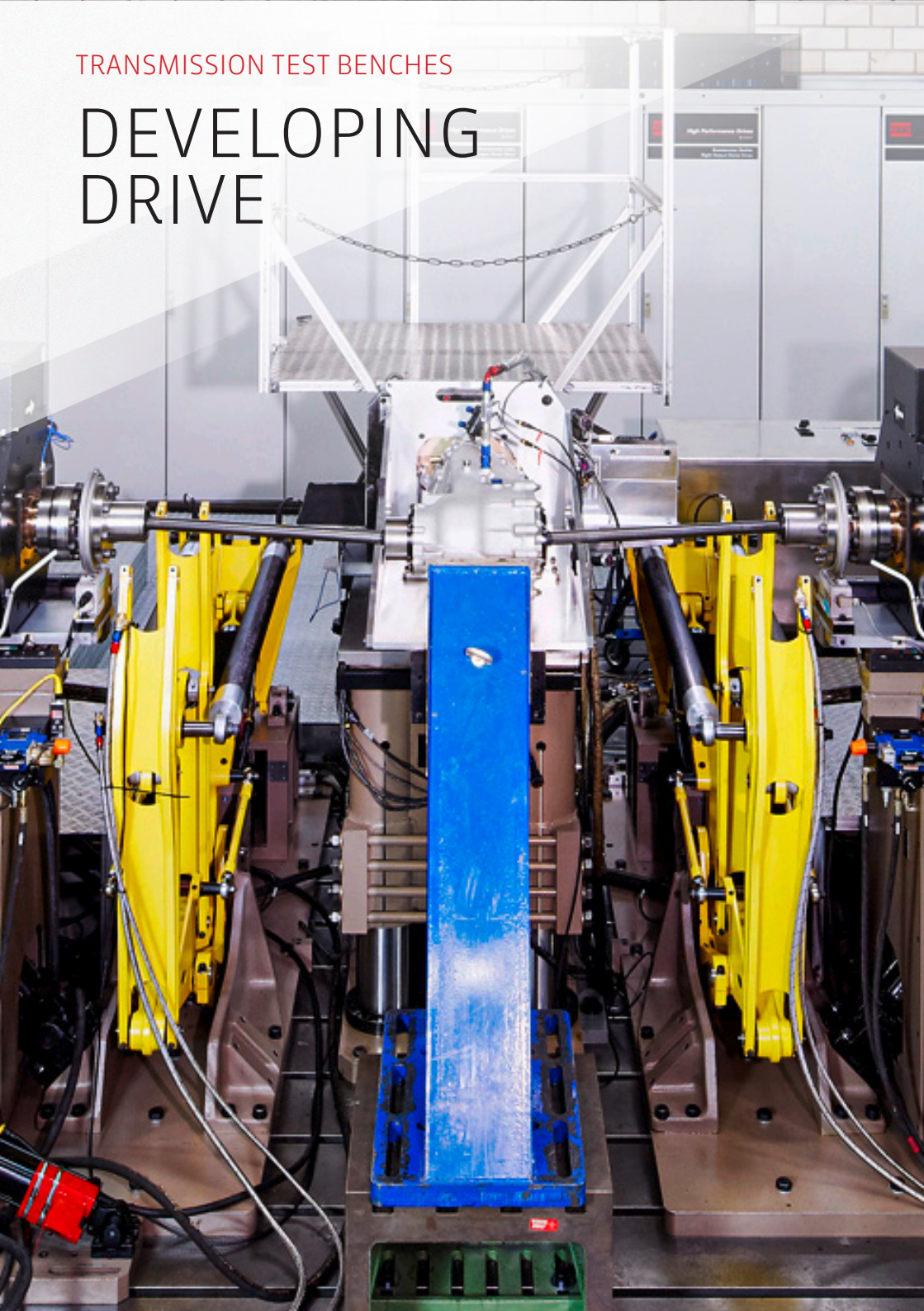
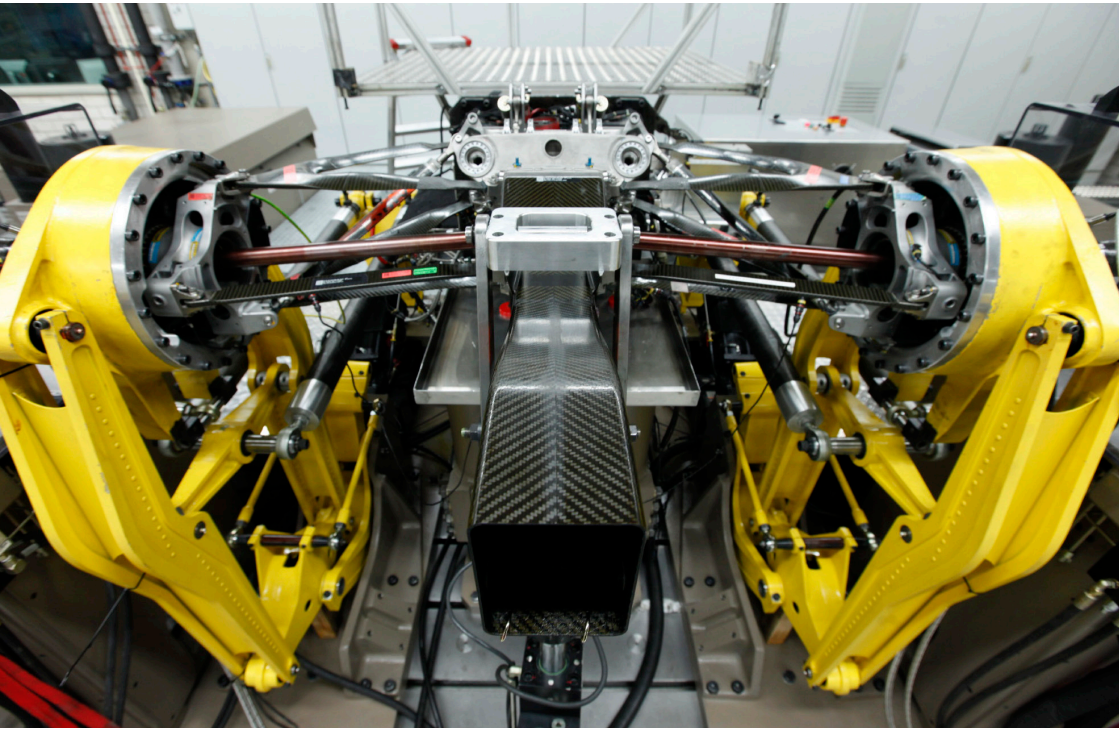
TRANSMISSION TEST BENCHES

