INTERSTATE COMMERCE COMMISSION

FORTY-NINTH ANNUAL REPORT

OF THE

DIRECTOR OF LOCOMOTIVE INSPECTION

TO THE

INTERSTATE COMMERCE COMMISSION

FISCAL YEAR ENDED
JUNE 30, 1960

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ANNUAL REPORT OF THE DIRECTOR OF LOCOMOTIVE INSPECTION

OCTOBER 3, 1960.

To the Interstate Commerce Commission:

In compliance with section 7 of the act of February 17, 1911, as amended, the Forty-Ninth Annual Report of the Director of Locomotive Inspection, covering the work of the fiscal year ended June 30, 1960, 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 INVESTIGATIONS OF ACCIDENTS

During the year, 10.2 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 a decrease of 0.2 percent from the results of the preceding year. Five hundred and thirty-one locomotives were ordered withheld from service by our inspectors because of the presence of defects that rendered the locomotives immediately unsafe; this is a decrease of 117 locomotives compared with the preceding year.

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

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

	Year ended June 30—					
	1955	1956	1957	1958	1959	1960
Number of locomotives for which reports were filed	36,992	38,062	37,353	36,905	36,069	35,645
Number inspected	98,025	97,348	100,607	95,593	105,347	108,629
Number found defective	9,913	11,107	9,887	8,394	10,912	11,126
Percentage of inspected found defective	10.1	11.4	9.8	8.8	10.4	10.2
Number ordered out of service	223	644	518	395	648	531
Number of defects found	29,968	35,560	26,385	21,532	32,330	32,830

As indicated in the preceding table there was a decrease in the number of locomotives for which carriers were filing reports on June 30, 1960, as compared to the number being filed on June 30, 1959. The decrease resulted from 702 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 278.

During the year, district locomotive inspectors devoted 9,892 days to regular inspections of locomotives, 391½ days making shop inspections to determine that repairs and tests were being made to meet the requirements of the law and rules, 222½ days investigating accidents, 591 days on special assignment relating to locomotive inspection including investigating complaints regarding possible violations of the law and rules, 399 days conferring with carrier representatives and officials, and 1,273½ days at their respective headquarters reviewing and processing inspection and repair reports filed by the carriers and performing other office work.

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

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

INVESTIGATION OF ACCIDENTS

Accidents reported under requirements of the law and Commission rules were investigated and appropriate action taken to prevent recurrence so far as possible. 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.

Fifty accidents occurred in connection with all types of locomotives in which 81 persons were injured. Compared with the preceding year there was a decrease of 16 accidents and a decrease of 9 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—					
	1955	1956	1957	1958	1959	1960
Number of accidents	83	73	75	72	66	50
Percent increase or decrease from previous year	21.0	12.0	[1] 2.7	4.0	8.3	24.2
Number of persons killed	3	4	0	0	0	0
Percent increase or decrease from previous year	0	[1] 33.3	100	0	0	0
Number of persons injured	142	79	90	86	90	81
Percent increase or decrease from previous year	53.0	44.4	[1] 13.9	4.4	[1] 4.7	10.0

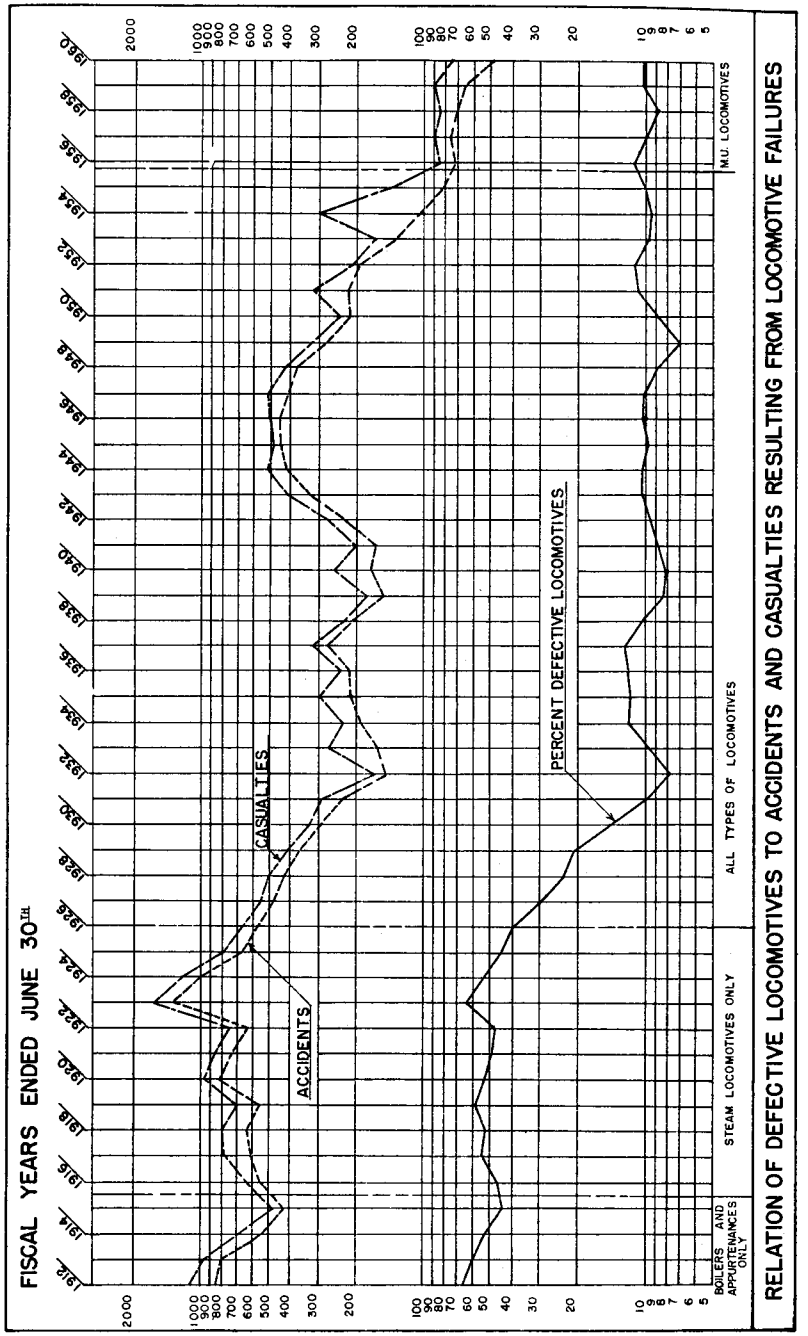
[1] Increase.

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—									
	1956		1957		1958		1959		1960	
	Killed	Injured	Killed	Injured	Killed	Injured	Killed	Injured	Killed	Injured
Members of train crews:										
Engineers	1	19	-------	17	-------	21	-------	22	-------	17
Firemen	2	38	-------	34	-------	36	-------	31	-------	21
Brakemen	1	10	-------	17	-------	11	-------	10	-------	11
Conductors	-------	8	-------	7	-------	5	-------	4	-------	2
Switchmen	-------	-------	-------	1	-------	-------	-------	-------	-------	1
Maintenance employees	-------	2	-------	-------	-------	-------	-------	1	-------	2
Other employees	-------	2	-------	2	-------	1	-------	1	-------	6
Nonemployees	-------	-------	-------	12	-------	12	-------	21	-------	21
Total	4	79	0	90	0	86	0	90	0	81



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

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

Part or appurtenance which caused accident	Year ended June 30, 1960		
	Accidents	Killed	Injured
Air compressors	2	0	7
Aprons	1	0	1
Boiler:			
Steam valves, piping and blowers	1	0	2
Brakes and brake rigging	3	0	5
Cab:			
Doors and windows	1	0	1
Seats	8	0	8
Couplers, draft and drawgear	2	0	2
Electrical equipment:			
Insulation short circuits, or electrical flashes	2	0	2
Fires due to liquid fuel or debris	2	0	2
Floors, steps and passageways	10	0	10
Internal-combustion engines and turbines:			
Crankcase or air-box explosions	9	0	10
Exhaust and cooling systems	4	0	4
Oil pumps and filters	1	0	1
Miscellaneous	4	0	26
Total	50	0	81

LOCOMOTIVE ACCIDENTS

Of the 50 accidents, 10 were caused by the defective condition of floors, steps, and passageways of diesel-electric locomotives. Seven of the 10 resulted from accumulation of oil on walking surfaces of the locomotives, a reduction of 5 compared with the preceding year.

Eight accidents were caused by defective condition of cab seats, compared with 12 in the previous year.

SPECIFICATIONS AND ALTERATION REPORTS

In compliance with rule 54 of the Rules and Instructions for Inspection and Testing of Steam Locomotives, 76 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, 917 specifications and 1,650 alteration reports for locomotive units, and 84 specifications and 439 alteration reports for heating boilers mounted in locomotive units were submitted by carriers.

No specifications or alteration reports were received for multiple operated electric locomotive units. 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 14,932 under rules 51 and 53 of the Rules and Instruc-

tions for Inspection and Testing of Steam Locomotives; 408,366 under rules 331 and 332 of the Rules and Instructions for Inspection and Testing of Locomotives Other Than Steam; and 32,486 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, 38 applications for extension of time for removal of flues were submitted.

After investigation, extensions were granted for the full period requested in 31 applications. Investigation disclosed that in one case the condition of the locomotive was such that an extension could not be granted. Two applications were canceled and four were pending.

SUITS FOR PENALTIES

During the year, three cases involving four 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 $1,000 were assessed.

