

Inv-2186

INTERSTATE COMMERCE COMMISSION

WASHINGTON

REPORT OF THE DIRECTOR

BUREAU OF SAFETY

ACCIDENT ON THE

INTERNATIONAL-GREAT NORTHERN RAILROAD

MANCHACA, TEX.

JULY 12, 1937.

INVESTIGATION NO. 2186

SUMMARY

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Railroad: International-Great Northern
Date: July 12, 1937
Location: Manchaca, Tex.
Kind of accident: Derailment
Train involved: Freight
Train number: 67
Engine number: 1115
Consist: 33 cars and caboose
Speed: 45 m.p.h.
Track: 1^o 30' curve: 1.264 percent
descending grade.
Weather: Clear
Time: 5.20 a.m.
Casualties: 3 killed and 5 injured
Cause: Not definitely determined

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August 21, 1937

To the Commission:

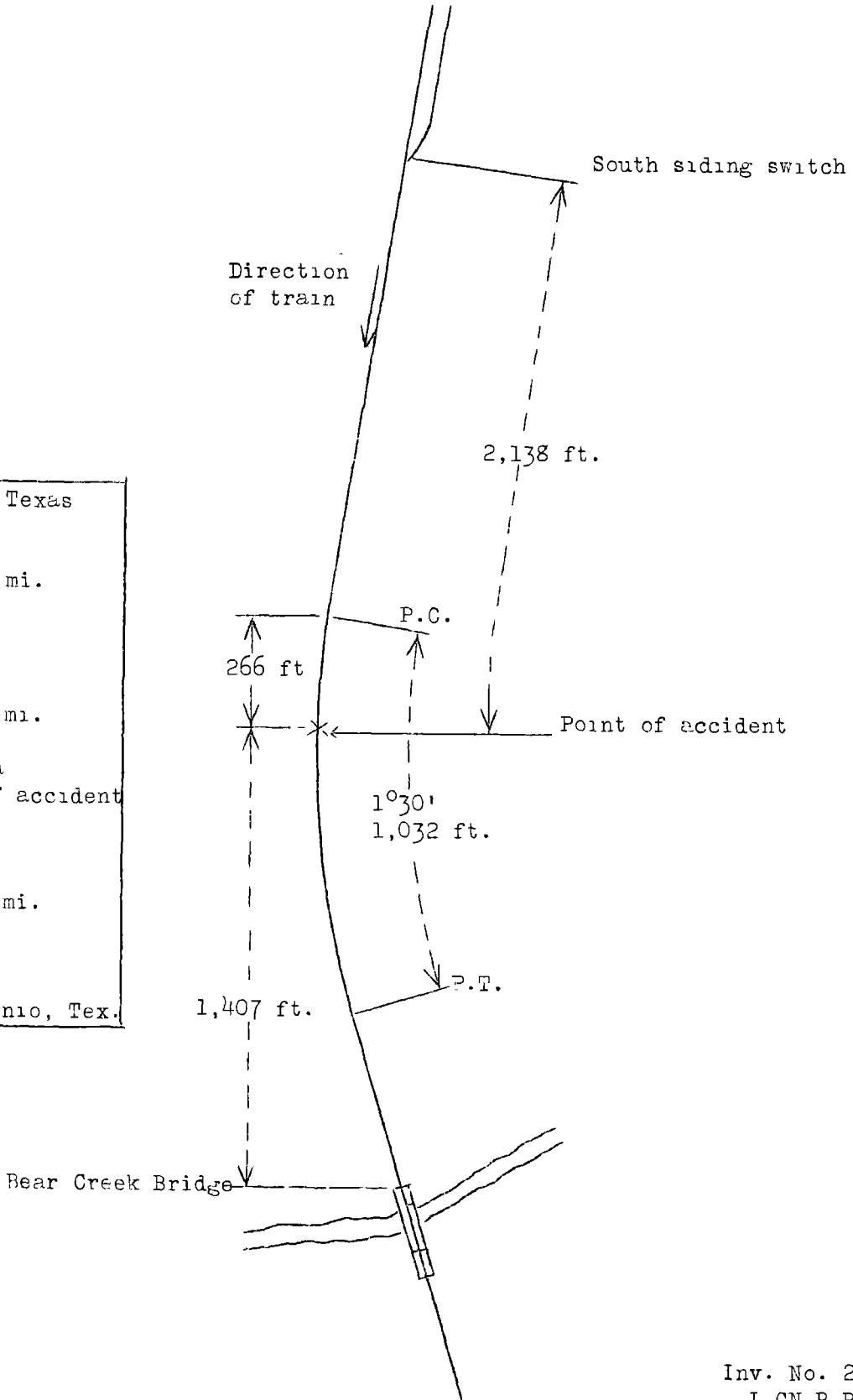
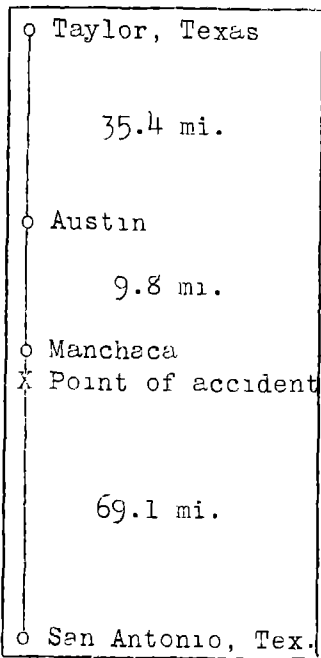
On July 12, 1937, there was a derailment of a freight train on the International-Great Northern Railroad near Manchaca, Texas, which resulted in the death of 3 trespassers and the injury of 5 trespassers.

