

INTERSTATE COMMERCE COMMISSION

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FORTY-SEVENTH ANNUAL REPORT  
OF THE  
DIRECTOR OF LOCOMOTIVE INSPECTION  
TO THE  
INTERSTATE COMMERCE COMMISSION

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FISCAL YEAR ENDED  
JUNE 30, 1958



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**ANNUAL REPORT OF THE  
DIRECTOR OF LOCOMOTIVE INSPECTION**

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OCTOBER 1, 1958.

*To the Interstate Commerce Commission:*

In compliance with section 7 of the act of February 17, 1911, as amended, the Forty-Seventh Annual Report of the Director of Locomotive Inspection, covering the work of the fiscal year ended June 30, 1958, is respectfully submitted.

Summaries are given, by railroads, of all accidents which resulted in serious injury or death to one or more persons, due to the failure of parts and appurtenances of locomotives, as reported and investigated under section 8 of the Locomotive Inspection Act. Accidents which occurred as a result of failure of parts and appurtenances of locomotives, which resulted in damage to property or equipment but not serious injury or death, are not included in this report. For additional information concerning railroad accidents, see Accident Bulletin, prepared by the Bureau of Transport Economics and Statistics.

Tables contained in the report show the results of inspection of locomotives, the number of accidents and resultant casualties caused by failure of some part or appurtenance of individual locomotives, and the parts and appurtenances which caused accidents and casualties. The tabulated inspection data cover the number of locomotives for which reports were filed, the number inspected, the number and percentage found defective, the number for which written notices for repairs were issued in accordance with section 6 of the act, and the total number of defects found and reported. Tables are included to show, by railroads, all locomotive defects found by district inspectors. Data for preceding years are given where possible for comparative purposes.

**GENERAL CONDITION OF LOCOMOTIVES**

There was a decrease in the number of locomotives found defective during the fiscal year as compared to the previous year which reflects the thorough supervision of and policing by our field personnel made possible by the allotment of sufficient travel funds to provide continued general coverage of all inspection points.

Results of locomotive inspections made by district inspectors in performance of duties prescribed under section 6 of the act are shown in the following table:

*Reports and inspections—steam locomotives, locomotive units other than steam, and multiple operated electric locomotive units*

	Year ended June 30—					
	1953	1954	1955	1956	1957	1958
Number of locomotives for which reports were filed.....	41, 172	39, 270	36, 992	38, 062	37, 353	36, 905
Number inspected.....	104, 069	103, 337	98, 025	97, 348	100, 667	95, 593
Number found defective.....	10, 154	9, 994	9, 913	11, 107	9, 887	8, 394
Percentage of inspected found defective.....	9.8	9.7	10.1	11.4	9.8	8.8
Number ordered out of service.....	281	257	223	644	518	395
Number of defects found.....	30, 143	29, 403	29, 968	35, 560	26, 385	21, 582

As in the preceding year the decrease in the number of locomotives for which reports were filed resulted from replacement of steam locomotives by locomotives other than steam. On June 30, 1958, there were 1,446 fewer steam locomotives for which carriers filed reports than there were on June 30, 1957, while the number of locomotive units other than steam, and multiple operated electric locomotive units for which reports were filed during the same period increased by 998.

The decrease in the number of locomotives inspected during the year reflects in part vacancies in the staff of locomotive inspectors throughout the year, which was on an average 3.45 percent inspector-years below the authorized complement of 58 inspectors.

Tables I, II, and III in the appendix show details of defective parts and appurtenances of steam locomotives, locomotive units other than steam, and multiple operated electric locomotive units reported, inspected, found defective, and ordered out of service. If the reported defective parts shown by the tables are considered, those parts which may be expected to require most maintenance will be indicated and inspection and repair programs may be set up accordingly.

Detailed results of inspections of steam locomotives, locomotive units other than steam, and multiple operated electric locomotive units are shown, by carriers, in tables IV, V, and VI in the appendix.

## INVESTIGATION OF ACCIDENTS

All accidents reported under requirements of the law and rules were carefully investigated and appropriate action taken to prevent recurrence so far as possible. Copies of published reports of accident investigations were made available to the general public and distributed to other interested parties, and all district inspectors were advised of details and causes of unusual accidents to better assist them in their safety promotional contacts. The dissemination of pertinent information concerning fundamental causes of locomotive accidents and resultant casualties has been an important adjunct to basic enforcement activities. Such public information combined with the active enforcement of the requirements has been effective in promotion of locomotive safety and has resulted in a decreasing accident trend.

Seventy-two accidents occurred in connection with all types of locomotives in which 86 persons were injured. Compared with the preceding year there was a decrease of 3 accidents and 4 injuries.

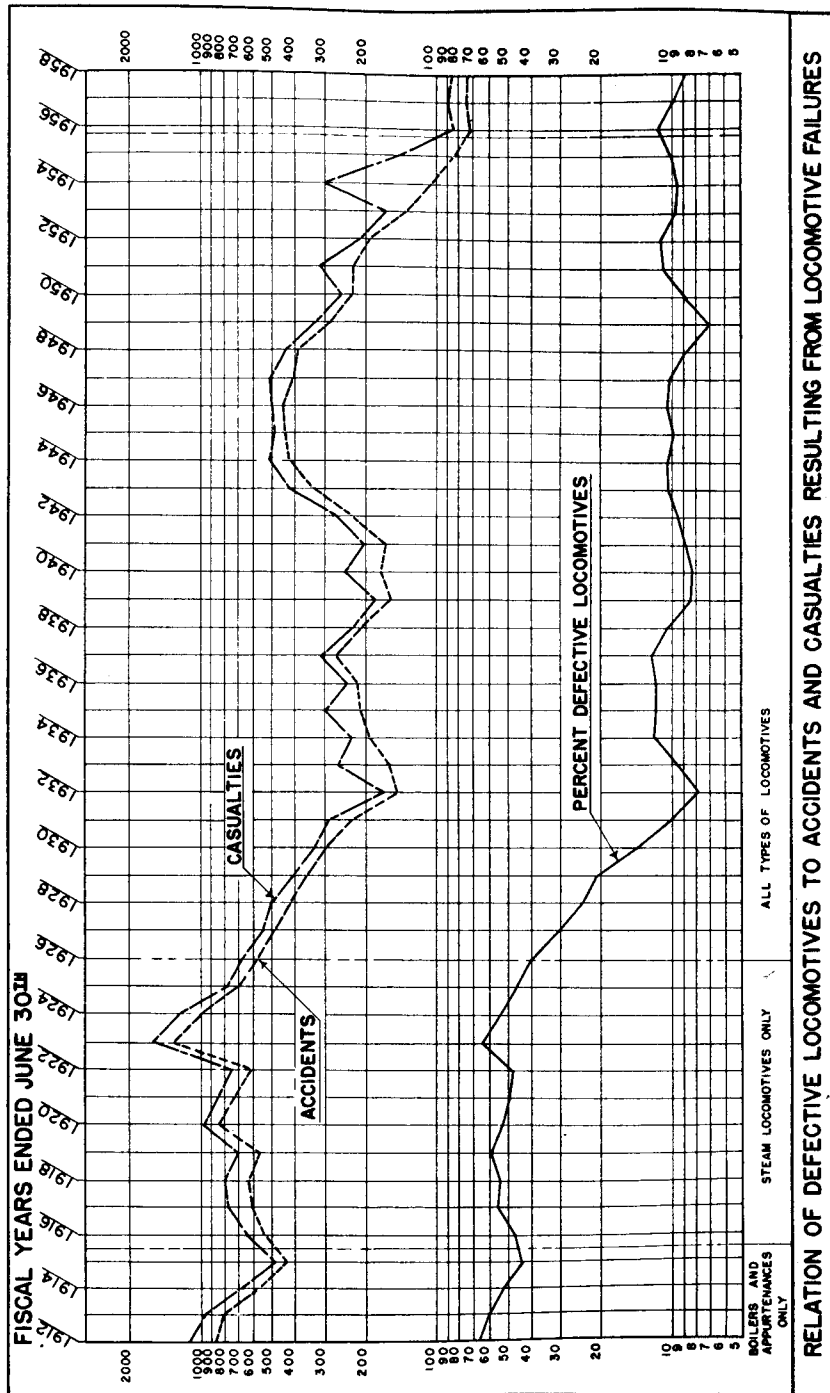
The following table provides details of accidents and casualties during the past 6 years caused by failure of some part or appurtenance of locomotives, and indicates increases or decreases in accidents and casualties.