The five cases, comprising 116 counts, involving failure to file required inspection reports on locomotives which were reported as pending last year were dismissed. These cases were brought upon the basis of violation of the daily or trip inspection requirement of the Rules and Instructions for the Inspection and Testing of Locomotives Other Than Steam, but on June 2, 1959, the rules were amended and no longer require inspection of locomotives at crew-change points.

APPEALS

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

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, 1960, 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.]

ATLANTIC COAST LINE RAILROAD:

April 11, 1960, unit 321–B, Donalsonville, Ga. Crankcase explosion due to failure of No. 4 main bearing; one injured.
One accident; one injured.

BALTIMORE AND OHIO RAILROAD:

July 8, 1959, unit 1416, Fitz Henry, Pa. Loose cover on oil tank permitted oil to leak on engineroom floor; repair oil leak and/or clean oil off floor was reported six times since June 30; one injured.
One accident; one injured.

BOSTON AND MAINE RAILROAD:

January 11, 1960, unit 1260, East Deerfield, Mass. Coupler cut-lever operating rod disengaged from locking pin lifting yoke permitting unrestricted movement of lever; one injured.
One accident; one injured.

CHESAPEAKE AND OHIO RAILWAY:

November 22, 1959, unit 7084, D.G. Cabin, Ky. Crankcase explosion due to an overheated crankshaft connecting rod bearing; one injured.
One accident; one injured.

CHICAGO AND NORTH WESTERN RAILWAY:

November 15, 1959, unit 5023–B, South Beaver Dam, Wis. Employee stepped into opening in cab floor when floor covering was not replaced after having been removed to shut off a defective steam train line shutoff valve; defects relative to accident were reported four times; one injured.
March 22, 1960, unit 1619, Sioux City, Iowa. Cab seat cushion dislodged due to clamps and screws missing; one injured.
Two accidents; two injured.

CHICAGO, BURLINGTON & QUINCY RAILROAD:

November 22, 1959, unit 9411–B, St. Paul, Minn. Crankcase explosion caused by overheated crankshaft main bearings; one injured.
One accident; one injured.

CHICAGO, MILWAUKEE, ST. PAUL & PACIFIC:

April 21, 1960, units 105–C, 35–B, & 96–C, Powerton, Wis. Derailment caused when lower half of a traction motor gear case became loose and fell to the track; 23 injured.
One accident; twenty-three injured.

ERIE RAILROAD:

November 11, 1959, unit 321, Meadville, Pa. Cab seat broke away from floor; base of seat was insecurely fastened to floor; one injured.
July 31, 1959, unit 306, Jersey City, N.J. Collision and derailment caused by brake failure. Brakes were ineffective due to broken pressure head of brake cylinder; three injured.
Two accidents; four injured.

INDIANA HARBOR BELT RAILROAD:

January 11, 1960, unit 8867, Argo, Ill. Crankcase explosion resulted from overheated crankshaft main bearings; one injured.
One accident; one injured.

INTERSTATE RAILROAD:

**December 8, 1959, unit 32, Norton, Va. Platform apron latch failed to hold, allowing the apron to fall from its raised position; one injured.
One accident; one injured.

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MISSOURI-KANSAS-TEXAS RAILROAD:

**September 19, 1959, unit 90–C, Bastrop, Tex. Fire extinguisher chemical entered employee's eyes while attempting to extinguish fire in dynamic braking grids; failure of grids and blower motor resulted in overheating and catching fire; one injured.

January 13, 1960, unit 3, Denison, Tex. Employee was injured when he jumped from unit to escape smoke from fire caused by an overheated bearing in air compressor; one injured.

Two accidents; two injured.

NEW YORK CENTRAL RAILROAD:

July 3, 1959, unit 2444, East Syracuse, N.Y. Crankcase explosion caused by main bearing and connecting rod bearings overheating; one injured.

July 14, 1959, unit 573, Dayton, Ohio. Cab seat gave way due to failure of weld securing seat base to pedestal; one injured.

September 13, 1959, unit 6003, Woodside, Ohio. Crankcase explosion resulted from an overheated crankshaft main bearing; two injured.

February 19, 1960, unit 4065, Milbury, Ohio. Broken lubricating oil supply pipe. Smoke and intense heat from fire in engine compartment entered cab causing the crew to initiate an emergency brake application; one injured.

May 5, 1960, unit 8910, Westville, Ill. Cab seat became dislodged due to defective welding; one injured.

May 14, 1960, unit 4062, Detroit, Mich. Bonnet ring-nut blew off cab heater steam end-valve; one injured.

**May 23, 1960, unit 8530, Limerick, N.Y. Defective throttle latch permitted throttle to open, resulting in undesired hard coupling to train; one injured.

Seven accidents; eight injured.

NEW YORK, CHICAGO AND ST. LOUIS:

**July 28, 1959, unit 850, Chicago, Ill. Cab seat fell to floor due to defective supporting assembly; one injured.

One accident; one injured.

NEW YORK, NEW HAVEN AND HARTFORD RAILROAD:

September 13, 1959, unit 0764, en route New Haven, Conn. to Boston, Mass. Smoke and gas escaping from two defective engine exhaust system elbows and a steam heating boiler entered cab through openings in cab floor; engine and/or steam heating boiler exhaust leaks were reported 17 times prior to and 10 times following accident; one injured.

**October 4, 1959, unit 0772, en route Boston to New Haven and at New Haven, Conn. Exhaust fumes entered cab. Oil on engineroom floor; defects relative to accident were reported 35 times since September 1; one injured.

October 11, 1959, unit 0781, Cedar Hill, Conn. Oil on engineroom walkway; defects having a bearing on accident were reported 17 times from September 1 to date of accident and 10 times following accident; one injured.

December 31, 1959, unit 0921, Boston, Mass. Lubricating oil filter operating shaft broke and blew out of housing allowing hot oil to be discharged; one injured.

January 25, 1960, unit 0428, Cedar Hill, Conn. Oil on engineroom walkway; injection pipe leaking at cylinder head; defects having a bearing on accident were reported 15 times since December 25; one injured.

February 12, 1960, unit 0944, New Haven, Conn. Oil on running board; defects relative to accident were reported 3 times since January 27; one injured.

April 16, 1960, unit 0405, vicinity of Westbrook, Conn. Oil on engineroom walkway; left No. 1 and No. 5 fuel pumps leaking; defects having a bearing on accident were reported 13 times since March 30; one injured.

Seven accidents; seven injured.

PENNSYLVANIA RAILROAD:

July 24, 1959, unit 9730–A, Big Prairie, Ohio. Exhaust gases entered cab due to leak at exhaust manifold expansion joint and broken turbocharger exhaust stack gasket; exhaust gas leakage reported 8 times since June 30; one injured.

August 29, 1959, units 2018–A, 9588–B, 9596–A, near Gallitzin, Pa. Employee was exposed to exhaust gases while stalled in a tunnel due to failure of engine cooling water system of one of a three unit locomotive operation, resulting in its overheating and shutdown of engine, causing the two remaining units to overload and also to shut down; one injured.

**September 3, 1959, unit 9236, Philadelphia, Pa. Uncoupling lever became disconnected due to a missing pin connecting clevis to lock lifter; one injured.

December 9, 1959, unit 9676–A, Rockville, Ohio. Crankcase explosion caused by overheated connecting rod bearings; one injured.

December 23, 1959, unit 4820, Rahway, N.J. Employee was exposed to smoke and fumes while extinguishing fire resulting from fuel oil leakage at oil pressure gage on heating boiler; one injured.

March 25, 1960, unit 4779, New Cumberland, Pa. Employee inhaled smoke caused by a short circuit at transformer tap switches; one injured.

February 19, 1960, unit 4917, New York, N.Y. Failure of steam line globe valve; two injured.

May 6, 1960, unit 489502, Philadelphia, Pa. Failure of air brake system as a result of improperly adjusted auxiliary compressor governor; six injured.

June 9, 1960, unit 4901, Lancaster, Pa. Defective holder on boiler room door; one injured.

Nine accidents; fifteen injured.

READING COMPANY:

July 9, 1959, unit 85, Philadelphia, Pa. Hand brake released unexpectedly; a number of the brake chain links were stretched and brake chain drum pockets were worn which allowed the chain links to override the drum; one injured.

April 6, 1960, unit 45, Philadelphia, Pa. Employee tripped on obstruction on running board; one injured.

Two accidents; two injured.

SEABOARD AIR LINE RAILROAD:

March 7, 1960, unit 1687, Lyons, Ga. Employee's hand caught in radiator shutter when he slipped in oil which was on engineroom and passageway floor due to ruptured lubricating oil line; one injured.

One accident; one injured.

SOUTHERN PACIFIC COMPANY:

July 15, 1959, unit 5635, Roseville, Calif. Cab seat broke off at weld to cushion support plate; one injured.

October 28, 1959, unit 6246, Beaumont, Calif. Cab door would not remain closed due to broken spring in door latch; one injured.

December 28, 1959, unit 6420, Thousand Palms, Calif. Flash occurred in high-voltage cabinet when employee accidentally contacted electrical equipment while attempting to clean dynamic braking contactor; one injured.

**March 4, 1960, unit 6008, Dunnigan, Calif. Crankcase explosion due to hole in top of piston; one injured.

Four accidents; four injured.

SOUTHERN RAILWAY:

January 13, 1960, unit 4218, Lowland, Tenn. Cab seat gave way due to defective condition of the seat mounting; one injured.

One accident; one injured.

