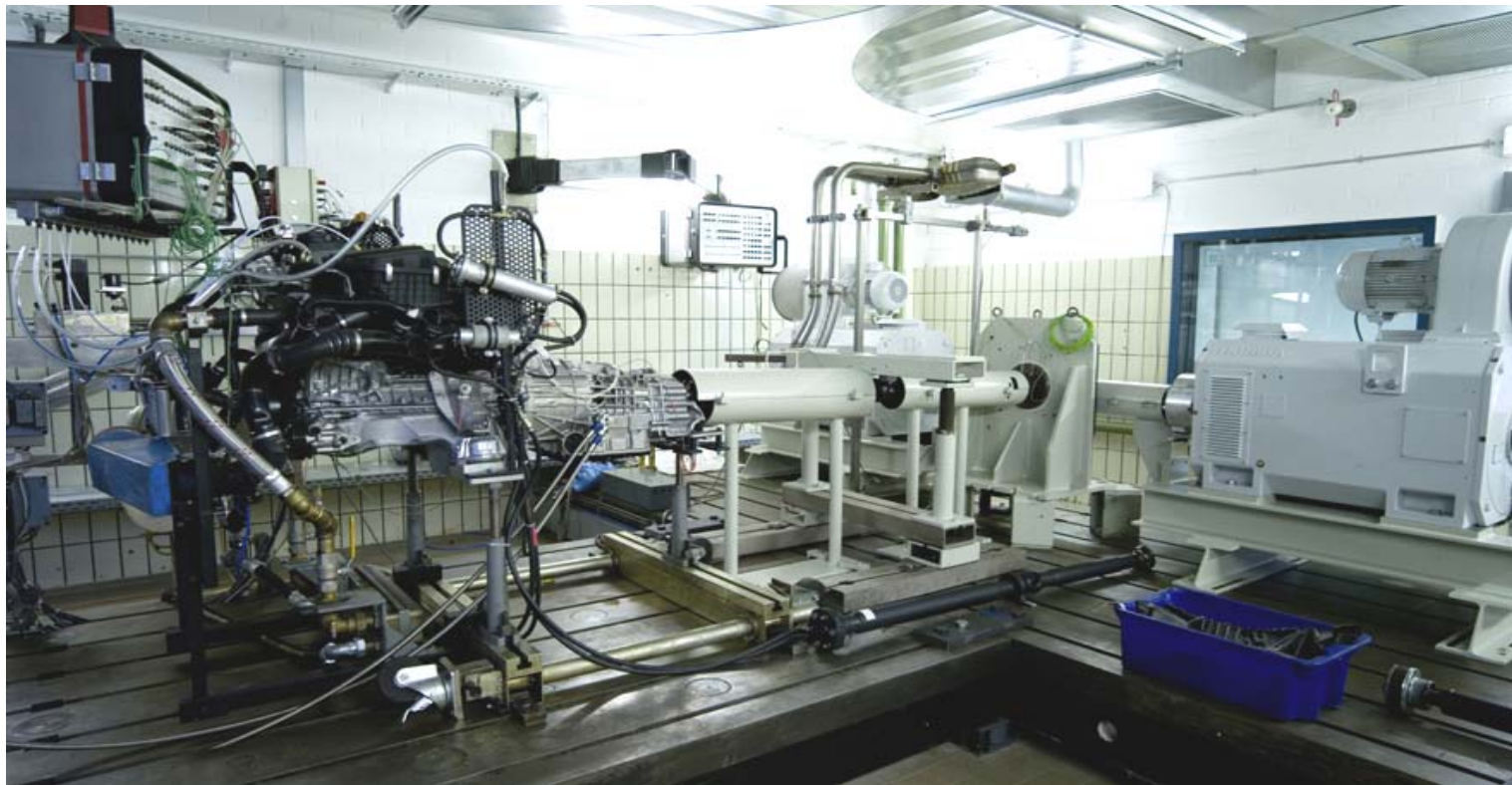


Contributions to the Development of Powertrain / Hybrid Drive



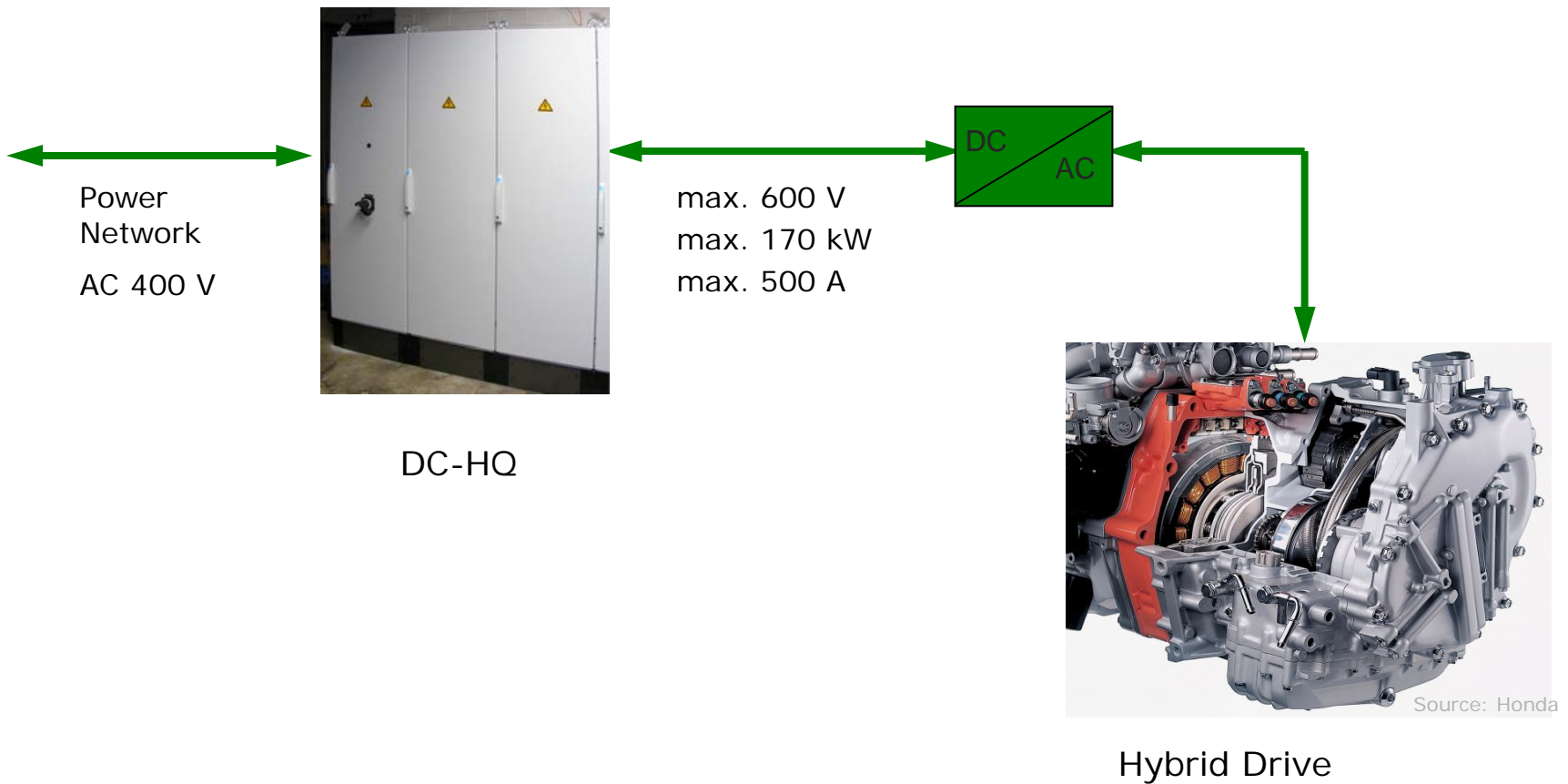
- Test Bench
- DC High Voltage Source
- Plan of Test Bench
- Test Bench / Equipment
- Battery Testing
- Spin Test Benches
- Integration of Hybrid Components
- Matrix of Competence

