INTERSTATE COMMERCE COMMISSION

FORTY-SEVENTH ANNUAL REPORT

OF THE

DIRECTOR OF LOCOMOTIVE INSPECTION

TO THE

INTERSTATE COMMERCE COMMISSION

FISCAL YEAR ENDED JUNE 30, 1958



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ANNUAL REPORT OF THE DIRECTOR OF LOCOMOTIVE INSPECTION

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

		3	Year ended	June 30-		
	1953	1954	1955	1956	1957	1958
Number of locomotives for which reports were filed	41, 172 104, 069 10, 154 9. 8 281 30, 143	39, 270 103, 337 9, 994 9. 7 257 29, 403	36, 992 98, 025 9, 913 10. 1 223 29, 968	38, 062 97, 348 11, 107 11. 4 644 35, 560	37, 353 100, 667 9, 887 9, 8 518 26, 385	36, 905 95, 593 8, 394 8. 8 395 21, 532

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-vears 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.

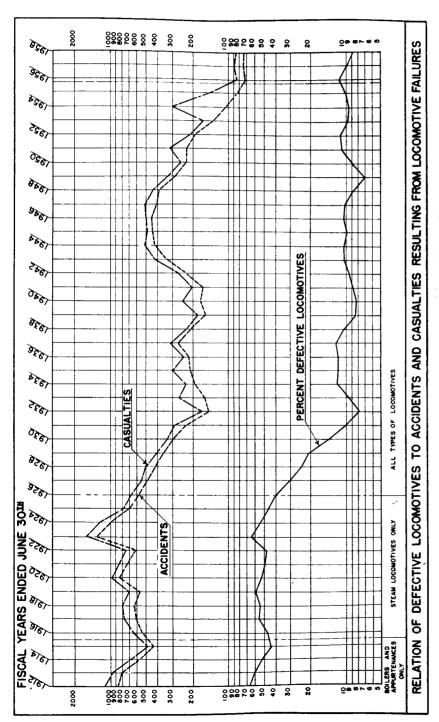
The following table provides details of accidents and casualties during the past 6 years caused by failure of some part or appurtenance of locomotives, and indicates increases or decreases in accidents and casualties.

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	1 2.7	4.0					
Number of persons killed	12	3	3	4	0	0					
Percent increase or decrease from previous year	1 200.0	75.0	0	1 33. 3	100	0					
Number of persons injured	150	302	142	79	90	86					
Percent increase or decrease from previous year	26.1	1 101.3	53.0	44. 4	1 13. 9	4.4					

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.



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—										
	19	1954 1955			19	56	19	57	19	58			
	Killed	Killed		Injured	Killed	Injured	Killed	Injured	Killed	Injured			
Members of train crews: Engineers. Fremen Brakemen Conductors Switchmen Maintenance employees Other employees Nonemployees	1	37 39 11 4 3 12 2 194	1	26 34 10 4 4 4 18 42	1 2 1	19 38 10 8 2 2		17 34 17 7 1		21 36 11 5			
Total	3 302		3	142	4	79	0	90	0	86			

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 ei	nded June	30, 1958
	Accidents	Killed	Injured
Air compressors	1		1
Axles, axle journals, and journal boxesBoller:	ī		12
Blow-off cocks	1		1
Flues and tubes including superheater, arch, and water Steam valves, piping, and blowers	1		1
Brakes and brake rigging	i		i
Cab:			_
Doors or windows	2		2
Control equipment-mechanical, electrical, pneumatic, or electro-pneu-			O
matic	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
Crankcase or air-box explosions.	8		. 8
Exhaust and cooling systems	3		3
Fuel injectors and connectionsSanders	1 2		$\frac{1}{2}$
Miscellaneous	6		7
Total	72		86

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 dereiled possenger 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):

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, Kirkville, 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:

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

**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.

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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

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

**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 ig-

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.

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

**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 inoneral	tive or missing, or in violation		Y	ear ended	June 30	-	
of	the rules	1953	1954	1955	1956	1957	1958
1 Air compressors		351	304	229	239	83	13
2 Arch tubes 3 Ashpans and mechan	dsm	5 36	24	5 17	13	1 4	1
/ A vlog		185	3 121	3 105	91		
5 Blow-off cocks 6 Boiler checks		182	158	84	70	30 26	2
7 Koller chall		94 1, 038	79 835	43	31	20	;
u (laha cah sembahawa (and curtains	354	298	636 241	565 187	256 101	8
0 Cab aprons and deck	S	179	133	100	113	22	· .
1 Cah carda	ling devices	40 30	27 22	19 11	23 17	18 8	
3 Crossheads, guides, p	istons, and piston rods	478	398	256	223	107	2
4 Crown bolts	-d stoom shorts	27 455	20 364	7 387	10 251	1.2	
5 Cylinders, saddles, a 6 Cylinder cocks and ri	nd steam chestsggings	136	132	130	116	157 54	1' 1
7 Domes and dome car	8	45	20	20	23	13	
B Draft gear Draw gear		168 108	150 79	133 69	107 57	45 23	1
Driving boxes, shoes,	wedges, pedestals, and braces.	345	258	226	250	72	2
1 Firebox sheets		55	37 32	20	25	23	
2 Flues	nd braces, locomotive	49 225	151	27 100	19 78	12 22	
Frames, tender		10	14	11	10	4	
5 Gages and gage fittin	gs, airgs, steam	61 112	47 89	42 61	40	25	8
6 Gages and gage fittin 7 Gage cocks	gs, steam	211	120	116	68 113	28 43	1.
Grate shakers and fir	e doors	121	90	107	54	34	
Handholds		196 18	146 33	110 35	112	33	
O Injectors, inoperative I Injectors and connect	ions	843	674	406	379	4 198	3
2 Inspections and tests	not made as required	53	24	26	37	24	1:
3 Lateral motion 4 Lights, cab and class	lfication	137 26	98 39	65 35	48 18	24 7	1
S LIGHTS NASCHIERLE		42	56	34	32	18	
6 Lubricators and shiel	ds	81	63	47	38	16	
7 Mud rings 8 Packing nuts		78 294	65 240	33 233	36 253	6 62	1
9 Packing, piston rod a	nd valve stem	220	154	122	106	74	
0 Pilots and pilot beau 1 Plugs and studs	ns	48 50	52 22	39 16	34 15	8 16	:
2 Reversing gear		216	170	151	108	39	ī
3 Rods, main and side,	crankpins, and collars	459	315	221	214	108	2
4 Saiety Valves 5 Sanders		19 324	15 277	22 155	17 123	9 72	
6 Springs and spring ri	gging	1,322	834	551	505	212	3:
		41	39	27	26	14	
8 Staybolts 9 Staybolts, broken		144 125	108 55	55 27	69 30	20 12	
0 Steam pipes		161	87	58	57	27	2 ¹
l Steam valves 2 Steps		68 321	69 255	33 157	21 147	7 42	
3 Tanks and tank valv	'es	466	340	269	217	99	1
4 Telltale holes		6	13	6	9	6	
5 Throttle and throttle 6 Trucks, engine and t	rigging	327 263	228 171	179 153	133 96	48 42	
7 Trucks, tender	railing	219	152	129	123	51	1
8 vaive mouon		195 138	174 79	114 73	105	55	
0 Stokers		133	55	58	83 68	39 33	
1 Water glasses, fitting	s, and shields	357	282	218	193	75	2
2 Wheels	al anniances hadge plates	151	107	94	70	39	ĺ
brakes (hand)	al appliances, badge plates,	339	263	194	166	68	
	.	12, 980	9, 763	7, 350	6, 487	2,840	59
ocomotives reported		15, 798	12, 135	8, 892	5,875	3, 868	2, 42
Locomotives inspected		28, 899	19, 999	8, 892 12, 128 1, 784	8, 794	5, 983	2,32
ocomotives defective	found defective	3, 583 12, 4	2, 599 13, 0	1,784	1, 499 17. 0	737 12. 3	15 6.
ocomotives ordered on	t of service	163	117	96	152	99	<u>"</u> وُ

