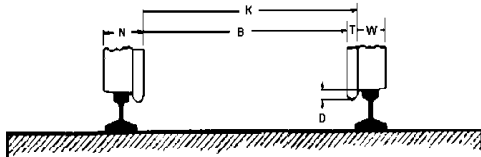




# STANDARD

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<b>Standard</b>	<b>S-4.1</b>
<b>Title</b>	<b>Wheels – Proto and Fine Scales</b>
<b>Version</b>	<b>January 2006</b>
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Original S4.1 approved 2004 had editing errors based on improper display of hidden precision values and in the calculation of metric conversion values.

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

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	Max	
<b>Fine:HO</b>	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	
<b>Fine:HO n3</b>	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	
<b>Fine:TT</b>	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	
<b>Fine:TT n3</b>	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	
<b>Fine:N</b>	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	
<b>Fine:N n3</b>	Inch	0.228	0.215	0.051	0.013	0.017	0.241	
	mm	5.8	5.5	1.3	0.3	0.4	6.1	

**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).