INTERSTATE COMMERCE COMMISSION

FORTY-EIGHTH ANNUAL REPORT

DIRECTOR OF LOCOMOTIVE INSPECTION

TO THE

INTERSTATE COMMERCE COMMISSION

FISCAL YEAR ENDED JUNE 30, 1959



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OCTOBER 1, 1959.

To the Interstate Commerce Commission:

In compliance with section 7 of the act of February 17, 1911, as amended, the Forty-Eighth Annual Report of the Director of Locomotive Inspection, covering the work of the fiscal year ended June 30, 1959, 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, 10.4 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; this is an increase of 1.6 percent from the results of the preceding year. Six hundred forty-eight locomotives were ordered withheld from service

by our inspectors because of the presence of defects the rendered the locomotives immediately unsafe; this is an increase of 2. locomotives compared with the preceding year.

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

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

Herminania. Tandavisionia servici koji	1954	1955	1956	1957	1958	1959
Number of locomotives for which reports were filed	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, 566	37, 353 100, 607 9, 887 9. 8 518 26, 386	36, 905 95, 593 8, 394 8, 8 395 21, 532	36, 069 105, 347 10, 912 10, 4 648 82, 330

As indicated in the preceding table there was a decrease in the number of locomotives for which carriers were filing reports on June 30, 1959, as compared to the number being filed on June 30, 1958. The decrease resulted from 932 steam locomotives being retired during the year, while the number of the other than steam and multiple operated electric locomotive units for which reports were filed during the same period increased by 96.

During the year, district locomotive inspectors devoted 10,182 days to regular inspections of locomotives, 340½ days making short inspections to determine that repairs and tests were being made to meet the requirements of the law and rules, 216½ days investigating accidents, 286½ days investigating complaints regarding possible violations of the law and rules, 295½ days conferring with carrier representatives and officials, and 1565½ 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, locomotives 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. 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 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-six accidents occurred in connection with all types of locomotives in which 90 persons were injured. Compared with the preceding year there was a decrease of 6 accidents and an increase of 4 injuries.

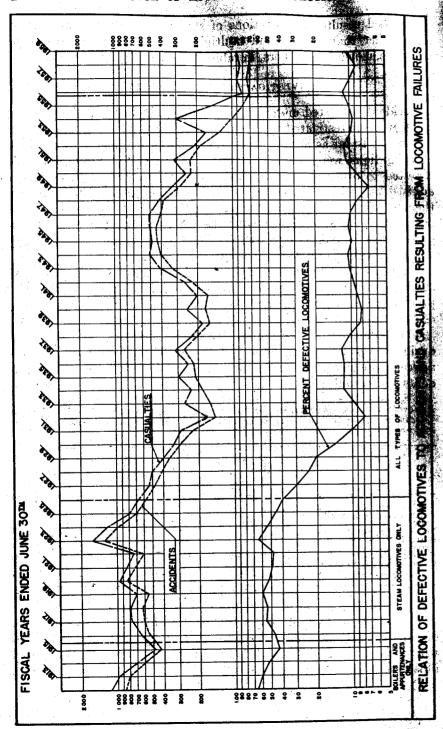
The following table provides details of accidents and casualties during the past 6 years caused by failure of some part or appurtenance of locomotives, and indicates increases or decreases in accidents and casualties:

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

		3	Year ended	June 30—		
	1954	1955	1956	1957	1958	1959
Number of accidents Percent increase or decrease from previous	105	83	73	75	72	66
year Number of persons killed Percent increase or decrease from previous	21.6	21. 0	12. 0 4	1 2. 7 0	4.0	8. 3 0
year	75. 0 302	0 142	1 33. 3 79	100 90	0 86	. 90
year	1 101. 3	53.0	44.4	1 13. 9	4.4	14.7

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

				Yes	r endec	l June	30—			
	19	55	19	56	19	57	19	58	19	59
	Killed	Injured	Killed	Injured	Killed	Injured	Killed	Injured	Killed	Injured
Members of train crews: Engineers Firemen Brakemen Conductors Switchmen	1 1	26 34 10 4	1 2 1	19 88 10 8		17 84 17 7		21 36 11 5		22 81 10 4
Maintenance employees Other employees Nonemployees		18 42		2 2		2 12		1 12		1 21
Total	3	142	4	79	0	90	0	86	0	90

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 E	nded Juine	30, 1959
	Accidents	Killed	Injure
Air reservoirs, fittings, safety and check valves	. 1		
Boiler:			
Flues and tubes including superheater, arch, and water			
Fuel explosions in firebox	2		
Brakes and brake rigging	1		1.0
Dab:	1		ra .
Doors or windows	1		
Seats	i 12		A 1.
Control equipment—mechanical, electrical, pneumatic, or electro-pneu	→		
matie			i .
Townlare droft and drawgeer	1 1		
Electrical equipment: Armature journals and bearings Energized electrical parts. Insulation, short circuits, or electrical flashes.	· ·		
Armature journals and hearings	1		
Energized electrical parts	~_ i	2	i
Insulation, short circuits, or electrical flashes	· 6		1
Fires due to liquid fuel or debris	i i		
Theore, steps and passageways	17		
Footboards	• •		1.
Handholds	''l i		. ,
Handholds			· ·
Crankcase or air-box explosions	0		
Exhaust and cooling systems			
Fuel injectors and connections	6		
Off pumps and filters	-1 1		
To the plant of the months			
Unguarded moving parts.			1 1 1
Miscellaneous			
Total	66		1
Total	90		

LOCOMOTIVE ACEIDMAN

Of the 66 accidents, 17 were caused by the condition of floors, steps, and passageways of diesel-electric beamatives. Twelve of the 17 resulted from accumulation of oil on value couries of the locomotives, a reduction of 6 compared with the presents year.

Twelve accidents were caused by defective condition of cab seats, compared with 8 in the previous year.

One accident occurred on a steam locomotive, resulting in injury to one employee.

SPECIFICATIONS AND ALTERATION REPORTS

In compliance with rule 54 of the Rules and Instructions for Inspection and Testing of Steam Locomotives, 5 specification cards and 105 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, 815 specifications and 1,494 alteration reports for locomotive units, and 89 specifications and 402 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, 6 specifications and 45 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 inspectors during the year totaled 24,866 under rules 51 and 53 of the Rules and Instructions for Inspection and Testing of Steam Locomotives; 404,310 under rules 331 and 332 of the Rules and Instructions for Inspection and Testing of Locomotives Other Than Steam; and 32,750 under rule 451 for Multiple Operated Electric Locomotive Units Designed to Carry Freight and/or Passenger Traffic.

EXTENSIONS OF TIME FOR REMOVAL OF FLUES

Under rule 10 of the Rules and Instructions for Inspection and Testing of Steam Locomotives, 64 applications for extension of time for removal of flues were submitted. After investigation, extensions were granted for the full period requested in 52 applications and after defects disclosed by the investigations were repaired, such extensions were granted in 2 other cases. One extension was granted for a shorter period than requested because of conditions disclosed by the

investigation. Nine applications were canceled for various reasons. Extensions were granted for the full period requested in the three applications pending on July 1, 1958.

SUITS FOR PENALTIES

During the year, three cases involving six counts for alleged violations of the Locomotive Inspection Act and rules prescribed thereunder were transmitted to United States attorneys for prosecution. Judgment was confessed on all counts, and penalties totaling \$1,500 were assessed.

At the beginning of the year, 11 cases containing 220 counts against 4 railroads for failure to file required inspection reports on locomotives were pending in district courts. Six of these cases involving 104 counts were dismissed, and the remaining 5 cases involving 116 counts are still pending.

The cases dismissed were brought on the basis of violations of rule 203 of the Rules and Instructions for Inspection and Testing of Locomotives Other Than Steam. At the time the actions were instituted, rule 203 was interpreted to mean that locomotives should be inspected at each crew-change point. Consequently, when rule 203 was amended so as not to require inspection at crew-change points, the actions were dismissed.

APPEALS

During the year ended June 30, 1959, nine formal appeals from decisions of district locomotive inspectors were filed by the carriers. In seven cases, the Director of Locomotive Inspection decided in favor of the carriers, and in the other two cases the appeals were denied. No appeals from the decisions of the Director were filed by any carrier.

BETTERMENT OF SERVICE

In continuance of the program for promoting and maintaining uniformity in methods of procedure and inspection practices and to insure uniform understanding of policies, conferences were held during the year with the zone supervisors and inspectors of the Section. The revised rules promulgated in the Commission's Ex Parte No. 174 and Ex Parte No. 203, with pertinent orders covering compliance dates and interpretations of certain rules and instructions were reviewed and discussed at these conferences.

