

BROTHERHOOD OF LOCOMOTIVE ENGINEERS AND TRAINMEN

*A DIVISION OF THE RAIL CONFERENCE
INTERNATIONAL BROTHERHOOD OF TEAMSTERS*

SAFETY TASK FORCE

INDEPENDENCE, OHIO

BEFORE THE NATIONAL TRANSPORTATION SAFETY BOARD

**NTSB Accident Number: DCA17FR011
Class: Regional**

August 2, 2017

Proposed findings, probable cause, and safety recommendations, in connection with CSXT freight train derailment and subsequent fire on August 2, 2017 in Hyndman, Pennsylvania

Stephen J. Bruno, BLET-Safety Task Force, National Chairman
L. Randy Fannon, BLET-Safety Task Force, Party Spokesman

FINAL SUBMISSION

ACCIDENT SYNOPSIS

On August 2, 2017, eastbound CSXT Train No. Q38831 derailed thirty-three (33) cars which subsequently caught fire in the borough of Hyndman, Pennsylvania at approximately 4:58 a.m. Eastern Daylight Time (“EDT”)¹. The train stopped on Main Track No. 1 between mileposts (“MPs”) BF 191.2 and BF 193.² Due to the hazardous material release and subsequent fire, the borough of Hyndman was evacuated by the Pennsylvania Emergency Management Agency, which established a one-mile radius evacuation zone, displacing 800 residents. All road crossings were blocked by the derailed train, and one (1) structure, a residential home, was a total loss; a residential garage also sustained structural damage.

The weather at the time of the incident was clear, temperature of 64° F, and calm winds.

ACCIDENT NARRATIVE

At approximately 4:58 a.m., CSXT Train No. Q38831 (a mixed manifest freight train) operating on Main Track No. 1 on the CSXT Baltimore Division, Keystone Subdivision, derailed in Hyndman, PA. The crew was a relief crew from Cumberland, Maryland. The relief crew was assigned to re-crew the Q38381 operating from Connellsville, PA (MP BF 269.7) to Cumberland, MD (MP BF 178.9) after the preceding crew stopped at MP BF 205.6 following an unrelated train airbrake issue. That train crew was a road switcher / turn crew.

The relief crew operated train Q21701 from Cumberland, MD to Connellsville, PA, and to operate Train Q38381 back to Cumberland. Train Q38381 consisted of 128 loaded cars, 50 empty cars, weighed a total of 18,252 tons, was 10,612 feet in length, with three (3) locomotives online and two (2) locomotives dead-in-tow. Within the forty-eight (48) cars directly behind the locomotives, there were six (6) loaded cars and forty-two (42) empty cars that weighed 1,000 tons. The remaining consist of the train weighed over 17,000 tons and was located behind the block of forty-two

¹ All times throughout this Report will be shown as Eastern Daylight Time.

² “BF” stands for the former Baltimore & Ohio Railroad (B&O) Keystone and Pittsburgh Subdivisions.

(42) empties. The crew traveled eastbound with helper service.³ After cresting the ruling grade (1.65 percent grade), the helper detached from the train while on the move utilizing the helper link.⁴ The Locomotive Engineer then had the entire train on the descending grade with a maximum 1.65% descending grade in a thirteen (13) mile descent into Hyndman.

Following the detachment of the helper locomotives, the Locomotive Engineer applied the train's airbrakes to maintain the track speed of thirty (30) miles per hour ("MPH") that was CSXT timetable instruction maximum authorized speed for this location. After making a minimum service reduction — 6-7 pounds per square inch ("psi"), the Locomotive Engineer noticed an increase in brake pipe pressure as indicated by the train's end of train device ("EOTD") from 79 psi to 80 psi. At that time, the Locomotive Engineer made an additional reduction to a total reduction of approximately 10 pounds psi. At approximately 11:27:16 p.m., the EOTD pressure reduced to 75 psi and then again gradually increased to 79 psi. The Locomotive Engineer stated in interviews that he was concerned that the increased EOTD brake pipe pressure may result in a release of the train's brakes, so he initiated a full service brake application, by reducing the train's brake pipe pressure by 26 psi to 64 psi, which brought the train to a stop at 11:36:42 p.m. at MP BF 205.6.

CSXT timetable instructions require that, when the total brake pipe reduction exceeds 18 pounds psi on any eastward freight train operating Sand Patch to Hyndman, the train must be stopped and a minimum of thirty percent (30%) of all handbrakes must be applied to the head end of the train to hold it on the grade during the recharge procedure.⁵ During interviews, the Conductor stated that when the train came to a stop at MP BF 205.6, he dismounted the locomotive and began applying hand brakes on the first twenty-five (25) cars behind the locomotive consist⁶ and skipped cars 26 through the 33 because the hand brakes were located on the top ladder of the cars. He then

³ Helper service is Distributed power or manned helper added to a train to assist movement over grades.

⁴ Helper Link is a CSXT automated system that cuts the helper/pusher off from the rear end of the train. The detachment was executed through communications between the head-end of the train and the manned helper service crew. It is a device added to a helper locomotive, which communicates brake pipe pressure via a radio signal between the two-way EOTD and the helper locomotive. It eliminates connecting the brake pipe between the helper locomotive and the rear of the train, enabling them to detach without stopping.

⁵ See Keystone District Timetable Special Instructions – Attachments A & C.

⁶ Locomotive Consist: A locomotive or combination of locomotives properly coupled for multiple unit operation and operated from a single control.

applied the remaining hand brakes on cars 34 through 64 (56 total handbrakes). After applying the hand brakes, the Conductor completed inspecting the remainder of the train for the source of a possible air leak. The Conductor found that car No. 159 was leaking air in the air hose assembly, and reported the leak to the Locomotive Engineer by radio. The Locomotive Engineer relayed the information regarding the defect to the CSXT Train Dispatcher. The Train Dispatcher, in turn, reported the defect to the CSXT mechanical department at Cumberland; he also made arrangements for the crew operating Train Q38381 to be relieved by road switcher (helper) crew B24801, which was scheduled to report for duty at Cumberland at 11:59 p.m.

