

RAILROAD ACCIDENT INVESTIGATION

REPORT NO. 4145

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PENN CENTRAL COMPANY

LANDISVILLE, PA.

JUNE 23, 1968

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DEPARTMENT OF TRANSPORTATION  
FEDERAL RAILROAD ADMINISTRATION  
WASHINGTON, D. C. 20591

SUMMARY

DATE: June 23, 1968

RAILROAD: Penn Central

LOCATION: Landisville, Pa.

KIND OF ACCIDENT: Derailment

TRAIN INVOLVED: Passenger

TRAIN NUMBER: 49

LOCOMOTIVE NUMBER: Electric unit 4914

CONSIST: 13 cars

SPEED: 75 m p h

OPERATION: Signal indications

TRACK: Double; tangent; 0.44 percent  
descending grade westward

WEATHER: Clear

TIME: 7:59 p.m.

CASUALTIES: 73 injured

CAUSE: Generator of a passenger car  
falling to the track structure  
under the train, resulting from  
breaks in the welds securing one  
of the generator brackets to the  
car.

RECOMMENDATION: That the Penn Central Company and  
all other railroads operating  
passenger cars instruct their  
mechanical department employees  
to thoroughly examine generators  
applied to such cars, to determine  
whether the generators are properly  
secured

DEPARTMENT OF TRANSPORTATION  
FEDERAL RAILROAD ADMINISTRATION  
RAILROAD SAFETY BOARD

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PENN CENTRAL COMPANY  
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Synopsis

On June 23, 1968, a Penn Central Railroad passenger train derailed at Landisville, Pa , resulting in injury to 73 passengers and employees

The derailment was caused by the generator of a passenger car falling to the track structure under the train, resulting from breaks in the welds securing one of the generator brackets to the car

Location and Method of Operation

The accident occurred on that part of the Harrisburg Division extending between Atglen and Banks, Pa , a distance of 66.1 miles. In the accident area, the railroad is a double-track line. From the north, the main tracks are designated as No 2 westward and No 1 eastward

Landis interlocking is located at Landisville, 28 1 miles west of Atglen. The interlocking extends 863 feet east and 891 feet west of the interlocking station, which was closed at the time of the accident. When the station is closed, trains moving with the current of traffic operate through the interlocking by signal indications of an automatic block-signal system, supplemented by automatic cab signal and speed control systems. A catenary system is provided for the electric propulsion of trains.

A single-track line of the Reading Company crosses the PC main tracks at grade within limits of the Landis interlocking, 53 feet west of the interlocking station.

The derailment occurred on track No. 2, 27 feet east of the Landis interlocking station at Landisville.

#### Signals and Dragging Equipment Detector

Signals 735 and 8L, governing westbound movements on track No. 2, are 1.9 miles and 846 feet east of the derailment point, respectively.

Track No. 2 is provided with a dragging-equipment detector, 1 8 miles east of signal 735. When the detector is actuated by dragging equipment, it causes signal 735 and 8L to display Approach and Stop aspects, respectively. Signal 8L is also caused to display a light with the letter "E", indicating that the dragging-equipment detector has been actuated.

#### Time and Weather

The derailment occurred at 7:59 p m, in clear weather.

#### Track No. 2

From the east on track No. 2 there are, successively, a tangent 942 feet in length, a 1°00' curve to the right 1,518 feet, and a tangent 1,410 feet to the derailment point and 2,642 feet beyond. The grade in this area is 0.44 per cent descending westward.

#### Authorized Train Speed

The maximum authorized speed for passenger trains in the derailment area is 75 miles per hour.

#### Circumstances Prior to Accident

The train involved in the accident was No. 49, a westbound first-class passenger train consisting of 1 electric locomotive, 1 baggage car, 5 sleeping cars, 1 lounge car, 2 dining cars, 1 lounge car and 3 coaches, in that order. The cars were of all-steel construction and had tightlock couplers.

