

Lecture Notes in Mobility

Marin Marinov *Editor*

# Sustainable Rail Transport

Proceedings of RailNewcastle Talks 2016

 Springer

# **Lecture Notes in Mobility**

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Editor

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# Chapter 8

## Aspects of Rail Infrastructure Design

Aleksander Śladkowski and Krzysztof Bizoń

### 8.1 Introduction

The rail fastenings, otherwise called connectors, are the elements of the railway infrastructure, whose task are to connect the rails with sleepers or other supports and to join rails together. The rail fastenings are divided into direct and indirect connectors, rigid and elastic. The parts of elastic fastening rails are the most common: anchors, spring clips, insulating pads, rail pad. Elements of rigid connections are the most common: rigid rail base plates, rail pads, sleeper spikes, rail clamps, clip bolts, nuts, spring washers (Oczykowski 2010).

#### 8.1.1 Direct Rail Fastening

Today, the direct fastenings are very rare using on Polish railways. They can even meet on the lines of local importance, where rail vehicles moving at low speeds and where there is low traffic. The fastening of this type does not provide a constant pressure of the rail to the sleeper. This fastening consists of a rigid rail base plates lying between the rail and the sleeper, and the three fastening screws with the flange. Tightening of the screws through the holes in the pad to wooden sleepers makes that rail is fixed by the pressure which they have on its bolt flanges (Fig. 8.1).

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