

UNITED STATES RAILROAD ADMINISTRATION
DIRECTOR GENERAL OF RAILROADS

PENNSYLVANIA RAILROAD, EASTERN LINES

WEST JERSEY & SEASHORE RAILROAD
NEW YORK, PHILADELPHIA & NORFOLK RAILROAD
HUNTINGDON & BROAD TOP MOUNTAIN RAILROAD

PENNSYLVANIA RAILROAD, WESTERN LINES

PITTSBURGH, CINCINNATI, CHICAGO AND ST. LOUIS RAILROAD
CINCINNATI, LEBANON AND NORTHERN RAILROAD
LORAIN, ASHLAND AND SOUTHERN RAILROAD
PITTSBURGH, CHARTERS AND YOUGHIOGHENY RAILROAD
OHIO RIVER AND WESTERN RAILROAD
AKRON AND BARBERTON BELT RAILROAD

ISSUED ALTOONA, PA.
NOVEMBER 1, 1919.

No. 109-G

CLASSIFICATION AND DESCRIPTION OF LOCOMOTIVES

(SUPERSEDING CLASSIFICATION AND DESCRIPTION No. 109-F, DATED JUNE 1, 1918)

In this classification, locomotives are grouped into typical classes according to the number of wheels used under them, irrespective of the service for which they are intended, using a primary letter to designate the type. Successive designs of a type are designated by numbers following the primary letter, and small suffix letters are used to indicate modifications of any particular class of locomotive.

Class A—Locomotives with two pairs of drivers and no truck.



Class B—Locomotives with three pairs of drivers and no truck.



Class C—Locomotives with four pairs of drivers and no truck.



Class D—Locomotives with two pairs of drivers and four wheel truck.



Class E—Locomotives with two pairs of drivers, four wheel truck and trailing wheels.



Class F—Locomotives with three pairs of drivers and two wheel truck.



Class G—Locomotives with three pairs of drivers and four wheel truck.



Class H—Locomotives with four pairs of drivers and two wheel truck.



Class I—Locomotives with five pairs of drivers and two wheel truck.



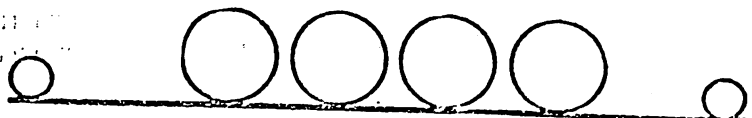
Class J—Locomotives with three pairs of drivers, two wheel truck and trailing wheels.



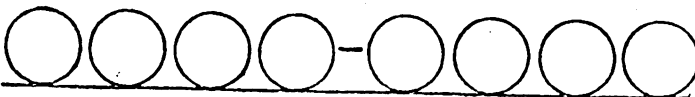
Class K—Locomotives with three pairs of drivers, four wheel truck and trailing wheels.



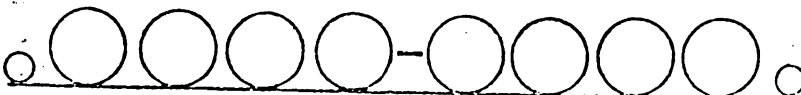
Class L—Locomotives with four pairs of drivers, two wheel truck and trailing wheels.



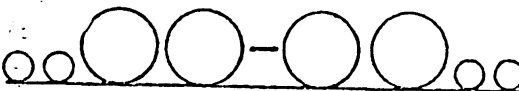
Class CC—Articulated locomotive with eight pairs of drivers and no truck.



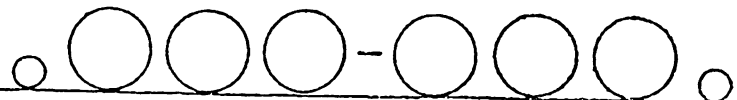
Class HH—Articulated locomotive with eight pairs of drivers and two two-wheel trucks.



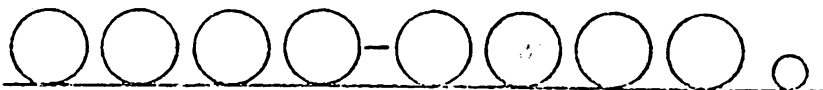
Class DD—Articulated locomotive with four pairs of drivers and two four-wheel trucks.



Class FF—Articulated locomotive with six pairs of drivers and two two-wheel trucks.



Class HC—Articulated locomotive with eight pairs of drivers and two-wheel truck.



Class A 1, formerly class Q, 44" drivers.
 Class A 2, formerly class Q, 50" drivers, with tender.
 Class A 2 a, formerly class Q, 50" drivers, without tender.
 Class A 3, formerly class U.
 Class A 3 a.
 Class A 4.
 Class A 5 s.

Class B 4, formerly class M, type of 1891.
 Class B 4 a, formerly class M, type of 1893.
 Class B 4 b, formerly B 4, with saddle tank applied.
 *Class B 5, formerly class I, converted into six-wheel shifting engines.
 *Class B 6.
 *Class B 6 s.
 *Class B 6 a.
 Class B 6 s a.
 Class B 6 s b.
 *Class B 7 a, formerly class H 3 a, converted into six-wheel shifting engines.
 *Class B 7 b.
 Class B 8.
 *Class B 22.
 *Class B 23.
 *Class B 28 a.
 *Class B 29.

*Class C 20.
 *Class C 31.
 Class Geared Electric No. 10001.
 Class Geared Electric No. 10002.

- Class D 8 a, formerly class O, 139 lbs.
- *Class D 10, formerly class O, 160 lbs., 57" boiler, 62" drivers.
- *Class D 10 a, formerly class O, 160 lbs., 57" boiler, 68" drivers.
- Class D 13 a, formerly class P, 160 lbs., 57" boiler, 68" drivers, type of 1892.
- Class D 13 c, formerly class P, 160 lbs., 57" boiler, 68" drivers, type of 1893.
- Class D 14 b, formerly class P, 175 lbs., 80" drivers. (68" drivers substituted for 80" drivers.)
- Class D 16, formerly class L, 68" drivers.
- Class D 16 a, formerly class L, 80" drivers.
- Class D 16 b.
- Class D 16 s b.
- *Class D 16 d.
- *Class D 16 s d.
- *Class D 26.
- *Class D 26 a.

- Class E 1 a.
- Class E 2.
- Class E 2 a.
- *Class E 2 b.
- *Class E 2 c.
- Class E 2 d.
- Class E 2 s d.
- Class E 3.
- Class E 3 a.
- Class E 3 s a.
- Class E 3 s d.
- Class E 5 s.
- Class E 6 s.
- *Class E 7 s.
- *Class E 7 s a.
- *Class E 21.
- *Class E 22.
- *Class E 23 s.
- Class E 28, Baldwin four-cylinder compound.
- Class E 29, American Loco. Co. four-cylinder compound.

- Class F 1 a.
- Class F 3.
- Class F 3 b.
- Class F 3 c.
- *Class F 24.
- *Class F 24 a.
- *Class F 25.
- *Class F 26.
- *Class F 27 s.

- *Class G 3, formerly class X, 68" drivers.
- *Class G 4.
- Class G 4 s.
- *Class G 4 a.
- *Class G 4 b.
- *Class G 24.

- Class H 3, formerly class R, built prior to December, 1889.
- Class H 3 a, formerly class R, built after December, 1889.
- Class H 3 b, formerly class R, type of 1893.
- *Class H 3 c.
- Class H 3 e.
- *Class H 4.
- Class H 5.
- Class H 5 s.
- Class H 6.
- Class H 6 s.
- Class H 6 a.
- Class H 6 s a.

Class H 6 b.
 Class H 6 s. b.
 Class H 8.
 Class H 8 a.
 •Class H 8 a.
 •Class H 8 s. a.
 Class H 8 b.
 Class H 8 s. b.
 •Class H 8 c.
 •Class H 8 s. c.
 Class H 9 s.
 •Class H 9 s. a.
 •Class H 9 s. c.
 •Class H 10 a.
 Class H 28, American Loco. Co., simple.

 Class I 1 s.

 Class J 28, American Loco. Co., simple prairie type.

 •Class K 2.
 Class K 2 s.
 Class K 2 s. a.
 Class K 2 s. b.
 •Class K 3 s.
 Class K 4 s.
 •Class K 21 s.
 •Class K 28 s, American Loco. Co., simple Pacific type.
 Class K 29 s, American Loco Co., simple Pacific type.

 Class L 1 s.

 •Class N 1 s.
 •Class N 2 s.

 •Class CC 1 s, Baldwin Mallet Compound.
 •Class CC 2 s.

 Class DD 1, Electric.
 Eng. Nos. 3998 and 3999 (DD 1), Electric.
 Class FF 1, Electric.

 Class HC 1 s.
 Class HH 1 s, American Loco Co., Mallet Simple.

None of the classes marked thus * are in existence on Lines East of Pittsburgh.

The use of the letter "s" after the numeral in a classification, indicates that fire tube superheaters are used.

For locomotives equipped with superheaters, the heating surface of the small superheater tubes as given by the lower figures of Item No. 28, is 50 per cent. greater than the actual area. These figures are used in obtaining items Nos. 30, 45 and 46.

J. T. WALLIS,
 Gen'l Sup't Motive Power,
 Penna. Railroad Lines East of Pittsburgh.

P. F. SMITH, Jr.,
 Gen'l Sup't Motive Power,
 Penna. Lines West of Pittsburgh.

STEAM LOCOMOTIVES

CLASSIFICATION.	A 1	A 2	A 2a	A 3	A 3a	A 4	A 5	
1 No. of Pairs of Driving Wheels,	2	2	2	2	2	2	2	1
2 Diam. of Driving Wheels,	41"	50"	50"	50"	50"	50"	50"	2
3 Size of Driving Axle Journals,	7½" D x 7½" L	7½" D x 7½" L	7½" D x 7½" L	8" D x 7½" L	8" D x 7½" L	8" D x 12" L	8" D x 12" L	3
4 Length of Driving Wheel Base,	7' 0"	7' 0"	7' 0"	7' 0"	7' 0"	7' 0"	7' 3"	4
5 Total Wheel Base of Engine,	7' 0"	7' 0"	7' 0"	7' 0"	7' 0"	7' 0"	7' 3"	5
6 Total Wheel Base of Eng. & Tender,	No Tender.	31' 7½"	No Tender.	37' 4"	No Tender.	42' 11"	43' 7½"	6
7 No. of Wheels in Engine Truck,								7
8 Diam. of Wheels in Engine Truck,								8
9 Size of Engine Truck Axle Journals,								9
10 Diameter of Trailing Wheels,								10
11 Size of Trailing Axle Journals,								11
12 Spread of Cylinders,	81"	81"	81"	84"	84"	86"	86"	12
13 Size of Cylinders,	15" x 22"	15" x 24"	15" x 24"	17" x 24"	17" x 24"	18½" x 24"	20" x 24"	13
14 Steam Ports,	1½" x 12"	1" x 12"	1" x 12"	1½" x 15½"	1½" x 15½"	1½" x 15½"	2½" wide.	14
15 Exhaust Ports,	2" x 12"	2" x 12"	2" x 12"	2½" x 15½"	2½" x 15½"	2½" x 15½"		15
16 Travel of Valve,	4"	4"	4"	5½"	5½"	5"	5"	16
17 Lap of Valve,	½"	½"	½"	½"	½"	½"	½"	17
18 Type of Valve,	D	D	D	D	D	D	8" Piston.	18
19 Type of Valve Gear,	Steph'n	Steph'n	Steph'n	Steph'n	Steph'n	Steph'n.	Wals't	19
20 Type of Boiler,	Straight with Radial Stays.	Straight with Radial Stays.	Straight with Radial Stays.	Belpaire	Belpaire.	Belpaire. Wide Fire Box	Belpaire. Wide Fire Box	20
21 Min. Internal Diam. Boiler,	42½"	42½"	42½"	51½"	51½"	60"	60"	21
22 Number of Tubes,	97	97	97	144	144	247	140, 18, 72	22
23 Outside Diam. of Tubes,	2"	2"	2"	2"	2"	2"	2", 5½", 1½"	23
24 Length of Tubes bet. Tube Sheets,	125½"	129½"	129½"	126½"	126½"	106½"	106½"	24
25 Fire Area through Tubes, sq. ft.,	1.62	1.62	1.62	2.40	2.40	4.12	3.71	25
26 Size of Fire Box, inside,	34½" x 50½"	34½" x 50½"	34½" x 50½"	34½" x 59½"	34½" x 59½"	66" x 60"	80" x 60"	26
27 Fire Grate Area, sq. ft.,	12.26	12.25	12.25	14.25	14.25	27.50	38.33	27
28 Ext. Heating Surface of Tubes, sq. ft.,	531	549	549	809	809	1148	827	28
29 Heating Surface of Fire Box, sq. ft.,	63	52.9	53	90	90	97	130	29
30 Total Heating Surface of Boiler, sq. ft.,	594	602	602	899	899	1245	1339	30
31 Steam Pressure, per square inch, lbs.,	125	125	125	160	160	185	185	31
32 No. of Wheels under Tender,		8		8		8	8	32
33 Diam. of Wheels under Tender,		30"		33"		33"	33"	33
34 Size of Tender Truck Axle Journals,		4½" x 8"		4½" x 8"		5½" x 10"	5½" x 10"	34
35 Wt. of Engine Empty, lbs.,	52200	60000	58530	72500		105500	120850	35
36 Wt. on Truck in Working Order, lbs.,								36
37 Wt. on 1st Pair of Drivers, lbs.,	33400	35000	32400	37100	45000	60000	67000	37
38 Wt. on 2d Pair of Drivers, lbs.,	30100	37000	37600	45200	53000	56500	64750	38
39 Wt. on 3d Pair of Drivers, lbs.,								39
40 Wt. on 4th Pair of Drivers, lbs.,								40
41 Wt. on Trailing Wheels, lbs.,								41
42 Wt. of Engine in Work'g Order, lbs.,	63500	72000	70000	82300	98000	116500	131750	42
43 Total Wt. on Drivers, lbs.,	63500	72000	70000	82300	98000	116500	131750	43
44 Wt. of Tender Loaded, lbs.,		59700		71000		122000	122000	44
45 Ratio of Heat'g Surf. to Grate Surface,	48.36	49.14	49.14	63.09	63.09	45.27	34.93	45
46 Ratio of Ext'l Flue Heating Surface } to Fire Box Heating Surface, }	8.41	10.38	10.38	8.99	8.99	11.78	9.20	46
47 Heat. Surf. + Wt. one Cyl'd Steam,	838.97	779.79	779.79	735.07	735.07	757.91	697.5	47
48 Grate Area + Wt. one Cyl'd Steam,	17.32	15.87	15.87	11.66	11.66	16.74	19.96	48
49 Tractive Power per lb. of M.E. Press.,	112.50	108.00	108.00	138.72	138.72	164.28	192.00	49
50 Tractive Power with M. E. Pressure } equal to 85% of Boiler Pressure, }	11953	11475	11475	18866	18866	25833	30192	50
51 Ratio Wt. on Drivers to Tract. Pow.,	5.31	6.27	6.10	4.36	5.19	4.51	4.56	51
52 Height of Deck Plate,	43½"	43½"	43½"	51"	51"	66½"	66½"	52

STEAM LOCOMOTIVES

CLASSIFICATION.	B 4	B 4 a	B 4 b	L. W. B 5	L. W. B 6	L. W. B 6 a	B 6 a	
1 No. of Pairs of Driving-Wheels,	3	3	3	3	3	3	3	1
2 Diam. of Driving-Wheels,	50"	50"	50"	50"	56"	56"	56"	2
3 Size of Driving Axle Journals,	8" D x 7 1/2" L	8" D x 7 1/2" L	8" D x 7 1/2" L	6 1/2" D x 7 1/2" L	8 1/2" D x 12" L	8 1/2" D x 12" L	8 1/2" D x 12" L	3
4 Length of Driving Wheel Base,	10' 7"	10' 7"	10' 7"	9' 0"	11' 6"	11' 6"	11' 6"	4
5 Total Wheel Base of Engine,	10' 7"	10' 7"	10' 7"	9' 0"	11' 6"	11' 6"	11' 6"	5
6 Total Wheel Base of Eng. & Tender,	41' 6 1/2"	41' 6 1/2"	No Tender.	39' 9 1/2"	48' 3 1/2"	45' 5 1/2"	48' 9 1/2"	6
7 No. of Wheels in Engine Truck,								7
8 Diam. of Wheels in Engine Truck,								8
9 Size of Engine Truck Axle Journals,								9
10 Diameter of Trailing Wheels,								10
11 Size of Trailing Axle Journals,								11
12 Spread of Cylinders,	84"	84"	84"	84"	86"	86"	86"	12
13 Size of Cylinders,	19" x 24"	19" x 24"	19" x 24"	20" x 24"	22" x 24"	22" x 24"	22" x 24"	13
14 Steam Ports,	1 1/4" x 15 1/2"	1 1/4" x 15 1/2"	1 1/4" x 15 1/2"	1 1/4" x 17 1/2"	2" wide.	2" wide.	2" wide.	14
15 Exhaust Ports,	2 1/2" x 15 1/2"	2 1/2" x 15 1/2"	2 1/2" x 15 1/2"	2 1/2" x 17 1/2"				15
16 Travel of Valve,	5"	5"	5"	5"	5"	5"	5"	16
17 Lap of Valve,	3"	3"	3"	3"	3"	3"	3"	17
18 Type of Valve,	D	D	D	D	10" Piston	10" Piston	10" Piston	18
19 Type of Valve Gear,	Steph'n	Steph'n	Steph'n	Steph'n	Steph'n	Steph'n	Wals'h't.	19
20 Type of Boiler,	Belhaire.	Belhaire.	Belpaire.	Alcoona.	Belpaire. Sloping Top.	Belpaire. Sloping Top.	Radial Pist. Wide Fire Box.	20
21 Min. Internal Diam. Boiler,	57"	57"	57"	53 1/2"	67 1/2"	67 1/2"	67 1/2"	21
22 Number of Tubes,	128	128	128	138	323	180, 26, 104	360	22
23 Outside Diam. of Tubes,	2 1/2"	2 1/2"	2 1/2"	2 1/2"	2"	2", 5 1/2", 1 1/2"	2"	23
24 Length of Tubes bet. Tube Sheets,	177"	177 1/2"	177"	153 1/2"	166 1/2"	166 1/2"	148"	24
25 Fire Area through Tubes, sq. ft.,	3.53	3.53	3.53	3.61	5.39	5.48	6.01	25
26 Size of Fire Box, inside,	34 1/2" x 62 1/2"	34 1/2" x 74 1/2"	34 1/2" x 62 1/2"	34 1/2" x 96"	66" x 90"	60" x 90"	80" x 111"	26
27 Fire Grate Area, sq. ft.,	14.94	17.82	14.94	23.00	41.25	41.25	61.67	27
28 Ext. Heating Surface of Tubes, sq. ft.,	1236	1236	1236	1159	2343	1824 867	2325	28
29 Heating Surface of Fire Box, sq. ft.,	98	117	98	101	152	172	168.0	29
30 Total Heating Surface of Boiler, sq. ft.,	1334	1353	1334	1260	2495	2803	2493	30
31 Steam Pressure per square inch, lbs.,	160	160	160	115	205	205	205	31
32 No. of Wheels under Tender,	8	8		8	8	8	8	32
33 Diam. of Wheels under Tender,	33"	33"		33"	33"	33"	36"	33
34 Size of Tender Truck Axle Journals,	4 1/2" x 8"	4 1/2" x 8"		4 1/2" x 8"	5 1/2" x 10"	5 1/2" x 10"	5 1/2" x 10"	34
35 Wt. of Engine Empty, lbs.,	94600	97000	101950	81300	146000		150600	35
36 Wt. on Truck in Working Order, lbs.,								36
37 Wt. on 1st Pair of Drivers, lbs.,	33750	35300	33800	29500	60000	66000	61400	37
38 Wt. on 2d Pair of Drivers, lbs.,	38800	36900	44875	29800	59500	56000	56300	38
39 Wt. on 3d Pair of Drivers, lbs.,	35550	35300	43425	31700	50500	52000	56300	39
40 Wt. on 4th Pair of Drivers, lbs.,								40
41 Wt. on Trailing Wheels, lbs.,								41
42 Wt. of Engine in Work'g Order, lbs.,	108100	107500	122100	91000	170000	174000	174000	42
43 Total Wt. on Drivers, lbs.,	108100	107500	122100	91000	170000	174000	174000	43
44 Wt. of Tender Loaded, lbs.,	71000	74000		64550	108000	108000	144000	44
45 Ratio of Heat'g Surf. to Grate Surface,	89.29	75.92	89.29	54.78	60.48	67.95	40.42	45
46 Ratio of Ext'l Flue Heating Surface to Fire Box Heating Surface, }	12.61	10.56	12.61	11.48	15.41	15.30	13.83	46
47 Heat. Surf. + Wt. one Cyl'd Steam,	809.20 855.00	809.20 855.00	809.20 855.00	917.61 988.55			973.2	47
48 Grate Area + Wt. one Cyl'd Steam,	8.78 16.58	11.67 12.82	8.78 10.38	16.75 17.55			24.07	48
49 Tractive Power per lb. of M. E. Press.,	173.28	173.28	173.28	192.00	207.43	207.43	207.43	49
50 Tractive Power with M. E. Pressure equal to 85% of Boiler Pressure, }	23566 18727	23566 18727	23566 18727	20400 18768	36144	36144	36144	50
51 Ratio Wt. on Drivers to Tract. Pow.,	4.58 5.80	4.56 5.77	4.52 5.80	4.46 4.85	4.70	4.81	4.81	51
52 Height of Deck Plate,	51"	51"		51 1/2"			65 1/2"	52

