INTERSTATE COMMERCE COMMISSION

WASHINGTON

INVESTIGATION NO. 2740

THE PENNSYLVANIA RAILROAD COMPANY

REPORT IN RE ACCIDENT

NEAR JOHNSTOWN, PA., ON

NOVEMBER 11, 1943

SUMMARY

Railroad:	Pennsylvania	
Date:	November 11, 1943	
Location:	Johnstown, Pa.	
Kind of accident:	Side collision	
Trains involved:	Freight	: Passenger
Train numbers:	Extra 4528 East	: Passenger Extra 5449 East
Engine numbers:	4528	: 5449
Consist:	74 cars, caboose	: 10 cars
Speed:	17.1 m. p. h.	: 30-35 m. p. h.
Operation:	Interlocking	
Track:	Five; $4^{\circ}07'$ curve; 0.27 percent ascending grade eastward	
Weather:	Snowing	
Time:	2:55 a. m.	
Casualties:	17 injured	
Cause:	Derailed freight car obstructing adjacent main track immediately in front of an approaching train	

INTERSTATE COMMERCE COMMISSION

INVESTIGATION NO. 2740

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

THE PENNSYLVANIA RAILROAD COMPANY

December 6, 1943.

Accident near Johnstown, Pa., on November 11, 1943, caused by derailed freight car obstructing an adjacent main track immediately in front of an approacning train.

REPORT OF THE COMMISSION[1]

PATTERSON, Commissioner:

On November 11, 1943, tnere was a collision between a derailed car of a freight train and a passenger train on tne Pennsylvania Railroad near Johnstown, Pa., which resulted in the injury of 14 passengers, 1 coach cleaner, 1 dining-car employee and 1 train-service employee.

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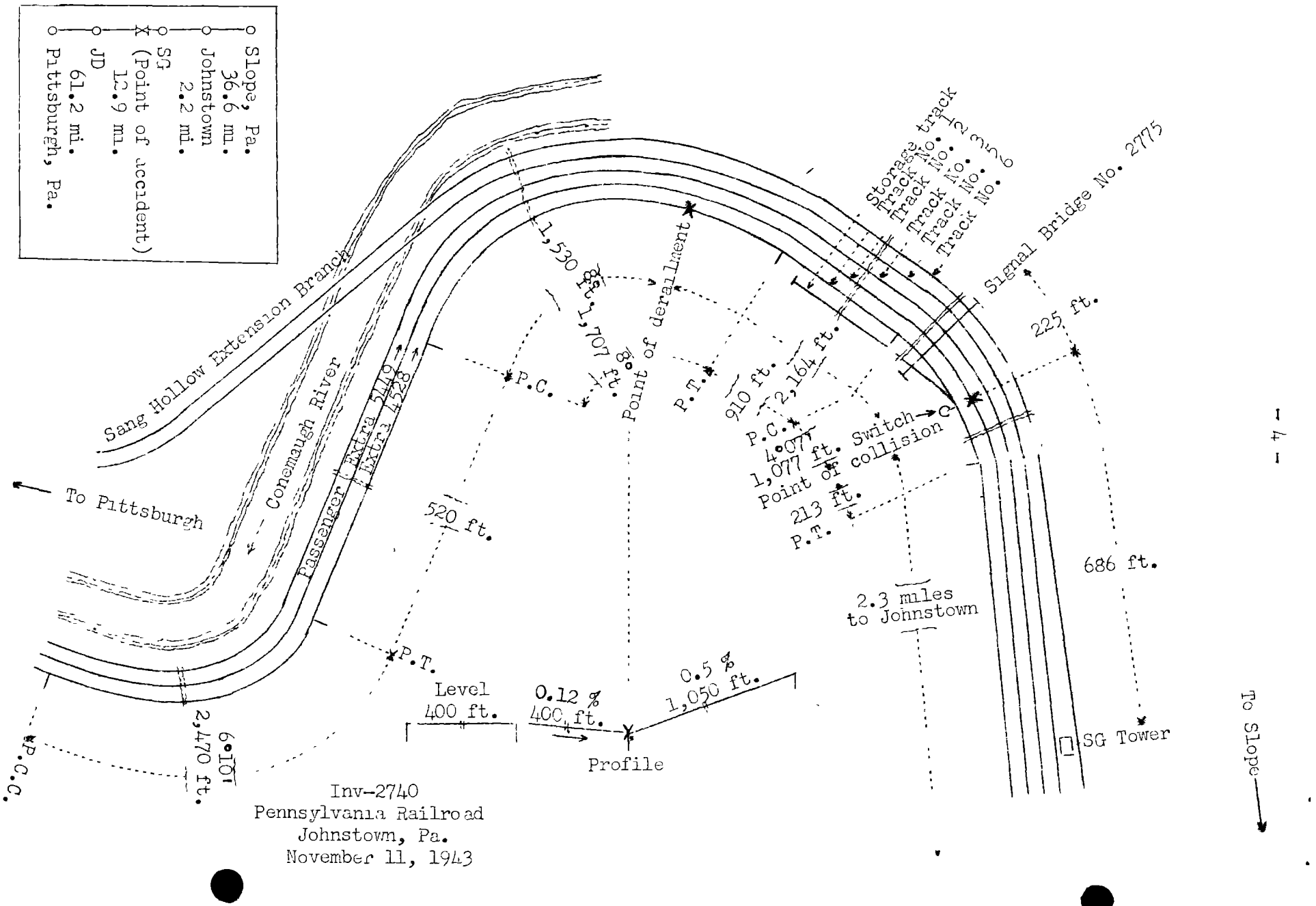
[1]Under authority of section 17 (2) of the Interstate Commerce Act tne above-entitled proceeding was referred by tne Commission to Commissioner Patterson for consideration and disposition.



