ENGINE TESTING PROCEDURES AND SCHEDULE PREPARATION

In order to repeat any given test at some time in the future, it is essential that all variables are noted, for example:

- Engine build specification
- Ignition and injection timing
- Type of fuel, oil and coolant
- Position of sensors on the engine and within the cell

It will be impossible to replicate tests at some time in the future if one does not have full records of engine build, cam timing, ignition and injection timing, compression ratio, fuel,oil and coolant used.

Calibration Equipment Identification

Where possible all critical equipment shall be tagged or labelled with the serial number, frequency of calibration and calibration status shown on the tag or label.

Engine Tests used within the testing industry:

- **Durability (Design Validation Test)** Within this group is;
- Steady load and speed operation
- Load cycling
- Speed cycling
- Thermal shock cycling
- Component development
- Vehicle cycle simulation

Performance, Within this group is;

Power curves

Governor curves

Lubrication oil consumption

Flow measurements

Heat balance

Emissions measurement

Lubricants & Fuels Within this group is;

- Automotive lubricants
- Marine lubricants
- Black sludge formation
- Intake valve deposits
- Combustion chamber deposits

Specialised investigations and testing

- Rig testing (bearings, antifreeze, erosion etc.)
- Simulated or environmental testing
- Photo elastic stress measurements
- Strain gauge testing
- Flywheel burst testing

Exhaust system testing

- Vehicle cycle simulation
- Steady state

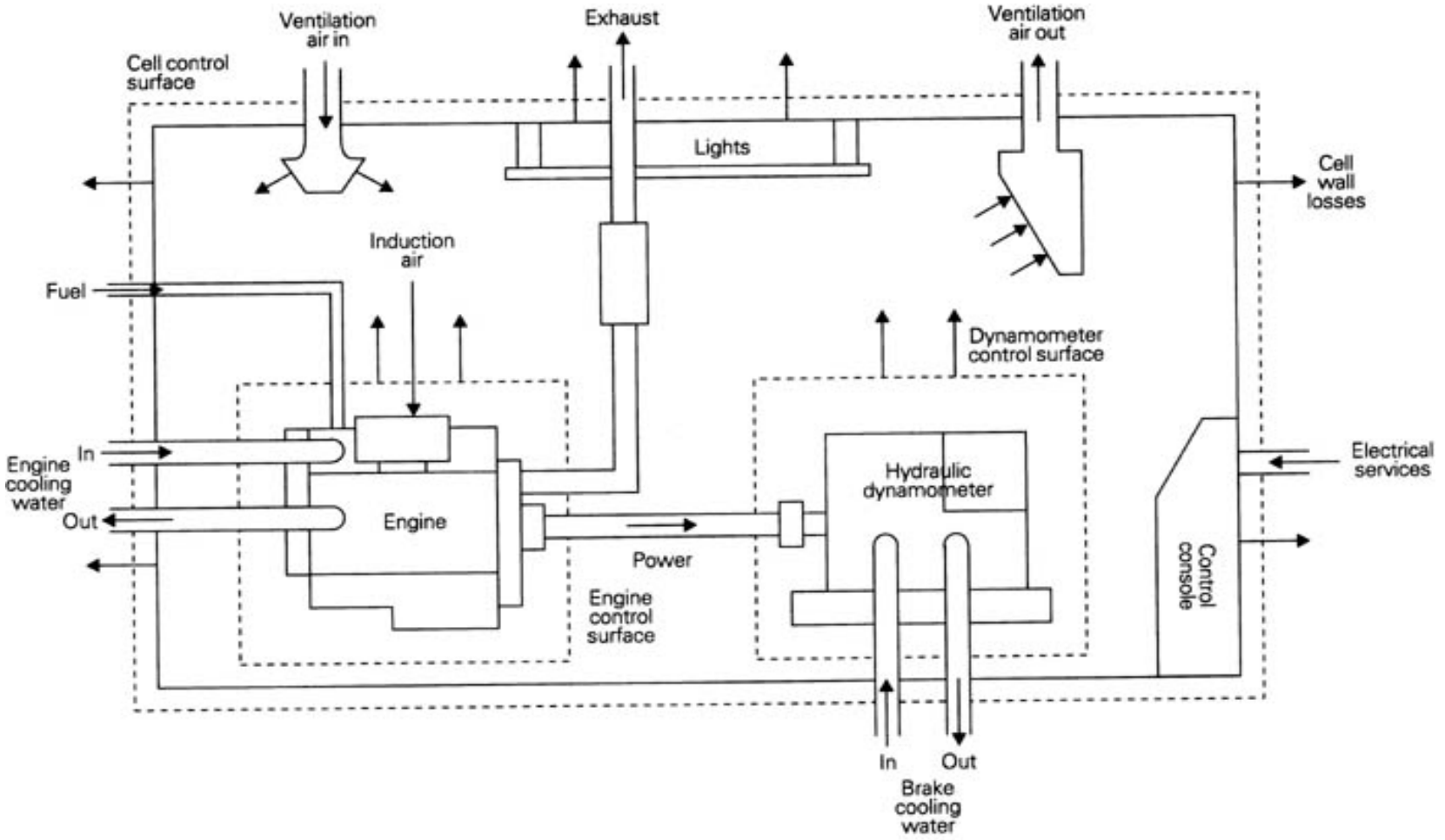
Catalyst ageing

- Vehicle cycle simulation
- Steady state
- Accelerated ageing
- Light off efficiency tests
- Sulphate release tests

