Department of condition monitoring in 2017

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Brno, January 2018

ÚSTAV
KONSTRUOVÁNÍ

CONTENTS

- Chain of command
- Scientific sections
- Publications
- Research results
- Funding sources
- Projects

CHAIN OF COMMAND

Vibro-acoustics brigade

Brigade commander



Employees




PhD students

Non-destructive testing brigade

Brigade commander



Employees

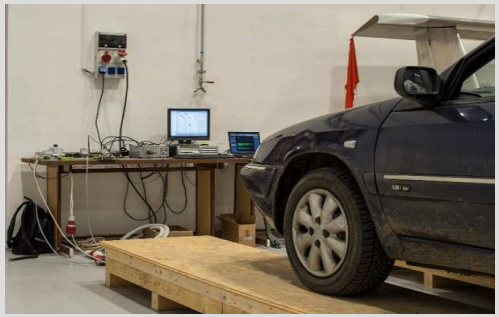

PhD students

SCIENTIFIC SECTIONS

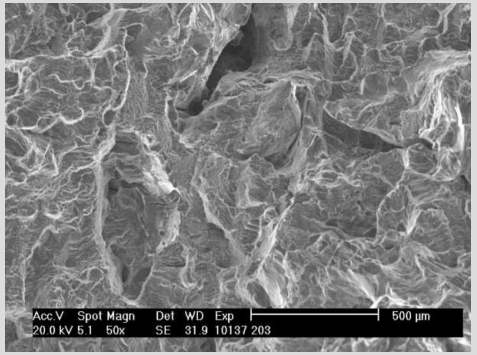
MR technology

Vibro-acoustics

Automotive suspension diagnostics



Non-destructive testing



PUBLICATIONS

Papers in Impact journals

- ROUPEC, J.; BERKA, P.; MAZŮREK, I.; STRECKER, Z.; KUBÍK, M.; MACHÁČEK, O., ANDANI, M. Taheri. A novel method for measurement of MR fluid sedimentation and its experimental verification. SMART MATERIALS & STRUCTURES, 2017, roč. 26, č. 10, s. 1-13. ISSN: 0964-1726. (IF 2,9)

- KUBÍK, M.; MACHÁČEK, O.; ROUPEC, J.; STRECKER, Z.; MAZŮREK, I. Design and testing of magnetorheological valve with fast force response time and great dynamic force range. SMART MATERIALS & STRUCTURES, 2017, roč. 26, č. 4, s. 1-10. ISSN: 0964-1726. (IF 2,9)

- KLAPKA, M.; MAZŮREK, I.; KUBÍK, M.; MACHÁČEK, O. Reinvention of the EUSAMA diagnostic methodology. Int. J. of Vehicle Design, 2017 (IF 0,72)

- MAHMOUD, H.; VLAŠIC, F.; MAZAL, P.; JÁNA, M. Leakage Analysis of Pneumatic Cylinders Using Acoustic Emission. INSIGHT, 2017, roč. 59, č. 9, s. 500-505. ISSN: 1354-2575. (IF 0,52)

PUBLICATIONS

Conference papers in Scopus

- MACHÁČEK, O.; KUBÍK, M.; NOVÁK, P. A NEW METHOD OF MAGNETORHEOLOGICAL DAMPER QUALITY EVALUATION. In ENGINEERING MECHANICS 2017. Praha: Institute of Thermomechanics Academy of Sciences of the Czech Republic, 2017. s. 594-597. ISBN: 978-80-214-5497-2.

- STRECKER, Z.; STRMISKA, T.; ROUPEC, J.; KUBÍK, M.; MACHÁČEK, O. DESIGN OF FAST MAGNETORHEOLOGICAL DAMPER USING SOFT MAGNETIC COMPOSITES. In ENGINEERING MECHANICS 2017, INST THERMOMECHANICS, 2017. s. 934-937. ISBN: 978-80-214-5497-2

- KUBÍK, M.; MACHÁČEK, O.; STRECKER, Z.; ROUPEC, J.; MAZŮREK, I. Dynamic viscosity of commercially available magnetorheological fluids. In 23rd International Conference ENGINEERING MECHANICS 2017. 2017. s. 538-541. ISBN: 978-80-214-5497-2.

