

Improving Fuel Efficiency

Creating cars with lower greenhouse gas emissions

• Improving the fuel efficiency of gasoline vehicles

We are actively developing new engine designs and bodies with lower rolling resistance so as to improve the fuel efficiency of gasoline vehicles.

New Engine Designs and the Development of CVT

The newly-developed KF Engine in our Sonica mini passenger car introduced in June 2006 provides improved fuel efficiency, reduced friction, and reduced vehicle weight. The Sonica achieves top-class fuel efficiency and emissions reduction through its CVT (Continuously Variable Transmission), which is the world's first input-speed reduction type three-shaft gear train system optimally designed for mini cars.

Reducing Rolling Resistance

Vehicle body weight, rolling friction, and air resistance due to body design are all types of rolling resistance that affect fuel efficiency.

Daihatsu attempts to reduce rolling resistance through light bodyweight achieved with high-tension steel, the development of drive systems with reduced transfer loss, and bodies with reduced air resistance developed through fluid simulation.

• Realizing the global top fuel efficiency level in the Mira V

Daihatsu has developed the EF-VD direct fuel-injection engine, which injects gasoline directly into the combustion chamber, with the aim of gaining even better combustion efficiency. The Mira V, which incorporates both the EF-VD engine and DAIHATSU STOP&GO SYSTEM automatic idling stop equipment, has achieved the global top fuel efficiency level at 30.5 kilometers per liter of gasoline.^{*1} The Mira V received the 2003 Energy Conservation Grand Prize.^{*2}

*1. 10-15 mode fuel efficiency, gasoline vehicles (excluding hybrid vehicles) August 2005

*2. The Energy Conservation Center Japan's Chairman's Award

• Early Achievement of the FY2010 Fuel Efficiency Standards

Daihatsu engaged in the development of fuel efficiency improvement technology with the goal of early achievement of the FY2010 Fuel Efficiency Standards. As a result, 83.5% of the passenger vehicles we shipped in FY2005 are in line with these standards.

10 of the 15 major categories of passenger and cargo vehicles have also achieved these standards.

We are working hard to improve the fuel efficiency of those categories (mainly FR vehicles) that have yet to achieve the 2010 standards.

Note) Since 2004 OEM vehicles from other companies have been switched to aggregated accounting at the companies where they were sold.



Achievement rate for FY2010 Fuel Efficiency Standards (passenger cars)

• Efforts to reduce vehicle noise

Daihatsu has been working to improve the environment of roadways by reducing the noise produced by cars. We have been working to reduce vehicle noise caused by engines, drive trains, and exhaust systems. As a result of our efforts, all Daihatsu vehicles clear the latest vehicle noise regulations.

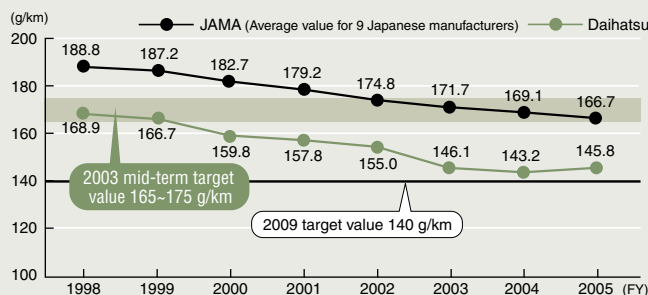
- High rigid aluminum block engine for improved quietness
- Plastic intake manifold



- Engine room insulation
- Exhaust system optimized for the new engine

• Reduction of CO₂ emissions of vehicles shipped to Europe

Each of the European, Korean, and Japanese automobile manufacturers' associations in Europe has established voluntary action targets and is working to improve fuel efficiency. The average value for CO₂ emissions of the roughly 32,000 Daihatsu vehicles sold in Europe in 2005 was 145.8g/km. Daihatsu is working to develop fuel efficiency technologies so as to reach our 2009 goal of 140g/km.



• CUORE (in Japan, the MIRA) takes second place in the VROM (Netherlands Ministry of Spatial Planning, Housing and the Environment) fuel efficiency rankings

The CUORE (in Japan, the MIRA) ranked second in the "Brandstofverbruiksboekje 2006" (fuel efficiency pamphlet for gasoline vehicles) published by VROM, behind the Toyota Prius (a hybrid vehicle).



