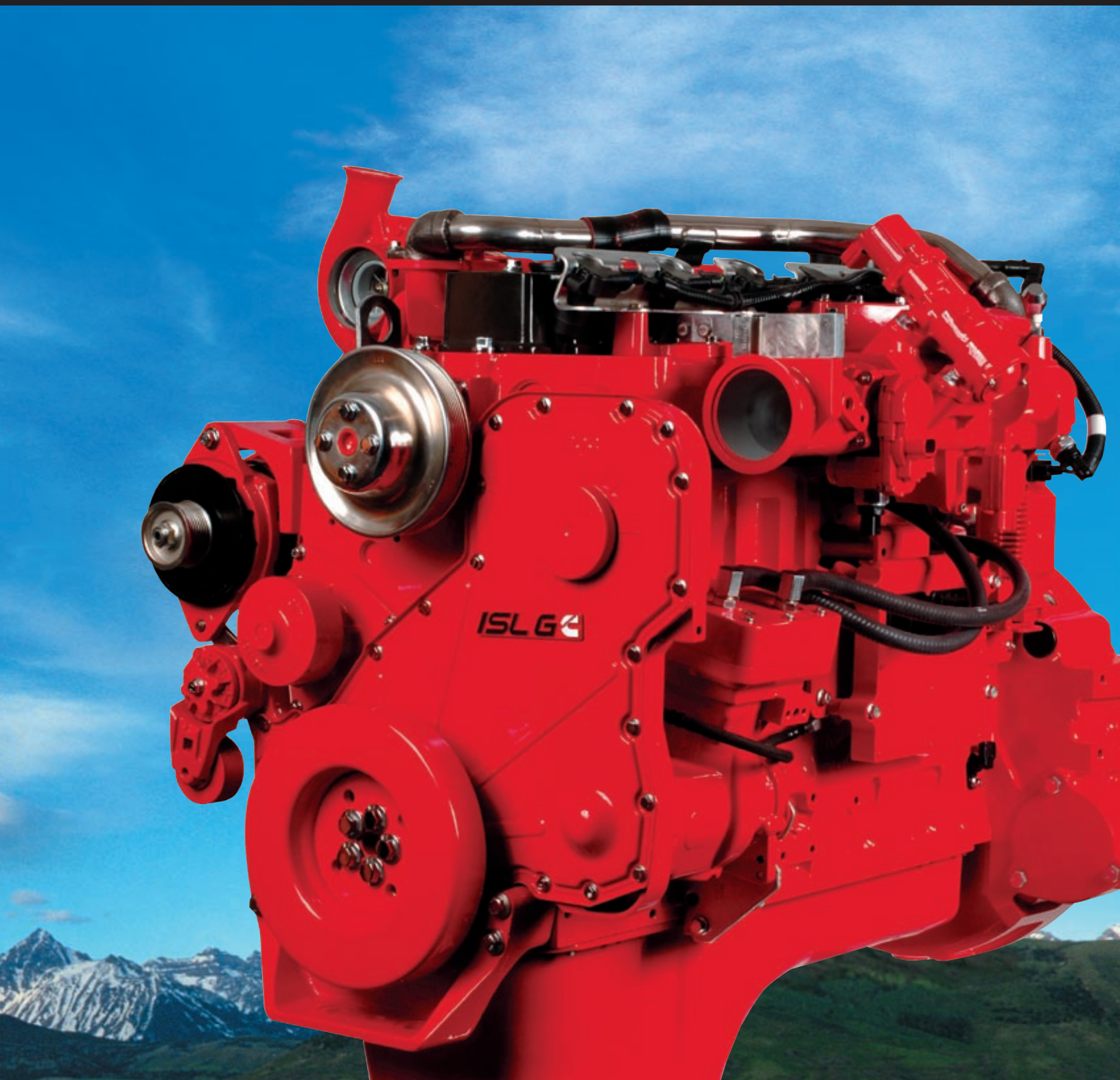
Cummins Westport

EVERY ALTERNATIVE.

TECHNOLOGY FOR 2010 NATURAL GAS ENGINES



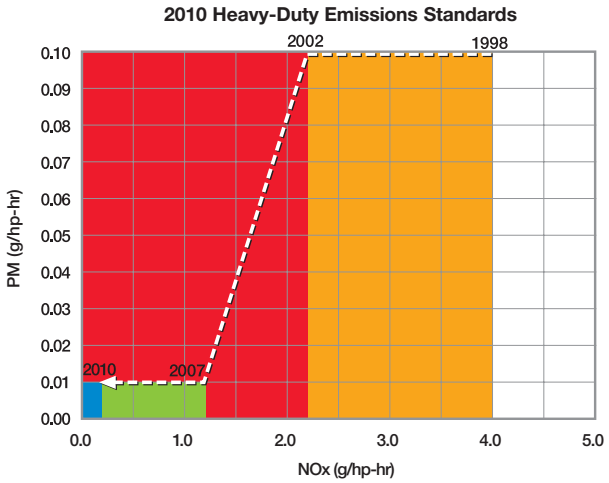
THE NATURAL EVOLUTION OF POWER.

Every Emissions Challenge.

