

INTERSTATE COMMERCE COMMISSION
WASHINGTON

REPORT OF THE DIRECTOR
BUREAU OF SAFETY

ACCIDENT ON THE
SOUTHERN PACIFIC RAILROAD

LERDO, CALIF.

FEBRUARY 25, 1936

INVESTIGATION NO. 2047

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SUMMARY

Railroad:	Southern Pacific
Date:	February 25, 1936
Location:	Lerdo, Calif.
Kind of accident:	Derailment
Train involved:	Freight
Train number:	Extra 3247 west
Engine number:	3247
Consist:	56 cars, caboose
Speed:	35-40 m.p.h.
Track:	Tangent
Weather:	Clear
Time:	12:15 p.m.
Casualties:	2 injured
Cause:	Failure of arch bar truck.

May 2, 1936

To the Commission:

On February 25, 1936, there was a derailment of a freight train on the line of the Southern Pacific Company near Lerdo, Calif., which resulted in the injury of 2 employees.

Location and method of operation

This accident occurred on the Fresno Subdivision of the San Joaquin Division, extending between Bakersfield and Fresno, Calif., a distance of 107.4 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 system. The accident occurred 4,925 feet east of the station at Lerdo, or at a point 104 feet east of the switch leading to Arkelian spur track, this being a trailing-point switch for westbound trains leading off the main track to the south; the initial mark of derailment appeared on a tie about 2 miles east of this point. Approaching the point of accident from the east the track is tangent for more than 4 miles, while the grade is 0.175 percent ascending for westbound trains.

The track, in the vicinity of the point of accident, is laid on a two-foot embankment and was well maintained as to gauge, surface, and alignment.

The maximum speed permitted for freight trains in that vicinity is 40 miles per hour.

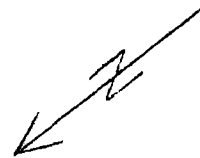
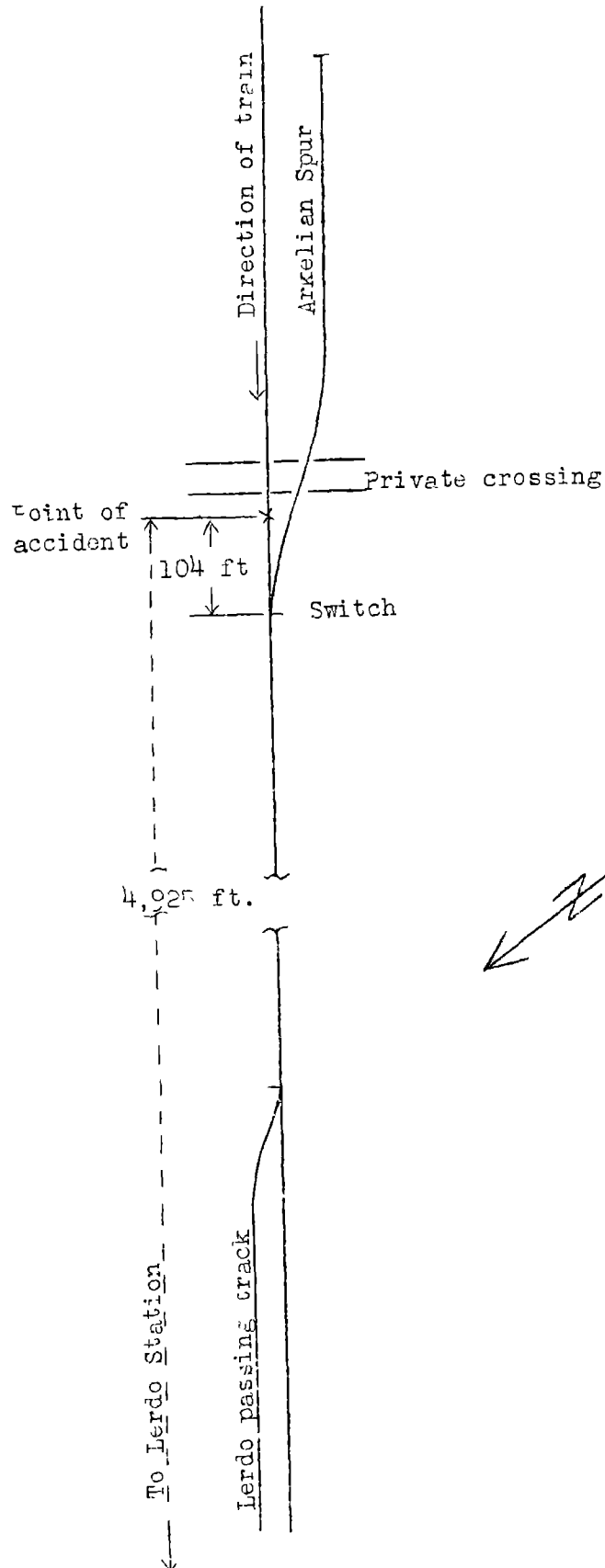
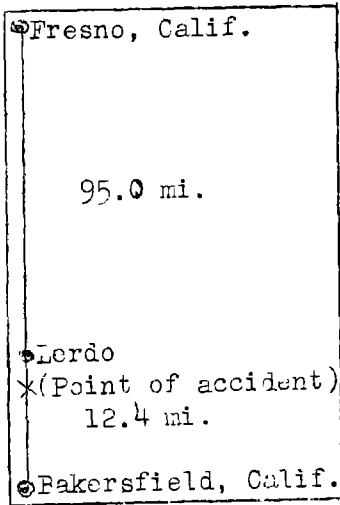
The weather was clear at the time of the accident, which occurred about 12:15 p.m.

