

H-
175
A-1
V. 107

Dept. of Transportation
JUL 09 1976
Library

INTERSTATE COMMERCE COMMISSION
WASHINGTON

REPORT NO. 3301
THE PENNSYLVANIA RAILROAD COMPANY
IN RE ACCIDENT
NEAR WINTERSET, PA., ON
NOVEMBER 21, 1949

SUMMARY

Date: November 21, 1949

Railroad: Pennsylvania

Location: Winterset, Pa.

Kind of accident: Derailment

Train involved: Freight

Train number: Extra 4355 West

Engine number: 4355

Consist: 28 cars, caboose

Estimated speed: 20 m. p. h.

Operation: Manual-block system;
special instructions

Track: Single; 9° curve; 1.57 percent
descending grade westward

Weather: Clear

Time: About 3:45 a. m.

Casualties: 1 killed; 1 injured

Cause: Overturning of a rail

INTERSTATE COMMERCE COMMISSION

REPORT NO. 3301

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

THE PENNSYLVANIA RAILROAD COMPANY

January 20, 1950

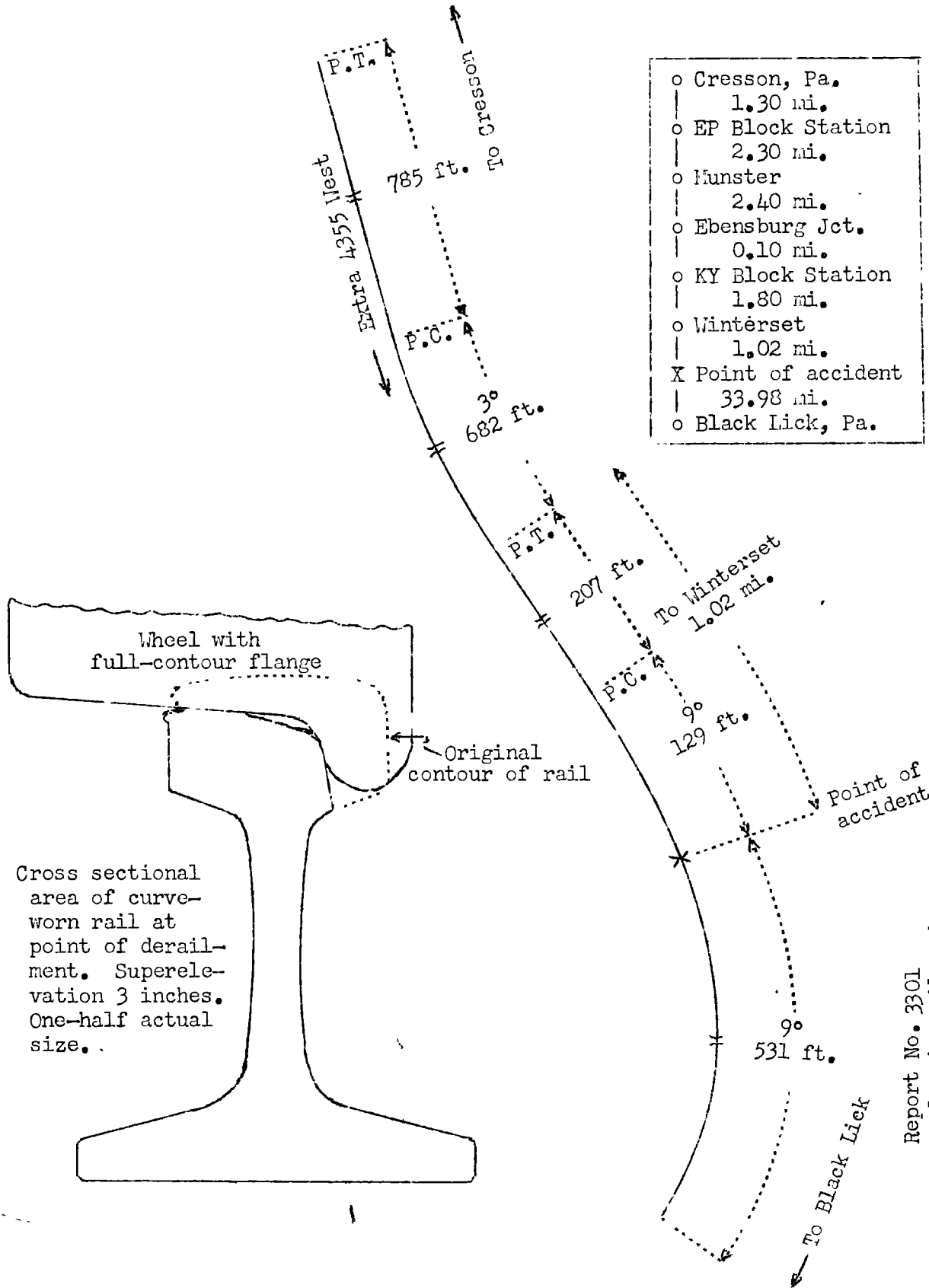
Accident near Winterset, Pa., on November 21, 1949, caused
by the overturning of a rail.

