

RAILWAY GAUGES

Rail gauge is the distance between the inner sides of the two parallel rails that make up a single railway line. There are three types:

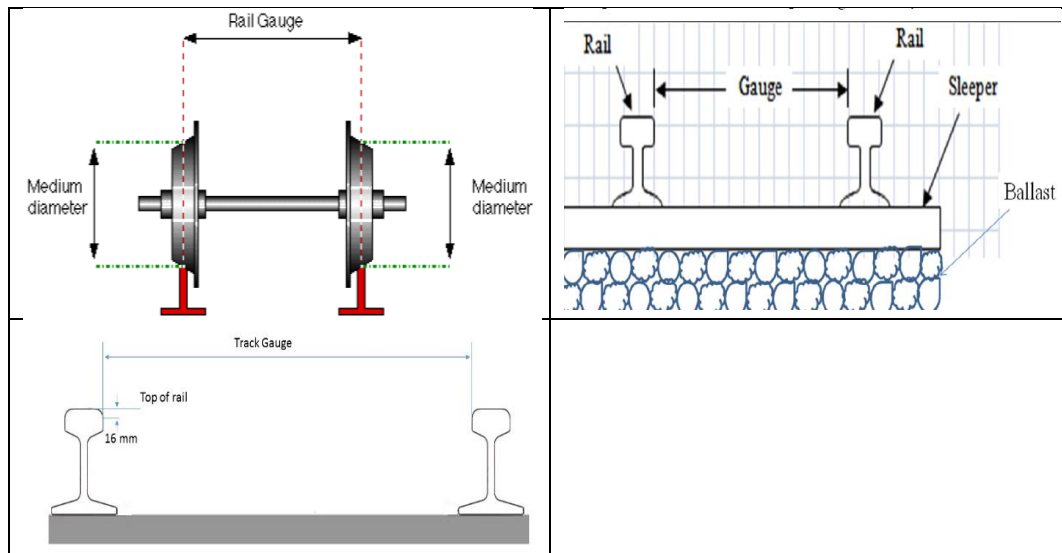
- 1- Track (Rail) gauge
- 2- Loading (clearance gauge)
- 3- Fixed Structure gauge

Track (Rail) gauge

Railway track gauge: Is the clear minimum perpendicular **distance** between the inner faces (inside heads) of the two rails **5/8"** below the top of rail. **60%** of the world's railways use a **4 feet 8½ inch (1435 mm)** gauge, which is known as **standard gauge** or international gauge.

Rail gauges larger than standard gauge are called **broad gauge**, and rail gauges smaller than standard are called narrow gauge.

A dual gauge railway has three or four rails positioned so that trains of two different gauges can use it.



Types of Rail gauges

1.Narrow Gauge

The other countries using narrow gauge are Britain, South Africa, etc. 10% of India's railway tracks have been laid to this gauge.

Suitability: Narrow gauge is suitable under the following conditions:

- (i) When the construction of a track with wider gauge is prohibited due to the provision of sharp curves, steep gradients, narrow bridges and tunnels etc.
- (ii) When the prospects of revenue are not very bright. This gauge is, therefore, used in hilly and very thinly populated areas. The feeder gauge is commonly used for feeding raw materials to big government manufacturing concerns as well as to private factories such as steel plants, oil refineries, sugar factories, etc.

2.Meter Gauge

The other countries using Meter gauge are France, Switzerland, Argentine, etc. 40% of India's railway tracks have been laid to this gauge.

Suitability: Meter Gauge is suitable under the following conditions:

- (i) When the funds available for the railway project are inadequate.
- (ii) When the prospects of revenue are not very bright. This gauge is, therefore, used for tracks in under-developed areas and in interior areas

3.Standard Gauge

A standard-gauge railway is a railway with a track gauge of **1,435 mm (4 ft 8 1/2 in)**. The standard railway gauge of 4 feet, 8 1/2 inches derives from the original specification for an Imperial Roman army war chariot.