Description

Extra 3247, a westbound freight train, consisted of 54 loads, 2 empties and a caboose, hauled by engine 3247 and was in charge of Conductor Lamb and Engineman Sullivan. This train left Bakersfield, 12.4 miles east of Lerdo, at 11:40 a.m., according to the train sheet, and was approaching Lerdo at a speed estimated to have been between 35 and 40 miles per hour when it was derailed.

Engine 3247 and the first 50 cars were not derailed; the rear pair of wheels of the fifty-first car were derailed but the car remained coupled to the head portion of the train and stopped 1,484 feet west of the initial point of derailment; the fifty-second car, McCloud River 2002, a loaded tank car, was derailed

Inv. No. 2047
Southern Pacific R.R.
Lerdo, Calif.
Feb. 25, 1936.



and stopped on its right side to the north of the track, 400 feet behind the head portion of the train; the fifty-third to the fifty-fifth cars, inclusive, were partially derailed but remained coupled and stopped 440 feet behind car 2002; the fifty-sixth car stopped on its left side, south of the track, about 100 feet behind these three cars and the caboose was in a similar position about 175 feet behind the rear car. The employees injured were the conductor and a brakeman.

Summary of evidence

Engineman Sullivan stated that the air brakes were tested, and worked properly en route, the train handled properly and there was no unusual slack action due to track conditions. While approaching Lerdo at a speed of about 35 or 40 miles per hour, he felt the speed being reduced as a result of the air brakes being applied from the rear; upon looking back he saw an oil tank being derailed to the right, then the forward portion of the train came to a gradual stop. After the accident he went back to the derailed cars and saw where an arch-bar bolt had broken on an oil tank car. He examined all of the derailed cars, but found nothing more that would have contributed to the accident. On going back to a private road crossing, about 32 feet east of the point of accident, he saw a flat mark, 4 or 6 inches wide, which extended the entire length of the crossing planks, some of which were slightly torn and splintered.

Fireman Franklin went back to the point of derailment about 1 hour after its occurrence; he also saw the mark on the crossing plank, east of the caboose. He looked particularly for indications of dragging equipment east of the crossing, but found none; he thought the accident was caused by arch bar trouble.

Approaching the point of accident Head Brakeman McKnight was in the gangway on the right side of the engine; he had looked back along the train en route, but noticed nothing wrong and no dust was flying. The first intimation he had of trouble was when the air brakes were applied in emergency from the rear; he immediately went back to the caboose, and then went back to flag. He saw the mark cut in the plank at the crossing east of Arkolian spur switch, and also saw a similar mark in the plank of the crossing east of Prospero, located 2.5 miles east of Lerdo. He found no marks on the rails or ties to indicate dragging equipment. In his opinion the marks cut in the planks of the two crossings were made by either a column bolt or a broken arch bar.

Conductor Lamb, Swing Brakeman Davis and Rear Brakeman Johnson were in the caboose and were not aware of anything wrong prior to the accident; they estimated the speed to have been between 35 and 40 miles per hour. Rear Brakeman Johnson thought

the gouge on the crossing plank was made by either a column, arch bar or box bolt, and that this defective condition was the cause of the accident; there was no indication of dragging equipment. About 30 minutes after the accident he found a broken bottom rod lying between the rails east of the crossing, but there was no mark on the track such as would have been made had the rod struck the road crossing while hanging from beneath a car.

Car Foreman McClure and Car Inspectors Armistead, De La Ossa, Gillespie, Nord and Wiebe, at Bakersfield yard, gave testimony to the effect that the derailed cars involved in the accident were inspected at about 8:30 a.m. at the time they were received from the Atchison, Topeka & Santa Fe Railway, approximately 3 hours before the train departed from Bakersfield. An ordinary visual inspection was given the brake rigging and running gear and a mirror was used during inspection of the arch bars; no defects were found on the trucks at that time.