STEAM LOCOMOTIVES

7

	CLASSIFICATION.	B 6 P 2	B 6 P 4	L. W. B 7 A	L. W. B 7 B	B 8	L. W. B 22	L. W. B 23	
1	No. of Pairs of Driving Wheels,	3	3	3	3	3	3	3	1
2	Diam. of Driving Wheels,	56"	56"	50"	50"	56"	51"	51"	2
3	Size of Driving Axle Journals,	8" D x 12" L	8" D x 12" L	8" D x 8 1/2" L	8" D x 8 1/2" L	8" D x 12" L	8 1/2" D x 9" L	9" D x 12" L	3
4	Length of Driving Wheel Base,	11' 6"	11' 6"	9' 3"	9' 3"	11' 6"	11' 6"	11' 6"	4
5	Total Wheel Base of Engine,	11' 6"	11' 6"	9' 3"	9' 3"	11' 6"	11' 6"	11' 6"	5
6	Total Wheel Base of Eng. & Tender,	49' 2 1/2"	49' 2 1/2"	41' 10"	41' 10"	47' 2 1/2"	40' 3 1/2"	41' 0 3/4"	6
7	No. of Wheels in Engine Truck,								7
8	Diam. of Wheels in Engine Truck,								8
9	Size of Engine Truck Axle Journals,								9
10	Diameter of Trailing Wheels,								10
11	Size of Trailing Axle Journals,								11
12	Spread of Cylinders,	86"	86"	86"	86"	86"	84"	86"	12
13	Size of Cylinders,	22" x 24"	22" x 24"	20" x 24"	20" x 24"	20" x 24"	19" x 26"	20" x 26"	13
14	Steam Ports,	2" wide	2" wide	1 1/4" x 17 1/4"	1 1/4" x 17 1/4"	1 1/4" x 15 1/4"	1 1/4" x 18"	1 1/4" x 18"	14
15	Exhaust Ports,			2 1/4" x 17 1/4"	2 1/4" x 17 1/4"	2 1/4" x 15 1/4"	2 1/4" x 18"	2 1/4" x 18"	15
16	Travel of Valve,	5"	5"	5"	5"	5"	5 1/2"	5 1/2"	16
17	Lap of Valve,	3"	3"	3"	3"	3"	3"	3"	17
18	Type of Valve,	8" Piston	8" Piston	D	D	D	D	D	18
19	Type of Valve Gear,	Wals'h't	Wals'h't	Steph'n	Steph'n	Steph'n	Steph'n	Steph'n	19
20	Type of Boiler,	Radial Stay Wide Fire Box	Radial Stay Wide Fire Box	Belpaire.	Belpaire.	Belpaire Rising Top	Straight Narrow F. B.	Straight Narrow F. B.	20
21	Min. Internal Diam. Boiler,	67 1/2"	67 1/2"	60"	60"	60"	63"	70 1/2"	21
22	Number of Tubes,	194, 26, 104.	194, 26, 104	174	174	247	253	311	22
23	Outside Diam. of Tubes,	2", 5 1/2", 1 1/2"	2", 5 1/2", 1 1/2"	2 1/4"	2 1/4"	2"	2"	2"	23
24	Length of Tubes bet. Tube Sheets,	148"	148"	159"	159"	163 1/2"	131"	131"	24
25	Fire Area through Tubes, sq. ft.,	5.32	5.32	3.79	38.3	4.13	4.22	5.19	25
26	Size of Fire Box, inside,	80" x 111"	79 1/2" x 111"	42" x 108"	42" x 108"	66" x 69"	33 1/2" x 102 1/2"	41 1/2" x 108 1/2"	26
27	Fire Grate Area, sq. ft.,	61.67	61.57	31.50	31.50	31.62	23.51	31.37	27
28	Ext. Heating Surface of Tubes, sq. ft.,	1714	1714	1358	1358	1762	1446	1778	28
29	Heating Surface of Fire Box, sq. ft.,	190	195	140	140	106	155	177	29
30	Total Heating Surface of Boiler, sq. ft.,	2505	2600	1498	1498	1868	1601	1955	30
31	Steam Pressure, per square inch, lbs.,	205	205	150	150	205	180	180	31
32	No. of Wheels under Tender,	8	8	8	8	8	8	8	32
33	Diam. of Wheels under Tender,	36"	36"	33"	33"	36"	33"	33"	33
34	Size of Tender Truck Axle Journals,	5 1/2" x 10"	5 1/2" x 10"	4 1/2" x 8"	4 1/2" x 8"	5 1/2" x 10"	5" x 9"	5" x 9"	34
35	Wt. of Engine Empty, lbs.,		161500	108350	115500	123100	109800	131600	35
36	Wt. on Truck in Working Order, lbs.,								36
37	Wt. on 1st Pair of Drivers, lbs.,	62700	61400	35900	34600	48100	40950	51600	37
38	Wt. on 2d Pair of Drivers, lbs.,	59400	62200	34150	40300	47100	44800	49900	38
39	Wt. on 3d Pair of Drivers, lbs.,	55250	56700	48800	51500	48250	38000	47200	39
40	Wt. on 4th Pair of Drivers, lbs.,								40
41	Wt. on Trailing Wheels, lbs.,								41
42	Wt. of Engine in Work'g Order, lbs.,	177350	180300	118150	126400	143450	123750	148700	42
43	Total Wt. on Drivers, lbs.,	177350	180300	118150	126400	143450	123750	148700	43
44	Wt. of Tender Loaded, lbs.,	128000	128000	102200	102200	122000	97000	99800	44
45	Ratio of Heat'g Surf. to Grate Surface,	42.08	42.22	47.55	47.56	59.07	68.1	62.4	45
46	Ratio of Ext'l Flue Heating Surface to Fire Box Heating Surface,	12.66	12.33	9.70	96.8	16.62	9.33	10.00	46
47	Heat. Surf. + Wt. one Cyl'd Steam,	1346.3	1319.3			882.34 929.67			47
48	Grate Area + Wt. one Cyl'd Steam,	31.99	31.24			14.93 15.73			48
49	Tractive Power per lb. of M.E. Press.,	207.43	207.43	192.00	192.00	171.43	184.04	203.92	49
50	Tractive Power with M. E. Pressure equal to 85% of Boiler Pressure,	36144	36144	24490	24490	29871 28414	28158	31200	50
51	Ratio Wt. on Drivers to Tract. Pow.,	4.90	4.90	4.85	5.16	4.80 5.03	4.39	4.77	51
52	Height of Deck Plate,	66 1/2"	66 1/2"			66 1/2"			52

STEAM LOCOMOTIVES

CLASSIFICATION.

L. W.
B 28 s

L. W.
B 29

1	No. of Pairs of Driving Wheels,	3	3	1
2	(Diam. of Driving Wheels,	51"	51"	2
3	Size of Driving Axle Journals,	9"b x 12"L	9"b x 10"L	3
4	Length of Driving Wheel Base,	11' 0"	11' 6"	4
5	Total Wheel Base of Engine,	11' 0"	11' 6"	5
6	Total Wheel Base of Eng. & Tender,	49' 9 1/2"	40' 9 1/2"	6
7	No. of Wheels in Engine Truck,			7
8	Diam. of Wheels in Engine Truck,			8
9	Size of Engine Truck Axle Journals,			9
10	Diameter of Trailing Wheels,			10
11	Size of Trailing Axle Journals,			11
12	Spread of Cylinders,	86"	86"	12
13	Size of Cylinders,	21" x 28"	19" x 26"	13
14	Steam Ports,	1 1/4" wide	1 1/4" x 18"	14
15	Exhaust Ports,		2 3/4" x 18"	15
16	Travel of Valve,	6"	5 1/2"	16
17	Lap of Valve,		3"	17
18	Type of Valve,	10" Piston	D	18
19	Type of Valve Gear,	Baker	Steph'n	19
20	Type of Boiler,	Straight Narrow F. h.	Straight.	20
21	Min. Internal Diam. Boiler,	64 1/2"	65"	21
22	Number of Tubes,	158-24-86	280	22
23	Outside Diam. of Tubes,	2"-5 1/4"-1 1/4"	2"	23
24	Length of Tubes bet. Tube Sheets,	178 1/2"	131"	24
25	Fire Area through Tubes, sq. ft.,	4.0	4.68	25
26	Size of Fire Box, inside,	66 1/2" x 72 1/2"	42" x 108 1/2"	26
27	(e Grate Area, sq. ft.,	33.00	31.54	27
28	Ext. Heating Surface of Tubes, sq. ft.,	17,448	1600	28
29	Heating Surface of Fire Box, sq. ft.,	138	155	29
30	Total Heating Surface of Boiler, sq. ft.,	2693	1755	30
31	Steam Pressure per square inch, lbs.,	190	180	31
32	No. of Wheels under Tender,	8	8	32
33	Diam. of Wheels under Tender,	33"	33"	33
34	Size of Tender Truck Axle Journals,	6" x 11"	5" x 9"	34
35	Wt. of Engine Empty, lbs.,	152000	117000	35
36	Wt. on Truck in Working Order, lbs.,			36
37	Wt. on 1st Pair of Drivers, lbs.,	47600	42500	37
38	Wt. on 2d Pair of Drivers, lbs.,	57900	47500	38
39	Wt. on 3d Pair of Drivers, lbs.,	61700	45000	39
40	Wt. on 4th Pair of Drivers, lbs.,			40
41	Wt. on Trailing Wheels, lbs.,			41
42	Wt. of Engine in Work'g Order, lbs.,	167200	135000	42
43	Total Wt. on Drivers, lbs.,	167200	135000	43
44	Wt. of Tender Loaded, lbs.,	160850	91050	44
45	Ratio of Heat'g Surf. to Grate Surface,	81.6	55.64	45
46	Ratio of Ext'l Flue Heating Surface } to Fire Box Heating Surface, }	18.51	10.32	46
47	Heat. Surf. + Wt. one Cyl'd Steam,			47
48	Grate Area + Wt. one Cyl'd Steam,			48
49	Tractive Power per lb. of M.E. Press.,	242.1	184.04	49
50	Tractive Power with M. E. Pressure } equal to 85% of Boiler Pressure, }	39100	28158	50
51	(No Wt. on Drivers to Tract. Pow.,	4.32	4.79	51
52	Height of Deck Plate,			52

STEAM LOCOMOTIVES

9

CLASSIFICATION.	L. W. C 30	L. W. C 31	
1 No. of Pairs of Driving Wheels,	4	4	1
2 Diam. of Driving Wheels,	50"	46"	2
3 Size of Driving Axle Journals,	8 1/2" x 8 1/2"	8" x 8 1/2"	3
4 Length of Driving Wheel Base,	15' 3"	13' 6"	4
5 Total Wheel Base of Engine,	15' 3"	13' 6"	5
6 Total Wheel Base of Eng. & Tender, No Tender	No Tender	No Tender	6
7 No. of Wheels in Engine Truck,			7
8 Diam. of Wheels in Engine Truck,			8
9 Size of Engine Truck Axle Journals,			9
10 Diameter of Trailing Wheels,			10
11 Size of Trailing Axle Journals,			11
12 Spread of Cylinders,	88"	84"	12
13 Size of Cylinders,	22" x 28"	20" x 24"	13
14 Steam Ports,	11" x 18"	11" x 16"	14
15 Exhaust Ports,	24" x 18"	24" x 16"	15
16 Travel of Valve,	5"	5"	16
17 Lap of Valve,	1"	1"	17
18 Type of Valve,	D	D	18
19 Type of Valve Gear,	Steph'n	Steph'n	19
20 Type of Boiler,	Belpatre	Wagon Top	20
21 Min. Internal Diam. Boiler,	60 1/2"	59 1/2"	21
22 Number of Tubes,	220	243	22
23 Outside Diam. of Tubes,	2"	2"	23
24 Length of Tubes bet. Tube Sheets,	160 1/2"	157 1/2"	24
25 Fire Area through Tubes, sq. ft.,	3.67	4.06	25
26 Size of Fire Box, inside,	42" x 93 1/2"	33 3/4" x 107 1/4"	26
27 Fire Grate Area, sq. ft.,	27.27	24.96	27
28 Ext. Heating Surface of Tubes, sq. ft.,	1542	1669	28
29 Heating Surface of Fire Box, sq. ft.,	141	137.8	29
30 Total Heating Surface of Boiler, sq. ft.,	1683	1807	30
31 Steam Pressure, per square inch, lbs.,	150	140	31
32 No. of Wheels under Tender,			32
33 Diam. of Wheels under Tender,			33
34 Size of Tender Truck Axle Journals,			34
35 Wt. of Engine Empty, lbs.,	118977	117000	35
36 Wt. on Truck in Working Order, lbs.,			36
37 Wt. on 1st Pair of Drivers, lbs.,	36000		37
38 Wt. on 2d Pair of Drivers, lbs.,	38800		38
39 Wt. on 3d Pair of Drivers, lbs.,	41700		39
40 Wt. on 4th Pair of Drivers, lbs.,	37800		40
41 Wt. on Trailing Wheels, lbs.,			41
42 Wt. of Engine in Work'g Order, lbs.,	154300	150000	42
43 Total Wt. on Drivers, lbs.,	154300	150000	43
44 Wt. of Tender Loaded, lbs.,			44
45 Ratio of Heat'g Surf. to Grate Surface,	61.72	72.39	45
46 Ratio of Ext'l Flue Heating Surface } to Fire Box Heating Surface, }	10.90	12.11	46
47 Heat. Surf. + Wt. one Cyl'd Steam,	743.78	1195.87	47
48 Grate Area + Wt. one Cyl'd Steam,	12.05	16.52	48
49 Tractive Power per lb. of M. E. Press.,	271.04	208.69	49
50 Tractive Power with M. E. Pressure } equal to 85% of Boiler Pressure, }	34558	24834	50
51 Ratio Wt. on Drivers to Tract. Pow.,	4.46	6.04	51
52 Height of Deck Plate,			52

STEAM LOCOMOTIVES

CLASSIFICATION.	D 8 a	L. W. D 10	L. W. D 10 a	D 13 a	D 13 c	D 14 b	D 16	
1 No. of Pairs of Driving Wheels,	2	2	2	2	2	2	2	1
2 Diam. of Driving Wheels,	62"	62"	68"	68"	68"	68"	68"	2
3 Size of Driving Axle Journals,	8 1/2" x 7 1/2"	8" x 7 1/2"	8 1/2" x 7 1/2"	8" x 10 1/2"	8 1/2" x 10 1/2"	8 1/2" x 10 1/2"	8 1/2" x 12 1/2"	3
4 Length of Driving Wheel Base,	8' 6"	8' 6"	8' 6"	7' 9"	7' 9"	7' 9"	7' 9"	4
5 Total Wheel Base of Engine,	22' 5 1/2"	22' 5 1/2"	22' 5 1/2"	22' 8 1/2"	22' 8 1/2"	22' 9 1/2"	22' 9 1/2"	5
6 Total Wheel Base of Eng. & Tender,	45' 6 1/2"	47' 4 1/2"	47' 4 1/2"	48' 7 1/2"	48' 7 1/2"	49' 3 1/2"	50' 3 1/2"	6
7 No. of Wheels in Engine Truck,	4	4	4	4	4	4	4	7
8 Diam. of Wheels in Engine Truck,	33"	33"	33"	33"	33"	36"	33"	8
9 Size of Engine Truck Axle Journals,	5 1/2" x 10"	5 1/2" x 10"	5 1/2" x 10"	5 1/2" x 10"	5 1/2" x 10"	5 1/2" x 10"	5 1/2" x 10"	9
10 Diameter of Trailing Wheels,								10
11 Size of Trailing Axle Journals,								11
12 Spread of Cylinders,	77"	77"	77"	77"	77"	77"	78"	12
13 Size of Cylinders,	18" x 24"	18" x 24"	18" x 24"	18 1/2" x 24"	18 1/2" x 24"	19" x 24"	18 1/2" x 26"	13
14 Steam Ports,	11" x 17 1/2"	11 1/2" x 17 1/2"	11" x 17 1/2"	11" x 17 1/2"	11" x 17 1/2"	11" x 20"	11" x 20"	14
15 Exhaust Ports,	2 1/2" x 17 1/2"	2 1/2" x 17 1/2"	2 1/2" x 17 1/2"	2 1/2" x 17 1/2"	2 1/2" x 17 1/2"	3" x 20"	3" x 20"	15
16 Travel of Valve,	5"	5"	5"	5"	5"	6"	6"	16
17 Lap of Valve,	1"	1"	1"	1"	1"	1 1/2"	1 1/2"	17
18 Type of Valve,	D	D	D	D	D	D	D	18
19 Type of Valve Gear,	Steph'n	Steph'n	Steph'n	Steph'n	Steph'n	Steph'n	Steph'n	19
20 Type of Boiler,	Wagon Top Crown Bars	Belpaire	Belpaire	Belpaire	Belpaire	Belpaire	Belpaire	20
21 Min. Internal Diam. Boiler,	53 1/2"	56 1/2"	56 1/2"	56 1/2"	56 1/2"	57"	58 1/2"	21
22 Number of Tubes,	193	196	196	258	258	258	310	22
23 Outside Diam. of Tubes,	2 1/2"	2"	2"	1 1/2"	1 1/2"	1 1/2"	1 1/2"	23
24 Length of Tubes bet. Tube Sheets,	131 1/2"	136"	136"	135 1/2"	135 1/2"	136"	136 1/2"	24
25 Fire Area through Tubes, sq. ft.,	4.21	3.27	3.27	3.72	3.72	3.72	4.46	25
26 Size of Fire Box, inside,	35" x 72 1/2"	34 1/2" x 72 1/2"	34 1/2" x 72 1/2"	40" x 119 1/2"	40" x 119 1/2"	40" x 119 1/2"	40" x 119 1/2"	26
27 Fire Grate Area, sq. ft.,	17.65	17.34	17.34	33.23	33.23	33.26	33.22	27
28 Ext. Heating Surface of Tubes, sq. ft.,	1250	1163	1163	1434	1434	1435	1734	28
29 Heating Surface of Fire Box, sq. ft.,	142	133	133	137	137	148	171	29
30 Total Heating Surface of Boiler, sq. ft.,	1392	1296	1296	1571	1571	1583	1905	30
31 Steam Pressure per square inch, lbs.,	14 1/2	160	160	15 1/2	15 1/2	175	17 1/2	31
32 No. of Wheels under Tender,	8	8	8	8	8	8	8	32
33 Diam. of Wheels under Tender,	33"	33"	33"	33"	33"	33"	36"	33
34 Size of Tender Truck Axle Journals,	4 1/2" x 8"	4 1/2" x 8"	4 1/2" x 8"	4 1/2" x 8"	4 1/2" x 8"	4 1/2" x 8"	4 1/2" x 8"	34
35 Wt. of Engine Empty, lbs.,	82000	91750	93050	100900	102400	114500	120900	35
36 Wt. on Truck in Working Order, lbs.,	36000	37000	37500	35000	35000	39750	41700	36
37 Wt. on 1st Pair of Drivers, lbs.,	31000	33000	34000	38950	42500	43500	48300	37
38 Wt. on 2d Pair of Drivers, lbs.,	28000	33000	32500	38250	37000	43800	45300	38
39 Wt. on 3d Pair of Drivers, lbs.,								39
40 Wt. on 4th Pair of Drivers, lbs.,								40
41 Wt. on Trailing Wheels, lbs.,								41
42 Wt. of Engine in Work'g Order, lbs.,	95000	103000	104000	112200	114500	127050	135300	42
43 Total Wt. on Drivers, lbs.,	59000	66000	66500	77200	79500	87300	93600	43
44 Wt. of Tender Loaded, lbs.,	102200	102200	102200	77000	77000	77000	75000	44
45 Ratio of Heat'g Surf. to Grate Surface,	78.87	74.72	74.72	47.28	47.28	47.59	57.34	45
46 Ratio of Ext'l Flue Heating Surface to Fire Box Heating Surface,	8.80	8.74	8.74	10.47	10.47	9.69	10.14	46
47 Heat. Surf. + Wt. one Cyl'd Steam,	1210.85	945.32	945.32	1084.94	1084.94	959.17	1070.64	47
48 Grate Area + Wt. one Cyl'd Steam,	14.42	12.65	12.65	22.94	22.94	20.15	18.67	48
49 Tractive Power per lb. of M. E. Press.,	125.42	125.42	114.35	120.79	120.79	127.41	130.86	49
50 Tractive Power with M. E. Pressure equal to 85% of Boiler Pressure,	18859	17057	15552	16428	17968	18952	20578	50
51 Ratio Wt. on Drivers to Tract. Pow.,	4.26	3.87	4.30	4.79	4.44	4.61	4.55	51
52 Height of Deck Plate,	51 1/2"	51 1/2"	51 1/2"	53 1/2"	53 1/2"	49 1/2"	55 1/2"	52