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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		Y	ear endec	l June 30		
of the rules	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 Batterles	40	82	83 203	97	35 208	15
5 Bollers	103 1.698	175 2, 126	2,790	275 3, 259	2,906	172 2, 469
6 Brake equipment	679	858	1,073	1,600	1,030	962
8 Cabs and cab windows	128	135	150	183	1, 350	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	1 6	3
16 Draft gear	218	291	336	360	253	357
17 Draw gear	128	55	140 249	146 291	121 154	128
18 Driving boxes, shoes, and wedges	22	154 32	14	30	130	135
20 Frames or frame braces	1, 853	1, 951	1, 833	2, 555	2, 431	2,307
22 Fuel system 23 Gages or fittings, air	138	136	226	278	289	166
24 Gages or fittings, steam	44	56	48	60	36	58
25 Gears and pinions	13	12	27	20	10	i
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 ap-						
purtenances	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	17	5	39	14	35	46
36 Lights, cab and classification	109	232 28	198 33	352 38	260	321 32
37 Lights, headlight	42 27	40	43	58	35 34	24
39 Meters, volt and ampere	655	813	880	1, 122	671	47
40 Motors and generators		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 plpes	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	10
56 Transformers, resistors, and rheostats	439	6 503	1,054	1,007	10 552	510
57 Trucks		34	31	1,007	19	310
59 Water tanks		11	16	14	5	
61 Warning signal appliances	122	121	152	1821	154	12
62 Wheels	212	257	282	252	256	189
63 Miscellaneous	864	1,005	898		736	762
Number of defects	17, 163	19, 640	22, 618	29, 054	23, 373]	20, 668
		====				
Locomotive units reported.	25, 374	27, 135 83, 338	28, 100	29, 405	30,740	31, 75
Locomotive units inspected.	75, 170	7 205	85, 897	88, 269	93, 187	91, 52, 8, 06
Locomotive units defective Percentage of inspected found defective	6, 571	7, 395 8, 9	8, 129 9, 5	9,597	9,031 9.7	8,00
Locomotive units ordered out of service		140	127	492	417	372
Trocomposite differ of references and are a section of the section	1 110	1 120	1 -24	1 702	22.7	1 3/2

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

	Year	ended Jun	e 30
Parts defective, inoperative or missing, or in violation of the rules	1 1956	1957	1958
1 Air compressors		4	
2 Axles, truck and driving			
4 Batteries.			
5 Boilers		19	<u>-</u>
4 Batteries		10	_
9 Cab cards	1	8	1
0 Cab floors, aprons, and deck plates			į
1 Ciutches			-
1 Clutches			
3 Coupling and uncoupling devices		20	2
4 Current collecting apparatus]		•
7 Draw gear			1
8 Driving hoves shoes and wedges			
7 Draw gear 8 Driving boxes, shoes, and wedges 90 Frames or frame braces			
22 Fuel system			1
5 Gears and pinions		7	4
9 Inspections and tests not made as required	2	46	2
O Insulation and safety devices	ī	1	
5 Gears and primons. 6 Handholds. 8 Inspections and tests not made as required. 9 Insulation and safety devices. 0 Internal-combustion engine defects, parts and appurtenances.			
0 Internal-com bustion engine detects, parts and appurtenances			
3 Jumpers and cable connectors	2	5	1
5 Lateral motion, wheels			
6 Lights, cab and classification			
0 Motors rolt and ampere			
7. Lights, headlight		3	
2 Pilots and pilot beams.			
3 Plugs and studs			
6 Rods, main, side, and drive shafts			
8 Sanders		25	i
1 Storbolts broken or defective			<u></u>
6 Rods, main, side, and drive shatts 8 Sanders 9 Springs and spring rigging, driving and truck 1 Staybolts, broken or defective 8 Steam pipes			
4 Steps, footboards, et cetera			
48 Steps, 10otboards, et cetera. 5 Switches, hand-operated, and fuses. 6 Transformers, resistors, and rheostats. 7 Trucks. 9 Water tanks.		1	
6 Transformers, resistors, and rheostats	10		
7 Trucks	122	ء ا	•
1 Washing gignal appliances		i	
2 Wheels		2	
3 Miscellaneous		7	
Number of defects		172	27
•		0.7/-	0.70
Locomotive units reported	2, 782 285	2,745 1,437	2, 72 1, 74
ocomotive units inspected	285	1, 437	1, 74
Decomptive units defective	3.9	8.3	9.
Percentage of inspected found defective Locomotive units ordered out of service		°. 2	"

¹ 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 IV .-- Number of steam locomotives reported, inspected,

	Parts defective, inoperative or missing, or in violation of the rules	Atchison, Topeka & Santa Fe	Baltimore & Ohio	Canadian National	Canadian Pacific	Chicago, Burlington & Quincy	Colorado & Southern	Denver & Rio Grande Western	Duluth, Missabe & Iron Range	Fort Worth & Denver	Grand Trunk Western
1	Air compressors		2				3	1			1
2	Arch tubes	1	1	1	1]	_			1 - 1
51	Ashpans and mechanism		1 -	}							
3 4	Ashpans and mechanism]			[-	
4	Axles]							
5	Blow-off cocks			1							1
6 I	Boiler checks			1					1	1 1	1
7 1	Boiler shell								î		1 1
ġ١	Brake equipment				1			2	9		6
តា	Brake equipment		8 1		i						וייו
5 6 7 8 9	Cabs, can windows, and curtains		.		1	- -	 -		1		
ו אַיַּ	Cab aprons and decks		2						1		
11	Cab cards	- -									
12	Coupling and uncoupling devices			l							
13	Crossheads, guides, pistons, and piston rods		1	1	- 	l	1	l	1		3
14 l	Crown bolts	I		l		l			l	[
15 l	Cylinders, saddles, and steam chests	I	ا ا ـ ـ آ				l		6	1	6
16 l	Crown bolts Cylinders, saddles, and steam chests Cylinder cocks and rigging	1	1	1				- -	, ,	[5
11 12 13 14 15 16	Domes and dome caps.	l	l	l							ا ۱
18	Deaft more		i-								
:: l	Draft gear		‡			[- -			
19 20	Draw gear		1						1	1	
2U	Driving boxes, shoes, wedges, pedestals,				4		. 1	5	5		
1	and braces.	ì		l		1					
21	Firebox sheets										
22	Flues	l		l	- -						
23	Frames, tail pieces, and braces, locomotive	l		i							1
24	Frames, tender										- 1
25 I	Gages and gage fittings, air		ī								i
- N	Gages and gage fittings, steam		1 -								- 1
~	Come and gage needigs, secard										
%	Gage cocks		=-					1	3		1
28	Grate shakers and fire doors		2				1	1			
29 I	Handholds			J					1		
30 J	Injectors, inoperative										
31	injectors and connections			l	1			1	4		
32	Inspections and tests not made as required.			l	1						1
33	Lateral motion Lights, cab and classification			l	1 1			2			I
34	Lights, cab and classification				- 1			ī	1		
35	Lights, headlight						1	î	-		
36	Lubricators and shields						î	•			
37	Mud rings.						î		1		
21 22 23 24 25 26 27 28 30 31 33 33 34 35 36 37 38	Packing nuts										
30	Packing nuts		•					i	4		
40	Dilete and pilet horms							1			
41	Pilots and pilot beams. Plugs and studs.								1		
70	Donossina soos		<u>i</u> -				1	2			
41 42 43 44 45 46 47 48	Reversing gear Rods, main and side, crankpins, and collars Setety values		1				ī	1	1		1 i
20	Cofet		1					1			1
	Safety valvesSanders		:-	- -							<u>-</u> -
#5	Sanders		3		 -				1		2
<u> </u>	Springs and spring rigging		6		2		2	3	2		1
<u>47</u>	Squirt if se			- -							:l
48	Staybolts		1	- -					1	 -	
49	Staybolts, broken										
50 Í	Steam pipes	 									77 7
51	Steam valves								1		
49 50 51 52 53 54 55 56 57 58 59 60 61	Steps		1						2		3
53	Tanks and tank valves		ı ^		2					1	9
54	Telitale holes				-						
55			;-								
1 250	Throttle and throttle rigging		1					2	1	-,,	
57	Trucks, engine and trailing Trucks, tender							1	1		
26	Trucks, tender						1	1			2
<u>8</u>	Valve motion		1					1			1
8	Washout plugs								1		1
30	Stokers				 	l			3		
51	Water glasses, fittings, and shields		2					1	2		
52			2		1			î			
33	Miscellaneous-Signal appliances, badge				_ [1		5	-	1
	Miscellaneous—Signal appliances, badge plates, brakes (hand).						- 1				- 1
- 1	Number of defects		39		15		14	33	62	3	38
	Locomotives reported	87	172	=-	28	====		$=$ ${22}$			
	Topomotines increased	91		50	28	107	31		118	21	102
ı	Locomotives inspected	- -	246	1	23	17	66	68	103	7	36
- 1	Locomotives defective		12		7 30. 4		6.1	. 8	11	1	9
- 1	Percentage of inspected found defective		4.9		30.4		6.1	11.8	10.7	14.3	36 9 25.0
_ '	Lecemetives ordered out of service	l	2	ļ						1 1	1

