

**Referee's Report
of the Dissertation Thesis**

**„WAYSIDE DIAGNOSIS OF RUNNING GEAR RELATED FAULTS
IN RAILWAY VEHICLES“**

Ing. Onur Kilinc, M.Sc.

The reviewed Dissertation Thesis „Wayside Diagnosis of Running Gear Related Faults in Railway Vehicles“, submitted by Ph.D. student of the Faculty of Transport Engineering of the University of Pardubice Mr. Onur Kilinc, M.Sc., was worked out in the study branch „Transport Means and Infrastructure“ under supervising of Ing. Jakub Vágner, CSc. and doc. Ing. Michael Lata, CSc. Its subject is fully corresponding to the professional orientation of the above mentioned study branch and is relevant for defending at the authorized Board UP 3706V 005.

The presented report, having total volume of 89 pages together with 19 tables and 54 figures in 6 chapters of text plus rich chapter of applied literature closed by publication overview of the PhD. student relevant to the dissertation theme, deals with diagnosis of running gears in railway vehicles, particularly for passenger transport. The theme of the submitted report is corresponding to the common present requirements for continuous control of structure and for ensuring safe operation and higher efficiency of operation. The work is focused on the diagnosis of running gear faults like wheel defects, wheelset and traction motor bearings and gearbox faults.

For controlling vehicle operation in a safe mode it is necessary to follow characteristic response of the examined structure at simultaneous respect of parasitic signals. The opening chapter is giving broad overview of applied method (from strain gages via ultrasonic up to laser sensors) and methodologies, all based on analysis and evaluation of followed signals during normal operation or workroom testing (particularly vibration response).

Practical applicability of the designed vehicle condition monitoring was realized in the scope of research project of the Ministry of Industry and Trade of the Czech Republic TAČR at Prague metro, where on two crosslines on the railway there are detecting anomalies of running metro trains (response of wheelset eccentricity, wheelset defects due to degradation and problems of gearboxes).

From the theoretical point of view it is necessary to appreciate the overview of supposedly selected methods, that are very rarely used in experiment in technology (more in biomechanics and medicine). This chapter can be a starting point for application in other branches and not only in transportation.

Closing chapter with results and discussion proves qualification of wayside diagnosis for application in railway vehicles service.

Non-omitting part of the report is the chapter 7, containing a very rich list of literature. Author of the report proves his quality by 8 presentations. All related to the theme of the dissertation and published at professional conferences.

According to the task given to the reviewer in the appointment I assess:

- A) up-to date-ness of the topic – topic and its working up is relevant to the today's requirements for monitoring of structures during their operation for ensuring safe operation and its higher operability;
- B) selected method – the author put a broad overview of supposedly method and for practical application he has taken that, which is from the view of applicability and economy an optimum;
- C) whether the work fulfilled the objectives – fully. It shows (in silence) further application in other branches of transportation;
- D) what findings the reviewed thesis has brought – in my opinion, that problem of continuous monitoring stopped to be only an academic problem, but respecting all scientific qualities;
- E) significance for scientific development – the gained results and experience are a good starting point for further research;
- F) the quality of published works related to the reviewed thesis – chapter 8 shows growing up publication activity of the thesis author, the number and standard (renomé) of the conferences, at which line of action and results were published, have been also increasing;
- G) whether the reviewed thesis meets the requirements for awarding the title Ph.D. – absolutely (see the conclusion).

Conclusion

The reviewed Dissertation thesis „Wayside Diagnosis of Running Gear Related Faults in Railway Vehicles“, submitted by PhD. student of the Faculty of Transport Engineering of the University of Pardubice Mr. Onur Kilinc, M.Sc., accomplishes all requirements of creative scientific work for awarding the author by the scientific title Ph.D. It deals with current problematics of diagnosis of running railway vehicles as a mean for higher safety and higher efficiency of transport process all round. For it Mr. Onur Kilinc, M.Sc. used relevant methodology and theory as well as experiment.

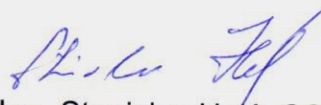
The proposed methodology and results will be a contribution to the safe operation of railway vehicles of all kinds, but not only for them.

Therefore I strongly recommend the submitted thesis „Wayside Diagnosis of Running Gear Related Faults in Railway Vehicles“ to be accepted for defending in front of the board for the doctoral branch “Transport means and infrastructure” of

Faculty of Transport Engineering, University of Pardubice and after having successfully defended **Mr. Onur Kilinc, M.Sc.** should be awarded by scientific title

Ph.D (philosophie doctor).

Prague, August 13, 2017



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