## INTERSTATE COMMERCE COMMISSION

# FORTY-FIFTH ANNUAL REPORT

OF THE

# DIRECTOR OF LOCOMOTIVE INSPECTION

TO THE

INTERSTATE COMMERCE COMMISSION

FISCAL YEAR ENDED JUNE 30, 1956



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# ANNUAL REPORT OF THE DIRECTOR OF LOCOMOTIVE INSPECTION

August 31, 1956.

To the Interstate Commerce Commission:

In compliance with section 7 of the act of February 17, 1911, as amended, the Forty-Fifth Annual Report of the Director of Locomotive Inspection, covering the work of the fiscal year ended June 30, 1956, 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 scrious injury or death, are not included in this report. For additional information concerning railroad accidents, see Accident Bulletin, prepared by the Bureau of Transport Economics and Statistics.

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

Results of locomotive inspections made by district inspectors in performance of duties prescribed under section 6 of the act are shown in table I. The decrease in the number of locomotives for which reports were filed which has occurred from 1950 to 1955 resulted, in the major part, from replacement of steam locomotives by locomotives other than steam most of which were of the Diesel-electric type. The increase in the fiscal year covered by this report resulted from

extension of our jurisdiction on April 1, 1956, to cover multiple

operated electric locomotive units.

During this and the preceding 3 years the number of locomotive units inspected per inspector remained approximately constant. However, because funds appropriated for travel were not sufficient to permit district inspectors to properly travel throughout their respective districts for the purpose of discharging duties assigned to them under the law, they were unable to visit outlying terminals with the same frequency as in former years. Consequently a nonuniform pattern of enforcement prevailed during this period. The appropriation for fiscal year 1957 provides for additional travel funds which will permit coverage of neglected inspection points and make possible greater uniformity of enforcement by district inspectors.

The increase in the number of locomotives found defective, the number of defects found, the percentage of inspected found defective and in the number ordered out of service is a reflection of the deterioration resulting from increasing age of the now predominating Diesel

power.

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

		Y	ear ende	d June 3	0	
	1956 1	1955	1954	1953	1952	1951
Number inspected.  Number found defective.  Percentage of inspected found defective.	38, 062 97, 348 11, 107 11, 4 644 35, 560	36, 992 98, 025 9, 913 10. 1 223 29, 968	39, 270 103, 337 9, 994 9, 7 257 29, 403	41, 172 104, 069 10, 154 9, 8 281 30, 143	43, 206 110, 483 12, 321 11, 2 505 41, 351	45, 915 115, 061 12, 370 10, 8 614 46, 592

<sup>&</sup>lt;sup>1</sup> Includes multiple operated electric locomotive units subsequent to March 31, 1956.

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. During the period from April 1 to June 30, 1956, there were reported 2,782 units of which 285 were inspected and 11 or 3.9 percent of those inspected were found defective.

## INVESTIGATION OF ACCIDENTS AND GENERAL CONDITION OF LOCOMOTIVES

All accidents reported under requirements of the law and rules were carefully investigated and appropriate action taken to prevent recurrence so far as possible. Copies of published reports of accident

investigations were distributed to interested parties, and all district inspectors were advised of details and causes of unusual accidents to better assist them in their educational contacts with railroad personnel. The dissemination of pertinent information concerning fundamental causes of locomotive accidents and resultant casualties has been an important adjunct to basic enforcement activities. Such public information combined with the active enforcement of the requirements has been effective in promotion of locomotive safety and has resulted in a decreasing accident trend. Special conferences are held with groups of district inspectors at which uniformity of enforcement procedures are stressed and methods of improvement in promotion of locomotive safety thoroughly discussed. These meetings are implemented by distribution of current activities bulletins, covering accident investigations, which are forwarded monthly to the district inspectors.

#### ACCIDENTS

Seventy-three accidents occurred in connection with all types of locomotives and resulted in 4 deaths and 79 injuries. Compared with the preceding year there was an increase of 1 death, a decrease of 10 accidents, and a decrease of 63 injuries.

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

Tables II, III, and IV which follow show details of accidents which occurred in the past year and are prepared to show their distribution among personnel and responsible parts and appurtenances. If advantage is taken of information contained in these tables, proper inspections and repairs made, and equipment maintained in compliance with the standards of condition established by the requirements of the law and rules many accidents may be prevented.

Tables V and VI show details of defective parts and appurtenances of steam locomotives and locomotives other than steam reported, inspected, found defective and ordered out of service. If the distribution of reported defective parts shown by the tables is considered, those parts which may be expected to require most maintenance will be indicated and inspection and repair programs may be set up on the emphasized basis.

Detailed results of inspections of steam locomotives and locomotive units other than steam are shown in tables VII and VIII, respectively.

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Table II.—Accidents and casualties caused by failure of some part or appurtenance of steam locomotives and locomotive units other than steam

		Y	ear endec	l June 30		
	1956 1	1955	1954	1953	1952	1951
Number of accidents  Percent increase or decrease from previous year  Number of persons killed  Percent increase or decrease from previous year  Number of persons injured  Percent increase or decrease from previous year	73 12.0 4 2 33.3 79 44.4	83 21.0 3 142 53.0	105 21.6 3 75.0 302 2 101.3	134 31. 6 12 2 200. 0 150 26. 1	196 11. 3 4 75. 0 203 32. 1	221 2 0. 5 16 2 60. 0 299 2 27. 8

<sup>&</sup>lt;sup>1</sup> No accidents involving multiple operated electric locomotive units were reported in 1956.

<sup>2</sup> Increase

Table III.—Number of casualties classified according to occupation—steam locomotives and locomotive units other than steam

				Year	r ended	June	30			
	19	956	19	55	19	54	19	53	19	52
	Killed	Injured	Killed	Injured	Killed	Injured	Killed	Injured	Killed	Injured
Members of train crews: Engineers. Firemen Brakemen. Conductors. Switchmen Maintenance employees Other employees. Nonemployees		19 38 10 8	1 1 1 1 1 1 1 1 1 1 1 1 1 1 1 1 1 1 1 1	26 34 10 4 4 4 18 42	2	37 39 11 4 3 12 2 194	4 4 3 1	37 57 20 8 4 8 2	1 2 1	51 76 31 7 10 24 2
Total	4	79	3	142	3	302	12	150	4	203

#### LOCOMOTIVE ACCIDENTS

Twenty-two accidents occurred on Diesel-electric locomotives because of defective condition of floors, steps and passageways. Twenty of these accidents were caused by accumulation of oil upon walking surfaces. In 11 of the 20 accidents oil accumulations had been reported from 4 to 29 times during the month preceding the accident. Continued reporting of the same defective condition indicates that necessary corrective repairs to eliminate the cause reponsible for the dangerous condition were not made and indicates a laxity in observance of basic safety essentials. Because each oil hazard is a potential source of a disabling accident, district inspectors have been instructed to give close attention to this type of defect particularly on railroads where this condition is prevalent.

Three accidents resulted from defective cab seats in the fiscal year. This is a reduction of 5 in the number of such accidents compared with the preceding year and apparently is a reflection of the surveillance exercised by the district inspectors.

Table IV.—Accidents and casualties resulting from failure of steam locomotives, tenders, locomotives other than steam and their appurtenances

Part or appurtenance which caused accident	Year end	led June 30	, 1956
Tato of apparational of which caused accident	Accidents	Killed	Injured
Air compressors	1		1
Axles, axle journals, and journal boxes	1		3
Boiler: Blow-off cocks	1		1
		4	2
Explosions Fuel explosions in firebox	ĺ	*	ī
Starbolts	l î		î
StayboltsSteam valves, piping and blowers	3		3
Brakes and brake rigging	Š		1 5
Cah:	1		
Doors or windows	3		3
Seats			3
Couplers, draft and drawgear			1
Electrical equipment:			
Insulation, short circuits or electrical flashes	3		3
Fans and shutters	1		1
Fires due to liquid fuel or debris	3		4
Floors, steps and passageways	24		24
Handholds	. 1		1
Internal-combustion engines and turbines:	_		
Crankcase or air-box explosions			8
Exhaust and cooling systems			2 2
Fuel injectors and connections	2		1 4
Machinery—steam locomotive:	1		1
Crossheads and guidesLubricators, glasses and connections	1 1		
Lubricators, glasses and connections	1 1		1
Valve and reversing gear			9
Unguarded moving parts Miscellaneous			3
Muscenaneous			l
Total	. 73	4	79

Seven crankcase explosions resulted in injury to 9 persons. Primary cause of these explosions was overheating of bearings, 4 of which were due to clogged or defective lubrication system, 1 due to bearing rotating causing stoppage of oil passages, and 2 were caused by defective pistons. Three accidents resulted from employees coming in contact with unguarded moving parts.

#### EXPLOSIONS AND OTHER BOILER ACCIDENTS

Two boiler explosions occurred in the fiscal year; both were caused by overheating of the crown sheet due to low water. Four persons were killed and two were injured in these accidents.