After the B24801 relief crew arrived at MP BF 205.6, both crews conducted a thorough job briefing of the situation and status of the train. The crew being relieved explained the problems with the air brakes and the number of hand brakes applied to secure the train. The B24801 relief crew then waited on the mechanical department employees (Qualified Mechanical Inspectors or “QMI” or “Carmen”) to arrive and inspect the train and the defective car. The Carmen arrived at approximately 2:20 a.m., held a job briefing with the crew, then began inspecting the train, located the air leak on the 159th car, and replaced an intermediate air hose on the car.⁷ The Carmen reported the air hose was falling apart and dry rotting in the location where the air hose was bent.

Following the repairs, the Conductor informed the Train Dispatcher that the repairs were completed and the crew were ready to proceed to Cumberland, and that they would need to stop at the bottom of the hill to release the handbrakes.⁸ The Locomotive Engineer attempted to move the train but was unsuccessful due to the number of handbrakes applied. The Conductor then walked back and released the first twenty-five (25) hand brakes. This placed the thirty-three (33) cars behind the locomotives with no hand brakes applied (hand brakes remained applied on the 34th through the 64th head cars). After releasing the first twenty-five (25) hand brakes, the Locomotive Engineer moved the train, and proceeded east towards Cumberland. According to data recovered from the lead locomotive event recorder, the crew departed MP BF 205 at 4:17:45 a.m.

⁷ Intermediate air hose is the flexible, rubber hose behind the angle cock that connects to the steel train line on the body of the rail car.

⁸ Stopping to release handbrakes is standard operating procedure for the territory to assist the crew in case of any further issues with the train after stopping on the grade as listed in the CSXT timetable.

The Locomotive Engineer maintained the train's speed at 30 MPH with a combination of hand brakes that were left applied; throttle modulation, and dynamic brakes. He intended to stop the train once it was clear of Hyndman, in order to release the remaining hand brakes.

Train Q38831 traversed a descending grade ranging from 0.50% to 2.12% beginning at MP BF 210.8 (top of grade) and continuing to MP BF 192.3 (train's resting place). From MP BF 195.2 to the point of derailment at MP BF 193.7, the train was on a descending grade of between 1.65% and 2.08%. At the point of derailment, the train was traversing an 8.375° curve. The train's speed was 29 MPH approaching the accident area. The Locomotive Engineer stated that he made an additional 10 pound psi brake pipe reduction as they were approaching the bottom of the hill.

In the post-accident interviews, the Conductor stated that he "felt a little lunge, and it wasn't no more than a second or two after that, the train went in emergency." After the train stopped, the Locomotive Engineer stayed on the locomotive to establish radio communications with the Train Dispatcher. The Conductor began walking the train to determine if the undesired emergency brake application ("UDE") caused, or was caused by, a derailment of any portion of their train. The Locomotive Engineer reported to the Train Dispatcher that their train had experienced a UDE, stating "We just went in emergency here on this Q38831 coming into – Hyndman between MP BF 191.2 and MP BF 193." Q38831's Locomotive Engineer further stated to the Train Dispatcher that the head-end of the train was approximately at MP BF 191.2 and that the rear of the train was near MP BF 193, with all the road crossings blocked. The Train Dispatcher repeated the milepost locations, and transmitted back to Q38831 that he had a track circuit showing on the adjacent Main No. 2 track.

According to the Train Dispatcher's voice recordings, the Locomotive Engineer reported that the Conductor was requesting emergency personnel because cars had derailed, and that one (1) car containing Liquid Petroleum Gas (CBTX 781553, 53 cars from the locomotives) had exploded and a second rail car of molten sulfur (ITDX 5082, 49 cars from the locomotives) had caught fire. The first car that derailed was the 34th car from the head end of the train, FWTX 620150, an asphalt car. Some of the following cars also contained molten sulfur. A total of thirty-two (32) cars derailed, with four (4) rail cars breached – releasing approximately 3,000 gallons of hazardous materials.



Figure 1: Aerial view of the derailment site, courtesy of NTSB

PROBABLE CAUSES

The Brotherhood of Locomotive Engineers and Trainmen (“BLET”) concludes that the probable causes of this accident were (1) the train makeup with the trailing tonnage creating high buff forces, along and (2) tread build up on the 34th head car due to the applied hand brake, causing the car to lift off the rail while traversing an 8.375° right-hand curve.

PROPOSED FINDINGS

HUMAN PERFORMANCE:

The Locomotive Engineer and Conductor complied with the applicable CSXT rules and restrictions in operating trains at that location. Both were in the operating compartment of the lead locomotive when the derailment occurred.

OPERATIONS:

The operations leading up to this incident were a contributing factor due to the train makeup. The immediate forty-eight (48) cars behind the locomotives contained only six (6) loaded cars. The train crew operated the train with a trailing tonnage in excess of 17,000 tons, behind the empty cars on the head end created excessive buff /draft forces.

PROPOSED RECOMMENDATIONS

To CSX Transportation, Inc.:

1. Reduce train size when operating in steep grade territory that exceeds 1% as outlined in the CSXT 07/01/2016 timetable. The accident train (Q38381) was operating with 128 loads and fifty (50) empties. The train weighed 18,252 tons which was inconsistently distributed throughout the train consist. The inconsistent placement of tonnage in the train consist caused excessive buff forces during braking which were exacerbated by the terrain, including operations over grades ranging from 0.50 percent to 2.12 percent.
2. Review train makeup and trailing tonnage for the territory by placing empties on the rear of the train. The Q38381 accident train consist had six (6) loads and forty-two (42) empties in the first forty-eight (48) cars, creating adverse buff forces due to the heavy tonnage behind this block of empty equipment.⁹

⁹ See Attachment E as a recommendation of safer instructions.