¹ Atchison, Topeka & Santa Fe.

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

Gulf, Colorado & Santa Fe	Illinois Central	Lake Superior & Ish- peming	Minneapolis, St. Paul & S. S. Marie	New York Central	New York, Chicago & St. Louis	Norfolk & Western	Northern Pacific	Pennsylvania	Reading	Richmond, Fredericks- burg & Potomac	Southern Pacific	Union Pacific	Virginian	Roads with less than 10 locomotives	Total
								2						4	13 1
	2						1					1		3	2 9 3 85 21 7 6 3 22
	1 :					12						6		2	3
	4 2 1				1	13 2	3 1	2						3 2 31 11 3 4 2	21
	1					2								3 4	7
					1									2	3
						3		4							
- -						2 3 1 1 1 4	2 2							1 1	17 11 1 17 6 21
						į	l								1
1	1					1	3 1							10 1 2	17 6
						4								2	21
	2													2	5
						2 1 1 1		1				1		2 3 7	4
	1				- -	1		1						7	15
							4							3	8
	<u>i</u>				2	12		4			i			11 11	37
						<u>ī</u> -					1			9	12
														3 1 11 9 6 2	8 4 15 6 8 1 37 12 10 4 5 3 14 5 2
						1								3	5
														1	,š
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			- -											1	!
								1						4	11
						3		1						15 1	22 1
	- -	-,			- -	<u>2</u> -		<u>1</u> -						4 15 1 3 12	11 22 1 9 32
						1		1 3				1		1 6 2 1 7 7 1 2 4 2	6 9 5 2 20 16 1 9 5 10 7
		- -				2						1		2	5
						1	4	2						7	20
	2				1			1						7	16 1
						1 1	1					1		2	9
	1						i							4	10
				<u>-</u>				2						2	7
	2														
						3					2			8 4 1	20 7 9
						1								1	9
1	20			<u> </u>	5	67	26	28			4	12		225	592
(¹) 11 1	205	16	12	29	156	267	80	157	21	10	191	145	25		
11 1	256 10 3. 9	5			189	680 23 3. 4	44 6	165 13	14		8	56 5		329 45	2, 422 2, 324 159
9. Î	3.9				1.6	3 4	13.6	7.9		<i>-</i>	12.5	8.9		45 13. 7	6. 8 22

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

	Parts defective, inoperative or missing, or in violation of the rules	Akron, Canton & Youngstown	Aliquipps & 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 Chi-	Bessemer & Lake Erte
1 2 4 5 6 8 9 10 11 12 13 14 16	Air compressors		2		1	1	8 1 9 56 28 3 61 15		1 2 1	1 13 57 8 2 43	2 53 14 6 57	3 1	1 	3 1
17 18 20 22 23 24 25 26 28 29	Ciutches Controllers, relays, circuit breakers, magnet valves and switch groups. Coupling and uncoupling devices Current collecting apparatus Draft gear Driving boxes, shoes and wedges Pruel system Gages or fittings, air Gages or fittings, steam Gears and pinions Handholds. Inspections and tests not made as required. Insulation and safety devices Internal-combustion engine defects, parts and appurtenances.						51 5 2 15 7 81		5	1 4 4 1 35 4 1 10 2 57	8 1 40 1 2 6 8 112	1 1 2	1	
32 33 35 36 37 39 40 42 43 44 46 48	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. Pilots and pilot beams. Plugs and studs. Quills. Rods, main, side, and drive shafts. Sanders. Springs and spring rigging, driving and truck.						8 8 16 1			3 1 14 2 5 1				1
51 53 54 55 56 57 59 60 61 62 63	Springs and spring rigging, driving and truck. Staybolts, broken or defective Steam pipes						7 7 6 3			16 3 2 	15 4			
30	Number of defects Locomotive units reported Locomotive units inspected Locomotive units defective Percentage of inspected found defective. Locomotive units ordered out of service.		2 15 30 2 6.7	18 21,	9 23 47 3 6, 4	2 11 35 2 5. 7	487	14 50 3 6. 0	10 28 92 4 4.3	374 562 1,585 147 9.3	480 1, 196 4, 533 295	14 37 40 5 12. 5	55 52 2 3.8	8 64 127 5 3. 9

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

		_																			
Birmingham Southern		Butte, Anaconda & Pacific	Camas Prairie	Canadian National	Canadian Pacific	Canton	Carolina & North- western	Central of Georgia	Central Railroad of New Jersey	Central Vermont	Charleston & Western Carolina	ıke &	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 4 1 2	2 29 52 20 3 95		1	1 2 3	2 4 1 5		3	9 2 46 16 2 38	18 3 2 5	1	3	3 2 1 3	4 3		6 156 98 4 98	1	1 6 17 3 4 9	1 1 9 1	8 1 115 23 5 53		1 2 4 5 6 8 9 10 11 12
9	2 2 61 6 6 37	2	2	2	3 111 3 6	1	1	12 2 1 26 12 	1 2 4 2 13 1			3 5 	1 2 1		24 20 158 3 1 6 13 18		5	1 4 1 3	2 6 21 6 58 6 1 2 22 17		13 14 16 17 18 20 22 23 24 25 26 28
4 2	3 109		<u>î</u>	- 7	1 28		<u>i</u>	14 115	1 15			1 9	<u>-</u> 5		22 96		17	<u>-</u> 5	10 153		29 30
2	22 7 3 1 15 1 23 6		2	1	2 2 14		1 1	1 13 2 58 10	5 14 10	1 1 1	2	22	2		111 2 3 1 9 3		3 1 1 1 111 3	1 1 1 	6 3 1 7 6 37 23		32 33 35 36 37 39 40 42 43 44 46 48
8	14 5 2 28			2	2 1 13		1	17 17 1 4 12	1 1 1			7	1 1 1		32 1 32 1 1 10 9 82	-	5 1 2 3 3		25 1 3 4 39		51 53 54 55 56 57 59 60 61 62 63
22 33 7 21. 2	576 392 918 209 22, 8	38 72 2 2, 8	12 26 27. 7	459 143 13 9, 1	163 101 30 29. 7	16 20 1 5. 0	10 11 24 4 16. 7	138 585 110 18. 8	198 385 35 9.1			1, 077 2, 009 24		11 34	706 2, 089 354 16, 9	14 14 14 7.1	105 695 2, 389 76 3. 2	133 418 28 6. 7	918 2, 403 260 10. 8	27 39	
	-•								-						-						

