This Data Sheet replaces Data Sheet 1R (1990) and its Supplement (1994).

INTRODUCTION

For 14.2mm track gauge these standards are centered on the true scale dimension of 14.125mm such that pointwork should be constructed to the true gauge, in line with prototype practice. The tolerances previously quoted applied to plain track. The same principles should be observed for all track gauges.

More specific details have been included for pointwork. They demonstrate a better understanding of, and compliance with, the prototype approach and allow the fine tuning of some of the dimensions in the table overleaf. These adjustments increase clearances through pointwork and so should improve operation.

This standard now includes data for 12mm and 13.5mm track gauges using fine standard wheels. The approach described above has been adopted resulting in slight changes to the data given in Mixed Traffic 106 for 12mm gauge.

DERIVING THE STANDARDS

Whatever their scale or gauge, trains must stay on the track and operate reliably. The key to successful operation lies in the use of compatible track and wheel standards. On plain track it is fairly easy to see what is required; points and crossings, on the other hand, may at first appear rather complicated. In fact, matters may be simplified to two main principles:

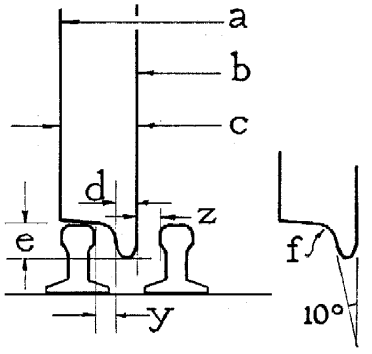
- the wheel flange must be prevented from going the wrong way at the crossing nose by a check rail;
- the wheel tread must be wide enough to be continuously supported as the wheel rolls from the knuckle of the wing rail to the crossing nose.

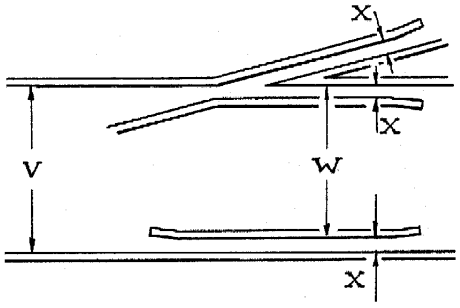
It is necessary to enlarge on these principles. The wheels must not be too wide, or coupling rods and valve gear will protrude too far. Wheel flanges must be prevented from binding on check rails and running rails. Finally, all dimensions need tolerances so that reliable operation may be enjoyed even though there may be some slight variations in accuracy of workmanship or manufacture.

All of these requirements can be summarised in six rules which govern the behaviour of a scale model's flanged wheels on track and pointwork:-

1. The maximum wheel back-to-back (b_{max}) plus the maximum wheel flange thickness (d_{max}) must not be greater than the minimum check rail gauge (w_{min}).
   $$b_{max} + d_{max} <= w_{min}$$
2. The minimum track gauge (v_{min}) minus the maximum wing rail gap (x_{max}) must not be less than the minimum check rail gauge (w_{min}).
   $$v_{min} - x_{max} >= w_{min}$$
3. Twice the maximum wing rail gap ($2x_{max}$) must not exceed the minimum wheel thickness (c_{min}). This ensures that the wheel will not drop at the common crossing (frog).
   $$2x_{max} <= c_{min}$$
4. The maximum check rail gauge (w_{max}) minus the minimum wing rail gap (x_{min}) must be less than the minimum wheel back to back (b_{min}). This ensures that wheels will not bind across check and wing rails, and establishes the inner clearances (z).
   $$w_{max} - x_{min} < b_{min}$$
5. The maximum wheel back to back (b_{max}) plus twice the maximum wheel thickness ($2c_{max}$) should not exceed the maximum outer faces dimension of 16.13mm. (prototype dimension scaled). This ensures that axleguards, splashers, outside frames, valve gear, cylinders and footsteps can be positioned to scale. If the scaled maximum outer faces dimension is exceeded, or sideplay introduced to cater for sharp curves, allowance must be made for positioning the above items.
   $$a_{max} = b_{max} + 2c_{max}$$
6. The outer clearances (between running rail faces and wheel flanges (y)) must not be reduced to nil when rail dimensions are at minimum tolerances, and wheel dimensions at maximum.
   $$v_{min} - b_{max} - 2d_{max} = y$$

The Society's recommended dimensions for track and wheels are shown in the table overleaf. It is hoped that manufacturers will produce items enabling modellers to work within these standards.