STEAM LOCOMOTIVES

11

CLASSIFICATION.	D 16 a	D 16 b	D 16 c b	L. W. D 16 s b	L. W. D 16 d	L. W. D 16 e d	L. W. D 26	
No. of Pairs of Driving Wheels,	2	2	2	2	2	2	2	1
Diam. of Driving Wheels,	80"	68"	68"	68"	80"	80"	73"	2
Size of Driving Axle Journals,	8 1/2" x 12 1/2"	9 1/2" x 12 1/2"	9 1/2" x 12 1/2"	9 1/2" x 12 1/2"	9 1/2" x 12 1/2"	9 1/2" x 12 1/2"	8 3/4" x 11 1/4"	3
Length of Driving Wheel Base,	7' 9"	7' 9"	7' 9"	7' 9"	7' 9"	7' 9"	8' 6"	4
Total Wheel Base of Engine,	22' 9 1/2"	22' 9 1/2"	22' 9 1/2"	22' 9 1/2"	22' 9 1/2"	22' 9 1/2"	23' 11"	5
Total Wheel Base of Eng. & Tender,	50' 3 1/2"	55' 0 1/2"	55' 0 1/2"	53' 4"	53' 4"	55' 0 1/2"	55' 3 1/2"	6
No. of Wheels in Engine Truck,	4	4	4	4	4	4	4	7
Diam. of Wheels in Engine Truck,	36"	33"	33"	33"	36"	36"	33"	8
Size of Engine Truck Axle Journals,	5 1/2" x 10"	5 1/2" x 10"	5 1/2" x 10"	5 1/2" x 10"	5 1/2" x 10"	5 1/2" x 10"	6" x 10"	9
Diameter of Trailing Wheels,								10
Size of Trailing Axle Journals,								11
Spread of Cylinders,	78"	78"	78"	78"	78"	78"	77"	12
Size of Cylinders,	18 1/2" x 26"	18 1/2" x 26"	20 1/2" x 26"	20 1/2" x 26"	18 1/2" x 26"	20 1/2" x 26"	20" x 24"	13
Steam Ports,	1 1/2" x 20"	1 1/2" x 20"	1 1/2" & 1 1/2"	1 1/2" x 1 1/2"	1 1/2" x 20"	1 1/2" & 1 1/2"	1 1/2" x 20"	14
Exhaust Ports,	3" x 20"	3" x 20"			3" x 20"		3" x 20"	15
Travel of Valve,	6"	6"	6"	6"	6"	6"	5 1/2"	16
Lap of Valve,	1 1/2"	1 1/2"	1 1/2"	1 1/2"	1 1/2"	1 1/2"	1 1/2"	17
Type of Valve,	D	D	8" Piston	8" Piston	D	8" Piston	D	18
Type of Valve Gear,	Steph'n	Steph'n	Steph'n	Steph'n	Steph'n	Steph'n	Steph'n	19
Type of Boiler,	Belpaire	Belpaire Sloping Top	Belpaire Sloping Top	Belpaire Sloping Top	Belpaire Sloping Top	Belpaire Sloping Top	Belpaire Sloping Top	20
Min. Internal Diam. Boiler,	58 1/2"	58 1/2"	58 1/2"	57 1/2"	58 1/2"	58 1/2"	61"	21
Number of Tubes,	310	310	159, 21, 84	159, 21, 84	310	159, 21, 84	290	22
Outside Diam. of Tubes,	1 1/2"	1 1/2"	1 1/2", 5 1/2", 1 1/2"	1 1/2", 1 1/2", 1 1/2"	1 1/2"	1 1/2", 5 1/2", 1 1/2"	2"	23
Length of Tubes bet. Tube Sheets,	136 3/4"	136 3/4"	135 1/4"	135 1/4"	136 3/4"	135 1/4"	143"	24
Fire Area through Tubes, sq. ft.,	4.46	4.46	3.97	3.97	4.46	3.97	4.84	25
Size of Fire Box, inside,	40" x 119 1/2"	40" x 119 1/2"	40" x 119 5/8"	40" x 119 5/8"	40" x 119 1/2"	40" x 119 1/2"	40" x 108 1/2"	26
Fire Grate Area, sq. ft.,	33.22	33.22	33.22	33.22	33.22	33.22	20.04	27
Ext. Heating Surface of Tubes, sq. ft.,	1734	1734	1228 456	1228 456	1734	1228 456	1800	28
Heating Surface of Fire Box, sq. ft.,	171	166	181	181	166	181	175	29
Total Heating Surface of Boiler, sq. ft.,	1905	1900	1897	1897	1900	1897	1984	30
Steam Pressure, per square inch, lbs.,	185 175	185 175	175	185	185	175	180	31
No. of Wheels under Tender,	8	8	8	8	8	8	8	32
Diam. of Wheels under Tender,	36"	36"	36"	33"	33"	36"	36"	33
Size of Tender Truck Axle Journals,	4 1/2" x 8"	5 1/2" x 10"	5 1/2" x 10"	5 1/2" x 10"	5 1/2" x 10"	5 1/2" x 10"	5 1/2" x 10"	34
Wt. of Engine Empty, lbs.,	120200	121800			121900		117200	35
Wt. on Truck in Working Order, lbs.,	41400	40900	42600	42600	40000		45000	36
Wt. on 1st Pair of Drivers, lbs.,	48400	50400	51800	51800	50000		42600	37
Wt. on 2d Pair of Drivers, lbs.,	44700	46700	46700	46700	48000		43400	38
Wt. on 3d Pair of Drivers, lbs.,								39
Wt. on 4th Pair of Drivers, lbs.,								40
Wt. on Trailing Wheels, lbs.,								41
Wt. of Engine in Work'g Order, lbs.,	134500	138000	141100	141100	138000		131000	42
Total Wt. on Drivers, lbs.,	93100	97100	98500	98500	98000		86000	43
Wt. of Tender Loaded, lbs.,	75000	134000	134000	134000	134000	134000	137300	44
Ratio of Heat'g Surf. to Grate Surface,	57.34	57.19	57.10	57.10	57.19	57.10	66.1	45
Ratio of Ext'l Flue Heating Surface to Fire Box Heating Surface,	10.14	10.44	9.48	9.48	10.44	9.48	10.3	46
Heat. Surf. + Wt. one Cyl'd Steam,	1079.64	1067.68	911.7			911.7		47
Grate Area + Wt. one Cyl'd Steam,	18.67	18.67	16.01			16.01		48
Tractive Power per lb. of M. E. Press.,	111.23	130.86	160.68	160.68	111.23	136.58	131.51	49
Tractive Power with M. E. Pressure equal to 85% of Boiler Pressure,	17491 16546	20578 19465	23902	25267	17491	20616	20121	50
Ratio Wt. on Drivers to Tract. Pow.,	3.33 3.63	4.72 5.06	4.12	3.89	5.60		4.27	51
Height of Deck Plate,	55 1/2"	55 1/2"	55 1/2"			55 1/2"		52

STEAM LOCOMOTIVES

CLASSIFICATION.		L. W. D 26 a		
1	No. of Pairs of Driving Wheels,	2		1
2	Diam. of Driving Wheels,	79"		2
3	Size of Driving Axle Journals,	8 1/2" x 11 1/2"		3
4	Length of Driving Wheel Base,	8' 6"		4
5	Total Wheel Base of Engine,	24' 5"		5
6	Total Wheel Base of Eng. & Tender,	55' 7 1/2"		6
7	No. of Wheels in Engine Truck,	4		7
8	Diam. of Wheels in Engine Truck,	36"		8
9	Size of Engine Truck Axle Journals,	6" x 10"		9
10	Diameter of Trailing Wheels,			10
11	Size of Trailing Axle Journals,			11
12	Spread of Cylinders,	77"		12
13	Size of Cylinders,	20" x 26"		13
14	Steam Ports,	1 1/2" x 18"		14
15	Exhaust Ports,	3" x 18"		15
16	Travel of Valve,	6"		16
17	Lap of Valve,	1 1/2"		17
18	Type of Valve,	D		18
19	Type of Valve Gear,	Steph'n		19
20	Type of Boiler,	Ext. Wagon Top Narrow F. R.		20
21	Min. Internal Diam. Boiler,	61"		21
22	Number of Tubes,	290		22
23	Outside Diam. of Tubes,	2"		23
24	Length of Tubes bet. Tube Sheets,	148"		24
25	Fire Area through Tubes, sq. ft.,	4.84		25
26	Size of Fire Box, inside,	40" x 108 1/2"		26
27	Fire Grate Area, sq. ft.,	30.05		27
28	Ext. Heating Surface of Tubes, sq. ft.,	1873		28
29	Heating Surface of Fire Box, sq. ft.,	189		29
30	Total Heating Surface of Boiler, sq. ft.,	2062		30
31	Steam Pressure per square inch, lbs.,	180		31
32	No. of Wheels under Tender,	8		32
33	Diam. of Wheels under Tender,	36"		33
34	Size of Tender Truck Axle Journals,	5 1/2" x 10"		34
35	Wt. of Engine Empty, lbs.,	124900		35
36	Wt. on Truck in Working Order, lbs.,	48100		36
37	Wt. on 1st Pair of Drivers, lbs.,	42800		37
38	Wt. on 2d Pair of Drivers, lbs.,	42700		38
39	Wt. on 3d Pair of Drivers, lbs.,			39
40	Wt. on 4th Pair of Drivers, lbs.,			40
41	Wt. on Trailing Wheels, lbs.,			41
42	Wt. of Engine in Work'g Order, lbs.,	139000		42
43	Total Wt. on Drivers, lbs.,	90900		43
44	Wt. of Tender Loaded, lbs.,	137300		44
45	Ratio of Heat'g Surf. to Grate Surface,	68.6		45
46	Ratio of Ext'l Flue Heating Surface to Fire Box Heating Surface,	9.91		46
47	Heat. Surf. + Wt. one Cyl'd Steam,			47
48	Grate Area + Wt. one Cyl'd Steam,			48
49	Tractive Power per lb. of M. E. Press.,	131.65		49
50	Tractive Power with M. E. Pressure equal to 85% of Boiler Pressure,	29142		50
51	Ratio Wt. on Drivers to Tract. Pow.,	4.51		51
52	Height of Deck Plate,			52

STEAM LOCOMOTIVES

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CLASSIFICATION.	E 1 a	E 2.	L. W. E 2.	E 2 a	L. W. E 2 a	L. W. E 2 b	L. W. E 2 c	
1 No. of Pairs of Driving Wheels,	2	2	2	2	2	2	2	1
2 Diam. of Driving Wheels,	80"	80"	80"	80"	80"	80"	80"	2
3 Size of Driving Axle Journals,	9 1/2" x 13 1/4"	9 1/2" x 13 1/4"	9 1/2" x 13 1/4"	9 1/2" x 13 1/4"	9 1/2" x 13 1/4"	9 1/2" x 13 1/4"	9 1/2" x 13 1/4"	3
4 Length of Driving Wheel Base,	7' 5"	7' 5"	7' 5"	7' 5"	7' 5"	7' 5"	7' 5"	4
5 Total Wheel Base of Engine,	30' 9 1/4"	30' 9 1/4"	30' 9 1/4"	30' 9 1/4"	30' 9 1/4"	30' 9 1/4"	30' 9 1/4"	5
6 Total Wheel Base of Eng. & Tender,	53' 9 1/4"	60' 6 1/2"	60' 11 1/2"	60' 6 1/2"	60' 11 1/2"	60' 11 1/2"	60' 11 1/2"	6
7 No. of Wheels in Engine Truck,	4	4	4	4	4	4	4	7
8 Diam. of Wheels in Engine Truck,	36"	36"	36"	36"	36"	36"	36"	8
9 Size of Engine Truck Axle Journals,	5 1/2" x 10"	5 1/2" x 10"	5 1/2" x 10"	5 1/2" x 10"	5 1/2" x 10"	5 1/2" x 10"	5 1/2" x 10"	9
10 Diameter of Trailing Wheels,	50"	50"	50"	50"	50"	50"	50"	10
11 Size of Trailing Axle Journals,	7" x 11 1/4"	7" x 11 1/4"	7" x 11 1/4"	7" x 11 1/4"	7" x 11 1/4"	7" x 11 1/4"	7" x 11 1/4"	11
12 Spread of Cylinders,	85 1/2"	85 1/2"	85 1/2"	85 1/2"	85 1/2"	85 1/2"	85 1/2"	12
13 Size of Cylinders,	20 1/2" x 26"	20 1/2" x 26"	20 1/2" x 26"	20 1/2" x 26"	20 1/2" x 26"	20 1/2" x 26"	20 1/2" x 26"	13
14 Steam Ports,	1 1/4" x 20"	1 1/4" x 20"	1 1/4" x 20"	1 1/4" x 20"	1 1/4" x 20"	1 1/4" wide.	1 1/4" x 20"	14
15 Exhaust Ports,	3" x 20"	3" x 20"	3" x 20"	3" x 20"	3" x 20"	2 1/2" wide.	3" x 20"	15
16 Travel of Valve,	7"	7"	7"	7"	7"	7"	7"	16
17 Lap of Valve,	1 1/2"	1 1/2"	1 1/2"	1 1/2"	1 1/2"	1 1/2"	1 1/2"	17
18 Type of Valve,	D	D	D	D	D	12" Piston.	D	18
19 Type of Valve Gear,	Steph'n	Steph'n	Steph'n	Steph'n	Steph'n	Steph'n	Steph'n	19
20 Type of Boiler,	Radial Stay Wide Fire Box	Radial Stay Wide Fire Box	Radial Stay Wide Fire Box	Radial Stay Wide Fire Box	Radial Stay Wide Fire Box	Radial Stay Wide Fire Box	Radial Stay Wide Fire Box	20
21 Min. Internal Diam. Boiler,	65 1/2"	65 1/2"	65 1/2"	65 1/2"	65 1/2"	65 1/2"	65 1/2"	21
22 Number of Tubes,	290	315	315	315	315	315	315	22
23 Outside Diam. of Tubes,	2"	2"	2"	2"	2"	2"	2"	23
24 Length of Tubes bet. Tube Sheets,	180"	180"	180"	180"	180"	180"	180"	24
25 Fire Area through Tubes, sq. ft.,	4.84	5.26	5.26	5.26	5.26	5.26	5.26	25
26 Size of Fire Box, inside,	66" x 111"	72" x 111"	72" x 111"	72" x 111"	72" x 111"	72" x 111"	72" x 111"	26
27 Fire Grate Area, sq. ft.,	50.87	55.55	55.55	55.55	55.55	55.55	55.55	27
28 Ext. Heating Surface of Tubes, sq. ft.,	2277	2474	2474	2474	2474	2474	2474	28
29 Heating Surface of Fire Box, sq. ft.,	152	166	166	166	166	166	166	29
30 Total Heating Surface of Boiler, sq. ft.,	2429	2640	2640	2640	2640	2640	2640	30
31 Steam Pressure, per square inch, lbs.,	185	205	205	205	205	205	205	31
32 No. of Wheels under Tender,	6	8	8	8	8	8	8	32
33 Diam. of Wheels under Tender,	42"	36"	36"	36"	36"	36"	36"	33
34 Size of Tender Truck Axle Journals,	5" x 9"	5 1/2" x 10"	5 1/2" x 10"	5 1/2" x 10"	5 1/2" x 10"	5 1/2" x 10"	5 1/2" x 10"	34
35 Wt. of Engine Empty, lbs.,	150500	157000	157000	162000	163100	163100	163100	35
36 Wt. on Truck in Working Order, lbs.,	36335	32000	32000	32000	32000	32000	32000	36
37 Wt. on 1st Pair of Drivers, lbs.,	49590	60000	60000	60000	60000	60000	60000	37
38 Wt. on 2d Pair of Drivers, lbs.,	51105	62000	62000	63000	63000	63000	62000	38
39 Wt. on 3d Pair of Drivers, lbs.,								39
40 Wt. on 4th Pair of Drivers, lbs.,								40
41 Wt. on Trailing Wheels, lbs.,	32320	31500	31500	32000	32000	32000	31000	41
42 Wt. of Engine in Work'g Order, lbs.,	169350	185500	185500	187000	187000	187000	185000	42
43 Total Wt. on Drivers, lbs.,	100685	122000	122000	123000	123000	123000	122000	43
44 Wt. of Tender Loaded, lbs.,	134000	134000	145150	134000	154050	154050	154050	44
45 Ratio of Heat'g Surf. to Grate Surface,	47.75	47.52	47.52	47.52	47.52	47.52	47.52	45
46 Ratio of Ext'l Flue Heating Surface to Fire Box Heating Surface,	14.98	14.90	14.90	14.90	14.90	14.90	14.90	46
47 Heat. Surf. + Wt. one Cyl'd Steam,	1111.61	1134.35	1134.35	1134.35	1134.35	1134.35	1134.35	47
48 Grate Area + Wt. one Cyl'd Steam,	23.28	23.35	23.35	23.35	23.35	23.35	23.35	48
49 Tractive Power per lb. of M. E. Press.,	136.58	136.58	136.58	136.58	136.58	136.58	136.58	49
50 Tractive Power with M. E. Pressure equal to 85% of Boiler Pressure,	21477	23799	23799	23799	23799	23799	23799	50
51 Ratio Wt. on Drivers to Tract. Pow.,	5.68	5.12	5.12	5.17	5.17	5.17	5.12	51
52 Height of Deck Plate,	58 1/2"	58 1/2"	58 1/2"	58 1/2"	58 1/2"	58 1/2"	58 1/2"	52

