

RAILROAD ACCIDENT INVESTIGATION

Report No 3777

CHICAGO, BURLINGTON & QUINCY RAILROAD COMPANY

CHARITON, IOWA

August 25, 1957

INTERSTATE COMMERCE COMMISSION

Washington

SUMMARY

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DATE	August 25, 1957
RAILROAD	Chicago, Burlington and Quincy
LOCATION	Chariton, Iowa
TRAIN INVOLVED	Passenger
TRAIN NUMBER	18
LOCOMOTIVE NUMBER	Diesel-electric units 9967, 9966, and 9935A
CONSIST	14 cars
SPEED	75 m p h
OPERATION	Signal indications
TRACKS	Double, tangent, 0 34 percent ascending grade eastward
WEATHER	Clear
TIME	7 42 a m
CASUALTIES	14 injured
CAUSE	False flange, resulting from a sliding wheel, coming in contact with the gage side of a stock rail

INTERSTATE COMMERCE COMMISSION

REPORT NO 3777

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

CHICAGO, BURLINGTON & QUINCY RAILROAD COMPANY

February 28, 1958

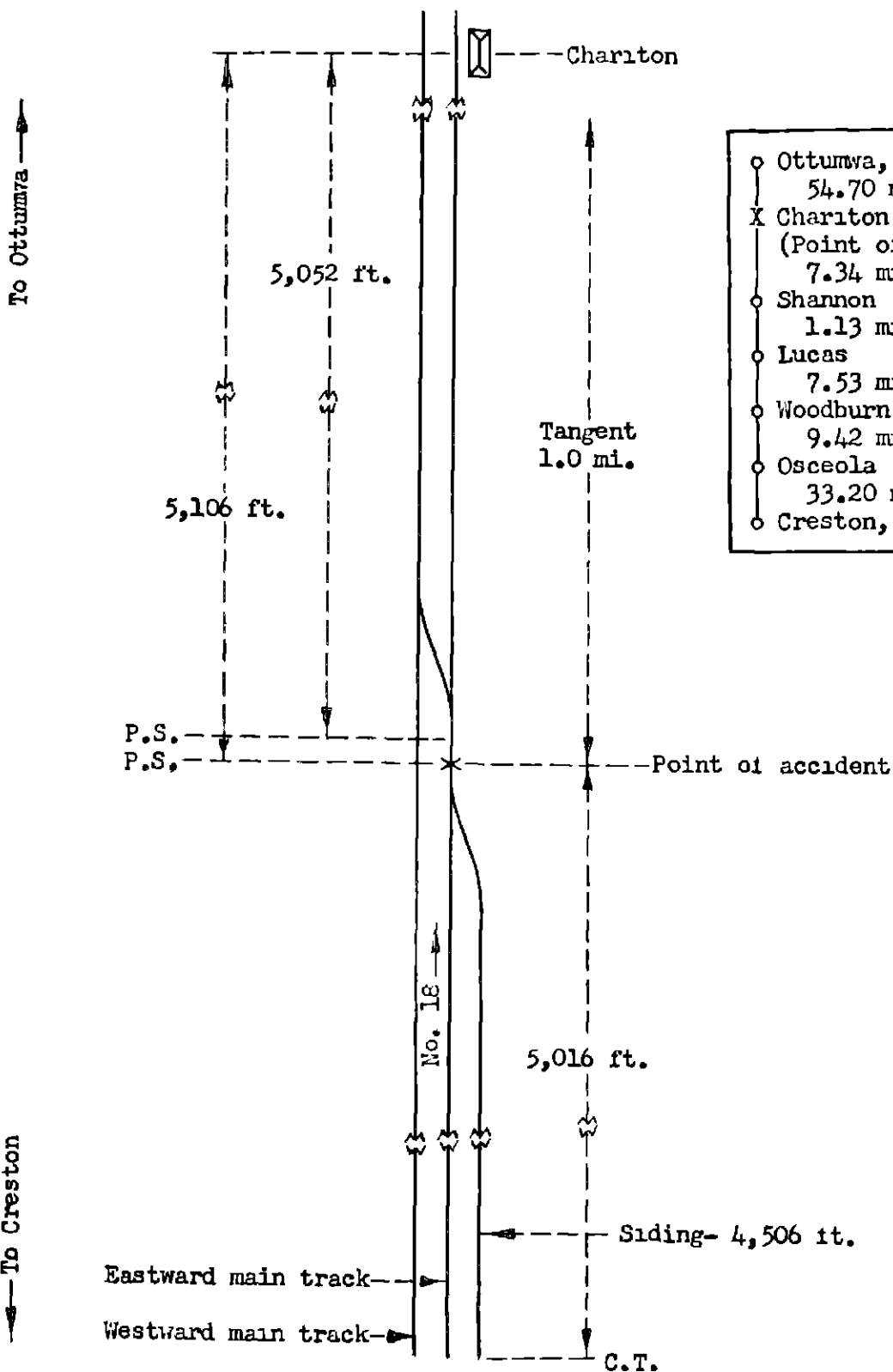
Accident at Chariton, Iowa, on August 25, 1957, caused by a false flange, resulting from a sliding wheel, coming in contact with the gage side of a stock rail