REPORT OF THE COMMISSION¹

PATTERSON, Commissioner:

On November 21, 1949, there was a derailment of a freight train on the Pennsylvania Railroad near Winterset, Pa., which resulted in the death of one employce, and the injury of one employee.

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.



Report No. 3301
 Pennsylvania Railroad
 Winterset, Pa.
 November 21, 1949

Location of Accident and Method of Operation

This accident occurred on that part of the Pittsburgh Division extending between Cresson and Black Lick, Pa., 42.9 miles, a single-track freight line, over which trains are operated by a manual-block system. The accident occurred at a point 8.92 miles west of Cresson and 1.02 miles west of Winterset. From the east there are, in succession, a tangent 785 feet in length, a 3° curve to the left 682 feet, a tangent 207 feet, and a 9° curve to the right 129 feet to the point of accident and 531 feet westward. The grade for west-bound trains is 1.57 percent descending 4,147 feet to the point of accident and a considerable distance westward.

At the point of accident, the track is constructed of 130-pound relay rail, 30 feet in length, laid in its present location in 1929 on an average of 17 treated ties to the rail length. It is fully tieplated with double-shouldered heavy-duty 130-pound tieplates, spiked with two rail-holding and two anchor spikes per tieplate, provided with 4-hole 24-inch joint bars fully bolted, and four rail anchors per rail length. It is ballasted with cinders to a depth of 18 inches below the ties. In the vicinity of the point of accident the track is laid in a cut, each wall of which is about 8 feet from the adjacent rail. Drainage is provided by a ditch on either side of the track about 34 inches below the level of the tops of the rails. The specified curvature is 9° and the specified superelevation is 3 inches.

The speed was restricted to 20 miles per hour on the curve on which the accident occurred.

Description of Accident

Extra 4355 West, a west-bound freight train, consisting of engine 4355, a 2-10-0 type, and a caboose, departed from Cresson at 2:50 a. m. and passed EP Block Station, 6.6 miles east of Winterset, at 3 a. m. At Munster, 4.3 miles east of Winterset, 28 empty hopper cars were added to the train. This train passed Ebensburg Jct., 1.9 miles east of Winterset, at 3:30 a. m., passed Winterset, and while it was moving at a speed of about 20 miles per hour on a 9° curve to the right the engine, the tender and the first eight cars were derailed.

The engine was derailed to the left and stopped parallel to the track, with the front end 265 feet west of the point of derailment. It leaned against the south wall of the cut at an angle of about 40 degrees. The tender remained coupled to the engine, stopped upright and across the track. All of the derailed cars stopped upright and in various positions on or along the track. The front truck of the eighth car was derailed. The engine, the tender and the first three cars were badly damaged. The next five cars were slightly damaged.

The fireman was killed. The engineer was injured.

The weather was clear at the time of the accident, which occurred about 3:45 a. m.

The total weight of engine 4355 in working order is 386,100 pounds, distributed as follows: Engine truck, 33,600 pounds; and the Nos. 1 to 5 driving wheels, successively, 71,500, 67,000, 72,600, 68,800 and 72,600 pounds. The diameters of the engine truck wheels and the driving wheels are, respectively, 33 inches and 62 inches. The driving wheelbase is 22 feet 8 inches long and the total wheelbase is 32 feet 2 inches long. The overall length of the engine and the tender, coupled, is 81 feet 10-1/4 inches. The spring-borne weight of the engine is carried on a two-part spring system. The front section equalizes the engine truck and the Nos. 1 and 2 pairs of driving wheels, and the rear section equalizes the Nos. 3, 4 and 5 pairs of driving wheels. The No. 3, or main, driving-wheel tires are not flanged. The engine truck consists of one pair of wheels mounted in a triangular frame. This frame is pivoted by means of a pin to the center of a cross member of the engine frame. The journal boxes are inside the wheels. The radial arms of the truck frame each are branched and bolted to the top and bottom of the journal boxes. The engine truck carries a portion of the weight of the engine by means of two elliptic springs arranged laterally and supported by hangers in front and behind the boxes. The centers of the springs bear against a U-shape casting which connects with a vertical king pin. The king pin extends through the pilot center frame and connects with the No. 1 driving-wheel spring rigging through a longitudinal equalizer pivoted to a main frame cross member. The tender is coupled to the engine by two draw bars and a spring-buffer arrangement. The engine is equipped with ET-6 brake equipment. It is not equipped with a speed-recording device.

The tender is rectangular in shape, and is equipped with two 4-wheel trucks. Its capacity is 10,300 gallons of water and 18.7 tons of coal. The total weight in working order is 204,700 pounds. The wheelbase is 24 feet 10 inches long and the overall length is 32 feet 2-1/2 inches.