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

	Parts defective, inoperative or missing, or in violation of the rules	Chicago, Rock Island & Pacific	Chicago South Shore & South Bend	Cincinnati Union Terminal	Clinchfield	Colorado & Southern	Colorado & Wyoming	Conemaugh & Black Lick	Cuyshoga Valley	Delaware & Hudson	Delaware, Lackawanna & Western	Denver & Rio Grande Western	Detroit & Toledo Shore Line	Detroit Terminal	Detroit, Toledo & Ironton
1	Air compressors	8 2			1	- -				1		3			
2	Axles, truck and driving Batteries	1													
řΙ	Bollers	14									<u>î</u>				
5 6 8	Brake equipment	359			5	3				īī	7	8			
8	Cabs and cab windows	83			Ιĭ	Ī				l ii	l i	l š			4
9	Cabs and cab windows	7								2		1	1		
10	Cab floors, aprons and deck plates	148				3				11	7	3			
11	Clutches	=													
12	Controllers, relays, circuit breakers,	33										3	1		
13	magnet valves and switch groups.	15	ŀ									2			
14	Current collecting apparatus	19										2			1
16	Draft gear	18			ī	2				ĩ	5	;		5	
17	Draw gear	17				·				_	š	1 -		ا آ	۷
18	Driving boxes, shoes and wedges	l i												[]	
20	Frames or frame braces	1										1			
22	Fuel system	128			1					16	34	7			
23	Gages or fittings, air	6			1					1				1	
24	Gages or nttings, steam	1													
26	Gears and pinions	3 6									8	3			
8	Inspections and tests not made as	39			6					9	4	3			4
~	required.	00			ľ					ľ	*				
29 30	Insulation and safety devices	14 174			2	1 6				94	1 34	13		3	
32	Jack shafts														
33	Jumpers and cahle connectors	16										1			
35	Lateral motion, wheels Lights, cab and classification														
36	Lights, cab and classification	5													
37	Lights, headlight	3													
19 10	Meters, volt and ampere	52 52				2				<u>-</u> 2					
12	Pilots and pilot beams	1 1				_					*	_			
13	Plugs and studs														
14	Quills														
16	Rods, main, side, and drive shafts	1													
18	Sanders	208			1	3				10	27	4	1		2
19	Springs and spring rigging, driving and truck.	13								1	1		1		
51	Staybolts, broken or defective	١.				'									
اقت	Steam pipes	29								ī		1			
3	Steam pipes Steps, footboards, et cetera	18			2					2	1	2			2
55 I	Switches, hand-operated, and fuses	1													
56 57 59	Transformers, resistors and rheostats.	57									:				
ا ۵ <u>۵</u>	Trucks	34								1	1	2			
őΙ	Water glasses, fittings and shields	1													
80 81	Warning signal appliances	9			2										
32	Wheels	9								1	3				
ا عر		50								2	4	1			2
เรื	Miscellaneous	1 00						-		177	146	61			18
3	Miscelianeous	1, 533	_	===	23	21	==	==	<u>== </u>		≖		-4	6	
3	Number of defects Locomotive units reported	1, 533	17	14	=== 66	40	20	 28	 11	162	224	254		13	49
3	Number of defects Locomotive units reported Locomotive units inspected	1, 533 540 2, 704	17 39	14 15	66 256	40 295	20 59	28 56	11 8	162 771	224 582	254 1, 571	41	13 22	49 129
3	Number of defects Locomotive units reported Locomotive units inspected Locomotive units defective	1, 533 540 2, 704 563		14 15	66 256 15	40 295 6			11 8	162 771 78	224 582 32	254 1, 571 28	41 1	13 22 2	49 129
3	Number of defects. Locomotive units reported. Locomotive units inspected. Locomotive units defective. Percentage of inspected found defec-	1, 533 540 2, 704		14 15	66 256	40 295			11 8	162 771	224 582	254 1, 571	41	13 22	49
33	Number of defects Locomotive units reported Locomotive units inspected Locomotive units defective	1, 533 540 2, 704 563		14 15	66 256 15	40 295 6			11 8	162 771 78	224 582 32	254 1, 571 28	41 1	13 22 2	49 129

¹ Atchison, Topeka & Santa Fe.

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

Donora Southern	Duluth, Missabe & Iron Range	Duluth, South Shore & Atlantic	Elgin, Jollet & Eastern	Erio	Florida East Coast	Fort Dodge, Des Moines	Fort 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	
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13 12	80 111	65	144 112 13 11. 6	493 1, 512 69	110 298 17 5. 7	10 38 2 5.3	45 183 11 6. 0	12 38 9 23. 7	31 106	144 317 41 12. 9	673 1, 624 163 10. 0	17 46 2 4. 3	(1) 578 12 2. 1	257 992 86 8. 7	22 85 1 1, 2	595 2, 036 58 2. 8	37 50 3 6.0	128 158 13 8. 2	12 56	10 44 2 4.5	10 22	:
	0.9	10. 8	11.6	4.6	5.7	5.3	6.0	23. 7	3.8	12.9	10.0	4.3	2.1	8.7	1.2	2.8	6.0	8. 2		4.5		
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Table V.-Number of locomotive units other than steam reported, inspected,

