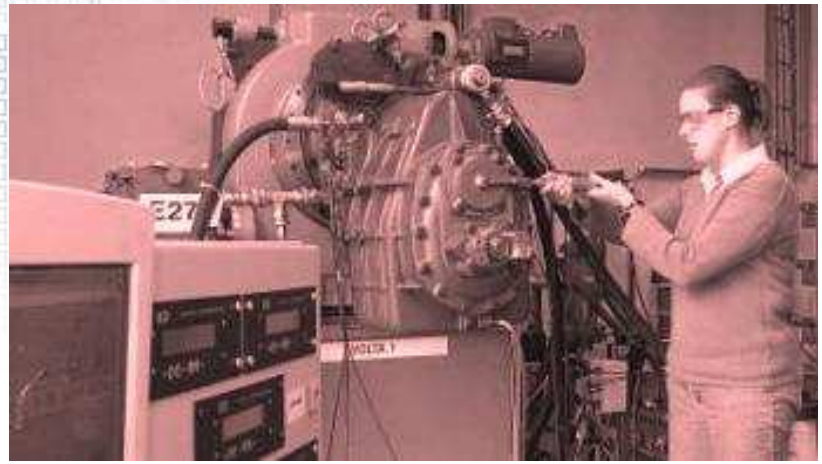
Off-Highway Europe Engineering

A brief presentation of

People & Test Rigs

- 1 Manager
- 1 Workshop & Logistics Supervisor
- 6 Test Engineers
- 8 Test Technicians



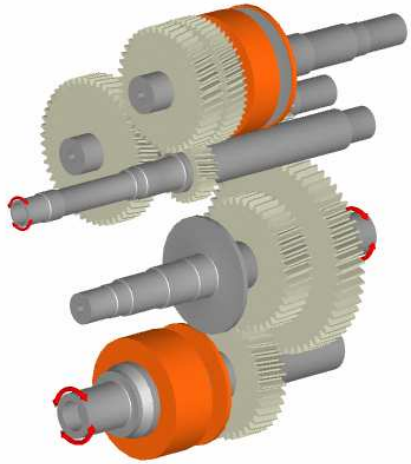
- 1 Clutch test rig
- 2 Fatigue test rigs
- 2 Dynamometer test rigs
- 4 Functional transmission test rigs
- 5 Hydraulic test rigs
- 7 Engine (Endurance) test rigs

Classification of tests

- **“Device Under Test”**
  - Component
  - Subassembly & assembly
  - Transmission
  - Vehicle
- **Duration**
  - Functional
  - Life time (Endurance)
- **Source**
  - New Product Development
  - Product Engineering
  - Production
  - Service & Warranty
  - Purchasing

Goals of tests

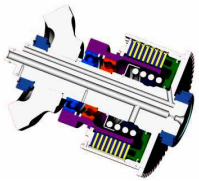
- Validating design models
- Defining accurate values for the parameters of the design models
- Checking functionality of prototypes
- Checking life time behavior of prototypes
- Checking supplier information
- Validating production methods
- Making testing obsolete …



Types of tests …

The standard component & (sub) assembly's tests are:

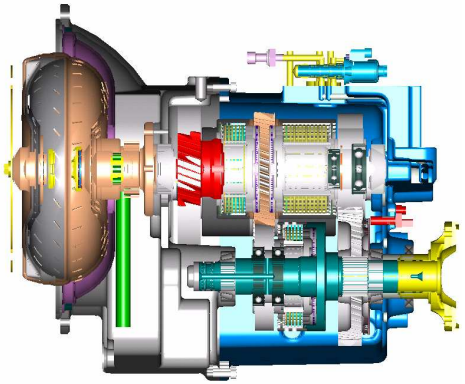
- **Clutch**
  - Closing
  - Inching
  - Drag measurement
  - Fatigue



- **Valve behaviour**
- **Shaft**
  - Distribution of oil flows (static & dynamic)
  - Fatigue (torque, bending, torque & bending)

Types of tests (2)

The standard transmission tests are:



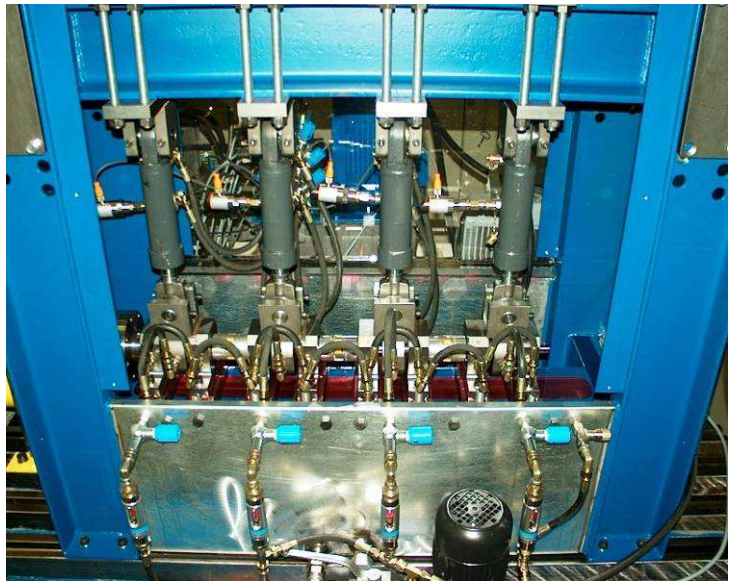
- **Functional**
- **Drag** & **efficiency** measurement
- **Noise** measurement
- **Gear & Bearing**, using a brake as static load
- **Forward-Reverse**, using a flywheel as dynamic load
- **Range**, using a brake as dynamic load
- **Inching**: continuous or intermittent, blocked or loaded
- **Power Take Off**: loaded by a hydraulic load

