

Common rail technology calls for dedicated test bench

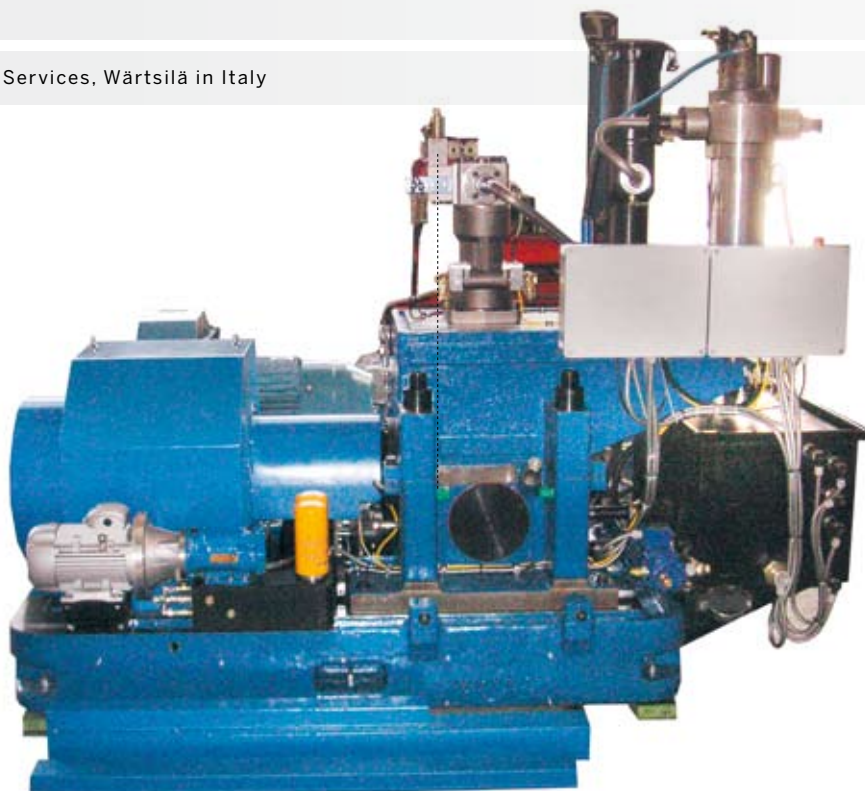
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The delivery of the first Wärtsilä common rail engines (Wärtsilä 46 and Wärtsilä 38) and the subsequent engine base growth, has highlighted the need for a new service and maintenance concept for common rail components and devices, for which the traditional way of working, its procedures and tools, are not suitable. One need was related to the maintenance and testing of the fuel valves.

In fact, while traditional fuel valve opening is simply controlled by a set spring, operated by the peak fuel pressure from the fuel pump, in a common rail (CR) engine the fuel valve is a complex component, the opening of which is controlled by a digital control system (WECS 7500 or UNIC C3). It is also possible to continuously set the injection timing and duration depending on the engine speed, load, and other parameters in order to optimize engine performance and emissions. Therefore, the traditional fuel valve test benches, utilised for any engine type and brand, cannot be used for this specific CR engine. Hence the need for a new generation of innovative maintenance tools.

Wärtsilä Services first designed and tested a preliminary experimental prototype, which was then further developed into an integrated and compact test bench, paying particular attention to ease of operation and installation, in selected Wärtsilä Services workshops.

The test bench is made up of three units, the driving and testing unit, the control cabinet with measuring unit, and the hydraulic unit. It can operate with both 50 and 60 Hz power supply. Wärtsilä 46 and Wärtsilä 38 CR fuel pumps, fuel valves and fuel accumulators can be easily tested on the bench, and are fitted to it by means of a complete set



■ Fig. 1 –The new fuel valve test bench driving unit.

of adaptation kits and cams. Additional kits are under development to extend the bench operation for the entire range of traditional medium-speed Wärtsilä engines fuel pumps and fuel valves as well. One of the advantages of the Wärtsilä Services bench is that fuel valves can be tested using exactly the same control as the one fitted on the engine, i.e. WECS 7500 and not a generic bench digital control.

The first two benches are already in operation in Wärtsilä workshops in Fort Lauderdale (USA) and Trieste (Italy). This supports the maintenance needs of Carnival Corporation fleet ships. Other locations will be fitted with the bench starting with one in Wärtsilä in Germany and one in Wärtsilä in Korea.

Further development of a high-technology adaptation kit is already underway in Italy to test Wärtsilä low-speed RT-flex engines fuel valves as well. ●



■ Fig. 2 –Operating the test bench.