

RAILROAD ACCIDENT INVESTIGATION

Report No 3794

FLORIDA EAST COAST RAILWAY COMPANY

COCOA JCT , FLA

DECEMBER 26 1957

INTERSTATE COMMERCE COMMISSION

Washington

SUMMARY

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DATE	December 26, 1957
RAILROAD	Florida East Coast
LOCATION	Cocoa Jct , Fla
KIND OF ACCIDENT	Deraiment
TRAIN INVOLVED	Passenger
TRAIN NUMBER	87
LOCOMOTIVE NUMBER	Diesel-electric units 1014, 1054, and 1011
CONSIST	19 cars
SPEED	70 m p h
OPERATION	Timetable, train orders, and automatic block-signal system
TRACK	Double, tangent, 0.26 percent descending grade southward
WEATHER	Raining
TIME	12 05 p m
CASUALTIES	25 injured
CAUSE	Defective switch

INTERSTATE COMMERCE COMMISSION

REPORT NO 3794

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

FLORIDA EAST COAST RAILWAY COMPANY

July 9, 1958

Accident at Cocoa Jct , Fla , on December 26, 1957, caused by a defective switch

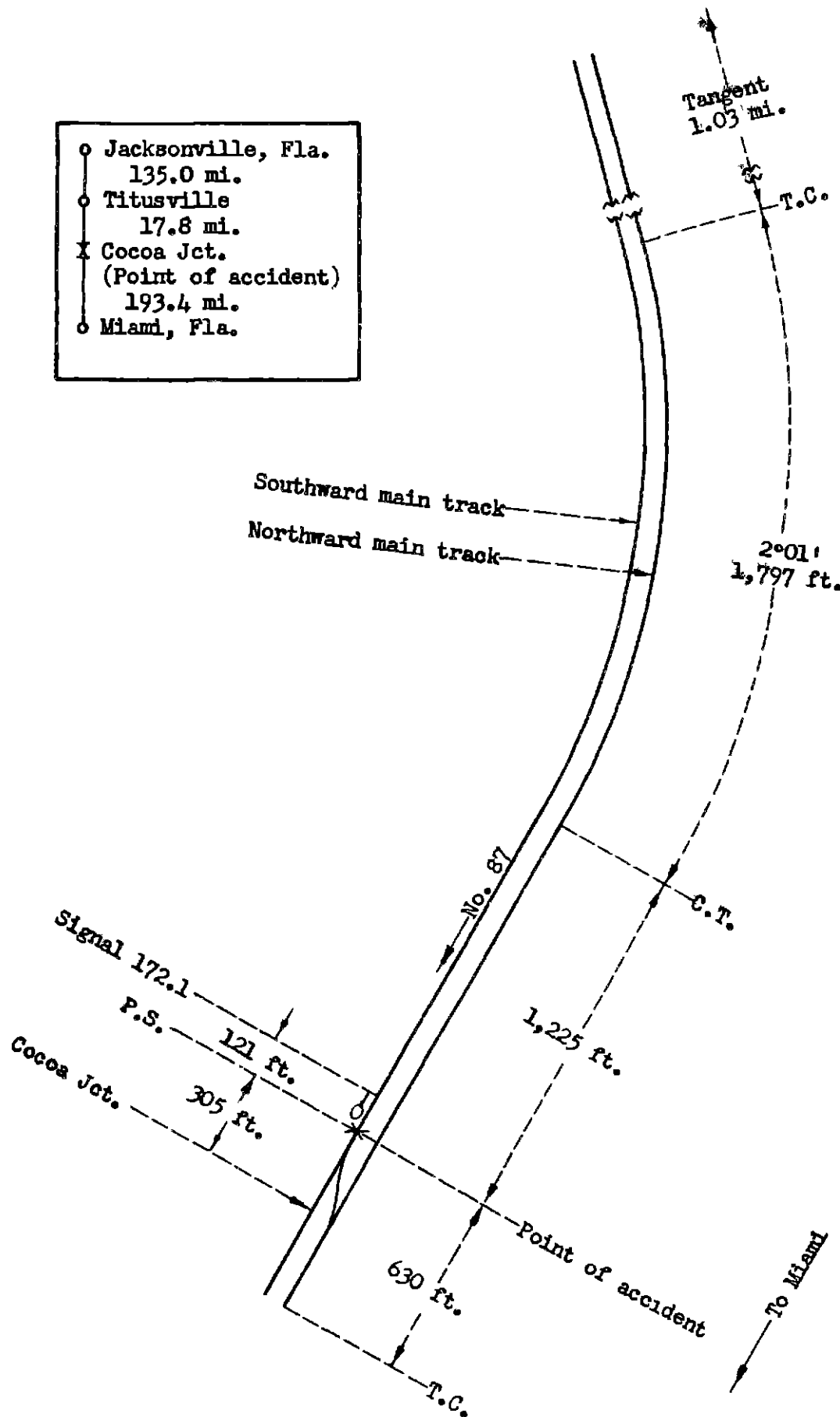
REPORT OF THE COMMISSION¹

TUGGLE, Commissioner

On December 26, 1957, there was a derailment of a passenger train on the Florida East Coast Railway at Cocoa Jct , Fla , which resulted in the injury of 16 passengers, 8 dining-car employees, and 1 Pullman porter

¹ Under authority of section 17 (2) of the *Interstate Commerce Act* the above-entitled proceeding was referred by the Commission to Commissioner Tuggle for consideration and disposition

o	Jacksonville, Fla.
	135.0 mi.
o	Titusville
	17.8 mi.
x	Cocoa Jct.
	(Point of accident)
	193.4 mi.
o	Miami, Fla.



Florida East Coast Railway
Cocoa Jct., Fla.
December 26, 1957

Location of Accident and Method of Operation

This accident occurred on that part of the railroad extending between Jacksonville and Miami, Fla., 346.2 miles. In the vicinity of the point of accident this is a double-track line over which trains moving with the current of traffic are operated by timetable, train orders, and an automatic block-signal system. At Cocoa Jct., 152.8 miles south of Jacksonville, a facing-point crossover connects the main tracks. The north switch of this crossover is located 305 feet north of Cocoa Jct. The accident occurred on the southward main track at the north switch of the crossover. From the north there are, in succession, a tangent 1.03 miles in length, a 2°01' curve to the right 1,797 feet, and a tangent 1,225 feet to the point of accident and 630 feet southward. The grade for southbound trains is 0.26 percent descending at the point of accident.