Test Bench



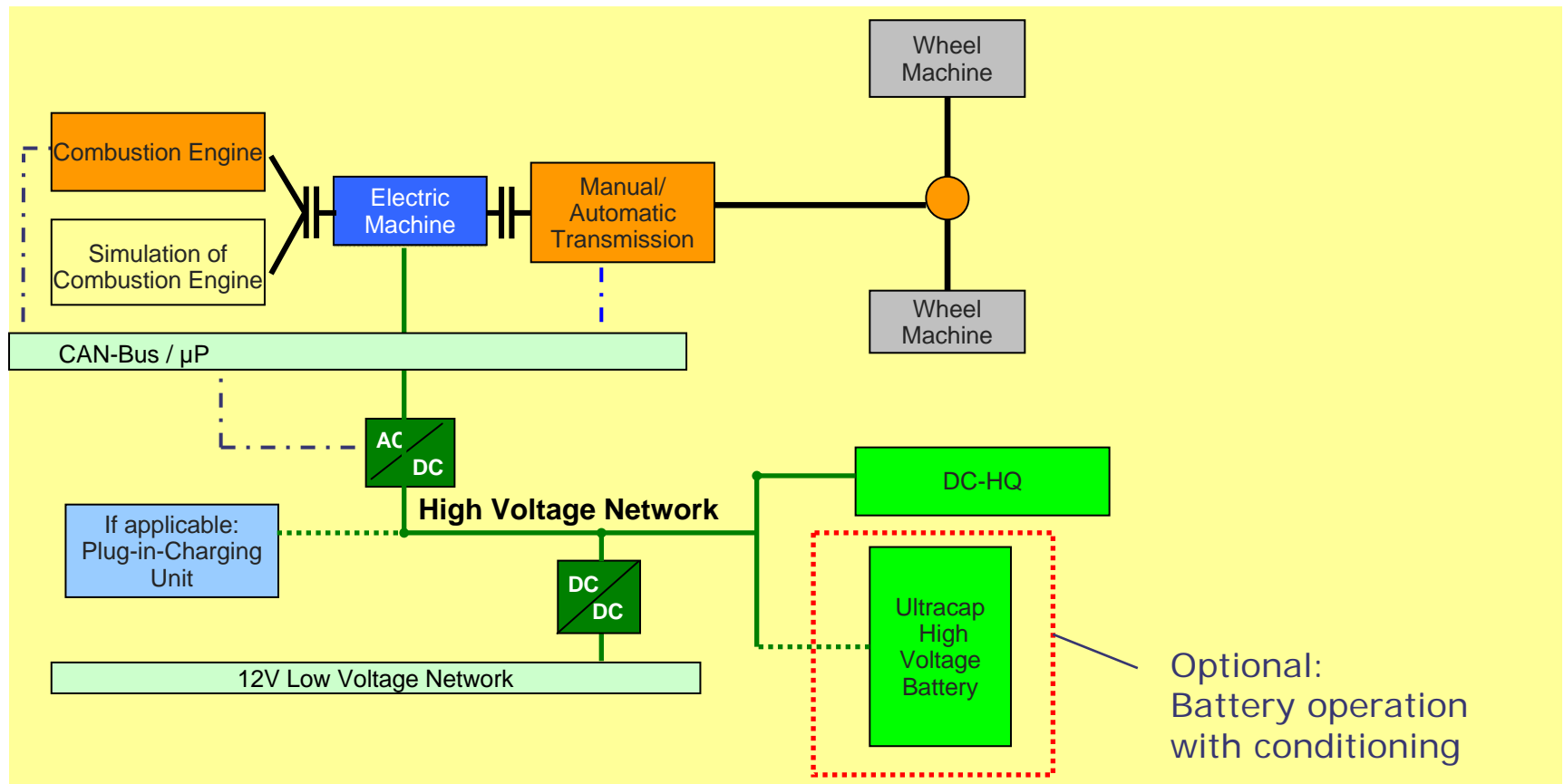
DC High Voltage Source

Simulation of Traction Battery



Plan of Test Bench

Wheel Machine Test Bench with High Voltage Source



