INTERSTATE COMMERCE COMMISSION

WASHINGTON

INVESTIGATION NO. 2524

THE BALTIMORE AND OHIO RAILROAD COMPANY

AND

THE ILLINOIS CENTRAL RAILROAD COMPANY

REPORT IN RE ACCIDENT

AT ODIN, ILL., ON

SEPTEMBER 11, 1941.

SUMMARY

Railroads:	Baltimore and Ohio	: Illinois Central
Date:	September 11, 1941	
Location:	Odin, Ill.	
Kind of accident:	Side collision	
Trains involved:	Freight	: Passenger
Train numbers:	Second 96	: 5
Engine numbers:	4580	: 1190
Consist:	68 cars, caboose	: 8 cars
Estimated speed:	Standing	: 20-35 m. p. h.
Operation:	Interlocking	
Track:	Single; tangent; 0.076 percent ascending grade eastward	: Double; tangent; 0.088 percent descending grade southward
Weather:	Clear	
Time:	5:45 p. m.	
Casualties:	1 killed; 8 injured	
Cause:	Accident caused by failure to operate B. & O. train in accordance with interlocking signal indications	
Recommendation:	That the Baltimore and Ohio Railroad Company immediately take necessary measures to insure that their home signal involved in this accident is brought into conformity with Section 42 of the Commission's order of April 15, 1939	

INTERSTATE COMMERCE COMMISSION

INVESTIGATION NO. 2524

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

THE BALTIMORE AND OHIO RAILROAD COMPANY
AND
THE ILLINOIS CENTRAL RAILROAD COMPANY

November 4, 1941.

Accident at Odin, Ill., on September 11, 1941, caused by failure to operate B. & O. train in accordance with interlocking signal indications.

REPORT OF THE COMMISSION[1]

PATTERSON, Commissioner:

On September 11, 1941, there was a side collision between a freight train of the Baltimore and Ohio Railroad and a passenger train of the Illinois Central Railroad at Odin, Ill., which resulted in the death of one train-service employee and the injury of three passengers, four dining-car employees and one train-service employee. This accident was investigated in conjunction with a representative of the Illinois Commerce Commission.

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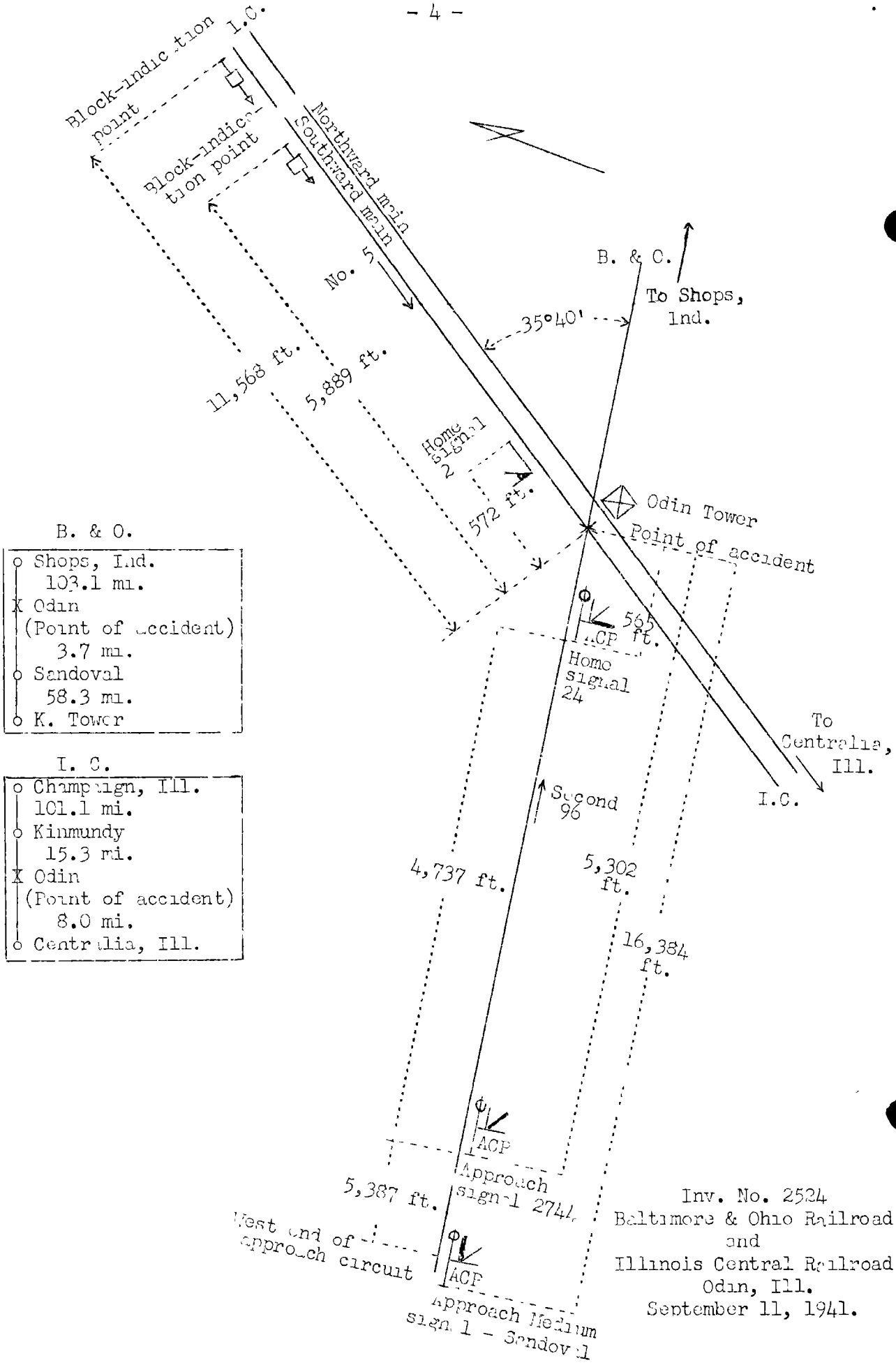
[1] Under authority of section 17 (2) of the Interstate Commerce Act the above-entitled proceeding was referred by the Commission to Commissioner Patterson for consideration and disposition.