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 ANDED JUNE 30. 1959. BY ROADS

[A double star (**) indicates accidents not properly reported, as required by reason 12; 335, and 454. Complete investigations therefore, could not be made, inasmuch as the Bureau, restart apprised of the accidents in sufficient time after they occurred to permit them to be properly investigation.

ATCHISON, TOPEKA AND SANTA FE RAILWAY:

June 13, 1959, unit 24, Dennison, Ariz. Wood screws securing cab managements. to floor failed, permitting seat to fall; one injured. One accident: one injured.

CHICAGO, BURLINGTON & QUINCY RAILROAD:

August 24, 1958, locomotive (C&S) 646, near Broomfield, Colo. Employee was burned by flash while attempting to light fire in oil-burning firebox; fire had been extinguished due to a 4-inch crack in weld in side sheet of firebox; one injured.

December 13, 1958, unit 9992, Naperville, Ill. Crankcase explosion resulted

from cracked cylinder head and liner; one injured.

Two accidents: two injured.

CHICAGO, ROCK ISLAND & PACIFIC RAILROAD:

August 13, 1958, unit 403, west of Shawnee, Okla. Crankcase explosion resulted from overheated crankshaft main bearings; one injured.

September 18, 1958, unit 401, Choctaw, Okla. Employee came in contact with high voltage electrical equipment while attempting to change battery charging fuse; one injured.

Two accidents; two injured.

ERIE RAILROAD:

March 18, 1959, unit 523, Chicago, Ill. Oil on running board; one injured. One accident; one injured.

LEHIGH VALLEY RAILROAD:

May 7, 1959, unit, 165, Newark, N.J. Crankcase explosion caused by overheated connecting rod bearing; one injured.

June 9, 1959, unit 143, near Caledonia, N.Y. Employee fell from right front footboard; portion of footboard was broken out and missing from right front top outside corner; one injured.

Two accidents: two injured.

LONG ISLAND RAIL ROAD:

September 17, 1958, multiple operated electric locomotive unit 1860. New York, N.Y. Collision resulting from a brake failure due to a broken clevis; one

One accident: one injured.

MAINE CENTRAL RAILROAD:

April 10, 1959, unit 555, Nicolin, Me. Crankcase explosion caused by overheated crankpin bearing; one injured. One accident; one injured.

MISSOURI-KANSAS-TEXAS RAILROAD:

November 18, 1958, unit 135, Kansas City, Mo. Oil on engineroom floor: one injured.

One accident; one injured.

MISSOURI PACIFIC RAILROAD:

August 25, 1958, unit 508-B, Dittlinger, Tex. Oil on engineroom floor caused by oil leaking at lubricating oil filter; floor not properly roughened; oil on engineroom floor had been reported 10 times in the 30-day period prior to accident; one injured.

September 16, 1958, unit 4290, League City, Tex. Cab door stuck in open position. While attempt was being made to close the door it suddently released due to retainer being defective; one injured.

October 3, 1958, unit 600, Palestine, Tex. Removable steps leading from engineroom to cab fell from position while employee was entering cab; steps were

not properly secured; one injured.

October 30, 1958, unit (T & P) 1538, Mart, Tex. Cab seat fell over backward due to failure of weld securing seat frame to pedestal assembly; one injured. Four accidents; four injured

NEW YORK CENTRAL RAILROAD:

**August 3, 1958, unit 9606, South Bend, Ind. Cab seat back rest gave way when a nail, inserted in place of locking pin in back rest adjustment assembly, worked out of retaining brackets; one injured.

October 18, 1958, unit 614, Charleston, W. Va. Cab seat broke from pedestal

due to defective welding connecting pedestal to seat base; one injured.

November 26, 1958, unit 5756, Ardsley, N.Y. Crankcase explosion due to a broken piston. Employee encountered a burst of smoke and oil fumes when he opened engine door to locate source of explosion; one injured.

December 22, 1958, unit 5792, Ligonier, Ind. While employee was attempting to extinguish fire in the high voltage cabinet he was forced to abandon cab due to heat and smoke, resulting in his falling from running board; one injured.

January 13, 1959, unit 5940, between Poughkeepsie and Rhinecliff, N.Y. Smoke and oil fumes in cab resulted from a broken intermediate steam generating coil in heating boiler; defects relative to accident were reported six times since December 23; one injured.

January 15, 1959, unit 1096, between Poughkeepsie and Croton, N.Y. Two broken studs securing fuel injection pump to camshaft housing permitted oil to leak over diesel engine, resulting in fumes entering cab; defects relative to accident were reported 22 times since December 15; one injured.

January 21, 1959, unit 605, Toledo, Ohio. Cab seat backrest gave way due to failure of old weld securing left horizontal crossbrace to vertical frame and

broken pivot bolt securing right backrest frame to seat frame; one injured.

April 3, 1959, unit 838, Syracuse, N.Y. While attempting to board unit employee slipped and fell from bottom step due to defective tread; one injured. May 8, 1959, unit 1667, Detroit, Mich. Oil on cab floor; "Clean oil off engine room floors" was reported April 16 and 18; one injured.

May 27, 1959, unit 1032, East Syracuse, N.Y. Undesired automatic train

control brake application due to defective ballast resistor; one injured.

Ten accidents; ten injured.

NEW YORK. NEW HAVEN & HARTFORD RAILROAD:

August 28, 1958, unit 1222, Providence, R.I. Exhaust fumes entered cab as a result of a diesel engine air box inspection cover blowing off, due to a broken locking bar; two injured.

September 8, 1958, unit 0500, Framingham, Mass. Oil on running board; oil leak at governor oil hose connection; defects having a bearing on accident

were reported eight times since August 8; one injured.

December 2, 1958, unit 0422, Cedar Hill, Conn. Oil on engineroom floor due to leaks in lubricating and fuel oil systems; defects having a bearing on accident were reported 41 times from November 3 to December 2; one injured.

December 12, 1958, unit 0725, Greenbush, Mass. Employee was exposed to smoke and fumes while extinguishing fire resulting from a series of explosions in a defective steam heating boiler; defective condition of the boiler was reported

four times prior to accident, and one time following accident; one injured.

February 8, 1959, unit 0460, Providence, R.I. Oil on engineroom floor resulting from improperly applied lubricating oil pipe hose clamps; defects having a bearing on accident were reported 24 times since January 8; one injured.

**February 9, 1959, unit 0771, between New Haven, Conn. and Boston, Mass. Four bolts securing elbow connection to exhaust manifold connection were missing, permitting gas fumes and smoke to escape and enter cab; defects having a bearing on accident were reported five times prior to accident, and three times following accident: one injured.

March 13, 1959, unit 1204, Boston, Mass. Oil on cab floor due to leak in fuel

pipe to steam heating boiler; one injured.

April 3, 1959, unit 0409, Worcester, Mass. While attempting to repair broken hose to fuel injection pump fuel oil sprayed in employee's eye; one injured.

May 15, 1959, unit 361, Oak Point, N. Y. Oil on engineroom floor; fuel tank overflow pipe leaking; oil leaks and/or clean oil from floor were reported 12 times prior to and 10 times following accident; one injured.

Nine accidents: ten injured.

Pennsylvania Railroad:

August 7, 1958, unit 5686, Long Island City, N. Y. While attempting to extinguish a fire, caused by a defective preventive coil, employed was exposed to smoke and fumes from burning insulation; one injured.

September 1, 1958, unit 9547-A, near New Florence, Pa. Cab seat back rest collapsed due to defective adjustment assembly, to which improper repairs had

previously been made; one injured.

September 11, 1958, unit 9003, Delair, N. J. Ammeter gage explosed, scattering broken glass in cab; two bolts securing ammeter motor to ammeter worked out allowing motor to vibrate until it broke internal wires which made contact with gage housing, resulting in short circuit; one injured.

October 15, 1958, unit 8984, Pitcairn, Pa. Fumes entered cab as a result of fuel oil being sprayed on heated engine parts due to a leaking fuel oil filter gasket; defects relative to accident were reported September 17, 19 (two times), and

October 5 and 14; one injured.

**October 22, 1958, unit 9778-A, Bedford, Ohio. Cab seat fell over backward due to failure of welding joining inner sleeve to plate assembly at seat base; one

December 16, 1958, unit 4810, New Brunswick, N. J. Defective light bulb socket and switch caused short circuit and electrical flash when employee at-

tempted to turn on light switch; one injured.

