

INTERSTATE COMMERCE COMMISSION  
WASHINGTON

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INVESTIGATION NO. 3008  
SOUTHERN RAILWAY COMPANY  
REPORT IN RE ACCIDENT  
NEAR SHIPMAN, VA., ON  
JULY 29, 1946

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SUMMARY

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Railroad: Southern  
Date: July 29, 1946  
Location: Shipman, Va.  
Kind of accident: Derailment  
Train involved: Baggage-mail-express  
Train number: 142  
Engine number: 1389  
Consist: 9 cars  
Estimated speed: Approximately 80 m. p. h.  
Operation: Timetable, train orders and  
automatic block-signal system  
Tracks: Double; 5°24' curve; 1.34 percent  
descending grade northward  
Weather: Clear  
Time: 4:38 a. m.  
Casualties: 2 killed; 3 injured  
Cause: Excessive speed on curve

INTERSTATE COMMERCE COMMISSION

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INVESTIGATION NO. 3008

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

SOUTHERN RAILWAY COMPANY

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September 12, 1946.

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Accident near Shipman, Va., on July 29, 1946, caused by  
excessive speed on a curve.

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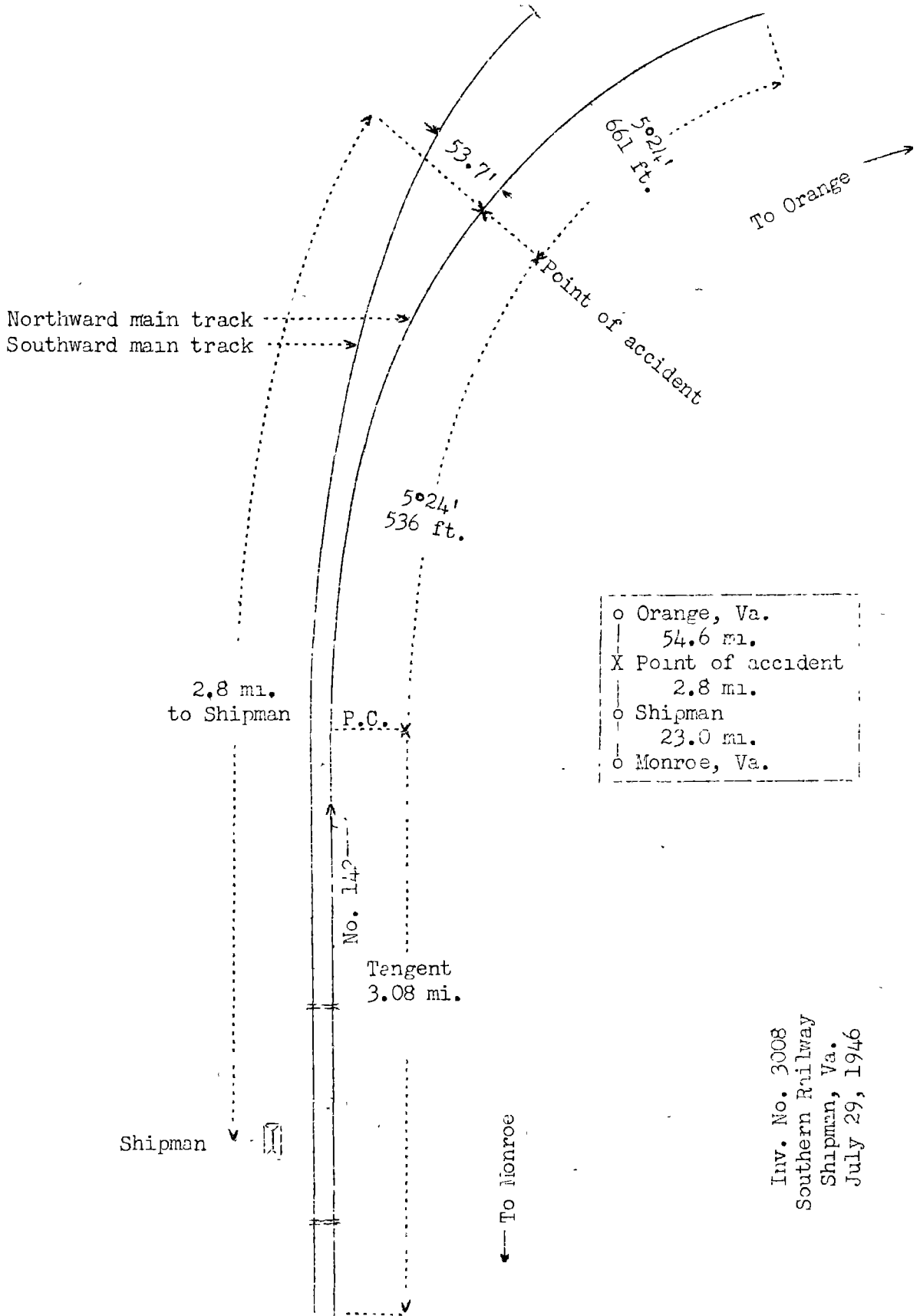
REPORT OF THE COMMISSION<sup>1</sup>

