

INTERSTATE COMMERCE COMMISSION

REPORT OF THE DIRECTOR OF THE BUREAU OF SAFETY IN RE
INVESTIGATION OF AN ACCIDENT WHICH OCCURRED ON THE
SOUTHERN RAILWAY SYSTEM, LINES WEST, NEAR DALLAS,
GA., ON MAY 15, 1929.

August 2, 1929.

To the Commission:

On May 15, 1929, there was a derailment of a work train on the Southern Railway System, Lines West, near Dallas, Ga., resulting in the death of one employee and the injury of one employee.

Location and method of operation

This accident occurred on that part of the Queen & Crescent District, Atlanta Division, extending between Atlanta, Ga., and Chattanooga, Tenn., a distance of 152.7 miles, in the vicinity of the point of accident this is a single-track line over which trains are operated by time-table, train orders and an automatic block-signal and train-control system. The accident occurred at a point about $1\frac{1}{4}$ miles south of the station at Dallas; approaching this point from the north the track is tangent for a distance of 671.7 feet, followed by a 50° curve to the right 766.7 feet in length, the accident occurring on this curve at a point 195.7 feet from its northern end. The grade for southbound trains is 0.91 per cent ascending at the point of accident. The track was laid with 85-pound rails, 39 feet in length, with about 24 ties to the rail-length, tie-plated, single spiked, and ballasted with slag to a depth of 8 inches. The track was well maintained.

The weather was clear at the time of the accident, which occurred at about 9.25 a.m.

Description

Work extra 556, in charge of Conductor Bonner and Engineman Launiere, consisted from north to south of engine 556, headed south and shoving the train, one dump car, one flat car containing ditching machine No. 27, two dump cars, one flat car upon which was mounted another ditching machine, one dump car and one spreader. Work of ditching had been in progress between Dallas and Hiram, 6 miles south thereof, for several days prior to the accident, the work train tying up at Dallas at night.

On the morning of the accident work extra 556 proceeded from Dallas to Hiram, in order to station a flagman, then returned northward to the vicinity of mile post 122-H, located about 3 miles south of Dallas, and performed work until it was run in at Dallas. Work extra 556 again departed southward from Dallas at about 9.15 or 9.20 a.m., en route to mile post 122-H, but was derailed while rounding the curve, located just south of mile post 120-H, at a speed estimated to have been between 15 and 20 miles per hour.

The five leading cars were not derailed, but the sixth car, this being the flat car upon which was mounted ditching machine No. 27, and the seventh car, a dump car, were derailed. The flat car came to rest with its trucks astride the left rail and the body of the car to the right of the track, while the ditching machine fell off the body of the car and came to rest against a bank on the inside of the curve; the dump car was also derailed to the left. The flat car was separated from the leading cars a distance of about 160 feet. The employee killed was the ditching machine fireman and the employee injured was the engineer of that machine.

Summary of evidence

The first mark of derailment appeared on top of the gauge side of the east or high rail of the curve, at a point approximately 231 feet south of mile post 120-H. This mark was a flange mark and evidently was made by the flange of the leading left wheel in the south truck of ditching machine No. 27, the mark continued to a point 10.8 feet beyond where it dropped outside to the base of the rail and at this point a corresponding mark appeared on the base of the gauge side of the opposite rail. These marks led to the left and the ties were marked for a distance of about 20 feet, at which point the marks on the outside of the east rail dropped off the ties and then the track was damaged considerably for a distance of about 84 feet.

Engineman Launiere stated that he was looking directly ahead at ditching engine No. 27 as the engine shoved the cars around the curve at a speed of about 15 miles per hour. On seeing dust flying from underneath the ditching machine he immediately applied the air brakes in emergency. Engineman Launiere stated that he was operating the work train at such an unusually low rate of speed that the conductor, who was riding on the leading car, was waving to him to increase speed. Engineman Launiere had noticed nothing wrong with the track where the accident occurred, so far as the riding qualities

of the engine were concerned, at the time the engine passed over it en route to Hiram and later on when run in at Dallas, or on the two days prior to the accident. After the accident he examined the track, but found nothing with respect to track conditions that would have caused the accident, and in his opinion the accident was caused by a broken truck bolster, in the leading truck of the flat car that carried ditching machine No. 27. Conductor Bonner stated that he was riding on the leading car in the work train, looking ahead, and that shortly after passing mile post 120-H, traveling at a speed not to exceed 20 miles per hour, he felt the air brakes apply in emergency. On looking back he saw dust flying and the ditching machine turn over. After the accident he saw the broken truck bolster, which in his opinion caused the accident. Statements of other members of the crew developed nothing additional of importance.

Car Repairs Foreman Eubanks stated that according to his records the car upon which ditching machine No. 27 was mounted was last inspected on May 4, 1929, at Atlanta; and at that time, in addition to other repairs two wrought iron side bearings were applied to the truck bolster that failed. Three 5/8 inch bolts were used in applying each of the bearings, two on the outside and one on the inside, the inside bolt being riveted. Foreman Eubanks said that on arrival at the scene of the accident about three or four hours after its occurrence he found these truck bolster side bearings lying on the ground and loose from the truck bolster, having been sheared off as a result of the derailment, but he could not find any of the bolts he had used in applying the side bearings. At first he was of the opinion that the accident was due to the broken bolster, which was worn and showed the presence of an old break. In a subsequent statement, however, he was not positive that the broken bolster caused the accident nor did he think the side bearings were involved.