One of the explosions occurred on a locomotive in freight-train service and the other on a switching locomotive. On the locomotive used in freight service, the color of the overheated sheets showed a line of demarcation which indicated that the water had been approximately 9 inches below the highest point of the crown sheet. The train was stationary at the time of the explosion. The switching locomotive was ordered for yard service and it was being prepared for service when the crown sheet failed. The entire crown sheet and top portion of the back flue sheet and door sheet had been overheated. The overheated area as shown by the color of the sheets

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

p	arts defective, inoperative or missing, or in		Y	ear ende	1 June 30	<del>-</del>	
•	violation of the rules	1956	1955	1954	1953	1952	1951
1 A	ir compressors	239	229	304	351	671	897
2   A1 3   A3	ch tubes	1 13	5 17	$\frac{4}{24}$	5 <b>3</b> 6	12 59	17 64
4   A:	kles	2	3	3		1	4
5   Bl 6   Be	low-off cocks	91 70	105 84	121 158	185 182	299 356	269 477
7   Be	oiler shell	31	43	79	94	174	220
3   B1	rake equipmentahs, cab windows, and curtains	565 187	636 241	835 298	1, 038 354	1, 955 694	2, 45 1, 17
í l č	ab aprons and decks	113	100	133	179	295	39.
1   C:	ab cards	23 17	19 11	27 22	40 30	53 42	85 5-
	oupling and uncoupling devices cossheads, guides, pistons, and piston rods	223	256	398	478	1,035	1, 36
i Çı	rown bolts	10	7	20	27	38	5
5   C	rown boltsylinders, saddles, and steam chests ylinder cocks and rigging	251 116	387 130	364 132	455 136	908 328	1, 43° 47-
Z D	omes and dome caps raft gear raw gear	23	20	20	45	85	13
8   D 9   D	rait gear	107 57	133 69	150 79	168 108	313 189	44 29
ען ו	riving boxes, snoes, weages, peaestais, and					1	
	braces rebox sheets	250 25	226 20	258 37	345 55	681 141	1, 14 20
2   F)	ues	19	27	32	49	121	18
3   F	rames, tail pieces, and braces, locomotive	78	100	151 14	225 10	368 26	48 4
4   F1 5   G.	rames, tenderages and gage fittings, air	10 1 40	11 42	47	61	136	17
6   G.	ages and gage fittings, steam	68	61	89	112	228	32 49
7   G: 3   G:	age cocksrate shakers and fire doors	113 54	116 107	120 90	211 121	337 282	33
$\widetilde{\mathbf{H}}$	rate shakers and fire doorsandholds	112	110	146	196	353	42
) In I In	jectors, inoperative jectors and connections	3 379	35 406	33 674	18 843	34 1, 615	2, 19
2   In	spections and tests not made as required	37	26	24	53	68	12
$egin{array}{c c} 3 & \mathbf{L} 3 \\ 4 & \mathbf{L} 5 \end{array}$	ateral motionghts, cab and classification	48 18	65 35	98 39	137 26	274 44	46 11
5   L	ights, headlight	32	34	56	42	100	10
$\frac{6}{7} \mid \frac{\text{L}_1}{\text{M}}$	ghts, headlightbricators and shields	38 36	47 33	63 65	81 78	160 149	22 15
7   M 8   P:	ud ringsacking nuts	253	233	240	294	552	63
9   P:	acking, piston rod and valve stem	106	122	154	220	494	76
0   P: 1   P:	ilots and pilot beams lugs and studs eversing gear	34 15	39 16	52 22	48 50	102   91	12 11
2   R	eversing gear	108	151	170	216	429	63
3   R 4   Sa	ods, main and side, crankpins, and collars	214 17	221 22	315 15	459 19	990 39	1, 51 4
5   Sa	inders.	123	155	277	324	552	80
6   St	orings and spring rigging	505 26	551 27	834 39	1, 322 41	2, 424 69	3, 34 9
8 St	quirt hose	69	55	108	144	254	28
9   St	aybolts, broken eam pipes eam valves	30	27 58	55 87	125 161	159 232	28 34
0   St 1   St	eam valves	57 21	33	69	68	146	18
2 St	epsank valves	147	157	255	321	561 980	80
3   T	elltale holes	217 9	269 6	340 13	466 6	980	1, 30 3
$ar{\mathbf{T}}$	elltale holes hrottle and throttle rigging	133	179	228	327	608	92
6 T	rucks, engine and trailing	96 123	153 129	171 152	263 219	427 474	70 71
$\mathbf{s} \mid \hat{\mathbf{v}}$	rucks, tenderalve motion	105	114	174	195	437	67
9   W	asnout plugs	83 68	73 58	79 55	138 133	266 253	32 30
1   W	okersater glasses, fittings, and shields	193	218	282	357	651	85
2   W	fiscellaneous—Signal appliances, badge plates,	70	94	107	151	340	53
	brakes (hand)	166	194	263	339	569	77
	Number of defects	6, 487	7, 350	9, 763	12, 980	24, 738	34, 65
Ļ	ocomotives reported	5, 875	8, 892	12, 135	15, 798	20, 490	26, 59
十七	ocomotives inspectedocomotives defective	8, 794 1, 499	12, 128 1, 784	19, 999 2, 599	28, 899 3, 583	45, 220 6, 234	62, 11 7, 99
P	ercentage of inspected found defective	17.0	14.7	13.0	12.4	13.8	12.
L	ocomotives ordered out of service	152	96	117	163	370	50

Table VI.—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 30	)—	
	violation of the rules	1956	1955	1954	1953	1952	1951
1	Air compressors	443	419	326	210	206	146
2	Axles, truck and driving	26	7	4	7	3	2
4	Batteries	97	83	82	40	39	85
5	Boilers	275	203	175	103	69	43
6	Brake equipment	3, 259	2, 790	2, 126	1,698	1,450	1, 166
8	Cabs and cab windows	1,600	1,073	858	679	813	672
.9	Cab cards	183	150	135	128	139	100
10	Cab floors, aprons, and deck plates	1,933	1,677	1, 703	1, 589	1, 694	1, 281
11	Clutches	4	2	5	9	5	4
12	Controllers, relays, circuit breakers, magnet valves and switch groups		000	454	404		100
13	Coupling and uncoupling devices	775	802	454	424	222	166
14	Coupling and uncoupling devices.	166	204	139	95	76	35
16	Current collecting apparatus	17 360	15	12	6	000	9
17	Draft gear	146	336	291 55	218 42	202	141
18	Draw gear	291	140 249		128	28 98	46 38
20	Driving boxes, shoes, and wedges	30	14	154	22	33	27
22	Fuel system.	2,555	1, 833	$\frac{32}{1,951}$	1,853		1, 082
23	Gages or fittings, air	2, 353	226	1, 931	1, 838	1, 751 110	70
24	Gages or fittings, steam	60	48	56	44	110	14
25	Gears and pinions	20	27	12	13	26	9
26	Handholds	258	219	230	121	127	97
28	Inspections and tests not made as required	748	183	185	175	159	143
29	Insulation and safety devices.	282	188	105	77	102	64
30	Internal-combustion engine defects, parts and	202	100	100	i	102	01
00	appurtenances	6, 356	5,035	4, 848	4, 564	4, 768	3, 270
32	Jack shafts	0,000	0,000	1,010	1,001	1, 100	5, 216
33	Jumpers and cable connectors	553	214	178	156	191	190
35	Lateral motion, wheels	14	39	5	107	8	iii
36	Lights, cab and classification	352	198	232	109	49	23
37	Lights, headlight	38	33	28	42	22	16
39	Meters, volt and ampere	58	43	40	27	41	14
40	Motors and generators	1,122	880	813	655	674	314
42	Pilots and pilot beams	78	71	71	46	53	36
43	Plugs and studs	1			3	3	3
44	Quills	26	22	11	6	15	26
46	Rods, main, side, and drive shafts	4	7			15	2
48	Sanders	2, 307	1, 492	1, 200	1, 224	1, 202	902
49	Springs and spring rigging, driving and truck	363	306	241	178	153	108
51	Staybolts, broken or defective					1	
53	Steam pipes	190	177	154	119	89	24
54 55	Steps, footboards, et cetera	1,005	737	622	505	480	377
56	Switches, hand-operated, and fuses	48	38	34	17	18	15
57	Transformers, resistors, and rheostats		3	6	430	200	9
59	Trucks	1,007 49	1, 054 31	503 34	439 31	390	234 33
60	Water tanks Water glasses, fittings, and shields	14	16	11	14	47 38	11
61	Warning signal appliances	182	152	121	122	117	83
62	Wheels	252	282	257	212	230	215
63	Miscellaneous	1, 220	898	1,005	864	638	574
	2.2.2.000	1, 220					
	Number of defects	29, 054	22, 618	19, 640	17, 163	16, 613	11, 935
	Locomotive units reported	29, 405	28, 100	27, 135	25, 374	22, 716	19, 320
	Locomotive units inspected	88, 269	85, 897	83, 338	75, 170	65, 263	52, 948
	Locomotive units defective	9, 597	8, 129	7, 395	6, 571	6, 087	4, 375
	Percentage of inspected found defective	10. 9	9. 5	8.9	8.7	9.3	8.3
	Locomotive units ordered out of service	492	127	140	118	135	106
						1	-00
							<del></del>

indicated that the water level had been about 16 inches below the highest point of the crown sheet.

Six boiler and appurtenance accidents other than explosions resulted in injury to 6 persons.

#### SPECIFICATIONS AND ALTERATION REPORTS

Under rule 54 of the Rules and Instructions for Inspection and Testing of Steam Locomotives, 51 specification cards and 570 alteration reports were filed, checked, and analyzed. These reports are necessary in order to determine whether or not the boilers represented were so constructed or repaired as to render safe and proper service and whether the stresses were within the allowed limits. Corrective measures were taken with respect to discrepancies found.

Under rules 328 and 329 of the Rules and Instructions for Inspection and Testing of Locomotives Other Than Steam, and under rule 449 for Multiple Operated Electric Locomotive Units, 3,588 specifications (including 1,829 M. U. specifications) and 1,452 alteration reports were filed for locomotive units and 335 specifications and 392 alteration reports were filed for boilers mounted on locomotive units other than steam. These were analyzed and corrective measures were taken with respect to discrepancies found.

