

Comparative dimensions of the Locomotives used on the Rhodesia Railways and National Railways of Zimbabwe

Notes to readers

The source documents for this file were held in the National Railways of Zimbabwe Drawing Office in Bulawayo. They were discovered, in March 1998, while I was helping with searching for a complete set of drawings of the 15th Class locomotives after No. 398 had been purchased by a private group in New Zealand for eventual export to that country.

The original documents were ink on linen tracings. These were photocopied (with permission), and slightly reduced to A4 size while in the Drawing Office, and the photocopies scanned once we were back in New Zealand.

The scanned files have been lightly “Photoshopped” to remove most of the artefacts resulting from the photocopying and scanning processes and to increase the contrast to make them more readable.

Any alterations, amendments or corrections done by hand on the original tracing have been left in place and this file is an accurate reproduction of the originals.

It will be noted that as locomotive classes were removed from service their entry in the Index was crossed out.

It will also be noted that the Index appears not to have been updated after the late 1970's and does not contain any details of the electric locomotives used on the electrified line south of Harare.

Alan Bailey
December 2010

COMPARATIVE DIMENSIONS OF LOCOMOTIVES—STRAIGHTS.

SHEET I

CLASS	ENGINE NUMBERS	CYLINDER		COUPLED WHEEL DIAMETER	WEIGHT IN WKG. ORDER		BOILER PRESSURE LB. /sq. IN.	TRACTION FORCE LB.	FACTOR OF ADHESION	% BRAKE POWER. ENG. & TEN.	TENDER CAPACITY.		TOTAL HEATING SURFACE SQ. FT.	BOILER I.H.P.	GRATE AREA. (SQ. FT.)	LENGTH OVER BUFFERS.	FIREBAR SPACING.
		DIA.	STROKE		TOTAL ENG. & TEN.	COUPLED WHEELS.					COAL (TONS)	WATER (GALLONS)					
SMALL	7	16"	22"	3'-6 3/4"	19-05	19-05	140	32 kN 7160	5-34		12 cwt.	500	350	150-5	5	22'-10"	
SMALL	1 & 2.	16"	22"	3'-6 3/4"	36	36	180	79 kN 17,785	4-534	60-11	1	700	613	263-6	13-5	27'-9"	
6TH	5, 7, 11 & 13	17"	23"	3'-6 3/4"	59-5	40-25	160	83 kN 18,660	4-63	58-42	3 1/2	1460	1088	467-9	17-5	37'-11"	5/8"
7TH	72, 25, 34, 43, 49	17"	23"	3'-6 3/4"	83	37-75	160	83 kN 18,660	4-531	43-35	6	2600	1088	467-9	17-5	54'-0 3/4"	5/8"
8TH	60	19"	24"	4'-0"	90-3	46-55	180	108 kN 24,370	4-28	42-62	6	3000	1314	565	21-35	54'-0 7/8"	1/16"
9TH	91, 93, 94, 96 107, 109, & 112.	20"	24"	4'-0"	108-05	51-35	175	132 kN 29,750	3-866	37-72	8 1/2	3000	1580-7	707-9	31-2	57'-8"	5/8"
9A.	117, 119, 120 & 122.	20"	24"	4'-0"	111-25	50-75	175	132 kN 29,750	3-82	46-08	9 1/2	4000	1549	732-4	32-25	60'-6 3/4"	1/16"
9B.	80-84, 86-90, 92, 95, 97, 105, 106, 108, 110, 111, 113-116, 107, 99, 94.	20"	24"	4'-0"	112-65	50-5	180	136 kN 30,600	3-699	36-97	8 1/2	4000	1754-62	767-2	36-42	57'-8"	1/16"
10TH	98-100	20"	26"	4'-6"	120-3	52	180	131 kN 29,466	3-955	31-6	8 1/2	3500	2015	870-4	32	64'-3 7/8"	1/16"
I	154-159	20"	26"	4'-6"	129-7	51-85	180	131 kN 29,466	3-944	32-55	9 1/2	4500	2015	870-4	32	69'-1 1/4"	1/16"
I	242-246	20"	26"	4'-6"	130-15	52	180	131 kN 29,466	3-054	32-5	9 1/2	4500	2035	881-6	32	69'-0"	1/16"
11TH	123, 129, 130, 140.	22 1/2"	24"	4'-0"	126-32	52-58	180	155 kN 37,020 34,952.	3-181 3-37	44-32	9 1/2	4000	2845	1290	35-2	65'-5"	1/16"
"	141-152.	22 1/2"	24"	4'-0"	127-68	52-58	180	155 kN 37,020 34,952.	3-181 3-37	42-9	9 1/2	4000	2845	1290	35-2	65'-4 3/4"	1/16"
11A.	304-315	21"	24"	4'-0"	132-72	54-08	200 180	150 kN 37,485 33,737	3-232 3-59	44-52	9 1/2	4500	2885	1309	36-38	68'-11"	1/16"
12TH	172-197, 199-211 214.	20"	26"	4'-3"	131-37	53-04	190	147 kN 32,940	3-607	39-21	10	4250	2379	1150	32-5	65'-9"	1/16"
"	247-258	20"	26"	4'-3"	131-47	53-04	190	147 kN 32,940	3-607	39-21	10	4250	2379	1150	32-5	65'-9"	1/16"
12A.	198, 212, 213	20"	26"	4'-3"	137-8	54-75	190	147 kN 32,940	3-723	37-92	12 1/4	4250	2885	1309	36-38	65'-0" 66'-0"	1/16"

