INTERSTATE COMMERCE COMMISSION

WASHINGTON

INVESTIGATION NO. 2536

THE BALTIMORE AND OHIO RAILROAD COMPANY

REPORT IN RE ACCIDENT

AT BYERS JCT.,OHIO, ON

OCTOBER 13, 1941

SUMMARY

Railroad:	Baltimore and Ohio	
Date:	October 13, 1941	
Location:	Byers Jct., Ohio	
Kind of accident:	Head-end collision	
Trains involved:	Freight:	: Passenger
Train numbers:	Extra 4502 East	: 1
Engine numbers:	4502	: Diesel-electric engine 54
Consist:	42 cars and caboose	: 11 cars
Speed:	Standing	: 6-15 m. p. h.
Operation:	Timetable, train orders and automatic block-signal system on single track; automatic block-signal system on double track	
Track:	Double; tangent; 0.02 percent ascending grade westward	
Weather:	Clear	
Time:	4:48 a. m.	
Casualties:	29 injured	
Cause:	Accident caused by failure to operate passenger train in accordance with signal indications	

INTERSTATE COMMERCE COMMISSION

INVESTIGATION NO. 2536

IN THE MATTER OF MAKING ACCIDENT INVESTIGATION REPORTS
UNDER THE ACCIDENT REPORTS ACT OF MAY 6, 1910.

THE BALTIMORE AND OHIO RAILROAD COMPANY

December 23, 1941

Accident at Byers Jct., Ohio, on October 13, 1941, caused by failure to operate passenger train in accordance with signal indications.

REPORT OF THE COMMISSION[1]

PATTERSON, Commissioner:

On October 13, 1941, there was a head-end collision between a passenger train and a freight train on the Baltimore and Ohio Railroad at Byers Jct., Ohio, which resulted in the injury of 20 passengers, 1 Pullman employee, 7 dining-car employees and 1 train-service employee. This accident was investigated in conjunction with a representative of the Public Utilities Commission of Ohio.

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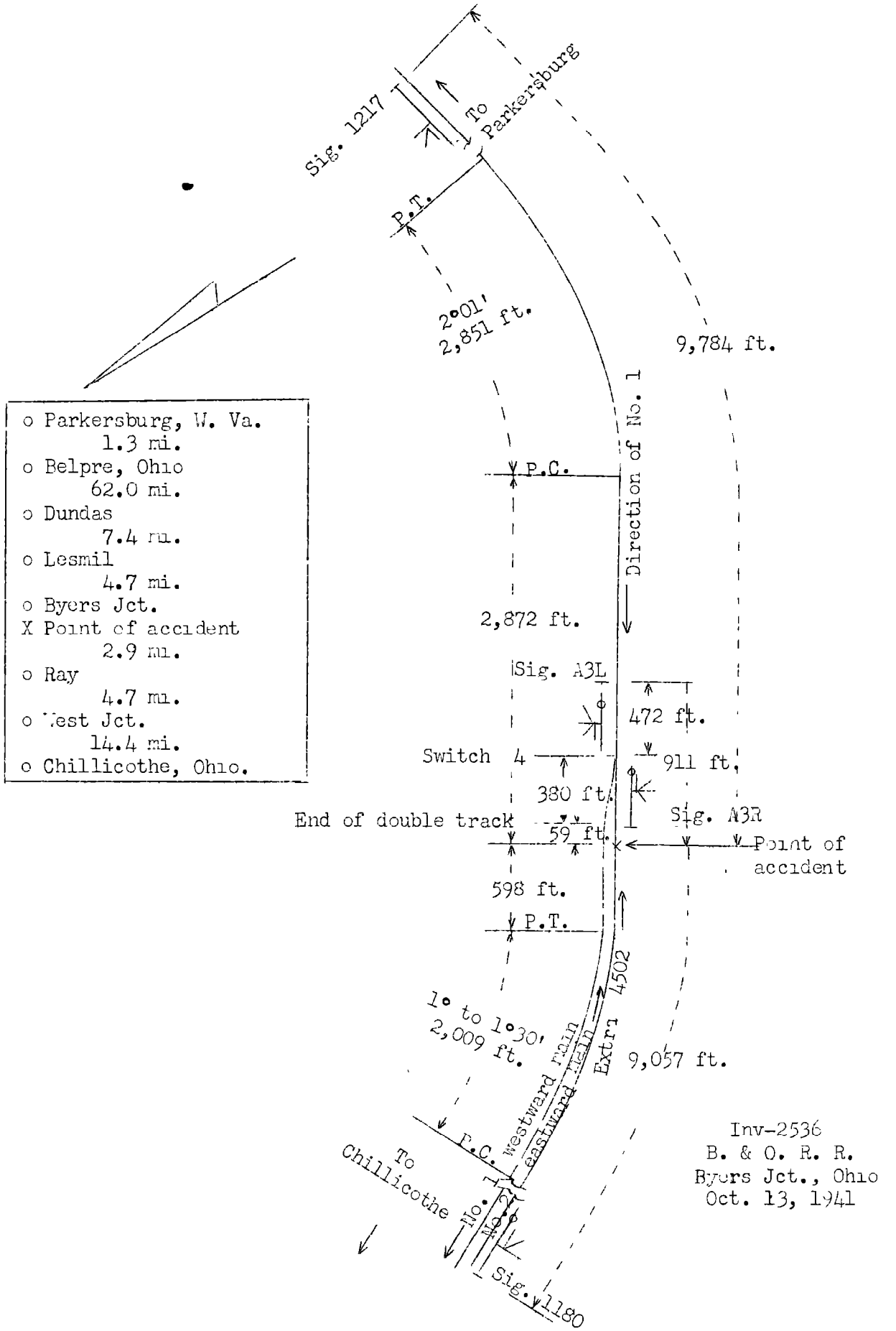
[1] Under authority of section 17 (2) of the Interstate Commerce Act the above-entitled proceeding was referred by the Commission to Commissioner Patterson for consideration and disposition.