The last class 3 repairs of engine 4355 were completed September 13, 1949. It was stored on September 20, 1949, after service of 371 miles. On November 16, 1949, the boiler was washed and the engine was returned to service. At the time of the accident the accumulated mileage was 906. The last trip inspection and repairs were made at Cresson on November 20, 1949.

Discussion

As Extra 4355 West was approaching the point where the accident occurred, the engineer and the fireman were in their respective positions in the cab of the engine, the front brakeman was in the brakeman's booth on the tender, and the conductor and the flagman were in the cupola of the caboose. The headlight was lighted brightly. After 28 hopper cars were added to the train at Munster, the brakes were tested and functioned properly. The train was stopped at KY Block Station, 1.8 miles east of Winterset, and the brakes functioned properly. The brakes were used on the descending grade and were released before the train entered the curve on which the accident occurred. The train was moving at a speed of about 20 miles per hour when the engine entered the curve. The derailment occurred when the engine reached the point of maximum curvature. The engine had been riding smoothly. The engineer said that an instant before the engine was derailed, he heard an unusual sound and he immediately initiated an emergency brake application. The conductor and the flagman said that the train was riding smoothly when the brakes were applied in emergency and that the stop was made without slack action.

Examination of the engine after the accident occurred did not disclose any defective condition which existed prior to the derailment. The driving-wheel assembly was in good condition. The flanges and the treads of all wheels of the engine were of full contour, and there was no appreciable tread wear. All wheel centers were tight on their axles. All tires were tight on their wheel centers and were parallel to their companion tires. There was no indication of abnormal contact with the track structure. The spring arrangements were maintained in good alignment and there was no indication of binding. Clearances between pedestal caps and

the bottoms of the driving boxes were within the specifications of the carrier. The lateral motion in the engine truck was $3/4$ inch. The lateral motion in driving wheels Nos. 1 to 5, successively, was $3/16$ inch, $1/8$ inch, $3/16$ inch, $1/8$ inch, and $1/4$ inch. Examination showed that the face of the chafing block between the engine and the tender was of good contour. The face of the chafing casting on the tender was of good contour and was adequately lubricated. There was no indication of binding. Both the large and the small helical springs were intact and under compression at the time of the derailment. The flanges and the treads of all wheels of the tender were of good contour. The tender bolsters and springs were in normal position. The center bearings of both tender trucks were well lubricated.

An examination of the track after the derailment occurred disclosed no indication of dragging equipment or of an obstruction on the track. The surface and alinement were well maintained for the maximum authorized speed. However, the south, or high, rail was excessively curve worn. The gage side of the head was worn $3/4$ inch at the lower edge. The curve-wear line sloped diagonally upward and outward at an angle of 10 degrees from vertical a distance of $5/8$ inch and then rounded outward to the outside edge of the rail. At the vertical axis the top of the rail was worn about $5/8$ inch. Approximately 46 percent of the cross-sectional area of the head of the rail was worn away. The division engineer said that the rail had not reached the carrier's condemning limit. The track in the vicinity was last surfaced in 1945, inspected as to gage and superelevation on November 10, 1949, and inspected from a track motor-car on November 18, 1949. The gage was 4 feet $8-1/2$ inches and the superelevation was 3 inches. A rail-defect detector car was operated over this track in January, 1948, and no rail defects were indicated. However, no broken rails were found at the point of derailment.

The derailment occurred near a rail joint on the high rail of the curve. The two joint-bar bolts at the east end of the joint were missing and were not recovered. Absence of rust in the joint-bar bolt holes and rail bolt holes indicated that these bolts were in place prior to the accident. The ends of both joint bars were bent outward from the rail. The outside joint bar was newly broken almost vertically and about equidistant between the bolt holes on the receiving end. The inside joint bar and the west portion of the outside joint bar remained on the receiving end of the rail west of the separation. The first rail west of the separation was turned outward and was marked on the inner side

of the web and directly under the head by a heavy longitudinal line. This mark apparently was made by an engine driving-wheel flange. The lower edge of the gage side of the head of the rail was feathered. These marks began 30 inches west of the receiving end of the rail. West of this point the track was destroyed throughout a distance of 150 feet. Approximately 75 feet east of the separation the outside rail showed distortion. The rail was canted outward but the outside edge of the base remained on the tieplates. The inside spikes were partially withdrawn. The degree of canting increased westward to the point of rail separation.

The investigation of this accident disclosed no indication that a wheel had crossed to the outside of a rail. Considering that the engine was rigid because of an accumulated mileage of only 906 miles since it last received class 3 repairs, that the flanges of the wheels of the engine were of full contour, and that the outside rail was excessively curve worn, it is apparent that the flanges were in contact with the upper part of the inclined surface of the curve-worn area of the head of the rail. As a result the forces were directed sufficiently outward and downward to cause the rail to overturn.

Cause

It is found that this accident was caused by the overturning of a rail.

Dated at Washington, D. C., this twentieth day of January, 1950.

By the Commission, Commissioner Patterson.

(SEAL)

W. P. BARTEL,
Secretary.