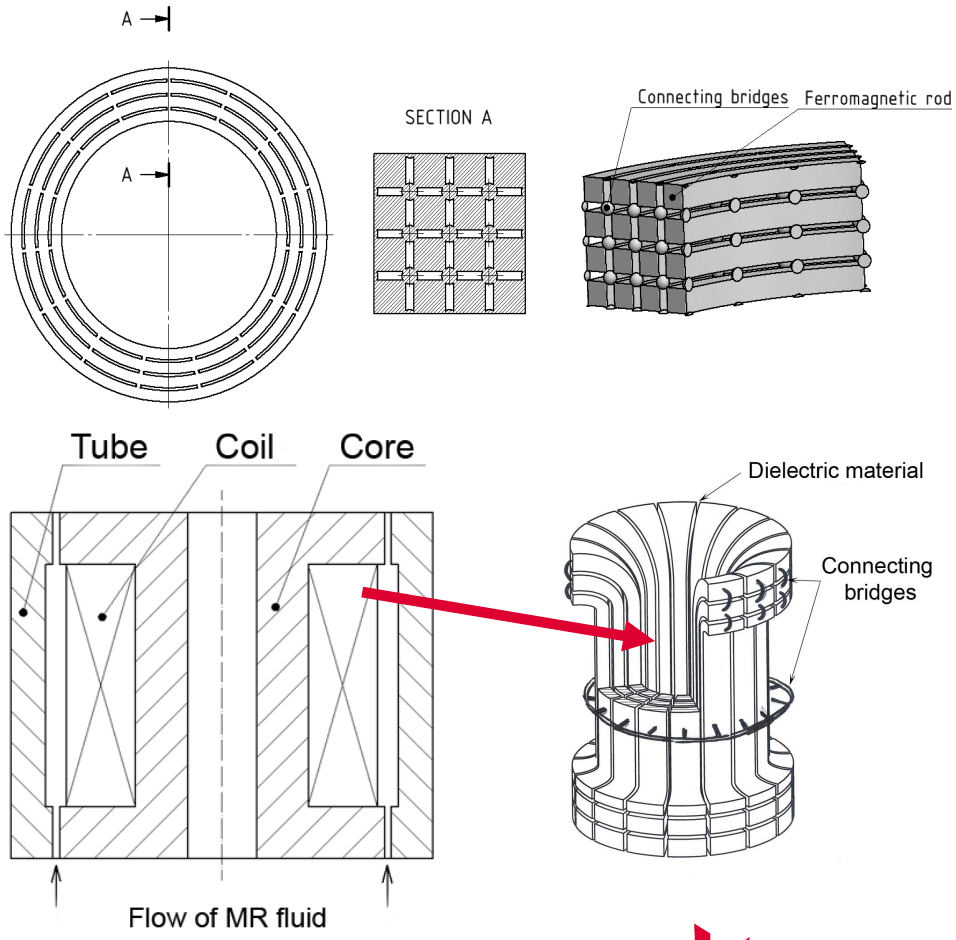
- KRATOCHVÍLOVÁ, V.; VLAŠIC, F.; MAZAL, P.; PALOUŠEK, D. Fatigue Behaviour Evaluation of Additively and Conventionally Produced Materials by Acoustic Emission Method. In 2nd International Conference on Structural Integrity, ICSI 2017, 4- 7 September 2017. Procedia Structural Integrity. Funchal, Madeira, Portugal: Elsevier B.V., 2017. s. 393-400. ISSN: 2452-3216.

- KRATOCHVÍLOVÁ, V.; VLAŠIC, F.; MAZAL, P.; PALOUŠEK, D.; PANTĚLEJEV, L. Analysis of fatigue processes of SLM materials by acoustic emission. International Journal of Microstructure and Materials Properties, 2017, roč. 17, č. 3, s. 63-74. ISSN: 1741-8410.

- MAHMOUD, H.; VLAŠIC, F.; MAZAL, P. Application of Acoustic Emission Method to Diagnose Damage in Pneumatic Cylinders. In First World Congress on Condition Monitoring. 1st. UK, Northampton: BINDT, 2017. s. 858-868. ISBN: 9781510844759.