STEAM LOCOMOTIVES

CLASSIFICATION.	E 2 d	E 2 s d	E 3	E 3 a	E 3 s a	E 3 s d	E 5-	
1 No. of Pairs of Driving Wheels,	2	2	2	2	2	2	2	1
2 Diam. of Driving Wheels,	80"	80"	80"	80"	80"	80"	80"	2
3 Size of Driving Axle Journals,	9 1/2" D x 13 1/2" L	9 1/2" D x 13 1/2" L	9 1/2" D x 13 1/2" L	9 1/2" D x 13 1/2" L	9 1/2" D x 13 1/2" L	9 1/2" D x 13 1/2" L	9 1/2" D x 13 1/2" L	3
4 Length of Driving Wheel Base,	7' 5"	7' 5"	7' 5"	7' 5"	7' 5"	7' 5"	7' 5"	4
5 Total Wheel Base of Engine,	30' 9 1/2"	30' 9 1/2"	30' 9 1/2"	30' 9 1/2"	30' 9 1/2"	30' 9 1/2"	29' 7 1/2"	5
6 Total Wheel Base of Eng. & Tender,	60' 6 1/2"	60' 6 1/2"	60' 6 1/2"	60' 6 1/2"	60' 6 1/2"	60' 6 1/2"	63' 6 1/2"	6
7 No. of Wheels in Engine Truck,	4	4	4	4	4	4	4	7
8 Diam. of Wheels in Engine Truck,	36"	36"	36"	36"	36"	36"	36"	8
9 Size of Engine Truck Axle Journals,	5 1/2" x 10"	5 1/2" x 10"	5 1/2" x 10"	5 1/2" x 10"	5 1/2" x 10"	5 1/2" x 10"	5 1/2" x 10"	9
10 Diameter of Trailing Wheels,	50"	50"	50"	50"	50"	50"	50"	10
11 Size of Trailing Axle Journals,	7" x 11 1/2"	7" x 11 1/2"	7" x 11 1/2"	7" x 11 1/2"	7" x 11 1/2"	7" x 11 1/2"	6 1/2" x 12"	11
12 Spread of Cylinders,	85 1/2"	85 1/2"	85 1/2"	85 1/2"	85 1/2"	85 1/2"	85 1/2"	12
13 Size of Cylinders,	20 1/2" x 26"	20 1/2" x 26"	22" x 26"	22" x 26"	22" x 26"	22" x 26"	22" x 26"	13
14 Steam Ports,	2" & 1 1/2"	2" & 1 1/2"	1 1/2" x 20"	1 1/2" x 20"	2" & 1 1/2"	2" & 1 1/2"	2" & 1 1/2"	14
15 Exhaust Ports,			3" x 20"	3" x 20"				15
16 Travel of Valve,	7"	7"	7"	7"	7"	7"	7"	16
17 Lap of Valve,	1 1/2"	1 1/2"	1 1/2"	1 1/2"	1 1/2"	1 1/2"	1 1/2"	17
18 Type of Valve,	12" Piston	12" Piston	D	D	12" Piston	12" Piston	12" Piston	18
19 Type of Valve Gear,	Wals'h't	Wals'h't	Steph'n	Steph'n	Wals'h't	Wals'h't	Wals'h't	19
20 Type of Boiler,	Belpaire, Wide Fire Box.	Belpaire, Wide Fire Box.	Radial Stay Wide Fire Box.	Belpaire, Wide Fire Box.	Belpaire, Wide Fire Box.	Belpaire, Wide Fire Box.	Belpaire, Wide Fire Box.	20
21 Min. Internal Diam. Boiler,	65 1/2"	65 1/2"	65 1/2"	65 1/2"	65 1/2"	65 1/2"	65 1/2"	21
22 Number of Tubes,	315	170, 24, 96,	315	315	170, 24, 96,	170, 24, 96,	170, 24, 96,	22
23 Outside Diam. of Tubes,	2"	2", 5 1/2", 1 1/2"	2"	2"	2", 5 1/2", 1 1/2"	2", 5 1/2", 1 1/2"	2", 5 1/2", 1 1/2"	23
24 Length of Tubes bet. Tube Sheets,	180"	180"	180"	180"	180"	180"	180"	24
25 Fire Area through Tubes, sq. ft.,	5.26	4.76	5.26	5.26	4.76	4.76	4.76	25
26 Size of Fire Box, inside,	72" x 111"	72" x 111"	72" x 111"	72" x 111"	72" x 111"	72" x 111"	72" x 111"	26
27 Fire Grate Area, sq. ft.,	55.55	55.55	55.55	55.55	55.55	55.55	55.55	27
28 Ext. Heating Surface of Tubes, sq. ft.,	2474	1854 7/8	2474	2474	1854 7/8	1854 7/8	1854 7/8	28
29 Heating Surface of Fire Box, sq. ft.,	166	166	166	166	166	166	166	29
30 Total Heating Surface of Boiler, sq. ft.,	2640	2806	2640	2640	2806	2806	2806	30
31 Steam Pressure per square inch, lbs.,	205	205	205	205	205	205	205	31
32 No. of Wheels under Tender,	8	8	8	8	8	8	8	32
33 Diam. of Wheels under Tender,	36"	36"	36"	36"	36"	36"	36"	33
34 Size of Tender Truck Axle Journals,	5 1/2" x 10"	5 1/2" x 10"	5 1/2" x 10"	5 1/2" x 10"	5 1/2" x 10"	5 1/2" x 10"	5 1/2" x 10"	34
35 Wt. of Engine Empty, lbs.,	171500	172900	168200	171100	175400	175400	185800	35
36 Wt. on Truck in Working Order, lbs.,	34000	34000	34500	35500	35500	35500	39300	36
37 Wt. on 1st Pair of Drivers, lbs.,	61300	62500	57700	56700	62700	62700	61500	37
38 Wt. on 2d Pair of Drivers, lbs.,	62600	63300	57000	61700	64500	64500	67400	38
39 Wt. on 3d Pair of Drivers, lbs.,								39
40 Wt. on 4th Pair of Drivers, lbs.,								40
41 Wt. on Trailing Wheels, lbs.,	32600	33400	33700	36700	33900	33900	40500	41
42 Wt. of Engine in Work'g Order, lbs.,	190500	193200	183500	190600	196600	196600	208700	42
43 Total Wt. on Drivers, lbs.,	123900	125800	115300	118400	127200	127200	128900	43
44 Wt. of Tender Loaded, lbs.,	134000	134000	134000	134000	134000	134000	159000	44
45 Ratio of Heat'g Surf. to Grate Surface,	47.52	50.51	47.52	47.52	50.51	50.51	50.51	45
46 Ratio of Ext'l Flue Heating Surface to Fire Box Heating Surface,	14.90	15.90	14.90	14.90	15.90	15.90	15.90	46
47 Heat. Surf. + Wt. one Cyl'd Steam,	1095.62	1159.2	951.31 1002.35	951.31 1002.35		1011.10 1065.35	1159.2	47
48 Grate Area + Wt. one Cyl'd Steam,	23.05	22.95	20.02 21.09	20.02 21.09		20.02 21.09	22.95	48
49 Tractive Power per lb. of M. E. Press.,	136.58	136.58	157.30	157.30	157.30	157.30	157.30	49
50 Tractive Power with M. E. Pressure equal to 85% of Boiler Pressure,	23799	23799	27409 26072	27409 26072	27409 26072	27409 26072	27409	50
51 Ratio Wt. on Drivers to Tract. Pow.,	5.20	5.29	4.20 4.42	4.31 4.54	4.64 4.87	4.64 4.87	4.70	51
52 Height of Deck Plate,	58 1/2"	58 1/2"	58 1/2"	58 1/2"	58 1/2"	58 1/2"	58 1/2"	52

STEAM LOCOMOTIVES

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	CLASSIFICATION.	L. W. E 5 s	E 6 s	L. W. E 7 s	L. W. E 7 s a	L. W. E 21	L. W. E 22	L. W. E 23 s 1910	
1	No. of Pairs of Driving Wheels,	2	2	2	2	2	2	2	1
2	Diam. of Driving Wheels,	80"	80"	80"	80"	79"	79"	79"	2
3	Size of Driving Axle Journals,	9 1/4" D x 13" L	9 1/4" D x 13" L	9 1/4" D x 13" L	9 1/4" D x 13" L	9 1/4" D x 12" L	9 1/4" D x 13" L	9 1/4" D x 13" L	3
4	Length of Driving Wheel Base,	7' 5"	7' 5"	7' 5"	7' 5"	7' 0"	7' 0"	7' 0"	4
5	Total Wheel Base of Engine,	29' 7 1/4"	29' 7 1/4"	30' 9 1/4"	30' 9 1/4"	28' 9"	27' 3"	27' 3"	5
6	Total Wheel Base of Eng. & Tender,	63' 3 1/4"	63' 10 1/4"	60' 1 1/4"	60' 1 1/4"	58' 5 1/4"	57' 10 1/4"	57' 10 1/4"	6
7	No. of Wheels in Engine Truck,	4	4	4	4	4	4	4	7
8	Diam. of Wheels in Engine Truck,	36"	36"	36"	36"	36"	36"	36"	8
9	Size of Engine Truck Axle Journals,	5 1/2" x 10"	6 1/2" x 12"	5 1/2" x 10"	5 1/2" x 10"	6" x 10"	6" x 10"	6" x 10"	9
10	Diameter of Trailing Wheels,	50"	50"	50"	50"	49"	49"	49"	10
11	Size of Trailing Axle Journals,	6 1/2" x 12"	6 1/2" x 12"	7" x 11 1/2"	7" x 11 1/2"	7 1/2" x 12"	7 1/2" x 12"	7 1/2" x 12"	11
12	Spread of Cylinders,	85 1/2"	85 1/2"	85 1/2"	85 1/2"	86"	86"	86"	12
13	Size of Cylinders,	22" x 26"	23 1/2" x 26"	22 1/2" x 28"	22 1/2" x 28"	20 1/2" x 26"	21" x 26"	21 1/2" x 26"	13
14	Steam Ports,	2" & 1 1/2"	2" & 2 1/4"	2" Wide	2" Wide	1 1/2" x 18"	1 1/2" x 18"	1 1/2" Wide	14
15	Exhaust Ports,					3" x 18"	3" x 18"		15
16	Travel of Valve,	7"	7"	7"	7"	6"	6"	6"	16
17	Lap of Valve,	1 1/2"	1 1/2"	1 1/2"	1 1/2"	1 1/2"	1 1/2"	1 1/2"	17
18	Type of Valve,	12" Piston.	12" Piston	12" Piston	12" Piston	D	D	12" Piston	18
19	Type of Valve Gear,	Wals'h't	Wals'h't	St-ph'n	Steph'n	Steph'n	Steph'n	Steph'n	19
20	Type of Boiler,	Belpaire Wide Fire Box.	Belpaire Wide Fire Box.	Belpaire Wide Fire Box.	Radial Bay Wide Fire Box.	Straight Top Wide Fire Box.	Straight Top Wide Fire Box.	Straight Top Wide Fire Box.	20
21	Min. Internal Diam. Boiler,	65 1/2"	76 1/2"	65 1/2"	65 1/2"	67"	70 1/2"	70 1/2"	21
22	Number of Tubes,	170, 24, 96	242, 36, 144	170, 24, 96	170, 24, 96	338	351	199, 28, 112	22
23	Outside Diam. of Tubes,	2", 5 1/2", 1 1/2"	2", 5 1/2", 1 1/2"	2", 5 1/2", 1 1/2"	2", 5 1/2", 1 1/2"	2"	2"	2", 5 1/2", 1 1/2"	23
24	Length of Tubes bet. Tube Sheets,	180"	180"	180"	180"	191"	190 1/2"	190 1/2"	24
25	Fire Area through Tubes, sq. ft.,	4.76	6.92	4.68	4.68	5.64	5.86	5.4	25
26	Size of Fire Box, inside,	72" x 111"	72" x 110 1/2"	72" x 111"	72" x 111"	65 1/2" x 102 1/2"	75 1/2" x 96 1/2"	75 1/2" x 96 1/2"	26
27	Fire Grate Area, sq. ft.,	55.55	55.13	55.55	55.55	46.36	50.23	50.23	27
28	Ext. Heating Surface of Tubes, sq. ft.,	1114	1177 1/2	1142	1142	2817	2923	1284	28
29	Heating Surface of Fire Box, sq. ft.,	187	218	187	166	196	203	196	29
30	Total Heating Surface of Boiler, sq. ft.,	2827	4091 1/2	2815	2794	3013	3126	3445	30
31	Steam Pressure, per square inch, lbs.,	205	205	205	205	200	200	200	31
32	No. of Wheels under Tender,	8	8	8	8	8	8	8	32
33	Diam. of Wheels under Tender,	36"	36"	36"	36"	36"	36"	36"	33
34	Size of Tender Truck Axle Journals,	5 1/2" x 10"	5 1/2" x 10"	5 1/2" x 10"	5 1/2" x 10"	5 1/2" x 10"	5 1/2" x 10"	5 1/2" x 10"	34
35	Wt. of Engine Empty, lbs.,	188800	215000	183000	177000	145500	162400	167100	35
36	Wt. on Truck in Working Order, lbs.,	39300	55200	35000	35000	35000	40000	43575	36
37	Wt. on 1st Pair of Drivers, lbs.,	61500	68000	57000	57000	47750	52500	51625	37
38	Wt. on 2d Pair of Drivers, lbs.,	67400	68000	64000	68000	45750	55500	54975	38
39	Wt. on 3d Pair of Drivers, lbs.,								39
40	Wt. on 4th Pair of Drivers, lbs.,								40
41	Wt. on Trailing Wheels, lbs.,	40500	52400	35000	34500	38000	86000	37525	41
42	Wt. of Engine in Work'g Order, lbs.,	208700	243600	191000	189500	164500	184000	187700	42
43	Total Wt. on Drivers, lbs.,	126900	136000	121000	120000	91500	108000	106600	43
44	Wt. of Tender Loaded, lbs.,	159000	159000	154050	145150	137200	142820	143000	44
45	Ratio of Heat'g Surf. to Grate Surface,	50.89	74.20	50.67	50.29	64.99	62.23	68.58	45
46	Ratio of Ext'l Flue Heating Surface to Fire Box Heating Surface,	14.11	17.77	14.05	11.09	14.37	14.40	16.57	46
47	Heat. Surf. + Wt. one Cyl'd Steam,		1292.0	962.54	962.54				47
48	Grate Area + Wt. one Cyl'd Steam,		17.41	19.13	19.13				48
49	Tractive Power per lb. of M.E. Press.,	157.30	179.48	164.53	164.53	138.31	145.14	152.0	49
50	Tractive Power with M. E. Pressure equal to 85% of Boiler Pressure,	27409	31275	28670	28670	23513	24674	25862	50
51	Ratio Wt. on Drivers to Tract. Pow.,	4.70	4.34	4.22	4.19	3.89	4.38	4.12	51
52	Height of Deck Plate,		66 1/2"						52

†For E6s locomotives Nos. 89, 1067, 1092 substitute in line 24, 164 1/2", line 25, 114 1/2" and line 30, 3647.

STEAM LOCOMOTIVES

CLASSIFICATION	L. W. E 23-s 1906-1907	E 28	E 29						
1 No. of Pairs of Driving Wheels,	2	2	2						1
2 Diam. of Driving Wheels,	79"	80"	80"						2
3 Size of Driving Axle Journals,	9 1/4" x 13 1/2"	11 1/4" x 13 1/2"	10 1/2" x 12 1/2"						3
4 Length of Driving Wheel Base,	7' 0"	7' 5"	7' 5"						4
5 Total Wheel Base of Engine,	27' 3"	33' 8"	31' 11"						5
6 Total Wheel Base of Eng. & Tender,	57' 10 1/2"	63' 1 1/2"	61' 4 1/2"						6
7 No. of Wheels in Engine Truck,	4	4	4						7
8 Diam. of Wheels in Engine Truck,	38"	36"	36"						8
9 Size of Engine Truck Axle Journals,	6" x 10"		6 1/2" x 12"						9
10 Diameter of Trailing Wheels,	49"	50"	50"						10
11 Size of Trailing Axle Journals,	7 1/4" x 12"	7" x 11 1/2"	7" x 11 1/2"						11
12 Spread of Cylinders,	88"	85 1/2"	85 1/2"						12
13 Size of Cylinders,	21 1/2" x 26"	1 5/8" x 20"	1 5/8" x 20"						13
14 Steam Ports,	1 1/2" Wide	1 1/2" wide							14
15 Exhaust Ports,									15
16 Travel of Valve,	6"		6"						16
17 Lap of Valve,	1 1/2"		1"						17
18 Type of Valve,	12" Piston	15" Piston	14" Piston						18
19 Type of Valve Gear,	Steph'n	Steph'n	Steph'n						19
20 Type of Boiler,	Straight Top Wide Fire Box	Belpaire Wide Fire Box	Belpaire Wide Fire Box						20
21 Min. Internal Diam. Boiler,	70 1/2"	65 1/2"	65 1/2"						21
22 Number of Tubes,	216, 28, 112	201	315						22
23 Outside Diam. of Tubes,	2", 5 1/2", 1 1/2"	2 1/2"	2"						23
24 Length of Tubes bet. Tube Sheets,	190 1/2"	211"	195"						24
25 Fire Area through Tubes, sq. ft.,	5.7	5.69	5.26						25
26 Size of Fire Box, inside,	75 1/2" x 96 1/2"	72" x 111"	72" x 111"						26
27 Fire Grate Area, sq. ft.,	50.23	55.55	55.55						27
28 Ext. Heating Surface of Tubes, sq. ft.,	2428	2703	2680						28
29 Heating Surface of Fire Box, sq. ft.,	203	166.0	166.0						29
30 Total Heating Surface of Boiler, sq. ft.,	3594	2869	2846						30
31 Steam Pressure per square inch, lbs.,	200	205	205						31
32 No. of Wheels under Tender,	8	8	8						32
33 Diam. of Wheels under Tender,	38"	36"	36"						33
34 Size of Tender Truck Axle Journals,	5 1/2" x 10"	5 1/2" x 10"	5 1/2" x 10"						34
35 Wt. of Engine Empty, lbs.,	187100	182575	177600						35
36 Wt. on Truck in Working Order, lbs.,	43575	38500	38000						36
37 Wt. on 1st Pair of Drivers, lbs.,	51625	62000	60000						37
38 Wt. on 2d Pair of Drivers, lbs.,	54975	65000	63000						38
39 Wt. on 3d Pair of Drivers, lbs.,									39
40 Wt. on 4th Pair of Drivers, lbs.,									40
41 Wt. on Trailing Wheels, lbs.,	37525	38500	38000						41
42 Wt. of Engine in Work'g Order, lbs.,	187700	204000	199000						42
43 Total Wt. on Drivers, lbs.,	106600	127000	123000						43
44 Wt. of Tender Loaded, lbs.,	143000	154050	154050						44
45 Ratio of Heat'g Surf. to Grate Surface,	71.55	51.65	51.23						45
46 Ratio of Ext'l Flue Heating Surface } to Fire Box Heating Surface,	16.70	16.28	16.14						46
47 Heat. Surf. + Wt. one Cyl'd Steam,									47
48 Grate Area + Wt. one Cyl'd Steam,									48
49 Tractive Power per lb. of M.E. Press.,	152.0								49
50 Tractive Power with M. E. Pressure } equal to 85% of Boiler Pressure,	25862	23500	23500						50
51 Ratio Wt. on Drivers to Tract. Pow.,	4.12	5.40	5.23						51
52 Height of Deck Plate,		58 1/2"	58 1/2"						52