Inv-2740
Pennsylvania Railroad
Johnstown, Pa.
November 11, 1943

Location of Accident and Method of Operation

This accident occurred on that part of the Pittsburgh Division extending between Pittsburgh and Slope, near Altoona, Pa., 112.9 miles. In the immediate vicinity of the point of accident this was a five-track line. The main tracks from south to north were No. 1, eastward freight, No. 2, eastward passenger, No. 3, westward passenger, and Nos. 5 and 6, westward freight. Trains moving with the current of traffic on tracks Nos. 1, 2, 3 and 5 and in either direction on track No. 6 were operated by an automatic-block and cab-signal system, the indications of which superseded time-table superiority. The trains involved were being operated on tracks Nos. 1 and 2, and the collision occurred within the interlocking limits at SG, about 2.3 miles west of Johnstown. At SG the distance between the track centers of tracks Nos. 1 and 2 was 15 feet 8-1/2 inches. The collision occurred on track No. 2, at a point 686 feet west of the tower. At this point an interlocked switch, which was a trailing-point for east-bound movements, connected track No. 1 and a storage track, which paralleled the main tracks on the south. From the west there were, in succession, a compound curve to the left 3,470 feet, having a maximum curvature of 6°10', a tangent 520 feet, an 8° curve to the right 1,707 feet, a tangent 910 feet, and a 4°07' curve to the right 1,077 feet to the point of collision and 213 feet beyond. The grade for east-bound trains was, successively, level 400 feet, 0.12 percent descending 400 feet, 0.50 percent ascending 1,050 feet, and 0.27 percent ascending 1,114 feet to the point of collision. The derailment on track No. 1 occurred where the grade changed from 0.12 percent descending to 0.50 percent ascending.

The tracks were laid on a hillside cut and paralleled the Conemaugh River on the south. On track No. 1 the track structure consisted of 130-pound cropped rail, 36 feet in length, on an average of 22 treated hardwood ties to the rail length. It was fully tieplated, double-spiked, provided with 6-hole angle bars and an average of 4 rail anchors per rail length, and was ballasted to a depth of 30 inches with crushed stone.

Eastward home signals governing movements on tracks Nos. 1 and 2 were mounted on a signal bridge located 225 feet west of the point of collision.

Operating rules read in part as follows:

> 76a. Engine and train crews as frequently as opportunity permits must observe engines and cars in their train, moving and standing, to detect any conditions that might interfere with the safe movement of trains.