TEXAS AND PACIFIC RAILWAY:

December 1, 1959, unit 1508, Cisco, Tex. Crankcase explosion due to overheated main bearings; one injured.

One accident; one injured.

WABASH RAILROAD:

August 17, 1959, unit 1203–A, Bluffs, Ill. Defective condition of brake pipe air hose coupling permitted coupling to separate from connection and strike employee; one injured.

January 14, 1960, unit 1141–A, Alvordton, Ohio. Cab seat disconnected from inner sleeve assembly due to defective bolt in seat frame and sleeve assembly; one injured.

Two accidents; two injured.

WESTERN PACIFIC RAILROAD:

**November 6, 1959, unit 919–C, Keddie, Calif. Employee slipped on oil and fell over fire extinguisher lying on engineroom floor; defects relative to accident were reported 18 times from October 2, to November 5; one injured.

One accident; one injured.

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

	Parts defective, inoperative or missing, or in violation of the rules	Year ended June 30—					
		1955	1956	1957	1958	1959	1960
1	Air compressors	229	239	83	13	11	4
2	Arch tubes	5	1	1	1	2	
3	Ashpans and mechanism	17	13	4			
4	Axles	3	2				
5	Blow-off cocks	105	91	30	2		
6	Boiler checks	84	70	26	9	3	3
7	Boiler shell	43	31	20	3	1	
8	Brake equipment	636	565	256	85	35	19
9	Cabs, cab windows, and curtains	241	187	101	21	3	3
10	Cab aprons and decks	100	113	22	7	3	
11	Cab cards	19	23	18	6	4	2
12	Coupling and uncoupling devices	11	17	8	3	6	1
13	Crossheads, guides, pistons, and piston rods	256	223	107	22	11	6
14	Crown bolts	7	10	2			
15	Cylinders, saddles, and steam chests	387	251	157	17	7	2
16	Cylinder cocks and rigging	130	116	54	11	1	3
17	Domes and dome caps	20	23	13	1		1
18	Draft gear	133	107	45	17	8	6
19	Draw gear	69	57	23	6	1	1
20	Driving boxes, shoes, wedges, pedestals, and braces	226	250	72	21	6	1
21	Firebox sheets	20	25	23		1	
22	Flues	27	19	12		2	1
23	Frames, tail pieces, and braces, locomotive	100	78	22	5	3	
24	Frames, tender	11	10	4			
25	Gages and gage fittings, air	42	40	25	8	3	1
26	Gages and gage fittings, steam	61	68	28	4	1	3
27	Gage cocks	116	113	43	15	5	2
28	Grate shakers and fire doors	107	54	34	6	1	1
29	Handbolds	110	112	33	8	12	5
30	Injectors, inoperative	35	3	4	1	1	1
31	Injectors and connections	406	379	198	37	15	9
32	Inspections and tests not made as required	26	37	24	12	10	
33	Lateral motion	65	48	24	10	2	1
34	Lights, cab and classification	35	18	7	4	1	1
35	Lights, headlight	34	32	18	5	3	1
36	Lubricators and shields	47	38	16	3	1	
37	Mud rings	33	36	6	3	3	
38	Packing nuts	233	253	62	14	10	4
39	Packing, piston rod and valve stem	122	106	74	5	8	
40	Pilots and pilot beams	39	34	8	2	2	1
41	Plugs and studs	16	15	16			
42	Reversing gear	151	108	39	11	5	1
43	Rods, main and side, crankpins, and collars	221	214	108	22	11	6
44	Safety valves	22	17	9	1		
45	Sanders	155	123	72	9	3	7
46	Springs and spring rigging	551	505	212	32	25	4
47	Squirt hose	27	26	14			
48	Staybolts	55	69	20	6	3	1
49	Staybolts, broken	27	30	12	9	19	8
50	Steam pipes	58	57	27	5	4	2
51	Steam valves	33	21	7	2	3	1
52	Steps	157	147	42	20	6	6
53	Tanks and tank valves	269	217	99	16	5	3
54	Telltale holes	6	9	6	1		
55	Throttle and throttle rigging	179	133	48	9	6	5
56	Trucks, engine and trailing	153	96	42	5	2	2
57	Trucks, tender	129	123	51	10	11	7
58	Valve motion	114	105	55	7	4	
59	Washout plugs	73	83	39	1	2	7
60	Stokers	58	68	33	3	2	
61	Water glasses, fittings, and shields	218	193	75	20	9	3
62	Wheels	94	70	39	7	13	1
63	Miscellaneous—Signal appliances, badge plates, brakes (hand)	194	166	68	9	6	2
	Number of defects	7,350	6,487	2,840	592	325	149
	Locomotives reported	8,892	5,875	3,868	2,422	1,490	788
	Locomotives inspected	12,128	8,794	5,983	2,324	967	356
	Locomotives defective	1,784	1,499	737	159	77	38
	Percentage of inspected found defective	14.7	17.0	12.3	6.8	8.0	10.7
	Locomotives ordered out of service	96	152	99	22	16	3

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

	Parts defective, inoperative or missing, or in violation of the rules	Year ended June 30—					
		1955	1956	1957	1958	1959	1960
1	Air compressors	419	443	328	232	337	290
2	Axles, truck and driving	7	26	34	59	100	126
4	Batteries	83	97	35	15	16	21
5	Boilers	203	275	208	172	313	284
6	Brake equipment	2,790	3,259	2,906	2,469	3,477	3,617
8	Cabs and cab windows	1,073	1,600	1,030	962	1,419	1,407
9	Cab cards	150	183	187	145	231	274
10	Cab floors, aprons, and deck plates	1,677	1,933	1,940	2,020	2,768	2,461
11	Clutches	2	4		2	3	6
12	Controllers, relays, circuit breakers, magnet valves and switch groups	802	775	360	348	613	704
13	Coupling and uncoupling devices	204	166	116	132	172	131
14	Current collecting apparatus	15	17	6	3	4	11
16	Draft gear	336	360	253	357	489	420
17	Draw gear	140	146	121	128	173	160
18	Driving boxes, shoes, and wedges	249	291	154	135	144	223
20	Frames or frame braces	14	30	30	17	23	19
22	Fuel system	1,833	2,555	2,431	2,307	3,343	2,702
23	Gages or fittings, air	226	278	289	166	277	254
24	Gages or fittings, steam	48	60	36	58	41	37
25	Gears and pinions	27	20	10	19	35	25
26	Handholds	219	258	208	217	230	244
28	Inspections and tests not made as required	183	748	703	623	682	1,063
29	Insulation and safety devices	188	282	133	228	210	209
30	Internal-combustion engine defects, parts and appurtenances	5,035	6,356	5,174	3,817	6,555	7,184
32	Jack shafts	2			1	1	
33	Jumpers and cable connectors	214	553	442	306	355	350
35	Lateral motion, wheels	39	14	35	46	25	49
36	Lights, cab and classification	198	352	260	321	480	404
37	Lights, headlight	33	38	35	32	46	34
39	Meters, volt and ampere	43	58	34	24	31	30
40	Motors and generators	880	1,122	671	472	787	821
42	Pilots and pilot beams	71	78	61	41	75	64
43	Plugs and studs		1				
44	Quills	22	26	6	32	46	24
46	Rods, main, side, and drive shafts	7	4	5	1	1	5
48	Sanders	1,492	2,307	2,023	2,310	3,613	3,602
49	Springs and spring rigging, driving and truck	306	363	370	380	542	512
51	Staybolts, broken or defective						
53	Steam pipes	177	190	164	141	182	131
54	Steps, footboards, et cetera	737	1,005	827	292	408	372
55	Switches, hand-operated, and fuses	38	48	16	16	11	17
56	Transformers, resistors, and rheostats	3	9	10	2	4	4
57	Trucks	1,054	1,007	552	510	823	765
59	Water tanks	31	49	19	31	32	30
60	Water glasses, fittings, and shields	16	14	5	4	2	1
61	Warning signal appliances	152	182	154	124	179	142
62	Wheels	282	252	256	189	382	798
63	Miscellaneous	898	1,220	736	762	1,491	1,400
	Number of defects	22,618	29,054	23,373	20,668	31,171	31,427
	Locomotive units reported	28,100	29,405	30,740	31,755	31,862	32,186
	Locomotive units inspected	85,897	88,269	93,187	91,522	102,149	105,702
	Locomotive units defective	8,129	9,597	9,031	8,067	10,473	10,638
	Percentage of inspected found defective	9.5	10.9	9.7	8.8	10.3	10.1
	Locomotive units ordered out of service	127	492	417	372	628	517