Car Foreman McClure stated that he was in charge of picking up the equipment after the derailment and at that time he inspected the rear truck of McCloud River tank car 2002. On the left side of the truck the front journal-box bolt, lead pair of wheels, was broken off at the head; the bolt was badly bent and the journal fell out of the oil box when the truck was picked up; the left front column bolt was broken off inside the nut, disclosing a new fracture of the bolt and an old fracture of the nut, the nut having the appearance of having been in contact with the rail; the left tie bar was broken at the center of a column-bolt hole and showed indication of considerable rubbing against some metal surface; the bolt holes in this bar were also slightly elongated. On the right side of the truck, the two journal-box bolts of the lead wheel were missing and the journal box was entirely out of place; the second bolt hole was worn, indicating the bolt had been loose. The two column bolts, right side, and the two rear journal-box bolts, right side, were in place. The forward end of the right arch bar was bent upward which, he said, would allow the truck to sag and he thought that this condition permitted the end of the right lead column-bolt to come into contact with the crossing plank and he believed that this sagging condition of the truck was responsible for the accident. He said that he identified the broken bottom rod, found east of the private road crossing after the accident, as having come off the rear truck of the caboose, undoubtedly due to the derailment.

Inspection of the track by the Commission's inspectors disclosed the first mark of derailment to be on a tie, between the rails, 20 inches from the base of the north rail, at a point about 2 miles east of the point of accident. This mark was made by the head of a journal box bolt which was found between the rails, 3 feet west of the mark. The next mark, a scar on top of a tie 10 inches north of the north rail, was found on the 34th tie

west of the first mark, and apparently was made by the dragging end of the broken journal box bolt. Similar scars were found on the 40th, 49th, 50th, 55th, 60th, and 61st ties west of the first mark made by the bolt head. The broken box bolt was found opposite the 70th tie west of the first mark and 15 feet north of the north rail; the head fitted to the broken bolt and subsequently this bolt was found to have been the rear journal box bolt, lead axle, right side of the rear truck of McCloud River tank car 2002. The next marks found were on the tops of the crossing planks at three road crossings located 8,470, 4,246 and 22 feet, respectively, east of the point of accident. These marks consisted of deep rips in the top surface of the planks, 2 inches wide and 8 inches from the head of the rail on the north side of the track, and were made by the right lead column bolt and nut. The front wheels of the truck were derailed at, or immediately after, the truck passed over the crossing. The first wheel mark was found on top of a tie, 6 inches north of the base of the north rail and 22 feet west of the center of the road crossing. From the first wheel mark westward, flange marks appeared on all of the ties to the point where car 2002 stopped. A single pair of wheels had marked the ties from the first wheel mark to the 43rd tie west; beyond this point the marks of several wheels appeared on the ties, until finally the damaged track precipitated the derailment.

Investigation made by the Commission's inspectors developed the following information relative to the rear truck of McCloud River tank car 2002:

RIGHT SIDE OF TRUCK

Location

Condition

Lead journal box:

Lead box-bolt missing, later found in wreckage broken off at nut end. Rear box bolt missing; later found 2 miles east of point of accident, broken off $\frac{1}{2}$ inch below head; bolt head worn to a $\frac{1}{8}$ inch taper from shank to outer edge of head; upper bolt hole worn to depth of $\frac{5}{32}$ inch by bolt head; bolt worn to depth of $\frac{1}{8}$ inch just above nut, caused by rubbing against tie bar; bright surface indicated looseness for some time prior to accident. Tie bar worn by bottom nut at bolt hole, to depth of $\frac{1}{16}$ inch.

Lead column bolt:

Bolt and nut intact; nut and end of bolt below nut badly scarred, evidently from striking crossing plank on top of rail at switch; hole in upper arch bar had been bored for a $1\frac{1}{2}$ inch bolt but was worn and elongated

to 1 $\frac{5}{8}$ x 2 inches and the polished surface of worn parts indicated bolt had been loose prior to accident.

Rear Column bolt: Intact and tight.

Rear journal box: Lead box-bolt nut loose, could be turned with fingers.

Rear box-bolt O.K.

Front end of arch bars and tie bar bent upward about 2 $\frac{1}{2}$ inches.

LEFT SIDE OF TRUCK

Location

Condition

Lead journal box: Lead box-bolt broken off near head; head missing and bolt badly bent but still attached to tie bar; scars on nut indicated bolt had been broken by nut striking track parts at time of derailment.
Rear box-bolt intact and holding tie bar.

Lead column bolt: Bolt broken off 3 threads inside nut; nut recovered and found badly scarred and burned, evidently broken at time of accident.

Rear column bolt: Bolt broken off at nut, nut recovered in wreckage; had apparently been broken off by sharp blow at time of derailment.

Rear journal box: Lead box-bolt intact but nut loose and could be turned with fingers.
Rear box-bolt intact and tight.

