

Modern Railway Track 2nd Edition

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ERRATA

'Last-minute' error

In the time-critical final stage of the production of the book Modern Railway Track 2^e Edition Murphy's Law was once again confirmed. As the first six chapters of the Book were already in print, one double reference was removed and 4 last-minute references were inserted in the reference list, followed by an Update All request in FrameMaker over all chapters of the book. As a result the correspondence in cross-reference between the updated chapters 1 to 6 on the computer and the printed ones was lost. The list below shows the false and correct reference numbers. The correct numbers should be inserted manually in the book with some fine pencil at the locations indicated.

| False ref. nr | Correct ref. nr | Diff. | in Chptr | in Page(s) | False ref. nr | Correct ref. nr | Diff. | in Chptr | in Page(s) |
|------------------|--------------------|-------|-------------|--------------------|------------------|--------------------|-------|-------------|---------------|
| 58 | 59 | 1 | 5 | 93, 95 | 205 | 207 | 2 | 6 | 137, 140, 142 |
| 68 | 69 | 1 | 6 | 137, 143 | 208 | 210 | 2 | 6 | 124 |
| 69 | 70 | 1 | 6 | 137, 143 | 209 | 211 | 2 | 5 | 95 |
| 70 | 71 | 1 | 6 | 137 | 211 | 213 | 2 | 4 | 64 |
| 72 | 73 | 1 | 5 | 79 | 219 | 221 | 2 | 4 | 67(2x), 68 |
| 74 | 75 | 1 | 6 | 137(2x), 143 | 220 | 222 | 2 | 4 | 63t/m66 |
| 78 | 79 | 1 | 6 | 137 | 228 | 230 | 2 | 6 | 150 |
| 94 | 95 | 1 | 5 | 75, 83, 86, 87, 88 | 231 | 235 | 4 | 6 | 124 |
| 95 | 96 | 1 | 6 | 164 | 235 | 239 | 4 | 2 | 23 |
| 98 | 99 | 1 | 6 | 117, 121, 164, 168 | 243 | 247 | 4 | 6 | 162 |
| 100 | 101 | 1 | 6 | 155 | 247 | 251 | 4 | 6 | 165 |
| 102 | 103 | 1 | 6 | 113 | 253 | 257 | 4 | 6 | 169, 170 |
| 106 | 107 | 1 | 6 | 141 | 254 | 258 | 4 | 6 | 162(2x), 164 |
| 115 | 117 | 2 | 5 | 80 | 254 | 258 | 4 | 6 | 165(4x) |
| 126 | 128 | 2 | 6 | 165, 167 | 255 | 259 | 4 | 6 | 165 |
| 127 | 129 | 2 | 6 | 162(2x) | 256 | 260 | 4 | 6 | 168 |
| 132 | 134 | 2 | 3 | 53 | 257 | 261 | 4 | 6 | 168(2x) |
| 137 | 139 | 2 | 6 | 112, 122 | 258 | 262 | 4 | 6 | 168 |
| 145 | 147 | 2 | 4 | 63, 64 | 259 | 263 | 4 | 6 | 168(2x) |
| 147 | 149 | 2 | 2 | 29 | 263 | 267 | 4 | 6 | 117, 164 |
| 148 | 150 | 2 | 6 | 164 | 265 | 269 | 4 | 5 | 88, 89, 94 |
| 149 | 151 | 2 | 5 | 78 | 268 | 271 | 3 | 6 | 123 |
| 154 | 156 | 2 | 6 | 164 | 269 | 272 | 3 | 6 | 124 |
| 163 | 165 | 2 | 6 | 164 | 273 | 276 | 3 | 4 | 67 |
| 164 | 166 | 2 | 6 | 165, 166, 167 | 277 | 280 | 3 | 3 | 35, 45 |
| 192 | 194 | 2 | 3 | 35, 40 | 280 | 283 | 3 | 3 | 53 |
| 203 | 205 | 2 | 4 | 60 | 292 | 295 | 3 | 5 | 71 |
| 204 | 206 | 2 | 6 | 137 | 297 | 300 | 3 | 5 | 74 |

