

TABLE I.—GRADE RATINGS OF DENVER AND RIO GRANDE RAILWAY LOCOMOTIVES FROM ACTUAL PRACTICE AND WITH RATINGS BY FORMULA INTERLINED, AND RATINGS BY FORMULA FOR NEW ZEALAND TYPE B AND PROPOSED 85-TON ENGINE.

Grade	{ Per cent. Feet per Mile (1 in x —	Level	0.5 26.4 1 in 200	0.8 42.3 1 in 125	1.0 52.8 1 in 100	1.5 79.2 1 in 66.7	1.74 91.9 1 in 57.5	2.0 105.6 1 in 50	2.4 126.8 1 in 41.7	2.7 142.6 1 in 37	3.0 158.4 1 in 33.3	3.125 165.0 1 in 32	3.5 184.8 1 in 28.6	3.57 188.50 1 in 28	4.0 211.2 1 in 25	4.55 240.20 1 in 22	5.0 264.0 1 in 20	—	Remarks.							
Resistance 6.58																										
Type.	Total Tons.	Weight on Drivers.	Adhe- sion.																	118.5	108.5	96.1	118.5	80 122	67 104	New Zealand. New Zealand.
100	91	108,600	24,420	{ 3,619 3,254	1,284 1,279	905 919	752 767	517 532	385 397	313 324	241 248	..	197 202	..	163 175	..	..	..	Formula. D. and R. G.							
200	110	122,200	27,500	{ 4,065 3,417	1,438 1,294	1,010 949	838 790	574 543	426 401	336 325	264 244	..	214 196	..	176 160	..	..	..	Formula. D. and R. G.							
300	129	166,400	37,430	{ 5,551 4,411	1,979 1,861	1,398 1,338	1,161 1,118	803 776	600 579	492 477	379 362	..	313 296	..	261 240	..	..	..	Formula. D. and R. G.							
400	134	164,425	37,000	{ 5,486 4,858	1,946 2,058	1,376 1,484	1,141 1,242	786 867	586 651	479 537	368 412	..	302 340	..	251 278	..	163 190	..	Formula. D. and R. G.							
500	107	123,300	27,750	{ 4,092 3,598	1,444 1,399	1,024 999	838 832	572 572	422 422	342 351	259 258	..	209 207	..	170 168	..	..	..	Formula. D. and R. G.							
600	128	168,000	37,800	{ 5,622 5,077	1,997 1,994	1,412 1,434	1,173 1,199	812 835	607 625	498 512	385 393	..	316 324	..	265 267	..	..	..	Formula. D. and R. G.							
700	138	177,000	39,800	{ 6,040 5,192	2,102 2,037	1,485 1,464	1,233 1,224	852 851	637 636	522 521	403 400	..	331 328	..	276 269	..	..	..	Formula. D. and R. G.							
B	65	70,112	15,790	..	..	..	..	278	238	..	187	..	..	118	98	80	67	..	D. and R. G.							
85-ton	85	100,000	22,500	..	..	..	..	409	353	..	251	209	..	177	150	122	104	..	New Zealand.							

The only material differences between the ratings by actual practice and the formula are in type 400, and in these the results by formula are on the safe side.