The track structure of the southward main track in the vicinity of the point of accident consists of 112-pound rail, 39 feet in length, laid new in 1944 on an average of 22 treated ties to the rail length. It is fully tieplated with single-shoulder tie plates, single-spiked, and is provided with 4-hole 24 inch joint bars and an average of 8 rail anchors per rail. It is ballasted with rock to a depth of 8 inches below the bottoms of the ties. The north turnout of the crossover consists of 112-pound reinforced switch rails 16 feet 6 inches in length, 112-pound rails, a No. 10 spring-rail frog and one-piece guard rails 8 feet 4 inches in length.

The switch stand of the north switch of the crossover is of the ground-throw low-stand type and is located 9 feet 4 inches west of the centerline of the southward main track. Electric switch locking is provided. When the switch is lined for movement on the southward main track, a white target 18 inches in diameter and a white light are displayed at the top of the spindle at right angles to the track. When the switch is lined for movement over the crossover, a red diamond-shaped banner and a red light are displayed at the top of the spindle at right angles to the track. The connecting rod of the switch is 1-3/8 inches in diameter and is provided with a clevis at the switch-stand end. The clevis is connected to the eye end of an eyebolt by a 1-inch bolt applied vertically. The eyebolt is 7 inches long and the threaded portion is 1-1/2 inches in diameter. It is screwed into the bottom end of the spindle and acts as an adjustable lever.

Automatic signal 1721, governing southbound movements on the southward main track, is located 121 feet north of the north switch of the crossover. The controlling circuit is so arranged that when the north switch of the crossover is lined for movement on the main track and the switch point does not fit properly, the signal will indicate Stop-and-proceed.