*Accidents and casualties caused by failure of some part or appurtenance of steam locomotives, locomotive units other than steam, and multiple operated electric locomotive units*

	Year ended June 30—					
	1953	1954	1955	1956	1957	1958
Number of accidents.....	134	105	83	73	75	72
Percent increase or decrease from previous year.....	31.6	21.6	21.0	12.0	12.7	4.0
Number of persons killed.....	12	3	3	4	0	0
Percent increase or decrease from previous year.....	1200.0	75.0	0	133.3	100	0
Number of persons injured.....	150	302	142	79	90	86
Percent increase or decrease from previous year.....	26.1	101.3	53.0	44.4	13.9	4.4

<sup>1</sup> Increase.

The chart on page 4 shows the relation between the percentage of defective locomotives and the number of accidents and casualties which have resulted from defective parts and appurtenances and illustrates the effect of operating locomotives in defective condition.



RELATION OF DEFECTIVE LOCOMOTIVES TO ACCIDENTS AND CASUALTIES RESULTING FROM LOCOMOTIVE FAILURES

Data is given for the past 5 years on the distribution of casualties among railroad personnel by occupations and nonemployees in the following table:

Number of casualties classified according to occupation—steam locomotives, locomotive units other than steam, and multiple operated electric locomotive units

	Year ended June 30—									
	1954		1955		1956		1957		1958	
	Killed	Injured	Killed	Injured	Killed	Injured	Killed	Injured	Killed	Injured
Members of train crews:										
Engineers.....	1	37	1	26	1	19		17		21
Firemen.....		39	1	34	2	38		34		36
Brakemen.....		11		10	1	10		17		11
Conductors.....		4		4		8		7		5
Switchmen.....		3		4				1		
Maintenance employees.....	2	12	1	4		2				
Other employees.....		2		18		2		2		1
Nonemployees.....		194		42				12		12
<b>Total.....</b>	<b>3</b>	<b>302</b>	<b>3</b>	<b>142</b>	<b>4</b>	<b>79</b>	<b>0</b>	<b>90</b>	<b>0</b>	<b>86</b>

The following table illustrates the parts or appurtenances of locomotives that caused the accidents which occurred during the past fiscal year:

Accidents and casualties resulting from failure of steam locomotives, tenders, locomotives other than steam, multiple operated electric locomotive units and their appurtenances

Part or appurtenance which caused accident	Year ended June 30, 1958		
	Accidents	Killed	Injured
Air compressors.....	1		1
Axles, axle journals, and journal boxes.....	1		12
Boiler:			
Blow-off cocks.....	1		1
Flues and tubes including superheater, arch, and water.....	1		1
Steam valves, piping, and blowers.....	1		1
Brakes and brake rigging.....	1		1
Cab:			
Doors or windows.....	2		2
Seats.....	8		8
Control equipment—mechanical, electrical, pneumatic, or electro-pneumatic.....	3		3
Electrical equipment:			
Insulation, short circuits or electrical flashes.....	7		9
Fires due to liquid fuel or debris.....	4		4
Floors, steps, and passageways.....	21		21
Footboards.....	1		1
Internal-combustion engines and turbines:			
Crankcase or air-box explosions.....	8		8
Exhaust and cooling systems.....	3		3
Fuel injectors and connections.....	1		1
Sanders.....	2		2
Miscellaneous.....	6		7
<b>Total.....</b>	<b>72</b>		<b>86</b>

## LOCOMOTIVE ACCIDENTS

Of the 72 accidents which occurred during the year, 21 were caused by the defective condition of floors, steps, and passageways of diesel-electric locomotives. All of the 21 accidents, except 3, resulted from the accumulation of oil on walking surfaces of diesel-electric locomotives. In 15 of these accidents oil accumulations were reported from 1 to 58 times during the month preceding the accidents. The number of accidents caused by the accumulation of oil on walking surfaces during the year ended June 30, 1958, increased 20 percent from the preceding year.

Eight accidents were caused by defective condition of cab seats.

Eight accidents were caused by explosions in the crankcases of diesel engines, injuring eight persons. Six of the explosions resulted from overheating of bearings, one from a defective piston, and one from a crack in a cylinder liner.

Two accidents occurred on steam locomotives, resulting in injury to two persons. In one of these accidents a person was injured when a superheater flue failed at the back flue sheet.

## SPECIFICATIONS AND ALTERATION REPORTS

In compliance with rule 54 of the Rules and Instructions for Inspection and Testing of Steam Locomotives, 13 specification cards and 309 alteration reports were submitted by carriers. Under rules 328 and 329 of the Rules and Instructions for Inspection and Testing of Locomotives Other Than Steam, 1,454 specifications and 4,818 alteration reports for locomotive units, and 134 specifications and 478 alteration reports for heating boilers mounted in locomotive units were submitted by carriers. As required by rule 449 for Multiple Operated Electric Locomotive Units Designed to Carry Freight and/or Passenger Traffic, seven alteration reports were submitted by carriers. The information contained in these specifications and reports was analyzed and corrective measures were taken when improper design or other discrepancies were found.

## INSPECTION AND REPAIR REPORTS

Inspection and repair reports filed with district locomotive inspectors during the year totaled: 41,304 under rules 51 and 53 of the Rules for Inspection and Testing of Steam Locomotives; 377,063 under rule 331 of the Rules and Instructions for Inspection and Testing of Locomotives Other Than Steam; 32,872 under rule 451, for Multiple

Operated Electric Locomotive Units Designed to Carry Freight and/or Passenger Traffic.

## EXTENSION OF TIME FOR REMOVAL OF FLUES

Under the provisions of rule 10 of the Rules and Instructions for Inspection and Testing of Steam Locomotives, 134 applications for the extension of time for the removal of flues were submitted. After investigation, extensions were granted for the full period requested in 110 applications, although in 9 of these, only after defects disclosed by the investigations were repaired. Extensions requested in 9 applications were denied and shorter extensions than requested were granted for 2 locomotives because of conditions disclosed by the investigations. Ten applications were canceled for various reasons and three others are pending.

## SUITS FOR PENALTIES

During the year, 2 cases involving 4 counts for alleged violations of the Locomotive Inspection Act and rules prescribed thereunder were transmitted to United States attorneys for prosecution under section 9 of the act. Judgment was confessed in both of these cases on all counts, and a total penalty of \$400 was assessed.

The 11 cases containing 220 counts against 4 railroads for failure to file required inspection reports on locomotives, which were pending on July 1, 1957, in the district courts, have not been determined as yet.

## APPEALS

No formal appeal by any carrier was taken from the decisions of any inspector during the year.

## BETTERMENT OF SERVICE

In furtherance of the program for maintaining uniformity in methods of procedure and inspection practices and to insure uniform understanding of policies, conferences with Zone Supervisors were held at various times throughout the year. Meetings also were held during the year with groups of district inspectors to discuss the application of new and revised inspection rules which, unless otherwise ordered by the Commission, will become effective January 1, 1959.

