

INTERSTATE COMMERCE COMMISSION  
WASHINGTON

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INVESTIGATION NO. 2760

THE DENVER AND RIO GRANDE WESTERN  
RAILROAD COMPANY

REPORT IN RE ACCIDENT

AT EAGLE, COLO., ON

JANUARY 11, 1944 ;

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SUMMARY

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Railroad: Denver and Rio Grande Western  
Date: January 11, 1944  
Location: Eagle, Colo.  
Kind of accident: Derailment  
Train involved: Passenger  
Train number: Extra 1706 West  
Engine number: 1706  
Consist: 12 cars  
Estimated speed: In excess of 60 m. p. h.  
Operation: Timetable, train orders and  
automatic block-signal system  
Track: Single; 5° curve; 0.74 percent  
descending grade westward  
Weather: Clear  
Time: 3:43 p. m.  
Casualties: 1 killed; 17 injured  
Cause: Excessive speed on sharp curve

INTERSTATE COMMERCE COMMISSION

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INVESTIGATION NO. 2760

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

THE DENVER AND RIO GRANDE WESTERN RAILROAD COMPANY

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February 11, 1944.

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Accident at Eagle, Colo., on January 11, 1944, caused by  
excessive speed on a sharp curve.

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

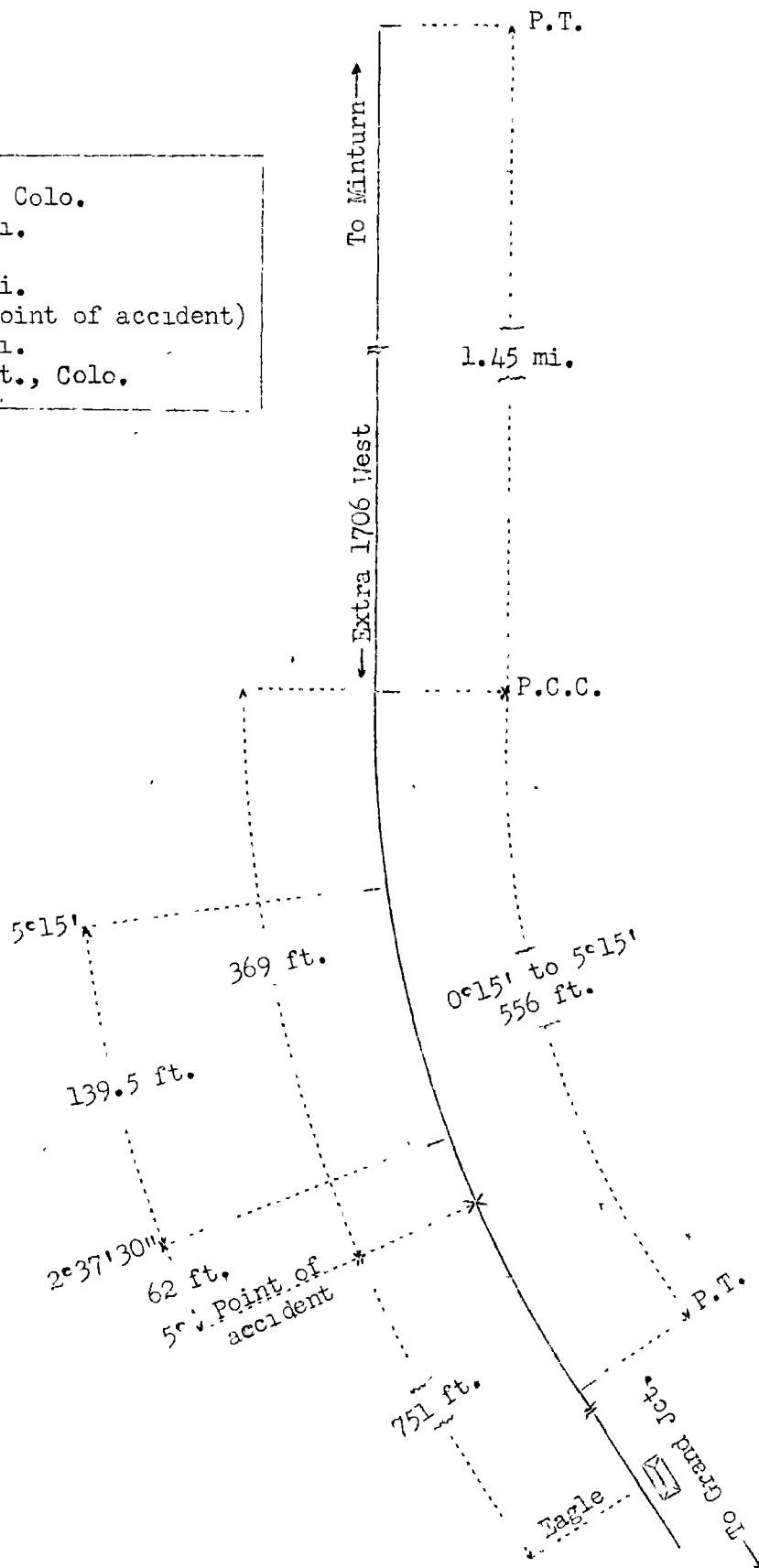
PATTERSON, Chairman:

On January 11, 1944, there was a derailment of a  
passenger train on the Denver and Rio Grande Western Rail-  
road at Eagle, Colo., which resulted in the death of 1  
employee, and the injury of 16 passengers and 1 employee.