3. Review operating rules governing the placement and continued use of hand brakes on a descending grade by reducing buff forces when hand brakes are used in conjunction with air brakes and throttle modulation. To reduce the buff forces, reduce the speed and modify the location of handbrakes in use to remain directly behind the locomotives.¹⁰ The review of the application and/or release of hand brakes should be standardized to maintain hand brakes behind the locomotive(s). If it is necessary to reduce the number of handbrakes, the brakes should be released from the farthest handbrake applied then releasing as one proceeds towards the locomotives in order to move the train safely.¹¹

¹⁰ The head twenty-five (25) hand brakes were removed, exacerbating buff forces lifting the wheel off the rail causing the derailment. Keeping handbrakes in place on the head end of the train may subsequently modulate buff forces.

¹¹ Maintaining of hand brakes behind the locomotive will reduce undulating buff forces and maintain a consistent buff force regulated to the head end of the train.

CERTIFICATE OF SERVICE

I certify that on June 15, 2018 I have electronically served upon Mr. Don Rhine, Investigator in Charge, National Transportation Safety Board, a complete and accurate copy of these proposed findings regarding the CSXT derailment and subsequent fire on August 2, 2017 in Hyndman, PA (NTSB Docket No. DCA17FR011). An electronic copy of same was also forwarded to the individuals listed below in this certificate of service, as required by 49 CFR § 845.27 (Proposed Findings).

National Transportation Safety Board
c/o Mr. Don Rhine
Investigator in Charge, DCA17FR011
490 L' Enfant Plaza, SW
Washington, DC20594
don.rhine@ntsb.gov

CSXT Railroad
Mr. Steve Ammons
System General Road Foreman of Engines
[REDACTED]

Mr. Michael Bull
U.S. Department of Transportation
Federal Railroad Administration
Operating Practices Safety Inspector
[REDACTED]

Mr. Jared Cassity
SMART/UTU Safety Team
[REDACTED]

Sincerely yours,

[REDACTED]

Stephen J. Bruno
Brotherhood of Locomotive Engineers & Trainmen
National Secretary Treasurer
National Chairman, Safety Task Force
7061 East Pleasant Valley Road
Independence, OH 44131

ATTACHMENT A

C S X T R A N S P O R T A T I
O N CSXT SYSTEM
JUNE 28, 2017

BULLETINS & NOTICES SYSTEM BULLETIN 001

TO: T&E CREWS AND ALL CONCERNED
SUBJECT: 2017 3RD QUARTER SYSTEM BULLETIN
REISSUE EFFECTIVE: 0001HRS, JULY 1, 2017

CHANGE TO EQUIPMENT HANDLING RULE 4466
EFFECTIVE: 0100HRS, APRIL 25, 2017

DOCUMENT

NUMBER: 014 ITEM 1 -

EQUIPMENT HANDLING RULE 4466

EQUIPMENT HANDLING RULE SECTION 4466 'PLACING EMPTY CARS IN TRAINS' IS REPLACED IN ITS ENTIRETY WITH THE BELOW.

FOR THE PURPOSES OF THESE RULES, THE FOLLOWING 80 FEET OR LONGER CARS MUST BE CONSIDERED AS EMPTY:

- A. CARS WEIGHING LESS THAN 50 TONS GROSS WEIGHT, OR
- B. FLAT CARS WITH A SINGLE LOADED TRAILER/CONTAINER, OR
- C. FLAT CARS WITH ONLY EMPTY TRAILERS/CONTAINERS, OR
- D. MULTI-PLATFORM CARS WITH EITHER END OR ANY ADJOINING PLATFORMS UNOCCUPIED.

WHEN PLACING EMPTY CARS IN MIXED FREIGHT TRAINS:

1. WHEN TRAIN TONNAGE EXCEEDS 6000 TONS, DO NOT PLACE ONE OR MORE EMPTY FLAT CARS OVER 80 FEET WITHIN THE FIRST 10 CARS, AND
2. DO NOT PLACE SOLID BLOCKS OF SIX OR MORE LOADED CARS DIRECTLY BEHIND SOLID BLOCKS OF 30 OR MORE EMPTY CARS.

IF OPERATING IN MIXED FREIGHT SERVICE, THE FOLLOWING EQUIPMENT MUST BE PLACED ON THE REAR OF THE TRAIN WITH ANY HELPER OR DP UNIT(S) PLACED AHEAD OF THE EQUIPMENT:

- A. EMPTY TOFC/COFC, OR
- B. EMPTY MULTI-PLATFORM, OR
- C. EMPTY FLAT CARS OF TYPE F126 OR F226 WITH INITIALS GTX, TILX, NKCR, OR TINX.

IF OPERATING IN UNIT TRAIN SERVICE, EMPTY 80 FEET OR LONGER CARS THAT ARE NOT BOXCARS MUST BE PLACED ON THE REAR OF THE TRAIN WITH ANY HELPER OR DP UNIT(S) PLACED AHEAD OF THE EQUIPMENT.

APPENDIX 1 – CSXT BULLETIN

C S X

TRANSPORTATION BALTIMORE DIVISION

August 14, 2017

BALTIMORE DIV BULLETINS

DIVISION BULLETIN

117

To: T&E crews and all concerned
Subject: Keystone (Mh) - 5558 Steep Grade (1% Or More) Train Handling Effective: 0159hrs, August 15, 2017

Item 1 - Current Baltimore Division Timetable Change Subdivision: Keystone (Mh)

	PAGE	ITEM	LOCATION
INSTRUCTION			
62	5	KEYSTO SD	Instructions Relating To Air Brake And Train Handling

Item 2 - 5558 Steep Grade (1% Or More) Train Handling Subdivision: Keystone (Mh)

The Instruction On Page 62 Under The Heading Brake Pipe Pressure Has Been Deleted In Its Entirety And Replaced With:

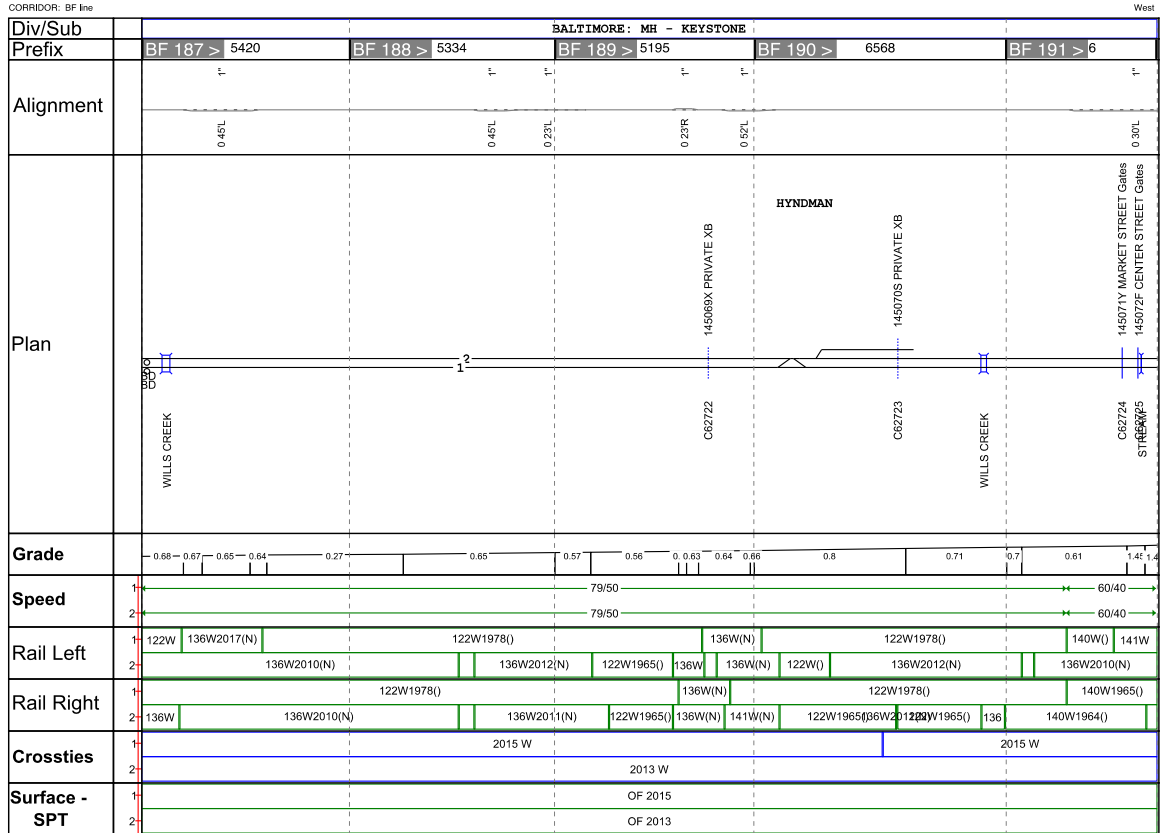
Brake Pipe Pressure -

The Brake Pipe Pressure On The Rear Of Eastward Loaded Trains Must Be 75 Psi. Or Higher Prior To Passing Over Summit At Sand Patch.

A Running Release Of The Train Brake Must Not Be Made On Eastward Freight Trains Operating Between Bf 211 - Bf 192.3 Mp. When The Total Brake Pipe Reduction Exceeds 18 Psi On Any Eastward Freight Train Operating Sand Patch To Hyndman, The Train Must Be Stopped. A Minimum Of 30% Hand Brakes Must Be Applied To The Head End Of The Train To Hold It On The Grade During The Recharge Procedure.

ATTACHMENT B

APPENDIX 2 – CSXT TRACK CHART



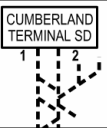
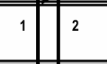
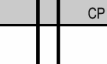

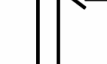

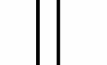
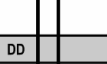



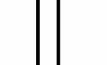
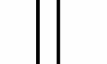
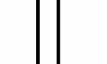
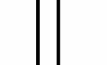

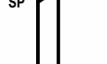
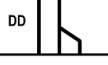





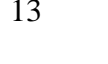

SCALE: 1 INCH = 2700 FEET

PRINTED: 8/4/17

PAGE: 1

ATTACHMENT C

KEYSTONE SUBDIVISION - MH

AUTHORIZED SPEED - REFER TO SPEED TABLES				MILE POST	STATION	TRACK DIAGRAM		AUTH FOR MOVE	NOTES
						WEST			
									
									
									
									
									
									
									
									
									
									
									
									
									
									
									
									
									
									
									
									
									
									
									
									
									

KEYSTONE SUBDIVISION SPECIAL INSTRUCTIONS

1. INSTRUCTIONS RELATING TO OPERATING RULES

AUTHORIZED SPEEDS – KEYSTONE

Trk	MP/Location	P	F	
Both	BF 178.6 - 178.9	25	25	
Both	BF 178.9 - 180.7	35		
Both	BF 180.7 - 182.3	40	35	
Both	BF 182.3 - 183.8	79	50	
Both	BF 183.8 - 183.9	75		
Both	BF 183.9 - 184.4	60		
Both	BF 184.4 - 185.2	79		
Both	BF 185.2 - 186.2	55		
Both	BF 186.2 - 191.4	79		
Both	BF 191.4 - 192.6	60		40
1	BF 192.6 - 193.7	35		25
2	BF 192.6 - 193.7			30
1	BF 193.7 - 194.1	30		25
2	BF 193.7 - 194.1	35	30	
1	BF 194.1 - 194.6		25	
2	BF 194.1 - 194.6	30		
1	BF 194.6 - 195.3	30	25	
2	BF 194.6 - 195.3		30	
1	BF 195.3 - 195.4		25	
2	BF 195.3 - 195.4	35	30	
1	BF 195.4 - 196.9		25	
2	BF 195.4 - 196.9	30		
1	BF 196.9 - 197.5	30	25	
2	BF 196.9 - 197.5	35	30	
1	BF 197.5 - 199.5	30	25	
2	BF 197.5 - 199.5		30	
1	BF 199.5 - 199.6	35	25	
2	BF 199.5 - 199.6	30	30	
1	BF 199.6 - 201.7	35	25	
2	BF 199.6 - 201.7		30	
1	BF 201.7 - 202.1		25	
2	BF 201.7 - 202.1		35	
1	BF 202.1 - 202.2		25	
2	BF 202.1 - 202.2		35	
1	BF 202.2 - 205.6		50	25
2	BF 202.2 - 205.6		35	
1	BF 205.6 - 206.9		40	25
2	BF 205.6 - 206.9			35
1	BF 206.9 - 207.0	25		
2	BF 206.9 - 207.0	35	30	
1	BF 207.0 - 208.4	30	25	
2	BF 207.0 - 208.4	35	30	
1	BF 208.4 - 209.1		25	
2	BF 208.4 - 209.1	30		
Both	BF 209.1 - 209.5	40	30	
Both	BF 209.5 - 211.1	45	35	
Both	BF 211.1 - 212.7			
Both	BF 212.7 - 213.7			
Both	BF 213.7 - 216.4			
Both	BF 216.4 - 217.7			
Both	BF 217.7 - 219.2			
Both	BF 219.2 - 220.9			
Both	BF 220.9 - 221.7			

