INTERSTATE COMMERCE COMMISSION

FIFTY-FIRST ANNUAL REPORT

OF THE

DIRECTOR OF LOCOMOTIVE INSPECTION

TO THE

INTERSTATE COMMERCE COMMISSION

FISCAL YEAR ENDED
JUNE 30, 1962



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ANNUAL REPORT OF THE DIRECTOR OF LOCOMOTIVE INSPECTION

DECEMBER 3, 1962.

To the Interstate Commerce Commission:

In compliance with section 7 of the act of February 17, 1911, as amended, the Fifty-first Annual Report of the Director of Locomotive Inspection, covering the work of the fiscal year ended June 30, 1962, 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 locomotive inspectors. Data for preceding years are given where possible for comparative purposes.

GENERAL CONDITIONS OF LOCOMOTIVES AND INVESTIGATION OF ACCIDENTS

During the year, 9.6 percent of the locomotives inspected by our inspectors were found with defects or errors in inspection that should have been corrected before the locomotives were put into use. Four hundred and eighty-eight locomotives were ordered withheld from service by our inspectors because of the presence of defects that ren-

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dered the locomotives immediately unsafe; this is a decrease of 16 locomotives compared with the preceding year.

Results of locomotive inspections made by district locomotive 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 ende	d June 30—	_	
	1957	1958	1959	1960	1961	1962
Number of locomotives for which reports were filed. Number inspected. Number found defective Percent of inspected found defective. Number ordered out of service. Number of defects found.	37, 353 100, 607 9, 887 9, 8 518 26, 385	36, 905 95, 593 8, 394 8. 8 395 21, 532	36, 069 105, 347 10, 912 10. 4 648 32, 330	35, 645 108, 629 11, 126 10. 2 531 32, 830	35, 074 98, 332 9, 399 9, 6 504 28, 308	34, 789 94, 592 9, 0£0 9, 6 488 26, 032

As indicated in the preceding table there was a decrease in the number of locomotives for which carriers were filing reports on June 30, 1962, as compared to the number being filed on June 30, 1961. The decrease resulted from 110 steam locomotives being retired during the year, and a decrease of 175 in the number of other than steam and multiple operated electric locomotive units for which reports were filed during the same period.

During the year, district locomotive inspectors devoted 9,026% days to regular inspections of locomotives, 374 days making shop inspections to determine that repairs and tests were being made to meet the requirements of the law and rules, 3221/2 days investigating accidents, 7221/2 days on special assignment relating to locomotive inspection including investigating complaints regarding possible violations of the law and rules, 439% days conferring with carrier representatives and officials, and 1,874½ days at their respective headquarters reviewing and processing inspection and repair reports filed by the carriers and performing other office work.

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

Accidents reported under requirements of the law and Commission rules were investigated and appropriate action taken to prevent recurrence so far as possible. All district inspectors were advised of details and causes of unusual accidents to better assist them in their safety promotional contacts. The dissemination of such 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.

Sixty-seven accidents occurred in connection with all types of locomotives in which 73 persons were injured. Compared with the preceding year there was a decrease of 4 accidents and a decrease of 4 injuries.

Of the 67 accidents, 8 were caused by the defective condition of floors, steps, and passageways of diesel-electric locomotives. Four of the 8 resulted from accumulation of oil on walking surfaces of the locomotives, a decrease of 10 compared with the preceding year.

Fifteen accidents were caused by defective condition of cab seats, compared with 7 in the previous year.

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

		Ye	ar ended	l June 30	_	
	1957	1958	1959	1960	1961	1962
Number of accidents Percent increase or decrease from previous year Number of persons killed Percent increase or decrease from previous year Number of persons injured Percent increase or decrease from previous year	75 1 2. 7 0 100 90 1 13. 9	72 4.0 0 0 86 4.4	$\begin{array}{c} 66 \\ 8.3 \\ 0 \\ 0 \\ 90 \\ 14.7 \end{array}$	50 24. 2 0 0 81 10. 0	71 1 42. 0 0 0 77 4. 9	$\begin{array}{c} 67 \\ 5.6 \\ 0 \\ 0 \\ 73 \\ 5.2 \end{array}$

¹ 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.

FAILURES LOCOMOTIVE FROM 0561 LOCOMOTIVES RESULTING CASUALTIES PERCENT DEFECTIVE AND ACCIDENTS 25.61 2 JUNE 3 ACCIDENTS OF DEFECTIVE S ENDED YEARS RELATION

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

				Ye	ar ende	d June 30)—			
	19	958	1	959	1	960	1	961	1	962
	Killed	Injured	Killed	Injured	Killed	Injured	Killed	Injured	Killed	Injured ———
Members of train crews: Engineers Firemen Brakemen Conductors Switchmen Maintenance employees. Other employees Nonemployees		21 36 11 5		22 31 10 4 		17 21 11 2 1 2 6 21		14 44 11 3 2		23 37 8 2 1 2
Total	0	86	0	90	0	81	0	77	0	73

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 ende	ed June	30, 1962
Part of appurturance which caused account	Accidents	Killed	Injured
Air compressorsAir reservoirs, fittings, safety and check valves	0	0	0
Air reservoirs, fittings, safety and check valves	0	U	, ,
		0	0
ExplosionsFuel explosions in firebox] ŏ	ŏ	ŏ
Fuel explosions in firebox	2	Ĭŏ	ž
Steam valves, piping and blowers	1 5	ŏ	3
Brakes and brake rigging	•	_	1
Cab: Doors and windows	8	0	8
	15	0	15
SeatsControl equipment—mechanical, electrical, pneumatic or electro-pneumatic		Ō	0
Control equipment—mechanical, electrical, phennials of electro phennials.	l i	Ō	1
	_		1
Electrical equipment: Insulation, short circuits, or electrical flashes	8	l 0	8 2
Fans and shutters	2	0	2
Direct days to liquid fuel or debris	. 0	0	0
Filos in the to find fuel to the state of th	. 8	0	8
F10015, sleeps and passage ways		1	ł
Crankcase or air-box explosions	13	0	18
Exhaust and cooling systems	. 5	0	6
Fuel injectors and connections	.} U	0	0
Miscellaneous	. 2	0	2
WISCENAII COMP.			
Total	. 67	0	73

SPECIFICATIONS AND ALTERATION REPORTS

In compliance with rule 54 of the Rules and Instructions for Inspection and Testing of Steam Locomotives, 5 specifications and 2 alteration reports for steam locomotives were submitted by carriers. Under rules 328 and 329 of the Rules and Instructions for Inspection and Testing of Locomotives Other Than Steam, 634 specifications and 1,242 alteration reports for locomotive units, and 68 specifications and 159 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, 36 specifications and 2 alteration reports were submitted by carriers. The information contained in these specifications and reports was analyzed and corrective measures were taken when discrepancies were found.

INSPECTION AND REPAIR REPORTS

Inspection and repair reports filed with district inspectors during the year totaled 3,669 under rules 51 and 53 of the Rules and Instructions for Inspection and Testing of Steam Locomotives; 384,377 under rules 331 and 332 of the Rules and Instructions for Inspection and Testing of Locomotives Other Than Steam; and 31,455 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 rule 10 of the Rules and Instructions for Inspection and Testing of Steam Locomotives, 28 applications for extension of time for removal of flues were submitted. After investigation, extensions were granted for the full period requested in 21 applications. One extension was denied, and a shorter extension than requested was granted for one locomotive because of conditions disclosed by our investigations. Four applications were canceled for various reasons and one application is pending. An extension was granted for the full period requested in the one application pending on July 1, 1961.

SUITS FOR PENALTIES

During the year, 14 cases involving 22 counts for alleged violations of the Locomotive Inspection Act and rules prescribed thereunder were transmitted to United States attorneys for prosecution. Judgment was confessed in 12 cases on 20 counts and penalties totaling

\$5,000 were assessed. Nine cases, involving 11 counts, were pending in the district courts at the end of the year. The following is a brief summary of the cases:

CASES INSTITUTED AND DISPOSED OF DURING THE YEAR

U.S. v. Tennessee Central Railway Company, consisting of two causes of action, involved the use of a diesel-electric locomotive unit when the driving brakes were cut out in violation of rule 201(c). Judgment was confessed on both counts and a penalty of \$500 was assessed.

