RAILROAD ACCIDENT INVESTIGATION

REPORT NO 4094

ILLINOIS CENTRAL RAILROAD COMPANY

PEOTONE, ILL

MAY 31, 1966

INTERSTATE COMMERCE COMMISSION

WASHINGTON

SUMMARY

DATE	May 31, 1966
RAILROAD	Illinois Central
LOCATION	Peotone, Ill
KIND OF ACCIDENT	Derailment
TRAIN INVOLVED	Passenger
TRAIN NUMBER	22
LOCOMOTIVE NUMBERS	Diesel-electric units IC4022, 4104, CG811
CONSIST	12 cars
SPEED	75-80 m.p.h.
OPERATION	Signal indications
TRACK	Double, tangent, 0.15 percent ascending grade northward
WEATHER	Clear
TIME	7 46 p.m.
CASUALTIES	31 injured
CAUSE	Spring frog assembly which was defective due to inadequate maintenance
RECOMMENDATION	That the Illinois Central Railroad Company take such action as is necessary to insure thorough inspection and adequate maintenance of spring frog assemblies

INTERSTATE COMMERCE COMMISSION

RAILROAD SAFETY AND SERVICE BOARD

RAILROAD ACCIDENT INVESTIGATION

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SYNOPSIS

On May 31, 1966, an Illinois Central Railroad passenger train derailed at Peotone, Ill Twenty-two passengers and nine employes were injured

The accident was caused by a spring frog assembly which was defective due to inadequate maintenance

LOCATION AND METHOD OF OPERATION

The accident occurred on that part of the Illinois Division extending between Stuenkel and Clinton, Ill., a distance of 116.9 miles. In the accident area this is a double-track line over which trains operate in either direction on both main tracks by signal indications of a traffic control system. From the west, the main tracks are designated as No. 1 and No. 2. At Peotone, 8.9 miles south of Stuenkel, a siding 1.1 miles long parallels track No. 1 on the west. The north siding-switch is 4,422 feet north of the station.

The derailment occurred on track No. 1, 4,344 feet north of the Peotone station, at the frog of the north turnout of the siding.

Details of the track, carrier's maintenance of way rules, train, damages and other factors are set forth in the appendix.

DESCRIPTION AND DISCUSSION

No. 22, a northbound first-class passenger train consisting of 3 diesel-electric units and 12 cars, passed Kankakee Jct., 14.8 miles south of Peotone, at 7.34 p.m., 18 minutes late. About 12 minutes later, as the train passed the north turnout of the siding at Peotone at 75 to 80 miles per hour, as estimated by the enginemen, the middle and rear wheels on the west side of both trucks of the third diesel-electric unit derailed at the frog of the turnout and rerailed immediately afterward. The rear wheels on the west side of both trucks of the 1st to 6th cars, inclusive, all wheels of both trucks of the 7th car, the rear wheels on the west side of both trucks of the 8th car, and all wheels of the 9th to 12th cars, inclusive, then derailed at or near the frog. The 1st, 2nd, 3rd, 5th and 6th cars, the rear wheels of the front truck of the 4th car and the rear truck of the 8th car rerailed immediately afterward.

The crew members were unaware of anything being wrong before the train brakes applied in emergency as a result of the derailment. The enginemen observed both sides of the train as they approached Peotone and noticed no unusual conditions.

Examination of the train equipment after the accident disclosed no condition which could have contributed to the cause of the derailment. Scrape marks were found on the front face of the rims of the middle and rear wheels on the west side of both trucks of the 3rd diesel-electric unit. Similar marks were found on the trailing wheels on the west side of both trucks of the 1st to 8th cars, inclusive.

Examination of the track structure throughout a considerable distance south of the frog involved disclosed no indication of defective track, dragging equipment or any obstruction having been on the track.

The first mark on the track structure was a gouge mark along the top edge of the gage side of the spring wing rail of the frog involved, starting 2 feet south of the frog point and extending northward about 4 feet. Scrape marks also appeared on the gage side of the spring wing rail beginning 2 feet south of the frog point and extending to the toe of the frog A wheel mark appeared on the south edge of a metal foot guard 35 1/2 inches north of the frog point and 2 inches below the top of the spring wing rail. The second foot guard, bolted to the spring wing rail 50 1/2 inches north of the frog point, had been struck by derailed wheels and

torn loose. The toe block and the 16-foot 1-inch straight closure rail immediately north of the frog remained in place. There were scrape marks on the gage side of this closure rail. The remaining straight closure rail was displaced and was broken into two pieces. The receiving end of each piece was heavily battered. Wheel marks appeared on the heads of spikes on the east side of the east rail, 18 feet 1 inch north of the toe of the frog. Northward from a point 16 feet 1 inch north of the toe of the frog, the west rail was displaced for 1,800 feet. The east rail of track No. 1 remained in place.