December 23, 1958, unit 5939, New York, N. Y. Employee was injured when he jumped from unit to ground to escape flames and smoke from electrical equipment fire; one injured.

December 23, 1958, unit 8530, Old Bridge, N. J. Employee fell between units when a walkway platform collapsed; platform became detached from hinge

support due to a broken hinge pin; one injured.

January 25, 1959, unit 8434, Detroit, Mich. Employee was exposed to fumes from exhaust stack which was not properly sealed to prevent fumes from entering cab: defects relative to accident were reported 10 times since January 1; one

February 3, 1959, unit 8938, Dover, Ohio. Uncoupling lever shaft suddenly disengaged from uncoupling lever bail, causing employee's hand to slip from lever and strike end plate of unit; inner uncoupling lever collar was missing, allowing excessive lateral movement, which prevented shaft from engaging lever bail: one

February 23, 1959, unit 8844, Valparaiso, Ind. Employee fell when cab seat cushion slipped from position; two securing clamps were missing and the remaining clamps were not properly secured; "Seat cushion #2 side off" was reported February 10 and "Seat loose on #2 side" was reported February 11; one injured.

February 26, 1959, unit 9840-A, Greensfork, Ind. Broken cross bar for securing air box inspection cover permitted cover to fall from position, resulting in

smoke and fumes escaping; one injured.

March 3, 1959, unit 5965, Long Island City, N. Y. Employee was exposed to smoke and fumes while extinguishing fire caused by overheated exhaust manifold

igniting accumulation of oil and debris on diesel engine; one injured.

March 28, 1959, unit 3912, Long Island City, N. Y. Employee was exposed to smoke and fumes while extinguishing fire from burning insulation in a defective preventive coil: one injured.

May 13, 1959, unit 4774, Frazer, Pa. Derailment and collision caused by a false flange on a slid-flat driving wheel, resulting from a seized traction motor

armature bearing; 24 injured.

June 6, 1959, unit 9590-A, Smithville, Ohio. Employee was exposed to smoke and fumes while extinguishing fire originating in battery compartment; metallic hose on CO₂ fire extinguisher built-in system was ruptured and three of four handtype fire extinguishers were inoperative; one injured.

Sixteen accidents; thirty-nine injured.

READING COMPANY:

October 13, 1958, unit 300-A, Tamaqua, Pa. Wood screws which fastened cab seat base to floor pulled out, permitting seat to overturn; one injured.

April 2, 1959, unit 725, Philadelphia, Pa. Cotter pin securing cab seat in raised position sheared off, permitting seat to suddenly drop to lower position; one injured.

Two accidents; two injured.

St. Louis-San Francisco Railway:

August 11, 1958, unit 532, Kimbrough, Ala. Employee sustained laceration of leg on jacket of water cooler due to 3 of 4 screws missing, allowing cooler faucet alcove to project out one-half inch from cooler jacket: one injured.

January 13, 1959, unit 279, West Tulsa, Okla. Cab seat back rest gave way due to support plate being weakened by an old fracture through approximately

34 percent of cross sectional area; one injured.

June 22, 1959, unit 616, Pittsburg, Kan. Defective dowel permitted grab iron to separate from handrail support bracket; one injured.

Three accidents: three injured.

SEABOARD AIR LINE RAILROAD:

February 6, 1959, unit 1504, Tallahassee, Fla. Crankcase explosion caused by failure of crankshaft main bearing; one injured.

One accident; one injured.

SOUTHERN PACIFIC COMPANY:

July 17, 1958, unit 6315, Vina, Calif. Crankcase explosion resulted from over-

heated main bearings; one injured.

July 23, 1958, unit 6007, Winnemucca, Nev. Employee's hand came in contact with blower-water pump drive belt while attempting to replace heating boiler control cabinet door. Door was displaced due to defective latch; one

**November 9, 1958, unit 6238, near Deeth, Nev. Oil on engineroom floor due to a number of oil leaks from diesel engine; oil leaks and/or oil on engineroom floor

were reported 8 times since November 1; one injured.

December 25, 1958, unit 1397, Los Angeles, Calif. Broken air horn pipe permitted sudden blast of air to escape and injure employee's ear; one injured. January 29, 1959, unit 1077, Oakland, Calif. Cab seat backrest became

detached from seat due to a defective bracket; one injured.

February 3, 1959, unit 6403, Sparks, Nev. Employee stepped on jumper cable lying on floor in nose compartment; one injured. Six accidents: six injured.

SOUTHERN RAILWAY:

**July 7, 1958, unit 6840, Somerset, Ky. While repairing fuel system employee

slipped and fell from running board to ground; one injured.

February 19, 1959, unit 2054, Carlisle, S. C. Crankcase explosion caused by an overheated connecting rod bearing; defects relative to accident were reported 9 times since January 21; one injured.

Two accidents: two injured.

TEXAS AND PACIFIC RAILWAY:

December 3, 1958, unit 1552, Jal, N. Mex. Oil on engineroom floor; one injured.

One accident; one injured.

WABASH RAILROAD:

July 16, 1958, unit 1105-A, Ryan, Ill. Oil on engineroom floor; oil leaking from area around valve cover frame and cylinder covers: defects relative to accident were reported 19 times since June 16; one injured

One accident: one injured.

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

D. 4. 1.4. Amorantiya or missing or in	2	Ye	ar ended	June 30-		
Parts defective, inoperative or missing, or in violation of the rules	1954	1955	1956	1957	1958	1959
Air compressors	304	229	239	83	13	
Air compressors	24	17	13	1	- 1	1.3
Ashpans and mechanism.	3	3	10	- T		
Plow off cooks	121	105	91	30	2	
Roiler checks	158	84	70	26	9	
	79	43	31	20	3	
Brake equipment	835	636	565	256	85	
Brake equipment Cabs, cab windows, and curtains Cab aprons and decks Cab dards	298 133	241 100	187 113	101 22	21 7	
Cab aprols and decks	27	19	23	18	6	
Coupling and uncoupling devices.	22	īi	17	8	3	•
Crossheads, guides, pistons, and piston rods	398	256	223	107	22	
Crown holts	20	7	10	2		
Cylinders, saddles, and steam chests	364	387	251	157	17 11	14.5
Cylinder cocks and rigging	132 20	130	116 23	54 13	71	100
Domes and dome caps	150	20 133	107	45	17	
Draft gear	79	69	57	23	6	7.
Draw gear Driving boxes, shoes, wedges, pedestals, and				1		
braces	258	226	250	72	21	
Firebox sheets	37	20	25	23 12		
Flues	32	27 100	19	12 22		
Frames, tail pieces, and braces, locomotive	151	100	78 10	4	٥١	
Frames, tender	14 47	42	40	25	8	
Gages and gage fittings, air	89	61	68	28	, 4 l	
Clare cocks	120	116	113	43	15	
Gage cocks. Grate shakers and fire doors.	90	107	54	84	6	
	146	110	112	33	8	
Injectors, inoperative	33	35	3	4	37	
Injectors and connections	674	406 26	379 37	198 24	12	
Inspections and tests not made as required	24 98	65	48	24	10	
Lateral motionLights, cab and classification	39	35	18	7	- 4	
Lights, headlight	56	34	32	18	- 5	l
Lubricators and shields	63	47	38	16	3	ı
Mad show	1 65	33	36	6	3	
Packing nuts. Packing, piston rod and valve stem. Pliots and pilot beams. Plugs and studs	240	233 122	253 106	62 74	14 5	
Packing, piston rod and valve stem	154 52	39	34	8	2	l
Phots and phot beams	22	16	15	16	` -	l
Reversing gear	170	151	108	39	11	[
Rods, main and side, crankpins, and collars	315	221	214	108	22	
Reversing general Reversing sand side, crankpins, and collars	15	22	17	9	1	
Sanders	277	155	123	72	9	ĺ
Springs and spring rigging	834	551 27	505 26	212 14	32	
Squirt hose	39 108	55	69	20	6	
Staybolts broken	55	27	30	12	ğ	1.
Staybolts. Staybolts, broken. Steam pipes	55 87	58	57	27	5	l
Steam valves	. 69	33	21	7	2	ł
Steps	. 200	157	147	42	20	
Tanks and tank valves	. 340	269	217	99	16 1	1
Telltale holes	13 228	179	133	48	9	[
Throttle and throttle riggingTrucks, engine and trailing	171	153	96	42	5	1
Trucks tender	152	129	123	- 51	10	
Trucks, tenderValve motion	174	114	105	55	7	
Washout plugs	.] 79	73	83	39	1	
Stokers	_ 55	58	68	33	20	1
Water glasses, fittings, and shields	282	218 94	193 70	75 39	20	
Wheels	107	J .94	1 .0	39	1 '	
Miscellaneous—Signal appliances, badge plates, brakes (hand)	263	194	166	68	9	1
Number of defects	9, 763	7, 350	6, 487	2, 840	592	
				2 900	0.400	1
Locomotives reported	- 12, 135 - 19, 999	8, 892 12, 128	5, 875 8, 794	3, 868 5, 983	2, 422 2, 324	1,
Locomotives inspected Locomotives defective	2, 599 13. 0	1,784	1, 499	737	159	1
LOCOMOTIVES delective	-1 -1000	14.7	17.0	12.3	6.8	1
Percentage of inspected found defective	(13 !!				1 0.0	

