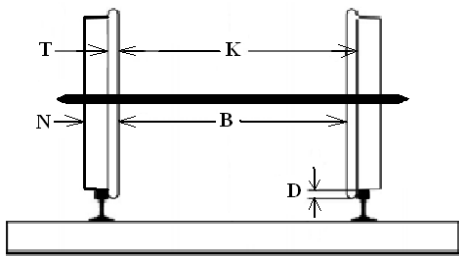


NMRA STANDARDS
S-4.3 STANDARDS, WHEELS WITH DEEP FLANGES



NMRA STANDARD	
Standards	
Wheels with Deep Flanges	
July 2009	S-4.3

Back-to-Back, B, is derived by knowing $B = K - T$. K is the primary controlling dimension.

Scales with deep flanges were developed to accommodate the needs of modelers who wish to operate model trains on very sharp curves or on track that has twists which is common in outdoor environments. Compromises are often made to both selectively compress the model and/or develop mechanisms that have the ability to navigate very sharp curves. In general models in this class use wheels with larger flanges and usually use track with a larger code size.

Scale	Scale Ratio		Standard S4.3 Deep Flange Wheels using Target and Asymmetric Tolerance									
			K			B			N	D	T	
			Wheel Check Gage			Back-to-Back			Width	Depth	Flange Width	
			Target	Plus	Minus	Target	Plus	Minus	Min	Max	Nom	Tol +/-
LS	Varied	Inch	1.634	0.002	0.002	1.576	0.002	0.002	0.234	0.090	0.058	0.002
		mm	41.50	0.05	0.05	40.03	0.05	0.05	5.94	2.29	1.47	0.05
O _{df}	1:48	Inch	1.153	0.003	0.005	1.090	0.003	0.005	0.275	0.095	0.063	0.002
		mm	29.29	0.08	0.13	27.69	0.08	0.13	6.99	2.41	1.60	0.05
O ₂₇	1:48	Inch	1.153	0.003	0.005	1.090	0.003	0.005	0.275	0.095	0.063	0.002
		mm	29.29	0.08	0.13	27.69	0.08	0.13	6.99	2.41	1.60	0.05
S _{df}	1:64	Inch	0.774	0.003	0.004	0.709	0.003	0.004	0.172	0.095	0.065	0.002
		mm	19.66	0.08	0.10	18.01	0.08	0.10	4.37	2.41	1.65	0.05
HO _{df}	1:87	Inch	0.602	0.002	0.004	0.567	0.002	0.004	0.110	0.047	0.035	0.002
		mm	15.29	0.05	0.10	14.40	0.05	0.10	2.79	1.19	0.89	0.05
N _{df}	1:160	Inch	0.318	0.002	0.003	0.294	0.002	0.003	0.087	0.035	0.024	0.002
		mm	8.08	0.05	0.08	7.47	0.05	0.08	2.21	0.89	0.61	0.05
Z _{df}	1:220	Inch	0.228	0.002	0.003	0.210	0.002	0.003	0.061	0.024	0.018	0.002
		mm	5.79	0.05	0.08	5.33	0.05	0.08	1.55	0.61	0.46	0.05

NOTES:

1. Wheels shall have a scale reduction in tread diameter from the prototype.
2. Models built to the deep flange standards typically do not operate on track built to the S-3.1 or S.3.2 standards unless the trackwork has been built to accommodate the deeper flanges. Models built to the S-1.3 standards shall be clearly labeled in order to not confuse the modeler.
3. The term LS scale is used to refer to range of scales developed to be able to be operated together, typically in an outdoors setting, for example a garden. LS models all use the same wheel and track profiles to facilitate interchange.
4. LS (Large Scale) wheels (code 234+) follow G1MRA profile and are not presently covered under RP-25.
5. To avoid difficulty with long wheelbase locomotives in curves sharper than 20 degrees, and where guard rails are used on both sides as in special trackwork, the following are suggested: See **RP-8**
 - Allow lateral movement in driver axles of 1 percent of the rigid wheelbase length.
 - Remove flanges from center drivers.