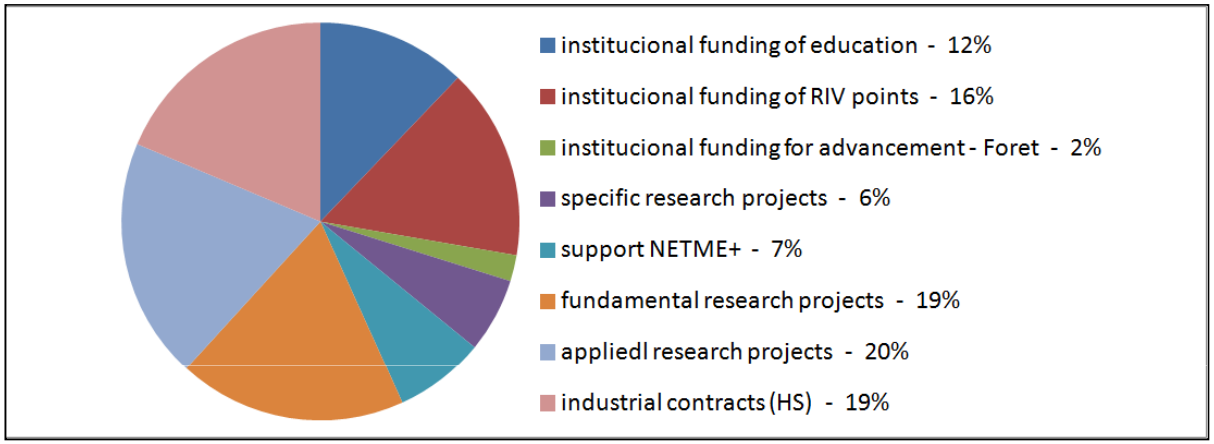
PV 2017-91 – NATIONAL PATENT APPLICATION

- The magnetic circuit containing rods of ferromagnetic material and the method of its manufacture
- Manufacturing method: 3D metal printing
- Improvement of efficiency of MR damper
  - Shorter response time
  - Higher dynamic force range
  - Lower weight



CAPITAL SOURCES

Total budget in 2017: **million CZK**



Launched and continuing projects in 2017

- GAČR – (1 x Strecker, 1 x Roupec, 1 x Mazal (Kaiser))
- TAČR Alfa – (1 x Mazůrek, 1 x Mazal)
- TAČR Epsilon – (1 x Mazal, 1 x Mazůrek)
- MPO Trio – (3 x Mazal)
- HS >100K – (2 x Mazůrek, 1 x Klapka, 1 x Mazal, 1 x Roupec)

