pass. 195.5

Gauge

Front 56.5 Rear 56.5

String Line

Front L.	<u>14/14"</u>	Front R.	<u>14/14"</u>	L 0	<u>1/8</u>
				R 0	<u>1/8</u>
Rear L.	<u>14/14"</u>	Rear R.	<u>14/14"</u>	L 0	<u>1/8</u>
				R 0	<u>1/8</u>

Wheel Loads

Front L. 800 Front R. 800

Rear L. 500 Rear R. 500

Notes

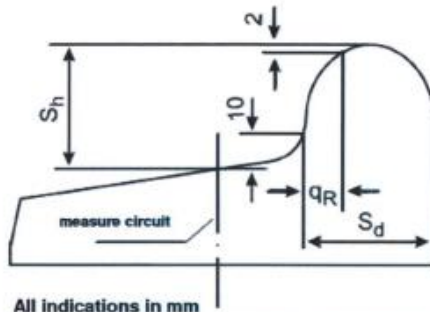
Front to back can be off due to Zagro HR Gear pivoting wheel assemblies
Wheel loads are adjustable if needed

Signature [REDACTED]

Attachment 1 – Contractor HRU Inspection Report completed 10/18/2019

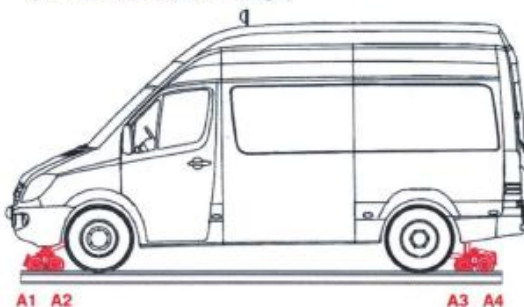
Appendix B:**Checklist wheel set tolerances and wheel profile
for road-rail vehicles category 2 and 3**

Vehicle type:
Chassis number:
Customer:



All indications in mm

	A 1		A 2		A 3		A 4	
	left	right	left	right	left	right	left	right
S _d								
S _h								
q _R								
unloaded								
A _R								
loaded								
A _R								
S _R								

(S_R = A_R loaded + S_d left + S_d right)

wheel Ø		330 to 840	> 840	
back to back distance	A _R	1359 - 1363	1357 - 1363	
wheel flange thickness	S _d	27,5 - 33,0	20,0 - 33,0	
gauge exactness	S _R	1415 - 1426	1410 - 1426	
wheel flange flank dimension	q _R	minimum 6,5		
wheel Ø		330 to 630	630 to 760	> 760
wheel flange height ***	S _h	32,0 - 38,0	30,0 - 36,0	26,0 - 36,0

Meßblatt **Diagramm**
über die Lage der Rollenspurhölzer: of the position of the truck-guiding device.

Vor der Messung (Vorstellung der Rollenspurhölzer) -
Stellung bringen und zwar so, daß das Maß „a“ (Stück der Wägen der Räder) links und rechts gleich ist.

Prior to measuring bring front wheels in straight ahead position so that measure „a“ is equal on left and right side.

Substanz: a 1362 + 3 (1359 - 1363) - 3
to rail steel flange and track gauge size (Difference max. 3mm)

Parallelism „b“ (see draft above):

	left (mm)	right (mm)
Front bogie		
Rear bogie		

Perm. difference between left & right = max. 3 mm

Attachment 1 – Tolerance sheet for the Zargo rail gear from their manual

Photos



Photo 1 – SRS HRU



Photo 2 – Right front of HRU Wheel Derailed

Date: 09/26/2019 Time 04:19 hrs.

Final Report –West Falls Church Yard – Derailment Rev .01
E19509

Page 9

Drafted By: SAFE 705 – 10/21/2019
Reviewed By: SAFE 701 – 10/30/2019
Approved By: SAFE 701 – 10/30/2019



Photo 3 – Damaged left front tire of HRU



Photo 4 – SRS HRU Inspection



Photo 5 – SRS HRU Inspection includes inspection of the hi-rail wheels to validate they are within specification with a Caliper



Photo 6 – HRU sticker# 015 was issued after re-inspection



Photo 7 – Significant side wear of the rail



Photo 8 – Significant side wear of the rail