JOHN A. HALL,  
*Director of Locomotive Inspection.*

**ACCIDENTS AND CASUALTIES RESULTING FROM THE FAILURE OF STEAM LOCOMOTIVES, TENDERS, LOCOMOTIVES OTHER THAN STEAM, MULTIPLE OPERATED ELECTRIC LOCOMOTIVE UNITS AND THEIR APPURTENANCES DURING THE FISCAL YEAR ENDED JUNE 30, 1958, BY ROADS**

[A double star (\*\*) indicates accidents not properly reported, as required by rules 55, 162, 335, and 454. Complete investigations therefore, could not be made, inasmuch as the Bureau was not apprised of the accidents in sufficient time after they occurred to permit them to be properly investigated.]

**ATCHISON, TOPEKA AND SANTA FE RAILWAY:**

May 20, 1958, unit 46-C, Barstow, Calif. Valve bonnet blew out of end valve in steam line; threaded portion of bonnet was worn and too small for proper fit in valve body; one injured.

\*\*June 27, 1958, unit 2349, Barstow, Calif. Employee stepped on a fuse lying on cab floor and fell against cab window; one injured.

Two accidents; two injured.

**CENTRAL RAILROAD OF NEW JERSEY:**

\*\*January 11, 1958, unit 51, Phillipsburg, N. J. Cab door would not remain closed; several tap screws securing door latch and door handle were loose; defects having a bearing on accident were reported 13 times prior to accident, and 10 times after accident; one injured.

One accident; one injured.

**CHESAPEAKE AND OHIO RAILWAY:**

July 3, 1957, unit 6150, Cane Forks, W. Va. Broken string band on the armature of auxiliary generator resulted in ringing of alarm bell and light signal indicating alternator failure. Employee attempting to locate cause for alarm removed a fuse for testing and inadvertently made contact between circuits in control cabinet with knife end of fuse, resulting in electrical flash; one injured.

One accident; one injured.

**CHICAGO, MILWAUKEE, ST. PAUL & PACIFIC RAILROAD:**

January 8, 1958, unit 17-B, Portage, Wis. Broken driving axle, and resultant derailed passenger equipment colliding with freight train standing on adjacent main track; twelve injured.

One accident; twelve injured.

**CHICAGO, ROCK ISLAND & PACIFIC RAILWAY:**

July 30, 1957, unit 707, Chicago, Ill. Unit would not make automatic transition, and an electrical flash occurred in high voltage cabinet when employee accidentally contacted magnet valve button on reverser switch while attempting to make transition manually; "Unit will not transfer" was reported July 26, and "Engine will not transfer automatically" was reported July 29; one injured.

One accident; one injured.

**ERIE RAILROAD:**

May 11, 1958, unit 732-D, Hornell, N. Y. Employee stumbled and fell over an electric light glass guard lying on floor in engineroom; one injured.

One accident; one injured.

**FLORIDA EAST COAST RAILWAY:**

August 31, 1957, unit 669, Fort Lauderdale, Fla. Insecure attachment to hold cab door in open position permitted door to close on employee's hand; one injured.

One accident; one injured.

**LEHIGH VALLEY RAILROAD:**

October 21, 1957, unit 580, near Lockwood, N. Y. Crankcase explosion resulted from an overheated piston caused by defective piston ring lands and stuck piston oil rings; one injured.

One accident; one injured.

**LOUISVILLE & NASHVILLE RAILROAD:**

August 31, 1957, unit (N. C. & St. L.) 904, Burns, Tenn. Crankcase explosion caused by overheated main bearings; one injured.

One accident; one injured.

**MISSOURI-KANSAS-TEXAS RAILROAD:**

December 27, 1957, unit (KCS) 73-C, Olathe, Kans. Crankcase explosion caused by overheated crankshaft main bearings; defects having a bearing on accident were reported 8 times since December 1; one injured.

March 1, 1958, unit 2110, Smith, Okla. Cab seat fell from pedestal when shaft pulled from sleeve of seat assembly due to defective and insufficient welded contact surfaces of shaft and sleeve; one injured.

June 28, 1958, unit 1519, Woodward, Okla. Crankcase explosion caused by overheated crankshaft main bearings; one injured.

Three accidents; three injured.

**MISSOURI PACIFIC RAILROAD:**

April 24, 1958, unit 7004-B, Overton, Tex. Oil on engineroom floor; defects having a bearing on accident were reported 24 times prior to accident; one injured.

One accident; one injured.

**NEW YORK CENTRAL RAILROAD:**

September 1, 1957, unit 8527, East Syracuse, N. Y. Fuel injection tube which was cracked approximately 40 percent through cross sectional area permitted fuel oil to be sprayed on exhaust manifold, resulting in fumes entering cab; one injured.

September 6, 1957, unit 5014, west of Galion, Ohio. Employee slipped on oil and water on engineroom floor; leak at flexible connection in engine cooling water line; floor not properly roughened to provide secure footing; defects relative to accident were reported 4 times prior to accident, and 1 time after accident; one injured.

October 23, 1957, unit 9106, Cleveland, Ohio. Right front sander inoperative due to hose connection to sand pipe being disconnected; hose was too short to provide sufficient slack for movement of the truck on sharp curves; defects relative to accident were reported October 6, 13, 19, 21, 22, 23, and 24 (after accident); one injured.

December 3, 1957, unit 5779, Rochester, N. Y. Undesired application of brakes caused by bursting of air brake hose at rear end of unit; hose was worn where it had been rubbing against car heater steam pipe; one injured.

December 12, 1957, unit 8348, Medina, N. Y. Employee attempting to remove cooling water tank filler pipe cap, to replenish water supply, when cap blew off; cooling water heater radiator hose leaked badly; threads on filler pipe and cap were deteriorated. Filler cap was not standard design and was not provided with a vent to relieve pressure in the event of overheating; one injured.

December 21, 1957, unit 1102, Kirksville, N. Y. Undesired train control brake application, resulting from defective primary coil in train control receiver; defects that may have had a bearing on accident were reported 2 times on December 20; one injured.

December 29, 1957, unit 9118, Buffalo, N. Y. Drain pipe from radiator compartment floor drain was too short, permitting oil to accumulate on bottom step tread; "Wash down engine room and fan compartment, very dirty." was reported December 5; one injured.

January 15, 1958, unit 8219, Rochester, N. Y. Smoke and fumes entered cab due to burning insulation on traction motor cables resulting from a fire in the high voltage cabinet; two injured.

January 24, 1958, unit (P&E) 5614, Veedersburg, Ind. Oil on running board and handholds due to a broken hose in lubricating oil line between engine lubricating system and oil pressure gage; one injured.

\*\*April 3, 1958, unit 1773, Syracuse, N. Y. Cab seat back rest supporting frame broke through old fracture allowing back rest to fall; one injured.

June 21, 1958, unit 1634, Kingston, N. Y. Tubular frame of cab seat back rest broke through defective welding at old fracture; "Engineer's seat broken" was reported June 15, 16, and 17; one injured.

Eleven accidents; twelve injured.

**NEW YORK, NEW HAVEN & HARTFORD RAILROAD:**

September 6, 1957, unit 796, New London, Conn. Guard rail gave way when employee slipped on steps, which were oily, while descending steps to engineroom; defects having a bearing on accident (clean floors, clean up oil in engineroom) were reported 34 times prior to accident, and 2 times after accident; one injured.

November 17, 1957, unit 0421, Berlin, Conn. Oil on engineroom floor due to a number of leaks in piping and component parts of engine lubricating system; defects relative to accident were reported 58 times since October 16; one injured.

December 2, 1957, unit 374, Woodlawn, N. Y. Smoke inhalation from electrical equipment fire in electrical equipment compartment and under walkway; three injured.