	Parts defective, inoperative or missing, or in violation of the rules	Kansas City Southern	Kansas City Terminal	Kansas, Oklahoma & Gulf	Kentucky & Indiana Terminal	Lake Superior & Ish- peming	Lake Terminal	Lehigh & Hudson River	Lehigh & New England	Lehigh Valley	Long Island	Louisiana & Arkansas	Louisville & Nashville	Maine Central
1 2 4 5	Air compressorsAxles, truck and driving	2								2	1		13	
4	Batteries													
	Boilers	1											2	1
6	Brake equipment Cabs and cab windows	27		1			2 2			18		21	79	14
8	Cab cards							'		4	i	*	51 1	3
0	Cab floors, aprons and deck plates	12		1				2	2	8		2	35	4
$\frac{1}{2}$	Controllers release circuit basebase	6								<u>-</u>				
ا ''	Controllers, relays, circuit breakers, magnet valves and switch groups.	٥		~						2	1		4	
3	Coupling and uncoupling devices	1						l					6	
4	Current collecting apparatus													
6	Draft gear	2								2			15	
7 8	Draw gear	1						1					7	
ŏ	Driving boxes, shoes and wedges Frames or frame braces												3	
2	Fuel system	10		2				2	4	19	i	1	87	2
3	Gages or fittings, air Gages or fittings, steam	3		<u>-</u>									8	ī
5	Gages or littings, steamGears and pinions											1	2	
ĕ	Handholds												10	
š	Inspections and tests not made as					1				2			10	3
. [required.	_								_				1
9	Insulation and safety devices	3 13						<u>-</u>	;	::			11	1 3
ויי	Internal-combustion engine defects, parts and appurtenances.	19						7	1	17		8	71	3
2	Jack shafts							l	:				!!	
3 5	Jumpers and cable connectors	4										3	1	
5	Lateral motion, wheels									8				
<u> 6</u>	Lateral motion, wheels Lights, cab and classification Lights, headlight	1											18	1
7	Meters, volt and ampere		<u>-</u> ī										1 1	
ŏΙ	Meters, volt and ampere Motors and generators Pilots and pilot beams	1								2			7	
2	Pilots and pilot beams													
3 4	Plugs and studsQuills													
å	Quills									1				
š	Sanders	24		3			<u>2</u>	13		22		8	105	2
9	Springs and spring rigging, driving									6	2		12	ĩ
,	and truck.				1	3					i			
3	Staybolts, broken or defective Steam pipes	i		~										
4 5	Steps, footboards, et cetera	3								i	_i	4	1 14	
5	Steps, footboards, et cetera													
6	Transformers, resistors and rheostats	<u>-</u> 2												
áΙ	Trucks	Z								12	1	3	22	3
ĎΙ	Water glasses, fittings and shields												1	
1	Water glasses, fittings and shields Warning signal appliances	2											6	
2	W Deers	2											11	
ا ٥	Miscellaneous	3								10			16	
-	Number of defects	129	1	7		1	6	25	7	136	10	52	631	39
		_	_		<u> </u>								201	
J	Locomotive units reported	152	17	15	23	15	22	13	32	225	80	17	732	80
-1	Locomotive units inspected Locomotive units defective	576 47	43 1	53	37	33	31	46		1,029	79	168		153
-1	Percentage of inspected found defec-	8. 2	2.3	5.7		3.0	9 7	5 10. 9	4.1	55 5. 3	3 8	21 12. 5	187	16 10. 5
	tive.		3	~ '		٥. ٧	٠. ۱	-0. 8	Z. 1	0.0	٥. ٥	-2.0	1.0	10.0
J	Locomotive units ordered out of	3]								1		15	1
Į	service.		ı								- [
			!		!	!					!			\

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

Minneapolis & St. Louis	Minneapolis, Northfield & Southern	Minneapolis, St. Paul & S. S. Marie	Minnesota Transfer	Mississippi Central	Missouri-Illinois	Missouri-Kansas-Texas	Missouri Pacifio	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	
15		 5 2			 2	3 2 68 39 3 81	3 1 51 14	3			 			24 11 1 15 199	 6 2	5 10 1 25 74 25			 1 10	 1	36	1 2 4 5 6 8 9 10 11 12
1		<u>2</u> 			1	8	138 138 			1 1 		 1		15 199 115 11 187 2 19	$\begin{bmatrix} -\frac{2}{2} \\ -\frac{3}{3} \end{bmatrix}$	25 6 104 			1 3 	<u>2</u>	36 13 1 3 13	
i		 1	2 		<u>2</u>	11 10 17 1	2 9 1							35 30 22	1	14 2 8				 1 	5 1 4	13 14 16 17 18 20 22 23 24 25 26 28
1 2 3		 1				73 2 1 13	100 1 4 16	 1		 1		1 		233 11 5 29 47	10 1 1 3	175 12 6 1 2 23	 1		 1 3		25 2 1 8	23 24 25 26 28
8		3				4 106	5 176	4		<u>î</u>				11 297	1 2	12 267	1		<u>-</u> 1	1 3	2 48	29 30 32
		 				23 4 5	10 					1		37 6 13		28 7 9 			1 		3 2 3	33 35 36 37 39
		 2				24 1	15				 			95 2 322	34	43 75					2 2	32 33 35 36 37 39 40 42 43 44 46 48
i						129 33 6 10	5 4 5							33 15 24	 1	75 10 					22 13	
2		1 				20	10 10 19			 	 			55 55	1 	39 5					14	51 53 54 55 56 57 59 60 61 62 63
1 1 47		2 27	2		7	2 7 17 724	26 	4 15	3 3 ===	5		8		16 17 65 2, 028	69	4 13 1,046	3		24	1 11	3 20 251	62 63
75 200 19 9. 5	11 41	212 618 14 2, 3	18 24 1 4. 2	10 32	15 44 4 9.1	232 884 278 31. 4		33 52 10 19. 2	27 66 2 3, 0	57 253 4 1.6	14 18	13 30 2 6. 7	18 31	2, 122 6, 465 847 13. 1	362 855 24 2, 8	1	24 15 1 6. 7	15 12 	212 479 17 3. 5	34 105 6 5. 7		
1		2				27	22		2					26	4	12			4		7	