PATTERSON, Commissioner:

On July 29, 1946, there was a derailment of a baggage-mail-express train on the Southern Railway near Shipman, Va., which resulted in the death of two employees, and the injury of one railway-express-messenger and two employees.

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<sup>1</sup>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. 3008  
 Southern Railway  
 Shipman, Va.  
 July 29, 1946

### Location of Accident and Method of Operation

This accident occurred on that part of the Washington Division extending between Monroe and Orange, Va., 80.4 miles, a double-track line, over which trains moving with the current of traffic are operated by timetable, train orders and an automatic block-signal system. The accident occurred on the northward main track, 25.8 miles north of Monroe, at a point 2.8 miles north of the station at Shipman. From the south on the northward main track there is a tangent 3.08 miles in length, which is followed by a  $5^{\circ}24'$  curve to the right 536 feet to the point of accident and 361 feet northward. The grade for north-bound trains on the northward main track varies between 0.42 percent and 1.21 percent ascending 1.93 miles, then it is, successively, practically level 1,500 feet, 1.00 percent descending 1,700 feet and 1.34 percent descending 369 feet to the point of accident and 231 feet northward. In the immediate vicinity of the point of accident, the distance between the centers of the northward and the southward main tracks is 53.7 feet.

On the curve on which the accident occurred, the track structure consists of 151-pound rail, 59 feet in length, laid new in June, 1942, on an average of 22 treated hardwood ties to the rail length. It is fully tieplated with double-shoulder canted tieplates, spiked with 4 spikes per tieplate, provided with 4-hole head-free angle bars and an average of 6 gage rods and 8 rail anchors per rail length, and is ballasted with crushed stone to a depth of 16 inches. The maximum superelevation on the curve was 5-1/8 inches, and the gage varied between 4 feet 8-3/8 inches and 4 feet 8-3/4 inches. At the point of derailment the superelevation was 5 inches, and the gage was 4 feet 8-3/4 inches.

Time-table special instructions prescribe the maximum authorized speed for the train involved as 70 miles per hour on tangent track and 40 miles per hour on the curve on which the derailment occurred.

### Description of Accident

No. 142, a north-bound first-class baggage-mail-express train, consisted of engine 1339, a 4-3-2 type, four express cars, four mail cars and one passenger-baggage car, in the order named. The second and eighth cars were of steel-under-frame construction, and the remainder were of all-steel construction. This train departed from Monroe at 4:10 a. m., 48 minutes late, passed Shipman, the last open office, at 4:35 a. m., 45 minutes late, and while moving at a speed estimated to have been approximately 80 miles per hour it was derailed.

The engine overturned to the left and continued in a general tangential line a distance of about 100 feet northward,