\*\*January 18, 1958, unit 0508, Braintree, Mass. Employee, to determine the cause of low fuel oil pressure, disconnected fuel oil supply pipe to learn if it was stopped up when oil gushed out on running board; suction line between fuel tank and emergency cut-off valve was obstructed with foreign matter; defects having a bearing on accident were reported January 4, 18 (day of accident), 20, and 21 (after accident); one injured.

February 7, 1958, unit 0417, Norwich, Conn. Oil on engineroom floor due to leaks in piping to engine external oil system components; defects having a bearing on accident were reported 29 times since January 8; one injured.

June 25, 1958, unit 0410, Barton, Mass. Oil on engineroom floor due to rocker box cover gaskets leaking on both sides of engine; defects having a bearing on accident were reported 24 times prior to accident, and 6 times after accident; one injured.

Six accidents; eight injured.

#### NORFOLK AND WESTERN RAILWAY:

January 27, 1958, locomotive 217, Kenova, W. Va. Employee's foot was crushed under driver wheel when he slipped while attempting to align sander pipe with rail; "Right back sanders not working" was reported January 24, and "Right rear sand not hitting rail due to brake hanger shoving pipe out of line making it difficult to stop without sliding drivers" was reported January 25; one injured.

One accident; one injured.

#### NORFOLK SOUTHERN RAILWAY:

June 19, 1958, unit 1509, Varina, N. C. Gas explosion in battery compartments; one injured.

One accident; one injured.

#### NORTHERN PACIFIC RAILWAY:

July 5, 1957, unit 6012-B, Glyndon, Minn. Flash occurred in high voltage cabinet when dynamic brake contactors closed while employee was attempting to learn the cause of failure of unit to load properly; defects relative to accident were reported 20 times since June 6 (before accident), and 11 times (after accident); one injured.

\*\*November 6, 1957, unit 419, Auburn, Wash. Employee was exposed to chemical solution while a fire was being extinguished in engineroom; the fire was caused by products of incomplete combustion from No. 3 exhaust stack draining upon the outside surface of the manifold and becoming ignited; "Wipe engine and clean engine room" was reported October 21, and "Clean oil from windows and off running board" was reported November 5; one injured.

Two accidents; two injured.

#### PACIFIC ELECTRIC RAILWAY:

August 31, 1957, unit (S. P.) 1005, San Pedro, Calif. Employee fell or slipped from footboard; footboard was not required width for full length of board; one injured.

One accident; one injured.

#### PENNSYLVANIA RAILROAD:

July 23, 1957, locomotive 4272, East Altoona, Pa. A superheater flue failure at back flue sheet permitted steam to enter cab; one injured.

July 29, 1957, unit 9574-A, Wooster, Ohio. Loss of cooling water resulted in diesel engine overheating and fumes to escape and enter cab; loss of water was due to a crack 30 inches in circumference in the No. 4 cylinder liner which extended into water chamber, and leak at connection between No. 1 water jumper and water outlet manifold; one injured.

\*\*August 6, 1957, unit 9478-A, Aynes, Ind. Oil on engineroom floor; oil pressure pipe leaking at engine governor; one injured.

August 17, 1957, unit 9476-A, near Coshocton, Ohio. Crankcase explosion caused by lack of lubrication in No. 8 cylinder due to a crack in cylinder liner which permitted water to enter between piston wall and liner wall; one injured.

August 24, 1957, unit 9781-A, Arcola, Ind. Crankcase explosion caused by overheated crankshaft main bearings; defects having a bearing on accident were reported August 4 (two times), 14, and 23; one injured.

September 12, 1957, unit 4838, Edgemoor, Del. Undesired application of brakes when the cab signal acknowledging switch failed to operate properly; return spring in switch was weak and operating shaft and bushings were dirty; one injured.

October 15, 1957, unit 4915, New York, N. Y. Electrical flash and explosion in transformer tap contactors due to short circuit in control wires; one injured.

October 19, 1957, unit 9800-A, Tyrone, Pa. Fire extinguisher cable disconnected from cable clamp when employee was preparing to extinguish a fire in engineroom; cable was not securely fastened in clamp; one injured.

October 21, 1957, unit 2001-A, between Altoona and Gallitzin, Pa. Exhaust fumes entered cab because of a missing pipe test plug hole in an exhaust pipe, and an improperly asbestos tape wrapped exhaust expansion slip joint; defects relative to accident were reported 9 times since September 22; one injured.

January 2, 1958, unit 9477-A, Delaware, Ohio. Slack run-in following penalty train brake application at low speed while attempting to start engine with low battery voltage; wire in voltage regulator circuit switch defective. Improper operation of overspeed relays was reported December 27; one injured.

January 17, 1958, unit 9093, New Albany, Ind. Cab seat back support broke, resulting in employee falling to floor; one injured.

February 15, 1958, unit 5776-A, Bay Head Junction, N. J. Oil on engineroom floor; defects relative to accident were reported 48 times since January 15; one injured.

\*\*February 22, 1958, unit 5854-A, Crestline, Ohio. Employee burned by hot water and steam escaping from vicinity of boiler separator blowdown valve; defects relative to accident were reported February 18 and 21 (three times); one injured.

March 12, 1958, unit 2005-A, near Bloomville, Ohio. Employee was exposed to gas and smoke while extinguishing fire due to oil in turbocharger drip pan igniting; oil had accumulated due to drip pan drain being clogged; "Clean turbocharger drip pan and pipe" was reported March 8; one injured.

March 16, 1958, unit 5674, Chicago, Ill. Employee slipped and fell due to oil on steps of unit; oil leaks and oil on running boards and engineroom floor were reported 11 times prior to accident, and 3 times after accident; one injured.

March 17, 1958, unit 5776-B, Oceanport, N. J. Employee was exposed to smoke and fumes while extinguishing fire, breakdown of insulation on traction motor lead cables caused short circuit, resulting in fire; one injured.

March 22, 1958, multiple operated electric locomotive unit 472, Paoli, Pa. Seat collapsed when supporting bracket came loose; one nut was missing and one nut was loose on bolts securing bracket to seat; one injured.

May 31, 1958, unit 9511-B, Greensburg Junction, Pa. Employee was exposed to smoke and fumes from fire caused by overheated brake shoes and wheels igniting an accumulation of oil; one injured.

June 12, 1958, unit 5862-A, Latrobe, Pa. Oil on engineroom floor; defects having a bearing on accident were reported 19 times since May 24; one injured.

June 13, 1958, unit 9574-A, near Ryde, Pa. Broken piston and cylinder liner resulted in lubricating oil fumes entering cab; one injured.

June 27, 1958, unit 5902-A, Rockville, Pa. Air compressor discharge pipe separated at connection to elbow; one injured.

Twenty-one accidents; twenty-one injured.

#### READING COMPANY:

October 5, 1957, unit 280-A, Buck Mountain, Pa. Oil on engineroom floor; loose bolt due to worn threads and portion of gasket missing allowed oil to leak through joint between crankcase and oil pan; clean oil off engineroom floors and/or oil leaks were reported 22 times since September 5; one injured.

December 7, 1957, unit 712, Philadelphia, Pa. Wood screws which fastened cab seat base to floor were loose, permitting seat base to pull loose from floor; one injured.

Two accidents; two injured.

## SEABOARD AIR LINE RAILROAD:

July 25, 1957, unit 4200, Lake Worth, Fla. Flash fire in engineroom resulted in fire and fumes entering cab through door that could not be fully closed due to improper adjustment. Fire was caused by oil being sprayed on hot metal parts as a result of a burst hose in lubricating oil line; one injured.

One accident; one injured.

## SOUTHERN PACIFIC COMPANY:

July 8, 1957, unit 5716, Alvarado, Calif. Drinking water container fell because stand supporting the container was not properly secured to cab floor; one injured.

