

September 22, 2010

Pierburg GmbH

Series production of combined cooler module for high-performance engines in LCV

Back in 2007, Pierburg GmbH together with a major OEM announced the development of a combined EGR module for commercial vehicles. Since the end of 2009, this has been in series production; it represents a major step in achieving compliance with EU 5 emission standards.

In order to create the necessary space for the two-stage turbocharger assembly on high-performance engines, the exhaust-gas recirculation (EGR) cooler had to be repositioned from its hot exhaust location to the intake side. The exhaust gas is routed directly from the exhaust gas manifold through a passage in the cylinder head to the EGR cooler. A solution has been devised that is ideal both in terms of footprint and function by combining oil cooler, oil filter mounting, EGR cooler, EGR valve and bypass controller to form one highly integrated assembly. This opens up attractive options for subsequent applications involving effective heat management and hence a shortening of the cold-start phase and especially according to the New European Driving Cycle (NEDC), contributing to a further significant reduction in emissions.

The EGR cooler comprises a water-immersed gas cassette made from die-cast aluminum. Because of the much larger flow cross-sections, there is considerably less risk of sooting.

Compared with conventional tubular coolers, cooling performance has been significantly upgraded, with minimum pressure losses. By raising cooler efficiency within the available installation space and lowering cooler intake temperatures, cooler performance has been upped about 30 percent compared with the car engine version. The module has an integrated EGR valve with position feedback and the possibility of switching between cooled and uncooled exhaust gas (bypass mode). In fact, the new cooler represents Pierburg's first successful step into a new market segment and demonstrates its competence in systems modularity.

Why cooled EGR?

Cooled recirculated exhaust gases are regarded as a preferred option for dealing with diesel engine NO_x emissions, reducing them by over 70 percent, depending on engine operating mode.

Photo no. 9

Combined EGR cooler for commercial vehicles.