where the front end struck the wall of a rock cut located between the main tracks, then it was deflected toward the northward main track and stopped on its left side 6 feet west of that track and practically parallel to it, with the front end 612 feet north of the point of derailment. The engine truck was torn loose, and stopped about 30 feet north of the engine. The left side of the engine was badly damaged, steam pipes within the cab were broken, and the cab was demolished. Break in the safety chains of the engine-truck were new, which indicated that the chains broke as a result of the derailment. The tender, remaining coupled to the engine, stopped at the rear of the engine and in line with it. The left rear pedestal jaw of the rear truck was broken off, and the break was new. The rear-end sheet was pushed inward about 12 inches. Separations occurred between all cars of the train. The first to fourth cars, inclusive, stopped generally in line with the track, with the front end of the first car and the rear end of the fourth car, respectively, 393 feet and 120 feet north of the engine. The first car was off its trucks and leaned to the east at an angle of 25 degrees, and was demolished. A portion of the frame of the rear truck of the tender was on the front end of this car. The second car leaned to the west at an angle of 20 degrees, and the forward half of the left side was torn out. The third car leaned to the west at an angle of 30 degrees. The left front corner was demolished and the left side was crushed inward. The fourth car leaned to the west at an angle of 35 degrees. The left side was demolished its entire length. The fifth car stopped against the tender, at an angle of 45 degrees to the track and leaned to the west at an angle of 20 degrees. The sixth car stopped against the right side of the fifth car, and the seventh car stopped against the right side of the sixth car. These cars were badly damaged. The eighth and ninth cars stopped to the south of the seventh car and leaned to the west at an angle of about 20 degrees, with the front end of the eighth car 18 feet west of the track and the rear of the ninth car on the roadbed. These cars were slightly damaged.

The weather was clear and day was breaking at the time of the accident, which occurred about 4:38 a. m.

The engineer and the fireman were killed. The conductor and the baggageman were injured.

The total weight of engine 1389 in working order is 300,000 pounds, distributed as follows: Engine truck, 60,000 pounds; driving wheels, 180,000 pounds; and trailer truck, 60,000 pounds. The specified diameters of the engine-truck wheels, the driving wheels, and the trailer-truck wheels are, respectively, 33 inches, 73 inches, and 43 inches. The rigid wheelbase of the engine is 13 feet in length, the total length of the wheelbase is 36 feet 1 inch, and the total length of the engine and tender is 83 feet 1/8 inch. The tender is rectangular in shape and is equipped with two 4-wheel trucks. Its capacity is 16 tons of

coal and 10,000 gallons of water. The total weight of the tender loaded is 195,300 pounds. The center of gravity of the engine is 75 inches above the tops of the rails. The center of gravity of the tender, with the calculated amount of fuel and water at the time of the accident, is estimated as 64.42 inches above the tops of the rails. The engine is provided with No. 6-ET brake equipment. The last class repairs were completed June 23, 1946. The last monthly certificate was issued July 19, 1946, and the last trip-inspection and repairs were completed at Monroe at 3:15 a. m. on the day of the accident. The accumulated mileage since the last class repairs was 9,482 miles. The engine is provided with an arrangement to open a brake-pipe vent valve when an engine-truck wheel drops two inches or more below its normal position.

#### Discussion

No. 142 was moving on a 5°24' curve to the right when it was derailed. The engine overturned to the left and stopped on its left side 612 feet north of the point of derailment. The maximum authorized speed for this train on the tangent immediately south of this curve was 70 miles per hour and on the curve it was 40 miles per hour.

There was no defective condition of the engine prior to the accident. There was no indication of dragging equipment, defective track, or of any obstruction having been on the track. Examination of the engine after the accident disclosed that the throttle lever was about one-half open, the independent brake valve was in running position and the automatic brake valve was in service-lap position. However, debris in the cab of the engine near the automatic brake valve indicated that as a result of the derailment this valve may have been forced from running position to the position in which it was found. The brake-pipe vent valve on the engine truck had been actuated.

As No. 142 was approaching the point where the derailment occurred, the conductor, the baggageman and the flagman were in the rear car, and the express messenger was in the second car. They said that the cars had been riding smoothly prior to the accident. The baggageman and the flagman made a running inspection of the train as it passed the station at Shipman at a speed of about 70 miles per hour, and there was no indication of defective equipment. The members of the train crew thought that when the train was in the vicinity of the apex of the grade, 2,300 feet south of the point of accident, a service application of the brakes was made, which was not released. They estimated the speed as about 40 miles per hour when the engine entered the curve. None of these employees observed any slack action which would be expected if the throttle was closed after the engine entered the descending grade. The first they knew of anything being wrong was when the brakes were applied in emergency, and the derailment occurred immediately afterward.