#### EXTENSION OF TIME FOR REMOVAL OF FLUES

Five hundred and nine applications were filed for extension of time for removal of flues, as provided in rule 10. Our investigations disclosed that in 43 of these cases the condition of the locomotives or other circumstances were such that extensions could not properly be granted. Six were in such condition that the full extensions requested could not be authorized, but extensions for shorter periods of time were allowed. Twenty-five applications were canceled for various reasons. Four hundred and thirty-five applications were granted for the full period requested, 48 of which were granted after defects disclosed by our investigations were required to be repaired.

#### SUITS FOR PENALTIES

During the year 6 cases involving 117 counts for alleged violations of the Locomotive Inspection Act and rules formulated thereunder were transmitted to United States attorneys for prosecution under section 9 of the act.

One case involving confession of judgment on 51 counts was decided for the United States. Five cases were pending at the end of the vear. Brief summary of the cases follows:

United States v. New York Central Railroad Company, northern district of Ohio, involved 102 counts for failure to file reports of monthly inspections with United States inspector within 10 days after inspection as required by the rules. Judgment on 51 counts for \$5.100: 51 counts dismissed.

United States v. New York Central Railroad Company, western district of New York, involved one count for use of locomotive while defective and in violation of rule 229 (d). Pending.

United States v. The Northwestern Pacific Railroad Company. northern district of California, involved 11 counts for permitting locomotive belonging to the Pacific Lumber Company to be used on its line of railroad when flues had not been removed and boiler cleaned and examined within the period of time specified in rule 10. Pending.

United States v. Chicago and North Western Railway Company, northern district of Illinois, involved one count for use of a locomotive having defective injector in violation of rule 43. Pending.

United States v. Union Pacific Railroad Company, district of Oregon, involved one count for use of locomotive while defective and in violation of rules 229 (d) and 318. Pending.

United States v. The Pennsylvania Railroad Company, middle district of Pennsylvania, involved one count for use of locomotive while defective and in violation of rules 101 and 102. Pending.

#### APPEALS

No formal appeal from the decision of a district inspector was filed by any carrier during the fiscal year.

#### BETTERMENT OF SERVICE

In order to keep district inspectors thoroughly informed and familiar with advancement and improvements on locomotives other than steam and multiple operated electric locomotive units, and to establish uniform enforcement standards in each and every district, they are assembled in groups at convenient locations for conferences and discussions with officials of the Bureau.

At these conferences such items as new locomotive designs, inspection problems arising in the various districts, matters concerning policies, and uniform inspection and enforcement procedure under the Locomotive Inspection Act are thoroughly discussed.

> JOHN A. HALL. Director of Locomotive Inspection.

ACCIDENTS AND CASUALTIES RESULTING FROM THE FAILURE OF STEAM LOCOMOTIVES, TENDERS, LOCOMOTIVES OTHER THAN STEAM AND THEIR APPURTENANCES DURING THE FISCAL YEAR ENDED JUNE 30, 1956, BY ROADS

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

#### ATCHISON, TOPEKA & SANTA FE RAILWAY:

August 20, 1955, unit 31, Lugo, Calif. Open circuit in jumper cable prevented normal functioning of reverser; one injured.

August 27, 1955, unit 136-A, near Saginaw, Tex. Air blower box flange cap screws loose; oil on engineroom floor; one injured.
September 15, 1955, unit 215-C, Winslow, Ariz. Oil on engineroom floor;

\*\*November 22, 1955, unit 2342, Los Angeles, Calif. Cab window stuck in partially opened position; one injured.

Four accidents; four injured.

### CHESAPEAKE & OHIO RAILWAY:

\*\*July 25, 1955, locomotive 2723, Quinnimont, W. Va. Defective restraining latch on power reverse gear permitted undesired movement of control wheel;

One accident: one injured.

#### CHICAGO & NORTH WESTERN RAILWAY:

November 18, 1955, locomotive 587, West Chicago, Ill. Crown sheet failure due to low water; one killed, one injured.

March 10, 1956, unit 5021-A, Bellevue, Wis. Adjusting trunk dowel latch was worn permitting cab seat to drop; one injured.

June 29, 1956, unit 5017-B, between Knapp and Hudson, Wis. Crankcase

explosion resulted from an overheated bearing; water leaking at lower liner seal; lower tangs #2 main bearing sheared off which permitted bearing to rotate 90 degrees, shutting off oil lubrication; "#2 engine used 6" of water in 3 hours" was reported June 22, "No. 2 engine using water" was reported June 23 and 24; one

Three accidents: one killed: three injured.

#### Chicago, Burlington & Quincy Railroad:

November 19, 1955, unit 114-A, Eola, Ill. Crankcase explosion caused by overheated crankshaft bearings; filter elements coated with heavy sludge; lubricating oil pressure regulating and relief valve was prevented from seating due to particles of flaked carbon lodged between it and the body seat; one injured.

One accident; one injured.

#### CHICAGO, ROCK ISLAND & PACIFIC RAILROAD:

October 9, 1955, unit 93-B, Clarksville, Iowa. Crankcase explosion resulted from an overheated bearing; one injector was defective and did not properly atomize the fuel oil; exhaust valves of 5 cylinders were leaking freely and permitted unburned fuel oil to pass into crankcase; one injured.

One accident; one injured.

#### ERIE RAILROAD:

December 20, 1955, unit 738-C, Cuba, N. Y. Crankcase explosion; surface of main part of left No. 2 piston very rough; cap, compression rings, upper oil ring, and top oil ring on skirt missing; two injured.

One accident; two injured.

#### GRAND TRUNK WESTERN RAILWAY:

October 22, 1955, unit 9008, Blue Island, Ill. Crankcase explosion caused by a defective and overheated piston; piston had a large hole in its crown and liner was excessively scored; one injured.

November 3, 1955, locomotive 6313, Fenton, Mich. Axle broke at the fillet between journal and wheel seat, resulting in derailment of freight train; old fracture in left main driver axle covered approximately 67 percent of crosssectional area; three injured.

Two accidents; four injured.

#### LOUISVILLE & NASHVILLE RAILROAD:

November 22, 1955, unit 817, Magella, Ala. Crankcase explosion resulted from an overheated bearing; one or more defective lower liner seals; engine lubricating oil with high percentage water contamination; one injured.

One accident; one injured.

#### MAINE CENTRAL RAILROAD:

\*\*February 25, 1956, unit 16, Lewiston, Maine. Cab threshold plate was not properly roughened; one injured.

One accident: one injured.

#### MISSOURI PACIFIC RAILROAD:

July 29, 1955, unit 7003-B, 1 mile south of Thrall, Tex. Flash occurred in high voltage cabinet when series contactor closed due to defective coil in reverser magnet valve; one injured.

One accident; one injured.

#### NEW YORK CENTRAL RAILROAD:

July 13, 1955, unit 1042, Erie, Pa. Lost cotter key permitted castle nut on train control receiver cable plug to work off resulting in undesired train control action and brake application; one injured.

\*\*October 13, 1955, unit (Crucible Steel Company of America Railway) 40. Geddes, N. Y. Employee's hand was caught in unguarded radiator fan when

attempting to stop racing engine. Emergency stop failed to function; one

injured. December 4, 1955, unit 4208, Lyons, N. Y. Oil on engineroom floor; leak at both ends of hose in lubricating oil delivery line between pump and filter; engine-room floor to be cleaned and/or oil leaks were reported 20 times since November 11: one injured.

\*\*February 1, 1956, unit 8242, Cayuga, N. Y. Tubular metal supports of cab seat back rest broke; supports were weakened by bolt holes provided for

attachment of back rest cushion; one injured.

\*\*February 4, 1956, unit 8618, Selkirk, N. Y. Defective joint between turbo-

charger and exhaust stack permitted escape of exhaust gas; one injured.

March 12, 1956, unit 1067, Kirkville, N. Y. Lubricating oil strainer was clogged; engine shut down because of low oil pressure; undesired automatic train control brake application resulted from low voltage when attempt was made to start engine; two injured.

April 1, 1956, unit 4057, Staatsburg, N. Y. Fire in heating boiler and battery compartments of unit caused by outfire relay on heating boiler improperly set and kickoff spring missing from fuel spray head. Excessive heat in exhaust stack damaged insulation on battery cables causing short circuit. Defective condition of heating boiler reported on March 6, 7, 9, 10, 11, and 27; two injured.

Seven accidents; nine injured.

#### NEW YORK, CHICAGO & St. LOUIS RAILROAD:

October 22, 1955, locomotive 804, Toledo, Ohio. Flexible staybolt cap and sleeve blew out of throat sheet; bolt broken and weld securing the sleeve failed; one injured.

One accident: one injured.

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

July 16, 1955, unit 0463, Brewster, N. Y. Oil on engineroom floor; clean oil off engineroom floor and/or oil leaks were reported 22 times since June 16 (before

accident), 3 times (after accident); one injured.

accident), 3 times (after accident); one injured.

July 20, 1955, unit 634, Cedar Hill, Conn. Employee slipped on sand that had been applied to front platform to absorb oil; leaking oil was reported July 6 (two times) and July 20 (two times), "clean decks" and "clean oil off engine and floor" was reported July 6, "clean engineroom cat walks" was reported July 13, "clean up cat walk" was reported July 17, "clean oil from walk" and "oil on floor in front end compartment" was reported July 20; one injured.

August 29, 1955, unit 0704, Westerly, R. I. Leaking turbocharger drip pan gaskets deposited oil on engineroom floor; clean engineroom floor and/or oil leaks.

gaskets deposited oil on engineroom floor; clean engineroom floor and/or oil leaks

were reported 27 times since August 2; one injured.

September 15, 1955, unit 799, Springfield, Mass. Oil on engineroom floor; engineroom floor to be cleaned and/or oil leaks in engine room were reported 25 times since August 16; one injured.

October 31, 1955, unit 0923, Boston, Mass. Defective fuel filter assembly permitted oil to leak to deck, runningboard and steps; clean up engineroom and/or

oil leaking were reported October 15, 18, 19, 22, 26 and 31; one injured.