STEAM LOCOMOTIVES

17

	CLASSIFICATION.	F 1 a	L. W. F 1 a	F 3	F 3 b	F 3 c	L. W. F 24	L. W. F 24 a	
1	No. of Pairs of Driving Wheels,	3	3	3	3	3	3	3	1
2	Diam. of Driving Wheels,	62"	62"	62"	62"	62"	63"	63"	2
3	Size of Driving Axle Journals,	$\frac{5}{8}$ " D x 12" L	$\frac{5}{8}$ " D x 12" L	$\frac{5}{8}$ " D x 12" L	$\frac{5}{8}$ " D x 12" L	$\frac{5}{8}$ " D x 12" L	$\frac{5}{8}$ " D x 11" L	$\frac{5}{8}$ " D x 11" L	3
4	Length of Driving Wheel Base,	14' 6"	14' 6"	14' 9"	14' 9"	14' 9"	14' 2"	14' 2"	4
5	Total Wheel Base of Engine,	23' 4"	23' 4"	23' 10"	23' 10"	23' 10"	22' 5"	22' 5"	5
6	Total Wheel Base of Eng. & Tender,	51' 11"	52' 7"	54' 5"	54' 5"	55' 10"	51' 11"	53' 11"	6
7	No. of Wheels in Engine Truck,	2	2	2	2	2	2	2	7
8	Diam. of Wheels in Engine Truck,	33"	33"	33"	33"	33"	33"	33"	8
9	Size of Engine Truck Axle Journals,	$\frac{5}{8}$ " x 10"	$\frac{5}{8}$ " x 10"	$\frac{5}{8}$ " x 10"	$\frac{5}{8}$ " x 10"	$\frac{5}{8}$ " x 10"	6" x 10"	6" x 10"	9
10	Diameter of Trailing Wheels,								10
11	Size of Trailing Axle Journal,								11
12	Spread of Cylinders,	86"	86"	86"	86"	86"	87"	87"	12
13	Size of Cylinders,	20" x 28"	20" x 28"	20" x 28"	20" x 28"	20" x 28"	20" x 26"	20" x 26"	13
14	Steam Ports,	$1\frac{1}{2}$ " x 18"	$1\frac{1}{2}$ " x 18"	$1\frac{1}{2}$ " x 18"	$1\frac{1}{2}$ " x 18"	$1\frac{1}{2}$ " x 18"	$1\frac{1}{2}$ " x 18"	$1\frac{1}{2}$ " x 18"	14
15	Exhaust Ports,	3" x 18"	3" x 18"	3" x 18"	3" x 18"	3" x 18"	3" x 18"	3" x 18"	15
16	Travel of Valve,	6"	6"	6"	6"	6"	5"	5"	16
17	Lap of Valve,	1"	1"	1"	1"	1"	$1\frac{1}{2}$ "	$1\frac{1}{2}$ "	17
18	Type of Valve,	D	D	D	D	D	D	D	18
19	Type of Valve Gear,	Steph'n	Steph'n	Steph'n	Steph'n	Steph'n	Steph'n	Steph'n	19
20	Type of Boiler,	Belpaire Sloping Top	Belpaire Sloping Top	Radial Stay Sloping Top	Radial Stay Wide Fire Box	Belpaire Wide Fire Box	Ext. Wagon Top Narrow Fire Box	Ext. Wagon Top Narrow Fire Box	20
21	Min. Internal Diam. Boiler,	60 $\frac{1}{2}$ "	60 $\frac{1}{2}$ "	67 $\frac{1}{2}$ "	67 $\frac{1}{2}$ "	67 $\frac{1}{2}$ "	61"	61"	21
22	Number of Tubes,	283	283	356	364	364	310	305	22
23	Outside Diam. of Tubes,	2"	2"	2"	2"	2"	2"	2"	23
24	Length of Tubes, bet. Tube Sheets,	140 $\frac{1}{2}$ "	140 $\frac{1}{2}$ "	145 $\frac{1}{2}$ "	145 $\frac{1}{2}$ "	145 $\frac{1}{2}$ "	143"	143"	24
25	Fire Area through Tubes, sq. ft.,	4.73	4.73	5.95	6.08	6.08	5.17	50.9	25
26	Size of Fire Box, inside,	40" x 108 $\frac{1}{2}$ "	40" x 108 $\frac{1}{2}$ "	39 $\frac{1}{2}$ " x 111 $\frac{1}{2}$ "	66" x 102.7"	66" x 102.7"	41" x 108 $\frac{1}{2}$ "	65 $\frac{1}{2}$ " x 102 $\frac{1}{2}$ "	26
27	Fire Grate Area, sq. ft.,	30.13	30.13	30.79	47.07	47.07	30.8	46.36	27
28	Ext. Heating Surface of Tubes, sq. ft.,	1737	1737	2284	2315	2315	1934	1903	28
29	Heating Surface of Fire Box, sq. ft.,	147	147	167	154	154	179	170	29
30	Total Heating Surface of Boiler, sq. ft.,	1884	1884	2451	2469	2469	2113	2073	30
31	Steam Pressure per square inch, lbs.,	$1\frac{1}{2}$	185	205	205	205	180	185	31
32	No. of Wheels under Tender,	8	8	8	8	8	8	8	32
33	Diam. of Wheels under Tender,	33"	33"	33"	33"	33"	33"	33"	33
34	Size of Tender Truck Axle Journals,	$4\frac{1}{2}$ " x 8"	5" x 9"	5" x 9"	5" x 9"	5 $\frac{1}{2}$ " x 10"	$4\frac{1}{2}$ " x 8"	5 $\frac{1}{2}$ " x 10"	34
35	Wt. of Engine Empty, lbs.,	131900	131800	145250	146300	147000	129500	128200	35
36	Wt. on Truck in Working Order, lbs.,	18000	18000	20050	22200	23000	18300	18600	36
37	Wt. on 1st Pair of Drivers, lbs.,	40500	40500	48700	49050	49000	40000	34900	37
38	Wt. on 2d Pair of Drivers, lbs.,	45000	45000	48350	47450	48200	44000	45100	38
39	Wt. on 3d Pair of Drivers, lbs.,	41500	41500	45000	43800	45700	44100	42950	39
40	Wt. on 4th Pair of Drivers, lbs.,								40
41	Wt. on Trailing Wheels, lbs.,								41
42	Wt. of Engine in Work'g Order, lbs.,	145000	145000	163000	162500	165900	146400	141550	42
43	Total Wt. on Drivers, lbs.,	127000	127000	142050	140300	142900	128100	122950	43
44	Wt. of Tender Loaded, lbs.,	96000	112000	113000	113000	147000	100500	137200	44
45	Ratio of Heat'g Surf. to Grate Surface,	62.52	62.52	78.95	52.45	52.45	68.6	44.8	45
46	Ratio of Ext'l Flue Heating Surface to Fire Box Heating Surface,	11.81	11.81	13.55	15.03	15.03	10.80	11.20	46
47	Heat. Surf. + Wt. one Cyl'd Steam,	$\frac{841.22}{861.50}$	841.13	984.24	999.62	999.62			47
48	Grate Area + Wt. one Cyl'd Steam,	$\frac{13.45}{13.76}$	13.45	12.47	19.06	19.06			48
49	Tractive Power per lb. of M.E. Press.,	180.65	180.65	180.65	180.65	180.65	165.08	165.08	49
50	Tractive Power with M. E. Pressure equal to 85% of Boiler Pressure,	$\frac{28406}{27639}$	28406	31477	31477	31477	25257	25959	50
51	Ratio Wt. on Drivers to Tract. Pow.,	$\frac{4.46}{4.59}$	4.46	4.51	4.45	4.54	5.07	4.74	51
52	Height of Deck Plate,	55 $\frac{1}{2}$ "		58 $\frac{1}{2}$ "	66 $\frac{1}{2}$ "	66 $\frac{1}{2}$ "			52

STEAM LOCOMOTIVES

CLASSIFICATION.		L. W. F 25	L. W. F 26	L. W. F 27			
1	No. of Pairs of Driving Wheels,	3	3	3			1
2	Diam. of Driving Wheels,	63"	51"	63"			2
3	Size of Driving Axle Journals,	9 1/2" D x 12" L	9" D x 12" L	9 1/2" D x 12" L			3
4	Length of Driving Wheel Base,	14' 9"	11' 6"	14' 9"			4
5	Total Wheel Base of Engine,	23' 10"	19' 3 1/2"	23' 10"			5
6	Total Wheel Base of Eng. & Tender,	56' 10"	48' 10 1/2"	56' 10"			6
7	No. of Wheels in Engine Truck,	2	2	2			7
8	Diam. of Wheels in Engine Truck,	33"	30"	33"			8
9	Size of Engine Truck Axle Journals,	6 1/2" x 12"	6 1/2" x 12"	6 1/2" x 12"			9
10	Diameter of Trailing Wheels,						10
11	Size of Trailing Axle Journals,						11
12	Spread of Cylinders,	86"	86"	86"			12
13	Size of Cylinders,	21" x 28"	20" x 26"	21 1/2" x 28"			13
14	Steam Ports,	1 1/2" x 18"	1 1/2" x 18"	1 1/2" wide			14
15	Exhaust Ports,	3" x 18"	2 1/2" x 18"				15
16	Travel of Valve,	6"	5 1/2"	6"			16
17	Lap of Valve,	1"	1"	1 1/2"			17
18	Type of Valve,	D	D	12" Piston			18
19	Type of Valve Gear,	Steph'n	Steph'n	Wals'h't			19
20	Type of Boiler,	Straight Top Wide Fire Box	Straight Top Narrow Fire Box	Straight Top Wide Fire Box			20
21	Min. Internal Diam. Boiler,	75"	70 1/2"	75"			21
22	Number of Tubes,	390	311	230, 32, 128			22
23	Outside Diam. of Tubes,	2"	2"	2", 5 1/2", 1 1/2"			23
24	Length of Tubes bet. Tube Sheets,	161 1/2"	181"	161 1/2"			24
25	Fire Area through Tubes, sq. ft.,	6.51	5.19	6.27			25
26	Size of Fire Box, inside,	69 1/2" x 108 1/2"	41 1/2" x 108 1/2"	69 1/2" x 108 1/2"			26
27	Fire Grate Area, sq. ft.,	52.0	31.37	52.0			27
28	Ext. Heating Surface of Tubes, sq. ft.,	2755	1778	2111			28
29	Heating Surface of Fire Box, sq. ft.,	180	177	208			29
30	Total Heating Surface of Boiler, sq. ft.,	2935	1955	3352			30
31	Steam Pressure per square inch, lbs.,	200	180	200			31
32	No. of Wheels under Tender,	8	8	8			32
33	Diam. of Wheels under Tender,	33"	33"	33"			33
34	Size of Tender Truck Axle Journals,	5 1/2" x 10"	5" x 9"	5 1/2" x 10"			34
35	Wt. of Engine Empty, lbs.,	161700	134400	170000			35
36	Wt. on Truck in Working Order, lbs.,	26000	16000	28400			36
37	Wt. on 1st Pair of Drivers, lbs.,	52000	44000	54950			37
38	Wt. on 2d Pair of Drivers, lbs.,	54500	47600	56025			38
39	Wt. on 3d Pair of Drivers, lbs.,	50000	44000	52275			39
40	Wt. on 4th Pair of Drivers, lbs.,						40
41	Wt. on Trailing Wheels, lbs.,						41
42	Wt. of Engine in Work'g Order, lbs.,	182500	151500	191650			42
43	Total Wt. on Drivers, lbs.,	156500	135500	163250			43
44	Wt. of Tender Loaded, lbs.,	147800	99600	147400			44
45	Ratio of Heat'g Surf. to Grate Surface,	56.4	62.4	64.46			45
46	Ratio of Ext'l Flue Heating Surface to Fire Box Heating Surface,	15.3	10.0	15.11			46
47	Heat. Surf. + Wt. one Cyl'd Steam						47
48	Grate Area + Wt. one Cyl'd Steam,						48
49	Tractive Power per lb. of M. E. Press.,	196.0	203.92				49
50	Tractive Power with M. E. Pressure equal to 85% of Boiler Pressure,	33320	31200	34925			50
	Ratio Wt. on Drivers to Tract. Pow.,	4.70	4.34	46.7			51
52	Height of Deck Plate,						52

STEAM LOCOMOTIVES

19

	CLASSIFICATION.	L. W. G 3	L. W. G 4	G 4 a	L. W. G 4 a	L. W. G 4 b	L. W. G 24	
1	No. of Pairs of Driving Wheels,	3	3	3	3	3	3	1
2	Diam. of Driving Wheels,	68"	72"	72"	62"	62"	51"	2
3	Size of Driving Axle Journals,	8"D x 9"L	8"D x 13"L	8"D x 13"L	8"D x 13"L	8"D x 13"L	8"D x 9"L	3
4	Length of Driving Wheel Base,	11' 10"	13' 10"	13' 10"	13' 10"	13' 10"	10' 6"	4
5	Total Wheel Base of Engine,	23' 0 1/2"	25' 5"	25' 5"	25' 5"	25' 5"	20' 9"	5
6	Total Wheel Base of Eng. & Tender,	51' 1 1/4"	58' 2 1/2"	57' 10"	58' 2 1/2"	58' 2 1/2"	47' 8 1/2"	6
7	No. of Wheels in Engine Truck,	4	4	4	4	4	4	7
8	Diam. of Wheels in Engine Truck,	33"	36"	36"	30"	30"	28"	8
9	Size of Engine Truck Axle Journals,	5 1/2" x 10"	5 1/2" x 10"	5 1/2" x 10"	5 1/2" x 10"	5 1/2" x 10"	5" x 9"	9
10	Diameter of Trailing Wheels,							10
11	Size of Trailing Axle Journal,							11
12	Spread of Cylinders,	88"	90"	90"	90"	90"	86"	12
13	Size of Cylinders,	19" x 24"	20" x 28"	23" x 28"	20" x 28"	20" x 28"	19" x 24"	13
14	Steam Ports,	1 1/2" x 23"	1 1/2" x 20"	2 1/2" & 2 1/8"	1 1/2" x 20"	1 1/2" x 20"	1 1/2" x 16"	14
15	Exhaust Ports,	2 1/2" x 23"	3" x 20"		3" x 20"	3" x 20"	2 1/2" x 16"	15
16	Travel of Valve,	5 1/2"	6"	7"	6"	6"	5 1/2"	16
17	Lap of Valve,	1 1/2"	1"	1 1/8"	1"	1"	1"	17
18	Type of Valve,	D	D	12" Piston	D	D	D	18
19	Type of Valve Gear,	Allan	Steph'n	Wals'h't	Steph'n	Steph'n	Steph'n	19
20	Type of Boiler,	Belpaire.	Radial Stay.	Radial Stay	Radial Stay.	Radial Stay. Wide Fire Box.	Radial Stay. Narrow Fire Box	20
21	Min. Internal Diam. Boiler,	59 1/2"	67"	67"	67"	67"	58 1/2"	21
22	Number of Tubes,	241	356	193, 20, 104	356	356	220	22
23	Outside Diam. of Tubes,	2"	2"	2", 5 1/2", 1 1/2"	2"	2"	2"	23
24	Length of Tubes, bet. Tube Sheets,	167"	170 1/2"	170 1/2"	170 1/2"	170 1/2"	142 1/2"	24
25	Fire Area through Tubes, sq. ft.,	4.03	5.95	5.30	5.95	5.95	3.67"	25
26	Size of Fire Box, inside,	41 1/2" x 107 1/2"	39 1/2" x 111 1/2"	39 1/2" x 111 1/2"	39 1/2" x 111 1/2"	66" x 100"	82 1/2" x 108"	26
27	Fire Grate Area, sq. ft.	31.35	30.78	30.78	30.78	45.83	24.28	27
28	Ext. Heating Surface of Tubes, sq. ft.,	1755	2654	1812	2654	2653	1838	28
29	Heating Surface of Fire Box, sq. ft.,	146	162	175	162	137	122	29
30	Total Heating Surface of Boiler, sq. ft.,	1901	2816	2959	2816	2790	1490	30
31	Steam Pressure per square inch, lbs.,	180	225	205	225	225	160	31
32	No. of Wheels under Tender,	8	8	8	8	8	8	32
33	Diam. of Wheels under Tender,	33"	36"	36"	33"	30"	33"	33
34	Size of Tender Truck Axle Journals,	5 1/2" x 10"	5 1/2" x 10"	5 1/2" x 10"	5 1/2" x 10"	5 1/2" x 10"	4 1/2" x 8"	34
35	Wt. of Engine Empty, lbs.,	127150	166400	177500	163000	170370	99300	35
36	Wt. on Truck in Working Order, lbs.,	30500	43600	47200	41000	42700	20200	36
37	Wt. on 1st Pair of Drivers, lbs.,	37000	46500	55900	48000	47450	31600	37
38	Wt. on 2d Pair of Drivers, lbs.,	41000	48500	50300	49000	51000	30500	38
39	Wt. on 3d Pair of Drivers, lbs.,	38000	45500	43400	45000	41550	29300	39
40	Wt. on 4th Pair of Drivers, lbs.,							40
41	Wt. on Trailing Wheels, lbs.,							41
42	Wt. of Engine in Work'g Order, lbs.,	146500	184300	197100	183000	182700	112200	42
43	Total Wt. on Drivers, lbs.,	116000	140500	149200	142000	140000	92000	43
44	Wt. of Tender Loaded, lbs.,	122000	122000	147000	122000	122000	89800	44
45	Ratio of Heat'g Surf. to Grate Surface,	60.63	91.48	96.13	91.48	60.90	61.4	45
46	Ratio of Ext'l Flue Heating Surface to Fire Box Heating Surface,	12.02	16.38	15.91	16.38	19.35	11.2	46
47	Heat. Surf. + Wt. one Cyl'd Steam,			1048.7				47
48	Grate Area + Wt. one Cyl'd Steam,			10.91				48
49	Tractive Power per lb. of M. E. Press.,	127.41	155.56	205.72	180.65	180.65	169.88	49
50	Tractive Power with M. E. Pressure equal to 85% of Boiler Pressure,	19494	29750	35847	34548	34548	23104	50
51	Ratio Wt. on Drivers to Tract. Pow.,	5.95	4.72	4.16	4.11	4.05	3.99	51
52	Height of Deck Plate,			56 1/2"				52

CLASSIFICATION.	H 3	H 3 a	H 3 b	H 3 c	H 3 e	L. W. H 4	H 5	
1 No. of Pairs of Driving Wheels,	4	4	4	4	4	4	4	1
2 Diam. of Driving Wheels,	50"	50"	50"	50"	50"	56"	56"	2
3 Size of Driving Axle Journals,	8"D x 8 1/2"L	8"D x 8 1/2"L	8"D x 8 1/2"L	8 1/4"D x 10 1/2"L	8"D x 8 1/2"L	8 1/4"D x 10 1/2"L	8 1/4"D x 13 1/2"L	3
4 Length of Driving Wheel Base,	13' 10"	13' 10"	13' 10"	13' 10"	13' 10"	18' 11"	17' 6"	4
5 Total Wheel Base of Engine,	21' 9"	21' 9"	21' 9"	21' 9"	21' 9"	25' 5"	25' 11 1/2"	5
6 Total Wheel Base of Eng. & Tender,	49' 9"	49' 9"	49' 9"	49' 9"	49' 9"	56' 2 1/2"	57' 3"	6
7 No. of Wheels in Engine Truck,	2	2	2	2	2	2	2	7
8 Diam. of Wheels in Engine Truck,	28"	28"	28"	28"	28"	30"	30"	8
9 Size of Engine Truck Axle Journals,	5 1/2" x 8 1/2"	5 1/2" x 8 1/2"	5 1/2" x 8 1/2"	5 1/2" x 8 1/2"	5 1/2" x 8 1/2"	5 1/2" x 10"	5 1/2" x 10"	9
10 Diameter of Trailing Wheels,								10
11 Size of Trailing Axle Journals,								11
12 Spread of Cylinders,	59"	86"	86"	88"	88"	88"	90"	12
13 Size of Cylinders,	20" x 24"	23" x 24"	20" x 24"	20" x 23"	20" x 24"	22" x 28"	23 1/2" x 28"	13
14 Steam Ports,	1 1/2" x 17 1/2"	1 1/2" x 17 1/2"	1 1/2" x 17 1/2"	1 1/2" x 21"	1 1/2" x 17 1/2"	1 1/2" x 21"	1 1/2" x 21"	14
15 Exhaust Ports,	2 1/2" x 17 1/2"	2 1/2" x 17 1/2"	2 1/2" x 17 1/2"	3" x 21"	2 1/2" x 17 1/2"	3" x 21"	3" x 21"	15
16 Travel of Valve,	5"	5"	5"	5"	5"	6"	6"	16
17 Lap of Valve,	1"	1"	1"	1"	1"	1"	1"	17
18 Type of Valve,	D	D	D	D	D	D	D	18
19 Type of Valve Gear,	Steph'n	Steph'n	Steph'n	Steph'n	Steph'n	Steph'n	Steph'n	19
20 Type of Boiler,	Belpaire.	Belpaire.	Belpaire.	Belpaire.	Altoona.	Belpaire.	Belpaire. Sloping Top.	20
21 Min. Internal Diam. Boiler,	59"	60"	60"	60"	59"	68"	69 1/2"	21
22 Number of Tubes,	183	174	174	174	183	216	206	22
23 Outside Diam. of Tubes,	2 1/2"	2 1/2"	2 1/2"	2 1/2"	2 1/2"	3"	3"	23
24 Length of Tubes bet. Tube Sheets,	156 1/2"	159"	159"	159"	156 1/2"	168"	168"	24
25 Fire Area through Tubes, sq. ft.,	5.05	8.83	8.83	8.83	5.05	5.78	6.16	25
26 Size of Fire Box, inside,	42" x 107"	42" x 108"	42" x 108"	42" x 108"	42" x 107"	40" x 106"	40" x 120"	26
27 Fire Grate Area, sq. ft.,	31.20	31.50	31.50	31.50	31.20	29.45	33.33	27
28 Ext. Heating Surface of Tubes, sq. ft.,	1565	1358	1358	1358	1565	2118	2105	28
29 Heating Surface of Fire Box, sq. ft.,	167	140	140	140	149	154	197	29
30 Total Heating Surface of Boiler, sq. ft.,	1732	1498	1498	1498	1714	2272	2302	30
31 Steam Pressure per square inch, lbs.,	140	140	140	140	140	205	185	31
32 No. of Wheels under Tender,	8	8	8	8	8	8	8	32
33 Diam. of Wheels under Tender,	33"	33"	33"	33"	33"	33"	33"	33
34 Size of Tender Truck Axle Journals,	4 1/2" x 8"	4 1/2" x 8"	4 1/2" x 8"	4 1/2" x 8"	4 1/2" x 8"	5" x 9"	5" x 9"	34
35 Wt. of Engine Empty, lbs.,	102000	116000	116100	116000		154950	173100	35
36 Wt. on Truck in Working Order, lbs.,	14030	15000	12000	13500		16000	20800	36
37 Wt. on 1st Pair of Drivers, lbs.,	24220	21500	20000	23000		36000	41600	37
38 Wt. on 2d Pair of Drivers, lbs.,	23370	29000	33000	31000		42000	43000	38
39 Wt. on 3d Pair of Drivers, lbs.,	26750	32000	37000	34000		45000	45600	39
40 Wt. on 4th Pair of Drivers, lbs.,	25750	29000	25000	30000		38000	45500	40
41 Wt. on Trailing Wheels, lbs.,								41
42 Wt. of Engine in Work'g Order, lbs.,	114620	126500	127000	131500		179000	196500	42
43 Total Wt. on Drivers, lbs.,	100590	111500	115000	118000		161000	175700	43
44 Wt. of Tender Loaded, lbs.,	75000	102200	102200	102200	80000	122000	113000	44
45 Ratio of Heat'g Surf. to Grate Surface,	55.49	47.56	47.56	47.56	54.94	15.04	13.73	45
46 Ratio of Ext'l Flue Heating Surface to Fire Box Heating Surface,	9.37	9.70	9.70	9.70	10.50	14.08	12.81	46
47 Heat. Surf. + Wt. one Cyl'd Steam	1148.34	991.89	991.41	849.76	1184.83	776.9	888.48	47
48 Grate Area + Wt. one Cyl'd Steam,	20.65	19.66	19.66	17.88	20.65		10.77	48
49 Tractive Power per lb. of M.E. Press.,	192.00	192.00	192.00	224.00	192.00	242.00	276.13	49
50 Tractive Power with M. E. Pressure equal to 85% of Boiler Pressure,	22348	22348	24480	26056	22848	42168	43421	50
51 Ratio Wt. on Drivers to Tract. Pow.,	4.48	4.88	4.88	4.18		3.82	4.04	51
52 Height of Deck Plate,	51"	51"	51"	51"	51"		51"	52