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

	Parts defective, inoperative or missing, or in violation of the rules	Northern Pacific Terminal	Northwestern Pacific	Pacific Electric	Patapsco & Back Rivers	Pennsylvania	Pennsylvania-Reading Seashore Lines	Peorts & Pekin Union	Philadelphia, Bethle- hem & New England	Piedmont & Northern	Pittsburgh & Lake Erie	Pittsburgh & West Virginia	Portland Terminal
1	Air compressorsAxles, truck and driving				- -	15 17							
1	Batteries												
?	BoilersBrake equipment					2	- -						
3	Cabs and cab windows	2	6	4		122		1			5		1
3	Cab cards.					66 5		- -			9		
ĭ	Cab floors aprons and deck plates					176	<u>-</u> i						
íl	Cab floors, aprons and deck plates Clutches		_ ^	*		170						1 -	
2	Controllers, relays, circuit breakers,					20					1		<u>1</u>
	Controllers, relays, circuit breakers, magnet valves and switch groups.												1
3	Coupling and uncoupling devices					18	!					l	
ı	Current collecting apparatus					3							
3	Draft gear					24							
7	Draw gear	1				1							
3	Driving boxes, shoes and wedges Frames or frame braces					22							~- -
וי	Frames or frame braces					5							
3	Fuel system		1	2		136					7	2	
!	Gages or fittings, air.					5						[]	1
: 1	Gages or ittings, steam					3						iI	
:	Gages or fittings, steam Gears and pinions Handholds					24						[
í	Inspections and tests not made as re-	4	36			43	***			<u>i</u>	1	니침	- -
'	quired.	}	90			40				1	1	2	
9	Insulation and safety devices	3				12							2
, ו	Internal-combustion engine defects,		3	1		261					8		1
	parts and appurtenances.		3	1		201					8		1
2	parts and appurtenances. Jack shafts										8		1
2	parts and appurtenances. Jack shafts Jumpers and cable connectors					46							
2	parts and appurtenances. Jack shafts Jumpers and cable connectors					46 5					8		1
2	parts and appurtenances. Jack shafts Jumpers and cable connectors		6			46 5 11					8		1
200	parts and appurtenances. Jack shafts Jumpers and cable connectors		6			46 5					8		1
22000	parts and appurtenances. Jack shafts Jumpers and cable connectors		6			46 5 11 1					8		1
28666	parts and appurtenances. Jack shafts Jumpers and cable connectors		6	1		46 5 11 1					8		1
2000.	parts and appurtenances. Jack shafts Jumpers and cable connectors. Lateral motion, wheels. Lights, cab and classification Lights, headlight. Meters, voit and ampere. Motors and generators. Pilots and pilot beams. Pilus and studs.		6			46 5 11 1					8		1
200000000000000000000000000000000000000	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.		6			46 5 11 1					8		1
200000000000000000000000000000000000000	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.		6			46 5 11 1 1 51 3							1
2855	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. Pilugs and studs. Quills. Rods, main, side, and drive shafts. Sanders.	1:	6	1		46 5 11 1 51 3 32	2				9		1
2355	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	1:	6	1		46 5 11 1 1 51 3	2						1
2855700284589	parts and appurtenances. Jack shafts Jumpers and cable connectors. Lateral motion, wheels. Lights, cab and classification Lights, headlight. Meters, voit and ampere. Motors and generators. Pilots and pilot beams. Pilugs and studs. Quills. Rods, main, side, and drive shafts. Sanders. Springs and spring rigging, driving and truck.	1	6	1		46 5 11 1 51 3 32	2				9		1
	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.	1	6	1		46 5 11 1 51 3 32	2				9		1
	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.	1	6	1		46 5 11 1 51 3 32	2			2	9		1
	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.	1	6	1		466 55 111 1 1 511 33 322 1922 25	2			2	9		1
	parts and appurtenances. Jack shafts Jumpers and cable connectors. Lateral motion, wheels. Lights, cab and classification Lights, headlight Meters, voit and ampere Motors and generators. Pilots and pilot beams. Pilots and pilot beams. Pilots 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 freostats.	1	6	1		466 55 111 1 1 511 33 322 1922 25	2			2	9		1
	parts and appurtenances. Jack shafts Jumpers and cable connectors. Lateral motion, wheels. Lights, cab and classification. Lights, headlight. Meters, voit and ampere. Motors and generators. Pilots and pilot beams. Pilots and pilot beams. Pilots 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.	1	6	1		466 55 111 1 1 511 33 322 1922 25	2			2	9		1
	parts and appurtenances. Jack shafts Jumpers and cable connectors. Lateral motion, wheels. Lights, cab and classification Lights, headlight Meters, voit and ampere Motors and generators. Pilots and pilot beams. Pilots and pilot beams. Pilots 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. Water tanks	1	6	1		466 55 111 1 1 511 33 322 1922 25	2			2	9		1
	parts and appurtenances. Jack shafts Jumpers and cable connectors. Lateral motion, wheels. Lights, cab and classification Lights, headlight Meters, voit and ampere Motors and generators. Pilots and pilot beams. Pilots and pilot beams. Pilots 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. Water tanks	1	6	1		466 55 111 1 1 511 3 3 2 25 25 4 18 422 2 2	2			2	9		1
	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. Pilots and pilot beams. Pilots and studs. Quilis. 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. Water glasses, fittings and shields. Warning signal appliances.	1	6	1		466 55 111 1 1 1 51 3 32 25 4 188 22 2 2 1 12 13 3 13				2	9 1		1
	parts and appurtenances. Jack shafts Jumpers and cable connectors. Lateral motion, wheels. Lights, cab and classification Lights, headlight. Meters, voit and ampere. Motors and generators. Pilots and pilot beams. Pilots and pilot beams. Pilots and studs. Quills. Rods, main, side, and drive shafts. Sanders. Springs and spring rigging, driving and truck. Staybolts, broken or defective. Steam pipes. Steps, lootboards, et cetera. Switches, hand-operated, and fuses. Trucks. Water tanks. Water tanks. Water tanks. Water glasses, fittings and shields. Warning signal appliances.	1	6	1		466 55 111 1 1 1 511 3 3 22 25 4 4 18 8 2 2 2 2 13 19 19 19 19 19 19 19 19 19 19 19 19 19				2	9	2	1
	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. Pilots and pilot beams. Pilots and studs. Quilis. 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. Water glasses, fittings and shields. Warning signal appliances.	1	6	1		466 55 111 1 1 1 511 3 3 22 25 4 4 18 8 2 2 2 2 13 19 19 19 19 19 19 19 19 19 19 19 19 19				2	9 1		1
	parts and appurtenances. Jack shafts Jumpers and cable connectors. Lateral motion, wheels. Lights, cab and classification Lights, headlight. Meters, voit and ampere. Motors and generators. Pilots and pilot beams. Pilots and pilot beams. Pilots and studs. Quills. Rods, main, side, and drive shafts. Sanders. Springs and spring rigging, driving and truck. Staybolts, broken or defective. Steam pipes. Steps, lootboards, et cetera. Switches, hand-operated, and fuses. Trucks. Water tanks. Water tanks. Water tanks. Water glasses, fittings and shields. Warning signal appliances.	1	6	1 1 10		466 55 111 1 1 1 511 3 3 22 25 4 4 18 8 2 2 2 2 13 19 19 19 19 19 19 19 19 19 19 19 19 19				2	9 1	2	1
	parts and appurtenances. Jack shafts Jumpers and cable connectors. Lateral motion, wheels. Lights, cab and classification Lights, headlight. Meters, voit and ampere. Motors and generators. Pilots and pilot beams. Pilots and pilot beams. Pilots and studs. Quills. Rods, main, side, and drive shafts. Sanders. Springs and spring rigging, driving and truck. Staybolts, broken or defective. Steam pipes. Steen, lootboards, et cetera. Switches, hand-operated, and fuses. Trucks. Water tanks. Water tanks. Water tanks. Water glasses, fittings and shields. Warning signal appliances. Wheels. Miscellaneous. Number of defects. Locomotive units reported.	1	1 55	1	46	466 55 111 1 1 1 1 511 3 3 2 25 25 1 18 2 2 2 1 1 4 4 2 2 2 2 2 2 2 2 2 2 2 2 2	3 48		588	4	9 1 1	-	1 1 7 7 7 17 17 17
	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. Pilots and spilot beams. Pilots and studs. Quilis. 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. Water glasses, fittings and shields. Warning signal appliances. Wheels. Miscellaneous. Locomotive units reported. Locomotive units reported.	1	55 35	1 10	46 27	466 55 111 1 1 1 1 511 3 3 2 25 25 1 18 2 2 2 1 1 4 4 2 2 2 2 2 2 2 2 2 2 2 2 2	3 48		588	4 18 64	9 1 1 2 3 3 47 138	27	1 1 1 1 1 1 1 1 1 1 1 1 1 1 1 1 1 1 1 1
	parts and appurtenances. Jack shafts. Jumpers and cable connectors. Lateral motion, wheels. Lights, cab and classification Lights, headlight. Meters, voit and ampere. Motors and generators. Pilots and pilot beams. Pilots and pilot beams. Pilots and studs. Quills. Rods, main, side, and drive shafts. Sanders. Springs and studs. Springs and struck. Staybolts, broken or defective. Steam pipes. Steps, footboards, et cetera. Switches, band-operated, and fuses. Transformers, resistors and rheostats. Trucks. Water glasses, fittings and shields. Warning signal appliances. Wheels. Miscellaneous. Number of defects. Locomotive units reported. Locomotive units defective.	8 8 16 322 5 5	66 	1 1 10 46 37 8		460 55 111 1 1 1 1 1 1 1 1 1 1 1 1 1 1 1 1	3 48 110	15 23 1	558	4 18 64	9 1 1 2 2 3 3 47 47 138 235 26	27 94 6	22 3
	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. Transformers, resistors and rheostats. Trucks. Water tanks. Water tanks. Water glasses, fittings and shields. Warning signal appliances. Wheels. Miscellaneous. Number of defects. Locomotive units reported. Locomotive units inspected. Locomotive units defective. Percentage of inspected found defective.	8 16 32	6	1 1 10 46 37 8		46 5 11 1 1 1 51 3 32 25 25 14 48 2 2 2 1 13 19 40 1,489 2 7,710 6,633 8,8 9,8 8 9,8	3 48 110	15 23	58	4 18	9 1 1 1 2 2 3 3 47 7 1388 235 235	27 94	22
	parts and appurtenances. Jack shafts. Jumpers and cable connectors. Lateral motion, wheels. Lights, cab and classification Lights, headlight. Meters, voit and ampere. Motors and generators. Pilots and pilot beams. Pilots and pilot beams. Pilots and studs. Quills. Rods, main, side, and drive shafts. Sanders. Springs and studs. Springs and struck. Staybolts, broken or defective. Steam pipes. Steps, footboards, et cetera. Switches, band-operated, and fuses. Transformers, resistors and rheostats. Trucks. Water glasses, fittings and shields. Warning signal appliances. Wheels. Miscellaneous. Number of defects. Locomotive units reported. Locomotive units defective.	8 8 16 322 5 5	66 	1 1 10 46 37 8		460 55 111 1 1 1 1 1 1 1 1 1 1 1 1 1 1 1 1	3 48 110	15 23 1	58 13	4 18 64	9 1 1 2 2 3 3 47 47 138 235 26	27 94 6	22 3
	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. Transformers, resistors and rheostats. Trucks. Water tanks. Water tanks. Water glasses, fittings and shields. Warning signal appliances. Wheels. Miscellaneous. Number of defects. Locomotive units reported. Locomotive units inspected. Locomotive units defective. Percentage of inspected found defective.	8 8 16 322 5 5	66 	1 1 10 46 37 8		46 5 11 1 1 1 51 3 32 25 25 14 48 2 2 2 1 13 19 40 1,489 2 7,710 6,633 8,8 9,8 8 9,8	3 48 110	15 23 1	588	4 18 64	9 1 1 2 2 3 3 47 47 138 235 26	27 94 6	22 3