REPORT OF THE COMMISSION¹

TUGGLE, Commissioner

On August 25, 1957, there was a derailment of a passenger train on the Chicago, Burlington & Quincy Railroad at Chariton, Iowa, which resulted in the injury of 6 passengers, 7 dining-car employees, and 1 porter. This accident was investigated in conjunction with a representative of the Iowa State Commerce Commission.

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.



○	Ottumwa, Iowa	54.70 mi.
X	Chariton (Point of accident)	7.34 mi.
○	Shannon	1.13 mi.
○	Lucas	7.53 mi.
○	Woodburn	9.42 mi.
○	Osceola	33.20 mi.
○	Creston, Iowa	

Chicago, Burlington & Quincy Railroad
 Chariton, Iowa
 August 25, 1957

Location of Accident and Method of Operation

This accident occurred on that part of the Ottumwa and Creston Divisions extending between Creston and Ottumwa, Iowa, 113.32 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 signal indications. From south to north the main tracks are designated as eastward and westward. At Chariton, 58.62 miles east of Creston, the main tracks are connected by a facing-point crossover, and a siding 4,506 feet in length parallels the eastward main track on the south. The west switch of the crossover and the east switch of the siding are located, respectively, 5,052 feet and 5,106 feet west of the station. The accident occurred on the eastward main track at the east switch of the siding. From the west the main tracks are tangent throughout a distance of 5,016 feet to the point of accident and 1.0 mile eastward. The grade is 0.34 percent ascending eastward at the point of accident.

In the vicinity of the point of accident the track structure of the eastward main track consists of 129-pound rail, 39 feet in length, laid new in 1950 and 1951 on an average of 23 ties to the rail length. It is fully tieplated and is provided with 6-hole 36-inch joint bars and an average of 10 rail anchors per rail. It is ballasted with chats and slag to a depth of 12 inches below the bottoms of the ties.

This carrier's operating rules read in part as follows:

906 When practicable, operators will be on the station platform while a passenger or freight train is passing. The rear trainman passing through stations must be where signals can be exchanged * * * with operator * * *

Observe the equipment, particularly running gear, and if anything dragging or other defects noticed likely to create a dangerous condition, give stop signal. * * *

* * *

ENGINEMEN

982 Observe markers frequently to see that train is complete, and as far as possible in good order, and see that fireman does the same.

PASSENGER TRAINMEN

1058 * * * Be watchful for breakage of any part of the draft-gear, brake-gear, and running-gear of train, inspecting same at convenient points on the road.

The maximum authorized speed for the train involved in the accident was 79 miles per hour.