The major chemical contributors to ground-level ozone are hydrocarbons (HC) and nitrogen oxides (NOx). Particulate matter (PM) emissions have been associated with public health concerns. In 2010, new emission standards established by the United States Environmental Protection Agency (EPA) targeting NOx, non-methane hydrocarbons (nmHC) and PM come into effect. These emission changes are the most significant in the history of the automotive heavy-duty engine industry.

To meet 2010 emission standards, diesel engines will apply advanced engine technologies including cooled exhaust gas recirculation (EGR) and exhaust aftertreatment components such as diesel particulate filters (DPF) and selective catalytic reduction (SCR).

These aftertreatment components are not required for 2010 ISL G natural gas engines.



Introducing the ISL G. The first 2010 compliant Transit and Truck engine.

The ISL G was introduced in 2007 and is the first heavy duty engine to meet the US EPA and California Air Resources Board (CARB) 2010 NOx emission levels of 0.2 g/bhp-hr. The ISL G is a stoichiometric EGR spark ignited natural gas engine with three-way catalyst aftertreatment that sets a new standard for performance, reliability and cost of operation. The ISL G operates on either liquid natural gas (LNG) or compressed natural gas (CNG).

Stoichiometric.

Stoichiometric or Theoretical Combustion is the ideal combustion process during which a fuel is burned completely. Also known as the perfect, correct or ideal fuel ratio, the stoichiometric ratio is the chemically correct mixing proportion. When burned, the engine consumes all the fuel and air without any excess of either left over.

Cooled EGR.

Cooled EGR is a very effective NOx control. The EGR system takes a measured quantity of exhaust gas, passes it through a cooler before mixing it with the incoming air charge to the cylinder. EGR lowers in-cylinder temperature and reduces oxygen concentration in the combustion chamber by diluting the incoming ambient air with cool exhaust gases.

Three-Way Catalysts.

Three-way catalysts (TWC) are simple passive aftertreatment devices, that are similar in outward appearance to a muffler and similar in size to an oxidation catalyst. They are highly effective in the control of HC, carbon monoxide, and NOx. TWC's are 95% effective in NOx conversion, provide consistent performance in a wide range of duty cycles, and are Maintenance-Free.

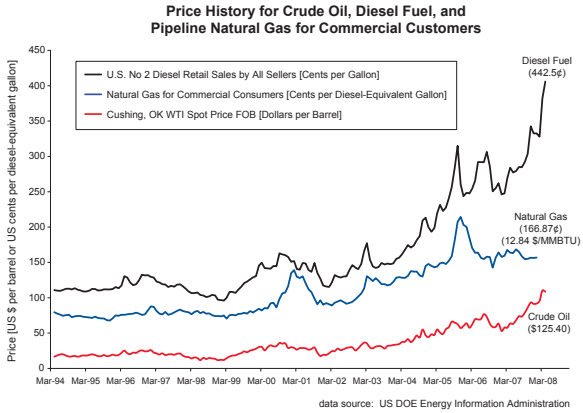
Every Advantage.

With over 30% more torque at idle than previous engines, the ISL G sets a new performance standard. Built on a Cummins diesel platform, the ISL G provides diesel like performance and reliability. Maintenance-Free aftertreatment and improved service intervals keep vehicles on the road longer, and fuel cost savings with natural gas contribute to lower total cost of operation.

ISL G

Every Mile.

Natural gas is an abundant domestic resource that lowers emissions and can also lower fleet costs, and dependence on imported oil. Including the cost of dispensing equipment, natural gas fuel costs less than diesel. And with the global increase in the cost of diesel fuel this advantage has increased.



Low Carbon.

Natural gas is a low carbon fuel that lowers greenhouse gas (GHG) emissions on a well-to-wheel basis as well as at the tailpipe. GHG emissions contribute to global warming.

Capturing landfill gas or biogas and processing the gas into biomethane provides a renewable fuel option with significant GHG benefits. The ISL G is capable of operating on up to 100% biomethane that meets fuel specifications.

- Unlike naturally occurring methane emissions, biomethane is converted to CO_2 during combustion (a 21 times GHG savings).
- Biomethane is a renewable resource that can displace fossil fuel by 100%.
- Biomethane does not compete with food production.
- The biomethane that is used as fuel in place of fossil fuels produces less GHG than the fuel it replaced.

Using natural gas and biomethane low carbon fuel addresses not only global warming, but also the problems of high oil prices and foreign oil dependence.

Every Benefit – Today and Tomorrow.

Meeting the 2010 emission targets three years ahead of schedule is only part of the story. Combining ISL G reliability, durability, and lower operating costs resulting from the natural gas fuel cost savings adds up to improved cost per mile (km). In high fuel use applications, like urban transit and refuse, it is possible to have a lower vehicle life cycle cost with natural gas.

Every Application

The ISL G is available from many bus and truck manufacturers for every application. From articulated Bus Rapid Transit (BRT) buses and heavy-duty trucks to refuse trucks and school buses, the ISL G meets fleet requirements every day. Visit our website for a full listing of manufacturers.

Get the Whole Story. Explore Every Alternative.

Cummins Westport Inc—a joint venture between Cummins Inc. and Westport Innovations Inc.—delivers high-performance alternative fuel engines for the global market. Cummins Westport Inc. engines are manufactured by Cummins, with warranty, service, and aftermarket support provided by the Global Cummins Distributor and Dealer network.

Contact your Cummins Westport representative or visit our website at: **www.cumminswestport.com**

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