Trk	MP/Location	P	F
Both	BF 221.7 - 223.1	40	35
Both	BF 223.1 - 225.4	50	45
Both	BF 225.4 - 227.0	45	40
1	BF 227.0 - 228.4	55	45
2	BF 227.0 - 228.4		40
1	BF 228.4 - 230.2	50	45
2	BF 228.4 - 230.2		40
1	BF 230.2 - 232.0	45	45
2	BF 230.2 - 232.0		40
Both	BF 232.0 - 232.2	50	45
1	BF 232.2 - 234.1		40
2	BF 232.2 - 234.1	45	40
1	BF 234.1 - 235.2	45	45
2	BF 234.1 - 235.2		40
SG	BF 235.2 - 237.9	35	30
Both	BF 237.9 - 239.0	40	
1	BF 239.0 - 239.6	30	40
1	BF 239.6 - 240.9	50	
1	BF 240.9 - 242.9	40	35
Both	BF 242.9 - 245.6		55
Both	BF 245.6 - 247.8	45	35
Both	BF 247.8 - 250.1	40	
Both	BF 250.1 - 251.5	45	40
Both	BF 251.5 - 253.0	30	45
Both	BF 253.0 - 253.7	40	
Both	BF 253.7 - 256.5	30	30
Both	BF 256.5 - 257.4	35	
Both	BF 257.4 - 258.4	40	45
Both	BF 258.4 - 259.1	50	
Both	BF 259.1 - 259.4	40	40
Both	BF 259.4 - 263.0	55	
Both	BF 263.0 - 266.0	50	45
Both	BF 266.0 - 266.2	45	40
Both	BF 266.2 - 266.7	55	
1	BF 266.7 - 267.2	45	45
1	BF 267.2 - 268.4	55	

AUTHORIZED SPEEDS -- BFJ TRACK - LOW GRADE

Trk	MP/Location	P	F
2	BFJ 6.0 - 5.2	35	30
2	BFJ 5.2 - 4.4	40	
2	BFJ 4.4 - 1.0	40	
2	BFJ 1.0 - 0.0	35	

ADDITIONAL SPEEDS (SP) -- KEYSTONE

Location	Track Type	P	F
BF 199.5 - 199.5	XOVER	20	20
BF 209.1 - 209.1		10	10
BF 209.2 - 209.3	POCKET	20	20
BF 218.4 - 219.5	SSDG	10	10

314.5 PROVIDING PROTECTION AT HIGHWAY-RAIL CROSSINGS AT GRADE

MP	Location	Instructions
BF 178.60 - BF 184.30	Road Xings, Cumberland, MD	Every reasonable effort must be made to not block any rd xing in the city of Cumberland MD. City code states that no train will prevent the use of any street for the purpose of travel for a period of time longer than 5 min

401 OPERATING SWITCHES AND DERAILS BY HAND POWER OPERATED SWITCH

BF 251.8 HK Tower - The Power Operated Switch is controlled by the BB Dispatcher.

409 SECUREMENT OF CARS

The following exceptions apply:

MP	Location	Minimum Tested Hand Brakes Required
BF 187.0 - BF 218.4	Between Cooks Mill & Yoder	1 car = 1 HB, 2 cars = 2 HB, 3 or more cars = 2 HB with min of 30%
BF 237.9 - BF 244.3	Between Fort Hill & Draketown	
BF 254.0 - BF 263.0	Between Ohio Pyle & Indian Creek	

Exception for certain cars

Crews setting off conventional TOFC-COFC, loaded spine cars, multi-platform double stack cars or single axle double-stack cars will apply 10% hand brakes plus 2 brakes.

All other equipment will be secured in accordance with Securing Equipment Rules.

504.1 GENERAL SIGNAL RULES

MP/Location	Signal Rules
Keystone SD	1281-1298

1003.6 GENERAL RADIO RULES

MP	Location	Hours	Channels Assigned	Type Station
BF 182.7	Corriganville	Cont	008, 094-2	Wayside
BF 197.6	Fairhope			
BF 204.8	Philson			
	Dans Rock			
BF 209.9	Sand Patch			
BF 253.4	Ohio Pyle			
BF 257.0	E Uniontown			
BF 258.9	Stewarton			
BF 191.6	Hyndman			
BFJ 5.0	Mt Davis			

Sand Patch Tunnel

A radio repeater system has been installed and is activated for radio communications inside Sand Patch tunnel. Radios must be set to the narrow band Channel 081 for transmitting and 008 for receiving in order to maintain communication inside tunnel. Radios that cannot be manually turned to these channels independently will need to be programmed by the Communications Department.

