Environmentally Conscious Products

Concept of Life Cycle Assessment (LCA)

Vehicle Development with Reduced Environmental Impact Throughout Their Life

As heavy-duty commercial vehicles usually record one million kilometer drive during their lifetime, fuel efficiency could result in significant differences in total energy consumption and CO_2 emissions. From the viewpoint of life cycle assessment (LCA), diesel-powered vehicles could help keep global warming under control with their less CO_2 emissions.

Commercial vehicles are also advantageous in the disposal phase for their excellent recyclability. Another major challenge is the reduction of nitrogen oxides (NOx), particulate matter (PM) and black smoke in exhaust gas. In addition to our efforts to reduce these emissions by improving combustion systems, we will devote ourselves to achieve further reductions by engine innovations. We are positively developing environment-friendly vehicles by various approaches based on the concept of LCA, such as further noise reduction, use of environment-friendly materials, and reduction of refrigerants in air conditioners.

Environmentally Conscious Products such as Diesel-powered Vehicles

- Improving fuel efficiency and reducing CO_2 emissions
- Less exhaust emissions
- Clean energy vehicles
- Less external noise
- Less substances with environmental impact
- Improved recyclability
- Reducing refrigerants in air-conditioners

Environmentally Conscious Product Development Support Systems

System for assessing the environmental and social effects during its entire lifecycle

Design support system for reducing the environmental impact

Chemical substance management system for reducing the substances in products that have environmental impact

Green Procurement

Promotion of Green Procurement

In November 2000, the "Isuzu Green Procurement Guidelines" were released to facilitate our cooperative and comprehensive efforts with our suppliers to reduce environmental impact. More specifically, we will establish an environmental management system for the procurement phase by adapting less harmful materials and parts from environmentally conscious suppliers.

To accomplish this goal, we have selected about 230 suppliers and asked them to obtain ISO 14001 certification, or to establish and operate an environmental management system equivalent to ISO 14001 by the end of 2003. Our suppliers are also requested to submit data on the substances with environmental impact that are used in the parts and materials, and to replace or reduce regulated substances.

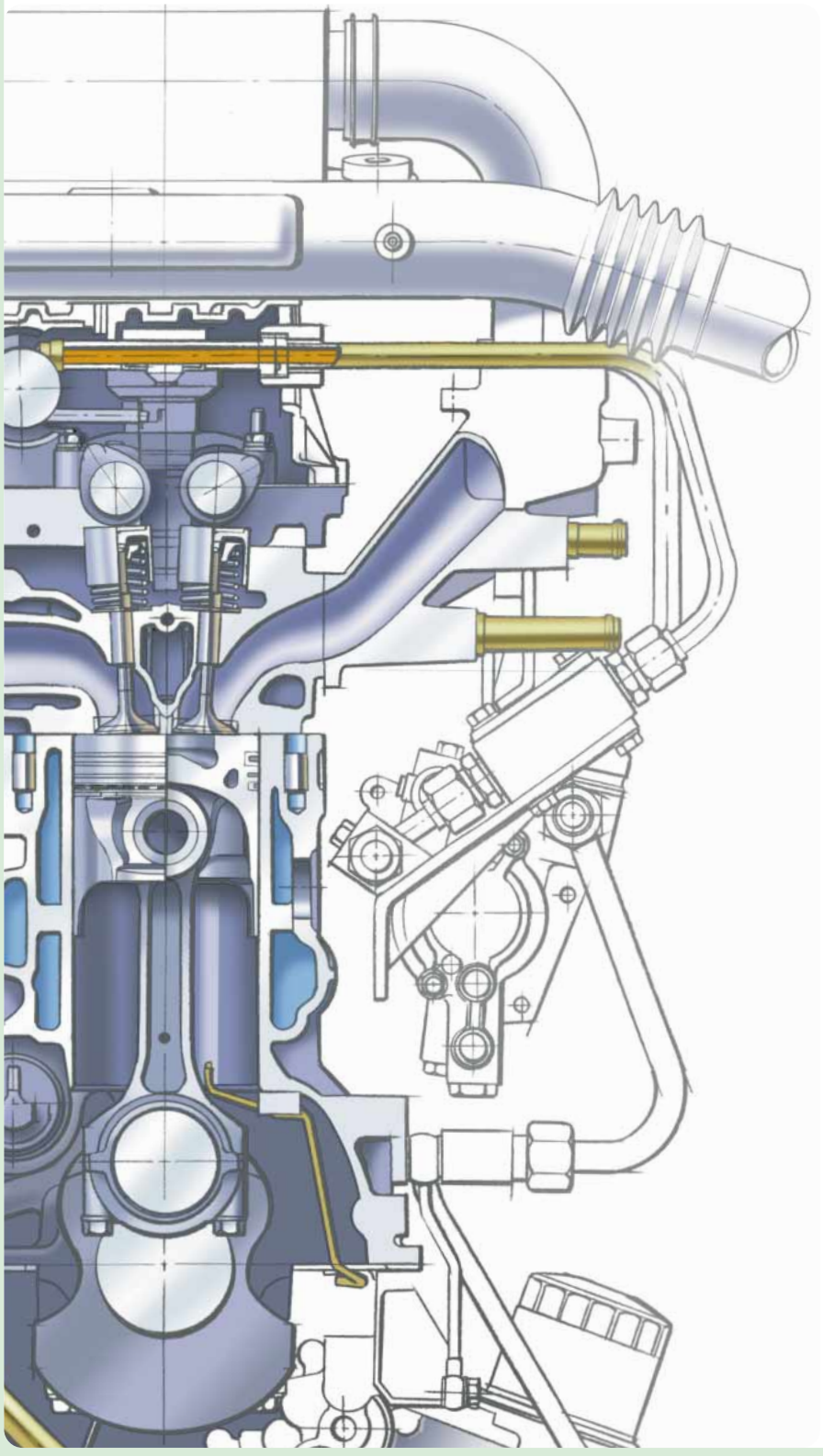
In addition, we disclose information on green purchasing (preference given to environmentally conscious products) via the Green Purchasing Network's Automobile Environment Databook.