No. 49 left New York, N. Y. , at 5:05 p.m. the day of the accident, after having had a brake test and an inspection by employees of the carrier's mechanical department. After stopping at several points en route, it left Lancaster, 7.2 miles east of Landisville, at 7:50 p.m. and continued westward on track No. 2. The engineer and fireman were in the control compartment of the locomotive, and the other crew members were in the tenth car.

Aboard the train were 177 passengers, and 26 employees serving in various capacities such as crew members, dining-car attendants, sleeping-car attendants, etc.

#### The Accident

##### Train No. 49

About six minutes after leaving Lancaster, No. 49 passed the dragging equipment detector located 1.8 miles east of signal 735. It then passed signals 735 and 8L, which displayed Clear aspects, indicating that the dragging equipment detector had not been actuated. Soon, thereafter, at about 7:59 p.m., while the train was moving westward on track No. 2 at 75 miles per hour, as indicated by the speed-recording device, the 6th to 13th cars, inclusive, derailed at a point 27 feet east of the Landis interlocking station. None of the crew members was aware of anything being wrong before the train brakes applied in emergency as a result of the derailment.

#### Damages

The locomotive and the first to sixth cars, inclusive, stopped with the front of the locomotive 3,462 feet west of the derailment point. Both trucks of the sixth car were derailed to the north. This car remained coupled to the fifth car and stopped upright on and in line with the structure of track No. 2. A separation occurred between the sixth and seventh cars. All trucks of the seven cars to the rear of the sixth car were also derailed to the north. This group of cars remained coupled and stopped with the front of the seventh car 1,910 feet to the rear of the sixth car. The cars stopped upright and in line, on or adjacent to the structure of track No. 2. The ninth to eleventh cars, inclusive, stopped in leaning positions to the north.

All eight derailed cars were damaged considerably. The total cost of damages to these cars was \$115,805 as estimated by the carrier.

The structure of track No. 2 was heavily damaged or destroyed throughout a distance of about 2,900 feet west of the derailment point.

### Casualties

The derailment resulted in injury to 58 passengers, 2 coach attendants, 10-dining-car employees, and 3 sleeping car employees. Most injuries were of a relatively minor nature, consisting mainly of abrasions, contusions, sprains etc. However, eight passengers sustained serious injuries as indicated in the following:

1	Ruptured spleen and rib fractures.	Hospitalized
2	Severe leg, arm and side strains	"
3	Severe leg injury	"
4	Contusions to back, hip and legs	"
5.	Broken blood vessels in leg, sprained back and hip.	"
6	Stomach and back injuries	"
7	Shoulder and left eye contusions	"
8.	Fracture of sternum	"

### Train Crew Hours of Service

At the time of the accident, the engineer and fireman had been on duty 10 hours 3 minutes in the aggregate. The conductor and flagman had been on duty 8 hours 15 minutes in the aggregate and the front brakeman had been on duty 8 hours in the aggregate. All crew members were previously off duty over 8 hours

### Post-Accident Examination of Track Structure

Examination of the structure of track No. 2 throughout a considerable distance east of the derailment point disclosed nothing that would indicate a defective track condition contributed to the accident.

Evidence of dragging equipment was disclosed Westward from a point 194 feet east of the derailment point, three consecutive rail anchors applied to the gage side of the north rail were either broken or heavily gouged. Beginning about 50 feet farther westward and extending to the derailment point, scrape and gouge marks appeared on the ties about midway between the rails. The marks were progressively heavier in approach to the derailment point. The track structure in the derailment point area, including the Reading Company rail crossing, was destroyed

### Post Accident Examination of Train Equipment

Examination of the train equipment was made to determine what appurtenance had fallen to the track structure and marked the ties as described above. It disclosed that the generator (genemotor) of the fifth car had fallen to the track structure, causing the aforesaid track marks and the derailment. It further disclosed that the truck at the east, or rear, end of the fifth car was somewhat damaged, and that both trucks of the sixth car were heavily damaged, by contact with the generator. The axles of the trucks of the sixth car were bent, and the brake beams of the trucks were bent

upward. The center sill and the flooring of the vestibule at the rear, or east end of the car, were also bent upward.