July 24, 1957, unit 5252, Creston, Calif. Crankcase explosion caused by overheated crankshaft main bearings; one injured.

\*\*July 24, 1957, unit 8116, Rocklin, Calif. Oil on engineroom floor; defects having a bearing on accident were reported July 13, 22, 24 (two times), and 25 (after accident); one injured.

August 2, 1957, unit 5910, Sacramento, Calif. Oil and water on engineroom floor; water leaking at packing nut on blowdown valve on heating boiler and oil leaks around engine base; floor plate in front of heating boiler worn smooth; defects having a bearing on accident were reported 25 times since July 2; one injured.

August 20, 1957, unit 6039, Ordway, Calif. Cracked nipple in hot lubricating oil supply line to fuel oil preheater cylinder permitted oil to leak on engineroom floor; "Clean oil off floors" was reported August 13, 17, 20 (before accident), and 20 (after accident); one injured.

October 17, 1957, unit 8248, North Battle Mountain, Nev. Oil on engineroom floor; oil leaking from engine head cover gaskets and air box inspection cover gaskets; one injured.

Six accidents; six injured.

## SOUTHERN RAILWAY:

June 30, 1958, unit 4134, Atlanta, Ga. Steps pulled away from cab frame while employee was entering nose of unit; 2 of 4 bolts securing steps to frame were missing and 1 was loose; one injured.

One accident; one injured.

## TEXAS AND NEW ORLEANS RAILROAD:

May 21, 1958, unit 603, between Chispa and Wendell, Tex. Cab seat broke from seat base due to wood screws pulling out, permitting seat to become detached from turnplate and supporting structure; one injured.

One accident; one injured.

## UNION PACIFIC RAILROAD:

July 21, 1957, unit 600-A, St. Marys, Kans. Crankcase explosion resulted from overheated connecting rod and crankshaft main bearings; defects having a bearing on accident were reported 5 times since June 23; one injured.

June 21, 1958, unit 1416-C, Minthorn, Oreg. Finger clip springs and latch spring securing air filter to housing were defective permitting filter to fall from position over engineroom doorway and strike employee; one injured.

Two accidents; two injured.

## WABASH RAILROAD:

\*\*September 2, 1957, unit 1101-B, Orland Park, Ill. Electrical flash occurred in high voltage cabinet; defects having a bearing on accident were reported 5 times prior to accident and 4 times following the accident; one injured.

\*\*June 29, 1958, unit 1106, Crocker, Ind. Cab seat broke from sleeve assembly at an old fracture due to defective welding of sleeve to stud connection of seat; one injured.

Two accidents; two injured.

TABLE I.—Number of steam locomotives reported, inspected, found defective, and ordered out of service

Parts defective, inoperative or missing, or in violation of the rules	Year ended June 30—					
	1953	1954	1955	1956	1957	1958
1 Air compressors.....	351	304	229	239	83	13
2 Arch tubes.....	5	4	5	1	1	1
3 Ashpans and mechanism.....	36	24	17	13	4	-----
4 Axles.....	1	3	3	2	-----	-----
5 Blow-off cocks.....	185	121	105	91	30	2
6 Boiler checks.....	182	158	84	70	26	9
7 Boiler shell.....	94	79	43	31	20	3
8 Brake equipment.....	1,038	836	636	565	256	85
9 Cabs, cab windows, and curtains.....	354	298	241	187	101	21
10 Cab aprons and decks.....	179	133	100	113	22	7
11 Cab cards.....	40	27	19	23	18	6
12 Coupling and uncoupling devices.....	30	22	11	17	8	3
13 Crossheads, guides, pistons, and piston rods.....	478	398	256	223	107	22
14 Crown bolts.....	27	20	7	10	2	-----
15 Cylinders, saddles, and steam chests.....	455	364	387	251	157	17
16 Cylinder cocks and rigging.....	136	132	130	116	54	11
17 Domes and dome caps.....	45	20	20	23	13	1
18 Draft gear.....	108	150	133	107	45	17
19 Draw gear.....	108	79	69	57	23	6
20 Driving boxes, shoes, wedges, pedestals, and braces.....	345	258	226	250	72	21
21 Firebox sheets.....	55	37	20	25	23	-----
22 Flues.....	49	32	27	19	12	-----
23 Frames, tail pieces, and braces, locomotive.....	225	151	100	78	22	5
24 Frames, tender.....	10	14	11	10	4	-----
25 Gages and gage fittings, air.....	61	47	42	40	25	8
26 Gages and gage fittings, steam.....	112	89	61	68	28	4
27 Gage cocks.....	211	120	116	113	43	15
28 Grate shakers and fire doors.....	121	90	107	64	34	6
29 Handholds.....	196	146	110	112	33	8
30 Injectors, inoperative.....	18	33	35	3	4	1
31 Injectors and connections.....	843	674	406	379	198	37
32 Inspections and tests not made as required.....	53	24	26	37	24	12
33 Lateral motion.....	137	98	65	48	24	10
34 Lights, cab and classification.....	26	39	35	18	7	4
35 Lights, headlight.....	42	56	34	32	18	5
36 Lubricators and shields.....	81	63	47	38	16	3
37 Mud rings.....	78	65	33	36	6	3
38 Packing nuts.....	294	240	233	253	62	14
39 Packing, piston rod and valve stem.....	220	154	122	106	74	5
40 Pilots and pilot beams.....	48	52	39	34	8	2
41 Plugs and studs.....	50	22	16	15	16	-----
42 Reversing gear.....	216	170	151	108	39	11
43 Rods, main and side, crankpins, and collars.....	459	315	221	214	108	22
44 Safety valves.....	19	15	22	17	9	1
45 Sanders.....	324	277	155	123	72	9
46 Springs and spring rigging.....	1,322	834	551	505	212	32
47 Squirt hose.....	41	39	27	26	14	-----
48 Staybolts.....	144	108	55	69	20	6
49 Staybolts, broken.....	125	55	27	30	12	9
50 Steam pipes.....	161	87	58	57	27	5
51 Steam valves.....	68	69	33	21	7	2
52 Steps.....	321	255	157	147	42	20
53 Tanks and tank valves.....	466	340	269	217	99	16
54 Telltale holes.....	6	13	6	9	6	1
55 Throttle and throttle rigging.....	327	228	179	133	48	9
56 Trucks, engine and tralling.....	263	171	153	96	42	5
57 Trucks, tender.....	219	152	129	123	51	10
58 Valve motion.....	195	174	114	105	55	7
59 Washout plugs.....	138	79	73	83	39	1
60 Stokers.....	133	55	58	68	33	3
61 Water glasses, fittings, and shields.....	357	282	218	193	75	20
62 Wheels.....	151	107	94	70	39	7
63 Miscellaneous—Signal appliances, badge plates, brakes (hand).....	339	263	194	166	68	9
Number of defects.....	12,980	9,763	7,350	6,487	2,840	592
Locomotives reported.....	15,798	12,135	8,892	5,875	3,868	2,422
Locomotives inspected.....	28,899	19,999	12,128	8,794	5,983	2,324
Locomotives defective.....	3,583	2,599	1,784	1,499	737	159
Percentage of inspected found defective.....	12.4	13.0	14.7	17.0	12.3	6.8
Locomotives ordered out of service.....	163	117	96	152	99	22



TABLE II.—Number of locomotive units other than steam reported, inspected, found defective, and ordered out of service