The express messenger said that he did not observe any application of the brakes immediately prior to the emergency application. The brakes of this train had been tested and had functioned properly en route. The engineer, who was 73 years of age, and the fireman, who was 36 years of age, were killed in the accident. The operator at Shipman said that when No. 142 passed that station the headlight was lighted brightly, the engine whistle was sounded for road crossings in the vicinity of the station, and the fireman exchanged hand signals with the operator. Two maintenance-of-way employees, who were walking along the track on their way to work when No. 142 passed them at a point about 4,000 feet south of the point of derailment, said that the speed of No. 142 was considerably in excess of the usual speed for passenger-equipment trains at this point, and that the engine continued to work steam on the descending grade until the derailment occurred.

The surface, alinement and gage of the track on the curve were well maintained for the maximum authorized speed of 40 miles per hour. This curve was last lined and surfaced during October, 1945, and the south spiral was lined and surfaced during May, 1946. It was last gaged on June 22, 1946, and was last inspected on July 27, 1946. The engineer of a north-bound passenger train, which passed this point about 1 hour before the accident occurred, said his engine rode smoothly at a speed of 40 miles per hour, and there was no indication of defective track.

The first indication of disturbed track was at a point 756 feet north of the south end of the curve. At this point the high rail was canted outward and the degree of cant progressively increased until the rail was overturned at a point 65 feet northward. The succeeding high rails were overturned and pushed westward off the ends of the ties throughout a distance of 358 feet. The first mark on the ties was a flange mark across a tie 8-1/4 inches inside the low rail 63.5 feet north of the first mark of disturbed track. At a point 1.5 feet northward there was a light scraping mark on the inside surface of the web of the high rail. Throughout a distance of 155 feet immediately north of this point there were flange marks inside the low rail and on the ends of the ties outside the high rail. These marks extended progressively outward and northward to the outer ends of the ties. Opposite the first canted rail and about 20 feet horizontally distant, coal had been spilled from the tender, and grass and weeds had been flattened by water spilled from the cistern. Starting at a point 253 feet north of the first canted rail the roadbed between the main tracks had been gouged by the engine as it slid on its left side to the point where it stopped against the rock wall, 139 feet northward. The displaced material of the roadbed was pushed forward by the engine, and the front end of the engine was half-buried by this material. There was no ballast mark on



any wheel of the engine or the tender. This fact indicates that the wheels did not touch the ground within the limits of the ballast structure.

The superintendent said that the theoretical overturning speed on the curve for engine 1389 was 90.14 miles per hour. The estimated overturning speed for the tender, with the amount of fuel and water it was calculated to have had at the time of the accident, was 35.17 miles per hour. The road foreman of engines said that, to control the speed of passenger-equipment trains in this territory, it is customary to place the throttle lever in drifting position when the engine reaches a point about 2,400 feet south of the south end of the curve and to make an initial brake-pipe reduction of about 6 pounds at a point about 300 feet northward. After slack action is adjusted, further brake-pipe reductions are made to reduce to the specified speed of 40 miles per hour, then the brake application is released before the engine enters the curve. It was his opinion that No. 142 was moving at a speed of between 60 and 70 miles per hour when the engine reached the apex of the grade immediately south of the curve, that no application of the brakes was made as the train was moving on the descending grade and that, as a result, the speed was in excess of 80 miles per hour when the engine entered the curve. The engine was not equipped with a speedometer.

Since there were no wheel marks between the rails or on the rails at the point of derailment, it appears that the engine was moving at approximately overturning speed when it entered the curve. Evidently after the engine entered the curve it thrust heavily against the high rail and leaned to the left sufficiently for the right engine-truck wheels to rise high enough to permit actuation of the engine-truck brake-pipe vent valve. Then the brakes became applied in emergency, and the force resulting from the sudden run-in of slack between the tender and the cars combined with the high rate of speed caused the engine to overturn. The marks on the track structure and the displacement of the high rail evidently occurred when the tender was pulled from the track by the engine.

Cause

It is found that this accident was caused by excessive speed on a curve.

Dated at Washington, D. C., this twelfth day of September, 1946.

By the Commission, Commissioner Patterson.

(SEAL)

W. P. BARTEL,  
Secretary.