The standard gauge is also called **Stephenson gauge** (after George Stephenson), **International gauge**, **UIC** gauge, uniform gauge, **normal** gauge and **European** gauge in Europe, and **SGR** in East Africa

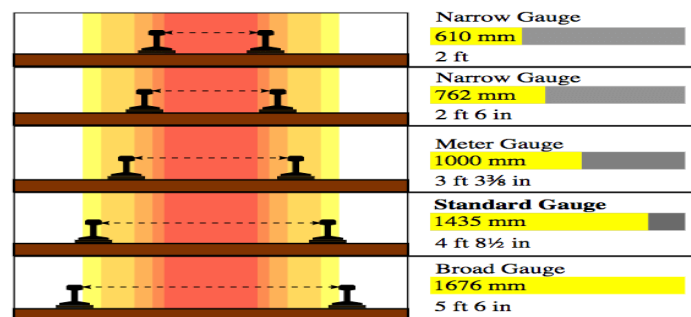
Standard gauge railway lines are the primary gauge used in many countries. It is used on such high speed lines as France's TGV, Germany's ICE, & Japan's Bullet Trains.

4.Broad Gauge

The countries using the Broad Gauge are India, Pakistan, Bangladesh, SriLanka, Brazil, Argentine, etc.

Suitability: Broad gauge is suitable under the following conditions:

- (i) When sufficient funds are available for the railway project.
- (ii) When the prospects of revenue are very bright. This gauge is, therefore, used for tracks in plain areas which are densely populated i.e. for routes of maximum traffic, intensities and at places which are centers of industry and commerce



Uniformity in gauges

One country should have only one gauge throughout its various parts.

But the policy of some countries and their topographical, geological and financial conditions have led to adopt various gauges in their different parts.

Break of gauge is a place where different gauges meet is called a.

Gauge tolerances specify how much the actual gauge may vary from the nominal gauge

Advantages of Breaking the Gauge

- i). The most effective advantage of breaking the gauge is to render the railway an economical and profitable concern.
- ii). It facilitates the provision of a steeper gradient, sharp curves and narrow tunnels by adopting a less wide gauge in hilly and rocky areas.

Disadvantages of Breaking the Gauge

- i). It causes much inconvenience to the passengers while changing the train at station, with change of gauge.
- ii). It causes delay in movement of people and goods.
- iii). It results in wastage of time.
- iv). It involves extra labor for unloading and reloading the goods. The goods are also likely to be damaged or dislocated at the junction station, having change of gauge.
- v). It requires the provision of extra and costly transshipment yards, go downs, sheds, etc. at every junction station having change of gauge.
- vi). It causes extreme difficulty in quick movement of military and ammunition during war days.

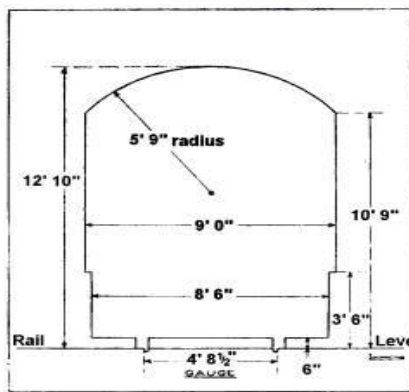
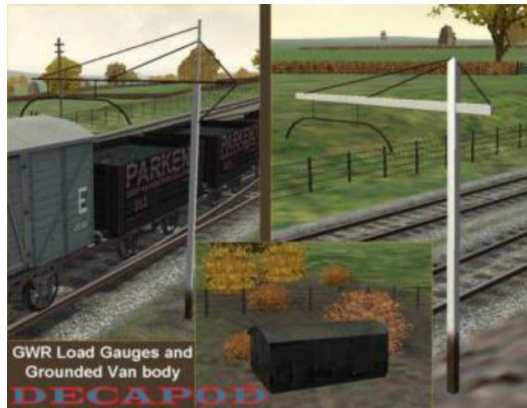