Inv-2536
B. & O. R. R.
Byers Jct., Ohio
Oct. 13, 1941

Location of Accident and Method of Operation

This accident occurred on that part of the Ohio Division designated as the Parkersburg Sub-division, which extends between Parkersburg, W. Va., and Chillicothe, Ohio, a distance of 97.4 miles. Between Byers Jct. and West Jct., a distance of 7.6 miles, this is a double-track line over which trains are operated with the current of traffic by an automatic block-signal system, the indications of which supersede time-table superiority. On single track, trains are operated by timetable, train orders and an automatic block-signal system. The main tracks from north to south are, No. 1, westward main, and No. 2, eastward main. At Byers Jct. movement of west-bound trains from single track to the westward main track are made through a facing-point turnout to the right. The switch of this turnout is 380 feet east of the end of double track and is known as switch 4. The accident occurred on the eastward main track at a point 438.9 feet west of switch 4 and 58.9 feet west of the end of double track. As the point of accident is approached from the east there is a 2°01' curve to the right 2,850 feet in length, which is followed by a tangent 2,872 feet to the point of accident. As the point of accident is approached from the west there is a compound curve to the left 2,009 feet in length, the maximum curvature of which is 1°30', then there is a tangent 598 feet to the point of accident. The grade for west-bound trains varies between 0.41 and 1.03 percent descending a distance of 11.75 miles, then it is 0.02 percent ascending 2,495 feet to the point of accident and 2,100 feet beyond.

Switch 4 is a power-operated switch controlled from a centralized-traffic-control machine located at West Jct. The normal position of this switch is for movement from the eastward main track to single track. Electric switch locking is provided for the switches in this vicinity and approach locking is provided for the home signals. On double track, automatic signal 1160 and home signal A3R, governing eastbound movements on the eastward main track, are located, respectively, 9,116 feet west of the end of double track and at the end of double track, and are of the color-position-light type.

On single track, automatic signal 1217 and home signal A3L, governing west-bound movements, are located, respectively, 9,345 feet and 472 feet east of switch 4, and are of the color-position-light type. The control circuits of signals governing movements on the line east of Byers Jct. are designed on the absolute-permissive-block principle. The involved aspects and corresponding indications and names of these signals are as follows:

Aspect	Indication	Name
White light above two green lights in vertical position	Proceed	Clear
White light above two yellow lights in diagonal position	Proceed, preparing to stop at next signal. Train exceeding medium speed must at once reduce to that speed	Approach
Two red lights in horizontal position	Stop	Stop

The westward approach circuit extends 12,153 feet east of signal A3L. The time release is set for 4 minutes 30 seconds. When the route is lined for movement from the eastward main track to single track east of switch 4, signal A3L displays stop and signal 1217 displays approach. When an east-bound train enters the approach circuit to signal A3R, the route cannot be changed for movement from the signal track to the westward main track until an interval of 4 minutes 30 seconds has elapsed.

Operating rules read in part as follows:

SPEED RESTRICTIONS

NORMAL SPEED--The maximum speed permitted by time-tables for main track movements.

MEDIUM SPEED--One-half the normal speed, not to exceed thirty (30) miles per hour.