December 17, 1955, unit 0504, Needham, Mass. Threads on valve body at

bonnet fit of steam heat valve badly worn and eroded; one injured.

December 29, 1955, unit 0703, Silver Spring, Providence, R. I. Oil on engineroom floor; leak at air compressor shaft oil seal of No. 1 engine; clean engineroom floor and/or No. 1 engine oil seal leaks were reported 17 times since December 4

(before accident), 1 time (after accident); one injured.

\*\*February 22, 1956, unit 0400, Woodlawn, R. I. Oil on engineroom floor; clean engineroom floor and/or oil leaks were reported 29 times (before accident)

April 21, 1956, unit 0619, Cedar Hill, Conn. Oil on right front step; oil cooling radiators leaking; "Oil all over walkway and front end" and "Oil on front catwalk" reported April 21 (day of accident); one injured.

June 26, 1956, unit 796, New London, Conn. Oil on engineroom floor; clean

oil off engineroom floor and/or oil leaks were reported 23 times since June 3:

one injured.

Ten accidents: ten injured.

#### NORFOLK & WESTERN RAILWAY:

December 12, 1955, locomotive 2153, near Wytheville, Va. Crown sheet failure due to low water; three killed, one injured. One accident; three killed; one injured.

#### NORTHERN PACIFIC RAILWAY:

December 4, 1955, locomotive 2673, Forsyth, Mont. Separation occurred in stoker steam line at union nut connection of shut-off valve; threads in nut were badly deteriorated; one injured.

March 19, 1956, locomotive 1576, Northtown Yard, Minn. Employee fell when investigating turbo-generator power failure; cinder accumulation on access

steps; one injured.

Two accidents; two injured.

#### NORTHWESTERN PACIFIC RAILROAD:

\*\*October 17, 1955, unit (S. P.) 4617, Arcata, Calif. Employee slipped on wet platform; drinking water container drain pipe plugged; one injured. One accident; one injured.

#### PENNSYLVANIA RAILROAD:

July 10, 1955, locomotive 4486, East Altoona, Pa. Overflow valve body disconnected from injector due to threads being in a worn condition; one injured.

\*\*October 5, 1955, unit 9131, Philadelphia, Pa. Fuel oil leak between injec-

tion pump and delivery pipe due to defective gasket; one injured.

\*\*November 1, 1955, locomotive 6715, Vineyard, Pa. Crosshead wrist pin became disengaged because of a disconnected valve motion union link; one injured.

\*\*November 11, 1955, unit 4872, Washington, D. C. Employee burned by backfire from steam heating boiler firebox. Fuel oil valve out of position, improper size connecting bolt in control arm, improper atomization pressure; one

\*\*November 15, 1955, unit 8817, Conway, Pa. Broken automatic coupler

lock lifter: one injured.

December 2, 1955, locomotive 6907, Harrisburg, Pa. Undesired application of air brakes caused by broken snap ring on differential piston in air compressor; one injured.

December 28, 1955, unit 2022-B, Crestline, Ohio. Leaking oil at fuel injection pump ignited by short circuit; oil leaks reported 12 times since November 28; wires in electrical supply line deteriorated and conduit corroded; one injured.

January 11, 1956, unit 9576-A, Hudson, Ohio. Oil on engineroom floor; scored and worn fuel oil delivery pipe fitting prevented tight fit with seat in fuel

injection pump delivery valve holder; "Clean up unit. Oil on floor." was reported on January 9, and "9576-A has fuel oil leak. Engineroom covered with oil. Check all pipes.'' was reported on January 10; one injured.

\*\*February 23, 1956, unit 5614, Washington, D. C. Employee's hand con-

tacted unguarded heater fan; protective screen missing; one injured.

\*\*March 6, 1956, unit 5758-A, Chicago, Ill. Cab window stuck in open position; defective adjusting mechanism became disconnected and struck employee's hand: one injured.

March 7, 1956, unit 9616-B, near Halfway, Md. Flash occurred in high voltage cabinet; defective magnet valve prevented proper operation of reverser;

April 21, 1956, unit 9622-A, Hubbard, N. Y. Employee slipped on oil on floor of unit; Eddy Current Clutch not properly protected; clean oil off floors and/or oil leaking were reported April 2, 4, 5, and 13 (before accident), April 23 (after accident); one injured.

\*\*May 7, 1956, unit 7853, New York, N. Y. Cut-out cock handle and body showed evidence of excessive striking; valve was difficult to operate; one injured.

\*\*May 12, 1956, unit 4820, Washington, D. C. Undesired application of automatic brakes resulted in severe slack action; broken low voltage contactor in axle speed governor control circuit; one injured.

May 14, 1956, unit 8456, Toledo, Ohio. Fumes emitted by overcharged and overheated storage batteries; two contact fingers and contact bar of voltage

regulator partially burned and pitted; two injured.

May 23, 1956, unit 9455-A, Jacks Run, Pa. Undesired application of air brakes caused by worn fulcrum pin in safety control foot pedal; one injured. Sixteen accidents: seventeen injured.

#### SEABOARD AIR LINE RAILROAD:

\*\*July 18, 1955, unit 1601, Wildwood, Fla. Improper application of the jumper

cable conduit fouled the hand brake chain; one injured.

November 25, 1955, unit 1747, Raleigh, N. C. Crankcase explosion caused by overheated main crankshaft bearings; low oil pressure and high oil pump suction shut down switch of engine governor inoperative; No. 8 fuel injector leaked at seal ring; one injured.

Two accidents; two injured.

#### SOUTHERN RAILWAY:

September 20, 1955, unit 4186, Lowland, Tenn. Oil on floor of passageway of engineroom; one injured.

One accident; one injured.

#### SOUTHERN PACIFIC—LINES WEST:

\*\*July 11, 1955, unit 1426, Alameda, Calif. Defective gasket between turbocharger and exhaust stack permitted gas to enter cab of unit; one injured.

July 12, 1955, locomotive 4456, Los Banos, Calif. Blow-off cock stuck open:

one injured.

\*\*August 21, 1955, unit 8060, Yuma, Ariz. Oil on engineroom floor; clean engineroom floor and/or oil leaking reported August 2, 9, 16, 17, and 18; one injured.

August 26, 1955, locomotive 3659, Los Banos, Calif. Oil on top and front of

tender fuel oil tank; one injured.

October 1, 1955, locomotive 4161, Rucker, Calif. Defective carrier bolt assembly permitted indicator box to slip from supporting bracket; one injured.

October 2, 1955, locomotive 4303, Planehaven, Calif. Employee burned by flash from open firebox door; heavy accumulation of sand in smokebox, lower flues plugged with sand; one injured.

\*\*December 10, 1955, unit 1354, Oakland, Calif. Oil on cab step; one injured. \*\*January 19, 1956, unit 1507, Marysville, Calif. Oil on running board; one

\*\*February 29, 1956, locomotive 2752, West Oakland, Calif. Valve yoke and steam valve assembly blew out of injector body while being tested; threads in injector body too large for proper fit. Boiler checks leaking and/or injector leaks were reported 16 times since February 6; one injured.

March 1, 1956, locomotive 4447, Goshen Junction, Calif. Broken hinges on cab door allowed door to fall and strike employee's leg; one injured.

\*\*March 20, 1956, unit 5206, Alvarado, Calif. Automatic radiator shutter control inoperative because of dry and rusted condition of shutters; manual control lever adjustment latch rusted and inoperative; hood door blew shut on employee's wrist while attempt was being made to adjust radiator shutters; one injured.

\*\*March 27, 1956, unit 6431, Yuma, Ariz. Frame of train number container distorted; employee slipped on unroughened floor while attempting to remove

train numbers from container; one injured.

May 15, 1956, unit 6279, Roseville, Calif. Employee's hand contacted unguarded heater fan; opening into heater was not completely protected; one

June 27, 1956, unit 6235, Beowawe, Nev. Oil on engineroom floor; oil on floor and/oil leaking were reported 11 times since June 16; one injured.

Fourteen accidents: fourteen injured.

#### UNION PACIFIC RAILROAD:

November 17, 1955, unit 936-B, between Arlington and The Dalles, Oreg. Heating boiler frozen and inoperative. Accumulation of snow and ice on passageway in unit which entered by door blocked open to permit use of hose to thaw boiler; one injured.

One accident: one injured.

#### WABASH RAILROAD:

June 1, 1956, unit 355, Danville, Ill. Locking pin assembly was missing permitting back rest to fall from cab seat; one injured.

One accident; one injured.

Note.—No accidents involving multiple operated electric locomotive units were reported in 1956.