Location and method of operation

This accident occurred on the Austin District of the San Antonio Division which extends between San Antonio and Taylor, Texas, a distance of 114.3 miles. In the vicinity of the point of accident this is a single-track line over which trains are operated by timetable, train orders and an automatic block-signal system. The accident occurred at a point 2,138 feet south of the south siding switch at Manchaca. Approaching this point from the north the track is tangent for more than 1 mile, followed by a 1° 30' curve to the left 1,032 feet in length, the accident occurring on this curve at a point 266 feet from its northern end. The grade for south-bound trains is 0.666 percent descending for a distance of 900 feet, then 1.264 percent descending for a distance of 3,400 feet, followed by level track for a distance of 1,300 feet, the derailment occurring on the 1.264 percent descending grade at a point 500 feet from its southern end.

The track is laid with 90-pound rails, 33 feet in length; with 20 oak and creosoted pine ties to the rail length, single-spiked, fully tie-plated and with 12 rail anchors to the rail length. The track is ballasted with from 10 to 12 inches of crushed stone under the ties. From the south switch of the siding to the curve on which the accident occurred the track was maintained in fair condition, while the track on the curve was well maintained with the exception of a low joint 101 feet north of the point of derailment. The maximum speed allowed for freight trains in this territory is 45 miles per hour.

A bridge is located 1,407 feet south of the point of derailment; it spans Bear Creek, being 318 feet in length, 47 feet 4 inches in height and is of open-type construction on concrete piers and abutments.



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The creek was about 48 feet below the base of the rail. Inner guard rails were used across the bridge, these rails extending 66 feet beyond the end of the bridge, coming together and being connected by frog points in the center of the track. Beginning at the point where the rails curve inward and for a distance of 16 ties, rail braces were used against the inner sides of the guard rails.

The weather was clear at the time of the accident, which occurred at 5.20 a.m.

Description

Train No. 67, a south-bound freight train, consisted of 33 cars and a caboose, hauled by engine 1115, and was in charge of Conductor Young and Engineman Reichert. This train departed from Taylor, 45.2 miles north of Manchaca, at 3.25 a.m., according to the train sheet, 4 hours 15 minutes late, left Colorado Bridge, 10.4 miles from Manchaca, at 4.50 a.m., 3 hours 48 minutes late, and was derailed after passing Manchaca while traveling at a speed estimated to have been about 45 miles per hour.

The engine, tender and first 22 cars were not derailed. The twenty-third to thirty-second cars, inclusive, were derailed and badly damaged, six of these cars being destroyed. The twenty-third car dropped on its right side to the right of the bridge just beyond the creek bed, approximately 1,597 feet beyond the point of derailment, the rear truck dropping in the creek while the front truck was to the left of the car. The following seven cars plunged off the bridge and stopped beyond, on top of, and to the rear of the twenty-third car, three of the cars being in the creek. The thirty-first car remained on the bridge with its front end overhanging the right side of the bridge, while the front trucks of the thirty-second car were derailed.

Summary of evidence

Engineman Reichert stated that he was operating his train at a speed of about 40 miles per hour on passing through Manchaca. He used steam on the descending grade to keep the slack stretched, but was using a drifting throttle when he felt the air brakes being applied in emergency, at which time he thought the speed

was about 45 miles per hour. He looked back and saw the cars going over the bridge. He did not notice any irregularities in the track. The engine rode smoothly on entering the curve and he did not notice any slack action or sudden jerk in the train. The head portion of the train traveled about 40 car lengths after the brakes were applied, the rear car of the head portion stopping about 20 car lengths beyond the bridge. The air brakes had been tested before departure from Taylor.