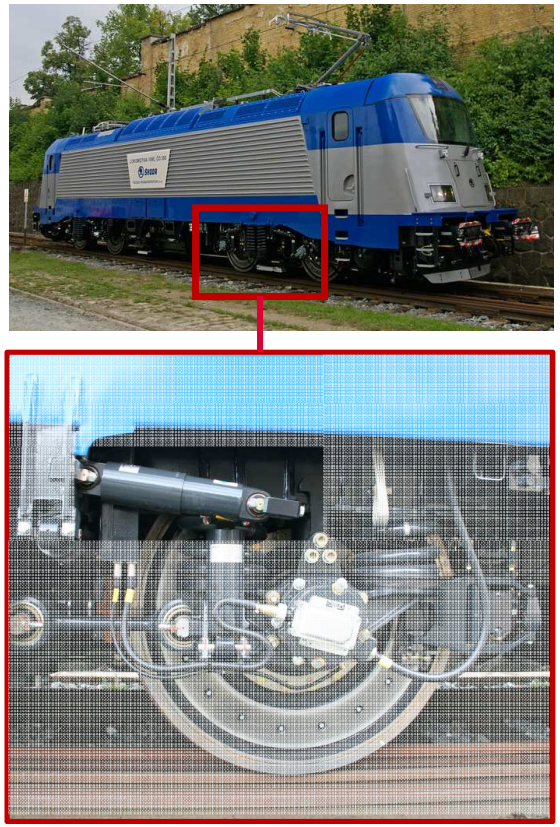
NEW PROJECTS

New projects in 2018

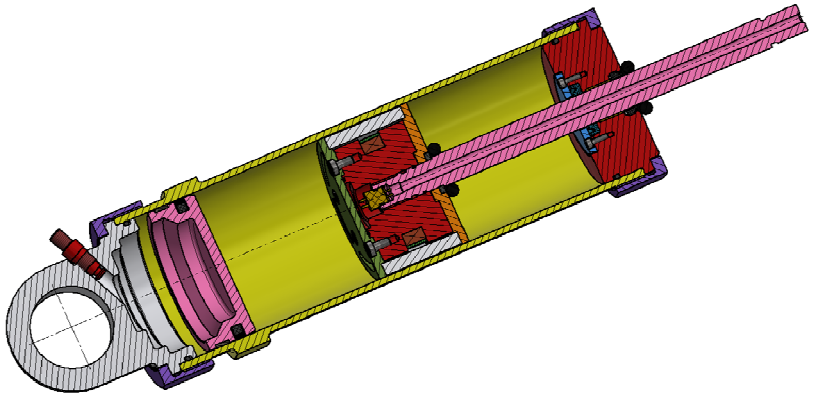
- TAČR Epsilon – New System for the Nondestructive Diagnostic of Pneumatic and Hydraulic Components – Poličské strojírny a.s. – (Mazal)
- MPO Trio3 – Development of Magnetorheological Damping System with Fast Response for Railway Vehicles – Strojírna Oslavany a.s. – (Mazůrek)
- HS Škoda Auto a.s. – Tool kit for shift test – (Mazůrek)

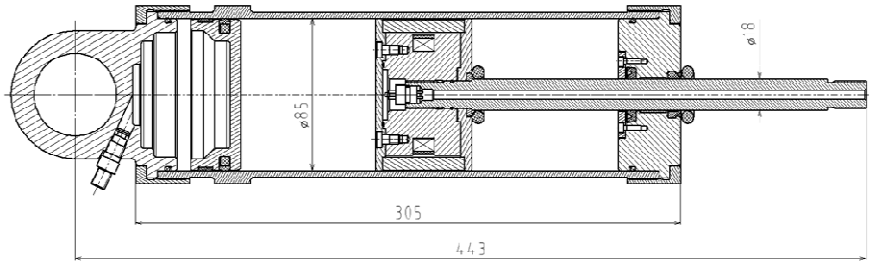
MAGNETORHEOLOGICAL DAMPER OF TRAIN BOGIE

- Project MPO TRIO2 > HS
- Development of MR Damping System with Fast Response for Railway Vehicles
- Yaw magnetorheological damper of train bogie
- Difficult damping selection
  High speed x turnout



https://www.skoda.cz/



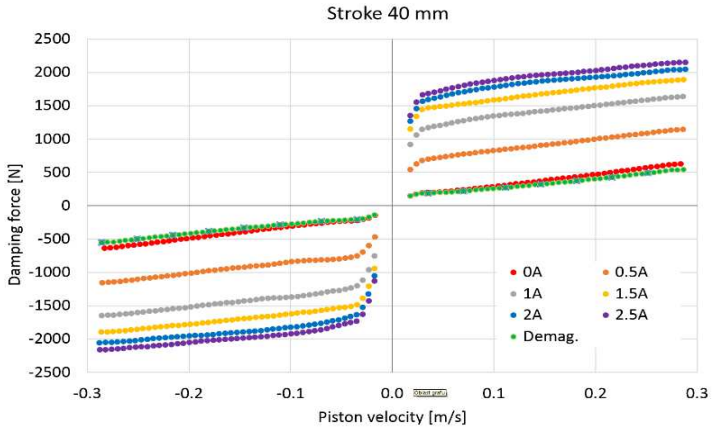


Yaw MR damper developed by BUT.