2. INSTRUCTIONS RELATING TO SAFETY RULES

NONE

3. INSTRUCTIONS RELATING TO HAZARDOUS MATERIALS

NONE

4. INSTRUCTIONS RELATING TO EQUIPMENT HANDLING RULES

4300 DEFECT DETECTORS AND CLEARANCE DETECTORS

MP	Location	Type	Note
BF 187.0	Cooks Mills	1	None
BF 200.3	Glencoe	2	
BF 215.1	Meyersdale	1	
BF 231.4	Casselman	2	
BF 239.8	Brook	1	
BF 252.1	HK		
BF 266.2	Casparis		
BFJ 4.0	Colflesh		

4400 THRU TRUSS BRIDGES

Thru Truss Bridges are at the following locations:

MP	Location
BF 192.2	Hyndman
BFG 1.0	Salisbury Branch

4400 TUNNELS

Tunnels are at the following locations:

MP	Tunnel
BF 198.4	Falls Cut
BF 210.0	Sand Patch
BF 239.2	Brook

4402 LIMITING THE SIZE OF INTERMODAL TRAINS ON OTHER THAN THE WATER LEVEL ROUTE

Do not operate an intermodal train on other than the water level route that is more than 11,000 tons or 12,000 feet.

4466 PLACING EMPTY CARS IN TRAINS

Empty Car Placement Train Classification Instructions for Manifest Trains:

Empty cars 80 feet and longer (other than a box car) must be placed in the train in such a location that the trailing tonnage behind these empty cars does not exceed the amount listed below. In territory where helper locomotives are used on the rear of the train, their tonnage rating should be subtracted to the trailing tonnage listed below when determining the location for the restricted car(s):

Between	Direction	Tonnage
Hyndman & Sand Patch	Westward	3,500
Connellsville & Sand Patch	Eastward	5,100
Connellsville & New Castle	Eastward & Westward	13,300

Empty Car Placement Instructions for Intermodal Trains Not Containing Military Equipment:

Empty cars 80 feet and longer must be placed in the train in such a location that the trailing tonnage behind these empty cars does not exceed the amount listed below. In territory where helper locomotives are used on the rear of the train, their tonnage rating should be subtracted to the trailing tonnage listed below when determining the location for the restricted car(s):

Between	Direction	Tonnage
Hyndman & Sand Patch	Westward	4,750
Connellsville & Sand Patch	Eastward	8,500
Connellsville & New Castle	Eastward & Westward	13,300

Car Placement Instructions for Intermodal Trains Containing Military Equipment:

An empty single platform intermodal flat car which is 80 feet and longer must be placed in the train in such a location that the trailing tonnage behind these empty cars does not exceed the amount listed below. In territory where helper locomotives are used on the rear of the train, their tonnage rating should be subtracted to the trailing tonnage listed below when determining the location for the restricted car(s):

Between	Direction	Tonnage
Hyndman & Sand Patch	Westward	3,500
Connellsville & Sand Patch	Eastward	5,100
Connellsville & New Castle	Eastward & Westward	13,300

Unit auto train loaded or empty does not have trailing tonnage restrictions.

4500 ENSURING AUTHORIZATION TO MOVE SHIPMENT

Double Stack and Multi-Level Movements

Unless otherwise authorized by the Clearance Bureau or Network Operations, the following are the maximum double stack and multi-level heights allowed on the main track and sidings. CSX Train Documentation will list this equipment as restricted and will show applicable height dimensions.

MP Locations	Double Stack	Multi-Level
Keystone SD	20'2"	20'2"

5. INSTRUCTIONS RELATING TO AIR BRAKE AND TRAIN HANDLING RULES

5406 B PROTECTING THE DIESEL ENGINE FROM FREEZING

Maximum units on line

If the temperature is less than 25 degrees Fahrenheit the following classes of locomotives must be kept on line with diesel engines running even if not needed: SW-15, MP-15, MP15T, U18B, B30-7. Other classes in the CSX fleet are equipped with an automatic rev-up feature to prevent damage and can remain isolated.

5502 A LIMITING TRACTIVE EFFORT

To limit draft forces, the maximum trailing tonnage for westward trains handled with only head-end power will be restricted to 7,000 tons.

1. On grades where this tonnage will be exceeded, trains will have a rear-end helper.
2. If not on rear-end, the helper must be appropriately positioned as an in-train helper or,
3. The trailing tonnage must be reduced.

5559 STEEP GRADE (1% OR MORE) TRAIN HANDLING

Brake Pipe Pressure –

The brake pipe pressure on the rear of eastward loaded trains must be 75lbs or higher prior to passing over summit at Sand Patch.

A running release of the train brake will not be made on eastward freight trains operating in this territory.

When the total brake pipe reduction exceeds 18lbs on any eastward freight train operating Sand Patch to Hyndman, the train will be stopped. 30% hand brakes will be applied to the head end of the train to hold it on the grade during the recharge procedure.

If needed, hand brakes may be left on the train to supplement air brakes while descending the rest of the grade. Avoid leaving hand brakes on any empty cars.

Use of pressure maintaining valves –

The controlling unit of the lead locomotive consist must be equipped with an operative pressure maintaining feature.

Dynamic brake requirements:

When possible, eastward trains having to add additional power to the head end of their train in order to comply with dynamic brake axles requirements to descend a grade must do so prior to passing Yoder, BF 218.4. If power cannot be added west of Yoder, the train must be properly secured while air brake test is performed.

Train handling –

Stretch braking is permitted for Eastward Trains:

Cresting grade at Sand Patch and stopping and starting train

Continuous Movement – As train crests grade, continue to use power and make a minimum reduction between 20 to 22 MPH. Then gradually reduce throttle and apply dynamic brake in such a manner to have speed between 25 and 30 MPH, passing BF 208.0.

BF 208.0 to 202.1 – In the vicinity of BF 207.0, train speed will gradually increase due to the heavier grade. When this occurs, make additional light brake applications, if necessary, modulating the dynamic brake to hold speed between 32 and 34 MPH, between BF 206.8 and BF 202.1.