U.S. v. Texas and New Orleans Railroad Company, consisting of three causes of action, involved the use of three diesel-electric locomotive units when the air brakes were cut out in violation of rule 201(c). Judgment was confessed on all three counts and a penalty of \$750 was assessed.

U.S. v. St. Louis Southwestern Railway Company, consisting of three causes of action, involved the use of three diesel-electric locomotive units when the air brakes were cut out in violation of rule 201(c). Judgment was confessed on all three counts and a penalty of \$750 was assessed.

U.S. v. St. Louis Southwestern Railway Company, consisting of two causes of action, involved the use of two diesel-electric locomotive units when the slipping or sliding wheel alarms were cut out in violation of rule 201(d). Judgment was confessed on both counts and a penalty of \$500 was assessed.

U.S. v. The Kansas City Southern Railway Company, consisting of one cause of action, involved the failure to immediately report by wire to the Director of Locomotive Inspection, at his office in Washington, D.C., an accident resulting in serious injury to an employee as a result of the failure of the cab seat of a locomotive, as required by rule 335. Judgment was confessed and a penalty of \$250 was assessed.

OTHER CASES DISPOSED OF DURING THE YEAR

U.S. v. The New York Central Railroad Company, consisting of three causes of action, involved the use of three diesel-electric locomotives when a monthly inspection had not been made as required by rule 331(a). Judgment was confessed on all three counts and a penalty of \$750 was assessed.

U.S. v. Wabash Railroad Company, consisting of one cause of action, involved the failure to immediately report by wire to the Director of Locomotive Inspection, at his office in Washington, D.C., an accident resulting in serious injury to an employee as a result of a diesel-electric locomotive crankcase explosion, as required by rule 335. Judgment was confessed and a penalty of \$250 was assessed.

U.S. v. The Pennsylvania Railroad Company, consisting of one cause of action, involved the use of a diesel-electric locomotive unit when the oil cooler was leaking oil in violation of rules 203(a) and 262(b). Judgment was confessed and a penalty of \$250 was assessed.

U.S. v. The Baltimore and Ohio Rail Road Company, consisting of one cause of action, involved the use of a diesel-electric locomotive unit when the rotair valve was defective, in violation of rule 204(a). Judgment was confessed and a penalty of \$250 was assessed.

U.S. v. The Pennsylvania Railroad Company, consisting of one cause of action, involved the use of one diesel-electric locomotive unit when the main reservoir had not been given the prescribed hydrostatic and hammer tests, as required by rule 206 (a) and (b). Judgment was confessed and a penalty of \$250 was assessed.

U.S. v. The New York Central Railroad Company, consisting of one cause of action, involved the use of a diesel-electric locomotive unit when the main reservoir had not been given the prescribed hydrostatic and hammer tests as required by rule 206 (a) and (b). Judgment was confessed and a penalty of \$250 was assessed.

U.S. v. Missouri Pacific Railroad Company, consisting of one cause of action, involved failure to immediately report by wire to the Director of Locomotive Inspection at his office in Washington, D.C., an accident resulting in serious injury to an employee when a locomotive cab seat failed, as required by rule 335. Judgment was confessed and a penalty of \$250 was assessed.

CASES PENDING AT THE CLOSE OF THE YEAR

U.S. v. Northern Pacific Railway Company, consisting of two causes of action, involves the failure to immediately report to the Director of Locomotive Inspection, at his office in Washington, D.C., by wire, an accident resulting in serious injury to an employee when said employee came in contact with an electrically energized part or appurtenance of a diesel-electric locomotive unit, as required by rule 335, and also involves the failure to immediately confirm by mail its wire reporting said accident, as required by rule 335.

U.S. v. Claremont and Concord Railway Company, Inc., consisting of two causes of action, involves the failure to file a specification card, size 8 x $10\frac{1}{2}$ inches, Form No. 4, for a steam locomotive, in the office of the Director of Locomotive Inspection, as required by rule 54, and when a duplicate of the report of the inspection of the interior and exterior of the boiler of the locomotive had not been filed with the inspector in charge, as required by rules 9 and 15.

U.S. v. Missouri Pacific Railroad Company, consisting of one cause of action, involves the use of a diesel-electric locomotive unit when the remote control shut off valve was defective, in violation of rules 203(a) and 321(a).

U.S. v. Georgia Railroad, Lessee Organization, consisting of one cause of action, involves the failure to immediately report to the Director of Locomotive Inspection, at his office in Washington, D.C., by wire, an accident resulting in serious injury to two employees as a result of a diesel-electric locomotive crankcase explosion, as required by rule 335.

U.S. v. Georgia Railroad, Lessee Organization, consisting of one cause of action, involves the failure to preserve intact the part or parts of a diesel-electric locomotive affected by an accident, as required by section 32 of Title 45 of the United States Code.

U.S. v. The New York Central Railroad Company, consisting of one cause of action, involves the failure to immediately report to the Director of Locomotive Inspection, at his office in Washington, D.C., by wire, an accident resulting in serious injury to an employee when said employee came in contact with an electrically energized part or appurtenance of a diesel-electric locomotive unit, as required by rule 335.

U.S. v. New York, Susquehanna & Western Railroad Company, consisting of one cause of action, involves the use of a diesel-electric unit on which an out-of-service report had been filed when an inspection and report had not been made before said locomotive was again returned to service, as required by rule 331(d).

U.S. v. The New York Central Railroad Company, consisting of one cause of action, involves the use of a diesel-electric locomotive unit when the rear truck brakes were cut out and in a defective condition, in violation of rules 203(a) and 204(a).

U.S. v. The Pittsburgh and Lake Eric Railroad Company, consisting of one cause of action, involves the failure to immediately report to the Director of Locomotive Inspection, at his office in Washington, D.C., by wire, an accident resulting in serious injury to an employee when a locomotive cab seat failed, as required by rule 335.

APPEALS

No formal appeals from decisions of district inspectors were filed by the carriers.

> John A. Hall, Director of Locomotive Inspection.

CCIDENTS 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, 1962, BY ROADS

[A double star [**] indicates accidents not properly reported, as required by rules 55, 162, 335, and 454.]

TLANTIC COAST LINE RAILROAD:

January 26, 1962, unit 513, Selma, N.C. Bell crank loose on shutter operating ever shaft; one employee injured.

One accident; one employee injured.

ALTIMORE AND OHIO RAILROAD:

October 16, 1961, unit 4590, M & K Junction, W. Va. Hatch closure sheet ecame dislodged from its position and struck employee; one employee injured. November 8, 1961, unit 4621, Niles Junction, Ohio. Crankcase explosion aused by defective piston; one employee injured.

January 28, 1962, unit 9209, Brunswick, Md. Crankcase explosion due to efective thrust bearing and fuel oil dilution of lube oil; one employee injured.

May 13, 1962, unit 4463, Salem, Ill. Employee slipped on oil on engineroom oor; one employee injured.

Four accidents; four employees injured.

SOSTON AND MAINE RAILROAD:

December 4, 1961, unit 6209, Rockport, Mass. Employee dropped cab seat

ackrest due to loose and missing screws; one employee injured.

December 18, 1961, unit 6213, Concord, Mass. Failure of cab seat caused by roken bolt at mounting bracket attaching seat frame to bulkhead; one employee

January 12, 1962, unit 4227-A, Deerfield, Mass. Flashover in main generator

esulting in fire; one employee injured.

Three accidents; three employees injured.

CENTRAL RAILROAD OF NEW JERSEY:

March 28, 1962, unit 71, Valley, N.J. Crankcase explosion caused by overeated piston; one employee injured.

One accident; one employee injured.

CHESAPEAKE AND OHIO RAILWAY:

December 22, 1961, unit 8011, North Mountain, Va. Flashover at main enerator resulting in engineroom fire; one employee injured.

One accident: one employee injured.

CHICAGO AND NORTH WESTERN RAILWAY:

February 25, 1962, unit 1242, Sioux City, Iowa. Cab seat cushion and back est became separated from seat pedestal causing employee to fall backwards to he floor; one employee injured.

May 18, 1962, unit 89, Sioux City, Iowa. Cab seat was not secured to seat

pedestal, causing employee to fall to cab floor; one employee injured.

Two accidents; two employees injured.

Chicago, Burlington and Quincy Railroad:

August 23, 1961, unit 9214, Ottawa, Ill. Crankcase explosion resulting from

he use of combustible cleaning material; one employee injured.

January 18, 1962, unit 128-D, near Camp Point, Ill. Electrical flash in high voltage cabinet; one employee injured.
Two accidents; two employees injured.