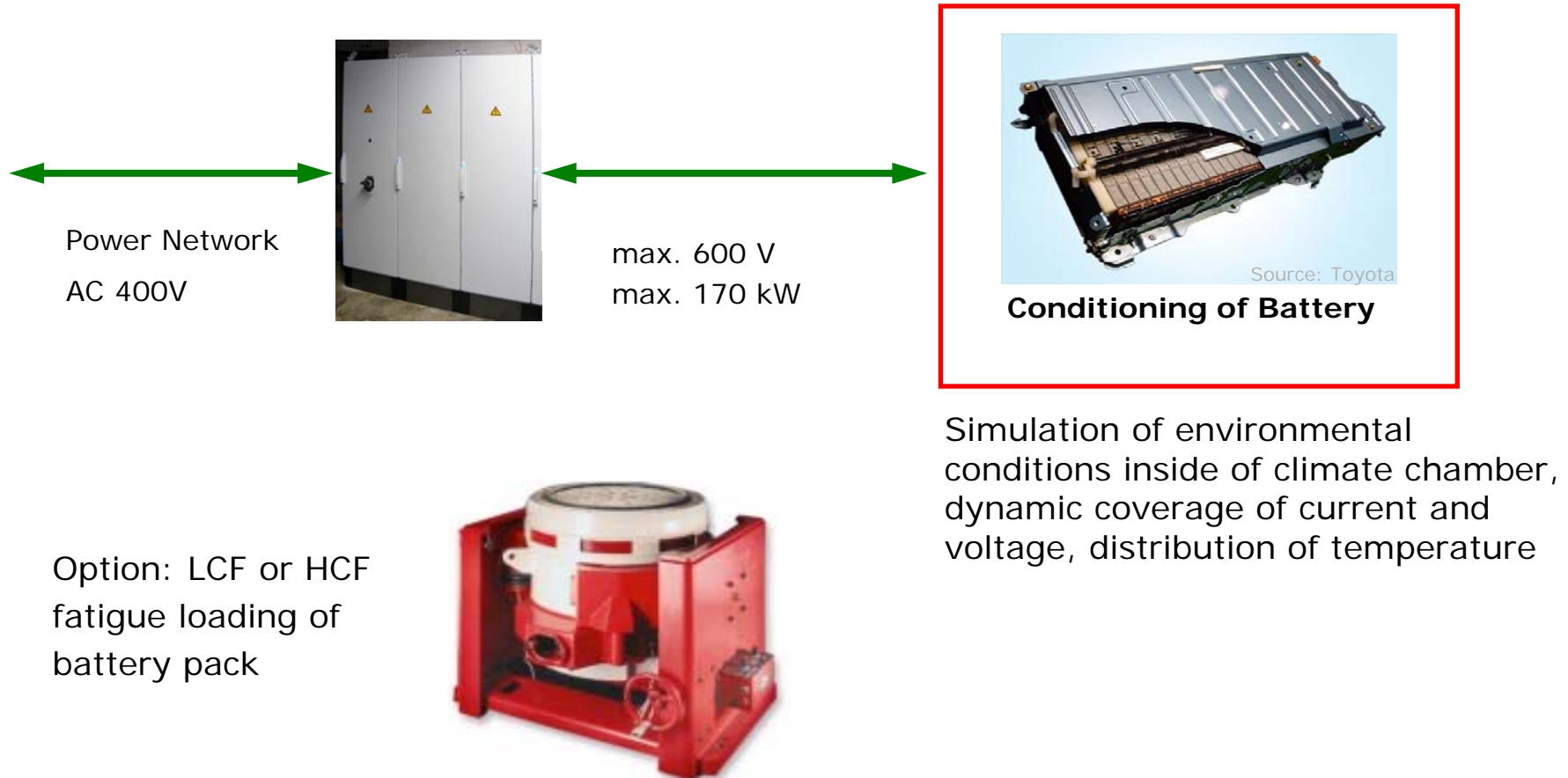
Test Bench



Load Unit / Drive Machine

	Power [kW]	Torque [Nm]	Speed _{max} [rpm]	Inertia [kgm ²]
Drive Machines	460	1000	10000	0.90
Wheel Machines	260	3200	3000	10.55