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		Y	ear ende	d June 3	0—	
violation of the rules	1954	1955	1956	1957	1958	1959
Air compressors	326	419	443	828	282	а
Axles, truck and driving	4	7	26	34	50	1
Batterles	82	83	97	35	715	i
Boilers	175	203	275	208	172	3
Brake equipment	2, 126	2,790	3, 259	2,906	2,460	3, 4
Cabs and cab windows	858	1,073	1,600	1,030	962	1,4
Cab cards Cab floors, aprons, and deck plates	135	150	183	187	145	2
Cab floors, aprons, and deck plates	1,703	1,677	1,933	1,940	2,020	2,7
Clutches	5	j 2	4		2	. i. iii.
Controllers, relays, circuit breakers, magnet	l	1			1	
valves and switch groups	454	802	775	36 0	348	
Coupling and uncoupling devices	139	204	166	116	132	1
Current collecting apparatus		15	17	6	3	1
Draft gear	291	336	360	253	357	4
Draw gear	55	140	146	121	128	
Driving boxes, shoes, and wedges	154	249	291	154	135] 3
Frames or frame braces	32	14	30	30	17	. ـ ا
Fuel system Gages or fittings, air	1, 951	1,833	2, 555	2, 431	2, 307	3,
Gages or nittings, air.	136	226	278	289	166	:
Gages or fittings, steam	56	48	60	36	58	İ
Gears and pinions	12	27	20	10	19	Ι.
Handholds	230	219	258	208	217	
Inspections and tests not made as required		183	748	703	623	
Insulation and safety devices	105	188	282	133	228	1 2
Internal-combustion engine defects, parts and ap-	4 040					
purtenances		5, 035	6, 356	5, 174	3,817	6,
Jack shafts		2			1 1	
Jumpers and cable connectors		214	553	442	306	
Lateral motion, wheels		39	14 352	35	46	
Lights, cab and classification	232	198 33		260 35	321 32	
Lights, headlight Meters, volt and ampere	40	43	58 58	34	24	
Motors and generators		880	1, 122	671	472	1
Pilots and pilot beams	71	71	78	61	41	
Plugs and studs			(1	. 01	**	
Quilis		22	26	6	32	
Rode main eide and delve chafte		7	4	5	1	
Rods, main, side, and drive shafts	1, 200	1, 492	2,307	2,023	2, 310	3, (
Springs and spring rigging, driving and truck	241	306	363	370	380	٠,
Staybolts, broken or defective		000	000	• • •	0.00	
Steam pipes		177	190	164	141]
Steps, footboards, et cetera		737	1,005	827	292	
Switches, hand-operated, and fuses		38	48	16	16	
Transformers, resistors, and rheostats.		3	ğ	10	2	100
Trucks	503	1,054	1,007	552	510	
Water tanks	34	31	49	19	31	
Water glasses, fittings, and shields	ĭi	16	14	- š	4	
Warning signal appliances	121	152	182	154	124	1
Wheels	257	282	252	256	189	
Miscellaneous	1,005	898	1, 220	736	762	1, 4
Number of defects.	19, 640	22, 618	29, 054	23, 373	20, 668	31,
Locomotive units reported	27, 135	28, 100	29, 405	30, 740	31, 755	31.8
Locomotive units inspected	83, 338	85, 897	88, 269	93, 187	91, 522	102,
Locomotive units defective	7, 395	8, 129	9, 597	9,031	8,067	102,
Locomotive units defective Percentage of inspected found defective	8.9	9.5	10.9	9.7	8.8	10,
Locomotive units ordered out of service		127	492	417	372	- 6
	1 10	1	702	244	0,2	,

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

ļ	Parts defective, inoperative or missing, or in violation of	7	ear ended	June 30	
	the rules	1 1956	1957	1958	1959
\vdash					
١.	Air compressors		4	2	8
١.	Air compresses Axies, truck and driving Batteries			•	. •
П	BatteriesBoilers				
	DL- aminment		18	23	18
1	Cobe and cap windows			2	2
1	Cabs and cab windows	1	8	13	
١	Cab floors, aprons, and deck plates			1	
	Controllers, relays, circuit breakers, magnet valves and switch groups. Coupling and uncoupling devices. Current collecting apparatus.			1	
	Switch groups				
	Coupling and incoupling devices		20	25	6
				1	1
	Draw gear Driving boxes, shoes, and wedges Frames or frame braces			9	
	Driving boxes, shoes, and wedges			2	100
	Frames or frame braces				
	Kijel gystem				
	Clarent on Attinger oir			11	
	Gages or fittings, an Gears and pinions				
	Gears and pinions	[7	45	
	Handholds		46	22	
	Inspections and tests not made as required	l "il	1		
	Handholds Inspections and tests not made as required Insulation and safety devices Internal-combustion engine defects, parts and appurte-	-	-		
ŀ	nances				
	- 1 1 A -				
	Jumpers and cable connectors	2	5	3	
	Jack shatts. 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.				
	Lights, cab and classification		. 1		
	Lights, headlight				
ŀ	Meters, volt and ampere				
	Motors and generators		•		
l	Pluce and stude				
l	Rods, main, side, and drive shafts				
	Rods, main, side, and drive shafts				
ľ	Sanders				
١	Springs and spring rigging, driving and truck		25	10	
l	Sanders Springs and spring rigging, driving and truck Staybolts, broken or defective	.			
ļ					
ı	Steps, footboards, et cetera				
l	Switches, hand-operated, and ruses		•		·
ŀ	Steps, footboards, et cetera. Switches, hand-operated, and fuses Transformers, resistors, and rheostats Trucks Water tanks	12	23	98	2
ŀ	Woter topks	1	l		
Ì	Water glasses fittings and shields			2	
l	Water glasses, fittings, and shields		1		ļ ·
ł	Wheels		2		
ļ	Miscellaneous		7	6	
	Number of defects	. 19	172	272	8
ĺ	Locomotive units reported	2,782	2, 745	2, 728	2, 7
١	Locomotive units inspected	285	1, 437	2, 728 1, 747	2,2
I	T accompations assists defeating	1 11	119	168	1
I	Percentage of inspected found defective	3.9	8.3	9.6	10
f	Locomotive units ordered out of service		. 2	1	

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

TABLE IV .- Number of steam locomotives reported, inspected, found

	Parts defective inonerative or missing, or in violation	Atchison, Topeka & Sante Fe	Baltimore & Ohlo	Oanadian National	Oanadian Pacific	Chicago, Burlington & Quincy	Colorado & Southern	Denver & Rio Grande Western	Duluth, Missabe & Iron Range	
l	Air compressors				1		3			
١	Arch tubes						1			
l	Axles									
Ĺ	Blow-off cocks Boiler checks									ŀ
	Boiler shelt				i	<u>1</u>	<u>-</u> -	₁ -		l
I	Brake equipmentCabs, cab windows, and curtains									
l	Cab aprons and decks				1				<u>-</u> -	
l	Cab cardsCoupling and uncoupling devices									
	Crossheads, guides, pistons, and piston rods	<u></u>			2			1		
1	Cylinders, saddles, and steam chests									ŀ
l	Cylinder cocks and rigging									
	Draft gear				1					
١	Draw gear Driving boxes, shoes, wedges, pedestals, and braces									ı
l	Firebox sheets									
l	Frames, tail pieces, and braces, locomotive									ŀ
1	Frames, tender									ı
l	Clages and gage fittings, steam				2					ŀ
ı	Gage cocks				2					1
l	Handholds									
l	Injectors, inoperativeInjectors and connections				2					l
I	Inspections and tests not made as required				i	1		i		
ı	Lights, cab and classification									l
ł	Lights, headlightLubricators and shields							ī		ţ
l	Mud rings				2					ł
١	Packing piston rod and valve stem				3	1				ŀ
l	Packing, piston rod and valve stem Pilots and pilot beams				1					١
۱	Plugs and studsReversing gear				1	1		i		ł
1	Rods, main and side, crankpins, and collarsSafety valves							2		1
1	Sanders					8				ŀ
	Springs and spring rigging				5					1
ł	Starbolts									1
1	Staybolts, broken	 -							J	-
١	Steam valves				1					1
1	Tanks and tank valves				2					-
Į	Telltale holes						2			1
1	Trucks, engine and trailing Trucks, tender				<u>-</u>		<u>-</u> -			١
	Valve motion						- -	ī		1
-	Washout plugsStokers				2				1	1
١	Water glasses, fittings, and shields	[2			ī		-
1	Wheels						1			
1		-	-	-	34	7	9	9	1	1
1	Number of defects			<u> </u>		<u> </u>	-	-	-	=
	Locomotives reported	10	99	37	17	99	35 41	22 52	88 18	١
-	Locomotives defective				6	1	41	3	1	-
1	Percentage of inspected found defectiveLocomotives ordered out of service				42.9	16.7	7. 3	5.8	5. 6	1
		1	1	1	l	1	-1	-1	-1	-1