CHICAGO, ROCK ISLAND AND PACIFIC RAILROAD:

July 30, 1961, unit 1222, LaSalle, Ill. Cab door stuck due to defective door and door latch assembly causing employee to slip; one employee injured.

October 16, 1961, unit 622, east of Seneca, Ill. Defective guard over rotating equipment resulted in insufficient operating clearance; one employee injured.

October 19, 1961, unit 628, between Palo and Shellsburg, Iowa. Employee slipped on leaves on passageway floor; one employee injured.

Three accidents; three employees injured.

ERIE-LACKAWANNA RAILROAD:

February 8, 1962, unit 546, Taylor, Pa. Crankcase explosion caused by

overheated connecting rod bearings; one employee injured.

April 27, 1962, unit 858, Hammond, Ind. Employee sustained injury to his right side when cab door handle became detached from the door causing him to fall against the locomotive car body; one employee injured.

Two accidents: two employees injured.

FLORIDA EAST COAST RAILWAY:

March 13, 1962, unit 502, Wabasso, Fla. Crankcase explosion due to failure of main bearings; two employees injured. One accident; two employees injured.

GEORGIA RAILROAD:

**February 3, 1962, unit 1025, Thomson, Ga. Crankcase explosion caused by overheated main bearings; two employees injured.

One accident: two employees injured.

ILLINOIS CENTRAL RAILROAD:

December 1, 1961, unit 9229, North Forreston, Ill. Failure of cab seat due to defective weld: one employee injured.

One accident; one employee injured.

KANSAS CITY SOUTHERN RAILWAY:

**October 21, 1961, unit 50-D, near DeQuincy, La. Cab seat became detached from pedestal bracket and fell to floor; one employee injured.

One accident; one employee injured.

LOUISVILLE AND NASHVILLE RAILROAD:

March 30, 1962, unit 811, Howard, Ky. Crankcase explosion caused by overheated crankshaft main bearings; two employees injured.

One accident; two employees injured.

MISSOURI-KANSAS-TEXAS RAILROAD:

August 7, 1961, unit 22, Dallas, Tex. Employee fell and injured his knee when his heel caught on stick used to keep door open. Door opening device was missing; one employee injured.

August 15, 1961, unit 65-D, Denton, Tex. Employee slipped on oil on floor:

one employee injured.

October 13, 1961, unit 80-A, Spanish Lake, Mo. Insufficient clearance around

cab door latch handle; one employee injured.

December 8, 1961, unit 6, Denison, Tex. Employees inhaled exhaust fumes

from diesel engine; two employees injured.

May 17, 1962, unit 89-A, Parsons, Kans. Crankcase explosion caused by overheated piston; one employee injured.

Five accidents; six employees injured.

MISSOURI PACIFIC RAILROAD:

January 30, 1962, unit 8021, Palestine, Tex. Employee injured when forced to escape through another unit as steam filled the boiler compartment due to failure of steam heat line union; one employee injured.

February 3, 1962, unit 9119, St. Louis, Mo. Upper window pane fell from rear

cab door striking employee; one employee injured. Two accidents; two employees injured.

NEW YORK CENTRAL RAILROAD:

July 24, 1961, unit 9613, Ecorse, Mich. Cab door handle became disconnected causing the employee to lose his balance and fall; one employee injured.

September 5, 1961, unit 849, Buffalo, N.Y. Defective cab seat adjusting

mechanism: one employee injured.

November 19, 1961, unit 8511, Syracuse, N.Y. Engine exhaust gases entering cab: one employee injured.

January 6, 1962, unit 5803, Detroit, Mich. Crankcase explosion caused by defective engine blower: two employees injured.

February 17, 1962, unit 1760, Carthage, N.Y. Left cab seat backrest broke away from seat and fell to floor due to failure of seat back pivot pins; one employee injured.

** March 1, 1962, unit 8807, Charleston, W. Va. Collision resulting from the operation of a locomotive with ineffective brakes; one employee injured.

** March 3, 1962, unit 9108, Cleveland, Ohio. Employee received electrical

arc burns when installing cooling fan fuse; one employee injured.

May 31, 1962, unit 865, Allston, Mass. Employee tripped on defective cab

door threshold; one employee injured.

June 6, 1962, unit 8503, West Springfield, Mass. Collision resulting from the operation of a locomotive with ineffective brakes; one employee injured.

June 22, 1962, unit 282, Ossining, N.Y. Employee fell to cab floor due to

improperly secured cab seat; one employee injured.

June 24, 1962, unit 3345, Liverpool, N.Y. Flashover in main generator: one employee injured.

Eleven accidents: twelve employees injured.

NEW YORK, NEW HAVEN AND HARTFORD RAILROAD:

July 17, 1961, units 0784 and 0767, en route Boston, Mass., to New Haven, Conn. Gas inhalation resulting from defective engine exhaust manifolds; one employee injured.

January 15, 1962, unit 519, between Chelmsford and Lowell, Mass. Failure of cab seat caused by missing and defective swivel plate clamps; one employee injured.

Two accidents: two employees injured.

NORTHERN PACIFIC RAILWAY:

** August 27, 1961, unit 6003-C, Perham, Minn. Flash in high voltage cabinet;

one employee injured.

February 26, 1962, unit 241, Spring Gulch, Mont. Employee sustained leg injuries when he slipped and fell while removing driver brake slice; one employee

Two accidents: two employees injured.

PENNSYLVANIA RAILROAD:

July 23, 1961, unit MU-153, Wayne, Pa. Failure of cab seat due to defective hinge; one employee injured.

July 27, 1961, unit 9378, Shadyside, Ohio. Employee received first and second degree burns when engine cooling water hose ruptured; one employee injured.

August 14, 1961, unit 9485-A, Columbus, Ohio. Cab seat backrest became detached due to defective hinge brackets; one employee injured.

September 14, 1961, unit 4923, Pennsylvania Station, N.Y. Defective steam line globe valve; one employee injured.

September 18, 1961, unit 9629-A, near New Florence, Pa. Crankcase explosion caused by defective piston; one employee injured.

December 15, 1961, unit 4883, South Elizabeth, N.J. Employee sustained electrical flash burns while attempting to change blower motor circuit fuses; one employee injured.

December 26, 1961, unit 9269, Jersey City, N.J. Crankcase explosion due to

failure of connecting rod bearings; two employees injured.

January 22, 1962, unit 9477-A, Bowerston, Ohio. Crankcase explosion caused by lack of lubrication of No. 1 piston resulting in incomplete combustion; one employee injured.

May 18, 1962, unit 5866-A, Mill Creek, Pa. Employee suffered injury to his hand while attempting to remove defective cooling fan hatch coverplate; one employee injured.

Nine accidents; ten employees injured.

PITTSBURGH AND LAKE ERIE RAILROAD:

** April 7, 1962, unit 8659, East Youngstown, Ohio. Failure of cab seat due to defective weld; one employee injured.

May 11, 1962, unit 8714, Campbell, Ohio. Employee slipped on worn nonskid running board while closing hood door; one employee injured.

Two accidents: two employees injured.

SOUTHERN RAILWAY:

March 2, 1962, unit 4172, Leadvale, Tenn. Cab seat cushion and backrest became separated from seat pedestal causing employee to fall backwards to the floor; one employee injured.

One accident; one employee injured.

SOUTHERN PACIFIC COMPANY:

August 20, 1961, unit 6420, Tecolote, N. Mex. Flash in high voltage cabinet when employee attempted to manually close dynamic brake contactors; one employee injured.

August 23, 1961, unit 5728, Emigrant Gap, Calif. Inoperative cab door latch necessitated entrance through another unit resulting in fall and injury to employee; one employee injured.

September 12, 1961, unit 6025, Rocklin, Calif. Employee was overcome by

smoke and fumes while extinguishing fire; one employee injured.

October 14, 1961, unit 6162, El Paso, Tex. Employee slipped on rear door threshold; one employee injured.

Four accidents; four employees injured.

TEXAS AND PACIFIC RAILWAY:

December 19, 1961, unit 2009, Big Spring, Tex. Employee slipped on oil on passageway floor; one employee injured.

December 26, 1961, unit 1530-B, Wickett, Tex. Employee slipped on oil on

passageway floor: one employee injured.

December 29, 1961, unit 2000, Fort Worth, Tex. Employee fell alighting from pilot step when his pants cuff caught on defective coupler pin lifting lever; one employee injured.