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

	Parts defective, inoperative or missing, or in violation of the rules	Year ended June 30—				
		[1] 1956	1957	1958	1959	1960
1	Air compressors		4	2	1	4
2	Axles, truck and driving			8	87	53
4	Batteries					
5	Boilers					
6	Brake equipment		18	23	188	491
8	Cabs and cab windows			2	25	26
9	Cab cards	1	8	13	5	8
10	Cab floors, aprons, and deck plates			1	2	
11	Clutches					
12	Controllers, relays, circuit breakers, magnet valves and switch groups			1	2	9
13	Coupling and uncoupling devices					
14	Current collecting apparatus		20	25	65	115
16	Draft gear			1	15	11
17	Draw gear			9	2	20
18	Driving boxes, shoes, and wedges			2	3	3
20	Frames or frame braces					
22	Fuel system					
23	Gages or fittings, air			1	8	5
24	Gages or fittings, steam					
25	Gears and pinions				4	5
26	Handholds		7	45	46	61
28	Inspections and tests not made as required	2	46	22	30	52
29	Insulation and safety devices	1	1		23	87
30	Internal-combustion engine defects, parts and appurtenances					
32	Jack shafts					
33	Jumpers and cable connectors	2	5	3	10	16
35	Lateral motion, wheels					
36	Lights, cab and classification		1		24	42
37	Lights, headlight				4	29
39	Meters, volt and ampere					
40	Motors and generators		3		31	23
42	Pilots and pilot beams				2	1
43	Plugs and studs					
44	Quills					
46	Rods, main, side, and drive shafts					
48	Sanders					1
49	Springs and spring rigging, driving and truck		25	10	8	17
51	Staybolts, broken or defective					
53	Steam pipes					
54	Steps, footboards, et cetera					
55	Switches, hand-operated, and fuses		1		1	3
56	Transformers, resistors, and rheostats	1			5	14
57	Trucks	12	23	98	222	152
59	Water tanks					
60	Water glasses, fittings, and shields					
61	Warning signal appliances		1		1	
62	Wheels		2		3	5
63	Miscellaneous		7	6	17	1
	Number of defects	19	172	272	834	1,254
	Locomotive units reported	2,782	2,745	2,728	2,717	2,671
	Locomotive units inspected	285	1,437	1,747	2,231	2,571
	Locomotive units defective	11	119	168	362	450
	Percentage of inspected found defective	3.9	8.3	9.6	16.2	17.5
	Locomotive units ordered out of service		2	1	4	11

[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 April 1, 1956.

TABLE IV.—*Number of steam locomotives 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 & Ohio	Canadian Pacific	Chicago, Burlington & Quincy	Colorado & Southern	Denver & Rio Grande Western	Duluth, Missabe & Iron Range	Grand Trunk Western	Illinois Central	Lake Superior & Ishpeming	New York, Chicago & St. Louis	Norfolk & Western	Reading	Southern Pacific	Union Pacific	Roads with less than 10 locomotives	Total
1	Air compressors	--	1	--	--	--	--	--	--	--	--	--	--	--	--	3	4
2	Arch tubes	--	--	--	--	--	--	--	--	--	--	--	--	--	--	--	--
3	Ashpans and mechanism	--	--	--	--	--	--	--	--	--	--	--	--	--	--	--	--
4	Axles	--	--	--	--	--	--	--	--	--	--	--	--	--	--	--	--
5	Blow-off cocks	--	--	--	--	--	--	--	--	--	--	--	--	--	--	--	--
6	Boiler checks	--	--	--	--	--	--	--	--	--	--	--	--	--	--	3	3
7	Boiler shell	--	--	--	--	--	--	--	--	--	--	--	--	--	--	--	--
8	Brake equipment	--	--	--	--	--	--	3	--	--	--	1	--	--	--	15	19
9	Cabs, cab windows, and curtains	--	--	--	--	--	--	1	--	--	--	--	--	--	--	2	3
10	Cab aprons and decks	--	--	--	--	--	--	--	--	--	--	--	--	--	--	--	--
11	Cab cards	--	--	--	--	--	--	--	--	--	--	--	--	--	--	2	2
12	Coupling and uncoupling devices	--	--	--	--	--	--	--	--	--	--	--	--	--	--	1	1
13	Crossheads, guides, pistons, and piston rods	--	1	--	--	--	--	3	--	--	--	--	--	--	--	2	6
14	Crown bolts	--	--	--	--	--	--	--	--	--	--	--	--	--	--	--	--
15	Cylinders, saddles, and steam chests	--	--	--	--	--	--	1	--	--	--	--	--	--	--	1	2
16	Cylinder cocks and rigging	--	--	--	--	--	--	2	--	--	--	--	--	--	--	1	3
17	Domes and dome caps	--	--	--	--	--	--	1	--	--	--	--	--	--	--	--	1
18	Draft gear	--	--	--	--	--	--	--	--	--	--	--	--	--	--	6	6
19	Draw gear	--	--	--	--	--	--	--	--	--	--	--	--	--	--	1	1
20	Driving boxes, shoes, wedges, pedestals, and braces	--	--	--	--	--	--	--	--	--	--	--	--	--	--	1	1
21	Firebox sheets	--	--	--	--	--	--	--	--	--	--	--	--	--	--	--	--
22	Flues	--	1	--	--	--	--	--	--	--	--	--	--	--	--	--	1
23	Frames, tail pieces, and braces, locomotive	--	--	--	--	--	--	--	--	--	--	--	--	--	--	--	--
24	Frames, tender	--	--	--	--	--	--	--	--	--	--	--	--	--	--	--	--
25	Gages and gage fittings, air	--	--	--	--	--	--	--	--	--	--	--	--	--	--	1	1
26	Gages and gage fittings, steam	--	--	--	--	--	--	--	--	--	--	1	--	--	--	2	3
27	Gage cocks	--	--	--	--	--	--	--	--	--	--	--	--	--	--	2	2
28	Grate shakers and fire doors	--	--	--	--	--	--	1	--	--	--	--	--	--	--	--	1
29	Handholds	--	--	--	--	--	--	--	--	--	--	--	--	--	--	5	5
30	Injectors, inoperative	--	--	--	--	--	--	--	--	--	--	--	--	--	--	1	1
31	Injectors and connections	--	3	--	--	--	--	--	--	--	--	--	--	--	--	6	9
32	Inspections and tests not made as required	--	--	--	--	--	--	--	--	--	--	--	--	--	--	--	--
33	Lateral motion	--	1	--	--	--	--	--	--	--	--	--	--	--	--	--	1
34	Lights, cab and classification	--	--	--	--	--	--	--	--	--	--	--	--	--	--	1	1
35	Lights, headlight	--	--	--	--	--	--	1	--	--	--	--	--	--	--	--	1
36	Lubricators and shields	--	--	--	--	--	--	--	--	--	--	--	--	--	--	--	--
37	Mud rings	--	--	--	--	--	--	--	--	--	--	--	--	--	--	--	--
38	Packing nuts	--	1	--	--	--	--	--	--	--	--	--	--	--	--	3	4
39	Packing, piston rod and valve stem	--	--	--	--	--	--	--	--	--	--	--	--	--	--	--	--
40	Pilots and pilot beams	--	--	--	--	--	--	--	--	--	--	--	--	--	--	1	1
41	Plugs and studs	--	--	--	--	--	--	--	--	--	--	--	--	--	--	--	--
42	Reversing gear	--	1	--	--	--	--	--	--	--	--	--	--	--	--	--	1
43	Rods, main and side, crankpins, and collars	--	--	--	--	--	--	1	--	--	--	1	--	--	--	4	6
44	Safety valves	--	--	--	--	--	--	--	--	--	--	--	--	--	--	--	--
45	Sanders	--	--	--	--	--	--	6	--	--	--	--	--	--	--	1	7
46	Springs and spring rigging	--	--	--	--	--	--	--	--	--	--	2	--	--	--	2	4
47	Squirt hose	--	--	--	--	--	--	--	--	--	--	--	--	--	--	--	--
48	Staybolts	--	--	--	--	--	--	--	--	--	--	--	--	--	--	1	1
49	Staybolts, broken	--	--	--	--	--	--	--	--	--	--	--	--	--	--	8	8
50	Steam pipes	--	1	--	--	--	--	--	--	--	--	--	--	--	--	1	2
51	Steam valves	--	--	--	--	--	--	--	--	--	--	--	--	--	--	1	1
52	Steps	--	--	--	--	--	--	2	--	--	--	--	--	--	--	4	6
53	Tanks and tank valves	--	--	--	--	--	--	--	--	--	--	--	--	--	--	3	3
54	Telltale holes	--	--	--	--	--	--	--	--	--	--	--	--	--	--	--	--
55	Throttle and throttle rigging	--	2	--	--	--	--	--	--	--	--	--	--	--	--	3	5
56	Trucks, engine and trailing	--	--	--	--	--	--	--	--	--	--	--	--	--	--	2	2
57	Trucks, tender	--	2	--	--	--	--	--	--	--	--	--	--	--	--	5	7
58	Valve motion	--	--	--	--	--	--	--	--	--	--	--	--	--	--	--	--
59	Washout plugs	--	2	--	--	--	--	--	--	--	--	--	--	--	--	5	7
60	Stokers	--	--	--	--	--	--	--	--	--	--	--	--	--	--	--	--
61	Water glasses, fittings, and shields	--	--	--	--	--	--	--	--	--	--	--	--	--	--	3	3
62	Wheels	--	--	--	--	--	--	--	--	--	--	--	--	--	--	1	1
63	Miscellaneous-Signal appliances, badge plates, brakes (hand)	--	1	--	--	--	--	1	--	--	--	--	--	--	--	--	2
	Number of defects	--	17	--	--	--	--	23	--	--	--	5	--	--	--	104	149
	Locomotives reported	45	10	88	29	22	59	39	95	13	44	11	16	24	71	222	788
	Locomotives inspected	--	7	1	5	57	14	20	5	3	12	30	10	--	4	188	356
	Locomotives defective	--	4	--	--	--	--	5	--	--	--	2	--	--	--	27	38

