

2019 AVL Powertrain Dynamometer Test System (Turnkey Test Cell) – 580 kW / 8,400 Nm – FWD & RWD – Battery Emulator 800 V

Turnkey AVL transient/dynamic powertrain test system (dynamometer) previously used for professional transmission and driveline R&D. Built for repeatable, laboratory-grade control of torque, speed and energy flows across ICE, EV and hybrid development programs. Supplied with an approx. 10 m x 8 m acoustically dampened test cell featuring a 2.5 t overhead crane, plus a temperature control system and ducting provisioned for cell heating and cooling.

This is a serious OEM-grade development asset — ideal for race engineering programs, powertrain engineering teams, or research groups seeking a proven, high-value alternative to a multi-year new-equipment lead time.

Why this system matters

- OEM-grade transient control and repeatability for calibration, durability, NVH and efficiency programs
- Dual-axis 2WD capability supporting both front-wheel and rear-wheel drive transmission/driveline configurations
- Regenerative 4-quadrant drive architecture (recover energy back to grid or local storage) reduces operating cost
- Integrated AVL automation ecosystem (PUMA Open 2 / EMCON) with EtherCAT and CAN for modern test workflows
- Includes key conditioning systems (fuel, coolant, transmission oil) for stable, repeatable testing

Typical use cases

Transmission, differential and complete driveline durability, NVH and efficiency testing

Gearshift strategy development, TCU/ECU calibration and HIL/SIL integration

ICE, hybrid and EV subsystem validation with real-time CAN/EtherCAT I/O

Accurate reproduction of road, track and regulatory cycles (emissions testing) for correlation and certification support

Motorsport-grade development: transient track simulation, repeatability for back-to-back A/B testing, component validation

Core system specification

Loading system (2 x AVL DynoForce ASM 4200/0.65-3) – one per 2WD axis

Per motor:

- 4,200 Nm continuous from 0–650 rpm
- 290 kW from 650–1,200 rpm
- Max speed 3,000 rpm
- Motoring power/torque approx. 10% lower than generating mode

- Forced-air cooling
Two units provide up to **8,400 Nm and 580 kW combined**.

Prime mover (AVL DynoUltra PMM 500/6-10 electric drive)

- 500 Nm continuous from 0–6,000 rpm
- 314 kW from 6,000–10,000 rpm
- nmax 10,000 rpm
- Closed-loop water cooling
Can simulate the torque/speed profile of an internal combustion engine or an electric machine, or be replaced by an actual ICE/EV/Hybrid drive unit as required.

Torque measurement

- HBM T40B torque flange, **5 kNm** capacity (with shunt calibration)

Power and drives

- AVL AFC 400/500 IGBT mains converter cabinets
- Common DC link for multi-axis 4-quadrant operation (regenerative)

Control and automation

- AVL EMCON with **PUMA Open 2**
- EtherCAT + CAN real-time interfaces
- Broad AVL device driver library for integrated measurement/control

Cycle capability

Simulates transient and steady-state conditions (uphill/downhill loading), mixed drive cycles (e.g., NEDC, FTP, SFTP, CLTC), race tracks, or any custom trace for tight correlation to on-road/track data.

Energy storage emulation / battery emulator

- AVL E-Storage High-Dynamic system, **250 kW class, 800 V capability**, integrated to PUMA with appropriate PDU/switching hardware

Included conditioning systems (repeatability + durability-ready)

Fuel measurement & conditioning (FlexFuel)

High-accuracy fuel measurement with temperature conditioning for repeatable test results. Designed for stable fuel temperature control during steady-state and transient programs.

Engine coolant conditioning (CONSYSCOOL 200)

Engine coolant conditioning system providing controlled coolant temperature management for consistent thermal conditions across durability and calibration testing.

Transmission cooling / conditioning

Transmission lube oil / fluid conditioning system with temperature and flow monitoring to maintain stable fluid conditions during endurance, efficiency and shift development testing.

Mechanical integration & safety

FWD and RWD support

Floating isolated T-shaped bedplate, driveline supports and adapter sets accommodate both front-wheel and rear-wheel drive transmissions.

Safety and wiring

Dual-channel speed sensing for safely-limited-speed (SLS) operation, emergency stop / STO cabling, cable support assemblies for X/Y wheelbase alignment, and instrumentation signal sets.

Environmental operating range

Typical lab conditions +5 to +40 °C.

Included test cell package (with sale)

Approx. **10 m x 8 m** acoustically dampened enclosure with integrated **2.5 t overhead crane**, plus temperature control system and ducting provisioned for cell heating (and cooling if chiller is added).

Note: Will require plumbing to an external chiller for cell cooling function.

Location: Scoresby, VIC

Removal: Purchaser to remove from site. Quotation from AVL's nominated service provider can be supplied for professional de-installation, loading and load-out planning.

Documentation: Full description/specification pack, installation manuals, electrical drawings and detailed & commented photography manual of wiring current state (for re-assembly).

Inspection available by arrangement.