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COMPLETE INJECTION SYSTEMS TEST BENCH



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COMPLETE INJECTION SYSTEM

In the research@mobility center dedicated to the technological development of new engine there is the need to characterize the injection systems in different environmental conditions; to satisfy this need, Loccioni Mobility has designed and developed a system for the test of complete injection systems (high pressure pump, rail and injectors) at different temperatures.

The system has been realized to carry out the characterization of the whole Diesel Common Rail and GDI Injection systems with different temperatures, ranging from -30°C to +90°C.

The injection system is housed inside a climatic chamber that guarantees the temperature regulation and the continuous purification of the air inside the bay under test; in this way it is possible to carry out some tests without previously making the chamber with nitrogen inert (that anyway occurs automatically in case the percentage of hydrocarbons in the test bay exceeds the alarm threshold).

In the climatic chamber are placed the interfaces with the electric motor for starting up the injection pump, the hydraulic power supplies (with test fluid temperature regulated in the same temperature range), the shot-to-shot flow meters for checking each injector's flow, the vacuum unit for the chamber washing with external air.

The whole system is managed by a PC; through a user friendly interface equipped with synoptic panel, the operator can monitor all the main system parameters.

TECHNICAL FEATURES

The system is composed of the following components:

- > Climatic Chamber with the relative Air Treatment Group annexed. Temperature ranging from -30°C to +90°C; accuracy $\pm 2^\circ\text{C}$; gradient $2^\circ\text{C}/\text{min}$ upwards and $1^\circ\text{C}/\text{min}$ downwards. Recirculation flow and filtering of the air corresponding to about 500 spare parts per hour.
- > Electric Motor for starting up the Injection System pump. Speed ranging from 30 to 6000 rpm; accuracy ± 1 rpm up to 1000 rpm, $\pm 1\%$ from 1000 to 6000 rpm. Angular acceleration range corresponding to ± 3000 rpm/s.

- > Shot-to-Shot flow meters for every single injector.
- > Thermoregulated Hydraulic system for Pump supply (the same performances of the climatic chamber except for the gradient corresponding to $2^\circ\text{C}/\text{min}$ both upwards and downwards).

The pump supply is automatically regulated and could work in "self-priming", "in pressure" mode up to 10 bar or in "depressure" mode to simulate the altitude .

- > Hydraulic system for automatically checking the Counter-pressure (up to 5 bar with accuracy ± 0.05 bar) and the drainage Flow from the pump and the injectors.
- > External Sound-proofing Protection for not altering the acoustic comfort with the possibility of installation in particularly quiet places.

