

**RAILROAD ACCIDENT INVESTIGATION**

**Report No 3770**

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THE NEW YORK CENTRAL RAILROAD COMPANY

GRAND CENTRAL TERMINAL, NEW YORK, N Y

JULY 15, 1957

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**INTERSTATE COMMERCE COMMISSION**

**Washington**

## SUMMARY

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DATE	July 15, 1957		
RAILROAD	New York Central		
LOCATION	Grand Central Terminal, New York, N Y		
KIND OF ACCIDENT	Collisions		
EQUIPMENT INVOLVED	Passenger units	Passenger train	Passenger units
CONSISTS	9 electrically propelled passenger units	9 electrically propelled passenger units	9 electrically propelled passenger units
ESTIMATED SPEEDS	Undetermined	Standing	Standing
OPERATION	Interlocking		
TRACKS	Station tracks, 13° curve, 0 50 percent descending grade eastward		
WEATHER	Underground, continuously lighted		
TIME	3 42 p m		
CASUALTIES	65 Injured		
CAUSE	Cut of electrically propelled passenger units moving out of control on descending grade as a result of failure properly to charge air-brake system		

## INTERSTATE COMMERCE COMMISSION

REPORT NO 3770

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

THE NEW YORK CENTRAL RAILROAD COMPANY

December 13, 1957

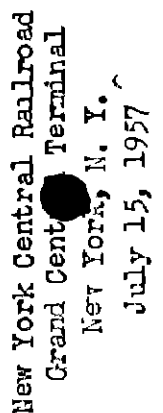
Accident at Grand Central Terminal, New York, N Y , on July 15, 1957, caused by a cut of electrically propelled passenger units moving out of control on a descending grade as a result of failure properly to charge the air-brake system

REPORT OF THE COMMISSION<sup>1</sup>*TUGGLE, Commissioner*

On July 15, 1957, there was a collision between a cut of electrically propelled passenger units moving out of control and a passenger train, which then collided with the side of a cut of electrically propelled passenger units standing on an adjacent track on the New York Central Railroad at Grand Central Terminal, New York, N Y , and resulted in the injury of 64 passengers and 1 train-service employee. This accident was investigated in conjunction with representatives of the New York Public Service Commission.

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<sup>1</sup> 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.



### Location of Accident and Method of Operation

This accident occurred on that part of the Electric Division designated as Grand Central Terminal, extending between East 42nd Street and East 59th Street, New York, N. Y., 4,500 feet, over which trains are operated by signal indications. All terminal tracks are underground and within interlocking limits. A power rail is provided for the electric propulsion of trains. Trains of the New York, New Haven, and Hartford Railroad, hereinafter referred to as the New Haven, are regularly operated over the terminal tracks of the New York Central, hereinafter referred to as N. Y. C. These tracks extend from north to south. Timetable directions are east and west, and these directions are used in this report. The tracks of the terminal are on two levels. Signals and switches on the lower level are controlled from Signal Tower B located on the lower level 1,843 feet west of East 42nd Street. Track A, located near the west end of the terminal, is one of several tracks connecting tracks of the upper and lower levels with the main line of the Electric Division. On the lower level near the east end of the terminal a number of station and storage tracks parallel each other. These tracks are designated consecutively from north to south as Tracks Nos. 101 to 125. Tracks Nos. 101 to 117, inclusive, are provided with platforms for the accommodation of passenger traffic. The west end of Track No. 102 connects with a lead track designated as Ladder T track at a point located 978 feet east of Signal Tower B. Ladder T track connects with Track A at switch 775 located 679 feet east of Signal Tower B. The east end of Track No. 103 connects with Track No. 102 at a point 1,745 feet east of Signal Tower B. Track No. 130 diverges to the north from Track A at a point 265 feet west of Signal Tower B. This track extends eastward and parallels Track A. A portion of a loop track designated as Track No. 200 parallels the station tracks north of Tracks Nos. 101 and 130, and connects with Track No. 130 at a point 45 feet west of Signal Tower B. The first collision occurred on Track No. 102 at a point 1,021 feet east of Signal Tower B. The second collision occurred at the fouling point near the turnout connecting Tracks Nos. 102 and 103. From the west via Track A, Ladder T track, and Track No. 102, there are, in succession, a tangent 2,321 feet in length, a  $13^{\circ}$  curve to the left 156 feet, a tangent 142 feet, and a  $13^{\circ}$  curve to the right 104 feet to the point of accident and 105 feet eastward. The grade for eastbound movements via that route is, successively, 2.70 percent descending a distance of 585 feet, a vertical curve 221 feet, 0.65 percent descending 238 feet, a vertical curve 66 feet, level 640 feet, a vertical curve 50 feet, and 0.50 percent descending 220 feet to the point of first collision and 28 feet eastward. The grade at the point of second collision is level.

