Abstract of doctoral dissertation

„Identification of setting force in turnouts during traveling of high speed train”

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The aim of the dissertation was identification of forces, which occur in cooperation between point machine - railway switch by static and operation testing, phenomena occurring within locking device. The studies included use research device to measure, registration and analysis of forces which appearing in multipoint machine within switch area, as a consequence of the increase in train speed and preparing new method of identification occurring of force in locking device of turnouts for high speed train. The study is characterized by vertical and horizontal relative displacements of switch blade which is away from stock rail, on which high speed train is going. The dissertation presents testing of switch area, which included 3 locking device and swing nose crossing, which included 2 locking device, for turnout with radius of diverging track R1200, during traveling of high speed train with velocity: 160[km/h] and 200[km/h]. Presented diagrams of trailing resistance of switch and swing nose crossing and diagrams of force occurring in cooperation between point machine - switch during traveling of high speed train. Switch blade used for the test are manufactured by turnouts producer and is not straight beam.

The following assumptions were made in the doctoral dissertation:

- the research methodology was applied, based on tensometric force test,
- not included transitional process and only established processes,
- realization of presented force will be random time functions (stochastic process), having stationary features in a broader sense and global ergodicity,
- tests carried out during traveling of high speed train on straight track

The thesis of the doctoral dissertation was:

Exist the possibility of identification of forces occur within locking device during traveling of high speed train by turnout.

The dissertation has been divided into five chapters. The first chapter contains the classification of high-speed turnouts and systems of cooperation between point machine - turnout. In the second chapter, discussed of tensometric method to the test of value of setting force together with presented dynamics model of the point machine - switch. Third chapter of

dissertation formulates the assumptions for the research model vertical and horizontal relative displacements of switch blade which is away from stock rail. The fourth chapter presents the results of operational tests including the innovative method of testing displacements of moving elements of high-speed railway switch. The fifth chapter presents a summary and conclusions from the research work carried out.

As a consequence of the presented research results, it was stated that the purpose of the work was achieved and the thesis of scientific work proved.