The spring wing rail of the frog was provided with hold downs 7 inches and 42 inches south of the frog point. The hold-down horns were riveted to the west side of the web of the spring wing rail. The flanges of the hold-down housings had their diagonal corners riveted to the frog plates and their outer edges welded to the frog plates. In addition, at the two remaining corners of each hold-down housing, spikes had been driven through the flanges and the frog plates into the switch ties. Examination of the frog after the derailment disclosed that the south hold-down horn was fractured at its outer end, and the three rivets securing the south end of the reinforcing bar to the spring wing rail were loose. At each hold-down housing the southwest corner was broken at the rivet. The weld along the south side of the housing and the flange on the north side of the housing were also broken. These defective conditions permitted independent vertical movements between the spring wing rail and the long point rail of the frog in excess of the maximum allowable one-eighth inch. The worn and polished appearance of the fractures of the broken pieces indicated that they had been broken and loose for a considerable time.

FINDINGS

It is apparent that the south hold-down horn and both hold-down housings of the spring frog assembly had been broken a considerable time, indicating that the spring frog assembly had been inadequately maintained.

The scrape marks on the front face of the rims of the trailing wheels and the absence of these marks on the leading wheel on the west side of each truck of the 3rd diesel-electric unit to the 8th car, inclusive, indicated that as the leading wheel moved off the long point rail of the frog to the spring wing rail, the

northern portion of this rail was deflected downward and the southern portion rocked upward. The front face of the rim of the following wheel then engaged the gage side of the raised spring wing rail and forced it outward as the wheel continued northward and dropped off the frog point into the throat of the frog Some of the trailing wheels rerailed between the toe of the frog and the second straight closure rail. Apparently the northern end of the first straight closure rail was forced westward sufficiently to break loose from the rail joint and allow some of the wheels to rerail at the receiving end of the second closure rail. After being heavily battered by derailed wheels, the second closure rail broke 14-1/2 feet from the south end. The remaining 24-1/2 feet received considerable batter at the broken end and apparently was displaced by the 9th car, and resulted in the derailment of both trucks of the 9th to 12th cars, inclusive.

CAUSE

This accident was caused by a spring frog assembly which was defective due to inadequate maintenance.

RECOMMENDATION

It is recommended that the Illinois Central Railroad Company take such action as is necessary to insure thorough inspection and adequate maintenance of spring frog assemblies.

Dated at Washington, D C , this 7th *day of* November 1966
By the Commission, Railroad Safety and Service Board

H NEIL GARSON,
Secretary

(SEAL)

APPENDIX

Track

Track No. 1 is tangent a considerable distance north and south of the derailment point. The grade for northbound trains is 0.15 percent ascending 2,400 feet to the derailment point and 1,700 feet northward.

The structure of track No. 1 in the derailment area consists of 132-pound continuous welded rail, 1,440 feet in length, laid new in 1956 on an average of 60 treated ties per 100 feet. It is fully tie-plated with double-shoulder tie plates, spiked with 2 rail holding spikes per tie plate, and is provided with 36-inch 6 hole joint bars and 4 rail anchors at every other tie and 2 rail anchors at each intermediate tie. It is ballasted with crushed slag to a depth of 12 inches or more below the ties.

The frog involved was a 132-pound, right-hand, No. 10 spring frog. It was 16 feet 6 inches long. The actual one-half inch frog point was 77 inches from the toe of the frog. The frog angle was $5^{O}43'29''$. The spring wing rail was 12 feet 10-1/2 inches long. The double-coil spring assembly, which held the spring wing rail against the long point rail, was 16 inches south of the frog point. The frog was supported by 11 frog plates on 11 treated switch ties.

The carrier's records indicate the following The frog was installed in October 1951. Work was last performed on the frog May 25, 1966, at which time the spring bolt was replaced because of worn threads. The track was resurfaced on May 26, 1966, at which time the track foreman inspected the frog and track and took no exception to the condition of the frog.