Interlocking signals 884 and 812, governing eastbound movements on Track A, and interlocking signal 809, governing eastbound movements on Ladder T track, are located, respectively, 417 feet west, 423 feet east, and 736 feet east of Signal Tower B. These signals are continuously lighted dwarf signals of the one-arm upper-quadrant semaphore type. Aspects applicable to this investigation and their corresponding indications and names are as follows:

Signal	Aspect	Indication	Name
884	Diagonal yellow light	PROCEED AT RESTRICTED SPEED	RESTRICTING
812) 809)	Horizontal red light	STOP	STOP

The controlling circuits are so arranged that when the route is lined for a westbound movement from Track No. 102 over Ladder T track to a track south of Track A, signals 812 and 809 indicate Stop. When the route is lined for an eastbound movement on Track A to signal 812, signal 884 will indicate Proceed-at-restricted-speed.

This carrier's operating rules read in part as follows

#### DEFINITIONS

**Restricted Speed**—A speed not exceeding that which will enable a train to stop short of train, obstruction, or switch not properly lined, look out for broken rail, \* \* \*

663 Trains or engines must not pass an interlocking signal indicating "Stop" \* \* \*

Timetable special instructions read in part as follows

#### AIR BRAKES

MU Equipment.

G C T

When making switching movements, before cars are moved and after brake system is fully recharged enginemen must make a 15-pound brake pipe reduction and use power forward to determine that brakes are applied and that cars do not move

N Y , N H & H

When stopping on grades for reverse movement, pneumatic brake must be used

The maximum authorized speed within interlocking limits at Signal Station B is 10 miles per hour

#### Description of Accident

A cut of nine New Haven electrically propelled passenger units, coupled in multiple-unit control, departed westward from Track No 200 about 3 36 p m , entered Track No 130 and stopped on Track A with the east end of the movement about 32 feet west of signal 884. The second, fourth, and eighth units were power units. The other units were trailer units. Shortly after stopping on Track A, the cut of units moved eastward out of control, passed signal 884, which indicated Proceed-at-restricted-speed, passed signal 812, which indicated Stop, trailed through switch 775, entered Ladder T track, passed signal 809, which indicated Stop, entered Track No 102, and while moving at an undetermined speed it struck the front end of No 433, a N Y C westbound first-class passenger train consisting of nine electrically propelled passenger units, coupled in multiple-unit control. No 433 was moved about 55 feet eastward by the force of the impact and the rear unit struck one of the units of a cut of nine N Y C electrically propelled passenger units which were standing on a lead track near the east end of the station tracks and fouling Track No 102. None of the New Haven units was derailed. The west end of the second New Haven unit from the east end of the cut telescoped the control compartment of the adjacent unit. The first and second units from the east end of the cut were slightly damaged, and the third unit was badly damaged. The rear truck of the ninth unit of No 433 was derailed. This unit was damaged slightly. The east truck of the second unit from the west end of the cut of N Y C units was derailed. This unit was badly damaged.

The engineer of the cut of New Haven units was injured.

The underground tracks of Grand Central Terminal are continuously lighted.

The accident occurred about 3 42 p m.

Power and trailer units are provided with schedule AMUE and schedule ATUE brake equipment, respectively. Each unit is provided with a control compartment at each end, a UEA-12-BC control valve, an auxiliary reservoir, a service reservoir, an emergency reservoir, a control reservoir, and two equalizing reservoirs. Each power unit is provided with two main reservoirs, an air compressor, and an air-compressor switch. Each control compartment is provided with a master controller and an ME-30 brake valve. The brake system is so designed that it can be controlled either pneumatically or electropneumatically. In order to make either a pneumatic or electropneumatic brake application it is necessary to charge the brake-pipe and related reservoirs in addition to having the main reservoirs charged. After the main reservoirs are charged, the brake equipment of each unit is charged by placing the brake-valve handle in release position. Air is then permitted to flow from the main reservoirs, through a pressure-regulating device, through the brake valve to the brake pipe, and thence to the auxiliary, service, emergency, and control reservoirs of each unit. When the brake-valve handle is in lap position, the brake-valve port leading to the brake pipe is closed preventing main-reservoir air from flowing to the brake pipe and related reservoirs. The brake-valve handle can be removed when the handle is in handle-off position. A safety-control feature actuated by upward movement of the controller handle is provided. If the controller handle is released, brake-pipe air will be vented at an emergency rate, and power to the traction motors will be shut off automatically. A reverser handle is provided for the master controller, and it can be removed when it is in off position. In order to energize the master controller, a control switch must be positioned and the reverser handle must be placed in either forward or reverse position. When the accident occurred, the regulatory devices governing maximum main-reservoir pressure and brake-pipe pressure were adjusted to provide 120 pounds and 80 pounds, respectively.