			Triang Standard		Intermediate Standard		TM Standard		Fine Standards					
	Full Size	3mm Scale	12mm gauge		12mm gauge		13.5mm gauge		12mm gauge		13.5mm gauge		14.2mm gauge	
			Dimension		Dimension		Dimension		Dimension		Dimension		Dimension	
WHEELS			Min	Max	Min	Max	Min	Max	Min	Max	Min	Max	Min	Max
a. Outer faces	5' 4½"	16.125	15.45	15.95	14.30	15.00	15.80	16.10	13.90	14.20	15.40	15.70	16.00	16.30
b. Back to back	4' 5½"	13.375	**10.10**		**10.35**		**11.85**		**10.65**		**12.15**		**12.75**	
			10.05	10.15	10.30	10.40	11.80	11.90	10.60	10.70	12.10	12.20	12.70	12.80
c. Total width	5½"-6½"	1.625	2.70	2.90	2.00	2.30	2.00	2.10	1.65	1.75	1.65	1.75	1.65	1.75
d. Flange width	1⅛"	0.28	0.65	0.75	0.40	0.60	0.40	0.50	0.30	0.40	0.30	0.40	0.30	0.40
e. Flange depth	1⅛"	0.28	0.80	1.10	0.50	0.75	0.50	0.60	0.50	0.55	0.50	0.55	0.50	0.55
f. Flange/tread radius					0.20	0.25	0.20	0.25	0.20	0.25	0.20	0.25	0.20	0.25
TRACK														
v. Gauge (plain track)	4' 8½"	14.125	12.00	12.20	12.00	12.10	13.50	13.60	12.00	12.10	13.50	13.60	14.10	14.20
v. Gauge (pointwork)	4' 8½"	14.125	**12.05**		**12.025**		**13.525**		**12.025**		**13.525**		**14.125**	
			12.00	12.10	12.00	12.05	13.50	13.55	12.00	12.05	13.50	13.55	14.10	14.15
w. Check rail gauge	4' 6¾"	13.69	**10.90**		**11.05**		**12.55**		**11.20**		**12.70**		**13.30**	
			10.85	10.95	11.00	11.10	12.50	12.60	11.15	11.25	12.65	12.75	13.25	13.35
x. Check rail gap	1¾"	0.44	**1.10**		**0.95**		**0.95**		**0.80**		**0.80**		**0.80**	
			1.00	1.15	0.90	1.00	0.90	1.00	0.75	0.85	0.75	0.85	0.75	0.85
y. Outer clearance	⅞"	0.22	0.35	0.85	0.40	1.00	0.60	1.00	0.50	0.85	0.50	0.85	0.50	0.85
z. Inner clearance	½"	0.125	0.10	0.45	0.10	0.40	0.10	0.40	0.10	0.40	0.10	0.40	0.10	0.40

The **bold** values for **b**, **v**, **w**, and **x** are the optimum dimensions.
Prototype dimensions are given in feet and inches. Model dimensions are in millimetres.

12mm GAUGE TRIANG STANDARDS

These standards are intended to give the best possible running with Triang and other matching wheels which have wide variations in their back to back dimensions. Back to back dimensions should be checked and, if necessary, adjusted. Too large or too small a dimension will give trouble through any pointwork.

Society/Ratio flexible track with Code 80 flat-bottom rail (which has a very narrow head) has a "near-scale" appearance and can be used with the ranges of soldered pointwork commercially available. Some modellers may wish to use a coarser flat-bottom rail for soldered track construction. The standards are not affected by the size or type of rail.

12mm GAUGE INTERMEDIATE STANDARDS

This standard is simple to apply, although it does exclude the use of Triang and other coarse standard wheels in favour of the finer types now available (eg Kean-Maygib, or Sharman). Older finer types can have their wheels etc replaced or modified, while more modern kits have wheels which are suitable. Generally only a routine check on their back to back dimension is necessary.

Track and pointwork is commonly built with code 80 flat-bottom rail (which matches the Society/Ratio flexible track), or Code 75 bullhead rail. The Society now has a scale Code 60 bullhead rail. A Code 60 flat-bottom rail is commercially available.

13.5mm GAUGE (TM) STANDARDS

These standards were first formulated in 1957 by Ken Garrett and originally published in the January 1958 Model Railway News. TM was designed as a 3mm equivalent of EM gauge but with better proportions. Indeed, the flanges were finer than those adopted later for 14.2mm gauge.

Modelling in 13.5mm gauge is now considerably easier as all the models and components produced for 12 and 14.2mm gauges can be used. Locomotive mechanism construction is easier due to the fact that most suitable modern motors will fit between the chassis frames.

THE FINE STANDARDS

Morris Thomson's suggestion of 14.2mm as the track gauge for fine standard 3mm modelling was first published in MIXED TRAFFIC 2 (1965). Since then its viability has been demonstrated by a number of Society members.

The 14.2mm gauge standards have now been modified to meet all the rules governing track and wheels. Thus 14.2mm is now the MAXIMUM gauge permitted by the tolerances, with a minimum value of 14.1mm. The rationalised tolerances mean that the new standards are very close indeed to scale.

As the tolerances are only marginally different from those of other fine standards, anyone who has successfully built track and stock should be capable of doing the same in 14.2mm gauge.

Modellers working in both 12 and 13.5mm track gauges have found the recently introduced range of fine standard wheels to be attractive. Because of this, standards for these track gauges to match the new wheels have also been included in the Fine Standards section of the table.

Many Society products, including its compensated W-irons and Code 60 bullhead rail, have been designed to be compatible with these fine standards.