Description of Accident

No. 18, an eastbound first-class passenger train, consisted of diesel-electric units 9967, 9966 and 9935A, coupled in multiple-unit control, 1 baggage car, 1 coach, 3 coach-dome cars, 1 buffet-dormitory-dome car, 1 dining car, and 7 sleeping cars, in the order named. All cars were of lightweight steel construction and were equipped with tightlock couplers. This train departed from Creston at 6:52 a. m., 9 minutes late, passed Osceola, 33.20 miles east of Creston, the last open office, at 7:20 a. m., 9 minutes late, and while moving at a speed of

75 miles per hour, as indicated by the tape of the speed-recording device, the rear truck of the sixth car was derailed at the east switch of the siding at Chanton. The front truck of the seventh car was derailed at the west switch of the crossover.

There were no separations between units of the train. The train stopped with the front end of the locomotive 3,403 feet east of the point of accident. The rear end of the sixth car and the front end of the seventh car stopped between the main tracks. The derailed trucks of these cars were heavily damaged.

The weather was clear at the time of the accident, which occurred about 7:42 a. m.

The sixth car, D & R G W 1140, a lightweight stainless steel buffet-dormitory-dome car, was built in 1948. Its lightweight is 161,180 pounds. It is 85 feet long over couplers and is mounted on two four-wheel trucks. The wheelbase of each truck is 8 feet 6 inches, and the distance between the centerlines of the trucks is 59 feet 6 inches. Each truck is provided with a cast-steel frame, 6-inch by 11-inch journals, and 36-inch wheels. The journals are equipped with roller bearings. Helical springs are provided on the truck bolster and equalizers. At the time the accident occurred the front pair of wheels of the rear truck was equipped with an axle-mounted gear drive for driving an electrical generator. The car is equipped with a D-22-BR control valve, disc brakes, and an anti-wheel slide controller. The brake equipment of all units of the train except the 13th car was designed for either pneumatic or electropneumatic operation. At the time the accident occurred the brakes were being controlled pneumatically.

The disc-brake assembly consists of a cast-iron disc cast to a steel bolting flange and attached to the inside hub of each wheel, two composition-lined brake shoes per disc, brake cylinders, operating levers, and supporting members. Both faces of each disc are braking surfaces and are installed parallel to the wheel. The outside and inside diameters of the braking surfaces are 2 feet 4 inches and 1 foot 5-5/8 inches, respectively. Radiating fins are provided between the braking surfaces. Each pair of shoes is actuated by a brake cylinder through a tong-lever system.

The anti-wheel slide controller consists of a rotary switch attached to one end of each axle, a pressure switch, and a relay panel, a wheel-slide control valve, and an on-off switch for each truck. When a pair of wheels of a truck tends to slide during a brake application, the rotary switches of that truck actuate the electrical control system in such manner that the control valve cuts off the air supply to the brake cylinders of the truck involved and vents brake-cylinder air to the atmosphere thereby permitting the wheels to resume normal rotation. When sliding has been eliminated, the rotary switches actuate the electrical control system in such manner that the control valve cuts off the flow of brake-cylinder air to the atmosphere and permits air to flow to the brake cylinders provided the brakes of the train have not been released. When an abnormal condition, such as a broken wire, exists in the control circuits of a truck, the on-off switch automatically moves to off position and the anti-wheel slide protection for the truck involved is eliminated. The pressure switch operates to connect the control circuits to the battery circuit when brake-cylinder pressure exceeds approximately 5 pounds.

The regulatory devices governing the maximum main-reservoir pressure and the brake-pipe pressure of the train involved in the accident were adjusted to provide 140 pounds and 110 pounds, respectively.

Discussion

As No 18 was approaching the point where the accident occurred, the enginemen were in the control compartment of the first diesel-electric unit, the conductor was in the eighth car, the front brakeman was in the second car, and the flagman was in the rear car. The brakes of the train were tested at Creston by observing the brakes on the rear car of the train after a full-service application and after release. No car-to-car inspection of the brakes was made at that point. A running brake test was made after the train departed from Creston and the engineer applied and released the brakes several times to control the speed of the train en route from Creston to the point of accident. The members of the crew did not notice anything en route to indicate defective brake equipment. They said that they made observations as the train moved on curves and that they did not observe anything unusual. The flagman said that when the train passed the station at Osceola the operator at that point gave a proceed signal indicating that he had not observed anything defective. The engineer initiated a service brake application immediately before the derailment occurred to comply with a speed restriction at Chariton. The first the members of the crew became aware of anything being wrong was when the brakes of the train became applied in emergency as a result of the derailment.