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<sup>1</sup>Under authority of section 17 (2) of the Interstate Com-  
merce Act the above-entitled proceeding was referred by the  
Commission to Chairman Patterson for consideration and dis-  
position.

- o Minturn, Colo.  
17.0 mi.
- o Wolcott  
10.0 mi.
- X Eagle (Point of accident)  
120.6 mi.
- o Grand Jct., Colo.



Inv. No. 2760  
Denver and Rio Grande Western Railroad  
Eagle, Colo.  
January 11, 1944

Location of Accident and Method of Operation

This accident occurred on that part of the Grand Junction Division designated as Sub-Division 4 and extending between Minturn and Grand Jct., Colo., 147.6 miles. In the vicinity of the point of accident this was a single-track line over which trains were operated by timetable, train orders and an automatic block-signal system. The accident occurred 751 feet east of the station at Eagle. From the east there was a tangent 1.45 miles in length, which was followed by a compound curve to the left 556 feet, the curvature of which varied between  $0^{\circ}15'$  and  $5^{\circ}15'$ . The derailment occurred on this curve 369 feet west of its eastern end, where the curvature was  $5^{\circ}00'$ . The grade for west-bound trains was, successively, 1.09 percent descending 1,614 feet, level 810 feet, 0.37 percent descending 1,950 feet, 1.30 percent descending 3,500 feet, level 808 feet and 0.74 percent descending 22 feet to the point of accident and 1,680 feet beyond.

On the curve the track structure consisted of 100-pound rail, 39 feet in length, laid in 1931 on 24 ties to the rail length. It was fully tieplated, double-spiked and was ballasted with slag to a depth of 6 inches. The maximum superelevation on the curve was 4-1/4 inches and the gage varied between 4 feet 8-1/2 inches and 4 feet 9 inches. At the point of derailment the superelevation was 3-5/8 inches and the gage was 4 feet 8-3/4 inches.

Operating rules read in part as follows:

10. COLOR SIGNALS

Color	Indication
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\* \* \*

- (n) Slow Boards, with the required numerals, \* \* \* located fourteen hundred (1400) feet, \* \* \*, in advance of certain locations where speed of trains is permanently restricted.

On boards where two numerals appear the upper numeral denotes the maximum speed in miles per hour permitted for passenger trains and the lower for freight or mixed trains.

\* \* \*

\* \* \*. Enginemen should restrict the speed of train until, in their judgment, the entire train has passed the restricted territory, \* \* \*

The foregoing provides maximum safe speeds in restricted territory and speeds therein specified must not be exceeded.

\* \* \*

## 16. COMMUNICATING SIGNALS

Note--The signals prescribed are illustrated by "o" for short sounds; "\_\_\_" for longer sounds. \* \* \*

Sound	Indication
* * *	
(f) o o o o	When running--reduce speed.
* * *	

The maximum authorized speed for passenger trains was 55 miles per hour, and on the curve involved, 47 miles per hour. A speed-limit sign bearing the numerals "47" was located 1,400 feet east of the east end of the curve. 37

### Description of Accident

Extra 1706 West, a west-bound passenger train, consisted of engine 1706, of the 4-8-4 type, one express car, four Pullman sleeping cars, two kitchen-baggage cars and five Pullman sleeping cars, in the order named. The first car was of steel-underframe construction and the remainder were of all-steel construction. After a terminal air-brake test was made this train departed from Minturn, 27 miles east of Eagle, at 3:11 p. m., passed Wolcott, 10 miles east of Eagle and the last open office, at 3:35 p. m., and while it was moving at a speed estimated to have been in excess of 60 miles per hour the engine and the first car were derailed.

Engine 1706 was derailed to the north and stopped, badly damaged, on its right side and at right angles to the track, with the front end 459 feet west of the point of derailment and 69 feet north of the track. The tender stopped, bottom up, behind the engine and at right angles to it, with the front end against the cab. The first car stopped against the driving-wheel assembly of the engine, and was demolished. The knuckle of the front coupler of the second car was broken, and this car became separated from the first car. The second to twelfth cars, inclusive, remained coupled and were not derailed. This portion of the train stopped with the front end of the first car 2,534 feet west of the point of derailment.