DC High Voltage Source for Charge and Discharge of Battery System



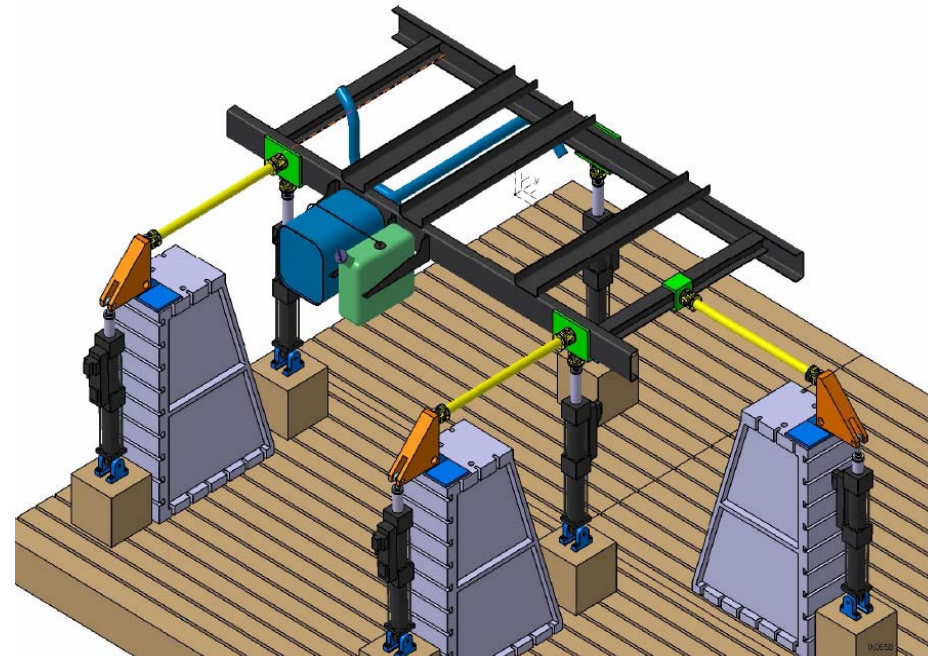
Rotor Dynamic Analyses of Electric Engines / Generators (Life Time Analyses, Rotor Dynamic Analyses, Burst and Overspeed Testing)

Test Bench	BSI 1	BSI 2	BSI 3	Schenck BI 1U	Schenck BI 2U
Diameter of Chamber	1600 mm	1600 mm	1500 mm	200 mm	250 mm
Axial Length	900 mm	900 mm	700 mm	200 mm	200 mm
Maximum Weight of Sample	4000 kg	4000 kg	450 kg	10 kg	50 kg
Speed Range	0 – 40000 rpm	0 – 40000 rpm	0 – 65000 rpm	0 - 16000 rpm	5000 – 120000 rpm
Control System	Computer-Controlled, Programmable	Computer-Controlled, Programmable	Computer-Controlled, Programmable	Computer-Controlled	Computer-Controlled
Vibration Monitor	2 – Channel	2 – Channel	2 – Channel		
Heating System	3 x 10 kW	3 x 10 kW		1 x 3 kW	1 x 10 kW
Maximum Temperature	800 °C	800 °C	800 °C	150 °C	600 °C
Transfer of Data	Telemetry	Telemetry	Telemetry		
Temperature Measurement	Optical Pyrometer	Optical Pyrometer	Optical Pyrometer		Optical Pyrometer
Data Logging	32 Channel	32 Channel	32 Channel	2 Channel	



Integration of Hybrid Components

- Structure-dynamic analyses
- Analyses for structural integrity of assemblies and components
- Dynamic simulation testing
- Life time testing



6-Axis-LCF Test Battery Pack attached to an Utility Vehicle Frame

Matrix of Competence

- Powertrain Test Bench
- Structural Testing

Competence of KST
Competence of GEVA



	Battery Test Bench	Power Train Test Bench	Engine Test Bench	Component Integration Structural Testing	Generator Spin Test Bench
Hybrid Drive Train					
Electric Drive Train					
Wheel Hub Drive					
Battery Pack					
Electric Engine/Generator					

Locations



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