NOTE: TRACTIVE EFFORT BASED ON 75% FOR SATURATED & 85% FOR SUPERHEATED ENGINES.
BRAKE POWER % BASED ON TOTAL WEIGHT OF ENGINE & TENDER IN FULL WORKING ORDER.

MEB (8) 2-12-53
R.M.(N.W) 2 23-9-61

D.T. POOLE (APRIL '49)

CLASS	ENGINE NUMBERS	CYLINDER.		COUPLED WHEEL DIAMETER	WT. IN WORKING ORDER		BOILER PRESSURE LB / 0"	TRACTIVE FORCE LB	FACTOR OF ADHESION	% BRAKE POWER. ENG. & TEN.	TENDER CAPACITY		TOTAL HEATING SURFACE, Sq. Ft.	BOILER I.H.P.	GRATE AREA (SQ. FT.)	LENGTH OVER BUFFERS.	FIREBAR SPACING.	
		DIA.	STROKE		TOTAL ENG. & TEN.	COUPLED WHEELS.					COAL (TONS)	WATER (GALLONS)						
12B	260-269	21" 20"	26"	4'-3"	136	55.4	190	^{147 KN} 36,509 32,940	3.74 3.77	38.33	10 1/2	4,595	2,885	1,309	36-38	66'-0"	1 1/16"	
19	316-335	21"	26"	4'-6"	157.03	53.12	200	^{161 KN} 36,090	3.297	40.81	12	6,500	2,237	1,052.	36	86'-8 5/8"	1"	
19	(CONDENSING LOCO) 336	"	"	"	157.63 165.74	53.12 55.74	"	"	3.297 3.46	41.61 39.31	10 ¹²	3,750 ^{2,300}	"	"	"	89'-0 7/8"	1"	
19B	337-338	"	"	"	131.01	54.0	"	"	3.35	36.5	7 3/4	4,850	"	"	"	67'-11 5/8"	1"	
15E	881, 882, 883 885, 886, 898	24"	28"	5'-0"	177.0	72.0	210	^{213 KN} 47,883	3.38		14	6,000	4,076	1,938	63	73'-6"		

MEB (8) 2-12-58

MEB (8) 2-12-58

COMPARATIVE DIMENSIONS OF LOCOMOTIVES-GARRATTS.