#### Fifth Car of Train

This car was a sleeping car (Charles Lockhart) owned by the Pullman Company, and built by Pullman-Standard in February 1949. It was 85 feet long over buffers and was mounted on two 4-wheel trucks. A Spicer generator drive assembly was attached to the innermost axle of the truck at the east, or rear, end of the car. A drive shaft about 43 inches long connected the aforesaid assembly to the generator.

#### Generator

The cylinder-shaped generator was  $47\frac{1}{2}$  inches long,  $18\frac{3}{4}$  inches in diameter, and weighed about 1,760 pounds. It had been suspended under the car by two steel brackets attached to the center sill at a point eleven feet ahead of the center of the rear truck. Each steel bracket had two arms, for securing the bracket to the center sill. (See sketches "A" and "B" appended to this report.)

#### Generator Suspension Brackets

The manufacturer's blueprint specifications call for three 13/16-inch holes to be bored in the top end of each arm of the brackets, for securement of the brackets to the webs of the center sill by bolts or rivets applied through the arm holes and holes in the webs of the center sill. Examination revealed that the arms of the bracket supporting the south side of the generator had been secured to the center sill in accordance with the manufacturer's blueprint specifications. Two bolts and four rivets used for securing this bracket to the car were found in their respective holes in the south web of the center sill. Holes in the north web of the center sill showed little or no evidence of bolts or rivets having been used to secure the north bracket of the generator to the center sill. From all indications, this bracket had been secured to the center sill by welds, instead of bolts or rivets.

The manufacturer's blueprint specifications also called for the generator brackets to be diagonally braced by two metal bars, as indicated by the dotted lines in sketch "B". No trace was found of the aforesaid braces having been applied as called for in the specifications.

The welds for securing the arms of the north generator bracket to the center sill were broken, and the arms of the south bracket were broken through their holes. These breaks permitted the generator to fall to the track structure, causing the derailment.

The generator was found on the north side of track No. 2, 562 feet west of the derailment point. It was heavily battered. The bracket supporting the south side of the generator was found between the rails of track No. 2, three feet east of the derailment point. The other bracket was found adjacent to the south side of track No. 1, seventy feet west of the derailment point. Both brackets were heavily battered and twisted.

#### History of Generator

According to information provided by the Penn Central, Pullman car "Charles Lockhart," the 5th car of No. 49, was shopped at Washington, D. C. on May 30, 1967, due to a defective generator bracket. The bracket was forwarded to the Chicago Calumet Shop of the Pullman Company and was returned in June to Washington, where it was reapplied to the car by Pullman Company employees. Information provided by the Penn Central indicates that the arms of the bracket were secured to the center sill of the car by welds, rather than bolts or rivets, and that the car was dispatched from Washington on July 4, 1967.

Inspection of the electrical equipment and associated appurtenances on the car was the responsibility of the Pullman Company. Records indicate that employees of this company serviced and inspected the car at frequent intervals between July 4, 1967 and the day of the accident. The last inspection by such employees was made at the PC Sunnyside Yard in New York, N. Y., on the day of the accident, prior to movement of the car to Pennsylvania Station, New York, for departure in train No. 49. Apparently this inspection and those made previously by Pullman Company employees detected no defective condition of the brackets supporting the generator.

Employees of the PC mechanical department inspected the equipment of No. 49 before the train left Pennsylvania Station on the day of the accident, and did not notice or detect any defective condition of the 5th car, Pullman car "Charles Lockhart." In view of the locations where the arms of the generator brackets were attached to the center sill of the car, it would be virtually impossible for railroad mechanical department employees to see these locations during normal inspections of train equipment at passenger stations.

#### Analysis of Accident

In June 1967, Pullman Company employees reapplied the north generator bracket of Pullman car "Charles Lockhart" and secured it to the center sill of the car by welds. On June 23, 1968, the day of the accident, this car was dispatched from New York, N. Y., as the fifth car of No. 49. From all indications, the welds securing the north generator bracket of the car to the center sill had been partially or completely broken by this time.