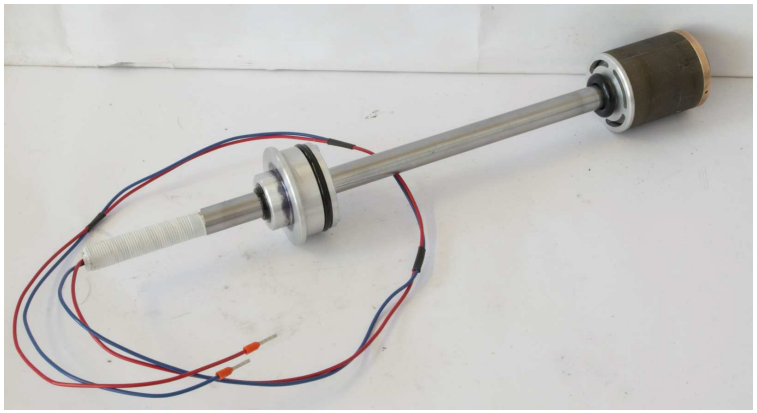
ST-OS strojírna oslavany

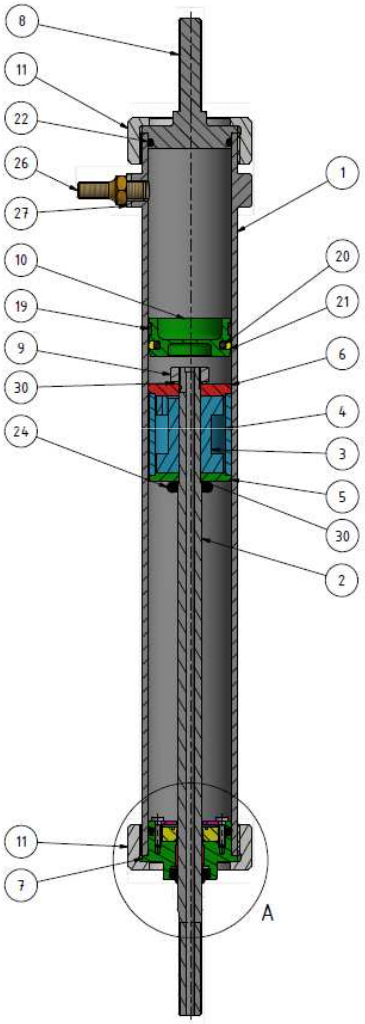
MK2

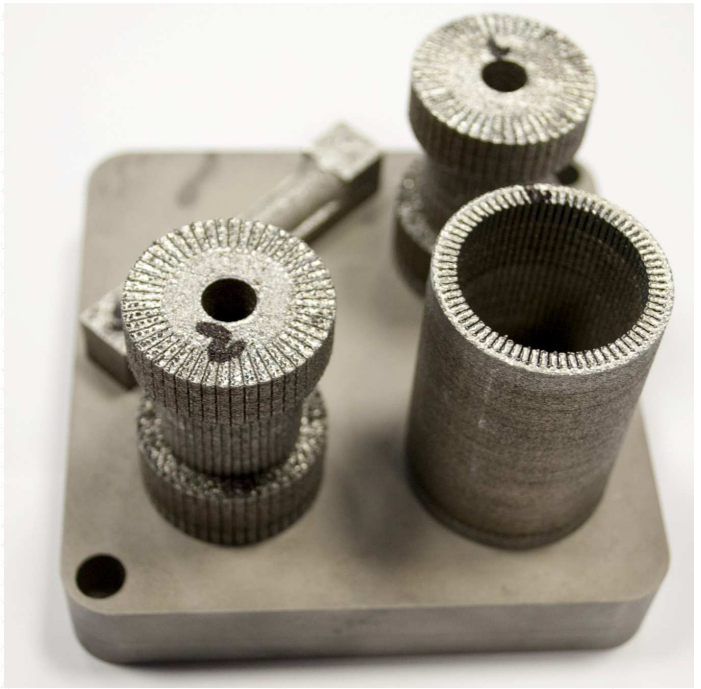
FAST MAGNETORHEOLOGICAL DAMPER

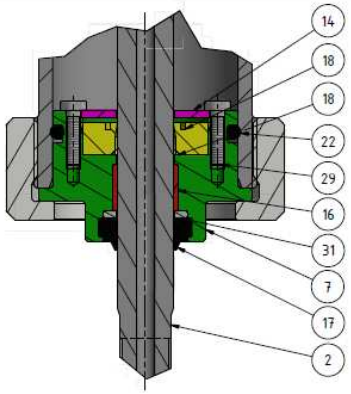


HYUNDAI | NEW THINKING. NEW POSSIBILITIES.