"Isuzu Green Procurement Guidelines"

Advanced Diesel Technology

Technology

It is our mission to prove the excellent features of diesel engines. Isuzu is making every effort to develop further efficient and cleaner diesel engines.



Developing next-generation diesel engines with our advanced technology and expertise.

Diesel engines are advantageous to gasoline engines in various aspects, including better fuel economy, longer driving distance and durability, and lower CO_2 emissions. To be the world's number one diesel manufacturer, Isuzu is developing technologies to enhance the advantages of diesels and clean exhaust emissions with its original expertise.

For example, our engines for SUVs have realized a combination of driving pleasure and low pollution and fuel consumption by electronic control. The DOHC direct injection system and the common-rail high pressure fuel injection with a maximum of 140 MPa optimizes the combustion condition with the assistance of an EGR (exhaust gas recirculation). For commercial vehicles, we have developed ultra light and super fuel-efficient engines equipped with an intercooler turbo charger for heavy-duty trucks. An electronically controlled common rail high-pressure fuel injection system and a one-way cooled EGR enable us to create diesels with high economic efficiency and low environmental impact.

We Keep on Challenging as a Diesel Pioneer

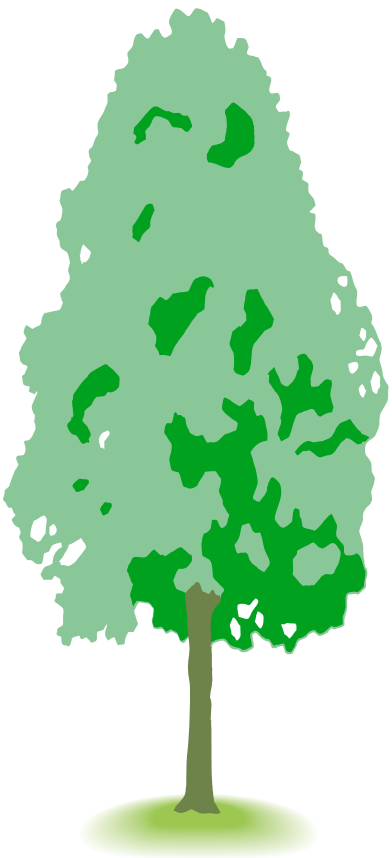
Our top priority in developing clean diesels is the simultaneous reduction of NOx, particulate matter and black smoke. To accomplish this goal, we are working on a precision control technology for more than one injection in 0.01 second at a fuel injection pressure exceeding 200 MPa. By bringing EGR systems, continuous regeneration DPF (diesel particulate filter) systems and NOx catalysts into practical application as well as the precision control technology, diesel engines could be more environmentally friendly than gasoline engines. It is Isuzu's goal and commitment to continuously make innovations for the future of diesel engines.

Photographs of Diesel Combustion Phases

Common-rail high pressure fuel injection system

Conventional fuel injection system

V6 engine with common-rail fuel injection system



Interview

The performance of a diesel engine is evaluated on exhaust emissions, fuel efficiency, and if the reliability and comfort meet the conditions of its use. We have the technical capabilities of developing fuel-efficient diesel engines with low exhaust emissions. At the 1999 Frankfurt Motor Show, Adam Opel presented a 3-liter car which can drive 100 km with 3 liters of fuel, and gained high reputation for its excellent drivability and comfort as well as its fuel efficiency. This car was mounted with an Isuzu's 1.7-liter diesel.

We are working hard to clean exhaust emissions further by refining the combustion and after treatment technology. We always keep our eyes on protection of the global environment and continue to work on creating excellent products that meet the needs of the coming age.

Toshio Ichimasa

Group Leader of Engine Engineering Dept. No. 2, Powertrain Engineering No. 2

Engaged in engine performance experimentation, then shifted to design work. In charge of designing diesel engines for passenger vehicles for the EU market.

Interview

In Japan, some people say that diesel engine is the major cause of air pollution. In the EU countries where people are highly environment conscious, however, diesel engines have been well appreciated and increased the sales remarkably. This fact illustrates that diesel engines fail to get comprehensive understanding in Japan. With their high thermal efficiency and low CO_2 emissions, diesel engines have the potential to prevent global warming. Smooth acceleration and deceleration can even reduce particulate matter and black smoke by half or more. The diesel engines that comply with the current emission regulations are by far cleaner than the conventional diesel engines. On a long-term basis, regulations have already been established to significantly reduce particulate matter in exhaust emissions, which will result in far cleaner emissions. It should be noted, however, that more than half of the vehicles on roads were manufactured before the particulate matter regulations were enforced. As long as these vehicles emitting black smoke are on roads, it is necessary to monitor and regulate them strictly.

I believe the environmental impact of diesel engines will be significantly reduced, especially in urban areas, as we will soon develop advanced engine combustion technology and low-sulfur fuels after-treatment systems, as well as hybrid diesel-powdered vehicles. I expect Isuzu to contribute to prevent global warming and develop ultra low-pollution vehicles through its world-leading technologies.

Ryoji Kihara

Ex-visiting professor, Waseda University