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

	Parts defective, inoperative or missing, or in violation of the rules	Akron, Canton & Youngstown	Aliquippa & Southern	Alton & Southern	Ann Arbor	Apalachicola Northern	Atchison, Topeka & Santa Fe	Atlanta & St. Andrews Bay	Atlanta & West Point	Atlantic Coast Line	Baltimore & Ohio
1	Air compressors						1			7	7
2	Axles, truck and driving						1			4	2
4	Batteries										
5	Boilers						10			29	6
6	Brake equipment			2			56		2	56	64
8	Cabs and cab windows						25		1	20	27
9	Cab cards						4			1	13
10	Cab floors, aprons and deck plates						96			47	61
11	Clutches									3	
12	Controllers, relays, circuit breakers, magnet valves and switch groups.			1			11		1	5	22
13	Coupling and uncoupling devices						1			2	1
14	Current collecting apparatus										
16	Draft gear									5	14
17	Draw gear	1					6				3
18	Driving boxes, shoes and wedges									2	8
20	Frames or frame braces									1	
22	Fuel system						33		1	76	43
23	Gages or fittings, air						5		1	8	5
24	Gages or fittings, steam								2	1	
25	Gears and pinions										
26	Handholds						2			3	4
28	Inspections and tests not made as required						36			20	51
29	Insulation and safety devices						4			7	5
30	Internal-combustion engine defects, parts and appurtenances.						189		1	198	171
32	Jack shafts										
33	Jumpers and cable connectors						13			8	16
35	Lateral motion, wheels										
36	Lights, cab and classification						12			9	1
37	Lights, headlight						2				
39	Meters, volt and ampere									1	
40	Motors and generators						17			22	48
42	Pilots and pilot beams										2
43	Plugs and studs										
44	Quills										
46	Rods, main, side, and drive shaft										
48	Sanders	3		2			87			32	38
49	Springs and spring rigging, driving and truck						9		1	12	12
51	Staybolts, broken or defective										
53	Steam pipes						9			2	2
54	Steps, footboards, et cetera						5			7	15
55	Switches, hand-operated, and fuses										
56	Transformers, resistors and rheostats										
57	Trucks		1				4			17	14
59	Water tanks										
60	Water glasses, fittings and shields										
61	Warning signal appliances						1			1	3
62	Wheels						31			38	37
63	Miscellaneous						34		3	25	101
	Number of defects	4	1	5			704		13	669	796
	Locomotive units reported	17	17	22	21	11	1,852	14	28	589	1,187
	Locomotive units inspected	67	14	37	70	14	7,384	25	74	2,021	4,929
	Locomotive units defective	1	1	2			341		4	228	447
	Percentage of inspected found defective	1.5	7.1	5.4			4.6		5.4	11.3	9.1
	Locomotive units ordered out of service	1					4			16	5

Bangor & Aroostook	Belt Railway of Chicago	Bessemer & Lake Erie	Birmingham Southern	Boston & Maine	Butte, Anaconda & Pacific	Carnas Prairie	Canadian National	Canadian Pacific	Canton	Central of Georgia	Central Railroad of New Jersey	Central Vermont	Chesapeake & Ohio	Chicago & Eastern Illinois	Chicago & Illinois Midland	Chicago & North Western	Chicago & Western Indiana	Chicago, Burlington & Quincy	Chicago Great Western	Chicago, Milwaukee, St. Paul & Pacific	
				11				2		8			1			13		1	1	3	1
										5	1									2	2
																					4
																1					5
				21									2	1		10		3	1	7	5
4	3		10	56	2		2	16		53	31		34	1		225		63	10	69	6
2	1		17	57			1	14		10	2		3	2		69		14		20	8
				24			1	4			2					8				7	9
1			1	77				21		10	23		10	1		64		3	2	27	10
																					11
			6	4						9			12	1		33		4	1	18	12
			1	10				1			1			2		5		3		4	13
																				3	14
				16			1	2		3	7	1	10	1		18		1	2	9	16
								1			2		3			17			2	5	17
				1						1						7				8	18
																				1	20
3			2	145			2	81		54	15		13	1	1	129		14	8	46	22
1			1	24				2		8			1			4		2		2	23
				1						1						1		4		1	24
				2												8					25
			5	2						2	1			2		8				3	26
			1	37	2		1	24		11	8	3	7	3		49		5	8	12	28
				6				1		3	1		3		1	24		1		7	29
6				565			6	136		108	68		42	2		121		29	3	102	30
																					32
			1	73			1			2	2		3			14		2	2	9	33
	1			2												3				2	35
				10				1		9			1			27		1		5	36
				3				1													37
				1												3				1	39
2				45				8		3	5	2	1			22		1		12	40
																18				4	42
																					43
																					44
																					46
			12	60			1	30		26	4	3	46	5		202		18	2	115	48
				7			1	8		6	7					51		1	8	23	49
																					51
				1						1				1						1	53
			2	3				1		8			12	1		20			3	8	54
				1												3		1		1	55
				2																	56
	3		5	60				15		6	5	1	6			32		3	2	25	57
				1																1	59
																					60
				1				2					1			16		3			61
			2	1				2		12	3		3		2	31		6	2	33	62
			1	41			1	11		12	16	1	13	1		116		2	2	24	63
19	8		67	1,371	4		18	384		371	204	11	227	25	4	1,372		185	59	620	
37	53	56	22	377	40	13	240	106	16	145	192	25	1,064	100	11	697	12	706	134	916	
123	52	110	80	1,777	54	17	97	203	12	770	517	91	2,098	283	47	1,933		2,694	458	2,596	
5	6		20	379	2		6	81		85	61	4	101	20	2	422		108	36	234	
4.1	11.5		25.0	21.3	3.7		6.2	39.9		11.0	11.8	4.4	4.8	7.1	4.3	21.8		4.0	7.9	9.0	
				17				7		14	5	1	2		1	21		1	1	11	

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	Chicago River & Indiana	Chicago, Rock Island & Pacific	Chicago South Shore & South Bend	Cincinnati Union Terminal	Clinchfield	Colorado & Southern	Colorado & Wyoming	Conemaugh & Black Lick	Cuyahoga Valley	Delaware & Hudson	Delaware, Lackawanna & Western	Denver & Rio Grande Western	Detroit & Toledo Shore Line	Detroit Terminal
1	Air compressors		9								8		1		
2	Axles, truck and driving		6												
4	Batteries														
5	Boilers		10									1			
6	Brake equipment	1	290	1		5	1				18	20	8	3	4
8	Cabs and cab windows		85								10	8	1		
9	Cab cards		4								2	2			
10	Cab floors, aprons and deck plates		117			1					41	21	9		
11	Clutches														
12	Controllers, relays, circuit breakers, magnet valves and switch groups		27									1	2		
13	Coupling and uncoupling devices		3									1			
14	Current collecting apparatus														
16	Draft gear		4								8	14			
17	Draw gear		20								5	8	1		
18	Driving boxes, shoes and wedges	1	19	1		1						4			
20	Frames or frame braces														
22	Fuel system		64			1	2				28	29	12		
23	Gages or fittings, air		9			1						2			
24	Gages or fittings, steam		1												
25	Gears and pinions		2												
26	Handholds		11								1	3	2		
28	Inspections and tests not made as required		50			2	1				10	6	3		
29	Insulation and safety devices		13										1		
30	Internal-combustion engine defects, parts and appurtenances	1	164			1					331	59	4		1
32	Jack shafts														
33	Jumpers and cable connectors		3			1						2	3		
35	Lateral motion, wheels					1									
36	Lights, cab and classification		20										2		
37	Lights, headlight		1								1		1		
39	Meters, volt and ampere		4												
40	Motors and generators		24								9	3	2		
42	Pilot and pilot beams		1												
43	Plugs and studs														
44	Quills														
46	Rods, main, side, and drive shafts		1												
48	Sanders	5	218	2			1				10	10	8	4	
49	Springs and spring rigging, driving, and truck		38									1	1		4
51	Staybolts, broken or defective														
53	Steam pipes		8									1			
54	Steps, footboards, et cetera		22								1	4			
55	Switches, hand-operated, and fuses														
56	Transformers, resistors and rheostats														
57	Trucks	1	33			1	1			2	3	5			
59	Water tanks		2												
60	Water glasses, fittings and shields														
61	Warning signal appliances		9								2	1			
62	Wheels		52										1		
63	Miscellaneous		65								30	4	2		
	Number of defects	9	1,409	4		15	6			2	518	210	64	7	9
	Locomotive units reported	27	554	17	12	60	56	20	28	10	161	213	254	16	15
	Locomotive units inspected	8	2,300	34	17	231	414	24	38	10	741	737	1,362	73	59
	Locomotive units defective	2	499	3		10	4			1	124	50	36	1	2
	Percentage of inspected found defective	25.0	21.7	8.8		4.3	9.7			10.0	16.7	6.8	2.6	1.4	3.4
	Locomotive units ordered out of service		15								3	1			