It was clear at the time of the accident, which occurred about 3:43 p. m.

The engineer was killed and the fireman was injured.

Because of damage to the engine, the position of the throttle, the reverse lever and the brake valves at the time of the accident could not be determined. There was evidence of recent brake burns on all driving-wheel tires. There was no indication of defective condition of the engine prior to the accident. There was no condition found that would prevent the proper application of the train brakes.

The total weight of engine 1706 in working order was 418,150 pounds. The diameter of the engine-truck wheels, driving wheels and trailer-truck wheels were, respectively, 36 inches, 70 inches and 42 inches. The tender was equipped with 6-wheel trucks. The rigid wheelbase of the engine was 18 feet 9 inches long. The total length of the engine and tender was 100 feet 6-1/4 inches. The center of gravity was 76-1/2 inches above the top of the rails.

After the accident, measurements of the track taken throughout a distance of 356.5 feet east of the point of accident were as follows:

<u>Distance east of point of accident</u>	<u>Superelevation</u>	<u>Gage</u>		<u>Curvature</u>
<u>Feet</u>	<u>Inches</u>	<u>Feet</u>	<u>Inches</u>	<u>Degrees</u>
356.5	1/4	4	8-1/2	0°45'00"
341	3/4	4	8-1/2	1°00'00"
325.5	1-1/4	4	8-1/2	1°22'30"
310	1-3/4	4	8-1/2	1°45'00"
294.5	2-1/4	4	8-1/2	2°22'30"
279	2-1/2	4	8-1/2	3°00'00"
263.5	2-5/8	4	8-1/2	3°15'00"
248	3-3/4	4	9	4°15'00"
232.5	3	4	8-3/4	5°07'30"
217	3-1/4	4	8-3/4	5°15'00"
201.5	3-1/2	4	9	5°15'00"
186	3-1/2	4	8-3/4	5°07'30"
170.5	3-1/2	4	8-3/4	5°07'30"
155	3-1/2	4	8-3/4	4°52'30"
139.5	3-1/2	4	8-3/4	4°07'30"
124	3-1/4	4	9	4°30'00"
108.5	3-1/4	4	9	3°15'00"
93	3-1/2	4	9	3°00'00"
77.5	4	4	8-3/4	2°52'30"
62	4-1/4	4	8-3/4	2°37'30"
46.5	3-1/2	4	8-1/2	2°45'00"
31	3-1/2	4	8-3/4	3°45'00"
15.5	3-1/2	4	9	4°45'00"
Point of accident	3-5/8	4	8-3/4	5°00'00"

### Discussion

Extra 1706 West was moving on a compound curve to the left when the engine and the first car were derailed to the right at a point where the curvature was 5° and the superelevation 3-5/8 inches. The engine overturned and stopped 459 feet beyond the point of derailment. The maximum authorized speed on the curve was 47 miles per hour. There was no defective condition of the engine prior to the accident, and there was no indication of dragging equipment, defective track, or of any obstruction having been on the track.

The fireman said that as the train was approaching the curve on which the derailment occurred the train air-signal was

sounded to reduce speed and, in addition, he warned the engineer that the speed was excessive, but the engineer did not take action to control the speed. The conductor said that he sounded the train air-signal for the engineer to reduce the speed of the train as it was approaching Eagle. The speed was not reduced in compliance with the signal, so he opened the emergency valve on the third car just prior to the derailment. These employees estimated that the speed of the train prior to the accident was in excess of 60 miles per hour.

According to A. R. E. A. tables, the overturning speed at the point of derailment for engine 1706 was about 83 miles per hour. No one definitely estimated the speed to be that high; however, the average speed throughout 10 miles immediately east of the point of derailment was approximately 75 miles per hour, and the highest speed in this territory was attained in the last mile. It is evident that the train was moving at overturning speed, as the engine was derailed to the outside of the curve without marking the track structure. This was a compound curve on which the curvature varied from  $5^{\circ}15'$  to  $2^{\circ}37'30''$  and then to  $5^{\circ}$  within a distance of 201.5 feet immediately east of the point of derailment. Within this distance the superelevation varied 1 inch, and at stations 62 and 46.5 feet east of the point of derailment the difference in superelevation was  $3/4$  inch. The variation in curvature and the irregularity in the surface were factors which contributed to some extent to causing the engine to overturn. It could not be determined why the engineer failed to take action to control the speed of the train in accordance with the speed restriction on the curve, as he was killed in the accident.

#### Cause

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

Dated at Washington, D. C., this eleventh day of February, 1944.

By the Commission, Chairman Patterson.

(SEAL)

W. P. BARTEL,  
Secretary.