Inv. No. 2524
Baltimore & Ohio Railroad
and
Illinois Central Railroad
Odin, Ill.
September 11, 1941.

Location of Accident and Method of Operation

This accident occurred at the intersection of the Baltimore and Ohio Railroad and the Illinois Central Railroad, hereinafter referred to, respectively, as the B. & O. and the I. C. Odin is located on that part of the St. Louis Division of the B. & O. designated as the Illinois Sub-Division, which extends between K Tower, East St. Louis, Ill., and Shops, Ind., a distance of 165.1 miles, and on that part of the Illinois Division of the I. C. designated as the Champaign District, which extends between Champaign and Centralia, Ill., a distance of 124.4 miles. In the vicinity of the point of accident the B. & O. is a single-track line and the I. C. is a double-track line. On the B. & O., trains are operated by timetable, train orders and an automatic block-signal system. On the I. C., trains are operated by timetable, train orders and an automatic cab-signal and train-stop system; there are no wayside signals except at interlockings. Time-table directions on the B. & O. are east and west and on the I. C., north and south. According to compass directions the B. & O. track extends from northeast to southwest and the I. C. tracks extend from northwest to southeast. These tracks intersect at an angle of 65°-0'. As the crossing is approached from the west on the B. & O. the track is tangent a distance of about 2 miles. The grade for east-bound trains on the B. & O. is 0.076 percent ascending at the point of accident. As the crossing is approached from the north on the I. C. the tracks are tangent a distance of about 4 miles. The grade for south-bound trains on the I. C. is 0.088 percent ascending at the point of accident.

The crossing is protected by an interlocking, controlled from Odin Tower, which is located in the southeast angle of the crossing. The interlocking is operated and maintained by the I. C. The interlocking machine is of the electric type and consists of 18 working levers in a 24-lever frame which controls 10 signals, 4 switches, 3 locking circuits, and 1 highway crossing bell. Approach locking and electric switch-locking are provided throughout the interlocking.

On the B. & O., signal 2744 and home signal 24, governing eastward movements, are located at points, respectively, 5,502 feet and 565 feet west of the center-line of the crossing, and are mounted on masts south of the south rail. Signal 2744 is of the automatic, four-indication, color-position-light type, and is approach lighted; its normal indication is approach. Signal 24 is of the semi-automatic, four-indication, color-position-light type, and is approach lighted; its normal indication is stop. The approach-lighting circuit for signals 2744 and 24 extends to a point 5,387 feet west of signal 2744. The involved aspects displayed by these signals and the corresponding indications and names are as follows:

Signal number	Aspect	Indication	Name
2744	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
24	Two red lights in horizontal position	Stop	Stop

On the I. C. the automatic cab-signal and train-stop system is of the continuous-inductive type. Engines are equipped with two-indication color-light cab signals which display either a green or a red aspect. In the territory involved there are no wayside signals except semi-automatic home signals at interlockings. Cab signals are actuated at block-indication points which correspond with the points at which wayside signals, if used, would be located. Block-indication points are located 11,568 feet and 5,889 feet north of the crossing. A warning whistle in the cab of the engine sounds when the cab signal changes from a green to a red aspect. If a red aspect is not acknowledged within 6 seconds by operation of the engineman's acknowledging lever, an automatic brake application sufficient to stop the train will occur. When a brake application is forestalled by an engineman, the train may proceed in accordance with operating rules.