The maximum authorized speed for all trains moving on tracks Nos. 1 and 2 was 35 miles per hour on the curve on which the freight car was derailed, and 45 miles per hour on the curve where the collision occurred.

Description of Accident

Extra 4528 East, an east-bound freight train, consisted of engine 4528, 73 loaded cars and 1 empty car and a caboose. This train departed from JD, 12.9 miles west of SG and the last open office west of SG, at 2:19 a. m., and while moving on track No. 1 at a speed of 17.1 miles per hour, as indicated by a track speed-recording device, the front pair of wheels of the front truck of the thirty-third car was derailed to the left 2,850 feet west of SG. The derailed car continued in line with the track throughout a distance of 2,164 feet eastward to the turnout rail of the storage-track switch, where the thirty-third car became entirely derailed and obstructed track No. 2.

Passenger Extra 5449 East, an east-bound passenger train, consisted of engine 5449, one baggage car, four coaches, one dining car, and four Pullman sleeping cars, in the order named. All cars were of conventional steel construction, except the seventh car, which was of light-weight steel construction. After a terminal air-brake test was made this train departed from Pittsburgh, Pa., 74.1 miles west of SG, at 1:23 a. m., passed JD at 2:41 a. m., passed the eastward home signal at SG, which displayed proceed, and while moving on track No. 2 at an estimated speed of 30 to 35 miles per hour it collided with the derailed freight car.

Engine 5449 was derailed to the north and stopped 190 feet east of the point of collision, with its front end 10 feet north of the center-line of track No. 2. The front-end frame was broken off and the smokebox was badly damaged. The tender and first two cars were derailed and stopped upright on the roadbed, to the rear of the engine and practically in line with the track. The thirty-third car of Extra 4528 was badly damaged. The force of the impact derailed the thirty-first and thirty-second cars. These cars were badly damaged and the thirtieth car was slightly damaged.

It was snowing at the time of the accident, which occurred at 2:55 a. m.

The train-service employee injured was the engineer of Passenger Extra 5449 East.

The thirty-third car of Extra 4528 East was A. T. & S. F. 141305, a steel box car, built in 1941. Its light weight, capacity and load limit were, respectively, 45,500 pounds, 100,000 pounds and 123,500 pounds. The height above the top of the rails was 14 feet 10-7/32 inches, the outside width was

9 feet 3-1/8 inches over the side plates, and the length over the striking castings was 40 feet 10-1/8 inches. The truck centers were spaced 30 feet 10-1/8 inches. The trucks were provided with roller-type side bearings. At the time of the accident the weight of the lading was 87,579 pounds and the height of the center of gravity was 90.9 inches. After the accident, inspection of the car failed to disclose any defective condition that could have existed prior to the accident.

Measurements of 155 feet of track No. 1 immediately west of the point of derailment were as follows:

Station	Curvature	Gage		Superelevation Light	Superelevation Under load
Feet	Degrees	Feet	Inches	Inches	Inches
155.0	6°00'	4	9	4-7/8	5
H.S. 148.5				4-7/8	4-7/8
139.5	7°00'	4	9	5	5
L.S. 137.0				5-1/4	5-1/2
124.0	7°30'	4	9	5-1/4	5-1/2
H.S. 121.5				5-1/4	5-1/8
108.5	8°00'	4	9-1/8	5-1/8	5-1/8
93.0	8°30'	4	9-1/4	5-1/8	5-1/4
L.S. 80.5				5-1/4	5-1/2
77.5	8°00'	4	9	5	4-7/8
H.S. 65.0				5	4-7/8
62.0	7°00'	4	9	5-1/8	5-1/2
L.S. 51.5				5-1/4	5-3/4
46.5	6°00'	4	9	5-1/4	5-1/2
H.S. 39.0				5-1/4	5
31.0	7°00'	4	9	4-7/8	4-5/8
L.S. 24.5				5-1/4	5-1/2
15.5	7°30'	4	9	4-7/8	5-1/4
H.S. 13.0				5	4-3/4
P. of D.	9°30'	4	9-1/4	4-7/8	4-3/4

Note: L.S. is joint of low rail;
H.S. is joint of high rail.