BF 202.0 to 191.1 – Approaching BF 202.0, the grade becomes less severe and the speed restriction at BF 202.1 is reduced from 35 MPH to 30 MPH. Therefore, watch deceleration rate very closely, and apply power, if necessary, to keep speed between 25 and 30 MPH between BF 202.0 and BF 198.0. In the vicinity of BF 197.0, grade again increases and train speed will generally begin to increase. If this occurs, it may be necessary to apply dynamic brake or throttle to Hyndman BF 191.0. Then if conditions permit, release train brakes and handle the train in accordance with good train handling procedures.

5559 LOADED UNIT TRAINS

Keystone Subdivision 1.0% to 1.5% Grade Requirements:

Tonnage	20 MPH Min. EDBA	25 MPH Min. EDBA	30 MPH Min. EDBA
16,001-17,000	14	17	20
17,001-18,000	15	18	20
18,001-19,000	16	18	20

Keystone Subdivision 1.51% to 1.75% Grade Requirements:

Tonnage	20 MPH Min. EDBA	25 MPH Min. EDBA
16,001-19,000	18	20

Eastward trains exceeding 19,001 tons must descend the grade from Sand Patch, BF 211.0 to Hyndman, BF 190.2 at speeds not exceeding 15 MPH.

5559 LOADED UNIT TRAINS, INTERMODAL, AND MANIFEST TRAINS

Tonnage	20 MPH Min. EDBA	25 MPH Min. EDBA	30 MPH Min. EDBA
16,001-17,000	14	17	20
17,001-18,000	15	18	20
18,001-19,000	16	18	20

5600 HELPER SERVICE

All trains operating with the helper locomotives on the Keystone SD will be governed as follows:

Westward: Unless equipped with a "helper link", helper locomotives assisting westward trains out of Hyndman will not detach until they are west of Petenbrink Road Crossing, BF 217.2. If they are "helper link" equipped, they may detach once they are west of Manila, BF 209.3. If a helper not equipped with "helper link" must detach on grade, the train must be properly secured while air brake test is performed.

Eastward: Unless equipped with a "helper link", helper locomotives assisting eastward trains out of Connellsville will not detach until they are east of Hyndman BF 190.2. If they are "helper link" equipped, they will detach at Sand Patch BF 211.0.

Descending heavy grades when helper links are not being used:

The helper locomotive operator will gradually reduce power as the train crests the grade. After cresting the grade, the throttle on the helper will normally be closed during the descent of the grade. A low throttle position 2 or 3 may be used for a short distance to control slack. On other than unit trains, a rear or mid-train helper will not exceed number 1 position while descending grades.

5655 INCLEMENT WEATHER TRAIN BRAKING

Locations of heavy snow operation on descending grades averaging in excess of 1.25% or greater for more than 3 miles are listed below. Instruction governing these grades can be found in Division Special Instructions:

MP	Average Grade
BF 191.8 - BF 195.3	1.68%
BF 196.2 - BF 200.5	1.31%
BF 203.1 - BF 209.8	1.47%

Eastward trains will stop and perform required brake inspection at Yoder, BF 218.4.

6. INSTRUCTIONS RELATING TO RESTRICTED EQUIPMENT

NONE

7. CLOSE CLEARANCE

NONE

8. MISCELLANEOUS

EXCEPTED TRACK

MP	Location	Track
BFG 0.0 - BFG 3.1	Salisbury Ind Trk	All

ATTACHMENT D

KEYSTONE SUBDIVISION SPECIAL INSTRUCTIONS

1. INSTRUCTIONS RELATING TO OPERATING RULES

14-1 ENGINE HORN

Engineers must not sound horn except in case of emergency at the following road crossings:

Franklin Street
Pear Street
Valley Street
Knox Street
Baltimore Street

95 SPRING SWITCHES

Casparis – East end of No. 4 track Normal for movements on No. 2 track Speed - 20 MPH facing movement 10 MPH trailing movement 4 to 2.

100-1 ROAD CROSSINGS AT GRADE

Road Crossings – Every reasonable effort must be made to not block any road crossing in the city of Cumberland, Maryland. Cumberland city code states that no train will prevent the use of any street for the purpose of travel for a period of time longer than five (5) minutes.

103D-1 HAND BRAKES

When necessary to secure trains at the locations listed below, 30% handbrakes must be applied:

Between Ellerslie & Garrett
Between Pinkerton & Draketown
Between Ohio Pyle & Indian Creek

103D.2 Rule 103-D Exception

Crews setting off conventional TOFC-COFC, loaded spine cars, multi-platform double stack cars or single axle double-stack cars will apply 10% hand brakes plus 2 brakes.

All other equipment will be secured in accordance with Operating Rule 103-D.

104- 1 USE OF SPECIFIED TRACKS

Salisbury I.T.

The Salisbury Industrial track is excepted track from MP 0.0 to end of track. The industrial track is located at MP BF 216.3, No. 2 track, Keystone Subdivision

CSX-W&LE Connection Track

That portion of CSX owned track from the EAS Sodem to the W&LE Railroad ownership, a distance of 5,478 feet is renamed the W&LE Connection Track.

2. INSTRUCTIONS RELATING TO SAFETY RULES

NONE

3. INSTRUCTIONS RELATING TO COMPANY POLICIES AND PROCEDURES

NONE

4. INSTRUCTIONS RELATING TO EQUIPMENT HANDLING RULES

4466-1 Empty car placement Train Classification Instructions:

Empty cars 80 feet and longer (other than box cars) must be placed in the train in such a location that the trailing tonnage behind these empty cars does not exceed the amount listed below. In territory where helper locomotives are used on the rear of the train, their tonnage rating should be added to the trailing tonnage listed on this chart when determining the location for the restricted car(s).

Hyndman and Sand Patch westbound – 3,500 tons
Connellsville and Sand Patch eastbound – 5,100 tons
Connellsville and New Castle E & W – 13,300 tons

2. INSTRUCTIONS RELATING TO AIR BRAKE TRAIN HANDLING RULES

5502-1 Maximum units on line

If the temperature is less than 25 degrees Fahrenheit the following classes of locomotives must be kept on line with diesel engines running even if not needed: SW-15, MP-15, MP-15T, U18B, B30-7

Other classes in the CSXT fleet have been equipped with an automatic rev-up feature to prevent damage and can remain isolated.