34. All members of train and engine crews will, when practicable, communicate to each other by its name the indication of each signal affecting the movement of their train or engine.

98. Trains must approach the end of two or more tracks, junctions, railroad crossings at grade and draw-bridges, prepared to stop, unless the switches are properly lined, signals indicate proceed and track is clear. * * *

949A. The duties of the fireman-helper on Diesel locomotives will consist of * * * observe everything in general in engine rooms, * * * .

> * * * Also observe signals at such points as instructed by the Road Foreman. Signal and train observance can be made from the window in the engine room. * * *

Instructions governing the operation of the train air-brake system read in part as follows:

> 2. * * * Independent brake valves will not be fastened in release position.
>
> 125. To apply brakes, make an eight-pound reduction, or heavier, if conditions warrant, but prevent brakes from applying on Diesel locomotives or engine and tender by use of independent brake valve. * * * make further light reductions as necessary to reduce the speed. * * *
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> 140. The emergency application of the brakes should not be used except in emergency cases, * * * . Engine brake must not be partially or wholly released unless drivers slide.

The maximum authorized speed for passenger trains between Parkersburg and Byers Jct. is 60 miles per hour. At Byers Jct. the maximum authorized speed for west-bound trains moving from single track to the westward main track is 50 miles per hour.

Description of Accident

Extra 4502, an east-bound freight train, consisted of engine 4502, 40 loaded and 2 empty cars and a caboose. This train departed from Chillicothe, 22 miles west of Byers Jct., at 3:42 a. m., according to the dispatcher's record of movement of trains, passed West Jct., 7.6 miles west of Byers Junction, at 4:10 a. m., passed signal 1180, which was displaying proceed, and, according to the statement of the engineman, when the engine was approximately 300 feet west of signal A3R, the indication of this signal changed from proceed to stop. At 4:42 a. m. the engine stopped with its front end about 59 feet west of the signal, according to statements of members of the crew, and at 4:48 a. m. it was struck by No. 1.

No. 1, a west-bound first-class passenger train, consisted of Diesel-electric engine 54, of the two-unit type, one mail car, one baggage-dormitory-coach, two coaches, one Pullman sleeping car, one dining car, four Pullman sleeping cars, and one Pullman observation car, in the order named. All cars were of steel construction. After a terminal air-brake test was completed this train departed from Parkersburg, W. Va., 75.4 miles east of Byers Jct., at 3:26 a. m., according to the dispatcher's record

of movement of trains, 18 minutes late. Soon afterward a running test of the brakes was made, and the brakes functioned properly at all points where used en route. This train passed Dundas, 12.1 miles east of Byers Jct. and the last open office, at 4:36 a. m., 13 minutes late, passed signal 1217, which was displaying approach, passed signal A3L, which was displaying stop, entered the eastward track, and while moving at a speed estimated as 6 to 15 miles per hour it collided with Extra 4502 East.

Because of track curvature the view from a west-bound engine of signal A3L is restricted to a distance of 2,450 feet.

The force of impact moved engine 4502 back a distance of 23 feet. The smokebox, the smokebox braces and the front deck-casting were broken. The engine truck and the twelfth and thirteenth cars were damaged. The rear pair of wheels of the front truck of engine 54 was derailed. The front end was damaged. The rear coupler casting of the "A" unit and the front coupler casting of the "B" unit were broken.

After the occurrence of the accident inspection of engine 54 disclosed that the automatic brake valve was in emergency position and the independent brake valve was blocked in release position by means of a wooden plug.

It was dark and the weather was clear at the time of the accident, which occurred at 4:48 a. m.

The employee injured was the conductor of No. 1

Signal Data

Tests made immediately after the accident disclosed that the signals and switch involved functioned as intended. The time release, which was set for 4 minutes 30 seconds, required 4 minutes 25 seconds to operate. In tests made on October 16, switch 4 failed to operate, and examination at that time disclosed that a brush of the switch motor was burned.

Diesel-electric engine 54 is provided with HSC brake equipment. A safety control feature actuated by a foot diaphragm valve is provided. Rail sanding is provided by a sander valve which functions automatically when the brake valve is moved to emergency position.

Discussion

The switch involved is protected by home signals remotely controlled from the tower at West Jct., 7.6 miles west of Byers Jct. The signals, circuits and electric locking are so arranged that when the route is lined for an east-bound train to move from the eastward main track to the single track the westward

home signal displays stop and the westward approach signal displays approach. When an east-bound train is in the approach circuit west of the eastward home signal, the route cannot be changed for a movement from the single track to the westward main track until the time release has operated, which requires an interval of 4 minutes 30 seconds.

