

THE VEHICLE AND EMISSIONS LABORATORY



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Real education. Real skills. Real jobs.

Discover a world class vehicle and engine testing facility

The Vehicle and Emissions Laboratory found within the walls of Kangan Institute at the Automotive Centre of Excellence is poised to revolutionise the automotive industry in Melbourne.

Comprising of a control room, truck dynamometer, brake test dynamometer, all-wheel drive dynamometer, motorcycle dynamometer as well as an engine dynamometer, the Vehicle and Emissions Laboratory leaves nothing to be desired.

Best of all, industry can now enjoy these full-fledged services under the one roof.

With the completion of Stage II of the Automotive Centre of Excellence (ACE), our Vehicle and Emissions Laboratory is primed and ready for the lime light. It's a world class centre designed to meet the ever changing needs of the automotive industry.

It is able to service a diverse range of clients from research and development, emission testing through to vocational training.

Whether you are a major automobile manufacturer bringing a new model to market, a logistics fleet operator trying new bio fuels, an enthusiast building a hot rod or simply changing the exhaust system on your hot hatch, it's important to know what the modifications you are installing are going to do to your engine. We offer the skills and technology you need.

Contact us to see how we can help you get the most out of your project.



Features of the Vehicle and Emissions Laboratory

Control Room

The control room looks out and into each test area with state-of-the-art hardware designed to get the most accurate data from the testing facilities.

Truck/bus Dynamometer

The truck/bus rolling road is a two wheel drive, fully regenerative, AC electrical dynamometer installed in a 10 metre pit. The system comprises of two mechanically connected rollers, driven by an AC motor which in turn is controlled by an AC Vector Drive.

The AC motor is force ventilated and provides power for the rollers and for absorbing power from the test vehicle. A load-cell is fitted to the dynamometer rig to measure the motoring and absorbing forces.

The vehicles exhaust system is connected to either extraction pipe work then vented externally to atmosphere or sampled back to an Horiba emissions gas bench for analysis.

A number of specific road simulation tests can be conducted such as DT80 (Diesel Test 80 second). The DT80 enable owners of vehicles built before 1996 with a gross vehicle mass (GVM) of 4.5 tonnes or above to claim the diesel fuel tax credit of up to 18.5%.

Specifications:

Maximum road speed	110 km/h
Maximum tractive effort	23,490 Newtons (0-80km/h)
Maximum power absorption	522 kW
Maximum axle load	20,000 kg

All-wheel Drive Dynamometer

The All-wheel Drive (AWD) dynamometer operates similarly to the truck dynamometer; however, the maximum vehicle mass permitted is less. The AWD dynamometer can also accommodate motorcycles with a minimum mass of 450 kg.

As the name implies, all four wheels of a vehicle,



whether it is a front wheel drive, rear wheel drive or four wheel drive can drive or be driven by the dynamometer. On non-driven wheels, any losses (i.e. wheel bearings, dragging brakes, tyre rolling resistance etc.) can be measured. As the dynamometer is able to “motor” the wheels of a vehicle, frictional and driveline losses can be determined for “hot” or “cold” conditioned vehicles.

Specifications:

Maximum road speed	200 km/h
Maximum continuous power absorption	236 kW
Momentary peak power value	335 kW
Maximum tractive effort	10,000N
Maximum tractive effort during overload	15,000N
Maximum torque	6095 Nm
Overload torque	9142 Nm
Maximum axle load (total)	3,500kg
Dyno separation distance	2m-3.5m

Motorcycle Dynamometer

The motorcycle dynamometer consists of one 533mm (21”) diameter steel roller. The roller is connected to an AC motor which in turn is controlled by an AC vector drive. Road load simulation is partly electrical and partly mechanical – the base inertia of the rig rollers is approximately 100kg for the roll set which can be controlled by electrical means to provide an inertia range of 80 - 450kg. A full range of emission tests can be catered for as well as the measurement of power, torque, fuel consumption etc. As a road simulation rig, the motorcycle dynamometer and software have very high resolution so that quite small performance differences such as frictional variations between “Ö” ring and non-“O” ring drive chains can be measured.

Specifications:

Maximum road speed	250 km/h
Maximum power absorption	150 KW
Maximum torque	720Nm

Engine Dynamometer

The extremely accurate control of the engine dynamometer, less than 10 RPM, is ideally suited to engine management calibration work for petrol, diesel and alternate fuelled vehicles. Sample rates of up to 1000 samples per second of acquired data can be logged and then processed by the Froude Hofmanns Texcel Analysis software. Similar to the chassis dynamometers, the exhaust system can be directed externally or to an Horiba emissions gas bench.

Specifications:

Maximum power	500kW (675 HP)
Maximum torque	3000 Nm
Maximum drive shaft speed	7,500 RPM


Brake Test Dynamometer

The brake test dynamometer is used to evaluate braking performance for most vehicles. This piece of equipment is configured to operate at speeds between 2.4 km/h for Anti-lock Braking System (ABS) vehicles or 4.8 km/h for non-ABS vehicles. Braking force values set by government agencies or vehicle manufactures can be pre-programmed for compliance and performance checks.

Emissions Testing

All dynamometers are connected to an Horiba emissions gas testing system. The vehicles exhaust system is connected to either extraction pipe then vented externally to atmosphere or sampled back to the gas bench for analysis. Additional equipment within the facility enables the following measurements:

- Opacity
- Particulate matter
- NOx (oxides of nitrogen)
- THC (total hydrocarbon)
- CO (carbon monoxide)
- CO2 (carbon dioxide) and CH4 (methane) for greenhouse gas determinations and fuel consumption calculations.



Contact us today to learn how we can help you:

- Test and evaluate emission standards.
- Meet safety compliance for States and Federal Agencies.
- Measure and report emission compliance for tax rebates.
- Measure vehicle performance to confirm engine modifications.
- Recalibrate engine and or transmission tuning specifications for optimum performance and fuel economy.



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