OTHER ERRATA

Here is a list with other errors discovered after completion and printing of the Book. Most of them are minor or negligible errors while others may be corrected manually

03 Curves and Gradients

Page 37: In Formula (3.6) R is missing. The formula should read: $a_d = \frac{V_{max}^2}{12.96 R} - \frac{h}{153} < \bar{a}_d$

Page 40, paragraph 3.3.6: Reference to Figure 3.11 should be Table 3.1

Page 52: In Figure 3.16 right the vertical label 'h [m]' should be replaced by 'h[mm]'

06 Dynamic Track design

Page 162: In Figure 6.75 the gradual transmission of light green to dark green is missing. Compare with Figure 6.84 on page 169.

08 Ballasted Track

Page 209: Figure 8.9 is **missing!!**. A small adhesive strip with the picture on it will be supplied to be attached at the bottom of page 209.

09 Slab Track

Page 265: In Figure 9.73 masks the text 'Tamping concrete' is covered by the dotted rectangle.

10 The Rail

Page 278: in the caption of Figure 10.4: 'process' should replace 'proces'.

Page 282: In the caption of Figure 10.12 'Roller straightener' should replace 'Rolling straightener'.

Page 312, 314 : In the caption of Figure 10.57 and Figure 10.62 'SmW' should replace 'Smw'.

Page 321: In Figure 10.74 the figure 'Spalling' is shown twice. Not confusing.

13 Numerical optimization of railway track

Page 439: In Figure 13.30 the colors of the curve do not correspond with the colors with the line peaces in the legenda. Correct is: blue curves = MARS curve fit, green curves = Recording. (Red is o.k.)

16 Inspection and Detection systems

Page 512: In the caption of Figure 16.55: 'EM 130' should be replaced by 'EM 30'.

17 High Speed Tracks

The title should be 'High Speed Track' (without the 's'), in accordance with the titles of Chapters 8 and 9.

Page 584: The caption in the table is missing and as a result in the first sentence of 17.3.9 'Table' has no reference. It should have been: 'Table 17.11: Required cross section in HSL tunnel'

Page 589: The existing Table 17.11 becomes Table 17.12 after the modification of the old Table 17.11. The columns 1 and 3 in the table don't have a yellow background as is the custom in other Tables.

Page 590: Formally speaking, Figure 17.29: Performance comparison of different systems' should have been Table 17.13:

For further information please refer to:

MRT-Productions, Groenwal 25, NL-5300 JJ Zaltbommel, mrt@esveld.com

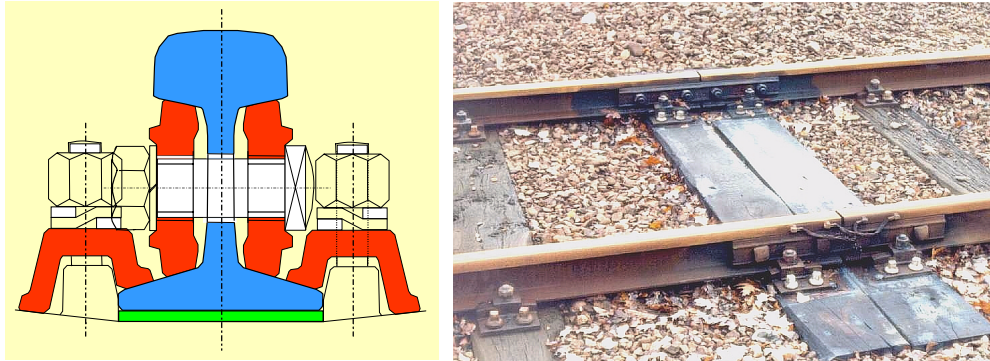


Figure 8.7: Fishplated joint on double sleepers

8.5.3 Expansion joints and expansion devices

These features serve to keep certain structures stress-free if the track on the structure is subject to large displacements as a result of temperature differences or creep.