STEAM LOCOMOTIVES

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CLASSIFICATION.		H 5 a	H 6	H 6 s	H 6 n	L. W. H 6 a. Stoker	H 6 s a	H 6 b	
1	No. of Pairs of Driving Wheels,	4	4	4	4	4	4	4	1
2	Diam. of Driving Wheels,	56"	56"	56"	56"	56"	56"	56"	2
3	Size of Driving Axle Journals	9" D x 13" L	9" D x 13" L	9" D x 13" L	9" D x 13" L	9" D x 13" L	9" D x 13" L	9" D x 13" L	3
4	Length of Driving Wheel Base,	17' 6"	16' 6 1/2"	16' 6 1/2"	16' 6 1/2"	16' 6 1/2"	16' 6 1/2"	16' 3"	4
5	Total Wheel Base of Engine,	25' 11 1/2"	24' 9"	24' 9"	24' 9"	24' 9"	24' 9"	24' 9"	5
6	Total Wheel Base of Eng. & Tender,	67' 3"	58' 8 1/2"	58' 8 1/2"	58' 1 1/2"	58' 1 1/2"	58' 1 1/2"	58' 1 1/2"	6
7	No. of Wheels in Engine Truck,	2	2	2	2	2	2	2	7
8	Diam. of Wheels in Engine Truck,	30"	30"	30"	30"	30"	30"	30"	8
9	Size of Engine Truck Axle Journals,	5 1/2" x 10"	5 1/2" x 10"	5 1/2" x 10"	5 1/2" x 10"	5 1/2" x 10"	5 1/2" x 10"	5 1/2" x 10"	9
10	Diameter of Trailing Wheels,								10
11	Size of Trailing Axle Journal,								11
12	Spread of Cylinders,	90"	88"	88"	88"	88"	88"	88"	12
13	Size of Cylinders,	23 1/2" x 28"	22" x 28"	23" x 28"	22" x 28"	22" x 28"	23" x 28"	22" x 28"	13
14	Steam Ports,	2" & 1 1/2"	1 1/2" x 21"	2" & 1 1/2"	1 1/2" x 21"	1 1/2" x 21"	1 1/2" & 2 1/2"	2 1/2" & 2 1/2"	14
15	Exhaust Ports,		3" x 21"		3" x 21"	3" x 21"			15
16	Travel of Valve,	6"	6"	6"	6"	6"	6"	6"	16
17	Lap of Valve,	1"	1"	1"	1"	1"	1"	1"	17
18	Type of Valve,	12" Piston	D	12" Piston	D	D	12" Piston	12" Piston.	18
19	Type of Valve Gear,	Steph'n	Steph'n	Steph'n	Steph'n	Steph'n	Steph'n	Wals'h't	19
20	Type of Boiler,	Belpaire. Sloping Top.	Belpaire. Sloping Top.	Belpaire. Wide Fire Box.	Belpaire. Wide Fire Box.	Belpaire. Wide Fire Box.	Belpaire. Wide Fire Box.	Belpaire. Wide Fire Box.	20
21	Min. Internal Diam. Boiler,	69 1/2"	69 1/2"	60 1/2"	69 1/2"	69 1/2"	69 1/2"	69 1/2"	21
22	Number of Tubes,	204, 28, 112	369	204, 28, 112	373	373	208, 28, 112	373	22
23	Outside Diam. of Tubes,	2", 5 1/2", 1 1/2"	2"	2", 5 1/2", 1 1/2"	2"	2"	2", 5 1/2", 1 1/2"	2"	23
24	Length of Tubes, bet. Tube Sheets,	168"	163 1/2"	163 1/2"	164 1/2"	164 1/2"	164 1/2"	164 1/2"	24
25	Fire Area through Tubes, sq. ft.,	5.04	6.16	5.04	6.23	6.29	5.71	6.23	25
26	Size of Fire Box, inside,	40" x 120"	40" x 120"	66" x 107"	66" x 107"	66" x 107"	66" x 107"	66" x 107"	26
27	Fire Grate Area, sq. ft.	33.33	33.33	49.04	49.04	49.04	49.04	49.04	27
28	Ext. Heating Surface of Tubes, sq. ft.,		2632	2046 800	2677	2677	2046 800	2677	28
29	Heating Surface of Fire Box, sq. ft.,	197	180	167	167	167	167	167	29
30	Total Heating Surface of Boiler, sq. ft.,		2812	3013	2844	2844	3013	2844	30
31	Steam Pressure per square inch, lbs.,	185	205 190	205 190	205 190	205	195	205 190	31
32	No. of Wheels under Tender,	8	8	8	8	8	8	8	32
33	Diam. of Wheels under Tender,	33"	33"	33"	33"	36"	33"	33"	33
34	Size of Tender Truck Axle Journals,	5" x 9"	5" x 9"	5 1/2" x 10"	5 1/2" x 10"	5 1/2" x 10"	5 1/2" x 10"	5 1/2" x 10"	34
35	Wt. of Engine Empty, lbs.,		162900		171600	182350		179400	35
36	Wt. on Truck in Working Order, lbs.,		20100		18800	17600		22000	36
37	Wt. on 1st Pair of Drivers, lbs.,		43800		43000	43200		45000	37
38	Wt. on 2d Pair of Drivers, lbs.,		40200		44000	48400		44000	38
39	Wt. on 3d Pair of Drivers, lbs.,		41500		46000	51200		46000	39
40	Wt. on 4th Pair of Drivers, lbs.,		40900		42700	44300		43700	40
41	Wt. on Trailing Wheels, lbs.,								41
42	Wt. of Engine in Work'g Order, lbs.,		186500		194500	204700		200700	42
43	Total Wt. on Drivers, lbs.,		166400		176700	187100		178700	43
44	Wt. of Tender Loaded, lbs.,		113000		147000	150050	147000	147000	44
45	Ratio of Heat'g Surf. to Grate Surface,		84.37		57.99	57.99	61.44	57.99	45
46	Ratio of Ext'l Flue Heating Surface to Fire Box Heating Surface,		14.62		16.03	16.03	17.04	16.03	46
47	Heat. Surf. + Wt. one Cyl'd Steam,		940.9 1014.1		951.62 1002.62			951.62 1002.62	47
48	Grate Area + Wt. one Cyl'd Steam,	10.78	11.15 12.01	15.02	16.41 17.29			16.41 17.29	48
49	Tractive Power per lb. of M.E. Press.,	259.88	242.00	246.66 262.40	242.00	242.00	264.5	242.00	49
50	Tractive Power with M. E. Pressure equal to 85% of Boiler Pressure,	40806	42168 39083	43378 41262	42168 40111	42168	43841	42168 40111	50
51	Ratio Wt. on Drivers to Tract. Pow.,		3.94 4.26		4.17 4.38	4.43		4.24 4.45	51
52	Height of Deck Plate,	51"	51"	51"	66 1/2"		66 1/2"	66 1/2"	52

STEAM LOCOMOTIVES

CLASSIFICATION.	L. W. H 6 b	H 6 s b	L. W. H 6 s b	H 8	H 8 s	L. W. H 8 a	L. W. H 8 s a	
1 No. of Pairs of Driving Wheels,	4	4	4	4	4	4	4	1
2 Diam. of Driving Wheels,	56"	56"	56"	62"	62"	62"	62"	2
3 Size of Driving Axle Journals,	9 1/2" D x 13 1/2" L	9 1/2" D x 13 1/2" L	9 1/2" D x 13 1/2" L	10 1/2" D x 13 1/2" L	10 1/2" D x 13 1/2" L	10 1/2" D x 13 1/2" L	10 1/2" D x 13 1/2" L	3
4 Length of Driving Wheel Base,	16' 3"	16' 3"	16' 3"	17' 0 1/2"	17' 0 1/2"	17' 0 1/2"	17' 0 1/2"	4
5 Total Wheel Base of Engine,	24' 9"	24' 9"	24' 9"	25' 9 1/2"	25' 9 1/2"	25' 9 1/2"	25' 9 1/2"	5
6 Total Wheel Base of Eng. & Tender,	58' 1 1/2"	58' 1 1/2"	58' 1 1/2"	59' 4 1/2"	59' 4 1/2"	59' 4 1/2"	59' 4 1/2"	6
7 No. of Wheels in Engine Truck,	2	2	2	2	2	2	2	7
8 Diam. of Wheels in Engine Truck,	30"	30"	30"	33"	33"	33"	33"	8
9 Size of Engine Truck Axle Journals,	5 1/2" x 10"	5 1/2" x 10"	5 1/2" x 10"	5 1/2" x 10"	5 1/2" x 10"	5 1/2" x 10"	5 1/2" x 10"	9
10 Diameter of Trailing Wheels,								10
11 Size of Trailing Axle Journals,								11
12 Spread of Cylinders,	88"	88"	88"	90"	90"	90"	90"	12
13 Size of Cylinders,	22" x 28"	22" x 28"	22" x 28"	24" x 28"	24" x 28"	24" x 28"	24" x 28"	13
14 Steam Ports,	2 1/2" & 2 1/2"	2 1/2" & 2 1/2"	2 1/2" x 2 1/2"	2 1/2" wide.	2 1/2" wide.	2 1/2" wide.	2 1/2" wide.	14
15 Exhaust Ports,								15
16 Travel of Valve,	6"	6"	6"	6"	6"	6"	6"	16
17 Lap of Valve,	1"	1"	1"	1"	1"	1"	1"	17
18 Type of Valve,	12" Piston	12" Piston.	12" Piston	12" Piston.	12" Piston.	14" Piston.	14" Piston.	18
19 Type of Valve Gear,	Wals'h't	Wals'h't	Wals'h't	Wals'h't.	Wals'h't	Wals'h't.	Wals'h't	19
20 Type of Boiler,	Belpaire Wide Fire Box	Belpaire Wide Fire Box	Belpaire Wide Fire Box	Belpaire Wide Fire Box	Belpaire Wide Fire Box.	Belpaire Wide Fire Box.	Belpaire Wide Fire Box.	20
21 Min. Internal Diam. Boiler,	69 1/2"	69 1/2"	69 1/2"	76 1/2"	76 1/2"	76 1/2"	76 1/2"	21
22 Number of Tubes,	373	208, 28, 112	208, 28, 112	465	265, 36, 144,	465	265, 36, 144,	22
23 Outside Diam. of Tubes,	2"	2", 5 1/2", 1 1/2"	2", 5 1/2", 1 1/2"	2"	2", 5 1/2", 1 1/2"	2"	2", 5 1/2", 1 1/2"	23
24 Length of Tubes bet. Tube Sheets,	164 1/2"	164 1/2"	164 1/2"	180"	180"	180"	180"	24
25 Fire Area through Tubes, sq. ft.,	0.23	5.71	5.71	7.77	7.30	7.77	7.94	25
26 Size of Fire Box, inside,	66" x 107"	66" x 107"	66" x 107"	72" x 110 1/2"	72" x 110 1/2"	72" x 110 1/2"	72" x 110 1/2"	26
27 Fire Grate Area, sq. ft.,	49.04	49.04	49.04	55.13	55.13	55.13	55.13	27
28 Ext. Heating Surface of Tubes, sq. ft.,	2677	2048 800	2048 800	3652	2858 1178	3052	2841 1173	28
29 Heating Surface of Fire Box, sq. ft.,	167	167	188	190	180	187	187	29
30 Total Heating Surface of Boiler, sq. ft.,	2844	3013	3394	3842	4222	3839	4201	30
31 Steam Pressure per square inch, lbs.,	205	205 195	205	205	205	205	205	31
32 No. of Wheels under Tender,	8	8	8	8	8	8	8	32
33 Diam. of Wheels under Tender,	36"	33"	36"	33"	33"	36"	36"	33
34 Size of Tender Truck Axle Journals,	5 1/2" x 10"	5 1/2" x 10"	5 1/2" x 10"	5 1/2" x 10"	5 1/2" x 10"	5 1/2" x 10"	5 1/2" x 10"	34
35 Wt. of Engine Empty, lbs.,	179400	185200	185200	213180	219900	204000	211800	35
36 Wt. on Truck in Working Order, lbs.,	22000	23900	25370	32200	27200	24000	24000	36
37 Wt. on 1st Pair of Drivers, lbs.,	45000	47000	47500	48500	59700	52000	52000	37
38 Wt. on 2d Pair of Drivers, lbs.,	44000	45100	47850	51400	53400	53000	55500	38
39 Wt. on 3d Pair of Drivers, lbs.,	46000	45400	46350	56100	55300	54000	57000	39
40 Wt. on 4th Pair of Drivers, lbs.,	43700	43400	46000	53800	49200	52000	55000	40
41 Wt. on Trailing Wheels, lbs.,								41
42 Wt. of Engine in Work'g Order, lbs.,	200700	204800	213070	242000	244800	235000	243500	42
43 Total Wt. on Drivers, lbs.,	178700	180900	187600	209800	217600	211000	219500	43
44 Wt. of Tender Loaded, lbs.,	157400	147000	157400	147000	147000	161450	161450	44
45 Ratio of Heat'g Surf. to Grate Surface,	57.99	61.44	61.87	69.69	76.58	69.64	76.21	45
46 Ratio of Ext'l Flue Heating Surface } to Fire Box Heating Surface, }	16.03	17.04	15.14	19.22	21.22	19.53	21.46	46
47 Heat. Surf. + Wt. one Cyl'd Steam		1188.0 1195.8		1080.21	1187.29			47
48 Grate Area + Wt. one Cyl'd Steam,		18.47 18.44		15.50	15.50			48
49 Tractive Power per lb. of M. E. Press.,	242.00	242.00	242.00	260.13	260.13	260.13	260.13	49
50 Tractive Power with M. E. Pressure } equal to 85% of Boiler Pressure, }	42168	42168 40111	42168	45327	45327	45327	45327	50
51 Ratio Wt. on Drivers to Tract. Pow.,	4.24	4.28 4.50	4.45	4.63	4.80	4.66	4.84	51
52 Height of Deck Plate,		60 1/2"		70 1/2"	70 1/2"	70 1/2"	70 1/2"	52

STEAM LOCOMOTIVES

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	CLASSIFICATION.	H 8 b	H 8 = b	L. W. H 8 c	L. W. H 8 c Stoker	L. W. H 8 a c	L. W. H 8 s c Stoker	H 9 s	
1	No. of Pairs of Driving Wheels,	4	4	4	4	4	4	4	1
2	Diam. of Driving Wheels,	62"	62"	62"	62"	62"	62"	62"	2
3	Size of Driving Axle Journals,	10 1/2" x 13"	10 1/2" x 13"	10 1/2" x 13"	10 1/2" x 13"	10 1/2" x 13"	10 1/2" x 13"	10 1/2" x 13"	3
4	Length of Driving Wheel Base,	17' 0 1/4"	17' 0 1/4"	17' 0 1/4"	17' 0 1/4"	17' 0 1/4"	17' 0 1/4"	17' 0 1/4"	4
5	Total Wheel Base of Engine,	25' 9 1/2"	25' 9 1/2"	25' 9 1/2"	25' 9 1/2"	25' 9 1/2"	25' 9 1/2"	25' 9 1/2"	5
6	Total Wheel Base of Eng. & Tender,	59' 4 1/2"	62' 4 1/2"	59' 4 1/2"	59' 4 1/2"	59' 4 1/2"	62' 4 1/2"	62' 5 1/2"	6
7	No. of Wheels in Engine Truck,	2	2	2	2	2	2	2	7
8	Diam. of Wheels in Engine Truck,	33"	33"	33"	33"	33"	33"	33"	8
9	Size of Engine Truck Axle Journals,	5 1/2" x 10"	5 1/2" x 10"	5 1/2" x 10"	5 1/2" x 10"	5 1/2" x 10"	5 1/2" x 10"	5 1/2" x 10"	9
10	Diameter of Trailing Wheels,								10
11	Size of Trailing Axle Journal,								11
12	Spread of Cylinders,	90"	90"	90"	90"	90"	90"	90"	12
13	Size of Cylinders,	24" x 28"	24" x 28"	24" x 28"	24" x 28"	24" x 28"	24" x 28"	25" x 28"	13
14	Steam Ports,	2 1/2" wide	2 1/2" wide	2" wide	2" wide	2" wide	2" wide	2 1/2" wide	14
15	Exhaust Ports,								15
16	Travel of Valve,	6"	6"	6"	6"	6"	6"	6"	16
17	Lap of Valve,	1"	1"	1"	1"	1"	1"	1"	17
18	Type of Valve,	12" Piston	12" Piston	14" Piston	14" Piston	14" Piston	14" Piston	12" Piston	18
19	Type of Valve Gear,	Wals'h't	Wals'h't	Wals'h't	Wals'h't	Wals'h't	Wals'h't	Wals'h't	19
20	Type of Boiler,	Belpaire Wide Fire Box	Belpaire Wide Fire Box	Belpaire Wide Fire Box	Belpaire Wide Fire Box	Belpaire Wide Fire Box	Belpaire Wide Fire Box	Belpaire Wide Fire Box	20
21	Min. Internal Diam. Boiler,	76 1/2"	76 1/2"	76 1/2"	76 1/2"	76 1/2"	76 1/2"	76 1/2"	21
22	Number of Tubes,	465	265, 36, 144	465	465	265, 36, 144	265, 36, 144	265, 36, 144	22
23	Outside Diam. of Tubes,	2"	2", 5 1/2", 1 1/2"	2	2"	2", 5 1/2", 1 1/2"	2", 5 1/2", 1 1/2"	2", 5 1/2", 1 1/2"	23
24	Length of Tubes, bet. Tube Sheets,	180"	180"	180"	180"	180"	180"	180"	24
25	Fire Area through Tubes, sq. ft.,	7.77	7.30	7.77	7.77	7.94	7.94	7.30	25
26	Size of Fire Box, inside,	72" x 110 1/4"	72" x 110 1/4"	72" x 110 1/4"	72" x 110 1/4"	72" x 110 1/4"	72" x 110 1/4"	72" x 110 1/4"	26
27	Fire Grate Area, sq. ft.	55.13	55.13	55.13	55.13	55.13	55.13	55.13	27
28	Ext. Heating Surface of Tubes, sq. ft.,	3652	2858	3652	3652	3641	3641	3641	28
29	Heating Surface of Fire Box, sq. ft.,	190	190	187	187	187	187	190	29
30	Total Heating Surface of Boiler, sq. ft.,	3842	4222	3839	3839	4201	4201	4222	30
31	Steam Pressure per square inch, lbs.,	205	205	205	205	205	205	205	31
32	No. of Wheels under Tender,	8	8	8	8	8	8	8	32
33	Diam. of Wheels under Tender,	33"	33"	36"	36"	36"	36"	33"	33
34	Size of Tender Truck Axle Journals,	5 1/2" x 10"	5 1/2" x 10"	5 1/2" x 10"	5 1/2" x 10"	6" x 11"	6" x 11"	5 1/2" x 10"	34
35	Wt. of Engine Empty, lbs.,	218000	225500	207800	218600	216400	224700	225500	35
36	Wt. on Truck in Working Order, lbs.,	29800	27500	25000	22600	23000	22000	27700	36
37	Wt. on 1st Pair of Drivers, lbs.,	57700	61000	52000	51400	52000	52000	62300	37
38	Wt. on 2d Pair of Drivers, lbs.,	47800	55000	54000	60200	57000	61000	54000	38
39	Wt. on 3d Pair of Drivers, lbs.,	54600	59000	56000	61100	60000	62000	55700	39
40	Wt. on 4th Pair of Drivers, lbs.,	51000	50000	52500	55000	56000	57000	50000	40
41	Wt. on Trailing Wheels, lbs.,								41
42	Wt. of Engine in Work'g Order, lbs.,	240700	252500	239500	250300	248000	254000	251000	42
43	Total Wt. on Drivers, lbs.,	210900	225000	214500	227700	225000	232000	223000	43
44	Wt. of Tender Loaded, lbs.,	147000	159000	165900	167100	167100	167100	159000	44
45	Ratio of Heat'g Surf. to Grate Surface,	69.69	76.58	69.64	69.64	76.21	76.21	76.58	45
46	Ratio of Ext'l Flue Heating Surface to Fire Box Heating Surface,	19.22	21.22	19.53	19.53	21.46	21.46	21.22	46
47	Heat. Surf. + Wt. one Cyl'd Steam,	1080.21	1187.29					1094.00	47
48	Grate Area + Wt. one Cyl'd Steam,	15.50	15.50					14.28	48
49	Tractive Power per lb. of M. E. Press.,	260.13	260.13	260.13	260.13	260.13	260.13	282.26	49
50	Tractive Power with M. E. Pressure equal to 85 % of Boiler Pressure,	45327	45327	45327	45327	45327	45327	49183	50
51	Ratio Wt. on Drivers to Tract. Pow.,	4.65	4.97	4.73	5.02	4.97	5.11	4.54	51
52	Height of Deck Plate,	70 1/2"	70 1/2"	70 1/2"				70 1/2"	52
53	Wt. of Tender Empty, lbs.,	48000							53