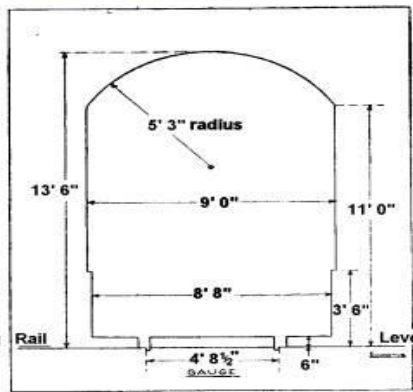
Clearance (loading) gauge

Clearance (loading) gauge: A limit above and to both sides of the track which no part of the rolling stock or their loads are allowed to encroach upon Or it is the maximum height and width for railway vehicles and their loads to ensure safe passage through bridges, tunnels and other structures.

It determines the sizes of passenger trains and the size of shipping container that can be conveyed on a section of railway line and varies across the world and often within a single railway system.



England (Average).
Gauge, 4 ft. 8 1/2 ins.



Scotland (Average).
Gauge, 4 ft. 8 1/2 ins.

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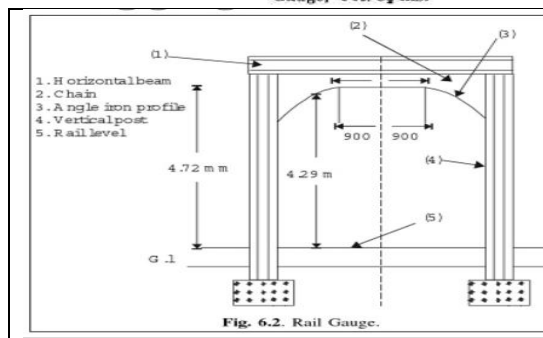
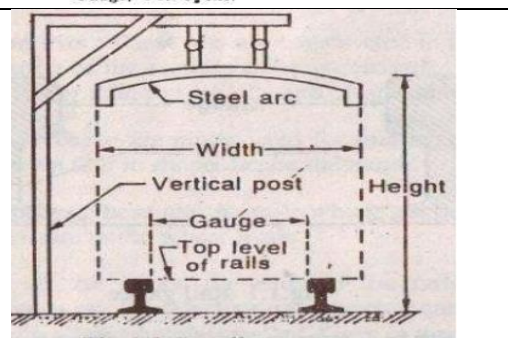
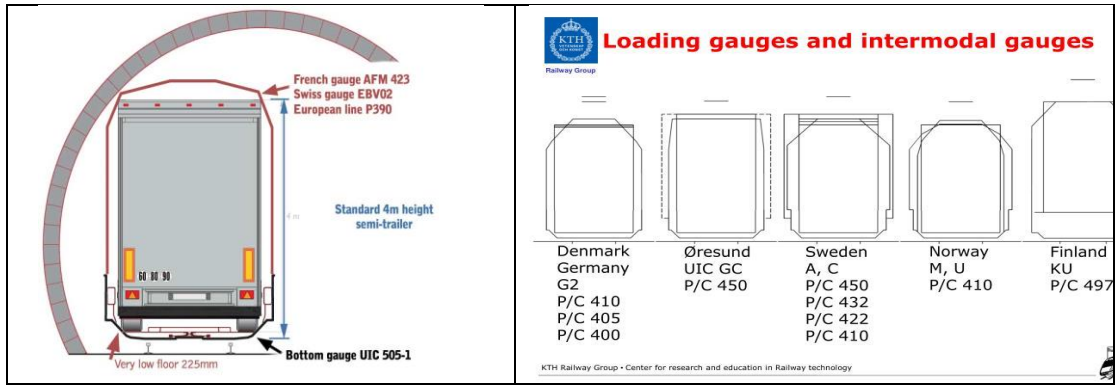


Fig. 6.2. Rail Gauge.





Fixed structure gauge

Structure gauge: Is the limit above and both sides of track within which no permanent structure installation is permitted

