FIXTURES AND FASTENINGS

FIXTURES AND FASTENINGS: Fixtures and fastenings are fittings requires for joining of rails end to end and also for fixing the rails to sleepers in a track.

FUNCTIONS OF FIXTURES AND FASTENINGS: Rail fixtures and fastenings have the following functions:

(i) To join the rails end to end to form full length of track.

(ii) To fix the rails to sleepers.

(iii) To maintain the correct alignment of the track.

(iv) To provide proper expansion gap between rails.

(v) To maintain the required tilt of rails.

To set the points and crossings in proper position.

TYPES OF FIXTURES AND FASTENING: Fixtures and fastenings commonly used in a permanent way are of following types:

1. Fish plates
2. Bearing plates
3. Spikes
4. Chairs
5. Bolts
6. Keys
7. Anti-creepers

FISH PLATES:

Fish plates are used in rail joints to maintain the continuity of the rails. Two types of fish plates are commonly used on Indian Railways for joining F.F. and B.H. rails, each fish plate is 457 mm long and provided with four holes 32 mm at a spacing of 114 mm c/c. These are manufactured of steel and are so designed that they fit in between the head and foot of the rail.

REQUIREMENTS OF FISH PLATES:

(i) They should hold the adjoining ends of rails in correct horizontal and vertical plane.

(ii) They should allow free longitudinal movements of rails due to temperature variation.

(iii) They should be able to resist all types of wear.

(iv) They should be able to bear the vertical and lateral stresses which come at joints without any distortion.

(v) They should allow easy renewal and replacement of rails in case of wear and damage.

BEARING PLATES:

Bearing plates are cast iron or steel plates placed in between the F.F rail and wooden sleepers of a railway track. F.F. rails if fixed directly on wooden sleepers sink in the sleeper due to the heavy loads of trains and thus loosen the spikes. To overcome this difficulty bearing plates are used under F.F. rails to distribute the load over a wider area and bring the intensity of pressure within limit. Bearing plates give the required 1 in 20 inward slopes to the rail directly and no adzing* is required in the wooden sleeper. These are fixed to sleepers by spikes.

ADVANTAGES Following are the advantages of bearing plates:

(i) They distribute the loads to wider area and prevent sinking of the rail to the sleeper.

(ii) They avoid adzing of sleepers.

(iii) They enable the spikes to remain tight and require less maintenance.

(iv) Bearing plates prevent the widening of gauge on curves.

(v) Bearing plates increase the overall stability of the track.

(vi) They prevent the destruction of the sleeper due to rubbing action of the rail.

DISADVANTAGES Following are the disadvantages of bearing plates:

(i) When the bearing plates become loose due to settlement of ballast, moisture is likely to enter between the sleepers and plates, causing sleepers to wear.

(ii) When any spike is damaged and it is required to be redriven at another place, all other spikes of the bearing plates have to be removed, which will reduce the holding power of the spikes.