SHEET I

CLASS	ENGINE NUMBER.	CYLINDER.		COUPLED WHEEL DIAMETER	WEIGHT IN W/KG. ORDER		BOILER PRESSURE LB _s /Q ²	TRACTION FORCE LB	FACTOR OF ADHESION.	% BRAKE POWER. ENG. & TEN.	TENDER CAPACITY.		TOTAL HEATING SURFACES Q. FT.	BOILER I.H.P.	GRATE AREA. (SQ. FT.)	LENGTH OVER BUFFERS.	FIREBAR SPACING.
		DIA.	STROKE		TOTAL ENG. & TEN.	COUPLED WHEELS.					COAL. (TONS)	WATER. (GALLONS)					
13 TH	160-161, 164, 165 166-171, 768, 768	16"	24"	4'-0"	122-15	7755	180	174 kN 39,168	4.435	71.07	7	4350	2220	1049	38.8	67'-7 1/2"	7/8"
14 TH	233-240 500-507.	16"	24"	4'-0"	125-35	8079	180	174 kN 39,168	4.62	58.41	7	3600	2230	1054	38.8	71'-0 1/2"	7/8"
15 TH	350-353	17 1/2"	26"	4'-9"	181.23	81.69	180	190 kN 42,750	4.281	58.87	10 1/2	7000	2830	1331	49.5	92'-4"	7/8"
"	354-363	17 1/2"	26"	4'-9"	183-57	83-04	180	190 kN 42,750	4.351	49.38	12 1/2	7000	2879	1359	49.6	92'-4"	7/8"
"	364-383	17 1/2"	26"	4'-9"	186-74	88-14	180	190 kN 42,750	4.618	46.5	12 1/2	7000	2,879	1,359	49.6	92'-4"	7/8"
15A	384-413	17 1/2"	26"	4'-9"	186-74	88-14	200	211 kN 47,496	4.157	50.69	12 1/2	7000	2,879	1,359	49.6	92'-4"	7/8"
15A	414-423	17 1/2"	26"	4'-9"	186-74	88-14	200	211 kN 47,496	4.157	50.69	12 1/2	7000	2,879	1,359	49.6	92'-4"	7/8"
16TH	600-604, 609, 611, 612, 623, 730, 738, 613, 614, etc.	18 1/2"	24"	4'-0"	155-15	109	180	233 kN 52,364	4.66	58.2	8 1/2 11	5190	2818	1332	49.5	81'-8"	7/8"
16A	620-649 648	18 1/2"	24"	4'-0"	169-18	117-12	200	259 kN 58,183	4.51	43.9	11 3/4	5600 5000	2837	1,336	49.6	82'-5"	7/8"
17 TH	271-280	16 3/4"	26"	4'-9"	166-1	83-16	190	184 kN 41,336	4.505	46.19	12 1/2	6900 7000	2400	1,117	43.2	88-11 1/4"	7/8"
18TH	281-289	19"	24"	3'-0 1/2"	151-75	103-65	180	259 kN 58,266	3.983	56.67	9	4600	3010	1418	51.3	79'-6 1/2"	7/8"
14A	508-525	16"	24"	4'-0"	131-67	81-13	180	174 kN 39,170	4.64	41.04	7	3600	2215	1049	38.6	72'-6"	7/8"
20 TH	700-714 701-720	20"	26"	4'-3"	223-388	135-712	200	308 kN 69,333	4.39	51.28	14	8000	3772	1724	63.1	95'-0 1/2"	WAUGH GRATE.
20A	721-729 721-733, 739 731-733	20"	26"	4'-3"	225-497	136-8	200	308 kN 69,333	4.419	50.86	14	8,000	3772	1724	63.1	95'-2 1/2"	WAUGH GRATE.

NOTE: TRACTIVE EFFORT BASED ON 75% FOR SATURATED & 85% FOR SUPERHEATED ENGINES.
BRAKE POWER, % BASED ON TOTAL WEIGHT OF ENGINE & TENDER IN FULL WORKING ORDER.

COMPARATIVE DIMENSIONS OF LOCOMOTIVES - DIESELS.

SHEET 1.