Parts defective, inoperative or missing, or in violation of the rules	Year ended June 30—					
	1953	1954	1955	1956	1957	1958
1 Air compressors.....	210	326	419	443	328	232
2 Axles, truck and driving.....	7	4	7	26	34	59
4 Batteries.....	40	82	83	97	35	15
5 Boilers.....	103	175	203	275	208	172
6 Brake equipment.....	1,698	2,126	2,790	3,259	2,906	2,469
8 Cabs and cab windows.....	679	858	1,073	1,600	1,030	962
9 Cab cards.....	128	135	150	183	187	145
10 Cab floors, aprons, and deck plates.....	1,589	1,703	1,677	1,933	1,940	2,020
11 Clutches.....	9	5	2	4	-----	2
12 Controllers, relays, circuit breakers, magnet valves and switch groups.....	424	454	802	775	360	348
13 Coupling and uncoupling devices.....	95	139	204	166	116	132
14 Current collecting apparatus.....	6	12	15	17	6	3
16 Draft gear.....	218	291	336	360	253	357
17 Draw gear.....	42	55	140	146	121	128
18 Driving boxes, shoes, and wedges.....	128	154	249	291	154	135
20 Frames or frame braces.....	22	32	14	30	30	17
22 Fuel system.....	1,853	1,951	1,833	2,555	2,431	2,307
23 Gages or fittings, air.....	138	136	226	278	269	166
24 Gages or fittings, steam.....	44	56	48	60	36	58
25 Gears and pinions.....	13	12	27	20	10	19
26 Handholds.....	121	230	219	258	208	217
28 Inspections and tests not made as required.....	175	185	183	748	703	623
29 Insulation and safety devices.....	77	105	188	282	133	228
30 Internal-combustion engine defects, parts and appurtenances.....	4,564	4,848	5,035	6,356	5,174	3,817
32 Jack shafts.....	1	-----	2	-----	-----	1
33 Jumpers and cable connectors.....	156	178	214	553	442	306
35 Lateral motion, wheels.....	7	5	39	14	35	46
36 Lights, cab and classification.....	109	232	198	352	260	321
37 Lights, headlight.....	42	28	33	38	35	32
39 Meters, volt and ampere.....	27	40	43	58	34	24
40 Motors and generators.....	655	813	880	1,122	671	472
42 Pilots and pilot beams.....	46	71	71	78	61	41
43 Plugs and studs.....	3	-----	-----	1	-----	-----
44 Quills.....	6	11	22	26	6	32
46 Rods, main, side, and drive shafts.....	-----	-----	7	4	5	1
48 Sanders.....	1,224	1,200	1,492	2,307	2,023	2,310
49 Springs and spring rigging, driving and truck.....	178	241	306	363	370	380
51 Staybolts, broken or defective.....	-----	-----	-----	-----	-----	-----
53 Steam pipes.....	119	154	177	190	164	141
54 Steps, footboards, et cetera.....	505	622	737	1,005	827	292
55 Switches, hand-operated, and fuses.....	17	34	38	48	16	16
56 Transformers, resistors, and rheostats.....	3	6	3	9	10	2
57 Trucks.....	439	503	1,054	1,007	552	510
59 Water tanks.....	31	34	31	49	19	31
60 Water glasses, fittings, and shields.....	14	11	16	14	5	4
61 Warning signal appliances.....	122	121	152	182	154	124
62 Wheels.....	212	257	282	252	256	189
63 Miscellaneous.....	864	1,005	898	1,220	736	762
Number of defects.....	17,163	19,640	22,618	29,054	23,373	20,668
Locomotive units reported.....	25,374	27,135	28,100	29,405	30,740	31,755
Locomotive units inspected.....	75,170	83,338	85,897	88,269	93,187	91,522
Locomotive units defective.....	6,571	7,395	8,129	9,597	9,031	8,067
Percentage of inspected found defective.....	8.7	8.9	9.5	10.9	9.7	8.8
Locomotive units ordered out of service.....	118	140	127	492	417	372

TABLE III.—Number of multiple operated electric locomotive units reported, inspected, found defective, and ordered out of service

Parts defective, inoperative or missing, or in violation of the rules	Year ended June 30—		
	1956	1957	1958
1 Air compressors.....	-----	4	2
2 Axles, truck and driving.....	-----	-----	8
4 Batteries.....	-----	-----	-----
5 Boilers.....	-----	18	23
6 Brake equipment.....	-----	-----	2
8 Cabs and cab windows.....	-----	8	13
9 Cab cards.....	1	-----	-----
10 Cab floors, aprons, and deck plates.....	-----	-----	1
11 Clutches.....	-----	-----	-----
12 Controllers, relays, circuit breakers, magnet valves and switch groups.....	-----	-----	1
13 Coupling and uncoupling devices.....	-----	20	25
14 Current collecting apparatus.....	-----	-----	1
16 Draft gear.....	-----	-----	9
17 Draw gear.....	-----	-----	2
18 Driving boxes, shoes, and wedges.....	-----	-----	-----
20 Frames or frame braces.....	-----	-----	-----
22 Fuel system.....	-----	-----	1
23 Gages or fittings, air.....	-----	-----	-----
24 Gages or fittings, steam.....	-----	-----	-----
25 Gears and pinions.....	-----	7	45
26 Handholds.....	2	46	22
28 Inspections and tests not made as required.....	1	1	-----
29 Insulation and safety devices.....	-----	-----	-----
30 Internal-combustion engine defects, parts and appurtenances.....	-----	-----	-----
32 Jack shafts.....	2	5	3
33 Jumpers and cable connectors.....	-----	-----	-----
35 Lateral motion, wheels.....	-----	1	-----
36 Lights, cab and classification.....	-----	-----	-----
37 Lights, headlight.....	-----	-----	-----
39 Meters, volt and ampere.....	-----	3	-----
40 Motors and generators.....	-----	-----	-----
42 Pilots and pilot beams.....	-----	-----	-----
43 Plugs and studs.....	-----	-----	-----
44 Quills.....	-----	-----	-----
46 Rods, main, side, and drive shafts.....	-----	-----	-----
48 Sanders.....	-----	25	10
49 Springs and spring rigging, driving and truck.....	-----	-----	-----
51 Staybolts, broken or defective.....	-----	-----	-----
53 Steam pipes.....	-----	-----	-----
54 Steps, footboards, et cetera.....	-----	1	-----
55 Switches, hand-operated, and fuses.....	1	-----	-----
56 Transformers, resistors, and rheostats.....	12	23	98
57 Trucks.....	-----	-----	-----
59 Water tanks.....	-----	-----	-----
60 Water glasses, fittings, and shields.....	-----	-----	-----
61 Warning signal appliances.....	-----	1	-----
62 Wheels.....	-----	2	-----
63 Miscellaneous.....	-----	7	6
Number of defects.....	19	172	272
Locomotive units reported.....	2,782	2,745	2,728
Locomotive units inspected.....	285	1,437	1,747
Locomotive units defective.....	11	119	168
Percentage of inspected found defective.....	3.9	8.3	9.6
Locomotive units ordered out of service.....	-----	2	1

<sup>1</sup> The Rules and Instructions for Inspection and Testing of Multiple Operated Electric Locomotive Units Designed to Carry Freight and/or Passenger Traffic became effective Apr. 1, 1956.