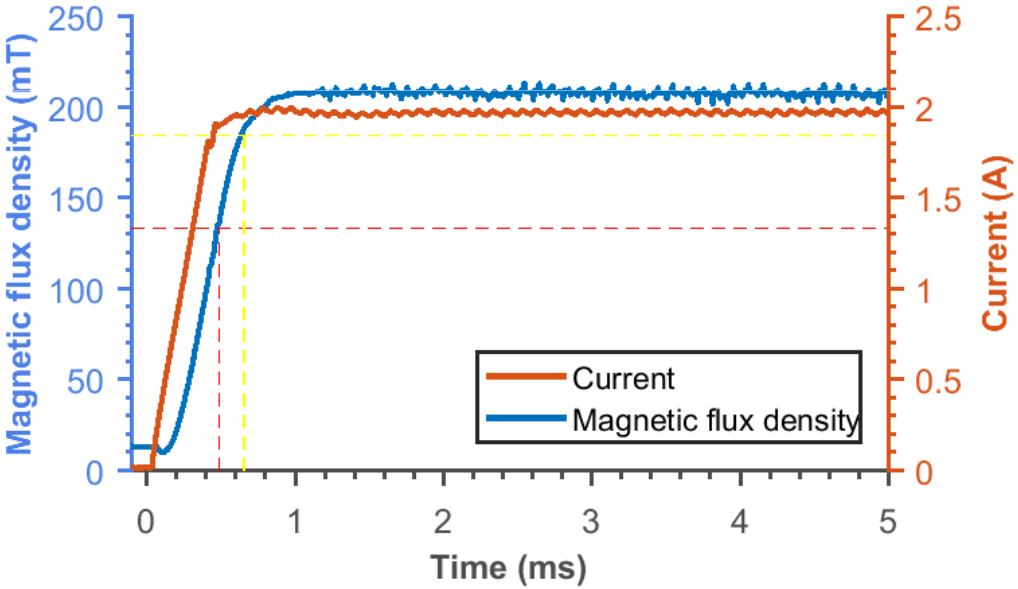
Snímek 11

MK2 možná lepší fast response?
Milan Klapka; 2.1.2018

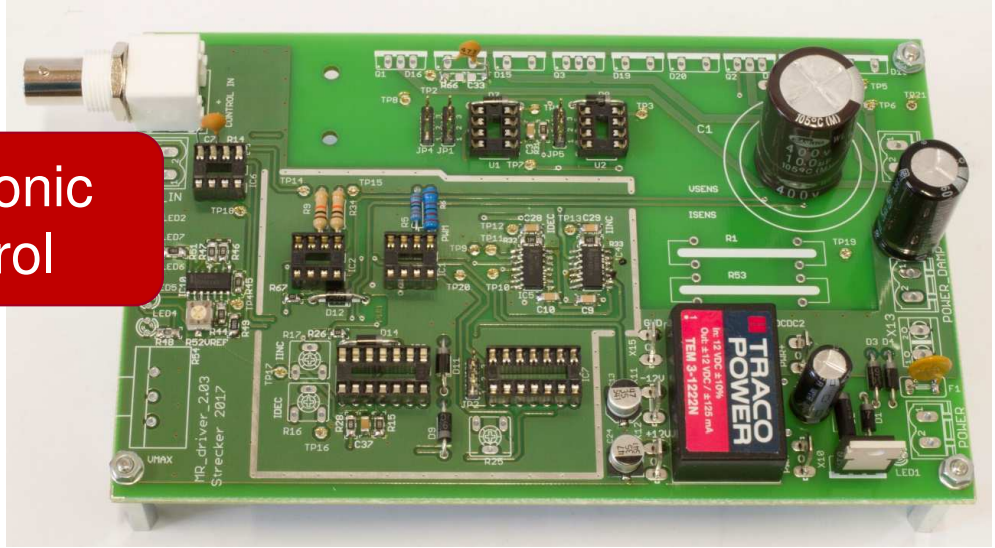
MK3

FAST MAGNETORHELOGICAL DAMPER

Problem:
coil inductivity