### Discussion

The New Haven equipment involved in the accident arrived at Grand Central Terminal about 7:14 a.m. on the day of the accident in train No. Y267. The engineer said that the brakes of that train were tested and had functioned properly when used en route. An engineer who assisted in moving the cut of nine units involved in the accident from the station track to Track No. 200 said that he operated the units from the west end of the west unit of the cut and that the brakes functioned properly when the movement was made. An electrician began an inspection of these units about 7:35 a.m. He applied a reverser handle and brake-valve handle to the control equipment at the west end of the west unit of the cut. He said that after the brake system was fully charged he made a 25-pound brake-pipe reduction and applied power to the units. The units did not move. He said that when he alighted all air compressors were operating and that the brakes were applied and the brake-valve handle was in lap position.

These units were scheduled to depart from Track No. 105 as No. Y298 at 4:14 p.m. The engineer assigned to move the cut boarded the cut at the west end of the west unit about 3:36 p.m. The route had already been established for movement of the cut to track A. He said he observed that the main-reservoir air gauge indicated a pressure of 70 pounds. He did not observe the indication of the brake-pipe gauge. He said that immediately after boarding the cut he moved the brake-valve handle from lap position to release position and shortly after applied power to the units. He said that when the cut had moved a short distance he stopped the movement by applying the electropneumatic brake. The cut of units then was moved from Track No. 200 and stopped on Track A with the east end of the cut about 32 feet west of signal 884. The engineer said that he stopped the movement by applying the electropneumatic brake. He said that after the movement stopped he initiated a pneumatic brake application. He said that when he made the application the volume of air exhausted from the brake valve was less than usual. Immediately after the movement stopped the train director instructed the levermen to line the route for movement of the cut eastward on

Track A to signal 812. A route for movement of No. 433 from Track No. 102 over Ladder T track to a track south of Track A had already been established. The engineer said that after making the pneumatic brake application he removed the reverser handle and the brake-valve handle intending to complete the movement of the cut to the station track by operating from the control station at the east end of the cut. He said that immediately after removing the handles the cut started to move eastward. He replaced the handles immediately and moved the brake-valve handle to emergency position. The speed of the cut did not decrease. He said that he then moved the controller handle to apply power to stop the cut but this was ineffective. He released the safety control feature but this was also ineffective. He said that he sounded warning blasts on the whistle and that he was attempting to apply the hand brake in the control compartment when the collision occurred.

The engineer of No. 433 observed the cut of New Haven units approaching and he alighted before the collision occurred. He said that the brakes of No. 433 were released. He was unable to estimate the speed of the New Haven cut when the first collision occurred. The engineer of the cut of N Y C. units estimated that the speed of No. 433 was about 4 miles per hour when it struck the N Y C. cut.

After the accident occurred, the brake equipment of the six undamaged units at the west end of the New Haven cut of units was fully charged and tested by operating the brake valve in the control compartment at the west end of the cut. The tests disclosed that the equipment functioned as intended. The undamaged brake equipment of the other three units was tested after broken pipes were repaired and the equipment was fully charged, and it was found that the equipment functioned as intended. Examination of the units shortly after the accident occurred disclosed that the brake pipe was broken at the east end of the second unit from the east end of the cut and that brake-cylinder pistons of all units were in release position. This condition indicated that the brake pipe was not properly charged when the accident occurred since venting of the brake pipe when the brake system is properly charged and is functioning as intended results in a brake application. It was found that the air compressor switches of all power units were positioned properly and all air compressors were functioning properly.

After the accident occurred tests were made with a test train having a consist similar to that of the cut of New Haven units involved in the accident. The tests disclosed that it required slightly over 5 minutes to fully charge the depleted brake pipe and related reservoirs from fully charged main reservoirs.

A representative of the carrier said that when units arriving in No. Y267 are assigned to No. Y298 and are placed on terminal tracks to await departure time, it is the practice to keep the air compressors in operation. Since the air compressors were functioning properly both before and after the accident occurred and since the compressors were not shut down from the time the units arrived in No. Y267 until after the accident occurred, it is apparent that the engineer was mistaken regarding the indication of the main-reservoir air gauge when he boarded the units and that the main reservoirs were fully charged when the movement proceeded from Track No. 200.

The cut of New Haven units stood on Track No. 200 with the brake-valve handle in lap position for a period of about 8 hours before the engineer boarded the cut about 3:36 p. m. It is apparent that brake-pipe and brake-cylinder leakage resulted in the depletion of air from the brake-pipe and related reservoirs. It is apparent that there was not sufficient time to charge the brake system properly from the time the engineer placed the brake valve in release position when he boarded the units to the time he applied the brakes pneumatically on Track A, and, as a result, the brakes were ineffective. Apparently either the reverser handle or the control switch, or both, were not positioned properly to energize the controller when the engineer attempted to stop the movement by applying power.



Timetable special instructions of the carrier require that before switching movements are made in the terminal the brake system of the units involved must be fully charged, a 15-pound brake-pipe reduction must be made, and power then applied to the units to determine that the brakes are applied and that the cars do not move. In the instant case, the engineer did not perform the required tests.

#### **Cause**

This accident was caused by a cut of electrically propelled passenger units moving out of control on a descending grade as a result of failure properly to charge the air-brake system.

Dated at Washington, D C , this thirteenth  
day of December, 1957

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**