TABLE V.—Number of locomotive units other than steam reported, inspected,

	Akron, Canton & Youngstown	Alliquippa & Southern	Alton & Southern	Ann Arbor	Apalachicola Northern	Atchison, Topeka & Santa Fe	Atlanta & St. Andrews Bay	Atlanta & West Point	Atlantic Coast Line	Baltimore & Ohio	Bangor & Aroostook	Belt Railway of Chicago	Bessemer & Lake Erie
1						8		1	10	3	1		
2										3			
3						1			1				
4						9			13	2			
5						57			53	3			
6		2		1		23			8	14			
7						3			2	6			
8						61			43	57			
9											1		
10											1		
11						15			7		1		
12													1
13						5			5				
14													
15						4			1	5			
16				2									
17													
18													
19													
20													
21						51	1	5	35	40	2	1	
22						5			4	1			
23						2			1	2			
24													
25						2			6				
26													
27						2			6				
28					1	15			10		1		
29						7			2	8	1		
30				5		81			57	112	2		
31													
32													
33						8			3	5			1
34													
35													
36						8			14	9			
37													
38													
39													
40						16			2	5	20		
41													
42						1			1		1		
43													
44													
45													
46						53	3		33	21			2
47													
48						2			16	15			
49													
50													
51													
52						6			2	4			
53						7			2	10			
54													
55													
56													
57						7				16			
58													
59													
60													
61						6			3	1	4		
62						3			1				
63						17		1	17	35			
Number of defects.....													
Locomotive units reported.....													
Locomotive units inspected.....													
Locomotive units defective.....													
Percentage of inspected found defective.....													
Locomotive units ordered out of service.....													

found defective, and ordered out of service, et cetera—by carriers

Birmingham Southern	Boston & Maine	Butte, Anaconda & Pacific	Camas Prairie	Canadian National	Canadian Pacific	Canton	Caroline & North-western	Central of Georgia	Central Railroad of New Jersey	Central Vermont	Charleston & Western Carolina	Chesapeake & Ohio	Chicago & Eastern Illinois	Chicago & Illinois Midland	Chicago & North Western	Chicago & Western Indiana	Chicago, Burlington & Quincy	Chicago Great Western	Chicago, Milwaukee, St. Paul & Pacific	Chicago River & Indiana	
1	2			2					9			3			8		1	1	8	1	
2	1																			2	
3	1																			4	
4	29																			5	
5	4	52						2	46	18		3			6		6		1	6	
6	1	20		1	2			3	16	3		1	4		98	1	17	9	115	8	
7	3	6						1	2	2		3	3		4		3		23	6	
8	1	3							2	2		1			4		4		5	8	
9	95		1	2					38	5		3	1		98		9		53	9	
10																				10	
11																				11	
12	2	3							5		1	3			18		1	2	15	12	
13		3								1					5				2	13	
14		2							12	2		3	1		24		1	1	9	14	
15		2							2	4									6	16	
16		2							1	2					20				21	17	
17																			6	18	
18									1	26	13	5	2		158		5	4	58	20	
19	9	61		2	2	11			12	1					3				6	22	
20	1	6							1	1					6				1	23	
21	1	6							1	1					1				6	24	
22															6				1	25	
23	1	2							1	1					13				23	26	
24		37	1		7	6	1	1	16	1					18		3	3	17	27	
25	4	3							14	1					22		2		10	28	
26	2	109		1	7	28		1	115	15			9	5	96		17	5	153	29	
27																					30
28																					
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48																					
49	7	23							1	58	14	1	2		93		11	6	37	48	
50	6								1	10	10	1			17		3	17	23	49	
51																					
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56																					
57																					
58																					
59																					
60																					
61																					
62																					
63																					
Number of defects.....																					
Locomotive units reported.....																					
Locomotive units inspected.....																					
Locomotive units defective.....																					
Percentage of inspected found defective.....																					
Locomotive units ordered out of service.....																					
43	576	3	6	27	104	1	10	441	103	4	6	48	24	1,058	1	105	72	707			
22	392	38	12	459	163	16	11	138	198	25	31	1,077	98	11	706	14	695	133	918	27	
33	918	72	26	143	101	20	24	585	385	109	88	2,009	274	34	2,089	14	2,389	418	2,403	39	
7	209	2	2	13	30	1	4	110	35	2	3	24	16		354	1	76	28	260		
21.2	22.8	2.8	7.7																		



TABLE V.—Number of locomotive units other than steam reported, inspected,

	Kansas City Southern	Kansas City Terminal	Kansas, Oklahoma & Gulf	Kentucky & Indiana Terminal	Lake Superior & Ishpeming	Lake Terminal	Lehigh & Hudson River	Lehigh & New England	Lehigh Valley	Long Island	Louisiana & Arkansas	Louisville & Nashville	Maine Central
1 Air compressors	2									1		13	
2 Axles, truck and driving									2				
4 Batteries													1
5 Boilers	1										2		
6 Brake equipment	27		1			2			18		21	79	14
8 Cabs and cab windows	5								2		1	51	
9 Cab cards										1		1	3
10 Cab floors, aprons and deck plates	12		1				2	2	8		2	35	4
11 Clutches													
12 Controllers, relays, circuit breakers, magnet valves and switch groups	6								2	1		4	
13 Coupling and uncoupling devices	1											6	
14 Current collecting apparatus													
16 Draft gear	2								2			15	
17 Draw gear	1						1					7	
18 Driving boxes, shoes and wedges												3	
20 Frames or frame braces													2
22 Fuel system	10		2				2	4	19	1	1	87	2
23 Gages or fittings, air	3											8	1
24 Gages or fittings, steam											1	2	
25 Gears and pinions													
26 Handholds									3	2		10	
28 Inspections and tests not made as required					1				2			10	3
29 Insulation and safety devices	3											11	1
30 Internal-combustion engine defects, parts and appurtenances	13						7	1	17		8	71	3
32 Jack shafts													
33 Jumpers and cable connectors	4										3	1	
35 Lateral motion, wheels													
36 Lights, cab and classification	1								8			18	1
37 Lights, headlight												1	
39 Meters, volt and ampere			1									1	
40 Motors and generators	1											7	
42 Pilots and pilot beams									2				
43 Plugs and studs													
44 Quills													
46 Rods, main, side, and drive shafts													
48 Sanders	24		3			2	13		22		8	105	2
49 Springs and spring rigging, driving and truck									6	2		12	1
51 Staybolts, broken or defective													
53 Steam pipes	1											1	
54 Steps, footboards, et cetera	3								1	1	4	14	
55 Switches, hand-operated, and fuses													
56 Transformers, resistors and rheostats													
57 Trucks	2								12	1	3	22	3
59 Water tanks												1	
60 Water glasses, fittings and shields													
61 Warning signal appliances	2											6	
62 Wheels	2											11	
63 Miscellaneous	3								10			16	
Number of defects	129	1	7		1	6	25	7	136	10	52	631	39
Locomotive units reported	152	17	15	23	15	22	13	32	225	80	17	732	80
Locomotive units inspected	576	43	53	37	33	31	46	74	1,029	79	168	2,405	153
Locomotive units defective	47	1	3		1	3	5	3	55	3	21	187	16
Percentage of inspected found defective	8.2	2.3	5.7		3.0	9.7	10.9	4.1	5.3	3.8	12.5	7.8	10.5
Locomotive units ordered out of service	3											15	1

found defective, and ordered out of service, et cetera—by carriers—Continued

Minnesota & St. Louis	Minneapolis, Northfield & Southern	Minneapolis, St. Paul & S. S. Marie	Minnesota Transfer	Mississippi Central	Missouri-Illinois	Missouri-Kansas-Texas	Missouri Pacific	Monongahela Connecting	Monongahela	Monon	Montour	Newburgh & South Shore	New Orleans Public Belt	New York Central	New York, Chicago & St. Louis	New York, New Haven & Hartford	New York, Susquehanna & Western	Norfolk & Portsmouth Belt Line	Norfolk & Western	Norfolk Southern	Northern Pacific	
						3	3							24		5						1
														1		10						2
														15		1						3
	15					2	2	1						199	2	25						4
	5					38	51	3						115	6	74						5
		2				3	14	1						11	2	25						6
						1	81	138						187	2	104						7
							8	16						19	3	13						8
							11	3						13	2							9
							17	2						35	1	14						10
	1					2	10	9						30	1	2						11
							1	1						22	2	8						12
							2	73	160	2				233	10	175						13
							2	2	1					11	1	12						14
							1	4	1					5	6							15
							1	16	1					29	1	1						16
	2						13	4	1					47	3	23						17
	3						4	5						11	1	12						18
							106	176	4					297	2	267						19
	8						23	10						37	28							20
							4							6	7							21
							5	3						13	9							22
							1							5	1							23
							24	15						95	43	1						24
							1							2								25
							129	132						322	34	75						26
	1						33	5						33	10							27
							6	4						15	19							28
							10	5						24	5							29
							20	10						1	1							30
	2						1							55	1	39						31
							2	9						5	5							32
	1						2	1						16	1	4						33
	1						7	1						17	1	4						34
	1						17	26	4					65	13							35
	47						7	724	827	15	3	5	8	2,028	69	1,046	3					36
	75	11	212	18	10	15	232	842	33	27	57	14	13	18	2,122	362	513	24	15	212	34	591
	200	41	618	24	32	44	884	2,731	52	66	253	18	30	31	6,465	855	985	15	12	479	105	1,667
	19		14	1		4	278	327	10	2	4		2		847	24	241	1		17	6	131
	9.5		2.3	4.2		9.1	31.4	12.0	19.2	3.0	1.6		6.7		13.1	2.8	24.5	6.7		3.5	5.7	7.9
	1						27	22						26	4	12				4		7