On some railways, like BR, expansion joints are made from suitably machined standard rails. The expansion joint, shown in Figure 8.8, is constructed from a non-standard rail and allows a maximum axial displacement of 120 mm. Expansion joints are expensive and are only used in jointed track near the moveable bearings of fairly large structures, at the end of CWR track, or at changes in structure such as switches, crossings, and bridges.

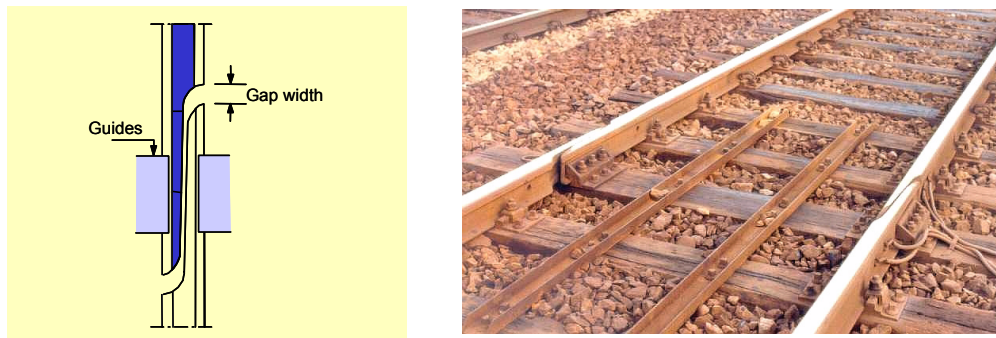


Figure 8.8: Expansion joint

The expansion device consists of a fixed stock rail and a blade, as illustrated in Figure 8.9, which can move parallel to the stock rail over a maximum distance of 220 mm. This device is used on CWR track on structures with a large expansion length.

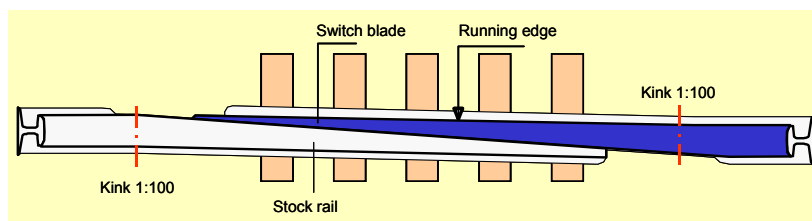


Figure 8.9: Expansion device

NEW ERRATA REPORTED AFTER THE RELEASE OF MODERN RAILWAY TRACK

Page 37: In Formula (3.6) R is missing. The formula should read: $a_d = \frac{V_{\max}^2}{12.96 R} - \frac{h}{153} < \bar{a}_d$

Page 221: Figure 8.23 not Pandrol fastening system but DSA fastening clip from STEDEF

Page 321: Headchecks UIC Code 2223

Page 322: Squats UIC Code 227

Page 22: In Fig 2.9 1434 m should be 1434 mm.

In this expression σ has the units cm/s^2 . For passenger comfort in the vertical direction:

$$H(f) = H_{CV} = 0.588 \left[\frac{1.911 f^2 + (0.25 f^2)^2}{(1 - 0.277 f^2) + (1.563 f - 0.0368 f^3)^2} \right]^{1/2} \quad (6.209)$$

In lateral direction:

$$H(f) = H_{CL} = 1.25 H_{CV} \quad (6.210)$$

For vehicle ride quality, the weighting in vertical and lateral directions is the same and reads:

$$H(f) = H_{RV} = H_{RL} = 1.14 \left[\frac{[(1 - 0.056 f^2)^2 + (0.645 f^2)^2](3.55 f^2)}{[(1 - 0.252 f^2)^2 + (1.547 f - 0.00444 f^3)^2](1 + 3.55 f^2)} \right]^{1/2} \quad (6.211)$$

Page 43: 4th line from above $a_d = 0.2 \text{ m/s}^3$ should read $\dot{a}_d = 0.2 \text{ m/s}^3$ or $\frac{da_d}{dt} = 0.2 \text{ m/s}^3$

Page 43: the line above (3.27): 'acceleration according to (3.25). If $\dot{a}_d = 0.2 \text{ m/s}^3$ this gives:' should be deleted

and replaces by 'cant, representing the admissible rotational speed of the vehicle, according to:

$$\frac{h * 10^{-3}}{L} = \frac{1}{10 * V}$$

Page 269: – Newly constructed track: $E_{v2} = 60 \text{ MN/m}^2$;
 – Existing track: $E_{v2} = 45 \text{ MN/m}^2$.