Examination of the track subsequent to the accident disclosed the gauge, surface and alinement to be well maintained and in excellent condition. The superelevation of the outside rail of the curve was $5\frac{1}{2}$ inches.

Ditching machine No. 27 was mounted at Sheffield, Ala., on June 10, 1927, on what was originally Southern flat car 115564, the flat car was built in August, 1906, with a load limit of 110,000 pounds. The ditching machine was bought new; its engine weighed 30 tons, while the boom and dipper weighed an additional 4 tons. A track extended the full length of the flat car, the ditching machine, which turned on its base, operated forward and backward on this track. Back-stops were bolted to the track at a point 2 feet from the south end of the car.

In normal riding position, with the wheels of the ditching machine against the back-stops, the boiler and of upper frame extends 2 feet over the south end of the flat car and the center of the machine reaches 29 inches inside of the center of the south truck bolster, while the boom and dipper rest on an 18-inch block secured at the north end of the flat car.

The Simplex bolster in the truck involved in this accident was manufactured, according to the blue print about 1905. The header strap was broken off at the east end of the bolster, this being the left side of the car in the direction in which the train was moving; each of the points of rupture was at a rivet hole, and in each case the strap showed signs of considerable wear, while the surfaces of the breaks indicated that cracks had existed for some time previously. It also appeared that the holes at the side-bearing locations on each end of the bolster had been burned with a torch and were oblong-shaped; their average measurement was $1 \frac{1}{16}$ inches, while the side bearings which Car Repairs Foreman Eubanks said he found at the scene of the accident had $\frac{7}{8}$ inch holes in them, although according to his other statements he used only $\frac{5}{8}$ inch bolts when applying the side bearings a few days previous to the accident.

An investigation in connection with the truck bolster involved in this accident was conducted by Mr. James E. Howard, engineer-physicist, whose remarks follow:

Remarks of the Engineer-Physicist.

The accident to the work train, on the Southern Railway System, Lines West, near Dallas, Ga., on May 15, 1929, was apparently due to the fracture of a worn end casting of the bolster of a Simplex truck frame. The truck in which this bolster was located was under the boiler end of a ditching machine, the truck being a part of the running gear of a flat car upon which the ditching machine was carried.

The fracture occurred when the ditching machine was in transit and on a 5-degree curve, having a super-elevation of $5\frac{1}{2}$ inches. The bolster fractured at the end which was on the high side of the curve.

The circumstances attending the accident seem to have been as follows: A weakened end casting, which had shoulders fixing the position of the bolster with reference to the side frames of the truck, fractured at the end on the high side of the curve, roller side bearings facilitated drift of the bolster toward the low side of the curve upon the fracture of the end casting, high

center of gravity at boiler end and momentum acquired when shoulders of end casting ceased presenting resistance, slow train movement without appreciable centrifugal force - these features seem to describe what happened and account for the wheels of the flat car climbing the high rail of the 5 degree curve, the side frame of the truck on the low side, top arch bar, being bent outward $2\frac{1}{2}$ inches, and the overturning of the ditching machine on the low side of the curve.

The primary cause of the accident seems attributable to the worn and weakened condition of the wings of the end casting of the truck bolster. In the construction of this truck, end castings were used which had wings reaching over and riveted to the sides of the bolster. These castings had shoulders which bore against the column castings of the truck frame, thereby limiting the side play of the bolster with reference to the frames. The wings of the casting which fractured had been worn thin. Fracture occurred across the rivet holes. According to evidence presented, there was a partial fracture of the casting prior to the accident. The truck was in a weakened condition, in an important detail of construction, the result of service conditions. Fracture finally occurred in the rupture of this weakened detail, under no unusual stress.

From the testimony it appears that this flat car had been on repair tracks eleven days prior to the accident. New wrought iron side bearings were bolted to the bolster which failed. After the accident these bearings were found loose from the bolster.

Why new side bearings were put in at that time does not appear in the testimony, nor their relations if any to the incidents attending the accident. However, their having been found after the accident detached from the bolster, with no trace of the bolts, does not present a commendable incident in a recent repair job.

Concerning pre-existing evidence of wear of the bolster end casting and abrasion of the column castings of the truck frame, their appearance after the accident would indicate that such evidence was visible. A distinction however should be made between indications which precede and those which follow in the trail of accidents, respecting their interpretation and estimate of their gravity. Parts which fail by reason of abrasion and wear undoubtedly present evidence of such facts, although differing in degree. But abraded surfaces are significant, showing where service stresses are greatest.

In the present case evidences of abrasion attached to a weak detail in the construction of this particular type of bolster. Wear took place at a vital detail, necessarily leading to adverse criticism of its design. The decided wear of the bolster at the boiler end of the flat car and very limited wear of the bolster at the boom end is not an unusual feature in ditching machines. In general practice more work is done at one end of the car than the other. An inspection of ditching machines commonly shows more wear under one end than the other.

Conclusions

In conclusion, the cause of the present accident is attributed to a weakened bolster, the weakness of which was the result of continued service conditions in the use and operation of the ditching machine, and in a minor degree by mileage in carrying more weight on the boiler end than on the boom end of the flat car on which the ditching machine was mounted.

Respectfully submitted,

W. P. BORLAND,

Director.