TABLE V.—Number of locomotive units other than steam reported, inspected, found defective, and ordered out of service, et cetera—by carriers—Continued

	Texas Pacific-Missouri Pacific-Territorial Railroad of New Orleans	Toledo, Peoria & Western	Toronto, Hamilton & Buffalo	Union Pacific	Union Railroad	Union Railway	Virginian	Wabash	Washington Terminal	Western Maryland	Western Pacific	Youngstown & Northern	Roads with less than 10 locomotive units	Total
1 Air compressors.....				9				1			1			232
2 Axles, truck and driving.....				3									2	59
4 Batteries.....								1						15
5 Boilers.....				6										172
6 Brake equipment.....				44	2		15			12	2	77	2,469	6
8 Cabs and cab windows.....				16	1					4		29	962	8
9 Cab cards.....				5								19	145	9
10 Cab floors, aprons and deck plates.....		1		77		2	1	13		16		22	2,020	10
11 Clutches.....														11
12 Controllers, relays, circuit breakers, magnet valves and switch groups.....				22				1		6		19	348	12
13 Coupling and uncoupling devices.....				6									8	132
14 Current collecting apparatus.....													3	14
16 Draft gear.....				10				1				25	357	16
17 Draw gear.....				3								2	128	17
18 Driving boxes, shoes and wedges.....												1	135	18
20 Frames or frame braces.....													1	17
22 Fuel system.....				75	2	3		7		8		13	2,307	22
23 Gages or fittings, air.....				7				1		1		6	166	23
24 Gages or fittings, steam.....				5						1			58	24
25 Gears and pinions.....				5									19	25
26 Handholds.....				3				3				7	217	26
28 Inspections and tests not made as required.....				11				2		4		38	623	28
29 Insulation and safety devices.....				5	1		2			4	1	10	228	29
30 Internal-combustion engine defects, parts and appurtenances.....				247	1		60			36	1	60	3,817	30
32 Jack shafts.....													1	32
33 Jumpers and cable connectors.....				16						3		1	306	33
35 Lateral motion, wheels.....													2	46
36 Lights, cab and classification.....				8						10			321	36
37 Lights, headlight.....				8									2	32
39 Meters, volt and ampere.....											2		24	39
40 Motors and generators.....				11	1			2		1		5	472	40
42 Pilots and pilot beams.....													2	41
43 Plugs and studs.....														43
44 Quills.....														32
46 Rods, main, side, and drive shafts.....														1
48 Sanders.....				50		1		5		17		53	2,310	48
49 Springs and spring rigging, driving and truck.....				7	3							5	380	49
51 Staybolts, broken or defective.....														51
53 Steam pipes.....				2				1					141	53
54 Steps, footboards, et cetera.....				6				1		1		22	292	54
55 Switches, hand-operated, and fuses.....				2									1	16
56 Transformers, resistors and rheostats.....														2
57 Trucks.....				7	1								6	510
59 Water tanks.....				1				1						31
60 Water glasses, fittings and shields.....														4
61 Warning signal appliances.....				1						1				124
62 Wheels.....					3								22	189
63 Miscellaneous.....				34				1				3		762
Number of defects.....	1		712	15	6	3	115			133	4	485	20,668	
Locomotive units reported.....	10	15	10	1,201	135	11	120	300	26	126	171	11	1,318	31,755
Locomotive units inspected.....	20	19	1	4,543	121	49	160	990	10	332	592	16	2,081	91,522
Locomotive units defective.....	1			326	10	2	1	38		70	3	180	8,067	
Percentage of inspected found defective.....	5.3			7.2	8.3	4.1	0.6	3.8		11.8	18.7		8.6	8.8
Locomotive units ordered out of service.....				2	2			1			1		24	372

TABLE VI.—Number of multiple operated electric locomotive units reported, inspected, found defective, and ordered out of service, et cetera—by carriers

	Baltimore & Ohio	Chicago North Shore & Milwaukee	Chicago South Shore & South Bend	Delaware, Lackawanna & Western	Illinois Central	Long Island	New York Central	New York, New Haven & Hartford	Pennsylvania	Reading	Total
1 Air compressors.....						1		1			2
2 Axles, truck and driving.....						2		1		3	6
4 Batteries.....											4
5 Boilers.....											5
6 Brake equipment.....				3		2	16	1	1		23
8 Cabs and cab windows.....				1				1			2
9 Cab cards.....				5		1	4	3			13
10 Cab floors, aprons and deck plates.....							1				1
11 Clutches.....											10
12 Controllers, relays, circuit breakers, magnet valves and switch groups.....		1									1
13 Coupling and uncoupling devices.....											13
14 Current collecting apparatus.....						11	12		2		25
16 Draft gear.....						1					1
17 Draw gear.....							9				9
18 Driving boxes, shoes and wedges.....				2							2
20 Frames or frame braces.....											20
22 Fuel system.....											22
23 Gages or fittings, air.....						1					1
24 Gages or fittings, steam.....											24
25 Gears and pinions.....											25
26 Handholds.....				28		6	4	1	6		45
28 Inspections and tests not made as required.....				2		2	5	10	3		22
29 Insulation and safety devices.....											29
30 Internal-combustion engine defects, parts and appurtenances.....											30
32 Jack shafts.....											32
33 Jumpers and cable connectors.....								1	2		3
35 Lateral motion, wheels.....											35
36 Lights, cab and classification.....											36
37 Lights, headlight.....											37
39 Meters, volt and ampere.....											39
40 Motors and generators.....											40
42 Pilots and pilot beams.....											42
43 Plugs and studs.....											43
44 Quills.....											44
46 Rods, main, side, and drive shafts.....											46
48 Sanders.....											48
49 Springs and spring rigging, driving and truck.....				7			1	1	1		10
51 Staybolts, broken or defective.....											51
53 Steam pipes.....											53
54 Steps, footboards, et cetera.....											54
55 Switches, hand-operated, and fuses.....											55
56 Transformers, resistors and rheostats.....											56
57 Trucks.....						3	5		90		98
59 Water tanks.....											59
60 Water glasses, fittings and shields.....											60
61 Warning signal appliances.....											61
62 Wheels.....											62
63 Miscellaneous.....				4		1	1				6
Number of defects.....	1		52			31	58	20	108	2	272
Locomotive units reported.....	55	142	65	281	280	714	371	227	457	136	2,728
Locomotive units inspected.....	27	104	37	262	132	216	265	99	441	161	1,747
Locomotive units defective.....		1		37		14	41	13	61	1	168
Percentage of inspected found defective.....	1.0			14.1		6.5	15.3	13.1	13.8	0.6	9.6
Locomotive units ordered out of service.....						1					1