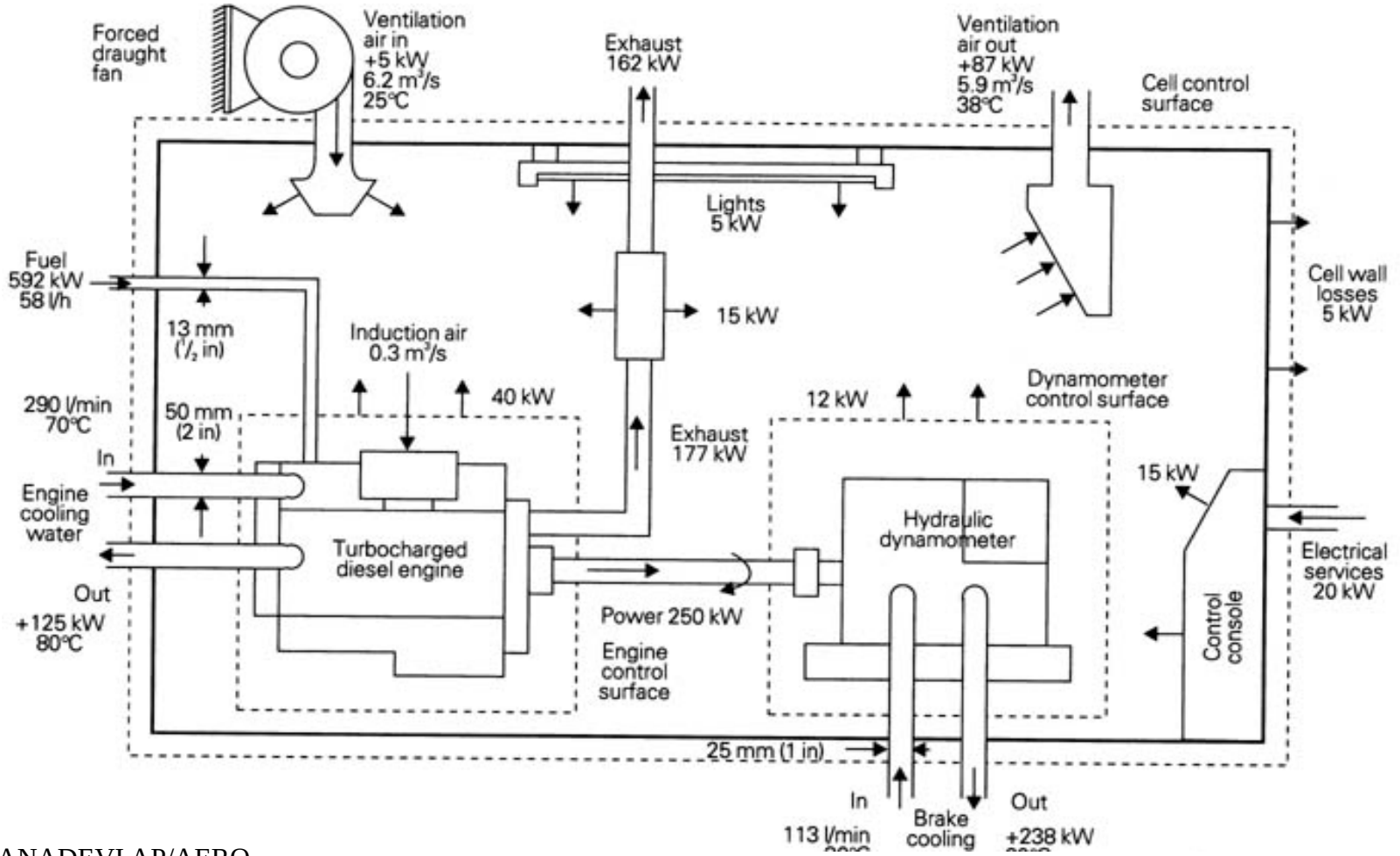
Transient testing

- Fully transient tests and indeed automatic mapping software programmes are disciplines worthy of additional study, however, in order to glean the maximum useful repeatable data from all forms of transient testing, it is essential to have a full understanding and experience of steady state test types. Mathematical modelling of engine functions is an essential element in the design and development of new engine types. It is the accurate cross correlation of modelled data with actual running data that enables the leading manufacturers to rapidly move ahead of the opposition and obtain clear market gains.

Services in and out of the test cell



Energy balance, the test cell as a unique system



Installation within the test cell

- Pallet
- QA ~ Instructions
- Documentation
- Items used
- Alignment
- Drive shafts
- Containment

Typical test cell