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

Reading	Richmond, Fredericks- burg & Potomac	River Terminal	Rutland	Sacramento Northern	St. Louis-San Fran- cisco	St. Louis Southwestern	Savannah & Atlanta	Seaboard Air Line	South Buffalo	Southern Pacific	Southern	Spokane International	Spokane, Portland & Seattle	Steelton & Highspire	Tennessee Central	Terminal R. R. Association of St. Louis	Texas & New Orleans	Texas & Pacific	Texas Mexican	
1 3	2			3 1	14 73 28	7 1 1 2		13 2 4 14		23 2 1 1 102 59 12 195	27 4 13 113 40 3 82	1	15 3		4 4 1 4	5 2	2 14 3	1 3 4		1 2 4 5 6 8 9 10 11 12
2			2	2	1 3 1 1 115	1 1 1		1 7 2 1		17 9 36 1 125	9 3 20 2 6		3 1 5 1 1		3 1	8	1 1	2		12 13 14 16 17 18 20 22 23 24 25 26 28
2	3		5		1 20 203	1 1 1		1 1 1 3 16		1 125 21 4 9 52 18 271	9 7 12 21		2 5		2 4	1 1 1 2	 1	1 1 2		23 24 25 26 28 29 30
	 1				21 8			8		1 15 4 87 1 23 3	31 		2 6 1 1		2 4		1			32 33 35 36 37 39 40 42 43 44 46 48
1 1	1				38 8	7 3		20 2		113 2	69 17	1	7 19		1 1	4	13	9		
3			i	1	9 3 7 1 18	2 1		9		24 3 6 1 6 3 58	4		1 4 12		1 1		3	1		51 53 54 55 56 57 59 60 61 62 63
368 972 8 0.8	70 121 13 10. 7	19 29	10 15 83 6 7. 2	10 13 18 3 16. 7	647 422 1, 537 165 10. 7 6	122 556 27 4. 9	11 24	139 523 1, 170 64 5. 5	60 107	1, 309 1, 564 4, 736 608 12. 8	816 895 2, 849 269 9. 4 21	12 15 15 6.7	140 106 431 53 12. 3	23 15	21 98 20 20, 4 4	107 158 16 10. 1	357 760 24 3. 2	27 209 687 16 2. 3	18 7	

