45 Automated Braking System to Increase Passengers Protection on Modern Public Railway Networks

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45.1 Abstract

In the first railways in 1830s and 1840s there wasn't any system to inform the driver about the condition of the track, so accidents happened. In order to achieve the most important goal of safety, methods of controlling the movement of trains had to be invented. This system uses circuits on the track which are short-circuited by wheels and axles of a wheel, setting the indication of danger "red" in signalling lamp, behind the train, in order to have adequate time headway between trains to avoid collision of a train with the one in front. The main disadvantage of this system, which is entirely dependent on the driver's perception, led to the development of the application with the term Automatic Protection Trains (A.T.P.), to provide continuous control of train speed. The A.T.P. is a control system used by the railways to avoid collisions with the aid of automatic motion control of maximum speed and braking of the train. This paper presents the equipment of A.T.P. located in each vehicle equipped with a driving cab to describe the automatic functions for the continuous and reliable monitoring of speed and braking. The desired and actual speed indication in the cab, the audible alarm on exceeding the desired speed and the automatic activation of the braking process of the train as well as the stop at stop signs. Along the auxiliary systems in railway track used for the support are examined. In this work, the innovative process that exists in the I.S.A.P trains with the adaptation of the old technology trains (8th, 10th pick) is highlighted. We compare with the previous signalling system (IDUZI) and explain how the A.T.P. is used as a tool to prevent accidents by ensuring smaller time headway between trains to carry more passengers. Finally, the conclusions and future prospects for greater rail safety are presented.