Page 52: Figure 3.16b: Vertical scale should be h [mm]

| Traffic | Class 1 | | | Class 2 | | | Class 3 | | | | Class 4 | |
|--|----------|------|------|-----------|------|------|---------|------|---------|------|----------|------|
| V _{max} [km/h] | 80 - 120 | | | 120 - 200 | | | > 250 | | | | 250 -300 | |
| | | | | | | | Italy | | Germany | | France | |
| Value | Norm. | Max. | Exc. | Norm. | Max. | Exc. | Norm. | Max. | Norm. | Max. | Norm. | Max. |
| Plain Track | | | | | | | | | | | | |
| \bar{h} [mm] | 150 | 160 | – | 120 | 150 | 160 | 125 | – | 65 | 85 | 180 | – |
| \bar{h}_d [mm] | 80 | 100 | 130 | 100 | 120 | 150 | 121 | – | 40 | 60 | 50 | 100 |
| \bar{a}_d [m/s ²] | 0.53 | 0.67 | 0.86 | 0.67 | 0.8 | 1 | 0.81 | -- | 0.27 | 0.4 | 0.33 | 0.67 |
| \bar{h}_e [mm] | 50 | 70 | 90 | 70 | 90 | 110 | 100 | – | 50 | 70 | – | 110 |
| Transition Curves with a constant change of curvature | | | | | | | | | | | | |
| $\frac{d\bar{h}_d}{dt}$ [mm/s] | 25 | 70 | 90 | 25 | 70 | – | 36 | – | 13 | – | 30 | 75 |
| $\frac{d\bar{a}_d}{dt}$ [mm/s ³] | 0.17 | 0.47 | 0.6 | 0.17 | 0.47 | – | 0.24 | – | 0.08 | – | 0.2 | 0.5 |
| Transition Curves with a variable change of curvature | | | | | | | | | | | | |
| $\frac{d\bar{h}_d}{dt}$ [mm/s] | 50 | 90 | – | 50 | 90 | – | – | – | – | – | – | – |
| $\frac{d\bar{a}_d}{dt}$ [mm/s ³] | 0.33 | 0.6 | – | 0.33 | 0.6 | – | – | – | – | – | – | – |
| Constant change of cant with ramp | | | | | | | | | | | | |
| $\frac{d\bar{h}}{dt}$ [mm/s] | 28 | 46 | 55 | 28 | 35 | 50 | 38 | – | 20 | – | 50 | 60 |
| Variable change of cant with ramp | | | | | | | | | | | | |
| $\frac{d\bar{h}}{dt}$ [mm/s] | 56 | 70 | – | 56 | 70 | – | – | – | – | – | – | – |
| Continuation of line in lateral turnouts and intersections | | | | | | | | | | | | |
| \bar{h}_d [mm] | 60 | 80 | 120 | 60 | 80 | 100 | -- | – | -- | – | 50 | 100 |
| \bar{a}_d [m/s ²] | 0.4 | 0.52 | 0.79 | 0.4 | 0.52 | 0.67 | -- | – | -- | – | 0.33 | 0.67 |
| Vertical acceleration | | | | | | | | | | | | |
| \bar{a}_v [m/s ²] | 0.2 | 0.3 | 0.4 | 0.2 | 0.3 | – | 0.16 | 0.24 | 0.2 | – | 0.45 | 0.6 |

Table 3.1: Recommended admissible quasi-static accelerations and related values in curves (UIC703, dated 01-01-1999)