Fireman Hay stated that on rounding the curve on which the accident occurred he was looking back and he saw sparks flying from one of the cars. He called to the engineman and about that time the air brakes were applied in emergency.

Conductor Young was on the right side in the cupola on passing through Manchaca and he saw sparks flying from under one of the cars; he saw the car become derailed, called out to the flagman who was on the left side of the cupola and they opened the valve, applying the air brakes in emergency. He thought that the head portion of the train that remained on the track stopped about 10 car lengths beyond the bridge. The twenty-third car, B. & A. 50609, was the first to be derailed. This car was loaded with lumber to the roof and it was his opinion that the car was top heavy, that the lumber had shifted and the car would not take the curve. He did not notice any of the cars rocking on descending the grade just prior to the accident. He made an inspection of the train at Austin and the only defect found was a loose safety brake-beam bar on the twelfth car in the train. After the accident he made an inspection of the train at New Braunfels, 37.3 miles beyond, and found nothing wrong. The statements of Flagman Barnhill corroborated those of the conductor. He inspected one side of the train at Austin while the conductor inspected the other side and the only defect found was the loose safety brake-beam bar found by the conductor. He did not notice any unusual conditions in the track approaching the point of accident.

Section Foreman Hancock, in charge of the section on which the accident occurred, stated that he had last worked on this track on July 1, when he checked a few low joints. A light rain had fallen on the morning prior to the accident and there was a sprinkle that evening. The drainage was good. While there may have been some joints churning, they were not bad. At a

point about 20 rail lengths north of the point of derailment on the east side, the ballast was working out from the ends of the ties, which would cause a little churning but he had not noticed any cars in freight trains rocking just before they reached the curve on which the accident occurred. He considered the track in first-class condition.

Roadmaster Love said that he arrived at the scene of accident about 9.00 a.m. and inspected the track for a distance of about 300 feet north of the point of derailment. He checked the track for gauge and level; he considered it in good condition and did not notice any unevenness that might have contributed to the derailment. He did notice the track churning to some extent. It was his opinion that there was something wrong with the rear truck of B. & A. 50609, the first car to be derailed; it had a loose wheel and grease was coming through between the axle and wheel. One wheel was flange worn which he thought was due to a bent axle.

Division Engineer Cook arrived at the scene about noon, and his inspection of the track showed the first mark of derailment to be a flange mark on the gauge side of the outside, or west, rail; this mark was 2 feet south of a joint. The flange mark appeared on this rail for a distance of 19 feet 8 inches and the wheel then dropped off on the outside of the rail. The first spike marked was on the outside of the rail 25 feet 10 inches from the point where the wheel had mounted the rail, and about 7 feet beyond was a flange mark on the outside of the rail. The first mark on the east side was a flange mark on a tie $22\frac{1}{2}$ feet from the point where the wheel had mounted the west rail; this mark was $6\frac{1}{2}$ inches from the gauge side of the rail and from this point for a distance of $33\frac{1}{2}$ feet there were corresponding marks on the ties between the rails and on the outside of the west rail, at which point the marks between the rails had reached the center of the track and the marks on the outside had reached the ends of the ties, as the derailed truck traveled toward the outside of the curve. These marks continued around the curve and on tangent track until the derailed truck came in contact with the points of the inner guard rail on the bridge, and the final derailment occurred. It was also found that the gauge side of the west rail had been marked by some part of the derailed truck coming in contact with the rail; this mark appeared 30 feet south of the first flange

mark on the ties and about where the wheels reached the center of the track and continued for 66 feet. This same marking was noted at four other places on the curve. The pressure exerted against the outside rail had the effect of throwing the track out of line from $\frac{1}{8}$ to $1\frac{1}{8}$ inches. The wheel marks indicated that the truck was slued, with the right front wheel forward. Division Engineer Cook was of the opinion that the derailment was due to a defective truck at the rear end of B. & A. car 50609. Examination of this truck revealed three defects which could have caused the accident; the side bearing on the right side was missing, having been broken off; both axles were bent, and the flange on the right front wheel was considerably worn and irregular, indicating that this condition had existed for some time; the right rear wheel was loose on the axle; this wheel appeared to be a new one. The marks on the ties indicated that the rear truck was the first to be derailed. Had the forward truck been derailed, this car no doubt would have pulled the next car ahead off the track, and examination of the coupler of the front of this car did not show any bend in the shank or any damage to the carrier iron. He did not think that the forward truck would have been derailed without some damage to the coupler. In addition, it was noted that the center sill of this car had been rubbed forward on the right side and back on the left side, indicating slued flanges of wheels coming in contact with center sill of car, which was discolored account of being hot; this was on the rear end of the car. He was present when this car was rerailed and it was in the same position as it was when derailed and he did not think the car had reversed itself when it became derailed. While the cross members were bent southward, this was done when the forward trucks were derailed after the car came in contact with the inner guard rail at the north end of the bridge. This car was loaded to the roof with green lumber. Division Engineer Cook further stated that the elevation on this curve was 3 inches. Measurements, however, showed the elevation to be $2\frac{5}{8}$ inches at the point of accident. The track was in good alinement and surface; the maximum variation in cross level was $\frac{3}{8}$ inch. The gauge varied from $\frac{1}{8}$ inch tight to $\frac{1}{4}$ inch wide. There was a lack of ballast in some places and except for a small amount of churning in the track on the tangent north of the curve, the track was in good condition.