	Parts defective, inoperative or missing, or in violation of the rules	Detroit, Toledo & Ironton	Donora Southern	Duluth, Missabe & Iron Range	Duluth, South Shore & Atlantic	Duluth, Winnipeg & Pacific	Elgin, Joliet & Eastern	Erie	Florida East Coast	Ft. Dodge, Des Moines & Southern	Ft. Worth & Denver	Georgia & Florida	Georgia	Grand Trunk Western	Great Northern	Green Bay & Western	Gulf, Colorado & Santa Fe	Gulf, Mobile & Ohio	Houston Belt & Terminal	Illinois Central	Illinois Terminal	Indiana Harbor Belt	
1	Air compressors				1			4	1						2		2	3		3			1
2	Axles, truck and driving							1				3	2								1		2
4	Batteries																						4
5	Boilers							1															5
6	Brake equipment	10			9		1	40	5		1	3	1	14	53		14	24		7	2	1	6
8	Cabs and cab windows	3						15	3		1	1		15	9		8	26				5	8
9	Cab cards							5	2			1			4	1		1		2			9
10	Cab floors, aprons and deck plates				1			33				1	1	5	28		3	47	1	2			10
11	Clutches																						11
12	Controllers, relays, circuit breakers, magnet valves and switch groups	1				1	2	3							15		7	13	1	6	1	2	12
13	Coupling and uncoupling devices	1					1	3							1								13
14	Current collecting apparatus																						14
16	Draft gear						1	4				1		11	7		4						16
17	Draw gear							1												1			17
18	Driving boxes, shoes and wedges							1				2	2	6	5		1						18
20	Frames or frame braces																						20
22	Fuel system				2			25	1				4	4	32	1	3	65		3			22
23	Gages or fittings, air				1			3					1	7	1		1	5		2			23
24	Gages or fittings, steam							1															24
25	Gears and pinions						1																25
26	Handholds	3						6						2	4	2		4					26
28	Inspections and tests not made as required	1						8	1	1		1	1	4	27			10		2			28
29	Insulation and safety devices						2	1							1			1					29
30	Internal-combustion engine defects, parts and appurtenances	2					2	49	14			2	7	12	177		16	101	3	7	2		30
32	Jack shafts																						32
33	Jumpers and cable connectors							2					1	2	4			3		2			33
35	Lateral motion, wheels																						35
36	Lights, cab and classification	2												4	14			21		1		1	36
37	Lights, headlight	2												2									37
39	Meters, volt and ampere					1									1								39
40	Motors and generators							8					1				3	9	2	2			40
42	Pilot and pilot beams							3							4					2			42
43	Plugs and studs																						43
44	Quills																						44
46	Rods, main, side, and drive shafts																						46
48	Sanders						2	14	3				2	47	90		8	81		18	5	7	48
49	Springs and spring rigging, driving, and truck	3						1				3	1	2	3		7					1	49
51	Staybolts, broken or defective																						51
53	Steam pipes							5															53
54	Steps, footboards, et cetera	4											1	3	10			2		2		6	54
55	Switches, hand-operated, and fuses	1																					55
56	Transformers, resistors and rheostats																						56
57	Trucks			1			1	4				1	1	1	4		2	3		4	1	2	57
59	Water tanks														1								59
60	Water glasses, fittings and shields																						60
61	Warning signal appliances			1		1		2						1	6		2	1			1		61
62	Wheels							7		1				3	5		15	6			8	8	62
63	Miscellaneous	2						9				1		2	29		3	27		4			63
	Number of defects	35		2	14	3	13	259	30	2	2	20	26	147	537	4	99	453	7	70	21	33	
	Locomotive units reported	49	13	119	24	16	145	487	110	11	48	12	31	178	648	17	(1)	257	22	627	37	127	
	Locomotive units inspected	121	19	151	65	36	99	2,067	309	30	190	32	168	500	1,737	44	827	973	31	1,978	63	100	
	Locomotive units defective	9		2	5	1	8	118	13	2	1	8	10	30	198	1	26	131	1	27	7	11	
	Percentage of inspected found defective	7.4		1.3	7.7	2.8	8.1	5.7	4.2	6.7	0.5	25.0	6.0	6.0	11.4	2.3	3.1	13.5	3.2	1.4	11.1	11.0	
	Locomotive units ordered out of service							1		1				3	13		2	3		1	1		

[1] Atchison, Topeka & Santa Fe.

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	Indianapolis Union	Interstate	Jacksonville Terminal	Kansas City Southern	Kansas City Terminal	Kansas, Oklahoma & Gulf	Kentucky & Indiana Terminal	Lake Superior & Ishpeming	Lake Terminal	Lehigh & Hudson River
1	Air compressors				3						
2	Axles, truck and driving										
4	Batteries				2						
5	Boilers				1						
6	Brake equipment		2		32	2		2	1	1	1
8	Cabs and cab windows				15	1					
9	Cab cards				1						
10	Cab floors, aprons and deck plates				19	1			1		2
11	Clutches										
12	Controllers, relays, circuit breakers, magnet valves and switch groups				19	1				1	
13	Coupling and uncoupling devices										
14	Current collecting apparatus				2	3	1		3		1
16	Draft gear				3						1
17	Draw gear										
18	Driving boxes, shoes and wedges										
20	Frames or frame braces										
22	Fuel system				33	3		1			6
23	Gages or fittings, air										
24	Gages or fittings, steam										
25	Gears and pinions										
26	Handholds								1		
28	Inspections and tests not made as required		1		12	3					
29	Insulation and safety devices										
30	Internal-combustion engine defects, parts and appurtenances				47	4			1		7
32	Jack shafts										
33	Jumpers and cable connectors										
35	Lateral motion, wheels										
36	Lights, cab and classification				4						
37	Lights, headlight					1					
39	Meters, volt and ampere				5						
40	Motors and generators										
42	Pilots and pilot beams										
43	Plugs and studs										
44	Quills										
46	Rods, main, side, and drive shafts				23	1			3		1
48	Sanders		1		6		2				
49	Springs and spring rigging, driving and truck										
51	Staybolts, broken or defective										
53	Steam pipes				1						
54	Steps, footboards, et cetera										
55	Switches, hand-operated, and fuses										
56	Transformers, resistors and rheostats				9	1				3	
57	Trucks										
59	Water tanks										
60	Water glasses, fittings and shields				2						
61	Warning signal appliances									8	2
62	Wheels				4	1					6
63	Miscellaneous										
	Number of defects		4		243	22	3	3	10	13	27
	Locomotive units reported	12	10	10	153	17	15	23	16	18	13
	Locomotive units inspected	48	42	27	488	66	54	56	46	20	71
	Locomotive units defective		2		66	12	3	2	4	4	5
	Percentage of inspected found defective		4.8		13.5	18.2	5.6	3.6	8.7	20.0	7.0
	Locomotive units ordered out of service				4	4				1	1

	Lehigh & New England	Lehigh Valley	Long Island	Louisiana & Arkansas	Louisville & Nashville	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	Monongahela Connecting	Monongahela	Monon	Montour	Newburgh & South Shore	New Orleans Public Belt	New York Central	
1		4	1		5								38	14							19	1
2													1	4							6	2
4					1									4							2	4
5			5		6	3								13							15	5
6	5	19	13	11	57	10	8		1	3		1	177	88	1		1				403	6
8		2	5	2	25	5	5			1			93	57	1						210	8
9			1	1	5		1		1				2	5							36	9
10	2	17	8	6	29	6			6				156	61	1		1				303	10
11																					3	11
12			2		28		1						35	14							122	12
13					1								6		1						29	13
14																						14
16		2	1	2	6	2	3		2	1			22	7							57	16
17	2				1								38	2							14	17
18							1						40	2							27	18
20														1							2	20
22	1	16	8	2	52	19	6		8				90	76			3				256	22
23		1	5		10	1							5	7							32	23
24					1																4	24
25														3								25
26			7		3		5						10	3	2						28	26
28		4	8	3	23		2		2				55	36							88	28
29					1								13	1							18	29
30	10	43	8	9	83	55	2		2			1	189	124	3		4				678	30
32																						32
33			2		5		1						22	2							41	33
35			1		1	1															11	35
36					9		2						25	21							30	36
37																					4	37
39				2						1				1							7	39
40		3	3		10	1							40	34							80	40
42					3																12	42
43																						43
44																						44
46														1								46
48		10	13	4	102	2	18		7				342	138			5				490	48
49					3	2			1				54	10		1					52	49
51																						51
53			2		1									4							1	53
54			2	2	14					1			17	6							52	54
55																					4	55
56																						56
57		6	9	6	21	11							31	29							99	57
59													3	4							2	59
60														1								60
61		2	2		5								5	7							18	61
62	1				54								33	14	2						135	62
63		7	1	4	34	6	5		1			2	66	26							161	63
	21	136	107	54	599	124	60		33	5		4	1608	820	11	1	14				3,551	
	32	222	79	21	733	80	79	11	212	18	10	15	225	834	31	27	57	13	15	18	2,104	
	111	1,157	111	167	2,505	289	229	34	507	22	16	37	960	2,778	45	53	268	35	22	39	6,869	
	6	52	23	18	210	35	25		13	2		4	418	263	8	1	7				1,240	
	5.4	4.5	20.7	10.8	8.4	12.1	10.9		2.6	0.9		10.8	43.5	9.5	17.8	1.9	2.6				18.1	
	1	3		1	18								56	14	2						23	