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

Forth Worth & Denver	Grand Trunk Western	Guif, Colorado & Santa Fe	Illinois Central	Lake Superior & Ishpeming	Minneapolis, St. Paul & S.S. Marie	New York, Chicago & St. Louis	Norfolk & Western	Reading	Richmond, Freder- icksburg & Potomac	Southern Pacific	Union Pacific	Virginian	Roads with less than 10 locomotives	Total
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20 7	95 21 3 14. 3	(1)	272 87	13	12	45	122	16 17	10		111	15	252	1,490 967 77 8.0 16
7	21	2	87	5		3	471 14	17		5	10		208 38	77
	14.3		16.2				. 8.0			20.0			14.7	8.0
			. 2				. 4	I		_1			_ 10	16

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

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		놣	- 1	.			3	38	- 1	1		1	_	- 1
	Dente defection in apparetive or miss.	8		1	- 1	_	5	2	- 1		"		Se	
	Parts defective, inoperative or miss- ing, or in violation of the rules	8	E	ı	٠ ا		oc.	8	百	_ 1		اير	ន្ទា	角目
	mig, of hi violation of the raises	& Youngstown	2	_ }		ġ.	3	Ð.	<u>و</u> ا			8	중ㅣ	뜄
1		-8	Aliquippa & Southern	Alton & Southern	- 1	Apalachicola Northern	Atchison, Topeka & Santa	St. Andrews Bay	Atlanta & West Point	Atlantic Coast Line	Baltimore & Ohio	Bangor & Aroostook	Belt Railway of Chicago	& Lake Erle
		Canton	න	4		Z	ĕ	اند	8	32	9	ğ	P	ΙĽ
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-			1						- 1	7	R			
1	Air compressors				1		1			i	2			
2 4	Air compressorsAxles, truck and driving				:- <u></u> 1	::: <u>:</u>].	1						, -	
5	Roilers						5			13	3] -		
6	Batteries		1				60		8	46 6	50 26	14 -		
8	Cabs and cab windows						25 8			î	5			
9	Cab cards				3		78		3	63	47	4.		
0	Cab floors, aprons and deex plates—Controllers, relays, circuit breakers, magnet valves and switch groups. Coupling and uncoupling devices—Current collecting apparatus—Draft gear—Driving boxes, shoes and wedges—Frames or frame braces—Fruel system—Gages or fittings, air—Gages or fittings, steam—Gears and plnions—Handholds—Inspections and tests not made as required.						. 1			1 7	ایی	<u>-</u> [-	,}-	
2	Controllers, relays, circuit breakers,				1		24		1	7	22	2		
- 1	magnet valves and switch groups.		١, ١		- 1			j		6	2	2		
3	Coupling and uncoupling devices		4				٥]			
4	Current collecting apparatus	i					1			5	3		[,
6	Draw gear						2			2	2 1			
8	Driving boxes, shoes and wedges				4		1			6	- 1	5		
0	Frames or frame braces			;			51		4	65	32	7		
3	Fuel system			1			3		- i	1	2			
4	Gages or fittings, steam										1		}	
25	Gears and pinions					- <i>-</i>				3				7,575
16	Handholds						28		2	19	13			
88	Inspections and tests not made as			1			20	77.77						
7D I	Incidetion and salety devices						5		4	15	6			,-,-
80	Internal-combustion engine defects,				3		102		3	174	82	12		
	parts and appurtenances.		1		1				1	1				
32	Jack shafts	-	1				6			9	15			
33 35	Teteral motion wheels									4	:			
86	Lights, cab and classification	.	.		1		10			17	1			i
37	Lights, headlight	-			1							1		
39	Meters, volt and ampere	-					17			15	35			
40 42	Pilots and pilot beams									3	1			
43	Plugs and studs		.											
44	Internal combustion engine defects, parts and appurtenances. Jack shafts. Jumpers and cable connectors. Lateral motion, wheels. Lights, cab and classification. Lights, headlight. 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.	-	-				 -							
46	Rods, main, side, and drive shatts			3		<u>i</u>	66	2	6	30	40			
48 49	Springs and spring rigging, driving		. 1				2		1	10	19			
70	and truck.	1		ŀ	1	1					1	l ·		L
51	and truck. Staybolts, broken or defective Steam pipes Steps, footboards, et cetera Switches, hand-operated, and fuses. Transformers, resistors and rheostats Trucks Water tanks		-					J	3	6]a			
53	Steam pipes	-		1	1	[1 2	3		ĭ	10			
54 55	Switches, hand-operated, and fuses.		-	.			1	l						
56	Transformers, resistors and rheostats	-	-	·			10	:	i	24	17	9		
57	Trucks	-	-			1	"	<u> </u>	1	2				
59	Weter glaceon fittings and soleids		-1					.]				.		
60 61	Warning signal appliances	_	-	.	.	ļ	1 .3	3	.	3	1	(
62		-	-	· - ;			2		<u>i</u>	28	نسد ا	SI		
63	Miscellaneous	-	-	<u> </u>	1 3		<u> </u>		-		-	-	-	-
	Number of defects		1 :	3 (3 18	5 1	57	7 5	38	594	53	62		
		-	=		==	, 	1 00	2 14	28	F.0.4	1, 18	47	54	ι
	Locomotive units reported		7 1 2			1 2	$\frac{1}{4}$ $\frac{1}{7}$, $\frac{80}{16}$			1, 923	4, 57			
	Locomotive units inspected	1		3 2	3 3	3 1	1 28	il i	u g	227	33	0 19		·
	Percentage of inspected found defec		4 11.				3.	9 1.1	10.0	11.8	7.	2 16, 1		
	tive.	1			1	1	1 .	ا ا	1	,	,	5	1	.
	Locomotive units ordered out of	ا	- '	1	-	-[- '	3	-	Ι '	1		1	1
	şervice.		1.		1		1	1	1	1	<u> </u>	<u> </u>	1	
					<u> </u>									

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

Birmingham Southern	Boston & Maine	Butte, Anaconda & Padfic	Camas Prairie	Canadian National	Canadian Pacific	Canton	Carolina & Northwestern	Central of Georgia	Central Railroad of New Jersey	Central Vermont	Charleston & Western Carolina	Chesapeake & Ohio	Chicago & Eastern Illinois	Chicago & Illinois Midland	Chicago & North Western	Chicago & Western Indiana	Chicago, Burlington & Quincy	Chicago Great Western	Chicago, Milwaukee, St. Paul & Pacific	
1	10 4 49 109 113 20 159			1 2 2 4	15 18 2 13		1	6 37 4 2 12	3 1 16 8 2 12	1	3	3 1 19 6 2 1	2 4 1		31 207 62 7 85	1	1 3 16 2 4	1 7 1 5	5 3 4 15 109 21 7 44	1 2 4 5 6 8 9 10 11 12
1	20 19 1 1 193 31 1 10 22			9	28 5 1			2 	1 3 3 14 5	1	2	11 1 2	1 1 1 1		40. 6 7 142 9 6 6 9	1	1 3 6 4 1 6	3 1 1 1 1	3 25 1 5 59 4 7 15	13 14 16 17 18 20 22 23 24 25 26 28
2	9 513			1 18	1 120			10 7 77	2 41	3	<u>-</u> 2	15	8		13 96		1 14	<u>i</u>	9 129	29 30
1	20 6 2 1 45 		3	7 	3 7 18 2			3 7 1 27 19	5 1 3 3		1	12 3	1		8 17 2 23 15 127 31	3	3 4 2 1 22 1	2 12	16 2 1 23 5 99 35	32 33 35 36 37 39 40 42 43 44 46 48 49
1				1 2 4	17 13			1 1 14 2 18 7	5		1 4	3 2 1 14 13	1 2		7 46 32 11 13 142		1 2 1 2 4	2 2 3 1	2 11 30 2 8 53	51 53 54 55 56 57 59 60 61 62 63
22	1, 746 422	40 51	12 31 1 3. 2	79 297 140 29 20. 7	112 173 62	16 16	1		197 517 48	25 115 4 3.5	31 132 10	1, 074 1, 879 59	273 15		703 2, 232 437 19. 6			127 487 32	791 900 2, 723 324 11. 9	
	21				i .			9	. i		1	ļ			21		1		14	