Forward end of left tie bar had been released by the breaking of front box-bolt, lead journal box, and was doubled back under the journal box; broken again at lead column-bolt hole and broken end doubled back under rear column bolt.

Examination of broken bolts revealed no old defects or metal flaws.

This car was built by the American Car Foundry in April, 1907; a new steel underframe was applied in July, 1926, but the tank and trucks are those originally applied. It is an 8,000 gallon, 80,000 pound capacity, all-steel car, light weight 36,400 pounds. The car is equipped with rigid diamond type arch-bar

trucks. The rear truck, B end, was the first to be derailed. The top arch bars of this truck are $4\frac{1}{2}$ x $1\frac{1}{4}$ inch channel bars with flute $2\frac{1}{2}$ inches wide and $\frac{1}{2}$ inch deep; the lower arch bar on the left side of the truck is the original bar, $4\frac{1}{2}$ x $1\frac{1}{4}$ inches; the lower arch bar on the right side is a replacement and is $4\frac{1}{2}$ x $1\frac{3}{4}$ inches; the tie bars are $4\frac{1}{2}$ x $5/8$ inches; the column bolts are $1\frac{1}{2}$ x 23 inches and box bolts are $1\frac{1}{8}$ x 16 inches. The bolster is built up of pressed steel and the journals are 5 x 9 inches.

Since December 3, 1935, this car had made four round trips from McCloud, Calif., to the loading point on the Sun Set Railroad, 60 miles east of Bakersfield, and was on its fifth trip when the accident occurred. There is no record of the car having been shopped for repairs during this period. The car was delivered to the A.T. & S.F. Ry. by the Southern Pacific R.R. at Bakersfield, Calif., on February 21, and was returned loaded on February 25. The records of the A.T. & S.F. Ry. and the S.P. R.R. disclose no defects found at the time of these interchanges.

In connection with this investigation information was obtained that on March 1, 1936, the Southern Pacific System owned 452 locomotives with arch-bar tender trucks and owned and controlled 47,695 freight cars, of which 7,102 were equipped with arch-bar trucks. Since January 1, 1935, arch-bar trucks on 478 cars in freight service have been replaced with trucks of other type, but no changes have been made on tender trucks. In the same period, due to failure of arch-bar trucks, five derailments have occurred, which resulted in the injury of two employees and property damage amounting to \$9,876.00. On March 2, 1936, the Commission's inspectors examined 21 freight cars equipped with arch-bar trucks on this line, and found 7 journal box bolts without nuts, including 2 on car McC.R. 2004, one of the cars involved in this accident.

Discussion

The investigation developed that arch bars on the cars involved in this accident were inspected with mirrors, which was in accordance with the general instructions of the company covering the inspection of arch-bar trucks. An ordinary visual inspection was made of the box bolts, column bolts, and nuts of McCloud River tank car 2002. This car was received loaded from the Sun Set Railroad via the A.T. & S.F. Ry. at Bakersfield, Calif., February 24, 1936. The car was given class "A" inspection, together with a mirror inspection of all the arch bars, by Southern Pacific car inspectors at Bakersfield, and was also inspected by A.T. & S.F. car inspectors prior to delivery to the Southern Pacific. No truck defects were reported by the inspectors of either of these lines. This car was the fifty-second in Extra 3247 west;

after being placed in the train no further inspection was made of this car other than a brake test and an observation as the train pulled out of the yard at Bakersfield. While approaching Lerdo, 12.4 miles west of Bakersfield, the car was derailed due to the failure of the right journal-box bolts, lead axle of the rear truck. The truck failed under a load of approximately 78 percent of the rated capacity of the car. Examination of the bolts after the derailment failed to disclose any old defects in either bolt. The rear box-bolt, however, showed considerable wear around the bottom of the bolt head, and the hole in the top arch^{bar} was worn considerably. The bolt was also worn just above the nut at the tie bar. This wear clearly indicated that the bolt had been loose for some time prior to the accident; it was the first to fail as it was found on the north side of the track about 2 miles east of the point of accident, at which point marks on the ties on the north side of the track showed where the bolt had engaged the ties before becoming entirely detached from the journal box.

Conclusions

This accident was caused by the failure of an arch bar truck.

Recommendations

Recommendations as to arch bar trucks have been made in previous reports as follows:

1. That arch bar trucks be removed from service at the earliest practicable date.
2. That until arch bar trucks can be eliminated from service, a reduction sufficient to guarantee safety of operation should be made in the permissible load limit on cars equipped with such trucks.
3. That inflammables, explosives or other dangerous articles should not be transported in cars which are equipped with arch bar trucks.
4. That provision be made in interchange rules whereby a receiving line may refuse to accept from a connecting line any car equipped with arch bar trucks.

Respectfully submitted,

W. J. PATTERSON,

Director.