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	New York, Chicago & St. Louis	New York, New Haven & Hartford	New York, Susquehanna & Western	Norfolk & Portsmouth Belt Line	Norfolk & Western	Norfolk Southern	Northern Pacific	Northern Pacific Terminal	Northwestern Pacific	Pacific Electric	Patapsco & Back Rivers
1	Air compressors	----	18	1	----	----	----	1	----	----	----	----
2	Axles, truck and driving	----	10	----	----	----	----	----	----	----	----	----
4	Batteries	----	5	----	----	----	----	----	----	----	----	----
5	Boilers	----	65	1	----	----	----	1	----	----	----	----
6	Brake equipment	5	215	4	----	5	----	41	1	1	4	----
8	Cabs and cab windows	----	124	2	----	----	----	8	----	----	----	----
9	Cab cards	1	28	1	----	6	----	2	----	----	----	----
10	Cab floors, aprons and deck plates	9	312	3	----	1	----	9	----	----	----	----
11	Clutches	----	----	----	----	----	----	----	----	----	----	----
12	Controllers, relays, circuit breakers, magnet valves and switch groups	5	13	1	----	----	----	6	1	----	----	----
13	Coupling and uncoupling devices	----	5	----	----	----	----	----	----	----	----	----
14	Current collecting apparatus	----	7	----	----	----	----	----	----	----	----	----
16	Draft gear	1	37	1	----	----	----	2	----	----	----	----
17	Draw gear	----	----	----	----	----	----	----	----	----	----	----
18	Driving boxes, shoes and wedges	11	7	----	----	----	----	----	----	----	----	----
20	Frames or frame braces	----	2	----	----	----	----	----	----	----	----	----
22	Fuel system	5	330	15	----	2	----	13	----	----	----	----
23	Gages or fittings, air	1	28	----	----	----	----	----	----	----	----	----
24	Gages or fittings, steam	----	7	----	----	----	----	1	----	----	----	----
25	Gears and pinions	----	3	----	----	----	----	----	----	----	----	----
26	Handholds	----	13	----	----	----	----	2	----	----	----	----
28	Inspections and tests not made as required	2	42	1	----	7	----	19	----	----	----	----
29	Insulation and safety devices	----	12	----	----	3	----	1	----	----	----	----
30	Internal-combustion engine defects, parts and appurtenances	41	886	21	----	7	----	61	----	----	1	----
32	Jack shafts	----	----	----	----	----	----	----	----	----	----	----
33	Jumpers and cable connectors	----	12	----	----	----	----	3	----	----	----	----
35	Lateral motion, wheels	----	6	2	----	----	----	----	----	----	----	----
36	Lights, cab and classification	----	14	----	----	----	----	3	----	----	----	----
37	Lights, headlight	----	3	----	----	----	----	----	----	----	----	----
39	Meters, volt and ampere	----	3	----	----	----	----	----	----	----	----	----
40	Motors and generators	2	108	2	----	----	----	3	----	----	1	----
42	Pilots and pilot beams	----	----	----	----	----	----	----	----	----	----	----
43	Plugs and studs	----	----	----	----	----	----	----	----	----	----	----
44	Quills	----	1	----	----	----	----	----	----	----	----	----
46	Rods, main, side, and drive shafts	----	----	----	----	----	----	----	----	----	----	----
48	Sanders	24	158	3	----	5	----	63	----	----	1	----
49	Springs and spring rigging, driving and truck	----	23	8	----	----	2	3	----	----	----	----
51	Staybolts, broken or defective	----	----	----	----	----	----	----	----	----	----	----
53	Steam pipes	----	46	----	----	----	----	1	----	----	----	----
54	Steps, footboards, et cetera	7	11	----	----	----	----	2	----	----	----	----
55	Switches, hand-operated, and fuses	----	2	----	----	----	----	----	----	----	----	----
56	Transformers, resistors and rheostats	----	----	----	----	----	----	----	----	----	----	----
57	Trucks	----	67	5	----	----	----	4	2	----	----	----
59	Water tanks	----	12	----	----	----	----	1	----	----	----	----
60	Water glasses, fittings and shields	----	----	----	----	----	----	----	----	----	----	----
61	Warning signal appliances	----	1	----	----	----	----	4	----	----	----	----
62	Wheels	9	14	----	----	----	----	6	----	----	----	----
63	Miscellaneous	3	52	----	----	1	----	5	----	----	----	----
	Number of defects	126	2,702	71	----	37	2	265	4	1	7	----
	Locomotive units reported	412	466	24	15	549	34	634	16	34	42	51
	Locomotive units inspected	1,206	1,462	46	49	1,350	81	1,998	64	122	129	43
	Locomotive units defective	40	586	16	----	24	1	131	2	1	2	----
	Percentage of inspected found defective	3.3	40.1	34.7	----	1.8	1.2	6.6	3.1	0.8	1.6	----
	Locomotive units ordered out of service	2	41	----	----	----	----	11	----	----	----	----

Pennsylvania	Pennsylvania-Reading Seashore Lines	Peoria & Pekin Union	Philadelphia, Bethlehem & New England	Piedmont & Northern	Pittsburgh & Lake Erie	Pittsburgh & West Virginia	Portland Terminal	Reading	Richmond, Fredericksburg & Potomac	River Terminal	Rutland	Sacramento Northern	St. Louis-San Francisco	St. Louis Southwestern	Savannah & Atlanta	Seaboard Air Line	South Buffalo	Southern Pacific	Southern	Spokane International	
9	----	----	----	----	----	----	----	----	----	----	----	----	10	6	----	----	----	27	37	----	1
39	----	----	----	----	----	----	----	----	----	----	----	----	----	----	----	6	----	18	1	----	2
----	----	----	----	----	----	----	----	----	----	----	----	----	----	----	----	----	----	3	2	----	4
5	----	----	----	----	1	----	----	----	1	----	----	----	5	----	----	4	----	15	19	----	5
282	1	----	----	----	8	1	9	----	----	2	----	----	91	10	----	43	----	212	309	----	6
42	----	----	----	1	1	----	1	1	----	1	----	----	35	9	----	4	----	88	124	----	8
9	----	----	----	----	----	1	----	----	----	----	1	----	3	----	1	4	----	29	15	----	9
133	----	----	----	----	5	----	----	5	4	----	----	1	41	4	----	8	----	213	178	----	10
----	----	----	----	----	----	----	----	----	----	----	----	----	----	----	----	----	----	----	----	----	11
37	----	1	----	----	----	----	----	----	----	----	----	----	27	4	----	4	----	60	45	----	12
22	----	----	----	----	1	----	----	----	----	----	----	----	1	1	----	2	----	11	6	----	13
1	----	----	----	----	----	----	----	----	----	----	----	----	----	----	----	----	----	----	----	----	14
28	2	----	----	----	----	----	----	----	----	1	----	1	8	----	1	9	----	22	22	----	16
7	----	----	----	----	----	----	----	1	----	----	----	----	4	2	----	1	----	----	4	----	17
13	----	----	----	----	----	----	----	----	----	----	----	----	4	----	----	----	----	10	23	----	18
3	----	----	----	----	----	----	----	----	----	----	----	----	2	----	----	----	----	1	2	----	20
170	1	----	----	----	2	2	----	5	2	----	1	----	47	16	1	30	----	163	169	----	22
8	----	----	----	----	1	----	----	----	----	----	1	----	5	----	----	----	----	16	18	----	23
1	----	----	----	----	----	----	----	----	----	----	----	----	----	----	----	----	----	4	1	----	24
3	----	----	----	----	----	----	----	----	----	----	----	----	----	----	----	----	----	1	----	----	25
19	----	----	----	----	1	----	----	----	----	----	----	----	3	1	----	3	----	27	32	----	26
49	----	----	----	----	1	1	----	4	----	2	----	----	12	2	----	2	----	128	54	----	28
28	----	----	----	----	2	----	----	----	----	----	----	----	----	----	----	3	----	19	14	----	29
352	3	1	----	3	1	----	4	12	6	----	4	2	106	33	----	69	----	563	518	----	30
----	----	----	----	----	----	----	----	----	----	----	----	----	----	----	----	----	----	----	----	----	32
30	----	----	----	----	----	1	----	1	1	----	----	----	----	----	----	----	----	32	9	----	33
1	----	----	----	----	----	----	----	----	----	----	----	----	----	----	----	4	----	3	9	----	35
1	----	----	----	----	1	----	----	----	----	----	----	----	10	4	----	5	----	46	69	----	36
4	----	----	----	----	----	----	----	----	----	----	----	----	1	----	----	----	----	7	1	----	37
----	----	----	----	----	----	----	----	----	----	----	----	----	1	----	----	----	----	----	1	----	39
52	----	----	----	----	1	----	----	4	----	----	----	----	28	18	1	10	----	38	76	----	40
2	----	----	----	----	----	----	----	1	----	----	----	----	1	1	----	2	----	3	2	----	42
----	----	----	----	----	----	----	----	----	----	----	----	----	----	----	----	----	----	----	----	----	43
23	----	----	----	----	----	----	----	----	----	----	----	----	----	----	----	----	----	----	----	----	44
----	----	----	----	----	----	----	----	----	----	----	----	----	2	----	----	----	----	----	1	----	46
174	4	----	----	----	8	----	----	2	----	----	----	----	74	21	----	29	----	271	158	----	48
34	----	----	----	----	----	----	----	1	----	----	----	----	10	1	----	9	----	9	42	----	49
----	----	----	----	----	----	----	----	----	----	----	----	----	----	----	----	----	----	----	----	----	51
5	----	----	----	----	----	----	----	----	----	----	----	----	10	----	----	2	----	5	15	----	53
25	----	----	----	----	----	----	----	1	----	1	----	----	5	1	----	1	----	24	36	----	54
----	----	----	----	1	----	----	----	----	----	----	----	----	1	----	----	----	----	2	----	----	55
----	----	----	----	----	----	----	----	----	----	----	----	----	1	1	----	----	----	----	----	----	56
40	----	----	----	----	----	----	----	1	----	----	----	----	13	7	----	11	----	25	44	----	57
----	----	----	----	----	----	----	----	----	----	----	----	----	1	----	----	----	----	----	2	----	59
----	----	----	----	----	----	----	----	----	----	----	----	----	----	----	----	----	----	----	----	----	60
6	----	----	----	----	----	----	----	----	----	----	----	----	6	----	----	----	----	10	12	----	61
41	----	----	----	1	6	----	----	----	----	----	----	----	6	3	----	6	----	39	19	----	62
67	----	1	----	1	2	----	----	3	----	----	----	----	29	4	----	6	----	95	142	----	63
1,765	11	3	----	7	42	6	14	42	14	7	7	4	603	149	4	277	----	2,239	2,231	----	
2,767	48	15	28	18	130	27	17	363	70	21	15	13	422	140	11	527	49	1,650	928	12	
7,183	108	30	20	59	263	92	32	986	230	42	72	33	1,747	547	21	1,575	70	7,587	3,732	12	
762	4	1	----	4	30	5	3	13	11	5	5	2	223	36	3	109	----	799	641	----	
10.6	3.7	3.3	----	6.8	11.4	5.4	9.4	1.3	4.8	11.9	6.9	6.1	12.8	6.6	14.3	6.9	----	10.5	17.2	----	
16	----	----	----	1	3	----	----	----	----	----	----	----	13	7	----	7	----	28	46	----	

