

## Versatile Test Bed

**Introduction:** CP Engineering designed the Versatile Test Bed (VTB) for operators of Quality Audit, Endurance and Research and Development engine test cells. The VTB has the advantages of a low installation cost and enabling rapid engine change, allowing maximum accessibility to the engine, and the ability to support engines with a wide range of physical sizes and power.

### General Concept:

Engine testing today involves test departments in major capital expenditure, with the dynamometer no longer being the only high cost item. As the cost of computer based test systems, smart instruments, gas analysis equipment and even transient dynamometers push the investment higher, it is becoming increasingly important to ensure that engine test cells work to the optimum. In an environment where tests are relatively short, and the engine can be changed there is a distinct advantage if the engine can be replaced quickly so maximising utilisation of the test cell. However, locating the engine to the bed, its drive shaft, its services and its instrumentation can be a time consuming exercise. There is a great deal of merit, therefore, in preparing the engine outside the test cell with a kit of adaptors, and transporting the rigged engine to the test bed where completing the installation can be carried out in the minimum of time. This is the concept of the VTB.

The construction of the VTB places most of the cooling system with its heat exchangers, couplings and valves in an area below the working height of the engine. The only exception being the combined engine water heat exchanger and header tank. Most of the support items such as the throttle actuator, transducer box and fuel meter are located on a post mounted to the rear of the VTB. This design enables maximum accessibility to the engine under test.



A typical VTB installation. This example shows an optional third temperature control module, API dynamometer with stool and FMS-400 fuel meter

# CP Data Sheet

## Specification:

The Versatile Test Bed consists of the following modules:

- Main Engine Frame with dowel locations and bolts
- Temperature Control Manifold equipped with control valves and actuators for engine water temperature and engine oil temperature closed loop control. Expansion for two further modules. (see separate Data Sheet)
- Engine water and oil quick connections. Each connection set including one bed and rigging halves
- Engine drip tray
- Two sets of engine pre-rig cross members
- Post for location of throttle actuator, transducer box, power modules, fuel meter etc
- Shaft guard (shaft details required)
- Configured to required centre line height

## Optional Items:

CP Engineering can provide the following optional items for inclusion with the VTB:

- An eddy-current dynamometer from a range of API single, double and triple rotor machines
- An AC transient dynamometer with a wide range of power and speed capabilities.
- A dynamometer stool. It will be necessary to advise dynamometer footprint dimensions and desired engine crankshaft centreline height.
- Dynamometer to engine shaft with engine and flywheel adaptors. It will be necessary to provide details of both the engine and dynamometer enabling CP to select the optimum shaft and flexible elements
- Additional temperature control modules for fuel and intercooler
- Gravimetric Fuel Meter
- Fuel Temperature Conditioning Unit
- Combustion Air Handling Unit (temperature, humidity and pressure control)

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