
ACUME_HV

Acoustic Emission Monitoring of Historical Vehicles

OBJECTIVES

This project aims at developing a non-invasive diagnostic tool for the engines of historical vehicles conserved in museums and collections. This tool will help conservator-restorers to make a decision and implement the reactivation of engines stopped for long time.

The method called Acoustic Emission (AE) allows to detect malfunctions before they are audible by human ear. It is used in the field of automotive industry for the diagnostic of new engines and in different fields of cultural heritage for the evaluation of historical objects and artworks.

In this project acoustic emission will be used for the first time as a diagnostic method for the reactivation of the historical engines. This feasibility study could lead to the development of a very innovative procedure of conservation of heritage vehicles.

PROGRAM

The research program includes :

- The elaboration of a procedure to measure AE signals for monitoring and diagnostic techniques on heritage vehicles : number, location and way of fixation of the AE sensors.
- The identification of engine signatures for both, good and bad functioning conditions for the specific type of vehicle representative of heritage collections.
- The characterization of the lubricants used in the tests.
- The development of a proper procedure for the interpretation of the recorded AE signals.

RESULTS

The two main deliverables of the project will be :

- A database of historical vehicles AE engine's features, for the selected type of vehicles.
- A detailed protocol for condition monitoring of heritage engines of the selected type using AE signals.
- The developed protocol will allow reactivating the engines of the selected cars avoiding failures and, in a second time, ranking the cars mechanical performances, such as : maximum engine speed, fuel consumption, combustion control, injection/valve regulation and mechanical/assembly functioning.



FUNDING

HES-SO, Réseau de Compétences Design et arts Visuels.

PROJECT LEADER

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PARTNERS

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DURATION

18 months
1.8.2018 - 31.1.2020