Trainmaster Holzmann stated that he made an examination of the trucks of B. & A. car 50609 after they had been brought out of the water and it was his opinion that the accident was caused by a bent axle, missing side bearing and loose wheel.

General Car Foreman Bell stated that his examination of B. & A. car 50609 showed marks on the center sill indicating that something had been rubbing. Examination of the loose wheel indicated the wheel fit on the axle to be bright and of recent origin and the side bearing fracture was new; it was his opinion that if the side bearing had been missing prior to the time of derailment, the car, being loaded to the top, would swing and lift the wheel from the rail and would not round the curve. One of the inside rivets appeared to be missing and the hole filled with mud; the other rivet showed it had been sheared off new and the other hole showed a clear shear.

Car Inspector Marrs stated that he made a thorough inspection of Train No. 67 on its arrival at Taylor and also inspected the cars which later were added to this train before its departure from that point and he did not find anything wrong with B. & A. car 50609. An air brake test was made and all brakes found to be working properly. When B. & A. car 50609 was picked up after the accident, he examined the trucks and superstructure, and found the cross bars underneath the car bent southward, indicating that the car had reversed its position after being derailed. It was his opinion that there was only one pair of wheels derailed on this truck, and that the loose wheel, bent axle and the missing side bearing were caused by the derailment.

Car Inspectors Krebs and Bingham assisted in making the inspection of the equipment of Train No. 67 and noted nothing wrong.

Car Inspector Derrick stated that he inspected the head portion of the train on its arrival at San Antonio after the accident and he did not find any defects or marks on the rear car of this portion of the train.

Engineman White and Fireman Purcell, of Train No. 7, which had passed over this track a short time before the accident, stated that they did not notice any rough track between Manchaca and Bear Creek Bridge and their

train entered the curve on which the accident occurred at a speed of about 35 or 40 miles per hour.

Superintendent Kelly stated that it was his opinion that the derailment was caused by a defective truck on B. & A. 50609. The missing side bearing, bent axle, and a very sharp flange on the right front wheel of the rear truck could have contributed to the cause of the accident. There also was a loose wheel on this truck.

Inspection of the track by the Commission's inspectors for a distance of 1 mile north of the point of accident did not disclose that anything had been dragging. Examination of the track from the south switch at Manchaca to the point of curve showed many of the spike heads from $\frac{1}{2}$ to 2 inches above and $\frac{1}{2}$ inch away from the rail base, there being only about 40 percent firmly spiked; this was caused by the churning conditions in the track. In several places the ballast had worked away from under the ends of the ties to a depth of 3 inches or more, while under the rails, the ties were one inch or more above the ballast, this condition existing from 728 feet to within 563 feet north of the point of derailment, and there was practically no ballast between the ties in the center of the track. Similar conditions were found at a rail joint on the west side at a point 365 feet from the point of derailment; the spikes being about $2\frac{1}{2}$ inches from the base of the rail. At a joint 101 feet north of the point of derailment, the elevation was $2\frac{1}{2}$ inches and the gauge $\frac{1}{4}$ inch wide; when an engine of one of the wrecking trains passed over this joint slowly it compressed about $\frac{3}{4}$ inch. At other churning places between this point and the south switch at Manchaca, the track compressed as much as 1 to $1\frac{3}{4}$ inches under the weight of a freight train. The marks of derailment were found to be as described by Division Engineer Cook.

Inspection of the track by the Commission's inspectors again on July 23, 12 days after the occurrence of the accident, disclosed that an extra gang had realigned and surfaced the curve to a point about 560 feet north of the point of derailment. North thereof about 165 feet of track had not been worked on, but the remainder of the tangent track northward to the south switch at Manchaca had been worked on and the extra gang was still engaged thereon. At the rail joint 101 feet north of the point of derailment, at which point

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the joint had compressed about $\frac{3}{4}$ inch, two new ties had been applied; several other new ties had been applied north of this point.