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

· · · · · · · · · · · · · · · · · · ·															
Parts defective, inoperative or missing, or in violation of the rules	Texas Pacific-Missouri Pacific Ter- minal Railroad of New Orleans	Toledo, Peorla & 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	
ers, magnet valves and switch			-	9 3 6 44 16 5 77	<u>-</u>			1 15 13					77 29 19 22	232 59 15 172 2, 469 962 145 2, 020 2 348	1 2 4 5 6 8 9 10 11 12
groups. Coupling and uncoupling devices. Current collecting apparatus. Draft gear. Draw gear. Driving boxes, shoes and wedges. Frames or frame braces. Fruel system. Gages or fittings, air. Gages or fittings, steam. Gears and pinions. Handholds.				75 7 5 5 3	2	 3		7 1			1 8 1		25 2 1 13 6	132 3 357 128 135 17 2, 307 166 58 19 217 623	13 14 16 17 18 20 22 23 24 25 26 28
required. Insulation and safety devices Internal-combustion engine de-				5 247	1 1		.				4 36	1 1	10 60	228 3, 817	29 30
lects, parts and appur chances. 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.				16 8 8							10 2		1 2 2 2 5 2	306 46 321 32 24 472 41	32 33 35 36 37 39 40 42 43 44
Quills Rods, main, side, and drive shafts. Sanders Springs and spring rigging, driving				50 7		 1		 5			17		53 5	32 1 2, 310 380	44 46 48 49
Staybolts, broken or defective				2 6				1 1		 	 1		22 1	141 292 16	51 53 54 55
Transformers, resistors and rheo-														2	56
Trucks				7 1 1	 <u>-</u> 3					'	1 1	 	22	31 4 124 189	62
Number of defects		1			 	6	3	115			133	4			<u>~</u>
Locomotive units reported Locomotive units inspected Locomotive units defective Percentage of inspected found de-	10 20	15 19 1	1	1, 201 4, 543 326	135 121 10	49 2	160 1	300 990 38			70	16 3	2,081	91, 522 8, 067	
fective. Locomotive units ordered out of service.				2	2			1			1		24	372	
	Air compressors. Axles, truck and driving. Batterles. Bollers. Brake equipment. Cabs and cab windows. Cab cards. Controllers, relays, circuit breakers, magnet valves and switch groups. Coupling and uncoupling devices. Current collecting apparatus. Dratt gear. Draw gear. Draw gear. Draw gear. Gages or fittings, steam. Gages or fittings, steam. Gages or fittings, steam. Gears and pintions. Handholds. Inspections and tests not made as required. Insulation and safety devices. Internal-combustion engine defects, parts and appurtenances. Jumpers and cable connectors. Lateral motion, wheels. Lights, cab and classification. Lights, headlight. Meters, volt and ampere. Motors and generators. Pilots and pilot beams. Pilots and pilot beams. Pilots and spind beams. Pilots and spind beams. Pilots and spind beams. Pilots, headlight. Rods, main, side, and drive shafts. Sanders. Svitches, hand-operated, and fuses. Transformers, resistors and rheostats. Trucks. Water tanks. Water tanks. Water tanks. Water glasses, fittings and shields. Warning signal appliances. Number of defects. Locomotive units reported. Locomotive units inspected. Locomotive units ordered out of	Air compressors	Air compressors. Axles, truck and driving. Batterles. Bollers. Brake equipment. Cabs and cab windows. Cab cards. Cab cards. Controllers, relays, circuit breakers, magnet valves and switch groups. Coupling and uncoupling devices. Current collecting apparatus. Dratt gear. Draw gear. Draw gear. Draw gear. Draw gear. Driving boxes, shoes and wedges. Frames or frame braces. Franes or fittings, sir. Gages or fittings, sir. Gages or fittings, steam. Gears and pinions. Handholds. 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, headlight. Meters, volt and ampere. Motors and generators. Pilots and pilot beams. Pilugs and studs. Quills. Rods, main, side, and drive shafts. Sanders. Switches, hand-operated, and fuses. Transformers, resistors and rheostats. Trucks. Water tanks. Occomotive units reported. Locomotive units inspected. 10 15 Locomotive units ordered out of	Air compressors. Axles, truck and driving. Batteries. Bollers. Brake equipment. Cabs and cab windows. Cab cards. Controllers, relays, circuit breakers, magnet valves and switch groups. Coupling and uncoupling devices. Current collecting apparatus. Dratt gear. Draw gear. Draw gear. Driving boxes, shoes and wedges. Frames or frame braces. Franes or fittings, air. Gages or fittings, air. Gages or fittings, steam. Gears and pinions. Handholds. 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, headlight. Meters, volt and ampere. Motors and generators. Pilots and pilot beams. Pilots, coboards, at cetera. Switches, hand-operated, and fuses. Transformers, resistors and rheostats. Trucks. Water tanks. Water tanks. Water tanks. Water glasses, fittings and shields. Warning signal appliances. Number of defects	Air compressors	Air compressors 9 Axles, truck and driving 3 Batteries 6 Bollers 6 Brake equipment 44 Cabs and cab windows 16 Cab floors, aprons and deck plates 1 Chitches 5 Controllers, relays, circuit breakers, magnet valves and switch groups. 22 Coupling and uncoupling devices 6 Current collecting apparatus 10 Dratt gear 10 Draw gear 3 Frames or frame braces 75 Frames or fittings, sterm 75 Gages or fittings, sterm 75 Gages or fittings, steam 5 Gears and pintions 5 Handholds 3 Inspections and tests not made as 11 <	Air compressors	Air compressors	Afr compressors	Arl compressors	Ari compressors. Axies, truck and driving. Batteries. Bollers. Gab sand cab windows. Cab and cab windows. Cab floors, aprons and deck plates. Colations. Controllers, relays, drenit break ers, magnet valves and switch groups. Courtollers, relays, drenit break ers, magnet valves and switch groups. Courtollers, relays, drenit break ers, magnet valves and switch groups. Courtollers, relays, drenit break ers, magnet valves and switch groups. Couring and uncoupling devices. Current collecting apparatus. Draw gear. Draw gear. 10 Draw gear. 3 Driving boxes, shoes and wedges. Frames or frame braces. Frew system. Gages or fittings, steam. Gages or fittings, steam. Gages or fittings, steam. Gages or fittings, steam. Gages or floor should be should be should be feets, parts and appurtenances. Jack shafts. Jumpers and cable connectors. Lateral motion, wheels. Lights, cab and classification. Lights, paddight. Moters, volt and ampere. Motors and generators. Pilos and pilot beams. Pilos and plot beams. Pilos and shuds. Quills. Rods, main, side, and drive shafts. Sanders. Springs and syring rigging, driving and truck. Stay bolts, broken or defective. Steam pipes. A common status. Trucks. Trucks. Number of defects. N	Arl compressors. Arles, truck and driving. Batterles. Botlers. 6 Brake equipment. Cabs and cab windows. 16 Cab cards. Cab floors, aprons and deek plates. Clitches. Controllers, relays, circuit breakers, magnet valves and switch groups. Coupling and uncoupling devices. Current collecting apparatus. Draff gear. Draw gear. Draw gear. Draw gear. Puel system. 76 Gages or fittings, steam. Gears and pintons. Handholds. Bandholds. Bandholds.	Arl compressors. Arles, truck and driving. Batteries. Botlers Brake equipment. Cab and cab windows. 16 1 1 5 12 2 Cabs and cab windows. 16 1 1 5 12 2 Cab cards. Cab cards. Cab cards. Cab cards. Coat floors, aprons and deek plates. 1 77 2 1 13 16 Clutches. Controllers, relays, circuit breakers, magnet valves and switch groups. Coupling and uncoupling devices. Courrent collecting apparatus. Draft gear. Puel system. Gages of fittings, steam. Gages of fittings and spurtenances. Jack shafts. Jumpers and cable connectors. Lateral motion, wheels. Lights, leadilght. Motors and generators. Jumpers and cable connectors. Lights, cab and classification. Rateral motion, wheels. Lights, cab and classificatio	Arl compressors Axles, truck and driving Batteries Botlers Brake equipment Cabs and cab windows. 16 10 27 18 27 27 28 28 27 28 28 29 20 20 20 20 20 20 20 20 20 20 20 20 20	Arl compressors. Arles, truck and driving

DIRECTOR OF LOCOMOTIVE INSPECTION

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

_	Parts defective, inoperative or missing, or in violation of the rules	Baltimore & Obio	Chicago North Shore & Milwaukee	Chicago South Shore	Delaware, Lackawanna & Western	Illinois Central	Long Island	New York Central	New York, New Haven & Hartford	Pennsylvania	Reading	Total	
<u>ı</u>	Air compressors	- -					$\frac{1}{2}$		1 1	3		2 8	
2 4	Axles, truck and driving												
5	Boilers												
8	Brake equipment Cabs and cab windows Cab cards				3		2	16	1	1		23 2	
8	Cab cards				5		1	4	3			13	
0	Cab floors, aprons and deck plates						'	1				1	1
1	Clutches											ī	1 1
2	Controllers, relays, circuit breakers, magnet valves and switch groups.											- 1	۱ ٔ
3	Counling and uncounling devices												1
١	Current collecting apparatus						11	12		2		25 1	1 1
3	Draft gear				- -		1	ā				9	1
۱	Driving boxes, shoes and wedges				2							2	1
	Driving boxes, shoes and wedges Frames or frame braces							- -					2
1	Fuel systemGages or fittings, air							- -				1	2 2
1	Gages or fittings, steam												12
1	Gages or fittings, steam Gears and pinions												2 2
1	Handbolds			-	28		6	4 5	1	6		45 22	2
1	Inspections and tests not made as required.				2		2	٥	10	3		22	1
١	Insulation and safety devices												2
١	Internal-combustion engine defects,												3
1	parts and appurtenances.									ľ			3
	Jack shafts Jumpers and cable connectors								ii	2		3	3
1	Lateral motion, wheels												3
	Lights, cab and classification												3
1	Meters volt and amnere												3
1	Motors and generators												4
	Pilots and pilot beams												4
١	Jumpers and cable connectors. Lateral motion, wheels. Lights, eab and classification. Lights, headlight. Meters, volt and ampere. Motors and generators. Pluts and pilot beams. Plugs and studs. Quills.							- -					4
١													4
ļ	Rods, main, side, and drive shafts Sanders												4
1	Springs and spring rigging, driving and truck.				7	- -		1	1	1		10	4
ļ	staybolts, broken or defective				L			L	L		l		5
١	Steam pipes												5
١	Steps, footboards, et cetera												5 5
ı	Switches, hand-operated, and fuses. Transformers, resistors and rheo-									- -			5
	stats.												
Ì	Trucks				- -		3	5		90		98	5 8
	Water tanks								-	 -			8
	Warning signal appliances												lθ
	Wheels							;		- -	- -		1 6
ļ	Miscellaneous				4		1	1				6	١۴
	Number of defects		1		52		31	58	20	108	2	272	
	Locomotive units reported	55 27	142	65 37	281 262	280 132	714 216	371 268	227 99	457 441	136 161	2, 728 1, 747	
	Locomotive units inspected Locomotive units defective		104	31	37	192	14	200 41	13		101	168	
	Percentage of inspected found de-		1.0		14.1		6.5	15.3	13, 1	13.8	0.6	9.6	
	fective.		1	l	ŀ	Ι ΄	1		l			1	
	Locomotive units ordered out of service.	l					1 1			1		, 1	ı