

## Diesel Pump Test Rig

Mecelec Design has designed and built a test rig which performs a full functional test on diesel pumps for a leading truck manufacturer.

The test rig has three identical test heads. Each test head can test 1 pump at a time. The rig has two modes, fully automated and manually loaded. In automatic mode, pumps are picked from the in-feed conveyor by a 6 axis robot and placed in a test head. After the test is complete, the robot removes the pump and places it on the out-feed conveyor. In Manual mode, the pumps are loaded and unloaded through vertical doors at the front of the rig.

In the truck, the pump is situated in the cylinder block and is driven by a camshaft. The pump pressurises a common rail to 3000 bar which then feeds the injectors.

In the test rig there is a cambox which replicates the cylinder block and camshaft. There is also an actual truck fuel rail which is pressurised to 3000 bar during the test.

At the rear of the test rig there is a hydraulic bay which conditions the temperature and pressure of the diesel calibration fluid and lube oil.



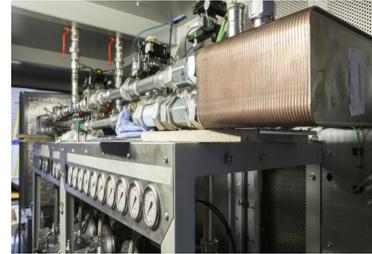
### Technical Data

UUT	Truck Diesel Pump
UUT supply pressure	10 Bar
UUT outlet pressure	3000 Bar
Lube oil supply pressure	2 bar
Electrical Power Supply	3 Phase 415VAC @ 125A
Control System	Allan Bradley PLC, C# PC Software
Operator Interface	Touchscreen Monitor
Cycle Time	60 seconds

# Case Study Automotive English

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An actual truck fuel rail is used in the test rig and is pumped to 3000 bar during the test. The high pressure connection to the UUT is automated with a lance system.



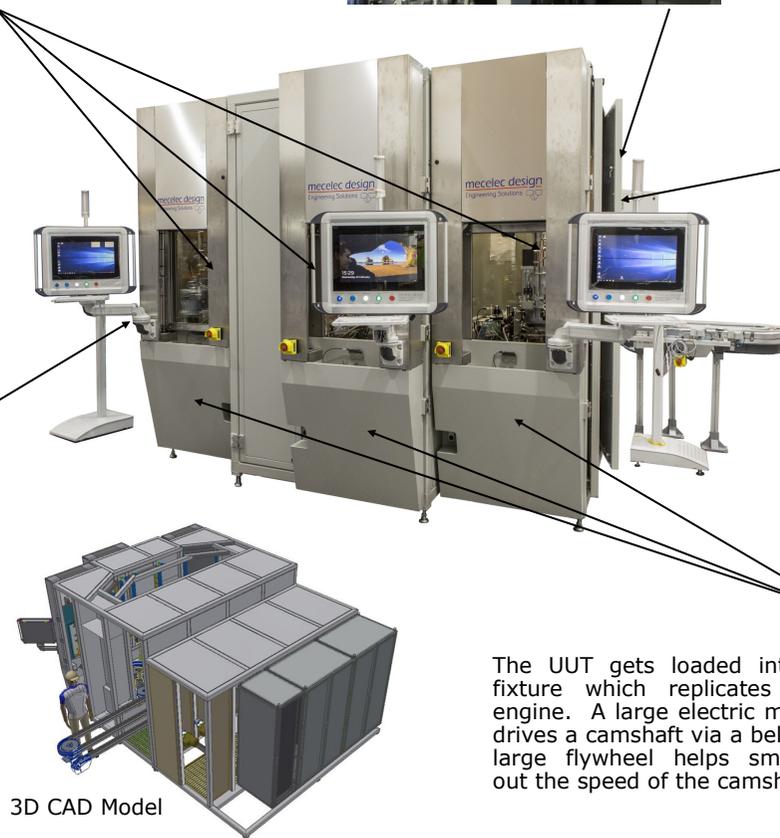
The hydraulic bay is situated at the rear of the rig and has a full width walkway for maintenance access. It's purpose is to condition the pressure and temperature of diesel calibration fluid and lube oil prior to supplying the test heads.



A six axis robot is mounted centrally between the conveyors and test heads. It has a double ended gripper to reduce cycle time.



The in-feed conveyor has a checking station to ensure the correct part has been loaded and that it is loaded correctly.



3D CAD Model

The UUT gets loaded into a fixture which replicates the engine. A large electric motor drives a camshaft via a belt. A large flywheel helps smooth out the speed of the camshaft.