Table VII.—Number of steam locomotives inspected, found defective,

	· · · · · · · · · · · · · · · · · · ·					· · · · · · · · · · · · · · · · · · ·		<del>,</del>
	Parts defective, inoperative or missing, or in violation of the rules	Atchison, Topeka & Santa Fe	Baltimore & Ohio	Boston & Maine	Canadian National	Canadian Pacific	Central Vermont	Chesapeake & Ohio
1	Air compressors	.	8		7	3	1	9
2	Arch tubes					. "	1	9
3	Ashpans and mechanism.					1	1	
1	AxlesBlow-off cocks				2	¦		
,	Boiler checks		1 5	i	3		1	
7	Boiler shell			7	3			
3	Brake equipment.		20		19	3	1	4
9	Cabs, cab windows, and curtains Cab aprons and decks		3		8	3	4	
1	Cab cards		7	1	6 1	1 4	1	
2	Coupling and uncoupling devices		2	1	1	4	1	1
3	Crossheads, guides, pistons, and piston rods		8		î	1		
4	Crown boiles					1		
9 8	Cylinders, saddles, and steam chests Cylinder cocks and rigging	3	9		$\frac{2}{2}$			8
7	Domes and dome caps		2					
8 1	Draft gear		3		6	1	1	
9 1	Draw gear		3		1	1	1	
1	Driving boxes, shoes, wedges, pedestals, and braces Firebox sheets		5 1		4	2	1	1
2	Flues		2			. 2		1
3	Frames, tail pieces, and braces, locomotive		8		3			i
1	Frames, tender				1			
8	Gages and gage fittings, air Gages and gage fittings, steam		1 6		1	5 2	$\frac{2}{1}$	
7	Gage cocks		10	1	4 5	2	i	
3	Grate shakers and fire doors		1				i	
9	Handholds		7		5	1		
1	Injectors, inoperative	1	12		13			
2	Inspections and tests not made as required	1	12		1.5	9	1	3
3	Lateral motion Lights, cab and classification					5		
1	Lights, cab and classification		1				1	
6	Lights, headlight Lubricators and shields		1			1		
7	Mud rings		5					
3	Packing nuts		14		2	3	1	
1	Packing, piston rod and valve stem		1		1 2	2		1
ĭ	Pilots and pilot beams	1	1		- 4	. 2		
2	Reversing gear	3	2	1	1			
3	Rods, main and side, crankpins, and collars Safety valves Sanders		5		5	2		4
5	Sanders		4		1			9
6	Springs and spring rigging		35		14	10	11	2
7	Squirt hose				1			
3	Staybolts		7 2		. 2	2		1
)	Steam pipes					2	1	
1	Steam valves				<u></u>		1	
3	Tanks and tank valves		5 10		9	12	3	
4	Telltale holes		2			1	.,	1
5	Throttle and throttle rigging		. 8		7	2	2	1
2	Trucks, engine and trailing Trucks, tender		10		2			
3	Valve motion		11 8		9	4	1	2
9	Washout plugs	3	11		2	2		
ï	Stokers.		3 24		$\frac{2}{2}$			
2	Water glasses, fittings, and shields Wheels		24	. 1	$\frac{2}{1}$	2	2	. 1
3	Miscellaneous—Signal appliances, badge plates.			!				
	brakes (hand)		4		3	1	2	
i	Number of defects	13	304	4	169	92	44	43
	Locomotives reported	116	508	15	143	80	30	130
-	Locomotives inspected Locomotives defective	39	973	6	83	32	73	165
	Percentage of inspected found defective	12.8	113 11. 6	33.3	$\frac{32}{38,6}$	19 59. 4	$\frac{14}{19.2}$	4. 2
	Locomotives ordered out of service		5		2	4	1	

<sup>1</sup> Atchison, Topeka & Santa Fe.

and ordered from service, et cetera—by carriers

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Western	Chicago, Burlington & Quincy	Chicago, St. Paul, Minneapolis & Omaha	Colorado & Southern	Denver & Rio Grande Western	Duluth, Missabe & Iron Range	Fort Worth & Denver	Grand Trunk Western	-	Gulf, Colorado Santa Fe		Lake Superior Ishpening	Louisville & Nashville
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Table VII.—Number of steam locomotives inspected, found defective,

	Parts defective, inoperative or missing, or in violation of the rules	Minneapolis, St. Paul & S. S. Marie	New York Central	New York, Chi- cago & St. Louis	Norfolk & Western	Northern Pacific	Pennsylvania
1	Air compressors		15	14	16	14	5
$\frac{2}{3}$	Arch tubes		1	1			1
5	A vlac		1 11		3	<u>-</u>	4
6	Blow-off cocks Boiler checks Boiler shell		13	4	1	3	5
7 8	Brake equipment		44	45	3 31	36	1 19
9	Brake equipment Cabs, cab windows, and curtains Cab aprons and decks		9	2 3	12	12 4	20 2
1 2	Cab cards		3 2			1	
3	Crossheads, guides, pistons, and piston rods.		41		22	11	6
5	Coupling and uncoupling devices Crossheads, guides, pistons, and piston rods Crown bolts. Cylinders, saddles, and steam chests		20	1 2	3 26	1 11	18
6	Cylinder cocks and rigging Domes and dome caps Draft gear		15 2	1	8	4 3	14
8	Draft gear.		6			9	2
9	Draw gear Driving boxes, shoes, wedges, pedestals, and braces		2 27	1	6 29	11 8	4
1 2	Firebox sheets		2 1	1 2	2	1	1
3	Frames, tall pieces, and braces, locomotive		5	ĩ	3	6	18 14 2 2 2 4 1 1 2 2 8 4 6 1 29
4	Gages and gage fittings, air		3	1	2	3	2
6	Gages and gage fittings, steam		5 9	$\frac{1}{2}$	3	6 5	2 8
8	Grate shakers and fire doors		8	ī	4	14	4
9	Handholds Injectors, inoperative		4 1		3	15	1
1 2	Injectors and connections Inspections and tests not made as required		48 4	17 1	15 2	21 1	29 1
3	Lateral motion		3	i	6		111
5	Lights, earl and classification Lights, headlight Lubricators and shields Mud rings		1	1			3
6	Lubricators and shields		3 4	1	9	2	$\frac{2}{3}$
8 9			35 15	16 5	2 8	6 4	1 3 2 3 4 7 2
0	Packing, piston rod and valve stem Pilots and pilot beams. Plugs and studs		1		4	6	2
2	Reversing gear		13	1 5	3	1	5
3 4	Reversing gear Rods, main and side, crankpins, and collars Safety values		28	5	17	6	22
5	Rods, main and side, crankpins, and collars		10	5 10	6	9	7
6	Squirt hose		30 4		56	22	58
8	Sanders Springs and spring rigging Squirt hose Staybolts Staybolts, broken Staybolts, broken		5	11	3	1	4 2
0	Steam pipes. Steam valves. Steps. Tanks and tank valves.		5 1	4	7	1	2 4
2	Steps		17	5	3	9	1 2 8
3	Tanks and tank valves Telltale holes		11	1	8	9	
6	Telltale holes Throttle and throttle rigging Trucks, engine and trailing Trucks, tender Valve motion		9 8	9	9 4	13 7	5 9
7	Trucks, tender		8	1	7	6	4
8	Washout plugs Stokers		12	14	5	6 5	4 3 1 10
i0   i1	Stokers		11 27	7 2	8 11	12 11	10 10
3	w neels		12	1	6		7
0	Miscellaneous-Signal appliances, badge plates, brakes (hand)		18	5	1	2	6
	Number of defects		609	213	382	349	364
ļ	Locomotives reported	29	168	200	425	368	709
	Locomotives inspected Locomotives defective	4	457 12 <b>3</b>	442 53	889 103	486 83	850 96
1	Percentage of inspected found defective Locomotives ordered out of service		26. 9 27	12.0	11.6	17. 1	11.3
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and ordered from service, et cetera-by carriers-Continued

Pennsylvania- Reading Sea- shore Lines	Pittsburgh & Lake Erie	Reading	Richmond, Fred- ericksburg & Po- tomac	River Terminal	St. Louis-San Francisco	Southern Pacific, lines east	Southern Pacifie, lines west	Spokane, Portland & Seattle	Union Pacific	Virginian	Roads with less than 10, and in- dustrial locomo- tives	Total
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				~~.			35		6		17	152