Carrier's Maintenance of Way Rule

342. *** In making inspection the wear and general condition of frogs should be closely observed. *** All bolts should be tight, foot guards in place, spring bolts in good condition and proper tension, guides and guide boxes in good condition, well oiled and spring wing rail working freely ***

Train

No. 22 consisted of car-body type diesel-electric units IC4022, 4104, CG811, coupled in multiple-unit control, 1 postal car, 1 dining car, 4 coaches, 1 kitchen car, 1 dining car, and 4 coaches,

in that order. The cars were of all-steel construction, and were equipped with tightlock couplers.

As the train approached the derailment point, the engineer and fireman were in the control compartment at the front of the first diesel-electric unit. The conductor and flagman were in the cars. The train brakes had been tested and functioned properly. The headlight was lighted.

Damages

No. 22 stopped with the front end 3,287 feet north of the derailment point. The rear wheels of the south truck of the 4th car and of the north truck of the 8th car and all wheels of the 7th and 9th to 12th cars, inclusive, were derailed. The derailed cars stopped upright, in line, on or near the track structure. There were no separations between cars.

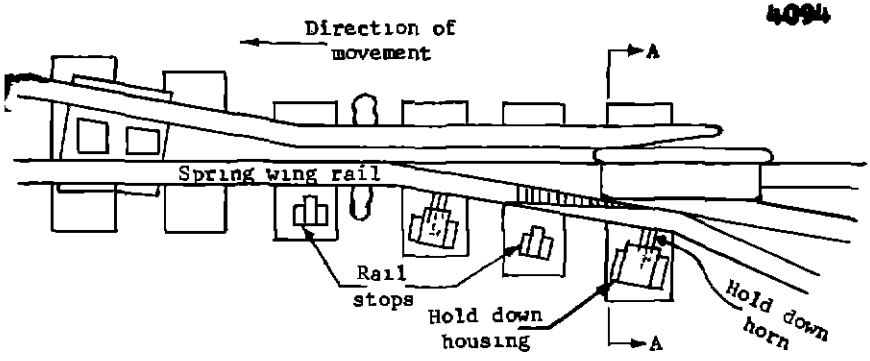
The 4th to 9th cars, inclusive, were slightly damaged. The 10th, 11th and 12th cars were somewhat damaged.

Other Factors

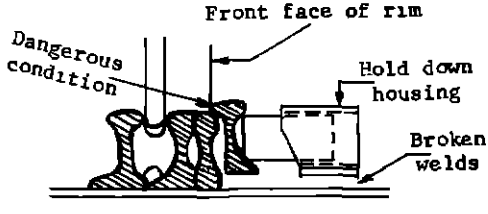
The accident occurred at 7.46 p.m., in clear weather.

The maximum authorized speed for passenger trains in the accident area is 79 miles per hour.

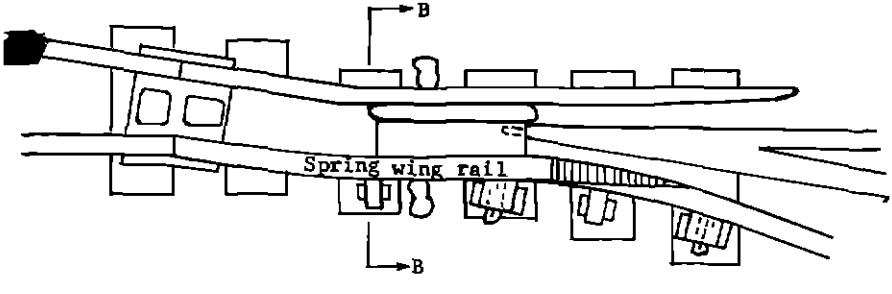
According to the daily time returns of the train and engine crew, the engineer and fireman had been on duty 2 hours 32 minutes at the time of the derailment, after having had release periods of 6 hours 35 minutes and 6 hours 50 minutes, respectively. Prior to the release periods, they had been on duty 3 hours 39 minutes and 3 hours 24 minutes, respectively, after having been off duty 1 day. The conductor and flagman had been on duty 12 hours 16 minutes at the time of the derailment, after having been off duty 48 hours.



