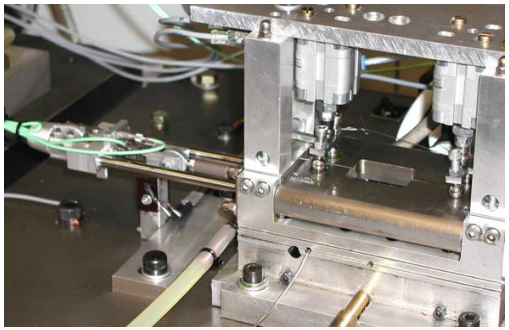
TASK 9.1: Reduced friction engine

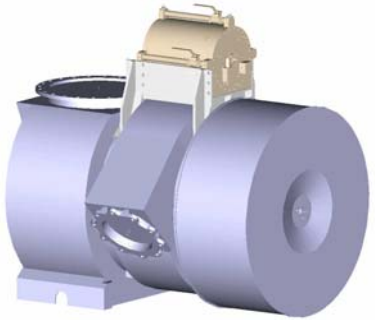
Objectives:

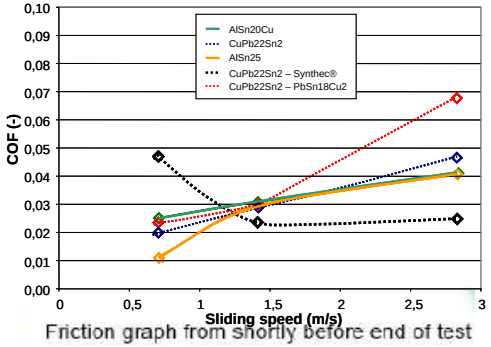
- To identify the areas with highest potential for reduction of the mechanical losses
- To generate ideas and concepts for reduction of the mechanical losses by new designs, materials, etc.
- To develop applicable solutions by rig testing and full-scale engine testing

Final Results & Achievements:

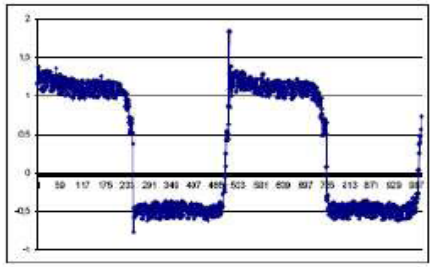
- Valuable information regarding the friction losses were obtained and significant differences depending on engine size were found.
- A new, “environmentally friendly”, non-metallic bearing material with reduced friction losses was developed.
- A tribometer with unique capability to accurately and reliably determine friction losses and wear resistances of piston ring and cylinder liner materials was developed.
- A Common Rail system with optimized fuel injection characteristic for a 1000 kW/cyl engine was developed and a significant reduction of fuel consumption achieved.
- A tuned/adaptive mass damper was developed.



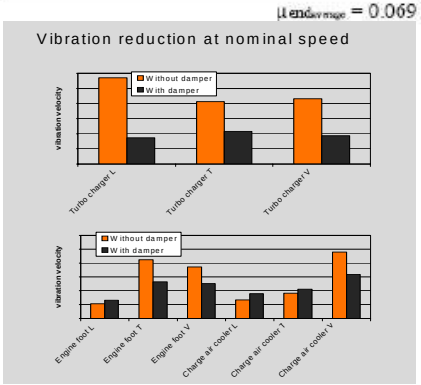




Friction graph from shortly before end of test



$\mu_{end_{average}} = 0.069$



Partners: VTT, AdaptaMat, Federal Mogul, Miba, M. Jürgensen Flensburg, Woodward, Wärtsilä