Inspection of B. & A. car 50609 at San Antonio disclosed the truck at the B or north end of the car to be badly damaged and it appeared to have been dragging in the ballast. Both axles of this truck were bent. The R-1 and L-1 wheels were new and showed very little wear, the flanges being in excellent condition. The R-1 wheel was $1\frac{1}{4}$ inch off normal position on the axle. This pair of wheels was taken to the back shops at San Antonio where it was pressed back to normal position with a pressure of 38 tons. It then required 42 tons pressure to start the wheel off the axle and then pressed off at 38 tons. The axle had a good finish and there was no indication of the wheel having been loose for any length of time. The marks on the axle had the appearance that the wheel had been pulled off. The R-2 wheel was out of gauge $1\frac{11}{16}$ inches due to the bent axle. The flange was worn considerably, the wear being uniform the entire circumference of the wheel; this wheel was gauged with three gauges, the sharp or worn flange, the tread worn hollow, and the worn-through chill gauges, and it was observed that the condition of the wheel was within the limits of the A.A.R. gauges. The L-2 wheel was worn considerably but the wear was uniform. The side bearing was missing on the B end, right side, and was evidently broken off during the derailment; at one end a rivet was sheared off clean and at the other end the metal had the appearance of being torn off and was bright; one rivet was gone. The upper bearing of the car showed marks where roller had been making contact. Couplers and carrier irons were in place and in good condition. Free slack in couplers was uniform, with $\frac{3}{4}$ inch at each end. Side-bearing clearance on A end of car had a total of $\frac{7}{16}$ inch and center castings were in good condition and did not show indications of having been rigid. Measurements of the circumference of wheels of the rear truck showed a variation of $\frac{1}{16}$ inch between the R-2 and L-2 wheels and the same distance between the R-1 and L-1 wheels as follows:

R-2 wheel 8 feet $6\frac{1}{4}$ inches
 L-2 wheel 8 feet $6\frac{3}{16}$ inches
 R-1 wheel 8 feet $7\frac{7}{16}$ inches
 L-1 wheel 8 feet $7\frac{1}{2}$ inches

The journal boxes on this car were repacked by the C.R.I. & P. on July 6, 1937.

B. & A. car 50609 was built in September, 1924; it was of all-steel construction with an inside height of 8 feet 7 inches, inside width 8 feet 6 inches, inside length 40 feet 6 inches, and the height from top of rail to eaves, 12 feet. This car was equipped with A.R.A. Type D couplers and W.H. Miner draft gear A-18-S, and Eettendorf truck sides; had a capacity of 110,000 pounds, load limit of 122,000 pounds and light weight of 47,000 pounds and was weighed 8-1935. This car, loaded with hardwood lumber, was billed from Little Rock, Ark., to Laredo, Tex., and was weighed at East Little Rock; gross weight 140,400 pounds, tare 47,000 pounds and net 93,400 pounds.

Discussion

The evidence indicated that the rear truck of B. & A. 50609, the twenty-third car in the train, was apparently the first to be derailed, the final derailment occurring when the derailed truck encountered the guard rail at the northern end of the bridge located 1,407 feet beyond. There was evidence of churning places on the tangent track, and at a joint 101 feet north of the point of derailment it compressed about $\frac{3}{4}$ inch when the wrecking train passed over this joint after the accident. At other churning points between this point and the south switch at Manchaca, the track compressed in several spots as much as from 1 to $1\frac{3}{4}$ inches when a freight train passed over the track. It is possible that the car involved, being loaded with green hardwood lumber to its full cubic capacity and encountering the low places on the 1.264 percent descending grade at a speed of 45 miles per hour, was rocking sufficiently to climb the outside rail when the curve was encountered.

Inspection of the rear truck disclosed that side-bearing was missing on the right side; it revealed a new break, however, apparently having broken off during the derailment. Both axles were bent and the flanges on the front pair of wheels were considerably worn, but were within the gauge limits of the Association of American Railroads; it was not definitely ascertained whether the axles were bent prior to or as a result of the derailment. The right rear wheel was found loose but it

cannot be definitely stated whether this wheel was loose prior to or was a result of the derailment.

From the evidence available after the accident it was impossible to determine whether the accident was caused by the irregular track conditions or the truck defects cited above, or a combination of these conditions.

Conclusion

The cause of this accident cannot be definitely determined.

Respectfully submitted,

W. J. PATTERSON,

Director.