SU-LEV Technologies

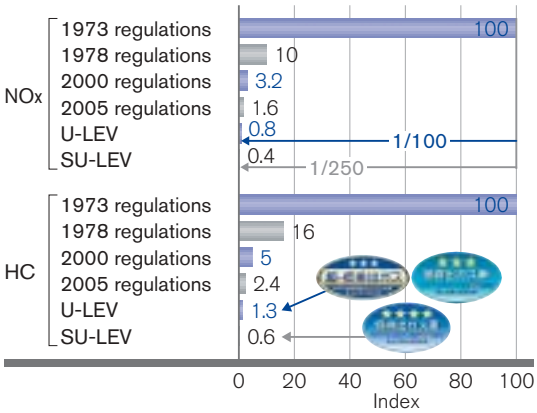
The Bluebird Sylphy that Nissan launched in the domestic market in August 2000 was the first gasoline-fueled car in Japan to be certified as an ultra-low emission vehicle (U-LEV) by the Ministry of Land, Infrastructure and Transport. As of March 2004, 90% of Nissan's gasoline-fueled passenger vehicles sold in the domestic market were U-LEVs. Moreover, in December 2003, the Bluebird Sylphy became the first car in Japan to be certified as a super ultra-low emission vehicle (SU-LEV), requiring a further reduction of exhaust emissions by 50% from the U-LEV standards. As part of the company's ongoing contributions to environmental protection, Nissan has set a goal of achieving an SU-LEV sales ratio of 80% or more by March 2006 among all its gasoline-fueled passenger vehicles sold in the domestic market.

Efforts to achieve cleaner exhaust emissions

Nissan was among the first to provide vehicles that comply with the latest regulations, beginning in 1970 with the Muskie Act in the US and the first emissions regulations adopted in Japan. Currently, our cleanest gasoline vehicles—U-LEVs and SU-LEVs—attain emission levels that are 1/100 and 1/250, respectively, of the levels originally called for by those regulations. We are working on a wide variety of technological developments, including technological improvements that allow for cleaner combustion and development of a catalyst that cleans exhaust emissions, as well as responses to gas evaporation from the fuel tank.

U-LEV: A vehicle that emits 75% fewer exhaust emissions of nitrogen oxide (NOx) and hydrocarbon (HC) than the level prescribed in the year 2000 exhaust emissions standards.

SU-LEV: A vehicle that emits 75% fewer exhaust emissions of nitrogen oxide (NOx) and nonmethane hydrocarbon (NMHC) than the level prescribed in the year 2005 exhaust emissions standards.

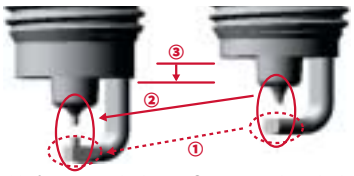


Major technologies featured on SU-LEVs

Long-discharge ignition coil
Double fine-tip spark plug

A long-discharge and high-energy ignition coil is used together with a double fine-tip spark plug having a reduced heat mass, thanks to its finer center and ground electrode tips and tapered ground electrode. As a result, mixture ignitability is substantially enhanced for a significant improvement of engine stability, and the exhaust gas temperature right after engine start is also raised to promote quicker catalyst light-off.

Spark plug configuration
(1) Fine center and ground electrode tips
(2) Tapered ground electrode
(3) Extended shroud



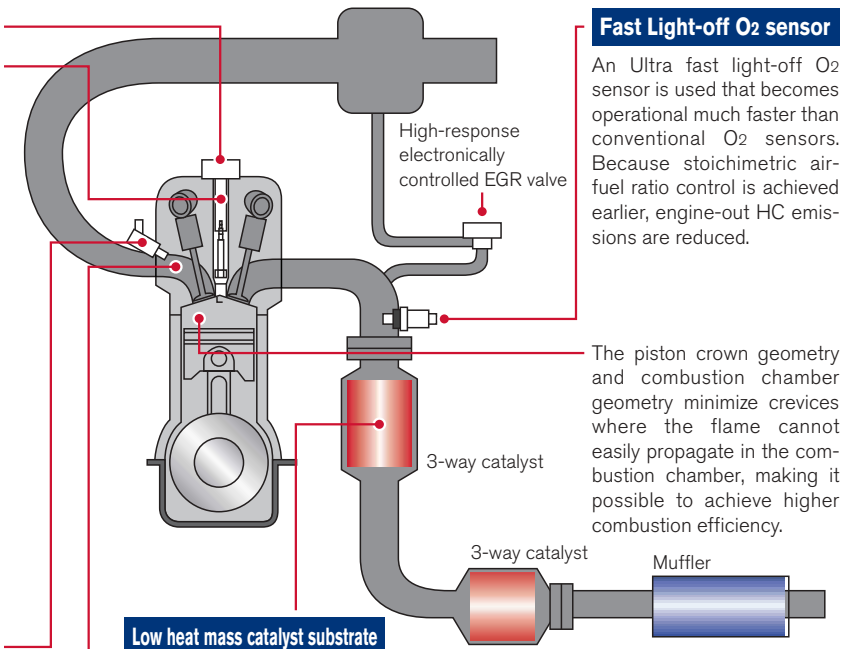
Double fine-tip spark plug Conventional spark plug

Fine-atomization fuel injector

A fine-atomization fuel injector is used to promote better fuel evaporation.

Optimization of fuel spray pattern and intake port geometry

Advanced computer-aided engineering (CAE) analysis was applied to achieve the optimum combination of atomized fuel spray pattern and intake port geometry. This combination works to reduce intake port wall-wetting by the fuel spray for a substantial reduction of HC emissions right after engine start.



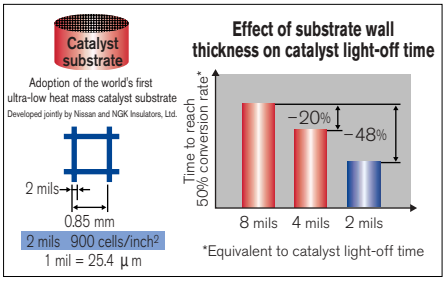
Fast Light-off O_2 sensor

An Ultra fast light-off O_2 sensor is used that becomes operational much faster than conventional O_2 sensors. Because stoichimetric air-fuel ratio control is achieved earlier, engine-out HC emissions are reduced.

The piston crown geometry and combustion chamber geometry minimize crevices where the flame cannot easily propagate in the combustion chamber, making it possible to achieve higher combustion efficiency.

Low heat mass catalyst substrate

The thickness of the substrate walls has been reduced to an unprecedented dimension of 2 mils. The resulting ultra-thin walls reduce the substrate heat mass, enabling the catalyst temperature to rise faster. This improvement of the temperature rise characteristic substantially shortens the catalyst light-off time.



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