



## Valvetrain / Cylinder Head Test Stand



New test rig dedicated to the study of friction, lubrication and wear on valvetrain

### I. Specifications:

- Motoring capacity:
  - Max power: 27 kW
  - Operating speed ranging from 100 to 7500 rpm with +/- 2 rpm accuracy
  - Max. torque of 65 N.m
- High-accuracy torque transducer HBM T12:
  - Up to 100 N.m
  - 0,01 % full scale accuracy
- Fluid conditioning capabilities:
  - Oil and water temperature controlled within +/-0.5°C
  - Oil conditioning from 35°C up to 155°C
  - Oil pressure adjustable from 0 to 6 bars and controlled within +/- 0,1 bar
  - Water conditioning from 35°C up to 120°C
- Test bench management system:
  - 32 analogic inputs (Voltage, Current, Pressure and Thermocouple)
  - 8 analogic outputs and 8 digital outputs
  - flexible and extendable
- Kronos software for data acquisition and control:
  - High-speed Data Acquisition Systems up to 30 KHz for torque measurement
  - Measurement frequency of 100 Hz for all other parameters



- Temperature conditioning and flow control of test cell air
- Flexible test geometry:
  - Large space available on bench top (1200 x 2000 mm)
  - Adjustable and movable driving motor on bench top (X-Y-Z)
- Cylinder head support designed to match oil and coolant circuit and to respect correct oil pressure and flow rate

## II. Capabilities:

- Investigation of the effect of different lubricants on frictional losses, allows for quick distinction and benchmark between lubricants and/or additives
- Study of new materials (especially hard coatings such as DLC) to reduce friction and wear. Continuous and real-time high accuracy wear measurement based on the RadioNuclide Technique (RNT)
- Benchmark of valvetrains and cylinder heads (databases setup)
- Simultaneously friction and wear measurement to study running-in and operating behaviors
- Very slow and idle driving speed to study friction and wear on critical phases such as start-up

## III. Upgradeability

- Possibility to feed the tested components with aerated oil to study oil aeration effects
- Possibility to enclose tested components in a climatic chamber
- Possibility to measure valve motion during testing with high-speed laser vibrometers
- Current test bench can be adapted to test: oil pumps, water pumps, chain drives, camshafts, crankshafts, fuel injection systems, etc.