Examination of the track structure after the accident occurred disclosed that eastward from a point approximately 18.5 miles west of the point of accident the tops of inside joint bars were marked intermittently. These marks became progressively heavier to the point of accident. The tops of all inside joint bars immediately west of the point of accident bore heavy marks. At Woodburn, 16.00 miles west of Chariton, the heel-riser block of the east turnout of a trailing-point crossover was marked and the north stock rail was bent outward approximately 1 inch. The frogs and stock rails of turnouts located at Lucas and Shannon, 8.47 miles and 7.34 miles west of Chariton respectively, bore indications of sliding wheels. The south stock rail and the spring wing-rail of the frog of the west turnout of the siding at Chariton also bore indications of sliding wheels. The heel-riser block of the frog of the east turnout of the siding bore a heavy flange mark. Both stock rails of that turnout were canted outward apparently by a wedging action. Immediately east of the switch point a mark appeared on the base of the inside of the south rail indicating that a wheel was derailed inside the rail. The frog of the west turnout of the crossover at Chariton was heavily damaged and marks on the track structure indicated that other wheels had become derailed at that point.

After the accident occurred slid-flat spots were found on the treads of the front wheels of the rear truck of the sixth car. The length of the flat spots on the left and right wheels were, respectively, 10-1/2 inches and 11-1/2 inches. There was no measurable tread or flange wear at other points on the wheels. False flanges approximately 5/8 inch in height had been formed on the outer edges of the treads as a result of sliding. It is evident from the track markings that the outside surface of the false flange on the right wheel bore on the gage side of the south stock rail of the east turnout of the siding at Chariton spreading the rails sufficiently to permit that wheel to derail.

The brake discs and brake rigging of the derailed trucks were badly damaged as a result of contact with the track structure. Only the bolting flange remained attached to the hub of the right wheel of the pair of wheels containing the flat spots. A segment extending throughout an angle of approximately 160 degrees was broken from the inside braking face of the disc attached to the left wheel and the radiating fins in that area were destroyed. All brake shoes of that

pair of wheels except one located at the inside braking surface of the left wheel were torn from the truck. Examination of the pieces of disc which were found and of the brake shoes disclosed no indications of excessive heating nor any indication that this pair of wheels had become locked because of a disc being broken prior to the accident.

The roller-bearing assemblies of the pair of wheels containing the flat spots, the gear drive attached to the axle, and the generator were disassembled and were found to have been in servicable condition.

Examination of the anti-wheel slide controller on the rear truck disclosed that the insulation of two control-circuit wires in the connection between the truck and the car body was badly chafed and the wires were broken.

Tests of the air-brake equipment of car D & R G W 1140 after the accident occurred disclosed that the service portion of the D-22-BR control valve was defective. Service piston-ring leakage, which should not exceed 4 pounds per minute according to the carrier's specification, was found to be 10 pounds per minute. The piston and slide valve failed the resistance test by exceeding carrier's specification of a maximum allowable 10 pounds. Under those conditions it is possible that the brakes of the car would not release after a service application.

It is apparent that because of the defective control valve the brakes of car D & R G W 1140 failed to release after the brake application was made when the train arrived at Creston, and, as a result, sufficient pressure was retained in the brake cylinders to permit the brake shoes to exert an appreciable force on the brake discs. It is apparent that when the train departed from Creston the resistance to the turning of the wheels set up by this force combined with the resistance offered by the gear drive attached to the front pair of wheels of the rear truck was sufficient to cause that pair of wheels to slide. Since the anti-wheel slide controller of the rear truck was defective it did not function to correct the sliding condition.

The D-22-BR control valve of car D & R G W 1140 was last cleaned and tested on February 27, 1957.

Cause

This accident was caused by a false flange, resulting from a sliding wheel, coming in contact with the gage side of a stock rail.

Dated at Washington, D C , this twenty-eighth day of February, 1958

By the Commission, Commissioner Tuggle

(SEAL)

HAROLD D McCOY,

Secretary