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

Description of Accident

No. 87, a southbound first-class passenger train, consisted of diesel-electric units 1014, 1054, and 1011, coupled in multiple-unit control, 1 dormitory-baggage car, 5 sleeping cars, 1 dining car, 4 sleeping cars, 1 dining car, and 7 sleeping cars, in the order named. These cars are of light-weight steel construction and are equipped with tightlock couplers. This train passed Titusville, Fla., 17.8 miles north of Cocoa Jct., the last open office, at 11:44 a.m., 51 minutes late, passed signal 1721, which indicated Proceed, and while moving at a speed of 70 miles per hour, as indicated by the tape of the speed-recording device, the 10th to the 18th cars, inclusive, and the front wheels of the front truck of the 19th car were derailed at the north switch of the crossover at Cocoa Jct.

A separation occurred between the 11th and 12th cars. The rear end of the 11th car and the front end of the 12th car stopped at points approximately 1,574 feet and 665 feet, respectively, south of the point of derailment. The derailed equipment stopped on the track structure and approximately in line. The 11th to the 13th cars, inclusive, and the 16th and 17th cars leaned slightly to the east. The other derailed cars stopped upright. The 12th to the 14th cars, inclusive, were heavily damaged. The 10th and 11th cars, and the 15th to the 18th cars, inclusive, were considerably damaged. The 19th car was slightly damaged.

It was raining at the time of the accident, which occurred about 12 05 p. m.

Discussion

As No. 87 was approaching the point where the accident occurred the enginemen were in the control compartment of the first diesel-electric unit and were maintaining a lookout ahead. The other members of the crew were in various locations in the cars of the train. The brakes of this train had been tested and had functioned properly when used en route. The members of the crew said that before the derailment occurred the locomotive and the cars were riding smoothly and that there was no indication of defective track or equipment. Signal 172 1 indicated Proceed, and the switch stand of the north switch of the crossover displayed a white target and a white light indicating that the switch was lined for movement on the southward main track. The first the enginemen became aware of anything being wrong was when the brakes became applied in emergency. The first the other members of the crew became aware of anything being wrong was when the derailment occurred. The conductor said that the brakes became applied in emergency before he could operate the conductor's brake valve.

Examination of the track throughout a considerable distance north of the point of derailment disclosed no indications of defective track or dragging equipment.

Examination of the north turnout of the crossover disclosed that the east side of the east switch rail was abraded throughout the length of the rail. A flange mark appeared between the west closure rail and west stock rail, and a corresponding mark appeared between the east closure rail and east stock rail immediately south of the switch rails. These marks indicated that the switch had opened sufficiently to permit a pair of wheels to enter the switch between the stock rails and switch rails, permitting the wheels to drop between these rails. The track structure was destroyed throughout a distance of approximately 500 feet south of the frog.

Examination of the switch stand after the accident occurred disclosed that the eyebolt at the bottom of the spindle had broken permitting the connecting rod and switch rails to move under the train. The eyebolt had broken approximately at right angles to its centerline at a location approximately 2-3/8 inches from the threaded end. Approximately 22 percent of the break was new. The remaining portion of the break showed batter and progressive fracture. Several small cracks were found extending from roots of threads near the broken surface into the body of the bolt. The break occurred at a location where it could not be observed unless the bolt was removed from the spindle.

On the day before the accident occurred the crews of two southbound trains reported that signal 172 1 displayed a red aspect when the block of the signal was unoccupied. A signal maintainer who was assigned to determine the cause of the red aspect found that although the signal was displaying a green aspect, the switch points of the north switch were slightly out of adjustment.

About an hour before the accident occurred a maintenance-of-way force adjusted the switch by closing the gage. The adjustment of the connecting rod was not changed. A track supervisor observed that the switch operated properly after the adjustment was made. He inspected the connecting rod and the eyebolt and observed nothing defective.

The switch was last inspected on December 20, 1957, by a section foreman and no exceptions were taken.

Cause

This accident was caused by a defective switch.

Dated at Washington, D. C., this ninth
day of July, 1958

By the Commission, Commissioner Tuggle

(SEAL)

HAROLD D. MCCOY,

Secretary

Interstate Commerce Commission

Washington 25, D C

OFFICIAL BUSINESS

RETURN AFTER FIVE DAYS

POSTAGE AND FEES PAID
INTERSTATE COMMERCE COMMISSION