# G3 Track Clearance

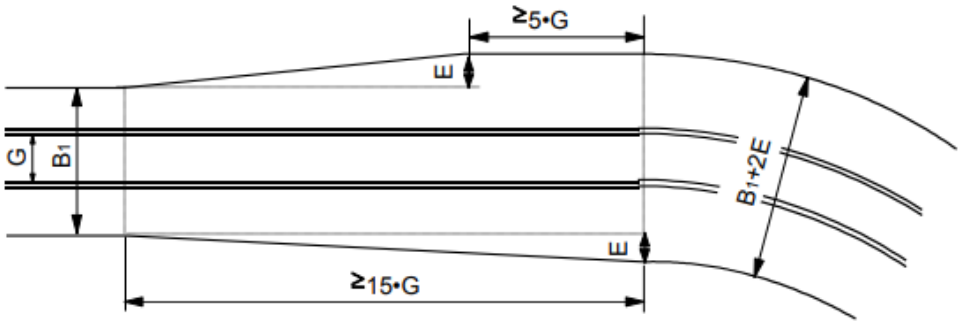
# S 02

The Gauge '3' track clearance standard (S02) has been written to enable the satisfactory design, construction & operation of Gauge '3' railways. It assumes therefore that models are based on British standard gauge prototypes, scaled at 1:22.6. This recommendation serves as an aid to determine the minimum track separation required on a given curve as a function of the length of vehicles being run. All measurements are in mm—with a tolerance of +/- 1mm unless otherwise stated.

The separation between straight Gauge '3' tracks (track centre-line to track centre-line) is recommended to be at least 160mm, although a scale prototypical "6 foot way" is just over 150mm. On a straight track the clearance should extend to a minimum of 80mm on either side of the track centres.

On curves, track separation (and clearance) must be increased. As the minimum track radius will vary according to the type of stock being used, we will examine curves of 1500mm, 3000mm, 4500mm, 6000mm & 7500mm radii, the radius being measured to the centre line of the track. It should be noted that track curves between 1500mm and 3000mm are normally only used where space is very limited.

The following calculations are based on formula originally published by MOROP* under NEM+ 103. NEM 103 uses three different 'maximum' carriage lengths (A, B & C) plus tables, to calculate the value of an expression 'E' which gives the additional clearance required for curves. In NEM terms the normal clearance of a straight track is called 'B1' and on a curve they define the required clearance as being 'B1+2E'. The expression 'E' is calculated by taking the radius of the curve and the distance between the two bogie pivot points.




As an example, a BR Mk1 coach is about the same size as the NEM size 'A' vehicle but to simplify matters (and as a safety margin) the NEM size 'B' is used for these calculations. This guideline therefore assumes a scale 'B' vehicle length of 1,072mm and a maximum between BPP (bogie-pivot-points) distance of 761mm. Based on these assumptions, on curved twin tracks the minimum distance between track centres can be calculated by using the formula (160+2E) mm.

A summary of the results is shown below.

| Radius of Curve (mm) | Clearance (B1 + 2E) mm |
|---|---|
| 1500 | 258 |
| 3000 | 208 |
| 4500 | 192 |
| 6000 | 184 |
| 7500 | 180 |

Based on these calculations, we recommend that twin-tracks should not normally be used on radii between 1500mm & 3000mm, at least not if long bogie stock is being run. They are best viewed as being for single track working and for short wheel-base stock, typically found on Light or Industrial type railways.

The larger track radii have calculated clearances of between 192mm and 180mm and can if desired be simplified to a single minimum clearance of 185mm, given that there is some tolerance in the calculations. The track separation should not be reduced further though, even if bogie-equipped vehicles are not being used.

Clearance should be widened at a point beginning not less that 952mm (>15 x Gauge) from the beginning of the curve. Within this transition area the clearance should increase from 160mm to the new clearance value in a linear fashion. This transition is required on both entering and leaving any twin track curve. To be clear, this is a 'clearance' widening transition, not a 'transition curve'.

*Footnotes*

** MOROP - The major (European) model railway National Associations created MOROP (initially called 'Organization of the Model Railway Friends Europe' and later renamed 'Organization of Model Railroaders and Railway Friends Europe'). The European umbrella organization MOROP today consists of 19 national organizations.*

*+ NEM—Norms of European Model (Railways)*

*From NEM 103*
*Type 'A' length up to 20.0 m and wheelbase (BBP) up to 14.0 m*
*Type 'B' length up to 24.2 m and wheelbase (BPP) up to 17.2 m*
*Type 'C' length up to 27.2 m and wheelbase (BBP) up to 19.5 m*
*BR Mk1 length of 19.6 m and wheelbase (BBP) of 14.2 m*