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

Ari compressors Axles, truck and driving Batteries Boilers Boilers Brake equipment 1 1 1 84 3 24 59 55 Cabs and cab windows 3 2 2 45 1 8 46 1 Cab cards Cab cards Controllers, relays, circuit breakers, magnet valves and switch groups Controllers, relays, circuit breakers, magnet valves and switch groups Controllers, relays, circuit breakers, magnet valves and switch groups Controllers, relays, circuit breakers, magnet valves and switch groups Controllers, relays, circuit breakers, magnet valves and switch groups Controllers, relays, circuit breakers, magnet valves and switch groups Controllers, relays, circuit breakers, magnet valves and switch groups Controllers, relays, circuit breakers, magnet valves and switch groups Controllers, relays, circuit breakers, magnet valves and switch groups Controllers, relays, circuit breakers, magnet valves and switch groups Controllers, relays, circuit breakers, magnet valves and switch groups Controllers, relays, circuit breakers, magnet valves and switch groups Controllers, relays, circuit breakers, magnet valves and switch groups Controllers, relays, circuit breakers, magnet valves and switch groups Controllers, relays, circuit breakers, magnet valves and switch groups Controllers, relays, circuit breakers, magnet valves and switch groups Controllers, relays, circuit breakers, magnet valves and switch groups Controllers, relays, circuit breakers, magnet valves and switch groups Controllers, relays, circuit breakers, magnet valves and switch groups Controllers, relays, circuit breakers, magnet valves and switch groups Controllers, relays, circuit breakers, magnet valves and switch groups Controllers, relays, circuit breakers, magnet valves and switch groups Controllers, relays, circuit breakers, magnet valves and switch groups Controllers, relays, circuit breakers, magnet valves and switch groups Controllers, relays, circuit breakers, magnet valves and switch groups Controllers, relays, circuit breakers, magnet valves and switch groups Controllers, relays, circuit plant Con		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	Bangor & Aroostook
Axles, truck and driving		Air compressors						12			2	1	
Boilers		Axles, truck and driving						1					
valves and switch groups		Batteries									1	1	
valves and switch groups		Brake equipment			1	1		84		3			
Valves and switch groups	-	Cabs and cab windows		3		2		45		1	8		1
Valves and switch groups		Cab floors, aprons and deck plates				1		144		1	9		
Valves and switch groups		Clutches											
Current collecting apparatus	۱	volves and switch mount				1		11			11	10	1:
Pramis of frame braces	1	Coupling and uncoupling devices						9				2	
Pramis of frame braces		Current collecting apparatus		- 1							<u>-</u>		
Pramis of frame braces	1	Draw gear						5					
Fuel system	İ	Driving poxes, snoes and wedges			1			2				37:	
Gages or fittings, steam		Fuel system				1		144		1	19	23	3
Handholds		Gages or fittings, air				. 4		14				3	2
Inspections and tests not made as required   1   19   9   10   1   1   1   1   1   1   1   1								3					
Instruction and safety devices								3 10			2	10	
Appurtenances   Appurtenance													
Lights, cab and classification	1							284	3	9	57	Q1	9
Lights, cab and classification	:	Jack shafts.											
Lights, cab and classification		Jumpers and cable connectors				2		22				7	
Meters volt and ampere		Lights, cab and classification						17			2	10	
Rods, main, side, and drive shafts		Lights, headlight					- <del>-</del>	4			2		
Rods, main, side, and drive shafts		Motors and generators						73					1
Rods, main, side, and drive shafts		Pilots and pilot beams						2					
Sanders   1   97   4   42   22   15													
Staybolts, broken of defective   Steam pipes		Rods, main, side, and drive shafts.											15
Staybolts, broken of defective   Steam pipes		Springs and spring rigging, driving and truck						2				9	
Tricks		Stavious broken or detective	İ					a			<u>-</u>		
Tricks		Steps, footboards, et cetera		1				41			6	12	3
Tricks		Switches, hand-operated, and fuses										1	
Water glasses, fittings and shields		Trucks						10		4	5	12	5
Wheels         1         7         11         4           Miscellaneous         1         1         26         1         9         24         2           Number of defects         6         1         18         1,166         3         21         243         484         47           Locomotive units reported         16         17         18         24         11         1,740         14         28         564         987         42           Locomotive units inspected         11         29         37         43         24         7,201         28         771, 733         2,892         41           Locomotive units defective         3         1         7         579         2         6         123         244         11           Percentage of inspected found defective         10.3         2         7.6         7.7         7.1         7.8         7.1         8.4         26.8		Water tanks											
Wheels         1         7         11         4           Miscellaneous         1         1         26         1         9         24         2           Number of defects         6         1         18         1,166         3         21         243         484         47           Locomotive units reported         16         17         18         24         11         1,740         14         28         564         987         42           Locomotive units inspected         11         29         37         43         24         7,201         28         771, 733         2,892         41           Locomotive units defective         3         1         7         579         2         6         123         244         11           Percentage of inspected found defective         10.3         2         7.6         7.7         7.1         7.8         7.1         8.4         26.8	1	Warning signal appliances						12			1	6	
Number of defects 6 1 18 1, 166 3 21 243 484 47  Locomotive units reported 16 17 18 24 11 1, 740 14 28 564 987 42  Locomotive units inspected 11 29 37 43 24 7, 291 28 77 1, 733 2, 892 41  Locomotive units defective 3 1 7 579 2 6 123 244 11  Percentage of inspected found defective 10.3 2.7 16.3 7.9 7.1 7.8 7.1 8.4 26.8		Wheels				1		7 26		;			
Locomotive units reported   16   17   18   24   11   1,740   14   28   564   987   42   12   13   14   15   15   16   17   18   18   19   19   19   19   19   19													
Locomotive units defective	1	Number of defects		$\frac{6}{}$	1	18		1, 166	3	21	243	484	47
Locomotive units defective	İ	Locomotive units reported	16	17						28	564	987	42
Percentage of inspected found defective	į	Locomotive units inspected	11	29 3	37 1	43			28	77	1, 733	2, 892 244	41
Locomotive units ordered out of service 5 11 1		Percentage of inspected found defective		10.3	2.7					7.8	7.1	8.4	26. 8
	į	Locomotive units ordered out of service						3			5	11	1

found defective, and ordered from service, et cetera-by carriers

Belt Railway of Chi- cago	Bessømer & Lake Erie	Birmingham Southern	Boston & Maine	Butte, Anaconda & Pacific	Camas Prairie	Canadian National	Canadian Pacific	Canton	Carolina & Northwest- ern	Central of Georgia	Central Railroad of New Jersey	Charleston & Western Carolina	Chesapeake & Ohio	Chicago & Eastern Illinois	Chicago & Illinois Midland	Chicago & North Western	Chicago & Western Indiana	Chicago, Burlington & Quincy	Chicago Great West-	Chicago, Milwaukee, St. Paul & Pacific
3	1	7 3	5 8 6 21 62 30 3 92	2	2 1	7	1 2 13 4 18			7 4 16 24 1 19	5 9 6	4	12 6	15 3		3 4 82 48 3 28		2 4 10 7	23 12 1 8	1 14 154 40 4 48
	4	2	75 9 4	1	1		2 6 20 1			11 1 1 15 2  1 6	1 -4 -1 1 1	3	3 1 2 	2 2 1 1 1		200 55 111 22 188 511 30 188 300 3		3 2 5 4 2	4 1 7 1 4 4 4	22 10 4 19 2 17 1 45 4 23 3
	3	12	282 8 8 3 21			16	35			50 5 5	2 2 1 3	5	14	3		30 3 67 21 2 1 25		21 3	16 3	
	2	22	27 13 7 25	3		1	13 4			29 4 1 18	5		12 1	9		48 8 40		4 5 1 5	26 6	96 32 2 7 1 43 2 77 20 45 45
3	10	2 2 2	22 1 1 15 30 820	10	4	28	1 5 157			3 4 14 260	5 12 2 78	21	1 2 1 2 1	1 49		61 3 1 5 34 651		2 1 1 4 99	3 1 6	2
54 71 2 2.8	64 147 4 2. 7	20 24 6 25. 0 2	358 1, 000 251 25. 1 13	I	10 31 4 12. 9	197 14 6	36 77 38	11	10 7	128 449 85 18. 9			870 1, 545 34		11 17	646 1, 820 215 11. 8	14	676 2, 689 48 1. 8	140 419 49	

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

								3 00						· · · · · ·
	Parts defective, inoperative or missing, or in violation of the rules	Chicago River & Indiana	Chicago, Rock Island & Pacific	Chicago, St. Paul, Minneapolis & Omaha	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
1	Air compressors		50	2				1				4	5	3
2	Axles, truck and driving												3	
4	Boilers		3 17	1									<u>-</u>	3
5	Brake equipment		323	35			1	2				10	14	33
8	Brake equipment Cabs and cab windows	1	101	18			ĩ	ī			3	18	14	8
9	Cab cards	1	124	13									2	
10 11	Cab floors, aprons and deck plates	1	134	13								5	6	7
12	Controllers, relays, circuit breakers													
13	magnet valves and switch groups Coupling and uncoupling devices		99				2					1	3	23
14	Current collecting apparatus.		9	1								3	3	1
16	Current collecting apparatus. Draft gear.		33	5				2				2	2	6
17	Draw gear		12									12		4
$\frac{18}{20}$	Driving boxes, shoes and wedges Frames or frame braces		2	13								2	4	
22	Fuel system		117	18				5				43	16	17
23	Gages or fittings, air		23			,					1		1	3
24 25	Gages or fittings, steam Gears and pinions		2									1	3	
26	Handholds		21	3						1		4	8	6
28	Inspections and tests not made as	ĺ						i .		1			, ,	}
29	required		57 39	12			4	1				3	3	1
30	Insulation and safety devices Internal-combustion engine defects,		39	12			2				!		5	4
	parts and appurtenances		410	31			7	3				144	11	39
32	Jack shafts													
33 35	Jumpers and cable connectorsLateral motion, wheels		24	3			1	2				5		6
36	Lights, cab and classification Lights, headlight		14	1			1				1		1	7
37	Lights, headlight													
39 40	Meters, volt and ampere		3 55									1 5	1 5	8
42	Pilots and pilot beams		5	i						!		,		i
43	Plugs and studs									(				
44 46	Quills													
48	Rods, main, side, and drive shafts Sanders		192	9			1	3				4	6	19
49	Springs and spring rigging, driving		-	1			1	Ŭ		1				-
51	and truck Staybolts, broken or defective		9	8			1						2	
53	Steam pipes		13											1
54	Steps, footboards, et cetera		51	16			4	2			1	14	7	3
55 56	Switches, hand-operated, and fuses Transformers, resistors and rheostats.		1									1	1	1
57	Trucks		110	7				ī				4	3	1 4
59	Water tanks		3											
60	Water glasses, fittings and shields													
61 62	Warning signal appliances		23	9		2	1	1				5	1	1 1
63	Miscellaneous		63	17			1					6	i	24
1	Number of defeats		0.000	997										
1	Number of defects	2	2, 038	227							5	297	137	236
ĺ	Locomotive units reported	27	534	59	18	14	64	31	19		10	164	215	234
	Locomotive units inspected	45			35	8	250	340	55	46			689	
	Percentage of inspected found de-	1	556	59			15	(			1	132	51	56
ļ	fective	2. 2	22. 5	17. 5			6.0	2, 1			6. 2	12.5	7.4	3.1
- 1	Locomotive units ordered out of					ĺ								1 .
-	service		52	3								4	4	1
			•				•						1	,

<sup>&</sup>lt;sup>1</sup> Atchison, Topeka & Santa Fe.