The involved aspects displayed by the cab signals and the corresponding indications and names are as follows:

Aspect	Indication	Name
Green	Proceed	Clear
Red	Proceed at restricted speed, not exceeding 15 miles per hour	Restricting

Home signal 2, governing southward movements on the I. C., is located 572 feet north of the center-line of the crossing. It is of the semi-automatic, 1-arm, two-position, lower-quadrant semaphore type, and is continuously lighted; its normal indication is stop. The involved day aspects displayed by this signal and the corresponding indications and names are as follows:

Signal	Aspect	Indication	Name
2	Vertical	Proceed	Clear
	Horizontal	Stop	Stop

The involved signals are so arranged that when the route is lined for a movement on the I. C. southward main track, B. & O. home signal 24 will display a stop indication, signal 2744 will display an approach indication and I. C. home signal 2 will display a proceed indication. The time release for B. & O. home signal 24 is set for 7 minutes 30 seconds and the time release for I. C. home signal 2 is set for 3 minutes 40 seconds.

An audible approach-indicator located in Odin Tower gives information of the approach of an east-bound B. & O. train from a point 15,819 feet west of home signal 24, and of the approach of a south-bound I. C. train from a point 16,591 feet north of home signal 2.

Operating rules of the B. & O. read in part as follows:

USE OF SIGNALS

27. A signal imperfectly displayed, or the absence of a signal at a place where a signal is usually shown must be regarded as the most restrictive indication that can be given by that signal, except:
(a) When sufficient lights in a Color Position Light Signal are displayed to determine indication of the signal it will govern.
* * *

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.

SPEED RESTRICTIONS

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

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

In the vicinity of the point of accident the maximum authorized speed for freight trains on the B. & O. is 45 miles per hour, and the maximum authorized speed for passenger trains on the I. C. is 80 miles per hour.

Description of Accident

Second 96, an east-bound second-class B.& O.freight train, consisted of engine 4580, 18 loaded and 50 empty cars, and a caboose. This train passed Sandoval, 3.7 miles west of Odin and the last open office, at 5:38 p. m., according to the dispatcher's record of movement of trains, 4 hours 49 minutes late, and passed the automatic block signal at the east end of Sandoval siding, which was displaying an approach-medium indication. While this train was moving at an estimated speed of 40 miles per hour it passed signal 2744, which was displaying approach, passed home signal 24, which was displaying stop, and stopped with the second car standing across the I. C. southward main track. Immediately afterward this car was struck by I. C. No. 5. The brakes of Second 96 had been tested and had functioned properly en route.

No. 5, a south-bound first-class I C. passenger train, consisted of engine 1190, one baggage car, one business car, one club car, two Pullman sleeping cars, one dining car and two Pullman sleeping cars, in the order named; all cars were of steel construction. This train departed from Champaign, 116.4 miles north of Odin, at 3:40 p. m., according to the dispatcher's record of movement of train, 5 minutes late, passed Kinmundy, 15.3 miles north of Odin and the last open office, at 5:29 p. m., 2 minutes late,passed signal 2, which was displaying stop, and, while moving at an estimated speed of 20 to 35 miles per hour, it struck the side of B. & O. Second 96. The brakes of No. 5 had previously been tested and had functioned properly en route.

There was no condition of the engine of either train that distracted the attention of the crew or obscured their vision. Because of buildings and trees in the northwest angle of the crossing, the crew of a south-bound I. C. train cannot see a B. & O. train approaching the crossing from the west until the I. C. engine is 754 feet north of the crossing and the B. & O. engine is 225 feet west of the crossing.

The second car of Second 96 was demolished. The third car was slightly damaged and its front truck was derailed. I. C. engine 1190 was derailed to the left, continued forward 270 feet, stopped diagonally across both I. C. main tracks, and leaned to the right at an angle of about 80 degrees. The front end was badly damaged and the right side of the cab was crushed inward. The tender was derailed to the right, became uncoupled from the engine, and stopped diagonally across the track with its front end against the tail piece of the engine. Both tender trucks were detached. The first car was derailed and stopped

upright at the rear of the tender. This car was slightly damaged. The second car was slightly damaged and its front truck was derailed.

The weather was clear at the time of the accident, which occurred at 5:45 p. m.

The employee killed was the fireman of the I C. train, and the employee injured was the engineer of the I. C. train.