Soon after No. 49 passed the dragging-equipment detector located 3.7 miles east of the Landis interlocking station, the arms of the north generator bracket separated from the

center sill of the car because of the broken welds, permitting the generator to swing downward with the south bracket holding it to the car. The generator and/or its north bracket then struck rail anchors applied to the gage side of the north rail of track No. 2 in the vicinity of a point about 227 feet east of the Landis interlocking station. Immediately thereafter, while the train was moving westward at approximately 75 miles per hour, the generator swung downward sufficiently to contact the ties, between the rails. Impact forces from this contact caused the south generator bracket to break through its arm holes, permitting the generator to drop free to the track structure and bounce or roll under the train. After the rear truck of the fifth car passed over it, the generator evidently became wedged, successively, under the front and rear trucks of the sixth car. Wedging action then lifted the wheels of the trucks off the rails, causing the derailment to occur 27 feet east of the Landis interlocking station.

The derailment occurred due to the breaking of the welds securing the arms of the north generator bracket to the center sill of the car. Inspection of the bracket indicates that the welds broke because of the use of faulty welding techniques, which resulted in insufficient fusion of fillet weld metal with the bracket metal. The generator brackets apparently were not braced as called for in the manufacturer's blueprint specifications, and the absence of this bracing may have been a causal factor with respect to the breaks in the welds.

### Findings

1. At the time of the derailment, the train was moving in accordance with applicable rules and regulations of the carrier.

2. Shortly after the train passed a wayside dragging equipment detector, the generator of the fifth car fell to the track structure due to breaks in the welds securing the north generator bracket to the center sill of the car. As a result, the south generator bracket broke, permitting the generator to drop free to the track structure and to roll or bounce under the train.

3. The generator became wedged, successively, under the front and rear trucks of the sixth car. Wedging action then caused the wheels of the trucks to lift from the rails, resulting in the derailment.

### Cause

The accident was caused by the generator of a passenger car falling to the track structure under the train, resulting from breaks in the welds securing one of the generator brackets to the car \*

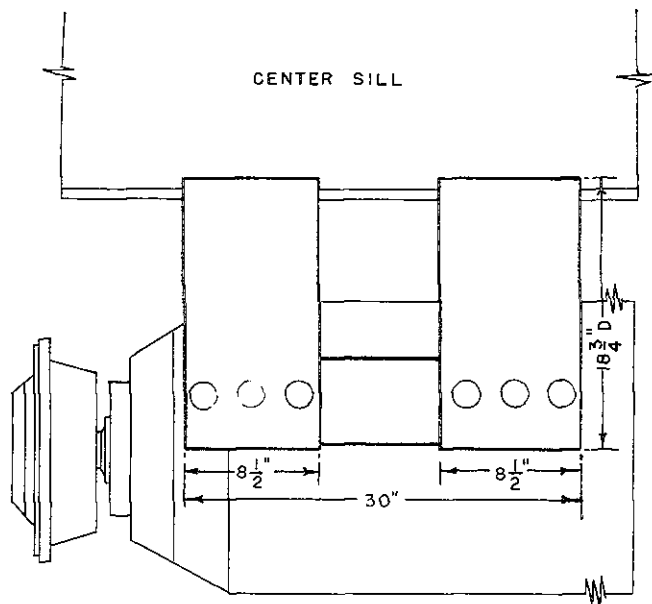
### Recommendation

It is recommended that the Penn Central Company and all other railroads operating passenger cars instruct their mechanical department employees to thoroughly examine generators applied to such cars, to determine whether the generators are properly secured