Three accidents: three employees injured.

UNION PACIFIC RAILROAD:

November 18, 1961, unit 414, Cheyenne, Wyo. Employee slipped on a piece of chipped ice on cab floor; one employee injured.

May 13, 1962, unit 55, between Oliver and Dix, Nebr. Failure of cab seat backrest causing employee to fall backwards to the floor; one employee injured.

Two accidents; two employees injured.

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

	Parts defective, inoperative or missing, or in		Y	ear ende	d June 30)—	
	violation of the rules	1957	1958	1959	1960	1961	1962
1	Air compressors	83	13	11	4	2	
2 3	Arch tubesAshpans and mechanism	. 1	1	2			
4	Avloc	4					
5	Blow-off cocks	30	2				
6 7	Boiler checks	26	9	3	3	2	
7	Boiler shell	20 256	3 85	1	19	16	
8	Brake equipmentCabs, cab windows, and curtains	101	21	35 3	3	16 2	· '
10	Cab aprons and decks	22	7	3	l	2 3	
11	Cab cards	18	6	4	2	3	1
12	Coupling and uncoupling devices	107	22	6 11	1 6	3	
13 14	Crossheads, guides, pistons, and piston rods	107	22	11	6		
15	Cylinders, saddles, and steam chests Cylinder cocks and rigging	$15\overline{7}$	17	7	2		
16	Cylinder cocks and rigging	54	11	1	3	1]
17	Domes and dome caps Draft gear	13 45	1 17]
18	Draft gear	23	17 6	8	6	2	:
$\frac{19}{20}$	Draw gear	20	0	1	1	1	
~	braces	72	21	6	1	1	
21	Firebox sheets	23		1		1	
$\frac{22}{23}$	Flues	12 22	<u>-</u> -	2 3	1	3 2	
23	Frames, tail pieces, and braces, locomotive Frames, tender	4) 3	3			,
24 25	Gages and gage fittings, air	25	8	3	1]
26	Gages and gage fittings, steam	28	4	1	3	2	
27 28	Gage cocks	43	15	5	2	5	
28	Grate shakers and fire doorsHandholds	34 33	6 8	1 12	1 5	5	
29 30	Injectors, inoperative	4	ı	12	Ιĭ	ľ	,
3ĭ	Injectors and connections	198	37	15	9	4	2
32	Inspections and tests not made as required	24	12	10		8	8
33	Lateral metion	24	10	2	1		2
34	Lights, cab and classification Lights, headlight	18	4 5	$\frac{1}{3}$	1 1	1	
35 36	Lubricators and shields	16	š	ĭ			
37	Mud rings	6	3	3] 1
38	Packing nuts	62 74	14	10	4	1	
39 40	Packing, piston rod and valve stem Pilots and pilot beams	8	2	8 2	i		
41	Plugs and studs	16				1	
42	Reversing gear	39	11	5	1		
43	Rods, main and side, crankpins, and collars	108	22	11	6	2	
44 45	Safety valves	$\begin{array}{c} 9 \\ 72 \end{array}$	1 9	3	7	1 3	
46	Oprings and enring rigging	212	32	25	4	2	l 1
47	Squirt hose	14					
48	Squirt hose Staybolts Staybolts, broken Steam pipes	20	6	3	1	6	3
49	Staybolts, broken	$\frac{12}{27}$	9 5	19 4	8 2	1	,
50 51	Steam valves	7	2	3	í		<u>-</u> j
52	Steps	42	20	6	6	3	2
53	Tanks and tank valves	99	16	5	3		
54	Telltale holes	6 48	9	6	5		
55 56	Throttle and throttle rigging Trucks, engine and trailing	42	5	2	2		
57	Trucks tender	51	10	11	7		l i
58 I	Valve motion Washout plugs	55	7	4			
59	Washout plugs	39 33	1	2	7]
60 61	Stokers Water glasses, fittings, and shields	75	3 20	2 9	3		
62	Wheels	39	7	13	i	1	ii
63	Miscellaneous—Signal appliances, badge plates,						ļ
- 1	brakes (hand)	68	9	6	2	1	
	Number of defects	2, 840	592	325	149	89	52
	Locomotives reported	3, 868	2 422	1, 490	788	367	257
	Locomotives reported	5, 983	2, 422 2, 324	967	356	243	195
	Locomotives defective	737	159	77	38	27	14
- 1	Percentage of inspected found defective Locomotives ordered out of service	12.3 99	6.8 22	8.0 16	10.7	11.1	7.2

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

DIRECTOR OF LOCOMOTIVE INSPECTION

1 2	Parts defective, inoperative or missing, or in violation of the rules						
1		1957	1958	1959	1960	1961	1962
9	Air compressors	328	232	337	290	208	203
	Axles, truck and driving	34	59	100	126	91	71
4	Batterics	35	15	16	21	25	29
5	Boilers	208	172	313	284	213	190
6	Brake equipment	2, 906	2,469	3, 477	3, 617	3, 066	2,658
8	Cabs and cab windows	1,030	962	1, 419 231	1,407 274	840 181	801 166
9	Cab cards	187	145		2, 461	2, 235	2, 276
10 11	Cab floors, aprons, and deck plates	1, 940	2,020	2, 768	2, 401	2, 200	2, 210
12	Controllers relays circuit breakers magnet		- 4	•	•	- 1	
12	Controllers, relays, circuit breakers, magnet valves and switch groups	360	348	613	704	565	504
13	Coupling and uncoupling devices	116	132	172	131	144	97
14	Current collecting apparatus.	6	3	4	11	5	- 6
16	Draft gear	253	357	489	420	402	349
17	Draw gear	121	128	173	160	108	123
18	Driving boxes, shoes, and wedges	154	135	144	223	148	169
20	Frames or frame braces	30	17	23 3, 343	19	55 2, 193	81 2, 184
22 23	Fuel system Gages or fittings, air	2, 431 289	$2,307 \\ 166$	3, 343	2, 702 254	163	142
24	Gages or fittings, steam	36	58	41	37	28	28
25	Gears and pinions	10	19	35	25	156	505
26	Handholds	208	217	230	244	210	181
28	Inspections and tests not made as required	703	623	682	1,063	847	685
29	Insulation and safety devices	133	228	210	209	163	179
30	Internal-combustion engine defects, parts and						
	appurtenances	5, 174	3, 817	6, 555	7, 184	6, 124	5, 880
32	Jack shafts		1	1		. 1	1
33	Jumpers and cable connectors	442	306	355	350	434	346
35	Lateral motion, wheels	35 260	46 321	25 480	49 404	28 269	63 151
36 37	Lights, cab and classification Lights, headlight	200 35	321	480	34	18	19
39	Meters, volt and ampere	34	24	31	30	22	18
40	Motors and generators	671	472	787	821	759	780
42	Pilots and pilot beams	61	41	75	64	54	43
43	Plugs and studs					1	
44	Quills	6	32	46	24	5	17
46	Rods, main, side, and drive shafts	5	1	1	5		2
48	Sanders.	2,023	2, 310	3, 613	3, 602 512	3, 131 415	2, 351 397
49 51	Springs and spring rigging, driving and truck	370	380	542	512	413	397
53	Staybolts, broken or defective	164	141	182	131	93	113
54	Steps, footboards, et cetera	827	292	408	372	307	256
55	Switches, hand-operated, and fuses	16	16	111	17	16	16
56	Transformers, resistors, and rheostats	10	2	4	4	6	3
57	Trucks	552	510	823	765	692	657
59	Water tanks	19	31	32	30	25	22
60	Water glasses, fittings, and shields	5	4	. 2	1	1	3
61	Warning signal appliances	154	124	179	142	148	127
62	Wheels	256	189	382	798	805	755 997
63	Miscellaneous	736	762	1, 491	1,400	1, 210	997
	Number of defects	23, 373	20,668	31, 171	31, 427	26, 614	24, 648
İ	Locomotive units reported	30, 740	31, 755	31, 862	32, 186	32,074	31, 917
	Locomotive units reported	93, 187	91, 522	102, 149	105, 702	95, 689	91, 493
	Locomotive units defective	9,031	8, 067	10, 473	10, 638	9,000	8,702
i	Percentage of inspected found defective	9.7	8.8	10. 3	10, 000	9.4	9.5
	Locomotive units ordered out of service	417	372	628	517	469	467