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

Air compressors																
Air compressors			liana	d & Pa-	hore &	erminal			ng.	k Liok		SDING OF	de West-	lore Line		ronton
Air compressors		Parts defective, inoperative or miss-	er & In	ck Islar		Union T		Souther	Wyomi	& Blac	Hudson	Lackaw	tio Gran	oledo 9		Detroit, Toledo & Ironton
Arl compressors.		mg, v. m 1	30 Rl	30, R	8.E	posti	nfleld	do &	ado &	neugl	rare &	rare,	er & I	it & I		۲ <u>.</u>
A ricompressors			Chica	Ohica	Chica	Cinci	Clincl	Color	Color	Cone	Delav	Delay	Denv	Detro		Detro
6 Bollers. Brake equipment. 2 273 30 13 11 3 15 12 3 1 0 0 15 12 3 1 0 0 15 12 3 1 0 0 0 1 1 1 0 0 0 1 1 1 1 1 1 0 <td></td> <td>Air compressors</td> <td></td> <td></td> <td></td> <td></td> <td></td> <td></td> <td></td> <td></td> <td>10</td> <td>3</td> <td>3</td> <td></td> <td></td> <td></td>		Air compressors									10	3	3			
Barke equipment.	4	Batteries		1 9								4			- -	
10 Cab floors, aprons and deck plates	8	Brake equipmentCabs and cab windows	2 1	79							15	. 12			 	1
Coupling and interoding apparatus 14	10	Cab floors, aprons and deck plates		91				3			38	16	8		 -	
17 Draw gear 18 Driving boxes, shoes and wedges 1 2 2 Fuel system 126 3 3 26 28 16 2 2 4 3 3 26 28 16 2 2 4 3 3 3 26 28 16 2 2 4 3 3 3 3 3 3 3 3 3	12	Controllers, relays, circuit breakers, magnet valves and switch groups Coupling and uncoupling devices					1				_i	1 	3		-2	2
Handholds	14 16						<u>î</u>				2 5		1 6		-	2
Handholds	18 20	Driving boxes, shoes and wedges Frames or frame braces		2		 	3				 26	28	 16		-	2
Handholds	22 23 24	Gages or fittings, air						1					2			
1	26	Handholds									1	2	1			
parts and appurtenances 148	29	quired						1								
Meters and generators	32	morte and annurtenances		14			. 1						10			
Meters, voit and ampleted Meters and pilot beams 3	33 35 36	Lateral motion, wheels Lights, cab and classification		2	l 2		ji		i							
Quills Add Rods, main, side, and drive shafts 236	37 39	Lights, headlight		3							1 8	6	1			
Sanders	43	Pilots and pilot beamsPlugs and studs			3 											
and truck.	46 48	Sanders		23	6	-					ii	12	11		3	
Steam pipes Steam pipes		and terret	.	.	_	-		-	8						1	
Trucks 1	53 54	Steam pipes				-	-		-				1		<u>-</u> 2	
Water tanks Water tanks Warning signal appliances S	56 57	Trucks		2	8		-	i		-		2	2			
Wheels	59 60	Water tanks Water glasses, fittings and shields Warning signal appliances		-	1	-		-	-	-		2				
Locomotive units reported	62	Wheels	-			-	-	-	-	=	.	-	-	-		_
Locomotive units inspected		The second of the second of the second of	Ī	=	_	7 1	_	=	- -	0 2	-	-		-	9 15	-
tive		Locomotive units inspected	- 3	0 2,50)5 E		8 21	8 24	11 2	7 5	7 80	7 66	9 1, 28	8 43		1
ice		tive	_ 6.	t.			2.	3 2.	.		1	1	1	7	5. 4	3
		ice	-	- '					1		1_	1	"	1	<u> </u>	1

¹ Atchison, Topeka & Santa Fe.

red out of service et cetera—bu carriers—Continued

fo	unc	d de	fect	ve,	and	orde	red	out	of 8	ervi	ce,	et ce	tera	0	ry co	ırrıe	78-	-001	10111	ued		· ————	
	outnern	Duluth, Missabe & Iron Range	Duluth, South Shore & At- lantic	Duluth, Winnipeg & Pacific	Elgin, Joliet & Eastern	Erie	Florida East Coast	Fort Doage, Des Momes & Southern	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	
		i	1 1 1 1	3	6	3 2 19 18 29 2 31	1 2	4	2 1		i	2 19 16	79 18 5 20		6	5 36 29 54	1	1 13 7	2	1 1 1			1 2 4 5 6 8 9 10
			3	1	4	1 1 4 1 27	3		2	3	3	5 5 7 8	12 2 12 2 3		2	9		1 1 1		1		- 1	12 13 14 16 17 18 20 22 23 24 25 26
		1			1 2	6 1 5 4 4	1 1		2	3	 1 6	2 3 1	4 1 7 10 1 144		1 1 3	1 11 9 137		3 1 1 12	2	1			28 29
-					6	3	1			3	1	3 7	9 1			1 42 2 3 1		1 i		1 1 4			30 32 33 35 36 37 39 40 42 43 44 46 48
				17	9 2	9 5 13 5	6		3	5	3 2	52 1 9 1	85 4 1 12		15	81 2 8		21 1		3			46 48 49 51 53 54 55 56 57 59 60 61 62 63
,			2 10				·l		1 14	27	19	1 2 1 6 175	550		2 39	614	1	1 87	4	21			57 59 60 61 62 63
	13 36	3 11(19)		1.		5. 1	4.6	1	1	1	4.1	158 362 34 9. 4	11.3		(1) 618 12 1. 9	1	2. 5	40	1.	1	ļ	10 31 	

									-				
Parts defective, inoperative or missing, or in violation of the rules	Jacksonville Terminal	'Kansas City Southern		klah 	Indi 	Lake Superior & Ish- peming	Lake Terminal	Lehigh & Hudson River	Lehigh & New England	Lehigh Valley	Long Island	Louisiana & Arkansas	Louisville & Nashville
		3	``		- ·		1			2		1	8
Air compressors										2			
Batteries													
Boilers										1	-5	1	3 80 29 1 35
Broke equipment		70	7			4	2	2		30	10	7 10	20
Cobserve on con windows		14	2							5	2	10	- 20
		1 20	;							11	2	10	35
Cab floors, aprons and deck plates		20	- 1			1		-		**			
Clutches		7	i								1		26
Controllers, relays, circuit breakers, magnet valves and switch groups.		- 1	-								-		
Coupling and uncoupling devices		. 1											5
Current collecting annaratus													
Draft gear		1	2	1		2		1		3	2		8
Drow gage								. 1		2 2		[- 1
Driving hores, shoes and wedges										-			
Frames or frame braces		29								24	6		65
		29								-71			ĭĭ
Gages or fittings, alr		2											
Gages or fittings, steam		- 4											
Handholds		ĩ								1	2		4
Inspections and tests not made as re-		8						1		2		3	14
anired.				1	1			w				ļ	2
Insulation and safety devices		2								29	10	10	98
Internal-combustion engine defects,		40		1				ಿ		29	10	10	•
parts and appurtenances.				1	,	1 '			ŀ				
Jack shafts		A								1		1	6
Jumpers and cable connectors		Ŭ									1		
Lateral mount, wheels		7											24
Lateral motion, wheels Lights, cab and classification Lights, headlight													. 1
Meters, volt and ampere													1 3 5
Motors and generatorsPilots and pilot beamsPlugs and studs		11								1 4			5
Pilots and pilot beams		'											
Plugs and studs													
Quills													
Rods, main, side, and drive shafts		18	1						5	29	9	11	105
Sanders Springs and spring rigging, driving		5								5			3
and truck					1	1		1	1	i		-	
Staybolts, broken or defective											i	2	7
Steam pipes]									*		3	4
Stone footboards, et cetera		3				1	L.*	1					-
Switches, hand-operated, and fuses Transformers, resistors and rheostats													
Trucks	7	9								7	2	2	9
Water tanks						l							
Water glasses, fittings and shields	- -			.									
Warning signal appliances		8								3			9
Wheels		19		- -]	l 1	j	1			11	i	3 7	3 8 30
Miscellaneous		19		-								<u> </u>	
Number of defects.		294	14	4	1	٤ ا	3 8	10	5	184	58	78	605
Number of defects					==	_	-	-			=	_	
Locomotive units reported	10	149				15	22	13	32			18	732
Locomotive units inspected	35	625	27	7 6			5	49			70	193	
Locomotive units defective		87	1	∌ '	4 3	L (5 8	3 4	4	73	11	24	211
Percentage of inspected found defec-	1	100	90 .			3 11. 9	5. 7	8,2	1. 8	5. 6	15 7	12. 4	9.7
tive		10.8	33.	6.	J 3. 6	,,,,,,,,,,,,,,,,,,,,,,,,,,,,,,,,,,,,,,,	"	' °'1	Ί •••	7 -	1	1	"'
Locomotive units ordered out of		8	٠		1 :	1		ll		. 4	1	1	14
service		1 6	1	~	٦ .		1	1	1		L		<u> </u>
l		• • •	·	<u> </u>									

