January 13, 2014

KSPG AG

New FlexValve valve train system for passenger diesel, commercial vehicle, and natural gas engines

In an era in which reduced fuel consumption is of growing significance, variable valve trains can make a significant contribution to load management on I.C. engines. The UniValve system acquired by KSPG AG in March 2011 has since been extensively refined and exhaustingly tested on naturally aspirated and turbocharged engines with the aid of state-of-the-art techniques and tools. Together with various OEMs, it is now being readied for series production. In order to make the benefits of variable valve control available to passenger diesel, commercial-vehicle and, most especially, natural-gas engines, KSPG has been making modifications to the FlexValve system. Since this latter is of modular design it offers very good integration and upgrade options for existing engine platforms, too. Just as UniValve, FlexValve is compact, has high structural integrity and a low degree of inertia.

As a purely mechanical valve actuation system and hence highly reliable and low-friction in operation, UniValve has vast fuel-saving potentials on present and future engine generations. Moreover, it helps enhance engine response, particularly on gasoline engines. Tests on complete engines have already been conducted with German and international OEMs.

“Fully variable valve control is a key technology in auto-engine CO\(_2\) reduction and we are convinced that it will play a bigger and bigger role on both existing and future gasoline engines,” says Horst Binnig, CEO at KSPG AG.

It was only in September 2012 that KSPG took over England’s Mechadyne International Limited, Kirtlington, Oxfordshire. The British company’s know-how in valve train systems dovetails ideally with KSPG’s mechanical valve trains and systems while rounding off UniValve technology for small and midsize cars as well as trucks. The valve train actuator developed by Mechadyne and, in some cases, manufactured under license, is already in series production with an OEM in the USA. In taking over Mechadyne International Limited, KSPG has been able to strategically strengthen its expertise in the highly promising market of valve control systems - a comparatively cost-competitive and effective technique for reducing CO\(_2\).

**FlexValve for the “heavies”**

FlexValve is engineered for light-, medium- and heavy-duty applications since due to its talents, especially in diesel-engine applications, it allows a whole string of engine management advantages. Also, FlexValve has the advantage of permitting control of
engine charging and aftertreatment systems in terms of how they operate, as well as their costs, size, and complexity.

In everyday operation, FlexValve facilitates a faster engine warm-up, improved cold-starting, optimized idle charge and part-load combustion as well as greater aftertreatment efficiency. Other advantages include quicker torque rise at low RPM, a generally improved transient torque build-up and efficiency enhancements especially at high engine loads.

FlexValve is based on a DuoCam camshaft with an electrohydraulic actuator. An intermediate lever, in which the roller-type cam followers are integrated, is activated by the camshaft and this, in turn, actuates the valves whose lift can be continuously varied.

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