DEVELOPING DRIVE



TRANSMISSION TEST SYSTEM

A unique hardware-in-the-loop tool for thorough transmission testing which simulates input and output forces on the gearbox whilst at the same time recreating 4 DOF suspension inputs per corner. Suitable for various transmission types including e-axles.



APPLICATIONS:

- Endurance tests with real-time lap simulation (Hardware in the loop)
- Launch and clutch development, including burnout simulation
- Complete rear-end testing, including uprights and hubs (performance and reliability)
- Compatibility with prototype gearboxes due to variable mounting plate
- Efficiency testing
- Adaptable for various test scenarios, including drive shaft testing
- High performance battery simulator for e-axle testing

TRANSMISSION TEST SYSTEM

OUTPUT DYNAMOMETER	
Continuous Power	450 kW
Maximum Speed	3,100 rpm
Base Speed	1,400 rpm
Continuous Torque at Maximum Speed	1,500 Nm
Peak Torque (1s) at Maximum Speed	2,000 Nm
Continuous Torque at Base Speed	2,700 Nm
Peak Torque (1s) at Base Speed	3,750 Nm
Inertia of Motor	0.6 $kg*m^2$
Motor Torque Control	3 ms

LATERAL INPUT (FRONT)	
Maximum Speed	9000 rpm
Continuous Power at Maximum Speed	635 kW
Peak Power at Maximum Speed	760 kW
Continuous Torque at various speeds	9000 rpm - 705Nm; 6500 rpm - 905 Nm; 1000 rpm - 1180Nm
Peak Torque at various speeds	9000 rpm - 800Nm; 6300 rpm - 1210 Nm
Inertia	0.1$kg*m^2$