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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		Y	ear ende	d June 30)	
	Parts defective, inoperative or missing, or in violation of the rules	1957	1958	1959	1960	1961	1962
1 2 4	Air compressors Axles, truck and driving Batteries.	- -	2 8	1 87	4 53	40	2 34
5 6 8 9	Boilers Brake equipment Cabs and cab windows Cab cards	18	23 2 13	188 25 5	491 26 8	951 11 9	835 12
10 11 12	Cab cards. Cab floors, aprons, and deck plates Clutches. Controllers, relays, circuit breakers, magnet		1	2		1	
13	valves and switch groups			2	9	8	16 2
14 16 17 18 20	Current collecting apparatus		25 1 9 2	65 15 2 3	115 11 20 3	151 22 16 3	99 9 16 5
22 23	Fuel system. Gages or fittings, air. Gages or fittings, steam.			8	5	4	i
24 25	Gears and pinions			4	5		<u>4</u>
26 28 29 30	Handholds Inspections and tests not made as required Insulation and safety devices Internal-combustion engine defects, parts and	7 46 1	45 22	46 30 23	61 52 87	14 61 78	11 55 29
32 33	appurtenances Jack shafts Jumpers and cable connectors Lateral motion, wheels		3	10	16	13	10
35 36 37	Lateral motion, wheels	i		24 4	42 29	23 5	<u>16</u>
39 40	Meters, volt and ampere Motors and generators Pilots and pilot beams	3		31	23	15	21
42 43 44	Pilots and pilot beams Plugs and studs Quils Rods, main, side, and drive shafts						
46 48	Rods, main, side, and drive shafts				<u>1</u>		
49 51 53	Sanders Springs and spring rigging, driving and truck Staybolts, broken or defective Steam pipes	25	10	8	17	8	
54 55	Steps, footboards, et cetera				3	5	
56 57	Switches, hand-operated, and fuses Transformers, resistors, and rheostats Trucks	23	98	$\begin{array}{c} 1\\5\\222\end{array}$	14 152	19 98	20 7 66
59 60	Water tanks Water glasses, fittings, and shields						
61 62 63	Warning signal appliances. Wheels. Miscellaneous	1 2 7	6	1 3 17	5 1	37 3	23 5
	Number of defects	172	272	834	1, 254	1,605	1,332
	Locomotive units reported	2, 745	2,728	2,717	2, 671	2, 633	2, 615
	Locomotive units inspected	1, 437 119 8. 3	1,747 168 9,6	2, 231 362 16, 2	2, 571 450 17. 5	2, 400 372 15, 5	2, 904 334 11, 5
	Locomotive units ordered out of service		1	4	ii	31	18

Table IV.—Number of steam locomotives reported, inspected, found defective, and ordered out of service, et cetera—by carriers

	ordered out of service, e	t cetera	-by ce	ırriers			
	Parts defective, inoperative or missing, or in violation of the rules	Denver & Rio Grande Western	Duluth, Missabe & Iron Range	Lake Superior & Ishpeming	Union Pacific	Roads with less than 10 locomotives	Total
1 2 3 4	Air compressors Arch tubes. Ashpans and mechanism Axles.						
5 6 7 8 9	Bioler cocks Boiler shell Brake equipment Cabs, cab windows, and curtains					7	7
10 11 12 13 14	Cab aprons and decks. Cab cards. Coupling and uncoupling devices. Crossheads, guides, pistons, and piston rods. Crown bolts.					8	8
15 16 17 18 19	Air compressors Arch tubes Arch tubes Ashpans and mechanism Axles Blow-off cocks Boiler checks Boiler checks Boiler shell Brake equipment Cabs, cab windows, and curtains Cab aprons and decks Cab cards Coupling and uncoupling devices Crossheads, guides, pistons, and piston rods Crown boils Cylinders, saddles, and steam chests Cylinder cocks and rigging Domes and dome caps Draft gear Draw gear Draw gear Driving boxes, shoes, wedges, pedestals, and braces Firebox sheets Filees Frames tail pieces and braces locomotive					1 1 1 1	1 1 1 1
20 21 22 23	Driving boxes, shoes, wedges, pedestals, and braces					1	1
24 25 26 27 28	Frames, tail pieces, and braces, locomotive Frames, tender Gages and gage fittings, air Gages and gage fittings, steam Gage cocks Grate shakers and fire doors						3
29 30 31 32 33 34	Handholds Injectors, inoperative Injectors and connections Inspections and connections Inspections and tests not made as required Lateral motion Lights, cab and classification					2 8 2	2 8
35 36 37 38	Lights, headlightLubricators and sbields						
39 40 41 42 43	Packing nuts Packing, piston rod and valve stem. Pilots and pilot beam Plugs and studs Reversing gear Rods, main and side, crankpins, and collars Safety valves					1	1
44 45 46 47 48	Springs and spring rigging Squirt hose Staybolts					3 1	
49 50 51 52 53	Stay bolts, broken Stay m pipes Steam valves Steps Tanks and tank valves Telltale holes					1 2	1 2
54 55 56 57 58 59	Throttle and throttle rigging					1 1	1 1 1
60 61 62 63	Water glasses, fittings, and shields		 			1	1
	Number of defects	====				52	52
	Locomotives reported		23	11 3	30	171 145 14 9. 7 3	257 195 14 7.2 3

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

	TABLE V.—IVumoer of tocomotic	·c u	2220	Othic	,, ,,,	un.	sicu ii		port	cu, i	nspe	ciea,
	Parts defective, inoperative or missing, or in violation of the rules	Akron, Canton & Youngstown	Aliquippa & Southern	Alton & Southern	Ann Arbor	Apalachicola Northern	Atchison, Topeka & Santa Fe	Atlanta & St. Andrews Bay	Atlanta & West Point	Atlantic Coast Line	Baltimore & Obio	Bangor & Aroostook
1	Air compressors						6			1	4	
2 4	Axles, truck and driving									2		
5	Boilers						20				<u>2</u>	
8	Brake equipment Cabs and cab windows Cab cards. Cab floors, aprons and deck plates.			1			92 53		3	32 1	64 22	4
9	Cab cards.						12				3	
10 11	Cab floors, aprons and deck plates						99			13	84	<u>ī</u>
12	Controllers voleres sinousit breakens massest	1					•		~			
13	valves and switch groups. Coupling and uncoupling devices. Current collecting apparatus. Draft gear. Draw gear. Driving boxes, shoes and wedges. Frames or frame braces.						10 4		4	8	7 3	
14	Current collecting apparatus.											
16 17	Draft gear						6 11		,-	4	6 1	
18	Driving boxes, shoes and wedges.									5 3	8	
20 22	Frames or frame braces						4		<u>2</u>	1	12	
23	Fuel system						68 1		2	17 2	47 3	5
24	Gages or fittings, air						2			2		
25 26	Handholds						2 8		<u>ī</u>	6	29 6	
28 29	Inspections and tests not made as required		~				41			9	20	
30	Handholds Inspections and tests not made as required Insulation and safety devices Internal-combustion engine defects, parts and						6			10	7	
32	appurtenances Jack shafts		2		3		191	2	6	70	170	6
33	Jumpers and cable connectors						25			₇	21	
35 36	Jumpers and cable connectors. Lateral motion, wheels Lights, cab and classification.										3	
36	Lights, ead and classification						5			<u>ī</u>	1	
39	Meters, volt and ampere						2					
40 42	Motors and generators						30			6	42	1
43	Lights, headlight. Meters, volt and ampere. Motors and generators. Pilots and pilot beams. Plugs and studs.											
44 46	Quills. Rods, main, side, and drive shafts											
48	Sanders			5			123		<u>ī</u>	<u>-</u>	29	<u>ī</u>
49 51	Springs and spring rigging, driving and truck.						5		1	2	12	
53							5			<u>i</u>	2	
54	Steps, footboards, et cetera						6			2	8	
55 56	Switches, hand-operated, and fuses Transformers, resistors and rheostats Trucks						1					
57 59	Trucks	1					10		1	4	25	
60	Water tanks Water glasses, fittings and shields										1	
61	Water glasses, fittings and shields Warning signal appliances						3				1	
62 63	Wheels		1				23 23		5 1	43 12	64 27	₁
	Number of defects	1	5	10	4		900	2	31	270	734	19
	Locomotive units reported	18	17	23	23	11	1,863	== 14	27	589	1, 203	41
	Locomotive units inspected Locomotive units defective	64	15	62	59	38	6, 143	53	85 7	1, 550	3,264	88
	Percent of inspected found defective	$\begin{vmatrix} 1\\1.6 \end{vmatrix}$	6.7	8.1	3.4		368 6.0	1 1.9	8. 2	104 6. 7	339 10. 4	5 5. 7
	Number ordered out of service		1				16		1	7	9	
l'					, ,	1		,				