STEAM LOCOMOTIVES

CLASSIFICATION.	L. W. H 9 s a	L. W. H 9 s a Stoker	L. W. H 9 s c	L. W. H 9 s c Stoker	L. W. H 10 s	L. W. H 10 s Stoker	H 2 s	
1 No. of Pairs of Driving Wheels,	4	4	4	4	4	4	4	1
2 Diam. of Driving Wheels,	62"	62"	62"	62"	62"	62"	63"	2
3 Size of Driving Axle Journals,	10 1/2" x 13" L	10 1/2" x 13" L	10 1/2" x 13" L	10 1/2" x 13" L	10 1/2" x 13" L	10 1/2" x 13" L	10 1/2" x 13" L	3
4 Length of Driving Wheel Base,	17' 0 1/4"	17' 0 1/4"	17' 0 1/4"	17' 0 1/4"	17' 0 1/4"	17' 0 1/4"	17' 6"	4
5 Total Wheel Base of Engine,	25' 9 1/4"	25' 9 1/4"	25' 9 1/4"	25' 9 1/4"	25' 9 1/4"	25' 9 1/4"	26' 5"	5
6 Total Wheel Base of Eng. & Tender,	62' 4 1/2"	62' 4 1/2"	59' 5 1/2"	59' 5 1/2"	62' 4 1/2"	62' 4 1/2"	60' 3 1/2"	6
7 No. of Wheels in Engine Truck,	2	2	2	2	2	2	2	7
8 Diam. of Wheels in Engine Truck,	33"	33"	33"	33"	33"	33"	33"	8
9 Size of Engine Truck Axle Journals,	5 1/2" x 10"	5 1/2" x 10"	5 1/2" x 10"	5 1/2" x 10"	5 1/2" x 10"	5 1/2" x 10"	6" x 10"	9
10 Diameter of Trailing Wheels,								10
11 Size of Trailing Axle Journals,								11
12 Spread of Cylinders,	90"	90"	90"	90"	90"	90"	88"	12
13 Size of Cylinders,	25" x 28"	25" x 28"	25" x 28"	25" x 28"	28" x 28"	26" x 28"	23" x 32"	13
14 Steam Ports,	2" wide.	2" Wide	2" Wide	2" Wide	2" wide.	2" Wide	1 1/2" wide.	14
15 Exhaust Ports,								15
16 Travel of Valve,	6"	6"	6"	6"	6"	6"	6"	16
17 Lap of Valve,	1"	1"	1 1/2"	1 1/2"	1"	1"	1"	17
18 Type of Valve,	14" Piston	14" Piston	14" Piston	14" Piston	14" Piston	14" Piston	14" Piston.	18
19 Type of Valve Gear,	Wals'h't	Wals'h't	Wals'h't	Wals'h't	Wals'h't	Wals'h't	Steph'n	19
20 Type of Boiler,	Belpaire Wide Fire Box	Belpaire Wide Fire Box	Belpaire Wide Fire Box	Belpaire Wide Fire Box	Belpaire Wide Fire Box	Belpaire Wide Fire Box	Radial Stays Wide Fire Box	20
21 Min. Internal Diam. Boiler,	76 1/2"	76 1/2"	76 1/2"	76 1/2"	76 1/2"	76 1/2"	80"	21
22 Number of Tubes,	265, 36, 144	265, 36, 144	265, 36, 144	265, 36, 144	265, 36, 144	266, 36, 144	446	22
23 Outside Diam. of Tubes,	2", 5 1/2", 1 1/2"	2", 5 1/2", 1 1/2"	2", 5 1/2", 1 1/2"	2", 5 1/2", 1 1/2"	2", 5 1/2", 1 1/2"	2", 5 1/2", 1 1/2"	2"	23
24 Length of Tubes bet. Tube Sheets,	180"	180"	180"	180"	180"	180"	184 1/2"	24
25 Fire Area through Tubes, sq. ft.,	7.94	7.94	7.94	7.94	7.94	7.94	7.45	25
26 Size of Fire Box, inside,	72" x 110 1/2"	72 x 110 1/2"	72" x 109 1/2"	72" x 109 1/2"	72" x 110 1/2"	72" x 110 1/2"	75 1/2" x 106 1/2"	26
27 Fire Grate Area, sq. ft.,	55.13	55.13	54.94	54.94	55.13	55.13	55.42	27
28 Ext. Heating Surface of Tubes, sq. ft.,	2841 1178	2841 1178	2841 1178	2841 1178	2841 1178	2841 1178	3594	28
29 Heating Surface of Fire Box, sq. ft.,	187	187	187	187	187	187	182	29
30 Total Heating Surface of Boiler, sq. ft.,	4201	4201	4201	4201	4201	4201	3776	30
31 Steam Pressure per square inch, lbs.,	205	205	205	205	205	205	200	31
32 No. of Wheels under Tender,	8	8	8	8	8	8	8	32
33 Diam. of Wheels under Tender,	36"	36"	33"	33"	36"	36"	36"	33
34 Size of Tender Truck Axle Journals,	6" x 11"	6" x 11"	5 1/2" x 10"	5 1/2" x 10"	6" x 11"	6" x 11"	5 1/2" x 10"	34
35 Wt. of Engine Empty, lbs.,	214400	224700	209450	217650	216400	224700		35
36 Wt. on Truck in Working Order, lbs.,	25915	23000	24495	24495	24500	24500	20000	36
37 Wt. on 1st Pair of Drivers, lbs.,	50910	52000	52800	49975	56000	52000	49000	37
38 Wt. on 2d Pair of Drivers, lbs.,	58350	57000	54700	58325	57000	61000	50000	38
39 Wt. on 3d Pair of Drivers, lbs.,	55660	60000	53900	58550	60000	62000	52500	39
40 Wt. on 4th Pair of Drivers, lbs.,	45900	56000	55000	57800	50000	56300	50000	40
41 Wt. on Trailing Wheels, lbs.,								41
42 Wt. of Engine in Work'g Order, lbs.,	236735	248000	240945	249145	247500	255800	221500	42
43 Total Wt. on Drivers, lbs.,	210820	225000	216450	224650	223000	231300	201500	43
44 Wt. of Tender Loaded, lbs.,	165900	167100	156800	156800	184000	184000	157400	44
45 Ratio of Heat'g Surf. to Grate Surface,	76.21	76.21	76.46	76.46	76.21	76.21	68.13	45
46 Ratio of Ext'l Flue Heating Surface to Fire Box Heating Surface, }	21.46	21.46	21.46	21.46	21.46	21.46	19.75	46
47 Heat. Surf. + Wt. one Cyl'd Steam								47
48 Grate Area + Wt. one Cyl'd Steam,								48
49 Tractive Power per lb. of M.E. Press.,	282.26	282.26	282.26	282.26	305.29	305.29	268.70	49
50 Tractive Power with M. E. Pressure equal to 85% of Boiler Pressure, }	49183	49183	49183	49183	53197	53197	45679	50
51 Ratio Wt. on Drivers to Tract. Pow.,	4.29	4.58	4.40	4.56	4.18	4.33	4.41	51
52 Height of Deck Plate,								52

STEAM LOCOMOTIVES

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CLASSIFICATION.		I 1 s	J 2 s	
1	No. of Pairs of Driving Wheels,	5	3	1
2	Diam. of Driving Wheels,	62"	80"	2
3	Size of Driving Axle Journals	12" D x 16" L	10" D x 12" L	3
4	Length of Driving Wheel Base,	22' 8"	14' 0"	4
5	Total Wheel Base of Engine,	32' 2"	34' 3"	5
6	Total Wheel Base of Eng. & Tender,	73' 0 1/2"	64' 10 1/2"	6
7	No. of Wheels in Engine Truck,	2	2	7
8	Diam. of Wheels in Engine Truck,	33"	42 1/2"	8
9	Size of Engine Truck Axle Journals,	6 1/2" x 12"	6 1/2" x 12"	9
10	Diameter of Trailing Wheels,		50"	10
11	Size of Trailing Axle Journal,		8" x 14"	11
12	Spread of Cylinders,	9 1/2"	87"	12
13	Size of Cylinders,	30 1/2" x 32"	21 1/4" x 28"	13
14	Steam Ports,		1 1/4" wide	14
15	Exhaust Ports,			15
16	Travel of Valve,	6"	5 1/2"	16
17	Lap of Valve,	2"	1 1/4"	17
18	Type of Valve,	12" Piston	12" Piston	18
19	Type of Valve Gear,	Wals'h't	Wals'h't	19
20	Type of Boiler,	Repalro Wide Fire Box	Radial Stay Wide Fire Box	20
21	Min. Internal Diam. Boiler,	82"	73"	21
22	Number of Tubes,	244, 48, 192	322	22
23	Outside Diam. of Tubes,	2 1/4", 5 1/2", 1 1/2"	2 1/4"	23
24	Length of Tubes, bet. Tube Sheets,	228"	232 1/2"	24
25	Fire Area through Tubes, sq. ft.,	9.16	7.03	25
26	Size of Fire Box, inside,	80" x 120"	73 1/4" x 108 1/4"	26
27	Fire Grate Area, sq. ft.	70	55.0	27
28	Ext. Heating Surface of Tubes, sq. ft.,	1111	3676	28
29	Heating Surface of Fire Box, sq. ft.,	272	198	29
30	Total Heating Surface of Boiler, sq. ft.,	6494 ✓	3874	30
31	Steam Pressure per square inch, lbs.,	250	200	31
32	No. of Wheels under Tender,	8	8	32
33	Diam. of Wheels under Tender,	33"	36"	33
34	Size of Tender Truck Axle Journals,	6" x 11"	5 1/2" x 10"	34
35	Wt. of Engine Empty, lbs.,	836900	210660	35
36	Wt. on Truck in Working Order, lbs.,	30000	27000	36
37	Wt. on 1st Pair of Drivers, lbs.,	66000	50000	37
38	Wt. on 2d Pair of Drivers, lbs.,	66000	59500	38
39	Wt. on 3d Pair of Drivers, lbs.,	73000	52000	39
40	Wt. on 4th Pair of Drivers, lbs.,	68000		40
41	Wt. on Trailing Wheels, lbs.,		45000	41
42	Wt. of Engine in Work'g Order, lbs.,	371000	233500	42
43	Total Wt. on Drivers, lbs.,	341000	161500	43
44	Wt. of Tender Loaded, lbs.,	182400	146050	44
45	Ratio of Heat'g Surf. to Grate Surface,	91.1	70.44	45
46	Ratio of Ext'l Flue Heating Surface to Fire Box Heating Surface, }	22.87	18.57	46
47	Heat. Surf. + Wt. one Cyl'd Steam,		1398.86	47
48	Grate Area + Wt. one Cyl'd Steam,		19.86	48
49	Tractive Power per lb. of M. E. Press.,	480.13	161.79	49
50	Tractive Power with M. E. Pressure equal to 85% of Boiler Pressure, }	90000 §	27504	50
51	Ratio Wt. on Drivers to Tract. Pow.,		5.87	51
52	Height of Deck Plate,	83	66 1/2"	52
53	Wt. on 5th Pair of Drivers, lbs.,	68000		53

§ Tractive Power with M. E. Pressure Equal to 75% of Boiler Pressure.

STEAM LOCOMOTIVES

CLASSIFICATION.	L. W. K 2	K 2 s	L. W. K 2 s Stoker	K 2 s a	L. W. K 2 s a Stoker	K 2 s b	L. W. K 3 s Stoker	
1 No. of Pairs of Driving Wheels,	3	3	3	3	3	3	3	1
2 Diam. of Driving Wheels,	80"	80"	80"	80"	80"	72"	80"	2
3 Size of Driving Axle Journals,	10 1/2" x 15" L	10 1/2" x 15" L	10 1/2" x 15" L	10 1/2" x 15" L	10 1/2" x 15" L	10 1/2" x 15" L	10 1/2" x 15" L	3
4 Length of Driving Wheel Base,	13' 10"	13' 10"	13' 10"	13' 10"	13' 10"	13' 10"	13' 10"	4
5 Total Wheel Base of Engine,	35' 2 1/2"	35' 2 1/2"	35' 2 1/2"	35' 2 1/2"	35' 2 1/2"	35' 4 1/2"	35' 2 1/2"	5
6 Total Wheel Base of Eng. & Tender,	70' 3" †	70' 3" †	70' 0 1/2"	70' 3"	70' 0 1/2"	70' 5"	70' 0 1/2"	6
7 No. of Wheels in Engine Truck,	4	4	4	4	4	4	4	7
8 Diam. of Wheels in Engine Truck,	36"	36"	36"	36"	36"	33"	36"	8
9 Size of Engine Truck Axle Journals,	6 1/2" x 12"	6 1/2" x 12"	6 1/2" x 12"	6 1/2" x 12"	6 1/2" x 12"	6 1/2" x 12"	6 1/2" x 12"	9
10 Diameter of Trailing Wheels,	56"	56"	56"	56"	56"	50"	56"	10
11 Size of Trailing Axle Journals,	8" x 14"	8" x 14"	8" x 14"	8" x 14"	8" x 14"	6 1/2" x 12"	8" x 14"	11
12 Spread of Cylinders,	88"	88"	88"	88"	88"	88"	88"	12
13 Size of Cylinders,	24" x 26"	24" x 26"	24" x 26"	24" x 26"	24" x 26"	24" x 26"	26" x 26"	13
14 Steam Ports,	1 1/4" wide	1 1/4" wide	1 1/4" wide	1 1/4" wide	1 1/4" wide	1 1/4" wide	1 1/4" wide	14
15 Exhaust Ports,								15
16 Travel of Valve,	7"	7"	7"	7"	7"	7"	7"	16
17 Lap of Valve,	1 1/2"	1 1/2"	1 1/2"	1 1/2"	1 1/2"	1 1/2"	1 1/2"	17
18 Type of Valve,	12" Piston	12" Piston	16" Piston	12" Piston	16" Piston	12" Piston	16" Piston	18
19 Type of Valve Gear,	Wals'h't	Wals'h't	Wals'h't	Wals'h't	Wals'h't	Wals'h't	Wals'h't	19
20 Type of Boiler,	Belpaire Wide Fire Box	Belpaire Wide Fire Box	Belpaire Wide Fire Box	Belpaire Wide Fire Box	Belpaire Wide Fire Box	Belpaire Wide Fire Box	Belpaire Wide Fire Box	20
21 Min. Internal Diam. Boiler,	78"	78"	78"	78"	78"	78"	78"	21
22 Number of Tubes,	359	202, 32, 128	202, 32, 128	202, 32, 128	202, 32, 128	202, 32, 128	202, 32, 128	22
23 Outside Diam. of Tubes,	2 1/4"	2 1/4", 5 1/4", 1 1/2"	2 1/4", 5 1/4", 1 1/2"	2 1/4", 5 1/4", 1 1/2"	2 1/4", 5 1/4", 1 1/2"	2 1/4", 5 1/4", 1 1/2"	2 1/4", 5 1/4", 1 1/2"	23
24 Length of Tubes bet. Tube Sheets,	250 1/2"	250 1/2"	250 1/2"	250 1/2"	250 1/2"	250 1/2"	260 1/2"	24
25 Fire Area through Tubes, sq. ft.,	7.83	6.96	7.53	6.96	7.53	6.96	7.53	25
26 Size of Fire Box, inside,	72" x 110 1/2"	72" x 110 1/2"	72" x 110 1/2"	72" x 110 1/2"	72" x 110 1/2"	72" x 110 1/2"	72" x 110 1/2"	26
27 Fire Grate Area, sq. ft.,	55.4	55.4	55.4	55.4	55.4	55.4	55.37	27
28 Ext. Heating Surface of Tubes, sq. ft.,	4421	3453 1509	3453 1509	3453 1509	3453 1509	3453 1509	3453 1509	28
29 Heating Surface of Fire Box, sq. ft.,	208	208	222	208	222	208	226	29
30 Total Heating Surface of Boiler, sq. ft.,	4629	5170	5184	5170	5184	5170	5188	30
31 Steam Pressure per square inch, lbs.,	205	205	205	205	205	205	205	31
32 No. of Wheels under Tender,	8	8	8	8	8	8	8	32
33 Diam. of Wheels under Tender,	36"	36"	36"	36"	36"	36"	36"	33
34 Size of Tender Truck Axle Journals,	5 1/2" x 10"	5 1/2" x 10"	5 1/2" x 10"	5 1/2" x 10"	5 1/2" x 10"	5 1/2" x 10"	6" x 11"	34
35 Wt. of Engine Empty, lbs.,	238500		246000		257200	257000	257200	35
36 Wt. on Truck in Working Order, lbs.,	42600	42500	43000	46000	46000	46200	49000	36
37 Wt. on 1st Pair of Drivers, lbs.,	62000	62000	62000	62000	62000	61200	63000	37
38 Wt. on 2d Pair of Drivers, lbs.,	64000	64000	65000	65000	65000	65400	65000	38
39 Wt. on 3d Pair of Drivers, lbs.,	59900	62000	63000	64000	64000	65900	65000	39
40 Wt. on 4th Pair of Drivers, lbs.,								40
41 Wt. on Trailing Wheels, lbs.,	50300	52500	57500	60000	60000	47900	60000	41
42 Wt. of Engine in Work'g Order, lbs.,	278800	283000	290500	297000	297000	286600	302000	42
43 Total Wt. on Drivers, lbs.,	185900	188000	190000	191000	191000	192500	193000	43
44 Wt. of Tender Loaded, lbs.,	159000	159000	167100	159000	167100	159000	184000	44
45 Ratio of Heat'g Surf. to Grate Surface,	83.55	93.32	93.57	93.32	93.57	93.32	93.69	45
46 Ratio of Ext'l Flue Heating Surface to Fire Box Heating Surface,	21.25	23.86	22.35	23.86	22.35	23.86	20.95	46
47 Heat. Surf. + Wt. one Cyl'd Steam	1401.87	1548.76		1548.76		1548.76		47
48 Grate Area + Wt. one Cyl'd Steam,	16.77	16.59		16.59		16.59		48
49 Tractive Power per lb. of M. E. Press.,	187.2	187.2	187.2	187.2	187.2	208.0	219.7	49
50 Tractive Power with M. E. Pressure equal to 85% of Boiler Pressure,	32620	32620	32620	32620	32620	36244	38283	50
51 Ratio Wt. on Drivers to Tract. Pow.,	5.70	5.76	5.82	5.85	5.85	5.31	5.04	51
52 Height of Deck Plate,	66 1/2"	66 1/2"		78"		66 1/2"		52
67 0 1/2" L. W. P.								
16" Piston Valve L. W. P.								