Data

Tests were made after the occurrence of the accident and at approximately the time of day the accident occurred. As seen from an engine approaching in the vicinity of signal 2744, no red lights were visible on the B.& O. home signal, but a bright yellow glow extended diagonally across the background of the signal. The white marker light above the yellow glow appeared to be lighted. At a point 2,811 feet west of the home signal a faint red light appeared to the right of the yellow glow. At a point 2,098 feet west of the home signal the yellow glow and the red light appeared to be of about equal intensity. At a point 950 feet west of the home signal the yellow glow disappeared and two red lights appeared in a horizontal position. The reflection of the sun's rays shining against the background produced the yellow light.

Discussion

The crossing involved is protected by an interlocking which is so arranged that when the route is lined for the I. C. and when a south-bound I. C. train has entered the approach circuit the I. C. home signal will display proceed, the B. & O. approach signal will display approach and the B. & O. home signal will display stop. In addition, after an I C. south-bound train has entered the approach circuit the route cannot be lined for a B. & O. train until the time release has operated an interval of 3 minutes 40 seconds.

The route was lined for the I. C. train involved at 5:42 p. m., the time it entered its approach circuit. The B. & O. train passed its approach signal, which was displaying approach, passed the home signal, which was displaying stop, and had just stopped with the second car standing across the I. C. southward main track when this car was struck by the engine of the I. C. train at 5:45 p. m.

According to the statement of the engineer of the B. & O. train, both the approach signal and the home signal were displaying approach for his train. The speed of his train was about 40 miles per hour as his engine passed the approach signal and he partially closed the throttle. The engineer and the fireman kept the home signal under constant observation throughout a distance of about 4,400 feet. As the home signal was approached the engineer called at least twice its indication as approach. No one observed whether the marker light on the home signal was displayed. The engineer said that if the marker light was not displayed, the yellow aspect which he saw displayed by the home signal would be an imperfectly displayed signal. When the engine reached a point about 200 feet west of the home signal, the speed of his train was 25 or 30 miles per hour, and he observed that the indication of this signal was stop. He immediately moved the brake valve to emergency position but the distance was not sufficient for stopping short of the crossing. On previous trips the engineer had never observed both the approach signal and the home signal displaying approach but it was his understanding that this was possible when there was a preceding train in the block beyond the first eastward signal east of the home signal. The rules required the B. & O. train to proceed at a speed not exceeding 22-1/2 miles per hour when it passed the approach signal displaying approach and to be prepared to stop at the home signal. Had the speed of the B. & O. train been controlled in accordance with the approach indication of the approach signal, it is probable this accident would have been averted.

The engineer of the I. C. train stated that his train was approaching Odin at a speed of about 70 miles per hour and his cab signal was displaying proceed. When his engine reached a point about 900 feet north of the home signal its indication changed to stop and the cab signal changed to a red aspect. He immediately closed the throttle and moved the brake valve to emergency position but the distance was insufficient for stopping short of the crossing.

Tests conducted after the accident occurred disclosed that the interlocking was functioning as intended and there was no condition disclosed that could have caused the B. & O. home signal to display approach and at the same time permit the route to be lined for the I. C. Previously, the interlocking had functioned properly. The investigation disclosed that the B. & O. home signal, as seen from the engine of the approaching B. & O. train when it was in the vicinity of the approach signal, displayed a yellow light, which was caused by a combination of the stray rays being reflected by the signal background and the red rays from the signal lamps, and which was interpreted as an approach indication. This indication continued to appear to be

displayed until the engine reached a point 950 feet west of the home signal, then the stop indication was observed, but it was too late to stop before the B. & O. train entered upon the crossing.

About 3 months prior to the time of the accident, a signal maintainer of the I. C. painted the B. & O. home signal involved with back paint furnished by a B. & O. maintainer. This paint was of the glossy type instead of the dull type generally used for this purpose. When the sun was low in the western horizon and the red lamps of the stop aspect were lighted, the reflection of the sun's rays from the glossy surface of this signal together with the red rays from the signal lamps resulted in the display of a yellow light, which gave the effect of a phantom indication.

Section 42 of the Commission's order of April 13, 1939, prescribing rules, standards, and instructions for installation, inspection, maintenance and repair of interlocking and other signal systems, which became effective September 1, 1939, reads as follows:

> Action shall be taken when necessary to prevent phantom indications from reflected external sources.

If the members of the crew on the B. & O. engine had been able to see the true indication displayed by the home signal when it first came into their view, it is probable this accident would have been averted.

Cause

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

Recommendation

It is recommended that the Baltimore and Ohio Railroad Company immediately take necessary measures to insure that their home signal involved in this accident is brought into conformity with Section 42 of the Commission's order of April 13, 1939.

Dated at Washington, D. C., this fourth day of November, 1941.

By the Commission, Commissioner Patterson.

W. P. BARTEL,

(SEAL) Secretary.