About 4:10 a. m. the operator lined the route for Extra 4502 East to move from the eastward main track to the single track. The eastward approach signal and the eastward home signal displayed proceed. After Extra 4502 passed the eastward approach signal, the operator realized that there was not sufficient time for Extra 4502 to proceed beyond the end of double track against No. 1, a first-class train, and he changed the eastward home signal to display stop. About 4:42 a. m. Extra 4502 stopped with the front end of the engine standing about 50 feet west of the eastward home signal, and about 6 minutes later it was struck by No. 1.

According to the statement of the engineer of No. 1, as his train was approaching the point where the accident occurred, he was maintaining a lookout ahead and the speed was about 62 miles per hour; however, according to the tape of the speed recorder with which the engine was equipped, the speed was 67 miles per hour. There was fog in pockets but the westward approach signal could be seen clearly a distance of 300 feet. This signal displayed approach, which indication required that the speed be reduced immediately to not more than 30 miles per hour and that the train be prepared to stop short of the home signal; however, action to control the speed of the train was not taken until the engine was about 1/2 mile beyond the signal. At that point a 15-pound brake-pipe reduction was made and the speed was reduced to 50 miles per hour at a point about 1,500 feet west of the home signal. The engineman observed that the home signal was displaying stop and according to his statement he moved the brake valve to emergency position but the distance was insufficient to stop short of the signal. No. 1 passed the westward home signal and collided with Extra 4502 at a point 911 feet beyond that signal. According to statements of the fireman, who was in the engine compartment of the first unit, and a Diesel-engine maintainer, who was in the control compartment with the engineer, the brakes were not applied in emergency prior to the collision. The engineer understood the requirements of the rules. His reason for not complying with the indication displayed by the approach signal was that he misread its indication for approach-medium, the indication usually displayed for his train at that point. An approach-medium indication requires that a train approach the next signal at a speed not exceeding 30 miles per hour. His train was about 1/2 mile west of the approach signal before he became aware that he was not operating his train in accordance with the indication actually displayed

by the approach signal. Even though the approach indication is displayed by a white light above two yellow lights in a diagonal position and the approach-medium indication is displayed by a white light staggered above two green lights in a vertical position, the engineer could not explain why he became confused concerning the indication displayed by the approach signal. Had the speed of No. 1 been controlled in accordance with the approach indication of the approach signal this accident could have been averted.

Investigation after the accident disclosed that the independent brake valve was blocked in release position by a plug, contrary to current instructions. This prevented the application of the brakes on both units of the Diesel-electric engine and undoubtedly was an important factor in the failure of No. 1 to stop short of the home signal. The investigation indicated that the speed of No. 1 at the time of the accident was not in excess of 15 miles per hour, and that had the brakes on the two units of the Diesel-electric engine been operated the collision probably would have been prevented.

The rules require all members of an engine crew to communicate to each other, when practicable, the indication of each signal that affects the movement of their train or engine; however, the fireman on a Diesel-electric engine is required to check the performance of the engines and the steam-heat boiler. During his tour through the two units, the fireman is not required to observe the indications of the automatic signals, but is required to observe the position of train-order signals. These observations may be made from the side windows of either unit. In this instance the fireman was in the engine room of the first unit and did not see the indications displayed by either the approach signal or the home signal. The Diesel-engine maintainer was in the control compartment with the engineer but failed to observe the indications displayed by the signals involved. If the fireman had been stationed in the control compartment, he could have observed that No. 1 was not being operated in accordance with the approach indication of the approach signal and could have taken action to avert the accident.

The operator said that after he changed the eastward home signal to display stop, he started the operation of the time release, and after 4 minutes 30 seconds he operated the switch lever to line the route from single track to the westward main track; however, the switch indication light showed that the switch had not moved. He operated the code button several times, but the switch failed to operate, and about 4:39 a. m. he informed the dispatcher of this difficulty. During tests made a few hours after the accident the switch and signals involved functioned as intended, but during tests made 3 days later the switch failed to operate, and examination disclosed that a brush of the switch

motor was burned. It appears probable that this condition existed on the day of the accident and may have caused the failure of the switch to operate just prior to the accident. Had the switch operated properly when the operator was endeavoring to line up the route to the westward track for No. 1 the accident would have been averted.

Cause

It is found that this accident was caused by failure to operate the passenger train in accordance with signal indications.

Dated at Washington, D. C., this twenty-third day of December, 1941.

By the Commission, Commissioner Patterson.

W. P. BARTEL,

(SEAL) Secretary.