The Dutch VROM fuel efficiency pamphlet.



Reducing Exhaust Emissions

Creating cars that don't pollute the air

• Super Intelligent Catalyst with even greater self-regeneration capabilities

The precious metals used in automobile catalytic converters (palladium, platinum, rhodium and others) have excellent detoxifying effects, changing pollutants such as CO, HC, NOx into non-toxic substances. As exhaust regulations are strengthened, the amount of these precious metals used increases, causing concerns about resource depletion as well as soaring prices for precious metals.

Daihatsu succeeded in 2002 in developing the world's first catalyst that stimulates the self-regeneration of palladium. We have taken this technology to the next level by succeeding in the additional self-regeneration of all the precious metals used in our catalytic converters (palladium, platinum, and rhodium). This technology allows us to attain a 75% reduction of the amount of precious metals used in comparison with previous catalytic converters.

• The prompt catalyst activation system reduces exhaust immediately after engine startup

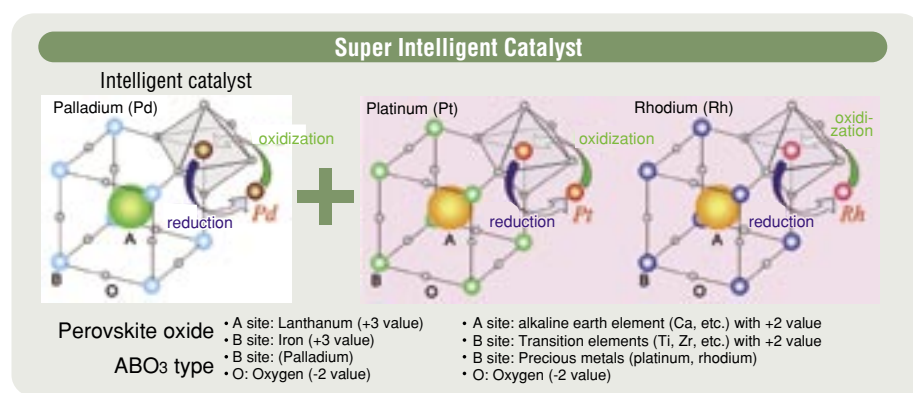
An engine is still cold immediately after startup, so the catalyst is unable to cleanse the exhaust sufficiently. Daihatsu developed the "prompt catalyst activation system" by applying the principle governing electrical current flow during combustion. In this way it is possible to attain precision engine control by monitoring combustion conditions according to the ionization level in the flame. This system succeeds in greatly reducing the exhaust gas emitted immediately after engine startup, which up to that point had been a major issue.

• Shipments of Low-Emissions Vehicles

In January 2004, Daihatsu began selling models of our "Mira" and Move" lines that took the lead in the industry by receiving "75% emission reduction based on 2005 standards" ("New Four-Star") certification.

34% of the passenger cars we shipped in FY2005 were "New Four-Star" certified, with "New Three-Star" certified or higher cars amounting to 74% of cars shipped.

Daihatsu is continuing to develop a wide array of clean cars.



Developing Clean Energy Vehicles

Creating cars that run clean

• We have sold 4,533 CNG (natural gas) vehicles

Daihatsu began developing CNG (natural gas) vehicles, which produce little emissions including CO₂ during operation, in 1993, and by 2005 we had sold a total of 4,533 vehicles. The mini cargo car market has been the destination of the majority of Daihatsu's CNG vehicles.

• Road tests of fuel cell vehicles has begun

Daihatsu engaged in joint efforts with Toyota to develop the Daihatsu Move FCV-K-2 fuel cell mini-car. A fuel cell vehicle based on the Tanto, as an advanced model, is currently in the developmental stage.

• We sell the first-ever mini cargo hybrid car

Daihatsu experiences a great demand for mini cargo cars from government offices and businesses. We offered our first hybrid mini cargo car, the Hi-Jet Cargo Hybrid, in September 2005.