5559-1 AIR BRAKE INSTRUCTIONS FOR DESCENDING SANDPATCH

Brake Pipe Pressure

The brake pipe pressure on the rear of eastbound loaded trains must be 70 lbs. or higher prior to passing over summit at Sand Patch.

A running release of the train brake will not be made on eastward freight trains operating in this territory.

When the total brake pipe reduction exceeds eighteen (18) pounds on any eastbound freight

train operating in this territory, train will be stopped and sufficient hand brakes applied to the head end of the train to hold it on the grade during the recharging procedure. Three (3) hand brakes for each ten (10) cars in train will be sufficient.

Use of Pressure Maintaining Valves

Keystone Subdivision Timetable Special Instructions

The use of retaining valves will not be required on eastward trains when:

- The controlling unit of the lead locomotive consist is equipped with an operative pressure maintaining feature;
- The lead locomotive consist has a minimum of eight (8) traction motors operating in dynamic braking.

Exceptions:

Grain Trains – The use of retaining valves will be required on eastward grain trains with over 100 cars unless:

- The controlling unit of the lead locomotive consist is equipped with an operative pressure maintaining feature, and;
- The lead locomotive consist has a minimum of 12 traction motors operating in dynamic braking.

Empty Trains – The use of retaining valves will not be required on eastward trains that consist entirely of empty cars when the controlling unit of the lead locomotive is equipped with an operative pressure maintaining feature.

The use of retaining valves will not be required in eastward freight trains consisting of not more than 36 cars when the controlling locomotive is equipped with an operative pressure maintaining feature and controlling locomotive has a minimum of 4 traction motors operating in dynamic braking, or not more than 48 cars with 6 traction motors operating in dynamic braking.

Train Handling

Stretch braking is permitted for Eastward Trains between Mance and Hyndman.

Cresting Grade At Sand Patch

Stopping And Starting Train

When eastbound train will be stopped between East Portal and West Portal Sand Patch tunnel and Manila to cut off helper or for any other reason, crest the grade at Sand Patch at a speed not exceeding ten (10) MPH. Have dynamic brake fully applied in order to bunch slack and complete STOP using as small a total reduction as possible.

After stopping, all trains except grain trains will release train brakes and then wait a minimum of 10 minutes to recharge train brake

system before proceeding. Trains will be started by placing dynamic brake in full application and gradually reducing the independent brake, until the train begins to move. The independent brake should be fully released when speed reaches 5 MPH.

Grain trains will be started by using power without releasing the train brakes when possible to do so. When grain trains cannot be started in this manner, release train brakes and recharge for a minimum of 20 minutes, after which following the same starting procedure outlined for other trains.

As speed increases to 15-17 MPH with dynamic brake fully applied, make an initial brake pipe application of 5 to 7 PSI with all trains except those trains exceeding an average of 100 tons per car. With these trains, make an initial brake application of 5 to 7 PSI before speed exceeds 12 MPH. Closely monitor acceleration rate and if necessary, modulate dynamic brake, and/or make additional light reductions in order to keep speed between 25 to 30 MPH passing BF208.

Continuous Movement

As train crests grade continue to use power and make an initial application of 5-7 PSI between 20 to 22 MPH. Then gradually reduce throttle and apply dynamic brake in such a manner to have speed between 25 and 30 MPH, passing BF208.

MP BF208.0 to BF202.1 – In the vicinity of MP BF207, train speed will gradually increase due to the heavier grade. When this occurs make additional light brake applications if necessary, modulating the dynamic brake to hold speed between 32 and 34 MPH, between MP BF207 and BF202.1.

MP BF202.0 to 191.1 – Approaching MP BF202 the grade becomes less severe and the speed restriction at BF202.1 is reduced from 35 MPH to 30 MPH. Therefore, watch deceleration rate very closely, and apply power if necessary to keep speed between 20 and 30 MPH between MP BF202 and MP BF198.0. In the vicinity of MP BF197.0, grade again increases and train speed will generally begin to increase. If this occurs, it may be necessary to apply dynamic brake, or to make an additional light brake application in order to maintain speed at 30 MPH. This speed should then be maintained by modulating the dynamic brake or throttle to Hyndman MP BF191.0. Then if conditions permit, release train brakes and handle train in accordance with good train handling.

5559-2

Effective immediately, eastbound trains on the Keystone Subdivision will be governed by the following grade chart in reference to Air Brake and Train Handling Rules 5559A-2 concerning total trailing tonnage on loaded unit trains 16,001 to 19,000 tons.

ATTACHMENT E

POCAHONTAS/WILLIAMSON DISTRICTS
5. LOCOMOTIVE AND CAR RESTRICTIONS
A. WEIGHT RESTRICTIONS Loaded 4-axle cars may be handled up to the weight shown provided the stenciled Load Limit (weight of car and lading) is NOT exceeded: 286,000 lbs.
B. EQUIPMENT RESTRICTIONS Trailing tonnage must be limited on line segments as shown below, behind the following equipment: <ol style="list-style-type: none">1. Empty Multi-level cars.2. Empty Intermodal single-platform flats and such loaded with empty trailers or containers.3. Empty 85-foot-long or longer flats and such flat cars when loaded with empty trailers or containers, or loaded with only one (1) trailer or container.4. Empty Intermodal single-axle truck flat car or such cars loaded with empty trailers or containers.5. Empty single or multiple-unit double-stack (well) cars, or articulated single-platform (spine) cars. Be governed by Appendix 1 in the System Timetable. Maximum safe trailing tonnage behind Restricted Equipment between Bluefield and Williamson is as follows: Eastward — 5,100 Westward — 4,500* *EXCEPT: 4,100 tons westward Bluefield to Williamson behind empty TTOX (single-axle truck) flat cars. 4,200 tons eastward Williamson to Bluefield behind empty TTOX (single-axle truck) flat cars. These instructions do not apply to radio trains or to a flat car loaded with more than one (1) trailer or container, one of which is loaded.