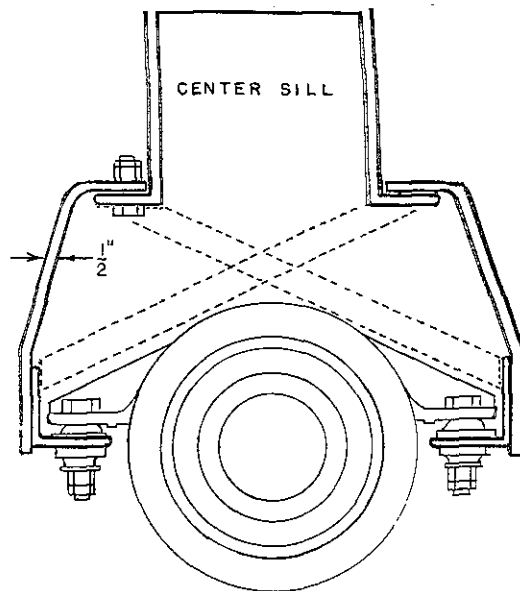
Dated at Washington, D C , this 23rd  
day of April  
By the Federal Railroad Administration

Mac E Rogers, Chairman  
Railroad Safety Board

\*The Federal Railroad Administration has no jurisdiction over railroad operating rules; track structures; bridges; rail-highway grade crossing protection; track clearances; consist of train crews; qualifications or physical condition of railroad employees; running and draft gear on cars, or the construction of cars except those appurtenances within jurisdiction of the Safety Appliance Acts and the Power Brake Law of 1958

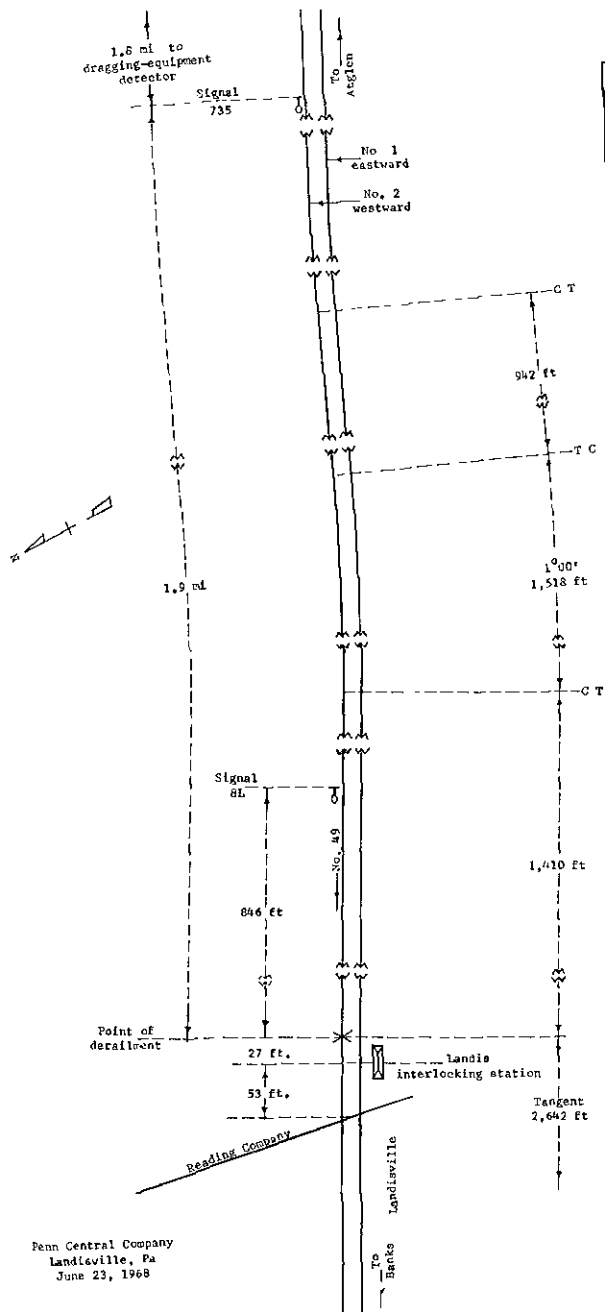


SKETCH "A"



SKETCH "B"

PULLMAN CAR "CHARLES LOCKHART"  
GENERATOR AND SUSPENSION BRACKET



Penn Central Company  
Landisville, Pa  
June 23, 1968