CLASS	LOCO NOS	ENGINE DETAILS.				TOTAL B.H.P.	CONTINUOUS TRACTION EFFORT.	RATED AT SPEED	BRAKE POWER (TONS)	% BRAKE POWER	FUEL OIL GALLS	COOLING WATER GALLS	WHEEL ARRGT.	DRIVING WHEEL DIA.	WEIGHT IN WKG ORDER	
		TYPE	CYL. BORE	STROKE	R.P.M.										DRIVING WHEELS	TOTAL.
DE.1	0101 - 0106 1000-1005	(2) V-12 CYL.	5 3/4" DIA.	8"	1200.	920.	7,94 Tonne 77,84 kN.	15 m.p.h. 24,14 km/h.	21.4.	28.2.	541. 2460 L	83.35.	Co-Co.	3'-0"	75.893.	75.893.
DE.2.	1200 - 1222. 1209, 1213 SCRAPPED.	V-16 CYL.	10" DIA.	12"	850.	1,710.	16,33 Tonne 160,13 kN.	13,6 m.p.h. 21,89 km/h.	76.5.	67.75.	1000. 4550 L	265.	1Co-Col.	3'-1 1/2"	90.00.	113.0.
DE.2.	1223 - 1234.	V-16 CYL.	10" DIA.	12"	850.	1,710.	16,33 Tonne 160,13 kN.	13,6 m.p.h. 21,89 km/h.	76.5.	67.75.	1,000. 4550 L	265.	1Co-Col.	3'-1 1/2"	90.0.	113.0.
DE.3	1300 - 1315.	V-12 CYL.	10" DIA.	12"	850.	1,850.	18,14 Tonne 177,9 kN.	13 m.p.h. 20,92 km/h.	71.58.	81,8 55.4.	1,000. 4550 L	227.	1Co-Col.	3'-1 1/2"	87.5.	110.18.
DE.4	1400 - 1413.	V-8 CYL V-12 CYL.	254 mm 9 3/4" DIA.	309,8 mm 12 1/2"	900 1000.	1780 kW 1750.	16,78 Tonne 164,7 kN.	13,6 m.p.h. 21,8 km/h.	79,6 78.7 TONNES	85.5.	1,000. 4550 L	810 216 LITRES	Co-Co.	1016 mm 3'-4"	93,095 92.0 TONNES	93,095 92.0 TONNES
DE.5	1501 1500 - 1534 1500 SCRAPPED	V-12 CYL.	230 mm	230 mm	1500	2250	25 Tonne 245,15 kN.	11,18 m.p.h. 18 km/h.	93.27 TONNES	90,5	5400 LITRES	550 LITRES	Co-Co	1016 mm (3'-4")	103 Tonnes	103 Tonnes.
DE.6	1600 - 1609.	V-12 CYL.	9" DIA.	10 1/2"	1000.	2,090.	21,45 Tonne 210,92 kN.	12,0 m.p.h. 19,3 km/h.	71.44.	80.	956. 4530 L	187.	Co-Co.	3'-0"	89.1.	89.1.
DE.7	1700 - 1711	V-12 CYL.	190 mm	220 mm	1400	1070 (MET)	11,7 Tonne 114,75 kN.	10,63 m.p.h. 17,1 km/h.	46,1 TONNES	88,6	2280 LITRES	545 LITRES	Bo-Bo	1000 mm	52 Tonnes	52 Tonnes
DE.7	1713 1712 - 1735 1714	V-12 CYL	190 mm	220 mm	1400	1070 (MET)	11,7 Tonne 114,75 kN.	10,63 m.p.h. 17,1 km/h.	46 TONNES	82,2	2280 LITRES	545 LITRES	Bo-Bo	1000 mm	56 Tonnes	56 Tonnes
DE.8	1800 - 1863 8A, 8B SCRAPPED 1825, 1831, 1853	V-16 CYL.	200 mm	210 mm	1500	2500	25,5 Tonne 250 kN.	11,8 m.p.h. 19 km/h.	78,8 78,8 TONNES	65,67-88A 77,25-88	6030 LITRES	910 LITRES	Co-Co	1050 mm	120 (102-88) TONNES.	120 (102-88) TONNES.
DE.9	1900 - 1919	V-12 CYL	6 1/4" DIA	8"	1300	1050	13,5 Tonne 132,38 kN.	9,32 m.p.h. 15 km/h.	45,73 TONNES	81,37	2270 LITRES	455 LITRES	Bo-Bo	965 mm (3'-2")	56.2 Tonnes	56.2 Tonnes
DE.9A	1920 - 1963	V-8 CYL	200 mm	210 mm	1500	720 kW	13,56 Tonne 132,97 kN.	10,87 m.p.h. 17,5 km/h.	45,73 TONNES	74,73	1880 LITRES	420 LITRES	Bo-Bo	965 mm	61,2 Tonnes	61,2 Tonnes.
DE.10A	1001 - 1061	V-12 CYL	230 mm	254 mm	900	1680 kW	21,00 Tonne 206,1 kN.	13,75 m.p.h. 22 km/h.	70,13 TONNES	74,3	6060 LITRES	760 LITRES	Co-Co	965 mm	94,35 TONNES	94,35 TONNES
DH.1	3101 - 3106	2 X V6 CYL 2 STROKE	8 1/2" DIA.	10"	835	1316	20,11 Tonne 197,2 kN.	6 m.p.h. 9,6 km/h.	57.0	77	600 2730 L		Bo-Bo	3'-5 1/2"	73.5	73.5
DH.2A	3201 - 3208	V8 CYL	160 mm	190 mm	1400	301 kW	11,42 Tonne 112 kN.	2,8 m.p.h. 4,5 km/h.	40,50 TONNES	80,2	1600 LITRES	240 LITRES	Co	1000 mm	50,5 Tonnes	50,5 Tonnes.

C.L. DUBUISSON, JUNE '67

6/21/67