



2AD Diesel Engine
(2.2ℓ; Used in the RAV4)

Engine Business

Responding to Customer Confidence and Striving for Environmental Conservation

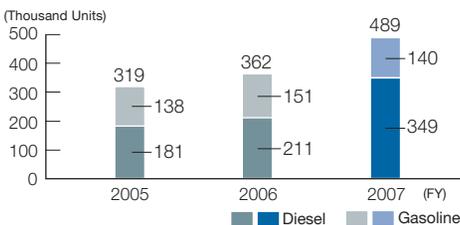
Environmental Responsibilities

- To help curb global warming by conserving energy during operation
- To comply with the environmental regulations of each country and region
- To help curb air pollution from emissions
- To comply with voluntary environmental standards and reduce the amount of waste produced by extending maintenance intervals

Social Responsibilities

- To maintain and improve the reliability and durability of our products
- To improve fuel efficiency
- To comply with the regulations of each country and region

Production Units of Gasoline and Diesel Engines



Reducing the Environmental Impact and Improving the Quality of Clean Diesel Engines

Toyota Industries, as a diesel engine manufacturer in the Toyota Group, aims to improve its technological capabilities and contribute to Toyota Motor Corporation's (TMC) development and production activities, including its overseas operations.

While diesel engines are more fuel-efficient and discharge less CO₂ than gasoline engines, they emit more NO_x and particulate matter. In an effort to enhance the environmental performance of our diesel engines, we have implemented post-treatment

measures for NO_x and particulate matter, but our biggest challenge for the engines themselves is to improve their fuel efficiency and to reduce their CO₂ emissions. In collaboration with TMC, Toyota Industries has realized significant reductions in environmental impact by introducing a number of new technologies that raise the fuel efficiency of diesel engines. The European emission regulations, EURO 4, which came into effect throughout the EU in 2005, require new automobiles to reduce emissions of particulate matter to one tenth of that of conventional automobiles. Our AD diesel engines, which we began producing in March 2005, satisfy the requirements of EURO 4. We are now preparing to satisfy EURO 5, even stricter regulations that are set to be introduced after 2009. In October 2006, we expanded our testing center to boost our development of next generation clean diesel engines.



New Testing Center

Bringing Our Environmentally Friendly Foundry Plants to the World

Our three plants in Japan, Hekinan, Higashichita, and Kyowa plants are charged with the task of adopting newly developed manufacturing technologies ahead of their overseas counterparts and perfecting them in Japanese production processes before transferring them to our overseas production bases. A good example of this is our casting technology for foundry parts that are essential to engine manufacture. The responsibility for the adoption, perfection, and transfer of this technology rests with our Higashichita Plant. In 2006, this plant received a Technology Award from the Japan Foundry Engineering Society for its development of CV foundry production technology for use in cylinder blocks for high-output diesel engines. This technology was applied to the 1VD diesel engine. (See topics)

On the environmental front, we have ensured safety by separating the work zones and equipment, and achieved zero waste, as well as CO₂ emission reductions through the introduction of environmentally friendly and energy-saving equipment and monitoring systems. We have thus succeeded in attaining world-class energy conservation and productivity in the production of die-cast cylinder blocks for AD engines. We have transferred this spirit of environmental protection to our plants in China, Poland, and other countries throughout the world.

TOPICS Production of New Diesel Engine (V8) Starts

To raise fuel efficiency and reduce CO₂ emissions, we worked to develop a lighter engine. This resulted in Japan's first mass production of a cylinder block made of lightweight and high strength vermicular graphite cast iron (FCV). In December 2006, we started production of the 1VD-FTV diesel engines with a common rail system that uses this FCV cylinder block.



1VD Diesel Engine
(4.5ℓ; Used in the Land Cruiser)