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

1.7	20.0	1.6	5.6	9.3	24. 6	12. 6 2	6.7	7.3	15.4	4.8	15.0	7.1	17.8 4	9.8 12	1.1	1.5	9. 6 13	5.2	6.0	15. 3
16 59 1	15 20 4	48 61 1	13 18 1	34 43 4	25 57 14	143 175 22	490 1, 439 97	100 234 17	20 39 6	33 147 7	12 20 3	24 98 7	102 258 46	651 1, 537 151	17 90 1	(1) 521 8	266 884 85	23 97 5	455 1, 518 91	51 72 11
2	13	4	1	19	57	60	238	31	15	16	8	11	183	408	3	8	372	8	412	27
1	3				2	1	10	4		1			2 1 5	2 15 19			3 2 13		2 8 14	
				<u>-</u>			1 2 3						2	2			3		<u>-</u> 2	<sub>ī</sub>
					2	4	12 1	1					1	26	<b>-</b>		10		18 1	
							12	;												
	1	2			4	5	12		2			2	12	15			7		15	
							i										5		3	
1	_			,	1	2	4	8			1	1	1	7			1	1	1	"
1				8	<u>i</u>	12	11					<u>-</u>	27	19			25	;	58	3
																			<del>-</del>	
					3	6	7	2	5				3	16 5			23		19 1	13
					1								<b>-</b> -				1			
													  - <b></b> -	1			12			
				<u>ī</u>	<sub>1</sub>	<u>ī</u>	<u>6</u>	1					<u>-</u> 2	14		4	<u>-</u> 2		3	
				<b>-</b> -	16	5	25	6			3	2	28	80			89		82	
							10 18		3	1	2		6 3	2			26 3		6 2	
							10		1				ام ا	16						
							1										1		<u>5</u>	
						2	19 1 2			1			4	1			49		35 2 1	
				ن 		<sub>1</sub>	<u>1</u> 9						17	<u>2</u> 6			 49			
							1							<u>-</u>			3 2		$\frac{2}{2}$	3
						9			9								3	2		
· •						1	6					2	4	18		<u>-</u>	6		12 2	1
					3	7	25 18 3 9	5				1 1	6	5 25			19 19		3 10	
	4		<u>î</u>	3	11 5	6 4	25 18	3	2	$\frac{2}{2}$	ĩ		36 18	59 24		2	43 15 2	4	72 17 3	4
·						1	5					1		1 3			1			
			~				7							1	<b>-</b>		$\frac{2}{1}$		15	
	—	<u> </u>	H :		_					_		_	-							
Detroit & Folego snore Line	Detroit Terminal	Detroit, Toledo Ironton	Donora Southern	Duluth, Missabe & Iron Range	Duluth, South Shore & Atlantic	Elgin, Joliet & Eastern	Erie	Florida East Coast	Fort Dodge, Des Moines & 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
20 11	it T	oit	ra Sc	ch, J	th, s	, Jol		la E	Dody & S	Wor	ria &	ria	d Tr	No	ı Ba	r,	Mo	ıst T	is C	is T
Ç.	erm	ront	outh	Miss Rang	Sout	iet (		ast	ge, I	th c	FIC		unk	rthe	y &	Col anta	bile	o n erm	entr	ermi
ego e	inal	ole on	ern	abe re	h Sl tic	& E		Coas	es l hern	C 3	rida		We	u.	Wes	ora Fe	o y	B (	al	inal
		d o		[3	or	ste		ب	Moi	env			ster		terr	ф	hio	1 t		

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## Fable VIII.—Number of locomotive units other than steam inspected, found defective,

Parts defective, inoperative or missing, or in violation of the rules	Indiana Harbor Belt	Indianapolis Union	Interstate	Jacksonville Terminal	Kansas City Southern	Kansas City Terminal	Kansas, Oklahoma & Gulf	Kentucky & Indiana Terminal	Lake Superior & Ish-	Lake Terminal	Lehigh & Hudson River	Lehigh & New England	Lehigh Valley
				1					1				
Air compressors					1			l					6
Axles, truck and driving Batteries					;								
Boilers					1								
Brake equipment	5	4			42					1			12
Cabs and cab windows	2				11		5						5
Cab cards	4				4					1	3		l
Cab floors, aprons and deck plates	5				16		2					ļ	11
Controllers releva circuit breekers													
Controllers, relays, circuit breakers, magnet valves, and switch groups	ļ	ŀ	1	ŀ	9				İ	ļ		1	1
Coupling and uncoupling devices.					2								2
Current eollecting apparatus													<u></u>
Draft gear			2		4	1			2				
Draw gear Driving boxes, shoes and wedges													
Frames or frame braces					1								
Fuel system.	4				25	1							<u>9</u>
Fuel system Gages or fittings, air Gages or fittings, steam		1			1					2			2
Gages or fittings, steam					2								
Gears and pinions Handholds						:							
Inspections and tests not made as re-	- <del>-</del>					1							2
required	3		l		8		i			l			6
Insulation and safety devices					2								ľ
Internal-combustion engine defects,	_					١.			ĺ				i
parts and appurtenances	5				71	1	7						25
Jack shafts					<u>-</u> 8								<u>-</u>
I Lateral motion, wheels													1
Lights, cab and classification Lights, headlight													
Lights, headlight.													
Meters, volt and ampere	1				24								2
Motors and generators Pilots and pilot beams	1	1			24						- <b>-</b>		2
Plugs and studs.													
Quills													
Rods, main, side, and drive shafts													
Sanders Springs and spring rigging, driving and	10				19	3							14
truck		1						l					
Staybolts, broken or defective													
Steam pipes		- <b>-</b>			- <b>-</b>				ļ				
Steps, footboards, et cetera	2				3				2				
Switches, hand-operated, and fuses Transformers, resistors and rheostats												<b>-</b> -	
Trucks					14								5
Water tanks					- <b>-</b>								
Water glasses, fittings and shields													
Warning signal appliances													
Miscellaneous	1	1			4								<u>i</u>
Number of defects	43	10	2		269	7	14		4	4	3		105
Locomotivo unito renest-4	110		=		==		==	===	<del></del>		===	==	=
Locomotive units reported Locomotive units inspected	118 182	12 92	10 35	10 39	155 552	17 89	15 35	23 13	13 29	21 30	13 38	32 62	225 894
Locomotive units defective	14	6	1	99	87	3	3	19	29 1	30	38 2	02	54
Percentage of inspected found defective.	7.7	6.5	2. 9		15.8	3.4	8.6			10.0	5. 3		6.0
Locomotive units ordered out of service.	2	1			3								2
	1			1	I I			- 1			- 1		

and ordered from service, et cetera—by carriers—Continued

Long Island	Louisiana & Arkansas	Louisville & Nashville	Maine Central	Minneapolis & St. Louis	Minneapolis, Northfield & Southern	Minneapolis, St. Paul & Sault Ste. Marie	Minnesota Transfer	Mississippi Central	Missouri-Illinois	Missouri-Kansas-Texas	Missouri Pacific	Monessen Southwestern	Monongahela Connect-	Monongahela	Monon	Montour	Nashville, Chattanooga & St. Louis	Newburgh & South Shore	New Orleans Public Belt	New York Central	New York, Chicago & St. Louis	
1 1 12 3 2 2	3 2 16 7 3	23 8 49 33 9 30 2	2 14 5	2  7 4	1	12 4	1 1 1		1	3 45 17 1 24	14 1 2 71 40 4 59		4		7 3 3		6  2 10 15 	1	2	44 3 10 34 416 292 13 269	28	1 2 4 5 6 8 9 10
10 5 1	2  1 1 3 	14 5 1 1 1 51 8 2	1  2  13 1	3		4	1	2	3	8 4 	8 6 7 		3		3  1  1		5 5 2	1	1	67 27 	1 1 1 3	12 13 14 16 17 18 20 22 23 24 25 26
2 2 11	<u>î</u> 20	14 4 164	1 1 51	13	 4	2 7	 1		3	2 9 95	26 7 261			 	1 4		49	6	 2	110 19 743	1 8	28 29 30
2	11 11 11 11 11 11 11 11 11 11 11 11 11	14 6 2 3 31 1	1 1 3	2		2		1	1	8 	14 1 1 1 80		1		2		1 4			84 4 21 2 12 186 19	7	30 32 33 35 36 37 39 40 42 43 44 46 48
2 	1 2 1 1 1 4	4 3 9  34 1 9 6 31	4	1	2	2	2			6 3 10  12 1 	16 39  11 3  10 1 49	4	1		3		1 5 1 3 4 6	1		84 	1   6 1	49 51 53 54 55 56 57 59 60 61 62 63
73	85 ———	618	114	45	7	53	7	3	8 	369	851	4 ===	14	  	36	- :    ;	163	9	5	4, 139	64	4
83 158 22 13. 9	24 226 21 9. 3	574 1, 585 153 9. 7 10	96 185 34 18. 4	78 197 16 8. 1	10 57 2 3. 5	206 548 18 3. 3	18 41 2 4.9	10 24 1 4. 2	15 16 3 18. 7 3	215 845 149 17. 6 3	853 2, 879 241 8. 4 17	12 27 2 7. 4 2	28 78 8 10. 3	27 59 	57 201 19 9. 5	14 34 	132 477 46 9. 6	15 6 2 33. 3	16 31 1 3. 2	2, 072 6, 216 1, 246 20. 0 61	255 635 30 4. 7	_