STEAM LOCOMOTIVES

27

CLASSIFICATION.		K 4 s	L. W. K 4 H Stoker	K 20 H	L. W. K 21 s 1910	L. W. K 21 s 1912-1913	L. W. K 28 s	
1	No. of Pairs of Driving Wheels,	3	3	3	3	3	3	1
2	Diam. of Driving Wheels,	80"	80"	80"	80"	80"	80"	2
3	Size of Driving Axle Journals,	11"D x 15"L	11"D x 15"L	11"D x 14"L	10"D x 14"L	10"D x 14"L	10"D x 14"L	3
4	Length of Driving Wheel Base,	13' 10"	13' 10"	13' 10"	13' 10"	13' 10"	13' 10"	4
5	Total Wheel Base of Engine,	36' 2"	36' 2"	36' 5"	34' 8 1/2"	34' 8 1/2"	35' 2 1/2"	5
6	Total Wheel Base of Eng. & Tender,	71' 10"	71' 10"	71' 5 1/2"	68' 5 1/2"	66' 9 1/2"	67' 0 1/2"	6
7	No. of Wheels in Engine Truck,	4	4	4	4	4	4	7
8	Diam. of Wheels in Engine Truck,	36"	36"	36"	36"	36"	36"	8
9	Size of Engine Truck Axle Journals,	6 1/2" x 12"	6 1/2" x 12"	6 1/2" x 12"	6 1/2" x 12"	6 1/2" x 12"	6 1/2" x 12"	9
10	Diameter of Trailing Wheels,	50"	50"	54"	55"	55"	54"	10
11	Size of Trailing Axle Journal,	6 1/2" x 12"	6 1/2" x 12"	9" x 14"	8" x 14"	8" x 14"	8" x 14"	11
12	Spread of Cylinders,	89"	89"	89"	90"	90"	88"	12
13	Size of Cylinders,	27" x 28"	27" x 28"	27" x 28"	24" x 20"	24" x 28"	24" x 26"	13
14	Steam Ports,	2 1/4" & 2 1/8"	2 1/4" & 2 1/8"	1 1/2" wide.	1 1/2" wide.	1 1/2" wide.	1 1/2" wide.	14
15	Exhaust Ports,							15
16	Travel of Valve,	7"	7"	7"	6 1/2"	6 1/2"	7"	16
17	Lap of Valve,	1 1/8"	1 1/8"	1 1/8"	1 1/2"	1 1/2"	1 1/8"	17
18	Type of Valve,	12" Piston	12" Piston	18" Piston	14" Piston	14" Piston	16" Piston	18
19	Type of Valve Gear,	Wals'h't	Wals'h't	Wals'h't	Wals'h't	Wals'h't	Wals'h't	19
20	Type of Boiler,	Belpaire Wide Fire Box	Belpaire Wide Fire Box	Belpaire Wide Fire Box	Straight Top Wide Fire Box	Straight Top Wide Fire Box	Radial Stay Wide Fire Box	20
21	Min. Internal Diam. Boiler,	76 1/2"	76 1/2"	80"	75"	75"	78"	21
22	Number of Tubes,	236, 40, 160	236, 40, 160	241, 40, 160	233, 30, 120	233, 30, 120	200, 30, 120	22
23	Outside Diam. of Tubes,	2 1/4", 5 1/2", 1 1/2"	2 1/4", 5 1/2", 1 1/2"	2 1/4", 5 1/2", 1 1/2"	2", 5 1/2", 1 1/2"	2", 5 1/2", 1 1/2"	2 1/4", 5 1/2", 1 1/2"	23
24	Length of Tubes, bet. Tube Sheets,	228"	228"	262 1/2"	250 1/2"	250 1/2"	252"	24
25	Fire Area through Tubes, sq. ft.,	8.34	8.34	8.73	6.17	6.17	7.40	25
26	Size of Fire Box, inside,	80" x 126"	80" x 126"	121 1/2" x 79 1/2"	75 1/2" x 108 1/2"	75 1/2" x 108 1/2"	80" x 111"	26
27	Fire Grate Area, sq. ft.	70	70	66.85	56.89	56.89	61.86	27
28	Ext. Heating Surface of Tubes, sq. ft.,	8781 1720	8781 1720	4871 1875	8484 1899	8484 1899	8879 1404	28
29	Heating Surface of Fire Box, sq. ft.,	315	349	231	226	223	228	29
30	Total Heating Surface of Boiler, sq. ft.,	5766	5800	6477	5059	5056	5011	30
31	Steam Pressure per square inch, lbs.,	205	205	200	200	200	205	31
32	No. of Wheels under Tender,	8	8	8	8	8	8	32
33	Diam. of Wheels under Tender,	36"	36"	36"	36"	36"	36"	33
34	Size of Tender Truck Axle Journals,	5 1/2" x 10"	5 1/2" x 10"	6" x 11"	5 1/2" x 10"	5 1/2" x 10"	5 1/2" x 10"	34
35	Wt. of Engine Empty, lbs.,		204100	230600	229000	234300	240200	35
36	Wt. on Truck in Working Order, lbs.,	53640	52500	50500	49500	49700	42800	36
37	Wt. on 1st Pair of Drivers, lbs.,	67550	69900	66000	52800	54400	62100	37
38	Wt. on 2d Pair of Drivers, lbs.,	67630	72600	65800	56400	58400	64600	38
39	Wt. on 3d Pair of Drivers, lbs.,	66650	67325	66000	52800	54400	55400	39
40	Wt. on 4th Pair of Drivers, lbs.,							40
41	Wt. on Trailing Wheels, lbs.,	53420	61600	68700	44500	46100	48700	41
42	Wt. of Engine in Work'g Order, lbs.,	308890	323675	317000	256000	263000	273600	42
43	Total Wt. on Drivers, lbs.,	201830	209825	197800	162000	167200	182100	43
44	Wt. of Tender Loaded, lbs.,	159000	189450	175700	145500	146900	157400	44
45	Ratio of Heat'g Surf. to Grate Surface,	82.37	82.85	96.89	88.93	88.93	81.0	45
46	Ratio of Ext'l Flue Heating Surface to Fire Box Heating Surface,	17.30	15.62	27.04	21.37	21.67	20.98	46
47	Heat. Surf. + Wt. one Cyl'd Steam,	1283.19		1483.19				47
48	Grate Area + Wt. one Cyl'd Steam,	15.55		15.31				48
49	Tractive Power per lb. of M.E. Press.,	255.15		255.15	187.2	187.2	187.2	49
50	Tractive Power with M. E. Pressure equal to 85% of Boiler Pressure,	44460		43375	31824	31824	32620	50
51	Ratio Wt. on Drivers to Tract. Pow.,	4.54	4.72	4.56	5.09	5.25	5.58	51
52	Height of Deck Plate,	70 1/2"		84 1/2"				52

STEAM LOCOMOTIVES

CLASSIFICATION.	L. 1 s	L. W. L 1 s	L. W. N 1 s	L. W. N 2 s	
1 No. of Pairs of Driving Wheels,	4	4	5	5	1
2 Diam. of Driving Wheels,	62"	62"	62"	63"	2
3 Size of Driving Axle Journals,	11"D x 15"L	11"D x 15"L	11"D x 15"L	11"D x 13"L	3
4 Length of Driving Wheel Base,	17' 0 1/4"	17' 0 1/4"	22' 2"	22' 4"	4
5 Total Wheel Base of Engine,	36' 4 1/4"	36' 4 1/4"	41' 11 1/4"	42' 2"	5
6 Total Wheel Base of Eng. & Tender,	73' 8 1/4"	73' 3 1/4"	82' 7 1/4"	82' 10 1/4"	6
7 No. of Wheels in Engine Truck,	2	2	2	2	7
8 Diam. of Wheels in Engine Truck,	33"	33"	33"	33"	8
9 Size of Engine Truck Axle Journals,	6 1/2" x 12"	6 1/2" x 12"	6 1/2" x 12"	6 1/2" x 12"	9
10 Diameter of Trailing Wheels,	50"	50"	38"	43"	10
11 Size of Trailing Axle Journals,	6 1/2" x 12"	6 1/2" x 12"	7 1/2" x 13 1/2"	9" x 14"	11
12 Spread of Cylinders,	90"	90"	92"	92"	12
13 Size of Cylinders,	27" x 30"	27" x 30"	30" x 32"	30" x 32"	13
14 Steam Ports,	2 1/4" wide	2 1/4" wide	2" wide	1 1/2" wide	14
15 Exhaust Ports,					15
16 Travel of Valve,	6"	6"	8 1/2"	7"	16
17 Lap of Valve,	1"	1"	1 1/2"	1 1/2"	17
18 Type of Valve,	12" Piston	12" Piston	14" Piston	14" Piston	18
19 Type of Valve Gear,	Wals'h't	Wals'h't	Wals'h't	Wals'h't	19
20 Type of Boiler,	Belpaire Wide Fire Box	Belpaire Wide Fire Box	Belpaire Wide Fire Box	Couical Wagon Top	20
21 Min. Internal Diam. Boiler,	76 1/2"	76 1/2"	88 1/2"	86 1/2"	21
22 Number of Tubes,	238, 40, 160	236, 40, 160	106, 54, 216	271, 50, 200	22
23 Outside Diam. of Tubes,	2 1/2", 5 1/2", 1 1/2"	2 1/2", 5 1/2", 1 1/2"	2 1/2", 5 1/2", 1 1/2"	2 1/2", 5 1/2", 1 1/2"	23
24 Length of Tubes bet. Tube Sheets,	228"	228"	250 1/2"	244 1/2"	24
25 Fire Area through Tubes, sq. ft.,	8.34	8.34	9.84	8.77	25
26 Size of Fire Box, inside,	80" x 128"	80" x 126"	80" x 144"	96 1/2" x 132 1/2"	26
27 Fire Grate Area, sq. ft.,	70	70	80	8.82	27
28 Ext. Heating Surface of Tubes, sq. ft.,	8781 1720	8781 1720	4218 2244	4224 2244	28
29 Heating Surface of Fire Box, sq. ft.,	315	349	422	429	29
30 Total Heating Surface of Boiler, sq. ft.,	5766	5800	7068	7500	30
31 Steam Pressure per square inch, lbs.,	205	205	215	190	31
32 No. of Wheels under Tender,	8	8	8	8	32
33 Diam. of Wheels under Tender,	33"	33"	33"	33"	33
34 Size of Tender Truck Axle Journals,	6" x 11"	6" x 11"	6" x 11"	6" x 11"	34
35 Wt. of Engine Empty, lbs.,	286500	305500	389000	343000	35
36 Wt. on Truck in Working Order, lbs.,	29600	26540	25000	28500	36
37 Wt. on 1st Pair of Drivers, lbs.,	56200	54160	70300	56400	37
38 Wt. on 2d Pair of Drivers, lbs.,	57200	55450	69000	55900	38
39 Wt. on 3d Pair of Drivers, lbs.,	62000	72560	75600	60600	39
40 Wt. on 4th Pair of Drivers, lbs.,	64800	71300	65500	59800	40
41 Wt. on Trailing Wheels, lbs.,	50900	55090	59000	58500	41
42 Wt. of Engine in Work'g Order, lbs.,	320700	335100	435000	380000	42
43 Total Wt. on Drivers, lbs.,	240200	253470	351000	293000	43
44 Wt. of Tender Loaded, lbs.,	182400	191300	207000	207760	44
45 Ratio of Heat'g Surf. to Grate Surface,	82.87	82.85	88.35	85.0	45
46 Ratio of Ext'l Flue Heating Surface to Fire Box Heating Surface, }	17.30	15.62	15.75	16.48	46
47 Heat. Surf. + Wt. one Cyl'd Steam	1195.58				47
48 Grate Area + Wt. one Cyl'd Steam,	14.51				48
49 Tractive Power per lb. of M.E. Press.,	352.74	352.74	464.85	458.2	49
50 Tractive Power with M. E. Pressure equal to 85% of Boiler Pressure, }	61465	61465	85000	74000	50
51 Ratio Wt. on Drivers to Tract. Pow.,	3.91	4.12	4.13	3.96	51
52 Height of Deck Plate,	66 1/2"				52
53 Wt. on 5th Pair of Drivers.			70600	60390	53

CLASSIFICATION.		CC 1 s	L. W. CC 2 s			HO 1 s	HH 1 s	
1	No. of Pairs of Driving Wheels,	8	8			8	8	1
2	Diam. of Driving Wheels,	50"	51"			62"	56"	2
3	Size of Driving Axle Journals	$10\frac{1}{4}" \times 13\frac{1}{2}"$	$10\frac{1}{4}" \times 14\frac{1}{2}"$			$12\frac{1}{2}" \times 14\frac{1}{2}"$	$10\frac{1}{2}" \times 12\frac{1}{2}"$	3
4	Length of Driving Wheel Base,	$15' 0" \times 8' 6"$ $\times 15' 0"$	$14' 8" \times 10' 14"$ $\times 14' 8"$			$17' 1\frac{1}{4}" \times 10' 11\frac{1}{4}"$ $\times 17' 1\frac{1}{4}"$	$15' 6" \times 10' 10"$ $\times 15' 6"$	4
5	Total Wheel Base of Engine,	39' 6"	40' 1 $\frac{1}{2}$ "			54' 8 $\frac{1}{2}$ "	57' 5"	5
6	Total Wheel Base of Eng. & Tender,	73' 10 $\frac{1}{2}$ "	79' 5 $\frac{1}{2}$ "			97' 3 $\frac{1}{2}$ "	88' 2"	6
7	No. of Wheels in Engine Truck,					2	2	7
8	Diam. of Wheels in Engine Truck,					33"	30"	8
9	Size of Engine Truck Axle Journals,					6 $\frac{1}{2}" \times 12"$	5 $\frac{1}{2}" \times 12"$	9
10	Diameter of Trailing Wheels,						30"	10
11	Size of Trailing Axle Journal,						5 $\frac{1}{2}" \times 12"$	11
12	Spread of Cylinders,	84"	88"			91 $\frac{1}{2}"$	86"	12
13	Size of Cylinders,	$25\frac{1}{2}" \times 80"$ $29\frac{1}{2}" \times 80"$	40" x 28"			30 $\frac{1}{2}" \times 32"$	27" x 28"	13
14	Steam Ports,						1 $\frac{1}{2}"$ wide.	14
15	Exhaust Ports,							15
16	Travel of Valve,					6"	6"	16
17	Lap of Valve,					2"	1"	17
18	Type of Valve,		H. P.—Piston L. P.—D			12" Piston	14" Piston	18
19	Type of Valve Gear,		Wals'h't			Wals'h't	Wals'h't	19
20	Type of Boiler,		Round Top			Belapale Wide Fire Box	Round Top	20
21	Min. Internal Diam. Boiler,	82 $\frac{1}{2}"$				83 $\frac{1}{2}"$	86"	21
22	Number of Tubes,	259, 36, 144	209, 52, 208			137, 284, 568	282, 45, 180	22
23	Outside Diam. of Tubes,	2 $\frac{1}{2}"$, 5 $\frac{1}{2}"$	2 $\frac{1}{2}"$, 5 $\frac{1}{2}"$, 1 $\frac{1}{2}"$			2 $\frac{1}{2}"$, 3 $\frac{1}{2}"$, 1 $\frac{1}{2}"$	2 $\frac{1}{2}"$, 5 $\frac{1}{2}"$, 1 $\frac{1}{2}"$	23
24	Length of Tubes, bet. Tube Sheets,	275"	264"			228"	296 $\frac{1}{2}"$	24
25	Fire Area through Tubes, sq. ft.,		10.15			11.50	9.85	25
26	Size of Fire Box, inside,	96" x 11 $\frac{1}{2}"$	144" x 96 $\frac{1}{2}"$			96" x 168"	144 $\frac{1}{2}" \times 96\frac{1}{2}"$	26
27	Fire Grate Area, sq. ft.	78	96.25			112	96.5	27
28	Ext. Heating Surface of Tubes, sq. ft.,	4819 1876	4888 1428			4151 1111	5717 1464	28
29	Heating Surface of Fire Box, sq. ft.,	237	378			531	404.0	29
30	Total Heating Surface of Boiler, sq. ft.,	6931.0	7472			11360	8525	30
31	Steam Pressure per square inch, lbs.,	205	225			205	160	31
32	No. of Wheels under Tender,	8	8			8	8	32
33	Diam. of Wheels under Tender,	33"	33"			33	33"	33
34	Size of Tender Truck Axle Journals,	6" x 11"	6" x 11"			6" x 11"	6" x 11"	34
35	Wt. of Engine Empty, lbs.,	359100					425700	35
36	Wt. on Truck in Working Order, lbs.,						22500	36
37	Wt. on 1st Pair of Drivers, lbs.,	45900					53500	37
38	Wt. on 2d Pair of Drivers, lbs.,	52000					55000	38
39	Wt. on 3d Pair of Drivers, lbs.,	54800					56000	39
40	Wt. on 4th Pair of Drivers, lbs.,	53500					52000	40
41	Wt. on Trailing Wheels, lbs.,						22500	41
42	Wt. of Engine in Work'g Order, lbs.,	408700					482500	42
43	Total Wt. on Drivers, lbs.,	408700					437500	43
44	Wt. of Tender Loaded, lbs.,	189400	207760			219000	186400	44
45	Ratio of Heat'g Surf. to Grate Surface,	88.86	77.63				88.34	45
46	Ratio of Ext'l Flue Heating Surface } to Fire Box Heating Surface, }	28.24	18.53				20.10	46
47	Heat. Surf. + Wt. one Cyl'd Steam,							47
48	Grate Area + Wt. one Cyl'd Steam,							48
49	Tractive Power per lb. of M.E. Press.,		523				729	49
50	Tractive Power with M. E. Pressure } equal to 85% of Boiler Pressure, }	91000	100000			130500 @	99144	50
51	Ratio Wt. on Drivers to Tract. Pow.,	4.00	4.66				4.41	51
52	Height of Deck Plate,					83"	84 $\frac{1}{2}"$	52
53	Wt. on 5th Pair of Drivers, lbs.,	49600					52000	53
54	Wt. on 6th Pair of Drivers, lbs.,	52500					53000	54
55	Wt. on 7th Pair of Drivers, lbs.,	51600					63500	55
56	Wt. on 8th Pair of Drivers, lbs.,	48000					52500	56

ELECTRIC LOCOMOTIVES

	CLASSIFICATION.	DD 1	10001 Grand	10002 Gearless	3998—3999	FF 1		
1	No. of Pairs of Driving Wheels,	4	4	4	4	6		
2	Diam. of Driving Wheels,	72"	56"	56"	68"	72"		
3	Size of Driving Axle Journals,	10" x 13½"	6" x 11½"	6" x 11½"	10" x 13½"	11" x 15"		
4	Length of Driving Wheel Base,	24' 1"	26' 1"	26' 1"	24' 1"	32' 8"		
5	Total Wheel Base of Engine,	55' 11"	26' 1"	28' 1"	55' 11"	67' 11"		
6	Height of Center of Gravity of Engine,		45½"	42½"				
7	Total Height of Loco. Cab,	13' 1½"	13' 4"	13' 4"	13' 1"	14' 8"		
8	Total Width of Loco. Cab,	10' 8½"	10' 1½"	10' 1½"	10' 8½"	10' 1"		
9	Total Height of Loco.,	14' 8½"	14' 6½"	14' 6½"	14' 8½"	15' 6"		
10	Method of Transmitting Power,	Through Jack Shaft	Through Gears	Through Spiders & Helical Springs	Through Jack Shaft	Through Gears and Jack Shaft		10
11	Type of Motor,	D. C.	D. C.	D. C.	D. C.	Three Phase		11
12	Number of Motors,	2	4	4	2	4		12
13	Horse Power of Motors, Normal,	1000 each	330 each	2-330 2-200	1000 each	1000 each		13
14	Horse Power of Motors, Maximum,	2000 each			2000 each	1200 each		14
15	Voltage of Motors,	650			650	850		15
16	Type of Motor Control,	Electro Pneumatic	Electro Pneumatic	Electro Pneumatic	Electro Pneumatic	Electro-Pneumatic		16
17	No. of Main Field Poles in each Mot.	10			10	6		17
18	No. of Inner Poles in each Motor,	10			10			18
19	No. of Brush Holders in each Motor,	10			10			19
20	Size of Air Gap bet. Armature & Pole Piece	½"			½"			20
21	Diam. of Motor Armature,	4' 8"			4' 8"			21
22	No. of Master Controllers per Loco.,	2	2	2	2	2		22
23	No. of Air Compressors, per Loco.,	2	2	2	2	2		23
24	Type of Air Compressors,	C-60 2-Stage			C-60 2-Stage	Vertical Compound		24
25	H. P. of Air Compressor Motor,	15 E. H. P.			15 E. H. P.	32		25
26	Voltage of Air Compressor Motor,	650			650			26
27	Current Collecting Devices,	Third Rail Shoes & Over Head Collect.	Third Rail Shoes & Over Head Collect.	Third Rail Shoes & Over Head Collect.	Third Rail Shoes & Over Head Collect.	Pantograph		27
28	Gear Ratio,		32 to 60			5 to 1		28
29	Length from Ins. to Ins. Pull Knuckle,	64' 11"	37' 10½"	37' 10½"	64' 11"	76' 6½"		29
30	Length of Rigid Wheel Base,	7' 2"	8' 6"	8' 6"	7' 2"	13' 4"		30
31								31
32								32
33								33
34								34
35								35
36	Wt. on Truck in Working Order,	57000			62000			36
37	Wt. on 1st Pair of Drivers, lbs.,	49750	49700	51090	52000			37
38	Wt. on 2nd Pair of Drivers, lbs.,	49750	40700	47950	52000			38
39	Wt. on 3rd Pair of Drivers, lbs.,	49750	40700	45180	52000			39
40	Wt. on 4th Pair of Drivers, lbs.,	49750	49700	50920	52000			40
41								41
42	Wt. of Engine in Work'g Order, lbs.,	318000	180800	195140	332000			42
43	Wt. on Drivers, lbs.,	199000	180800	195140	208000			43
44								44
45								45
46								46
47								47
48								48
49								49
50	Tractive Power, lbs.,	66000			66000			50
51	Ratio of Wt. on Driv's to Trac. Pow.	3.00			3.15			51
52								52