Discussion

As Extra 4528 was moving on track No. 1 at a speed of 17.1 miles per hour on a curve to the right, where the maximum authorized speed was 35 miles per hour, the front pair of wheels of the front truck of the thirty-third car was derailed to the left. These wheels continued in line with the track 2,164 feet, then the other wheels were derailed at a trailing-point switch, and the car obstructed track No. 2. Prior to the time of the derailment the engine and cars were riding normally, and there was no indication of defective equipment or track. The first

the crew knew of anything being wrong was after the engine passed the tower at SG, when the brakes became applied in emergency, and the train stopped abruptly. About 40 seconds later the derailed car was struck by Passenger Extra 5449 East.

Passenger Extra 5449 East was moving on track No. 2 at a speed of 30 or 35 miles per hour. The throttle was open, the headlight was lighted brightly, and both enginemen were maintaining a lookout ahead. Because of track curvature and the freight train on track No. 1, the engineer did not see the obstruction on track No. 2 until the engine was about 100 feet distant from it. He immediately moved the brake valve to emergency position and closed the throttle, but the engine struck the derailed car before the brakes became effective. Operating rules of this carrier provide that when a train is stopped suddenly by an emergency application of the air brakes or other cause, adjacent tracks that might be obstructed must be protected at once in both directions until it is ascertained they are safe and clear for the movement of trains. Members of the crew of Extra 4528 understood this requirement, but the engine of Passenger Extra 5449 had passed the rear of the freight train before the brakes became applied in emergency.

The first mark of derailment on the track structure of track No. 1 was a diagonal flange mark 6 inches long on the top of the head of the high rail, near the outside edge, 1,530 feet east of the west end of the curve. The next mark was on a spike outside the high rail 1 foot 10 inches farther east. The first mark inside the low rail was 3 feet 6 inches east of the first mark on the high rail. These flange marks continued diagonally about 20 feet. Eastward from this point, 2,140 feet, flange marks appeared on the ties about 26 inches inside the south rail and 20 inches outside the north rail. Marks on the track and marks on the center-sill and bolster of the car indicated that only one pair of wheels was derailed west of the switch. On the curve where the derailment occurred, the curvature was specified as 8° and the superelevation as 4-1/2 inches, but throughout 155 feet of track immediately west of the point of derailment the curvature varied from 6° to $9^{\circ}30'$. At the point of derailment the curvature was $9^{\circ}30'$. Cross-levels taken under load disclosed a variation in superelevation of 7/8 inch at adjacent stations 31 feet and 24.5 feet west of the point of derailment. At two stations 9 feet and 11.5 feet farther east the variation was 1/2 inch. There were numerous soft spots under the low rail, especially at joints. Adjacent ties churned and deflected under load, but the ties were firm in the ballast under the high rail and in the center of the track.

After the accident, examination of the car failed to disclose any defective condition which could have existed prior

to the accident. At the time of the derailment this car was loaded so that the center of gravity was 90.9 inches above the top of the rail. The variation in surface and alinement, combined with the high center of gravity, caused the car to roll laterally and to pivot sufficiently for the left No. 1 wheel of the front truck to be raised high enough for its flange to drop on the top of the head of the high rail. It is probable that slack adjustment in the train contributed to some extent in causing the wheel to mount the high rail, as this car was derailed at a point where the gradient changed from 0.12 percent descending to 0.5 percent ascending.

The division engineer said that the spongy condition under the low rail resulted from excessive rainfall, which had not drained from the roadbed because of heavy accumulation of sand and cinders in the stone ballast. The ballast on the low side had last been cleaned in 1942, and on the high side, in July, 1943. Track No. 1 had been surfaced on the curve involved about four weeks prior to the day of the accident, and had been inspected by the section foreman on November 5, 1943. At that time the variations in superelevation did not exceed 1/4 inch. About one week prior to November 11, the supervisor observed this track as trains passed over it. At that time ties were churning under the low rail, but he did not consider this condition to be dangerous.

Cause

It is found that this accident was caused by a derailed freight car obstructing an adjacent main track immediately in front of an approaching train.

Dated at Washington, D. C., this sixth day of December, 1943.

By the Commission, Commissioner Patterson.

W. P. BARTEL,

(SEAL)

Secretary.