Electronic control



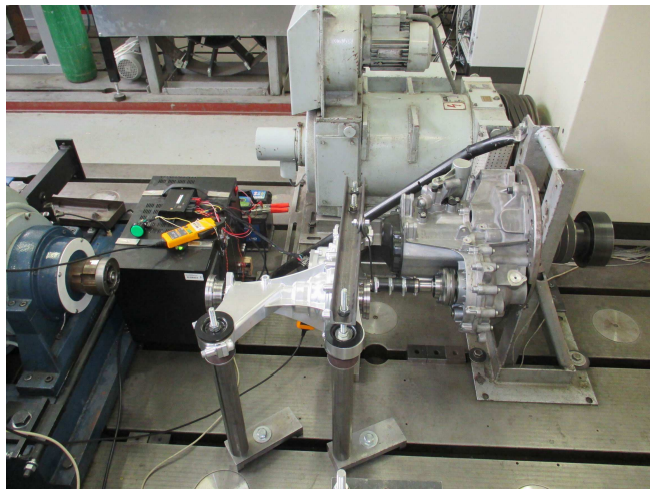
Capacitors for charging and discharging of the coil using overvoltage
up to 120 V

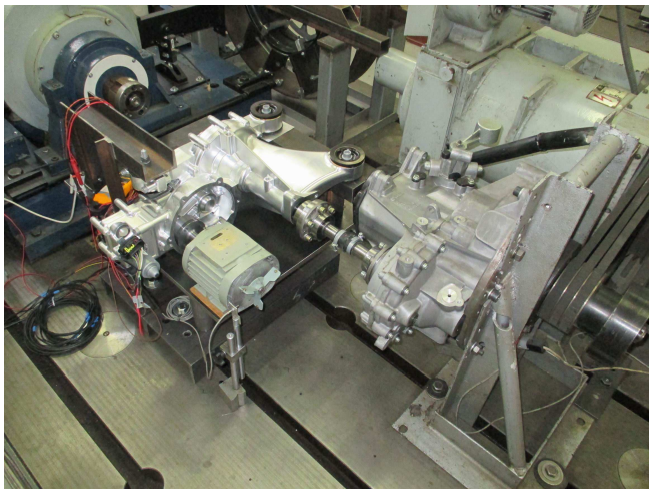
HYUNDAI NEW THINKING. NEW POSSIBILITIES.

