Aerodynamic and Flexible Trucks for Next Generation of Long Distance Road Transport

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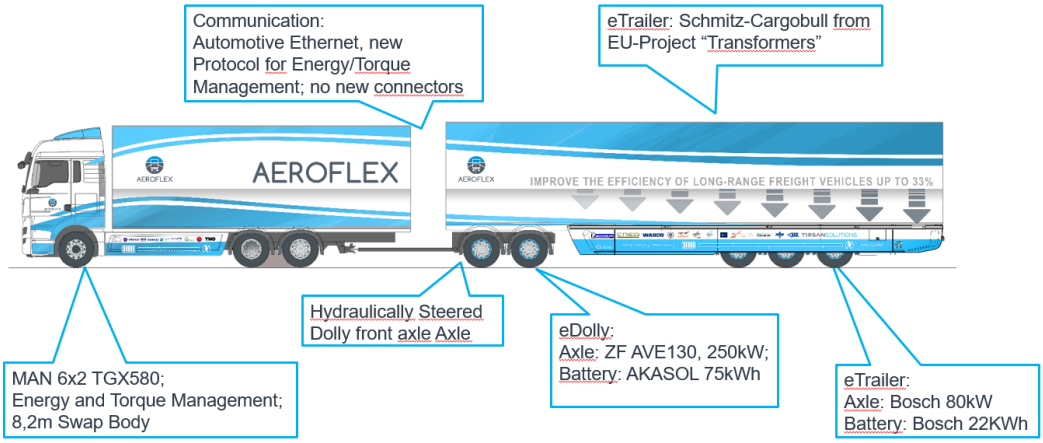
Document Change Log

Name	Date	Comments
Wittig	1.2.2021	Draft parts for dolly and trailer
Engasser	4.3.2021	First complete draft
Engasser	22.4.2021	Update of known issues list, Error code table. New section for transport.
Engasser	30.4.2021	Included some changes from FHG IVI, in particular highlighting of the waiting times before vehicle restart in sections 8 and 9, as well as the requirement of charging the trailer 12V-Battery regularly (Section7).
Engasser	11.5.2021	Transfer of Handbook into Deliverable
Engasser	2.7.21	Included amendments of reviewers

Publishable Executive Summary

In AEROFLEX WP2 an EMS1 vehicle was built which demonstrates the fuel consumption reduction potential of a distributed powertrain in a long and heavy vehicle. This report describes the vehicle's features and how to operate it. The demonstrator consists of a 6x2 swap body truck, an eDolly and an eTrailer.



The truck contains global energy management functions which integrate the additional electric drives into it's propulsion and endurance brake management. The driver receives accordant powertrain information from the e-Drive display installed in the truck's cabin.

This document also serves as a handbook for operation of the vehicle within the upcoming test program. Before handing over the vehicle went through an intense test program. Brake energy can be recuperated, and the engine's operating point can be shifted towards more efficient areas.

The eDolly was completely designed and built within the scope of the AEROFLEX project. Batteries are perfectly fitted inside the vehicle frame. With an energy capacity of 79kWh and a peak power of 250 kW it is able to recuperate a large amount of energy during downhill parts of a highway. Apart from that, a remote control enables manoeuvring of the trailer on yards.

The eTrailer has been taken over from the Transformers project. A gateway module was developed to make it adaptable with the new AEROFLEX communication protocol. The communication between the vehicle units is changed from conventional CAN to Automotive Ethernet which allows far more data to be transferred.

1 Acknowledgement

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Project partners:

#	Partner	Partner Full Name
1	MAN	MAN TRUCK & BUS AG
2	DAF	DAF Trucks NV
3	IVECO	IVECO S.p.A
4	SCANIA	SCANIA CV AB
5	VOLVO	VOLVO TECHNOLOGY AB
6	CRF	CENTRO RICERCHE FIAT SCPA
7	UNR	UNIRESEARCH BV
8	SCB	SCHMITZ CARGOBULL AG
10	TIRSAN	TIRSAN TREYLER SANAYI VE TICARET A.S.
11	CREO	CREO DYNAMICS AB
12	MICH	MANUFACTURE FRANCAISE DES PNEUMATIQUES MICHELIN
13	WABCO	WABCO Automotive
14	CHALM	CHALMERS TEKNISKA HOEGSKOLA AB
15	DLR	DEUTSCHES ZENTRUM FUER LUFT - UND RAUMFAHRT EV
16	FHG	FRAUNHOFER GESELLSCHAFT ZUR FOERDERUNG DER ANGEWANDTEN FORSCHUNG E.V.
17	HAN	STICHTING HOGESCHOOL VAN ARNHEM ENNIJMEGEN HAN
18	IDIADA	IDIADA AUTOMOTIVE TECHNOLOGY SA
19	NLR	STICHTING NATIONAAL LUCHT- EN RUIMTEVAARTLABORATORIUM
20	TML	TRANSPORT & MOBILITY LEUVEN NV
21	TNO	NEDERLANDSE ORGANISATIE VOOR TOEGEPAST NATUURWETENSCHAPPELIJK ONDERZOEK TNO
22	MHH	MEDIZINISCHE HOCHSCHULE HANNOVER
23	UIRR	UNION INTERNATIONALE DES SOCIETES DE TRANSPORT COMBINE RAIL-ROUTE SCRL
25	ZF	ZF CV Systems Hannover GmbH
26	VET	Van Eck Trailers

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