ROAD SIMULATOR		
VERTICAL ACTUATOR	**Maximum Yoke Force**	+14 / 0 kN
	Maximum Yoke Displacement	± 60 mm
	Response	50 Hz
LATERAL ACTUATOR	**Maximum Yoke Force**	+14 / -7 kN
	Maximum Yoke Displacement	± 15 mm
	Response	50 Hz
DOWNFORCE ACTUATOR	**Maximum Yoke Force**	±20 kN
	Maximum Yoke Displacement	± 90 mm
	Response	50 Hz
LONGITUDINAL ACTUATOR	**Maximum Yoke Force**	+10 kN
	Maximum Yoke Displacement	±16.5 mm
	Response	50 Hz
BRAKE ACTUATOR	**Maximum Yoke Force**	+4/0 KNm
	Maximum Yoke Displacement	±5°
	Response	50 Hz

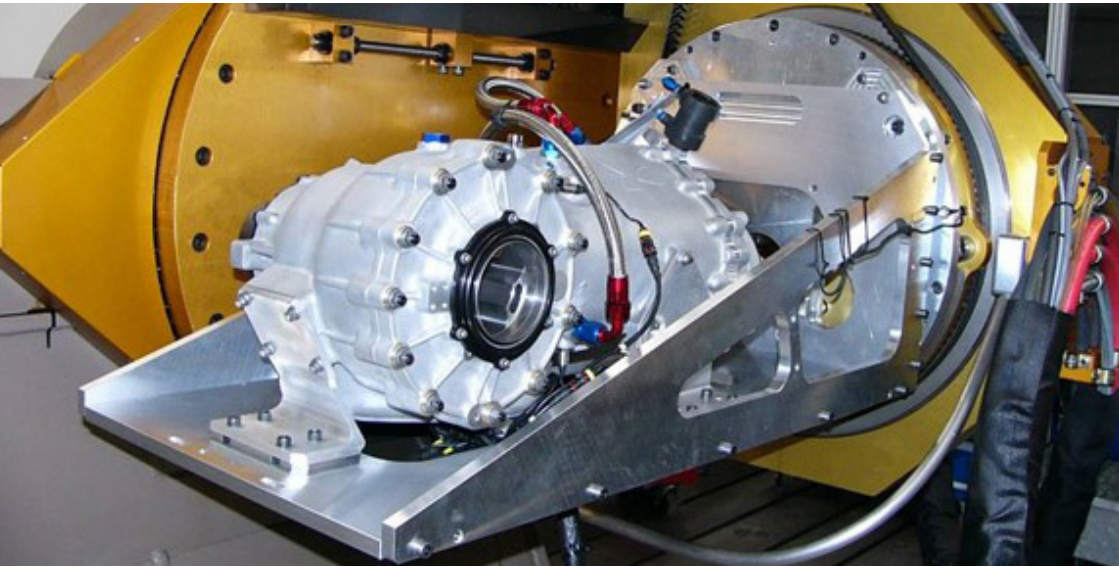
BATTERY SIMULATOR	
Voltage Range	12-920 Volt DC
Continuous Current	400 A
Peak Current (30secs)	800 A

LUBRICATION TEST SYSTEM

The forces experienced by transmission lubricants is recreated using real car data (Ax, Ay and Az acceleration data) which is recreated by the rig in rotation around two axes. This causes transmission oil distribution to be recreated accurately. A high-speed AC induction motor recreates the drive input from the engine. Oil can be conditioned to recreate different temperature scenarios. This delivers a very accurate analysis of lubricant behaviour in on-road conditions.

APPLICATIONS:

- Complete gearbox lubrication testing and analysis
- Replay of lap profiles (speed, acceleration)
- Specialised synthetic tests focusing on cornering and straightline details
- Spray bar set-up development
- Oil pump tests
- Cooler pressure drop testing



SPECIFICATIONS	
Continuous Power	63kW
Maximum Speed	20,000rpm
Torque	60Nm
Pitch Angle	-90° to 80°
Roll Angle	±60°