The Hi-Jet Cargo Hybrid is simply designed, with a slim motor located between the engine and the transmission. In addition to achieving a roughly 30% improvement in 10/15 mode fuel efficiency, it has already achieved the equivalent of 75% reduction from 2005 emissions standard levels. We will continue to seek to reduce the cost of this vehicle and make further fuel efficiency improvements so as to increase the popularity of this vehicle.

2005 Energy Conservation Prize winner



Hi-Jet Cargo Hybrid



Research into Traffic Environment

Improving the traffic environment through ITS

• We are working to make "Town ITS" available for small car users

The Intelligent Transport System (ITS) is designed to improve traffic safety, convenience, and efficiency, resolving environmental issues through the use of information technology. As part of this system, Daihatsu is developing a car-sharing system that fuses environmentally friendly small cars with ITS technology.

This system was first adopted by Saito (the "International Culture Park City") in Osaka, where it is used as a car sharing system well-adapted to local conditions.

Daihatsu has also been providing a "welfare transport service support system" (Friendship-i) as an Intelligent Transport System for mini cars used by welfare agencies, which have been a great success. We hope to contribute to local community environments by providing such systems for efficient vehicle use.



Further Reduction of Substances of Concern

Creating cars that do not contain substances of concern

The Japanese automobile industry has instituted a voluntary action plan for the reduction of the four substances of particular concern (lead, mercury, hexavalent chrome, cadmium), so as to prevent pollution resulting from the disposal of car parts containing these substances. Daihatsu is promoting this action plan.

• Reducing the use of lead

Daihatsu continued to make progress in reducing lead use. We have made the use of lead-free products a priority in all possible areas in which large amounts of lead are used.

Through such actions as developing lead-free plating technology for the fuel tanks in our new "Boon" line in June 2004, we have achieved the automobile industry's 2006 goal (1/10 or less in comparison to 1996) ahead of schedule.

Furthermore, we have achieved 2006 goal for all new model cars sold in FY2005.

• Reducing the use of mercury and other substances

[Mercury/Cadmium]

Daihatsu aims to switch to mercury and cadmium-free parts at the earliest possible stage. We have reduced the use of these substances in navigation displays, to miniscule amounts.

[Hexavalent chrome]

This substance is used in the anti-rust coating applied to bolts and similar items. We are in the process of changing to an alternative product.

Examples of the main substances of particular concern and the Japanese automobile industry voluntary action plan

Substance	Parts containing substance	Voluntary action plan
Lead (excluding batteries)	Electrical mother boards Other engine parts (alloys)	From 2006 on, use 1/10 or less lead content per vehicle to the 1996.
Mercury	Light bulbs (discharge lamps) Navigation and other display devices Combination meters Cabin lights	From the implementation of the Automobile Recycling Law on, ban of all usage except for very small amounts for use in traffic safety items
Cadmium	Circuits (IC chips, other)	Banned in January 2007
Hexavalent chrome	Anti-rust coating for auto parts (bolts, nuts, various other parts)	Banned in January 2008

• Responding to EU regulations

The EU also began a staged process of eliminating the use of lead, mercury, cadmium, and hexavalent chrome in 2003. The goal in principle is to have the use of these substances eliminated by 2008. The Daihatsu Group is working with parts manufacturers to ascertain the amounts of the four main substances of concern used in auto parts, and began production of vehicles free of these four substances in 2003.



Mercury free discharge lamps

Development of 3R* and Easy-to-Recycle Products

Creating cars that conserve resources

• Improving recyclability

Daihatsu's Environmental Action Plan cites "development of products suitable to 3R or which are easily disposed of properly", to which end the following actions are being implemented:

1. Promote planning tied to reduce.
2. Planning that promotes improvement of reuse, dissolubility, and scrapability.
3. Use easily recycled materials, consolidate and reduce variety of materials, and expand development and application of recycling technologies.

*3R = Reduce, Reuse, Recycle

• Prior evaluation of recyclability

Beginning at the design stage, we execute prior evaluation of recyclability, with the target of improving product recyclability. This mainly consists in evaluating dissolubility and the extractability of oil, etc. The results are reflected in product design.



Breakdown mark on door trim and elsewhere