DIRECTOR OF LOCOMOTIVE INSPECTION

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

$ \begin{array}{c ccccccccccccccccccccccccccccccccccc$	Maine Central	Minneapolis & St. Louis	Minneapolis, Northfield & Southern	Minneapolis, St. Paul & S. S. Marie	Minnesota Transfer	Mississippi Central	Missouri-Illinois	Missouri-Kansas-Texas	Missouri Pacific	Monogahela Connect- ing	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	
1	2 8 1	6 4		6 1				3 282 203 12 264	4 61 22 8 90	1 1		3				15 337 174 18 256	<u>-</u> 9	1 57 214 103 15 313	2 1 1 3		17	1 2 4 5 6 8 9 10 11 12
1	2 15 2	1 8		4 10	1		 2	5 63 30 40 276 9	7 3 1 122 7		1	2				16 43 30 29	2 1 52	3 2 42 1 5 5 33 6	2		5 1	
11	25	1 12 2		4				18 510 37	1 174 4	5		2				3 460	2 36	21 8 962 32 3 19 2	10		4	29 30
80 82 11 212 18 10 15 243 838 34 27 57 13 13 18 2,057 397 491 25 15 402 246 275 42 578 45 15 431 411 2,822 48 104 266 43 33 366 5921 2,284 1,361 12 32 636 30 27 26 1 2 757 288 6 3 4 1 1,031 50 572 5 18	5	13		3 4 1			1	604 105	89	2	2					135 12 395 55		125 202 16	3 1 1		14	
80 82 11 212 18 10 15 243 838 34 27 57 13 13 18 2,057 397 491 25 15 402 246 275 42 578 45 15 43 1,411 2,822 48 104 266 43 33 36 6,592 1,284 1,361 12 32 636 30 27 26 1 2 757 288 6 3 4 1 1,031 50 572 5 18		1		2				114 1 32 56 117	7 	3						81 3 16 12 142		73 13 3 10 89	2 2 1			51 53 54 55 56 57 59 60 61 62 63
1 1 39 14 3 32 3 30 30 30 30	80 246 30	82 275 27	l	212 578 26	18 45 1	10 15	15 43 2	243 1, 411 757 58. 6	838 2, 822 288	34 48 6 12. 5	27 104 3	57 266 4	13 43	13° 33 1	18 36	2, 057 6, 592 1, 031 15. 6	397 1, 284 50 3. 9	491 1, 361 572 42. 0	25 12 5	15 32	402 636 18	

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

	Parts defective, inoperative or missing, or in violation of the rules	Norfolk Southern	Northern Pacific	Northern Pacific Terminal	Northwestern Pacific	Pacific Electric	Patapsco & Back Rivers	Pennsylvanía	Pennsylvania-Reading Seashore Lines	Peoria & Pekin Union	Philadelphia, Bethlehem & New England	Pledmont & Northern	Pittsburgn & Lake Eite	Pittsburgh & West Virginia	Fortigna Terminaa
,	Air compressors				-			22].	-	-		1 -	-	
2	Axles, truck and driving				-	-		28		-	-	-		-	~~
4	Batteries					-	-	3					-		
2 5 6 8 9	Boilers	5	41	i	2	3		308		i.	[Ī	11 .	-	
0	Brake equipmentCabs and cab windows		10			1		70		-			3 -	-	
å	Cab cards.		1			-		71		-	-		-	-	1
1Ŏ	Cab floors, aprons and deck plates		11			-		191		-			7		
11 12	Clutches Controllers, relays, circuit breakers,	[2	il:		22							
12	magnet valves and switch groups.		- 1		٦	-1					٠ ١				
18	Coupling and uncoupling devices].				1 -		30		-	-		-	-	
14	Current collecting apparatus	}				-:- -		2 39		;				[-	
16	Draft gear		ိ		*			- 00							\
14 16 17 18	Draw gear		i			[6				-			1
30 To	Driving boxes, shoes and wedges Frames or frame braces							3		-		-			[
22	Fuel system		15		1	1 .		143	1				9	2	·
23	Gages or fittings, air				1	[9					- 1	1	
24	Gages or fittings, steam							7							
25	Gears and pinions Handholds		1		ĩ			29					1		
20 22 23 24 25 26 28	Inspections and tests not made as re-		6			1		21				:			
29 30 32	quired. Insulation and safety devices Internal-combustion engine defects, parts and appurtenances.	<u>ī</u>	61		2 1			9 33 5				3	6 19	1	3
33	Jumpers and cable connectors		1			1		32							
35 36	Lateral motion, wheels	JI						3 8						[
36	Lights, cab and classification		Ä		*			i							
37 39	Lights, neadight	1	3					ī]				
40	Motors and generators			1				.48						;	
42	Jack shatts. Jumpers and cable connectors. Lateral motion, wheels. Lights, eab and classification. Lights, headlight. Meters, volt and ampere. Motors and generators. Pilots and pilot beams. Pluce and studs.							. 2		- 				1	
43	Plugs and studs							46		[[
40 42 43 44 46 48	Quills	[[
48	Sanders.		44			1		213					5		
49	Springs and spring rigging, driving and	 	6					45		ļ			- 1	-1	
	truck.				ŀ				L				I		
51	Staybolts, broken or defective	1						9					:1		I
00 K4	Steps, footboards, et cetera		4		ļ	2		34					2		
55	Switches, hand-operated, and fuses		1												
56	Transformers, resistors and rheostats	· - 						41		-,		2			1
57	Trucks		' ـ ـ ـ ا	1	1			1							
PC.	Water tanks Water glasses, fittings and shields Warning signal appliances	1			.										
61	Warning signal appliances	-	ئے ا	[13]			2	3		ř
53 54 55 56 57 59 60 61 62	Wheels	<u>-</u>	20					66		1			1		
63	Miscellaneous	-	<u> </u>	1	-			l		-		-	<u></u>		-
	Number of defects	. 7	263	3 1	18	12		1, 854	1	2		8	66	5	4
		=	<u></u>		=	4	47	2, 686	48	15	56	18	138	27	17
	Locometive units reported	. 34		10	36 120	41 91		6,405	116			80	279	94	32
	Locomotive units inspected Locomotive units defective	- 115	14	3		4		748	3 **	1		4	36	4	' 2
	i Decompose of inspected found delective	3. 8	6.	3 1.1	7 5. 8	4. 4		11.7	7 0. 8	2. 3		5.0	12. 9	4.3	6. 2
	Locomotive units ordered out of service	-	1	8	-	·		3.	L†		·	1	4		
	The state of the s	- 1	1				1					1 .		1	1

