



Engine Business



Responding to Customer Confidence and Striving for Environmental Conservation



2KD Diesel Engine (2,5ℓ Used in the Hilux Vigo)



2AD Diesel Engine (2,2ℓ Used in the RAV4)

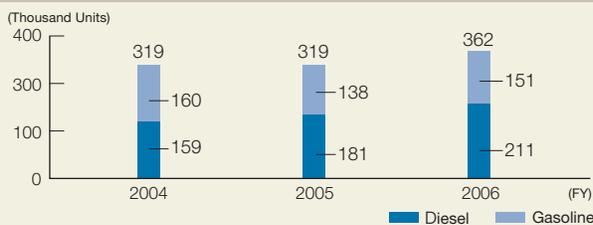
Environmental Responsibilities

- To help curb global warming by conserving energy during operation
- To comply with the environmental regulations of each country and region
- To help curb atmospheric 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 regulations of each country and region

Production Units of Gasoline and Diesel Engines



Topics

Production of Diesel Engines Starts in Poland

In Europe, where highway networks are well developed and vehicles travel long distances, diesel engines are becoming increasingly popular for their high fuel efficiency and low CO₂ emissions compared to gasoline engines. The market for diesel engines in Europe is expected to continue to grow in future.

As a joint venture with Toyota Motor Corporation, Toyota Industries established Toyota Motor Industries Poland SP. z o.o (TMIP) in October 2002 as its European production base. Assembly of AD engines began in March 2005 and full-scale production (casting, machining and assembly) commenced in December of the same year.



TMIP



Cylinder Head Machining Line

Reducing the Environmental Impact of Our Diesel Engines and Improving Their Quality

Toyota Industries, in manufacturing automotive engines under consignment from Toyota Motor Corporation (TMC), bears an enormous responsibility; namely, to boost customer confidence in the superior quality of Toyota's engines.

We believe that our engine business, carries out thorough quality control, as well as using FMEA (Failure Mode and Effect Analysis) at the product and process designing stage to forecast failure mode, such as potential defects or malfunctions, and rates the level of importance according to frequency of occurrence, the degree of impact and difficulty of detection. In addition, we input data relating to past failures and problems into a database. In order to prevent defect occurrence, we undertake steady and continuous efforts when preparing new production lines, such as checking whether each item of equipment, jig and standardized worksheet perfectly incorporates countermeasures against problems that are anticipated by utilizing the information contained within the database.

While diesel engines are more fuel-efficient and discharge less CO₂ than gasoline engines, they also emit more NO_x and particulate matter. In an effort to enhance the environmental performance of diesel engine, we have implemented post-treatment measures for NO_x and particulate matter, but our biggest challenge for the engines themselves is to improve fuel efficiency and to reduce 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 force 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.

Bringing Our Environmentally Friendly Foundry Plants to the World

Our three plants in Japan, Hekinan, Higashichita and Kyowa, 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.

On the environmental front, we have ensured safety by separating the work zones and equipment, and achieved zero waste and 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.