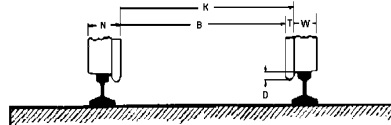


NMRA Standard S-4.1, Wheels, Proto and Fine Scales

Original S4.1 approved 2004 had editing errors based on improper display of hidden precision values and in the calculation of metric conversion values.

Wheels	
Proto and Fine Scales	
Edit Correction Update BOD Approved Jan 2006	S-4.1



S-4.1 PROTO Wheels		K		B		N		T		D		WHEEL GAGE	
		Wheel Check Gage		Back to Back		Wheel Width		Flange Width		Flange Depth			
		Min	Max	Min	Max	Min	Max	Min	Max	Min	Max		
Proto:20.32	Inch	2.654	2.681	2.597	2.627	0.271	0.282	0.057	0.067	0.050	0.062	2.711	2.761
	mm	67.41	68.10	65.96	66.73	6.88	7.16	1.45	1.70	1.27	1.57	68.86	70.13
Proto:20.32n3	Inch	1.645	1.672	1.588	1.618	0.271	0.282	0.057	0.067	0.050	0.062	1.702	1.752
	mm	41.78	42.47	40.34	41.10	6.88	7.16	1.45	1.70	1.27	1.57	43.23	44.50
Proto:32	Inch	1.685	1.702	1.649	1.668	0.172	0.180	0.036	0.042	0.032	0.039	1.721	1.752
	mm	42.80	43.23	41.88	42.37	4.37	4.57	0.91	1.07	0.81	0.99	43.71	44.50
Proto:32n3	Inch	1.045	1.062	1.009	1.027	0.172	0.180	0.036	0.042	0.032	0.039	1.081	1.111
	mm	26.54	26.97	25.63	26.09	4.37	4.57	0.91	1.07	0.81	0.99	27.46	28.22
Proto:48	Inch	1.124	1.134	1.100	1.112	0.115	0.120	0.024	0.028	0.022	0.026	1.148	1.168
	mm	28.55	28.80	27.94	28.24	2.92	3.05	0.61	0.71	0.56	0.66	29.16	29.67
Proto:48n3	Inch	0.697	0.707	0.673	0.685	0.115	0.120	0.024	0.028	0.022	0.026	0.721	0.741
	mm	17.70	17.96	17.09	17.40	2.92	3.05	0.61	0.71	0.56	0.66	18.31	18.82
Proto:64	Inch	0.842	0.850	0.825	0.834	0.087	0.092	0.017	0.019	0.018	0.020	0.859	0.872
	mm	21.39	21.59	20.96	21.18	2.21	2.34	0.43	0.48	0.46	0.51	21.82	22.15
Proto:64n3	Inch	0.522	0.529	0.505	0.514	0.087	0.092	0.017	0.019	0.018	0.020	0.539	0.552
	mm	13.26	13.44	12.83	13.06	2.21	2.34	0.43	0.48	0.46	0.51	13.69	14.02
Proto:87.1	Inch	0.621	0.624	0.607	0.613	0.064	0.069	0.012	0.014	0.013	0.014	0.631	0.641
	mm	15.77	15.85	15.42	15.57	1.63	1.75	0.30	0.36	0.33	0.36	16.03	16.28
Proto:87.1n3	Inch	0.383	0.388	0.371	0.378	0.064	0.069	0.012	0.014	0.013	0.014	0.395	0.406
	mm	9.73	9.86	9.42	9.60	1.63	1.75	0.30	0.36	0.33	0.36	10.03	10.31

Fine Scale Options							
Name of Scale		K	B	N	T	D	WHEEL GAGE note 5
		Wheel Check Gage	Back to Back	Wheel Width	Flange Width	Flange Depth	
		Max	Min	Min	Max	Max	
Fine:HO	Inch	0.613	0.581	0.086	0.025	0.023	0.638
	mm	15.6	14.8	2.2	0.6	0.6	16.2
Fine:HO n3	Inch	0.377	0.345	0.086	0.025	0.023	0.402
	mm	9.6	8.8	2.2	0.6	0.6	10.2
Fine:TT	Inch	0.441	0.415	0.071	0.020	0.022	0.461
	mm	11.2	10.5	1.8	0.5	0.6	11.7
Fine:TT n3	Inch	0.270	0.244	0.071	0.020	0.022	0.290
	mm	6.9	6.2	1.8	0.5	0.6	7.4
Fine:N	Inch	0.336	0.323	0.051	0.013	0.017	0.349
	mm	8.5	8.2	1.3	0.3	0.4	8.9
Fine:N n3	Inch	0.228	0.215	0.051	0.013	0.017	0.241
	mm	5.8	5.5	1.3	0.3	0.4	0.3

NOTES:

1. See Tech-Note TN-1.1.2 (Proto and Fine) for a more detail on the Proto Scale dimensions and issues related to building in Proto and Fine Scale.
2. Options of Proto:Scale wheel profiles are provided in the Tech Note.
3. Tread Taper is 1:20 for all profiles.
4. Tread Taper and Fillet Radius are not optional – but are required for Proto:Scales.
5. Wheel Gage is from facing flange gage point to facing flange gage point (K+T).