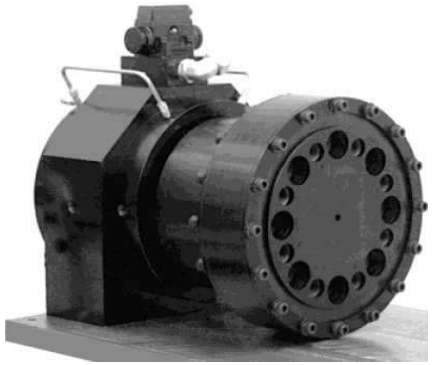
Hydraulic Test Rigs

- Designed & built by TTC personnel
- Can operate in manual or automated mode
- Computer controlled
- Loads components with oil pressure & flow

Fatigue Test Rigs

- Torsion (25 kNm) & Bending
- Shafts & Clutch Drums
- Supplier of 1st: MTS (USA)



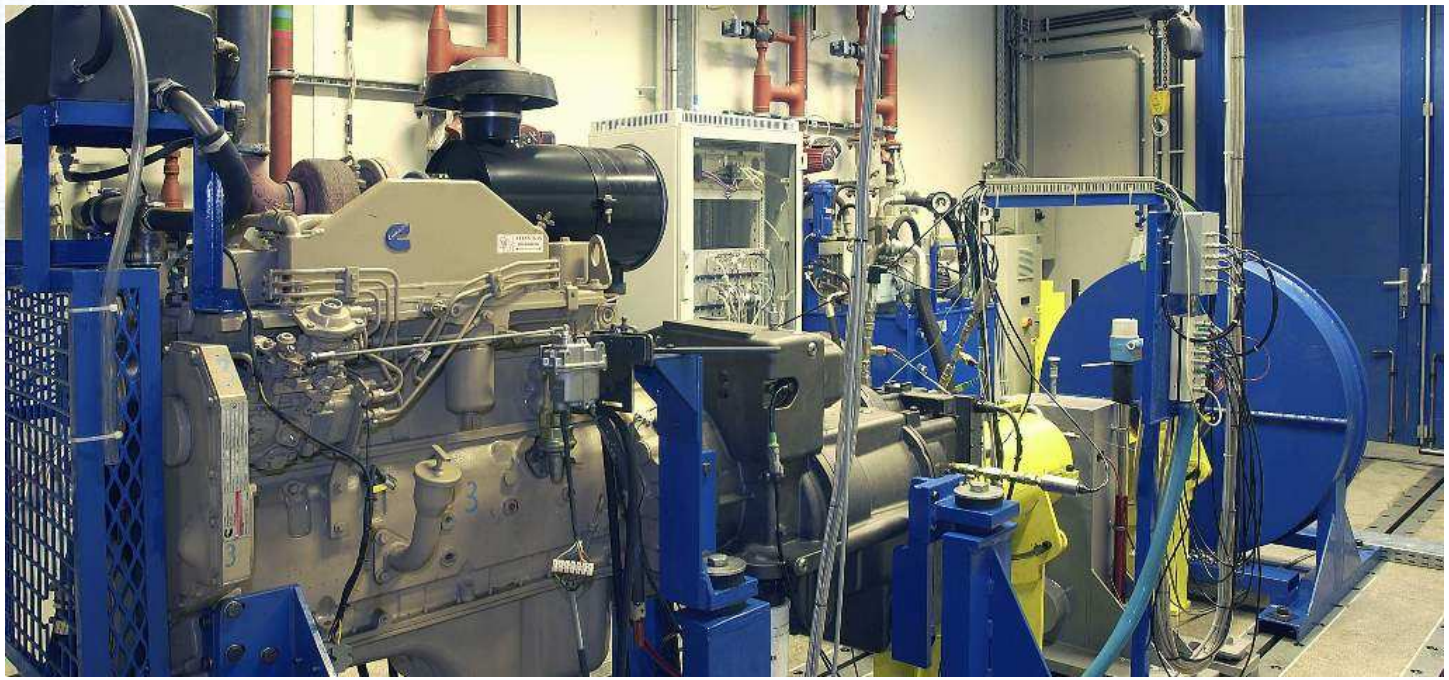


Dynamometer Test Rigs

- Electric drives:
  - 150 kW
  - 300 kW
- Electric brakes:
  - 215 kW
  - 350 kW
- Tests:
  - G&B
  - Efficiency
  - Noise

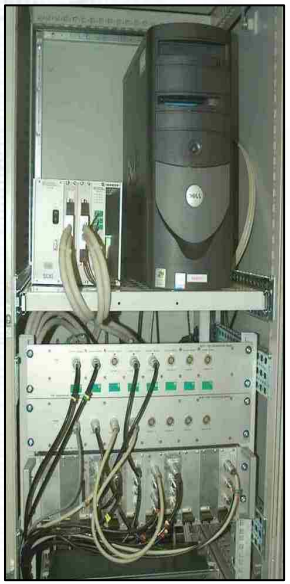
Engine Transmission Test Rigs

- Diesel engines from 75 to 320 kW
- Flywheels till 120 kg.m²
- Electric, low inertia brake of 260 kW
- Eddy current brakes till 1200 kW
- F/R, G&B, Range, PTO, Kick down & Inching tests



Test Track

- 140 m long
- 2 roundabouts
- 15% hill of 15 m

Measurement equipment

LABVIEW (NI)