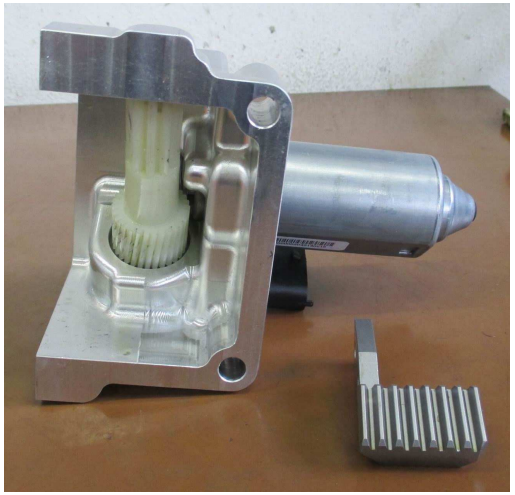
Snímek 12

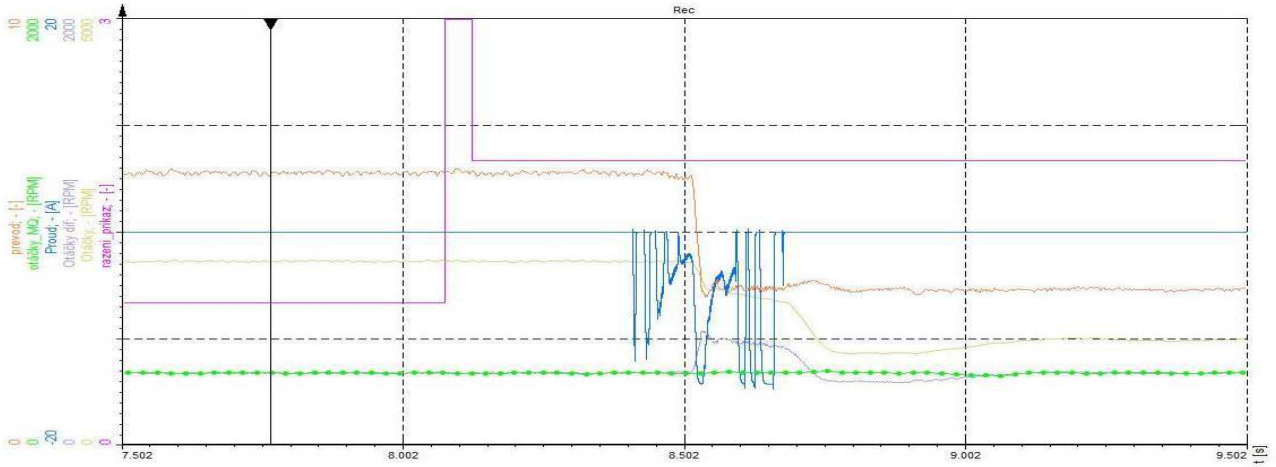
MK3 možná lepší fast response?
Milan Klapka; 2.1.2018

GEARBOX TESTS FOR THE ELECTRIC DRIVE OF THE REAR AXLE OF THE ŠKODA OCTAVIA







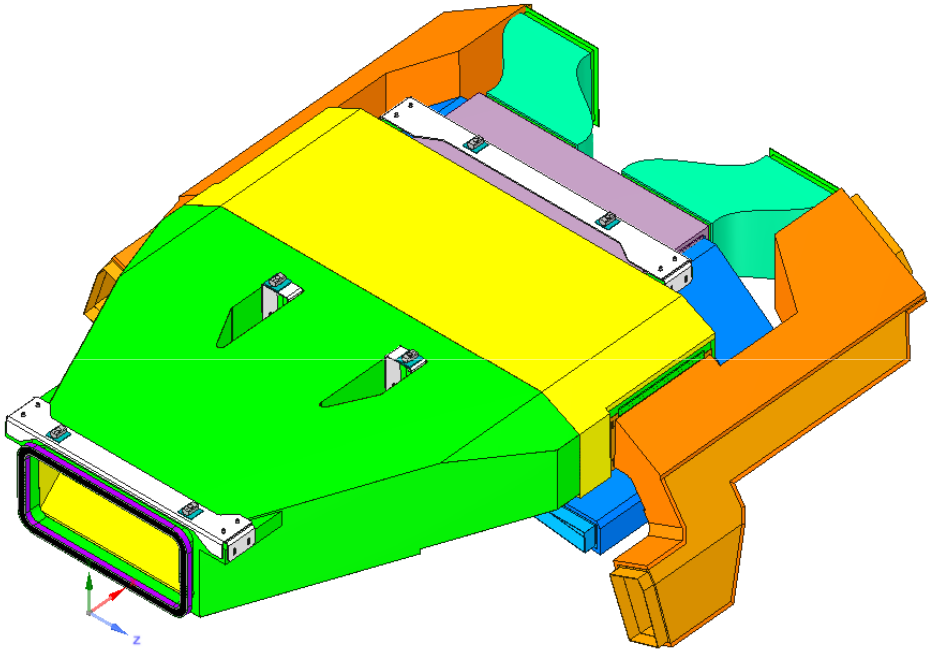


SIMPLY CLEVER

ACOUSTIC SILENCER STUDY

- Study of the acoustic attenuation of the silencer for heating, ventilation, and air conditioning of the railway passenger cars.
- Cooperation of IMID, Heat Transfer and Fluid Flow Laboratory and Institute of Aerospace Engineering.
- Customer: Siemens AG, Munich, Germany

SIEMENS



Model of the silencer prototype.

NEW PORTAL FOR THE HYDRAULIC PULSATOR INOVA

ELECTRIC CAR 1913

THANK YOU FOR ATTENTION

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