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

Parts defective, inoperative or missing, or in violation of the rules	New York, New Haven & Hartford	New York, Ontario & Western	New York, Susquehanna & Western	Norfolk & Portsmouth Belt Line	Norfolk & Western	Norfolk Southern	Northern Pacific	Northern Pacific Terminal	Northwestern Pacific	Pacific Electric	Patapsco & Back Rivers	Pennsylvania	Pennsylvania-Reading Seashore Lines
Air compressors Axles, truck and driving Batteries	11 2 75		  2				4		1	2		24 4 3 3	
Brake equipment	177	2	2		1		42	1	2	5		128	
Cabs and cab windows	76	1					16 4			3		55	
Cab floors, aprons and deck plates	12 88						20			23		17 158	
Clutches													
Controllers, relays, circuit breakers,	25						8					31	
magnet valves, and switch groups.	6											17	
Current collecting apparatus	5											8	
Draft gear	19						3			1		18	
Draw gear	28 28						3					19	
Driving boxes, shoes and wedges Frames or frame braces	1 20	1					3					5	
Fuel system	134		2			1	12			19		117	
Gages or fittings, air	16					1	7					9	
Gages or fittings, steam	8 2											3	
Handholds	8						1		1			20	
Inspections and tests not made as	20				1		12	1		1		30	
required.	_											17	
Insulation and safety devices Internal-combustion engine defects,	362		2				35			41		254	
parts and appurtenances.	502	_	_										
Jack shafts													
Jumpers and cable connectors	23 3				3		15					38	
Lateral motion, wheels  Lights, cab and classification	5		1				3					7	
Lights, headlight												1	
Meters, volt and ampere	7 40					<sub>1</sub>	11					83	
Motors and generators Pilots and pilot beams	40 6						11			· · · ·		9 9	
Plugs and studs												1	
Quills												26	
Rods, main, side, and drive shafts Sanders	67						14		2	4		91	
Springs and spring rigging, driving	20	2	2				5					46	
and truck.													
Staybolts, broken or defective Steam pipes	37						2					6	
Steps, footboards, et cetera	35	2	1				14			4		47	
Switches, hand-operated, and fuses	3												
Transformers, resistors and rheostats.	55		1				8			2		39	
Water tanks.	15											1	
Water glasses, fittings and shields	7						1			2		1 10	
Warning signal appliances	1 3						12			1		16	
Miscellaneous	17						6		1	2		56	
Number of defects	1, 428	10	13		5	3	261	2	8	114		1, 423	
Locomotive units reported	514	46	28	15	31	32	441	16	36	47	41	2, 379 5, 753	50
Locomotive units inspected	1,089	192	65	7	25	102	1, 106	24	58	114	8	5, 753	57
Locomotive units defective Percentage of inspected found de-	345 31.7	2.1	$\begin{bmatrix} & 4 \\ 6, 2 \end{bmatrix}$		8.0	1.0	122 11.0	8.3	6.9	33 28. 9		568 9. 9	
fective.	01.7	1	"		3.0	0		5.0					
Locomotive units ordered out of	14			<b>-</b> -	<b></b>		13			2		30	
service.		ĺ	l		1		'						
		·											

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

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Peoria & Pekin Union	Philadelphia, Bethlehem & New England	Piedmont & Northern	Pittsburgh & Lake Erie	Pittsburgh & West Virginia	Reading	Richmond, Fredericksburg	River Terminal	Rutland	Sacramento Northern	St. Louis-San Francisco	St. Louis Southwestern	Savannah & Atlanta	Seaboard Air Linc	South Buffalo	Southern Pacific, lines east	Southern Pacific, lines west	Southern	Spokane International	Spokane, Portland & Seattle	Steelton & Highspire	
1		1	1 1 2 1 1 2 1 1 1 1 1 1 1 1 1 1 1 1 1 1	1	177 2 2	1	4	1	2	18 2 64 36 2 50	2  31 20  10  21		8  69 31 1 24		7 1 4	33 2 8 14 167 85 7 215	54 2 12 4 205 79 12 80	1	11 1		1 2 4 5 6 8 9 10 11 12
		3	5	1	2			6	1	2 4 3 2 90 6 2 1 19	1 2 1 13 6 3 3 4	1	12 10 2 1 68 6  3 41	2	8	14 19 2 5 4 195 14 1 6 13 20	20 3 4 136 26 16	i	2 2		13 14 16 17 18 20 22 23 24 25 26 28
		<u>-</u>	<sub>1</sub>		1 6	12		11	<del>-</del> 7	10 <b>2</b> 83	2 48	1	3 145		8	11 426	12 387		6		29 30
			1		1 1 1	1		3	3	22 	2 9 1 6 1		12 1 9 1 2 7 1 89 10		1	35 80 4 1 69 3	44 1 28 2 3 62 8  157		1		32 35 36 37 39 40 42 43 44 46 48
1 15 22 1 4. 5	500 277	5 18 72 1 1. 4	1 1 1 1 228 124 228 12 5.3	5 7 24 85 5, 9	34 366 736 13	71 145 8	2 	3  2 32 16 95 15 15.8	25 6	12.6	1 7 9 1 1 6 6 225 118 486 50 10.3	3 11 25 2 8.0	2 20 12 1 1 8 3 20 630 502 1,510 217 14.4	3 59 247 1 0.4	3  1  43  871 28 3.2	5 38 3 20 1 1 12 9 107 1,809 1,437 4,988 751 15.1	13 39 1 67 15 1 83 1,774 895 2,982 527 17.7	2 12 20 1 5. 0	288 1066 1900 211.6	22 10	51 53 54 55 56 57 59 60 61 62 63
			1					1		4	4		34			111	43				

# Table VIII .- Number of locomotive units other than steam inspected,

Parts defective, inoperative or missing, or in violation of the rules	Tennessee Central	Tennessee Coal & Iron Division	Terminal Railroad Association of St. Louis	Texas & Pacific	Texas Mexican	Texas Pacific-Missouri Pacific Terminal Railroad of New Orleans
Air compressors						
Axles, truck and driving Batteries	1					
Boilers	l					
Brake equipment	2 2	10 1	20 27	1	1	
Cab cards	-				1	
Cab floors, aprons and deck plates	5	1	3	2		
Controllers, relays, circuit breakers, magnet valves, and			6			
switch groups. Coupling and uncoupling devices.						
Current collecting apparatus	ł					
Draft gear Draw gear	1	l	5			
Driving boxes, shoes and wedges	i					
Frames or frame braces.						
l (lages or fittings, air	1	z	21			
Gages or fittings, steam Gears and pinions	1					
Handholds				<b>-</b>		
Inspections and tests not made as required	1 1					
Insulation and safety devices	1 11	10	20	2 3		
nances.  Jack shafts				Ů		
Jumpers and cable connectors	1					
Lateral motion, wheels	ī					
Lights, cab and classification Lights, headlight						
Lights, headlight.  Lights, headlight.  Meters, volt and ampere.  Motors and generators.  Pilots and nilot hears.						
Pilots and pilot beams		2	1			
Plugs and studs	i I					
Quills Rods, main, side, and drive shafts						
Sanders Springs and spring rigging, driving and truck	2	6	1			1
l Staubolts broken or defective						
l Steam nines						
Steps, footboards, et cetera. Switches, hand-operated, and fuses.	1	2	4			
Trucks	1	1			<b></b>	
Water glasses, fittings and shields						
Warning signal appliances	2		1 3			
Miscellaneous		2				1
Number of defects	30	37	112	8		2
Locomotive units reported	19	44	107	205	18	10
Locomotive units inspected	76 10	12 3	299 39	560 4	34	15
Locomotive units defective Percentage of inspected found defective	13.2	25.0	13.0	0.7	2.9	6.7
Locomotive units ordered out of service	2		2			
·						

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

Toledo, Peoria & Western	Toledo Terminal	Toronto, Hamilton & Buffalo	Union Pacific	Union Railroad	Union Railway	Virginian	Wabash	Washington Ter- minal	Waterloo, Cedar Falls & Northern	Western Maryland	Western Pacific	Youngstown & Northern	Roads With less than 10, and industrial locomotive units	Total	
				1			<u> </u>	<u> </u>	<u> </u>	<u> </u>		- <u>-</u> -			
			22								1		17 2	443 26 97 275 3, 259 1, 600 183 1, 933 4 775	1 2 4 5 6 8 9 10 11 12
			7 2 133 27 15 55				1 2 16				1 26 26 20 2 3	2		275	5
		1	27	6			7				20		86 64 16 20	1,600	8
			55	1			24				3		20	1, 933	10
		1	88				5				8		10	775	112
			1				<del>-</del> -				1		4	166	13
			15			1	2				5		13	360	16
		3	15 9 8 2 137 20 1			2					11		13 1 17	166 17 360 146 291 30 2, 555 278	13 14 16 17 18 20 22 23 24 25 26 28 29 30
			137	<u>I</u>			20 2				15 2		63 5	2, 555	20 22
			1				Z 				2 		5	278 60	23 24
			7	2							4		13	20 258	25 26
			7 22 26 454				5 1 57				2 2 2 22		13 33 11 161	60 20 258 748 282 6, 356	28 29
		<b>-</b>	454	2			57				22	1	161	6, 356	1
			26				2				7		16	553	32 33
			59 8								16 1		8	14 352	35 36
			1							<b>-</b>			4 1 42	38 58	37 39
		- <b>-</b>	37	2			11				4 2	6	42 1	1, 122	40
													<b>-</b> -	553 14 352 38 58 1,122 78 1 26	43
			38	2			8				12		4 68 5	2, 307 363	46
			38 10										5	363	49
			8				2 12				1 10			190	32 33 35 36 37 39 40 42 43 44 46 48 49 51 53 54 55 60 61 62 63
			8 27 31 3 23 2 2 2 3 4 174										46 1	190 1,005 48 9 1,007 49 14 182 252 1,220	55 55
			23				4 1				8 1		16	1,007	57
			2											14	59 60
			4				1 9 3				5		4 20 43	182 252	61 62
											19			!	63
15		5	1, 509	17		10	195				213	9	815	29, 054	
15 5	11 73	10 14 3 21. 4	1, 107 5, 052 467 9, 2	128 94 10	11 67	94 113 2 1.8	288 999 73 7. 3	25 17	11 6	116 121	174 620 58 9. 4	13 10 5 50. 0	1, 279 2, 178 231 10. 6 23	29, 405 88, 269 9, 597 10. 9 492	
		21. 4	9.2	10.6		1.8	7.3				9.4	50.0	231 10. 6	9, 597	
		- <b>-</b>	10				7				3		23	492	