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	Spokane, Portland & Seattle	Steelton & Highspire	Tennessee Central	Terminal R.R. Association of St. Louis	Texas & New Orleans	Texas & Pacific	Texas Mexican	Texas Pacific-Missouri Pacific Terminal R.R. of New Orleans	Toledo, Peoria & Western	Toronto, Hamilton & Buffalo	Union Pacific	Union Railroad	Union Railway	Wabash	Washington Terminal	Western Maryland	Western Pacific	Youngstown & Northern	Roads with less than 10 locomotive units	Total	
1	Air compressors			2	1							2			2			1			290	1
2	Axles, truck and driving	3				1						6	1							2	126	2
4	Batteries											1									21	4
5	Boilers											17			2			3			284	5
6	Brake equipment	8		10	14	14	2			1		71			26			33		60	3,617	6
8	Cabs and cab windows	2		1		5	3					19	1		9			2	1	26	1,407	8
9	Cab cards	3										10	2						1	16	274	9
10	Cab floors, aprons and deck plates	4		9	4	11	7					77	1		16			18		14	2,461	10
11	Clutches																				6	11
12	Controllers, relays, circuit breakers, magnet valves and switch groups	9		1		3						28	1		4			6		15	704	12
13	Coupling and uncoupling devices									1		2								1	131	13
14	Current collecting apparatus																				11	14
16	Draft gear			1	2	3						3			4			1		12	420	16
17	Draw gear	1								1		1								1	160	17
18	Driving boxes, shoes and wedges			2		2	1			5		1			1			1		2	223	18
20	Frames or frame braces											3			1						19	20
22	Fuel system	11		11	23	10	6			1		62	4	5	18			8	1	45	2,702	22
23	Gages or fittings, air	6										3			1			3		5	254	23
24	Gages or fittings, steam										1	4									37	24
25	Gears and pinions											1						1			25	25
26	Handholds	1			1	1						8			2					1	244	26
28	Inspections and tests not made as required	4		2		4	2					36	1					13		32	1,063	28
29	Insulation and safety devices											7								5	209	29
30	Internal-combustion engine defects, parts and appurtenances	11		5	38	22	16					238	4		72			48	1	63	7,184	30
32	Jack shafts																					32
33	Jumpers and cable connectors			1		3						13						2			350	33
35	Lateral motion, wheels																				49	35
36	Lights, cab and classification	2		1						1		12			1			2		1	404	36
37	Lights, headlight											1									34	37
39	Meters, volt and ampere											1									30	39
40	Motors and generators					1						24						6		19	821	40
42	Pilots and pilot beams											2								1	64	42
43	Plugs and studs																					43
44	Quills																				24	44
46	Rods, main, side, and drive shafts																				5	46
48	Sanders	18			7	12	6			2		102		1	43			13		22	3,602	48
49	Springs and spring rigging, driving and truck					3						19	1		1					4	512	49
51	Staybolts, broken or defective																					51
53	Steam pipes																				131	53
54	Steps, footboards, et cetera	2		5	3	2	1					5			2						131	53
55	Switches, hand-operated, and fuses											3								8	372	54
56	Transformers, resistors and rheostats																				17	55
57	Trucks	5		4	1	2															4	56
59	Water tanks						3					14	1		2			4		15	765	57
60	Water glasses, fittings and shields																				30	59
61	Warning and signal appliances					1															1	60
62	Wheels	1		6								2	1		2					1	142	61
63	Miscellaneous	3		1	2	6	3					21	2		14			3		40	798	62
	Number of defects	94		62	96	106	3					31			4			15		18	1,400	63
	Locomotive units reported	108	14	21	101	357	53			12	1	850	20	6	227			183	4	429	31,427	
	Locomotive units inspected	503	40	113	140	1,085	221	19	10	15	10	1,313	135	11	298	25	126	177	11	1,402	32,186	
	Locomotive units defective	50		23	33	39	804	38	21	47	2	5,820	131	27	1,064	20	473	730	19	2,227	105,702	
	Percentage of inspected found defective	9.9		20.4	23.6	3.6	14			5	1	353	10	1	74			77	3	136	10,638	
	Locomotive units ordered out of service	4		11	3	1	1.7			10.6	50.0	6.1	7.6	3.8	7.0			10.5	15.8	6.1	10.1	
							2					9	1		2			6	1	23	517	

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 & Ohio	Chicago North Shore & Milwaukee	Chicago South Shore & South Bend	Delaware, Lackawanna & Western	Illinois Central	Long Island	New York Central	New York, New Haven & Hartford	Pennsylvania	Reading	Total
1	Air compressors							2	2			4
2	Axles, truck and driving	2					1	30		20		53
4	Batteries											
5	Boilers											
6	Brake equipment		1	1	1		6	416	11	55		491
8	Cabs and cab windows							21		5		26
9	Cab cards							3	5			8
10	Cab floors, aprons and deck plates											
11	Clutches											
12	Controllers, relays, circuit breakers, magnet valves and switch groups	6					1	2				9
13	Coupling and uncoupling devices											
14	Current collecting apparatus						11	103	1			115
16	Draft gear							9	1	1		11
17	Draw gear						2	6		12		20
18	Driving boxes, shoes and wedges	1								2		3
20	Frames or frame braces											
22	Fuel system											
23	Gages or fittings, air		2					3				5
24	Gages or fittings, steam											
25	Gears and pinions							5				5
26	Handholds						4	1		56		61
28	Inspections and tests not made as required				1		3	31	15	2		52
29	Insulation and safety devices						1	86				87
30	Internal-combustion engine defects, parts and appurtenances											
32	Jack shafts											
33	Jumpers and cable connectors							8	8			16
35	Lateral motion, wheels											
36	Lights, cab and classification	13						24		5		42
37	Lights, headlight	3						25		1		29
39	Meters, volt and ampere											
40	Motors and generators							1	5	17		23
42	Pilots and pilot beams		1									1
43	Plugs and studs											
44	Quills											
46	Rods, main, side, and drive shafts											
48	Sanders			1								1
49	Springs and spring rigging, driving and truck				3			6	7	1		17
51	Staybolts, broken or defective											
53	Steam pipes											
54	Steps, footboards, et cetera											
55	Switches, hand-operated, and fuses							3				3
56	Transformers, resistors and rheostats							6		8		14
57	Trucks		1		1		1	28	2	119		152
59	Water tanks											
60	Water glasses, fittings and shields											
61	Warning signal appliances											
62	Wheels						2		2	1		5
63	Miscellaneous							1				1
	Number of defects	25	5	2	6		32	820	59	305		1,254
	Locomotive units reported	55	138	65	270	280	692	359	221	455	136	2,671
	Locomotive units inspected	33	48	26	384	47	427	634	236	574	162	2,571
	Locomotive units defective	11	3	2	4		12	231	33	154		450
	Percentage of inspected found defective	33.3	6.2	7.7	1.0		2.8	36.4	14.0	26.8		17.5
	Locomotive units ordered out of service						1	4	4	2		11

ILLUSTRATIONS OF THE TYPE OF DEFECTS ON LOCOMOTIVES THAT HAVE BEEN RESPONSIBLE FOR ACCIDENTS AND RESULTANT CASUALTIES INVOLVING EMPLOYEES AND TRAVELERS UPON RAILROADS

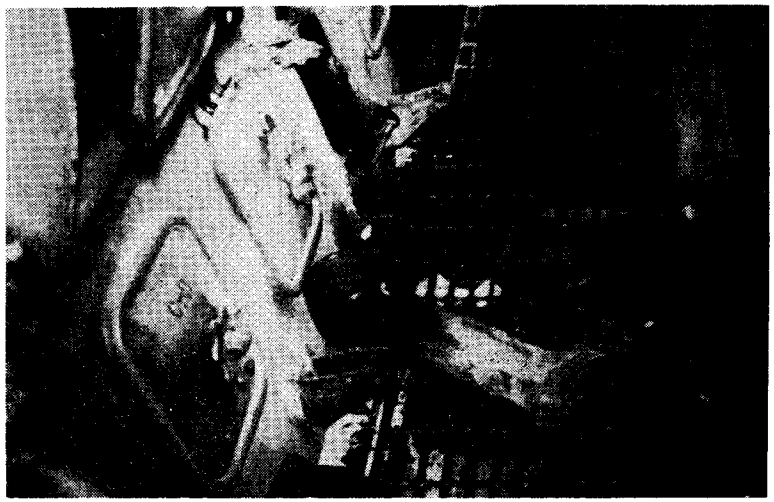

Plate 1

Plate 1 shows damage to diesel engine of locomotive resulting from crankcase explosion. One employee was injured.

Plate 2

Plate 2 shows failed main steam shut-off valve which failed through body. Two employees were injured.