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

		<u> </u>																			
Belt Railway of Chicago	Bessemer & Lake Erie	Birmingham Southern	Boston & Maine	Butte, Anaconda & Pacific	Camas Prairie	Canadian National	Canadian Pacific	Canton	Central of Georgia	Central Railroad of New Jersey	Central Vermont	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	6	10 2 10 41 58 15 80		1	3 1	3 5 12 2 7	1	2 1 26 2 3	7 24 24 2 1 48	1 1 4	3 1 22 8 3 14	2 4	1	2 3 230 20 4 92	1	18 2 6	9	11 1 77 13 1 52	2	1 2 4 5 6 8 9 10 11
			5 	1		5	50 4		4 1 12 3	3 8 5 3 1 45 1 3 3	6	5 3 1 5 13 1	1		25 5 8 4 97 12	1	1 2 4 1	1 1 10 	18 4 4 3 49 26 9	1	12 13 14 16 17 18 20 22 23 24 25 26 28 29 30 32 33
			6 2 20 2 354 	4		12	2 8 -44		10 1 24 	10	14	3 1 91 5	6	1	30 12 135 7 11 1		1	4 2	6 7 74 7 24 2 1		28 29 30 32 33 35 36 37 39 40
	3		18 47 7 5 4			3	3 12 1 2		10 5	3 8 9 1	7	20 6	2		35 7 85 40 15		7	10 8	34 3 119 24 5	1	40 42 43 44 46 48 49 51 53 54 55 56 57 59 60 61 62 63
	5	1 12	35 1 2 33 954	6	1	7 	6 1 166	1	1 9 1 122	2 11 29 392	3 3 55	8 2 22 8 257	1 1 19	3	29 7 33 44 1, 085	6	2 	1 2 14 1 82	24 1 	1 1 6	
53 43 1 2.3	39 58 2 3. 4	15 55 8 14. 5	348 1, 785 297 16. 6 9	40 80 6 7. 5	12 49 1 2.0	108 106 12 11. 3	110 136 40 29. 4 4	16 13 1 7. 7	145 533 41 7.7 4	178 592 107 18. 1 4	25 109 23 21. 1 2	1, 067 1, 819 109 6. 0	100 310 14 4. 5	15 40 2 5.0	803 1, 822 350 19. 2	12 23 2 8. 7	701 2, 536 48 1. 9	139 412 37 9. 1 6	899 2,311 270 11.7	27 17 3 17. 6	

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

	Parts defective, inor erative or missing, or in violation of the rules	Rock Island &	Chicago South Shore & South Bend	Cincinnati Union Terminal	Clinchfield	Colcrado & Southern	Colorado & Wyoming	Conemaugh & Black Lick	Cuyahoga Valley	Delaware & Hudson	Denver & Rio Grande Western	Detroit & Toledo Shore Line	Detroit Terminal	Detroit, Toledo & Ironton
1 2 4 5 6 8 9	Air compressors Axles, truck and driving Batteries Boilers Brake equipment Cabs and cab windows Cab cards Cab foors, aprons and deck plates	7 6 3 20 232 48 7 114			6	1				20 14	4 1 1 8			3
1 2 3 4 6 7	Clutches. Controllers, relays, circuit breakers, magnet valves and switch groups. Coupling and uneoupling devices. Current collecting apparatus. Draft gear Draw gear	20 4 9 19								6 3	1		[1	
8 20 22 23 24 25 26	Driving boxes, shoes and wedgesFrames or frame bracesFuel system Gages or fittings, air Gages or fittings, steam Gears and pinions. Handholds	84 7 5 39 2			3 1				2	47 2 1	2		1 1	2
28 29 30 32 33	Inspections and tests not made as required, Insulation and safety devices. Internal-combustion engine defects, parts and appurtenances. Jack shafts. Jumpers and cable connectors.	34 7 182				3				280 1	8		5	3
15 16 17 19 10 12	Lateral motion, wheels Lights, cab and classification Lights, headlight Meters, volt and ampere Motors and generators Pilots and pilot beams	7 3 2 21 21								5				
13 14 16 18 19	Plugs and studs	213 21				3 1				6	7 1		2 2	1
51 53 54 55 56 57	Staybolts, broken or defective	2 10 2								1 5 4	i			2
59 60 61 62 63	Water tanks. Water glasses, fittings and shields. Warning signal appliances. Wheels. Miscellaneous. Number of defects.	7 31 49 1,275			1 11				2	32	41	1	2	12
	Locomotive units reported Locomotive units inspected Locomotive units defective Percentage of inspected found defective.	548 2,284 443 19. 4	17 4 42 3		66	58 542 4	20 75	28 37	10 20 1 5. 0	161 825 109 13.2	257 1,47 2 23	16 84 1 1. 2	14 31 2	44 132
	Locomotive units ordered out of service.	30)		1				1	1		1		

¹ Atchison, Topeka & Santa Fe.

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

Duluth, Missabe & Iron Range	Duluth, Winnipeg & Pacific	Elgin, Joliet & Eastern	Erie-Lackawanna	Florida East Coast	Ft. Dodge Des Moines & Southern	Ft. Worth & Denver	Georgia & Florida	Georgia	Grand Trunk Western	Great Northern	Green Bay & Western	Gulf, Colorado & Santa Fe	Gulf, Mobile & Ohio	Houston Belt & Terminal	Illinois Central	Illinois Terminal	Indiana Harbor Belt	Indianapolis Union	Interstate	Jacksonville Terminal	Kansas City Southern	
		10	3 1 14 43 25 4 102	3	1	2		5	9 1	1 1 1 31 10 4 27		1 13 1 14	2 47 14 35	3	1 1 1	1 5 8	9 1 2		1		24 4 39	1 4 8 8 10 11 12
		5	13 8 2 73 3 4	3		2 1	1	2	1 3	3 3 39 2 4 7		6	1 43 3	1	5	1 	6	1			21	13 14 16 17 18 20 22 23 24 24 25 26
			18 2 203	1 2 1				2 5	1 4	29 160		 16	5 64		1 10	6	1 2 5		 1		5 72	29 30
	4	1	10 20 19 8	1		2		8	1	1 7 4 135 7		7	1 3 3 2 2 1 1 		3	2	9	 i			3 6 	32 33 36 36 36 36 36 46 44 44 44 44 44 44 44 44 44
	1	2	17 5 4 2 2 5 13		1		1	 2 1	1 1 4 2	5 4 		1 2 2	16 		1 2	1 1 4	5 27		 1		5	5: 5: 5: 5: 5: 5: 6: 6: 6:
110 115	9 15 25 3 12. 0	28 141 124 8 6. 5	621 697 2,196 204 9. 3	13 104 316 6 1. 9	7 10 48 2 4. 2	7 46 188 4 2. 1	5 13 28 1 3.6	26 31 139 7 5. 0	30 177 409 13 3. 2	548 643 1,710 205 12. 0	17 21	67 (1) 644 32 5. 0	372 253 1,102 111 10. 1	5 22 25 2 8.0	38 633 1,929 20 1. 0	37 130 21 16. 2	74 125 141 15 10. 6	12 49 2 4. 1	10 23 28. 7	10 36	211 169 430 54 12. 6	