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

Reading	Richmond, Fredericksburg & Potomac	River Terminal	Rutland	Sacramento Northern	St. Louis-San Francisco	St. Louis Southwestern	Savannah & Atlanta	Seaboard Air Line	South Buffalo	Southern Paolfic	Southern	Spokane International	Spokane, Portland & Seattle	Steelton & Highspire	Tennessee Central	Terminal R.R. Association of St. Louis	Техва & New Orleans	Texas & Pacific	Texas Mexican	Texas Pacific-Missouri Pacific Terminal R.B. of New Orleans
			1		15 1			1		21 1	38		2 2			. 1				
					1			1					z							
2	2				125	<u>-</u> 8		16 38 4 2 24		6 164 83 18 289	2 19 119 42 10 105		15		8	24 8	17	<u>3</u>		
1		1	i		125 24 4 62	8		4		83	42		3			8	4			
ī	1			ī	62	9	- -	24		289	105		16		8	7	12	9		
<u>1</u>		1			19	4		11		46	23		1		i		8		<u>i</u>	
								5		16	. 4				.					
			3		6 11	2		2 3		37	9 6	<u>ī</u>	1		1					
					1					37 1 3 3 179 15	4 8 101		1				1			
3	3		ī	1	126 4 1	25	3	50 1		179	101		20		3	13	12 1			
		1.			1			1		2	1		z						-,	
1					2			<u>1</u>		29	5		4		<u>-</u> -1					
ī					2 11			1 6		29 91	14		3		7		4			
4	10 10		4	4	3 156	1 20	1	5 70		18 539	10 177		25		8	10	20	1 15		
2					10			4			9									
										29 1 39 4 2 29	1									
	l	_i			15			2		39 4	58		3		- 6	3				
	1				17	5		5		20	13						<u>î</u>			
					i	ľ		ĭ		4	1									
			;		77	12		30		227	97		16			36	35	4	_i	
4	i	1			77 13	ĩ		38 4		227 14	97 17							2		
																				
			3		13 8 1	2		2 1 1		7 22 4	9 15					4	<u>î</u>			
	·				ĭ			i		4	į						-			
	1				42	5		17		12	28		1		i		4			
											1									
					9					4	7		3 8		1					
	1 3		2		9 5 25	<u>ī</u>	ī	14		15 83	60		8			i	4	1		
22	1		17	8	812	97	5	330		2, 057	1, 024	1	134		56	108	133	41	2	<u> </u>
360	8 216	21	15	13	1 710	129 + 512	11	527	60 47	1, 624 6, 580	880 3, 207	12	108 569	23 37	21 135	107 201	358 1, 003	217 764	19 46	10 24
366 1, 07: 1.	3 66 3 216 3 21 7 9. 7	21 42 3 7. 1	15 69 6 8. 7	13 38 4 10. 5	423 1,719 250 14. 5	129 * 513 33 6. 4	11 18 2 11. 1	527 1, 549 115 7. 4		1, 624 6, 589 750 11. 4	880 3, 207 350 10. 9	12 22 1 4. 5	108 569 58 10. 2		21 135 32 23. 7	107 201 35 17. 4	358 1,003 52 5. 2	217 764 17 2. 2	2.2	1
1.	(9.7	T 7.1	8.7	J.U. 5	14.5	0.4	111, 1	7.4		11.4	I TO' R	ղ 4⊪.0	J 10. 2	1	40. (14.4	0.2	1 40.2	7 4 4	1

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

	aejecuve, and ordered out of			,			- 0								
	Parts defective, inoperative or missing, or in violation of the rules	Toledo, Peoria & Western	Toronto, Hamilton & Buffalo	Union Pacific	Union Railroad	Union Railway	Virginian	Wabash	Washington Terminal	Western Maryland	Western Pacific	Youngstown & Northern	Roads with less than 10 loco- motive units	Total	
1 2 4 5 6 8 9 10 11 12	Air compressors Axles, truck and driving Batteries Boilers Brake equipment Cabs and cab windows Cab cards Cab floors, aprons and deck plates Clutches Controllersrelays, circuit breakers.	i		9 63 20 3 104	1 2 4 2			1 28 3 11			- 71	1	71 36 38 16	337 100 16 313 3,477 1,419 231 2,768 3 613	1 2 4 5 6 8 9 10 11 12
18 14 16 17 18 20 22 23 24 25 26 28	magnet valves and switch groups. Ourling and uncoupling devices. Ourrent collecting apparatus. Draft gear. Driving boxes, shoes and wedges. Frames or frame braces. Fruel system. Gages or fittings, air. Gages or fittings, steam. Gears and plnions. Handholds.	6		5 7 7 1 92 8 4	8			22 22 2			1 2 1 8 4		10 2 1 34 8	172 4 489 173 144 23 3, 343 277 41 35 230 682	13 14 16 17 18 20 22 23 24 25 26 28
28 29 30	quired. Insulation and safety devicesInternal-combustion engine defects,			20 7 305	<u>2</u>			1 22			6 2 85	<u>-</u>	34 6 101	210 6, 555	29
32 33 35 36 37 39 40 42 43 44 46 48	parts and appurtenances. Jumpers and cable connectors. Lateral motion, wheels. Lights, cab and classification. Lights, headlight. Meters, voit 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			17 10 1 5 4				1 1 1 1 1 1 1 1 1 1 1 1 1 1 1 1 1 1 1 1			2 1 1		1 4 9 7 1 	1 355 25 480 46 31 787 75 46 1 3, 613	35 36 37 39 40 42 43 44 46 48
51 53 54 55 56 57 60 61 62 63	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 glasses, fittings and shields Warning signal appliances Wheels Miscellaneous	1		5 11 10 1 3 5 53	i 4	2		1 			3 1 15	1	22 	182 408 111 4 823 32 179 382 1, 491	54 55 56 57 59 60 61 62 63
	Number of defectsLocomotive units reportedLocomotive units inspectedLocomotive units defective. Percentage of inspected found defective. Locomotive units ordered out of service.	14 31 2 6. 4	10	5, 189 338	132 146 20 13. 7	39	120 120 120	294 1, 069 52 4. 9	l	126 361 	l 68	11 31 1 3.2	1, 356 2, 398 179 7. 5	31, 171 31, 862 102, 149 10, 473 10, 3 628	2

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

Baltimore & Ohio Chicago North Shore & Milwaukee Chicago South Shore & Bouth Band Delaware, Lackawanna & Western Illinois Central Cong Island New York Central		
Parts defective, inoperative or missing.		' l
Parts defective, inoperative or missing		ľ
	1	
or in violation of the rules		
Baltimore & Ohio Chicago North 8tho Chicago South 8tho New York Central New York, New H	9	
Baltimore & Chicago Nor Chicago Nor Chicago Nor Chicago Sou Chicago Sou Chicago Sou Chicago Sou Chicago Control Chicago Chicag	Pennsylvanis Reading	
lon long war war vo Y o	Pennsyl Reading	_
alth hice ong ong ong		Total
	Pr 195	H
1 Air compressors		1
2 Axles, truck and driving 2 8 29 2	48	188 25 5
Batteries Bollers		
6 Brake equipment 2 27 8 120 1 8 Cabs and cab windows 2 2 31	30	188 25
6 Brake equipment. 2 27 6 120 1 8 Cabs and cab windows. 2 22 1 22 1 22 1 2 22 1 3 1 3 1 1 3 1 1		5 2 1
Cab floors, aprons and deck plates		2 1
1 Clutches 2 Controllers, relays, circuit breakers, magnet 1 1 1 1 1		2 1
Controllers, relays, circuit breakers, magnet		1
5 LARININE BRU URCARDINE COVICO	13	65 1
4 Current collecting apparatus	1	15 1 2 1
	3	2 1 3 1
7 Draw gear 8 Driving boxes, shoes and wedges 9 Frames or frame braces.		3
3 Gages or fittings, air	4	8
8		15 2 3 1 3 1 8 4 46 30 23
6 Handholds	30	46 2
S Inspections and tests not made as required	4	46 2 30 2 23 2
9 Insulation and safety devices 22 1 Internal-combustion engine defects, parts 22 1		8
and appurtenances. Jack shafts		
3 Jumpers and cable connectors 1 6 3		10
8 Lights, cab and classification 13	11	24
3 Jimpers and cable connectors	1	4
0 Motors and generators	25	31
2 Pilots and pilot beams 2 2 2 Pilots and studs		2
8 Sanders		24 4 31 2
9 Springs and spring rigging, driving and	5	. 8
truck. Staybolts, broken or defective		
3 Steam pipes		1 5 222
55 Switches, hand-operated, and fuses.		1 5
57 Trices Discourse 101 1	200	222
Water tanks		
9 Water tanks 10 Water glasses, fittings and shields 11 Warning signal appliances		. 1
62 W neels	9	3 17
99 Microllonouse		834
Miscellaneous,	904	
83 Miscellaneous. 1 4 2 1 Number of defects. 3 7 52 53 311 14	394	
Number of defects	463 136	
Miscellaneous	463 136 486 167 197	2,717 7 2,231 362
Miscellaneous	463 136 486 167 197	8 2,717 7 2,231