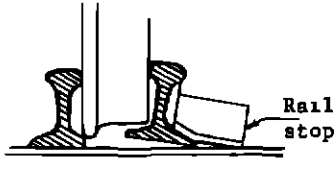
Sketch of frog showing position of wheel where a dangerous condition existed, due to defective hold downs, as shown in Section A-A



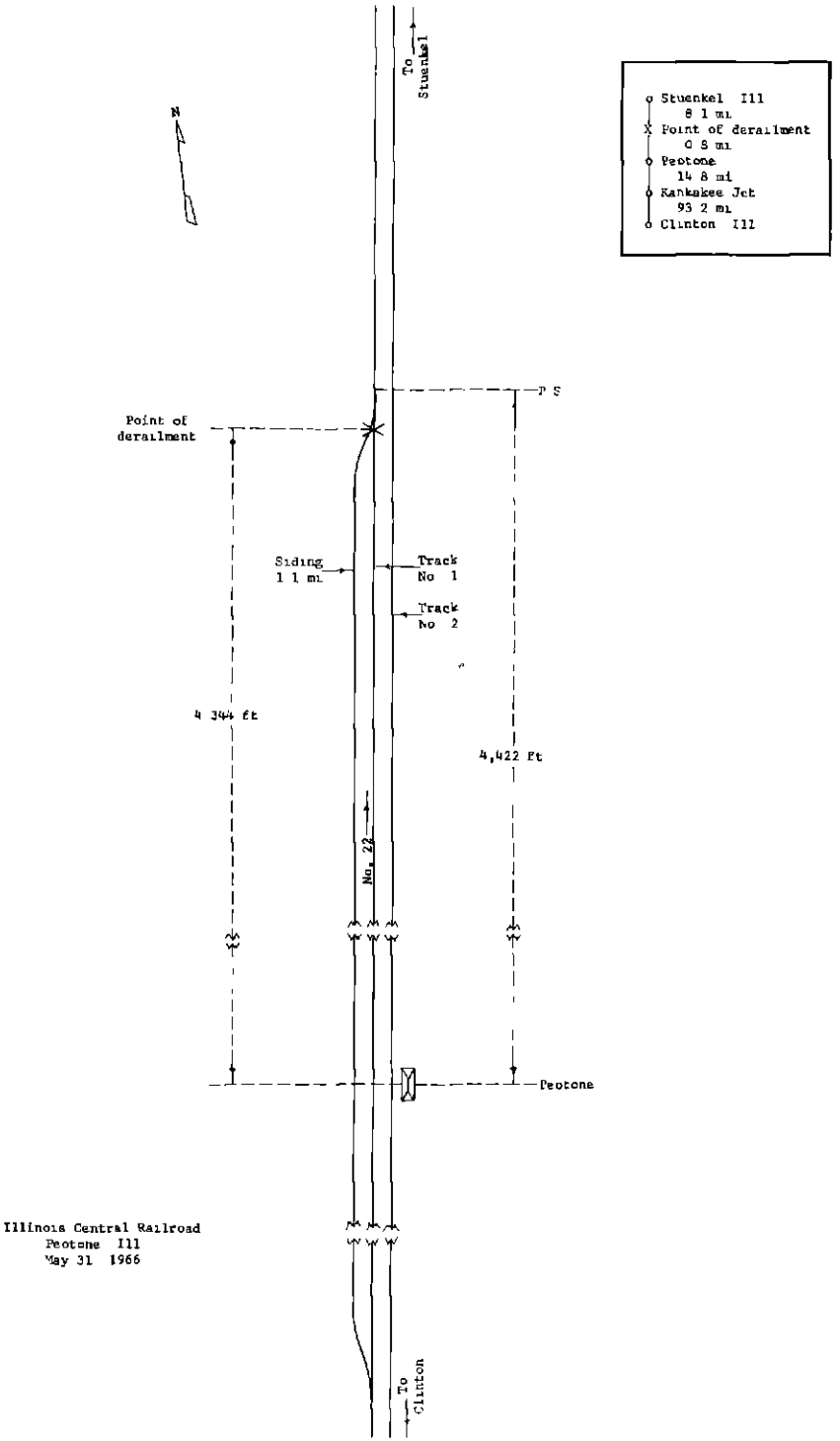
Section A-A
Defective hold down



Sketch of frog showing wheel derailed after engaging spring wing rail and forcing it out of position, as shown in Section B-B



Section B-B
Wheel derailed after passing over point of frog



Illinois Central Railroad
Peotone Ill
May 31 1966

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