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

										_			
	Parts defective, inoperative or missing, or in violation of the rules	Kansas City Terminal	Kansas, Oklahoma & Gulf	Kentucky & Indiana Terminal	Lake Superior & Ishpeming	Lake Terminal	Lehigh & Hudson River	Lehigh Valley	Long Island	Louisiana & Arkansas	Louisville & Nashville	Maine Central	Minneapolis, Northfield & Southern
32 333 35 36 37 39 40 42 43 44 46 48 49 55 55 55 55 56 57	Air compressors Axles, truck and driving Batteries Boilers Brake equipment Cabs and cab windows Cab cards Cab floors, aprons and deck plates Clutches Controllers, relays, circuit breakers, magnet valves and switch groups Coupling and uncoupling devices Current collecting apparatus Draft gear Driving boxes, shoe and wedges Frames or frame braces Fuel system Gages or fittings, air Gages or fittings, air Gages or fittings, steam Gears and pinions Handbolds Inspections and tests not made as required Insulation and safety devices Internal-combustion engine defects, parts and appurtenances Jack shafts Jumpers and cable connectors Lateral motion, wheels Lights, cab and classification Lights, headlight Meters, volt and ampere Motors and generators Pilots and pilot beams Plugs and studs Quills Rods, main, side, and drive shafts Sanders Springs and spring rigging, driving and truck Staybolts, broken or defective Steam pipes Steps, footboards, et cetera Switches, hand-operated, and fuses Trucks Water tanks Water tanks Water tanks Water tanks Water is server.	1			5		1 1		1 10 2 2 2 14	1 5 2	229 5 68 2 5 68 2 1 1 3 3 3 69 4 4 5 28 5 203 16 6 1 1 3 3 3 4 4 2 3 3 3 5 5 5 5 5 5 5 5 5 6 6 6 6 6 6 6 6	15	4
3	Miscellaneous		1		1 1 		10			$\frac{1}{2}$			i
	Number of defects	17	15 59 3 5.1	23 44	16 35	20 23	13	217 920	79 120	18 193	728 2, 396 285	77 244 17	11 23

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

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	Northern Pacific Terminal	Northwestern Pacific
	_																		'	
		1 1	15 2 1 4 142 37 4 57	9 1 6 64 44 2 79	1						14 1 2 3 218 88 15 181	1 1 1	7 6 1 26 81 52 8 210	1 	6 4	3 26 9 1		1 25 3 1 13	2 2	
		~									3									- 1
			16 7 27 17 27	18 1 12 1							52 15 1 46 11 10	3	12 5 16 1	3		1 1		5 2	 	
			4	4 9							4		8			1				
			$\frac{40}{2}$	68 4			1				221 14	3	266 23	12	1	23		10 1		
				25						-	1	5	1 1			2		3		
ĩ			28 5 20				1				58 28 53 6	5 1 2 1	$\begin{vmatrix} & 3 \\ & 7 \\ & 21 \end{vmatrix}$			2 7		2 11		
· -			20 8	8 2							- 53 6	1	6			8				
		5	88	179							408	6	630	14		18	- -	41		
			<u>i</u>								42		10					10	'	
				ĩ							8		13			$\begin{vmatrix} 2\\1 \end{vmatrix}$				
			16	11							10 3		13							
			1 41	$\frac{2}{21}$							$\begin{array}{ c c c c } & 1 \\ & 95 \\ & \end{array}$		87			6		3		
			4	1							3							-		
													2							
			95 34	128			2				125 42	13	69	1		57		68	<u>ī</u>	
				8			2				42				3	6		5		
			3 16	1 1							5 35		17				- -	4 2		
			5																	
- -			1 25	<u>-</u> 27							66	3	65	3		9		3		
				2									_ a							
			7	5 19					2		17 39	1			3			2 3		
		<u>ī</u>	7 30 14	29			<u>ī</u>				128	1 2	47		4	11 15		13		
3		<u></u>	856	800	1		8				2,074	49	1, 717	45	21	224		233	9	
	10					27		19		18				-			34	i 	16	34
18 20	10 20	15 54	218 692 235	777 2, 793 260 9. 3	31 6 1	27 42	57 204	12 9	13 23 1	18 37	2, 103 5, 554 792 14. 3	403 1, 174 28 2. 4	472 1, 277 402 31. 5	45	15 75 6	588 1, 413	34 46	628 1, 787 114	16 43	34 124
5. 0		11. 1	134.0	9.3	16. 7		2.0		4.3		14.3	2.4	31. 5	23 45 11 24. 4	8.0	97 6. 9		6.4	14.0	
			19	18							17		23	2		5	- -	4		-

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

	TABLE V: IVantoer of tocomotive	α.υ.		,,,,,,,,,,,,,,,,,,,,,,,,,,,,,,,,,,,,,,,		000		, cpc		,	ope	ueu,
	Parts defective, inoperative or missing, or in violation of the rules	Pacific Electric	Patapsco & Back Rivers	Pennsylvania	Pennsylvania-Reading Seashore Lines	Peoria & Pekin Union	Philadelphia, Bethlehem & New England	Piedmont & Northern	Pittsburgh & Lake Erie	Pittsburgh & West Virginia	Portland Terminal	Reading
1	Air compressors			9								
2	Axles, truck and driving			26								
4	Axles, truck and drivingBatteries			5								
5	Boilers			5								
6	Brake equipment. Cabs and cab windows	1		165 25							1	3
8 9	Cab cards	1		23								
10	Cab floors, aprons and deck plates			125					1			5
11	Clutches											
12	Controllers, relays, circuit breakers, magnet valves and switch groups.			33		2						
13	valves and switch groups.			5								
14	Coupling and uncoupling devices			9								
16	Draft gear			14				2				i
17	Draw gear			1					1			
18	Draw gear			35								
20 22	Frames or frame braces			97								
23	Games or fittings oir	1		5					3			
24	Gages or fittings, steam			İ								
25	Fuel system Gages or fittings, air Gages or fittings, steam Gears and pinions			52					2	$\tilde{2}$		
26	nanunolus			8								
28	Inspections and tests not made as required	2		42]			2	1			1
29 30	Insulation and safety devices Internal-combustion engine defects, parts and appurtenances	1	1	309					1		11	17
32	appurtenances. Jack shafts									7-		
33	Jumpers and cable connectors			17		ļ						
35	Lateral motion, wheels			2								
36 37	Lights, can and classification	ī		4			,					
39	Lateral motion, wheels Lights, cab and classification Lights, headlight. Meters, volt and ampere											
40	Motors and generators	1 2		70								2
42	Pilots and pilot beamsPlugs and studs			3								
43 44	Plugs and studs			15								
46	Quills	- -		10								
48	Sanders.	1		66		2						
49	Springs and spring rigging, driving and truck Staybolts, broken or defective			55								1
51	Staybolts, broken or defective											
53 54	Steam pipesSteps, footboards, et cetera			18								
55	Switches, hand-operated, and fuses	-										
56	Transformers, resistors and rheostats											
57	Trucks			56		1						1
59	Water tanks			3								
60 61	Water glasses, fittings and shields			10								
62	Warning signal appliances			52				ī				1
63	Wheels Miscellaneous	2		95								4
	Number of defects	15		1, 438		5		 5	9		12	38
					<u> </u>	=	<u> </u>			_	_	
	Locomotive units reported Locomotive units inspected	42	51	2, 731	46	15 28	28	18	115	26	16	358
	Locomotive units inspectedLocomotive units defective	132	17	4, 610 488	67	28	20	37	89 4	41 1	37 5	438 10
	Percentage of inspected found defective	3.8	5. 9			10. 7		8.1	4.5		13. 5	2.3
	Locomotive units ordered out of service			18				2				1
l¹		<u> </u>	<u> </u>	1		l	l	<u> </u>				!
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found defective, and ordered out of service, et cetera—by carriers—Continued

DIRECTOR OF LOCOMOTIVE INSPECTION

Richmond, Fredericksburg & Potomac	River Terminal	Rutland	Sacramente Northern	St. Louis-San Francisco	St. Leuis Southwestern	Savannah & Atlanta	Seaboard Air Line	Soo Line	South Buffalo	Southern Pacific	Southern	Spokane International	Spokane, Portland & Seattle	Steelton & Highspire	Tennessee Central	Terminal R.R. Association of St. Louis	Texas & Pacific	Texas Mexican	Texas Pacific-Missouri Pacific Ter- minal R.R. of New Orleans	Toledo, Peoria & Western
					1		1			13	51				1		1			
- - '				3						13 7 2 10 151 46 26 198	5					i				
<u>-</u> -				3 5 49	12		<u>5</u> 8	1 6		10 151	16 199		3		2	<u>-</u>	1 7			₁
				10	12 12			6 2		46	54 5		2		$\frac{2}{3}$	7 2	9			
1				17	6		6	5		198	164				9	2	15			
1				4	10		5	2		30	51					15				
				2						16	10					2				
																3				
										27 3 7 3 132 5 8 16 19 79 14	13 1									
<u>i</u>				<u>i</u>	₁		1 1			7	15 2					<u>î</u>				
4		1		21	12	1	18 3	10		132	110		7			10	6			
										8	7 5					1				
1				14 5	21		14			16	17 23 31 30					11 3				
;	2			3	2		4	6	1	79	31					3				
14				14 5 3 2 44	35	î	4 5 45	4 6		14 466	30 318		8		<u>.</u>	14	70			
				1			4			30	11						1			1
				3	$\frac{1}{2}$					8	34		3		1	1				
				<u>i</u>						8 4 1	2									
3				9	8		4	3		31 2	82		1		1	3	9			
				3			1			2	2									
2			<u>i</u>	20	12		23	15		159	122 27		11			₁₁	17			
1				4	2	1	2			10	27		1				1			
				12			3			6	4						2			
1				3			2			25 3	$\frac{22}{1}$		4			4				
			- -		;					19	1						;			
		- -		²	4 		1	'		19	3									
				3			4			9	<u>î</u> â									
8	1	<u>1</u>		6	16 5	1	3 8	8		43 62	27 88		1		5		12			1
				11				1								6	4			
54	4	2	2	262	165	4	226	78		1, 691	1,608		43		30	105	165			3
70 190 25 13. 2	21	14 4 1 25. 0	13 30 2 6. 7	422 1, 503	147	12 16 2 12. 5 1	539 1, 288 88 6. 8	231 365 30 8. 2	43 43 1 2.3 1	2, 041 8, 104 669 8. 3 32	896 3, 331 530 15. 9 71	12	107 409	12 13	19 54 13 24. 1	101 270 55	220	19 38	11 49	15 38
25	3	1	2	1, 503 114 7. 6	490	2	1, 288	30	43 1	669	3, 331 530	4	409 24 5. 9 2	13	54 13	270 55	220 918 62	38	49	1
13. 2	5.8	2 5. 0	6.7	7.6	9.9	12.5	6.8	8.2	2.3	8.3	15.9		5.9		24. 1	20.4	6.8			2.6

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

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	Parts defective, inoperative or missing, or in violation of the rules	Toronto, Hamilton & Buffalo	Union Pacific	Union Railroad	Wabash	Washington Terminal	Western Maryland	Western Pacific	Youngstown & Northern	Roads with less than 10 locomotive units	Total
ĺ	7 7 7 7 7 7 7 7 7 7 7 7 7 7 7 7 7 7 7 7										
١	Air compressors		3							2	203
ł	Axles, truck and driving		4				_.	-			71 29
١	Boilers		5		6						190
	Brake equipment		70		_ ~ ~ I			4		46	2,658
.	Cabs and cab windows		12							18	801
١	Cab cards		10	ļ				3		9	166
١.	Cab floors, aprons and deck plates		103		24			8		11	2, 276
.	Clutches									1	4
1	Controllers, relays, circuit breakers, magnet valves		-	1	10		İ	1		12	=0.4
1	and switch groups Coupling and uncoupling devices		3					1		12	504 97
1	Current collecting apparatus		9		١						6
1	Draft gear		i		1					6	349
1	Draft gear. Draw gear Driving boxes, shoes and wedges.		1							1	123
1	Driving boxes, shoes and wedges		5							3	169
1	Frames or frame braces		4		4]		2	81
1	Fuel systemGages or fittings, air		46		16			5		21	2, 184
Ί.	Gages or fittings, steam		9							1	142 28
1	Gears and pinions		~~~~~~~~~~~~~~~~~~~~~~~~~~~~~~~~~~~~		8					2	505
١	Handholds		4		ĭ					3	181
1	Inspections and tests not made as required		15		1			3		36	685
' l	Insulation and safety devices		4		5					3	179
1	Internal-combustion engine defects, parts and ap- purtenances		251		69			55		0.4	F 000
.	Jack shafts		231		09			30		34	5, 880 1
	Jumpers and cable connectors		24		ī			1		ī	346
П	Lateral motion, wheels				1						63
П	Lateral motion, wheels Lights, cab and classification		1		4					2	151
1	Lights, headlight										19
1	Meters, volt and ampere		1 1		1 1					2	18
	Motors and generators Pilots and pilot beams		13		ീ			1		3	780 43
	Plugs and studs		ľ								40
.	Quils										17
1	Rods, main, side, and drive shafts										2
1	Sanders		98		30			3			2, 351
1	Springs and spring rigging, driving and truck Staybolts, broken or defective		10		1			2		6	397
1	Steam pipes		3								113
1	Steps, footboards, et cetera		3		اؤا						256
1	Switches, hand-operated, and fuses									·	16
1	Transformers, resistors and rheostats										ı š
1	Trucks		10		7					12	657
۱,	Water tanks				3						22
1	Water glasses, fittings and shields Warning signal appliances									4	3 127
.			7		ĺί			6		21	755
1	Miscellaneous				5			5		8	997
ı											
ĺ	Number of defects		760	1	270			98		306	24.648
	Locomotive units reported		1 071	120	910		100	175	==	1 000	91 015
1			1, 371 5, 356		312 920	25	126 306	175 623	12	1, 392	31, 917 91, 493
	Locomotive units defective		344	1	102	10	300	42	11	115	8, 702
1	Percentage of inspected found defective		6.4		11. 1			6.7		5. 5	9, 5
	Locomotive units ordered out of service		7		4					21	467
1				[Ï	"				- '

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

			- ,									
	Parts defective, inoperated or missing, or in violation of the rules	Baltimore & Ohio	Chicago, North Shore	Chicago, South Shore	Erie-Lackawanna	Illinois Central	Long Island	New York Central	New York, New Haven & Hartford	Pennsylvania	Reading	Total
1 2	Air Compressors						2 6	1		27		2 34
4 5 6	Batteries Boilers Brake equipment Cab and cab windows Cab cards Cab floors, aprons and deck plates Clutches							719				835
8 9	Cab and cab windows						27 4 2	713 6	12 1 1	80		12
10 11	Cab floors, aprons and deck plates							1 				
12	Cab floors, aprons and deck plates Clutches Controllers, relays, circuit breakers, magnet valves and switch groups Coupling and uncoupling devices Current collecting apparatus Draft gear Draw gear Driving boxes, shoes and wedges Frames or frame braces Fuel system Gages, or fittings, air Gages or fittings, steam Gears and pinions Handholds											10
13	and switch groups Coupling and uncoupling devices							15 1		1		16 2
14 16	Draft gear						27 1	70 6	1	1		99 9
17 18	Driving boxes, shoes and wedges				<u>ī</u>		2	6		8 4		16 5
20 22	Fuel system					~ -						
23 24	Gages or fittings, steam							<u>-</u>				1
25 26	Handholds Inspections and tests not made as required						7	:		4		4 11
28 29	Insulation and safety devices Internal-combustion engine defects, parts and						12	24 17	7	19		55 29
30	annrtanancas			1 1								-
32 33	Jack shafts Jumpers and cable connectors					- -		6	<u>ī</u>	3		10
35 36	Lights, cab and classification						₁	15				16
37 39	Meters, volt and ampere			!	1			1				2
40 42	Motors and generators				2		4	1	2	12		21
43 44	Jack shafts Jumpers and cable connectors Lateral motion, wheels. Lights, cab and classification. Lights, headlight. Meters, volt and ampere Motors and generators. Pilots and pilot beams. Plugs and studs. Quills. Rods, main, side, and drive shafts. Sanders. Springs and spring rigging, driving and truck. Staybolts, broken or defective. Steam pipes. Steps, footboards, et cetera Switches, hand-operated, and fuses. Transformers, resistors and rheostats. Trucks.											
46 48	Rods, main, side, and drive shaftsSanders											
49 51	Springs and spring rigging, driving and truck Staybolts, broken or defective				2		4	1	11	10		28
53 54	Steam pipesSteps, footboards, et cetera											
55 56	Switches, hand-operated, and fuses						5	15 2		<u>-</u> 5		20 7
57 59							2	7	1	50		66
60 61	Water glasses, fittings and shields Warning signal appliances											
62 63	Wheels Miscellaneous				1		1	3	3			23 5
İ	Number of defects				21		108	914	43			1, 332
	Locomotive units reported	48	138	 65	267	280	660	352	221	448	136	2,615
	Locomotive units inspected Locomotive units defective	23	12	34	14	108	684 44	665 163	22	543 91	95	2, 904 334
	Percentage of inspected found defectiveLocomotive units ordered out of service			l			6.4	24. 5 2		16. 8 8		11. 5 18
!				١ .		i			!		Ι	i