



DAIHATSU



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Daihatsu further innovates e:S Technology to boost fuel efficiency for its compact cars; achieves 33.4 km/L, tops among gasoline cars

Daihatsu Motor Co., Ltd. (Daihatsu), in improving the fuel efficiency of its compact cars, further innovated e:S Technology (Energy Saving Technology), which serves as its core technology in producing fuel-efficient, affordable cars.

Improvements were made in the three major aspects of e:S Technology: (1) better power train, (2) more advanced vehicle and (3) energy management, and the company thoroughly pursued improvements in combustion efficiency, reduced running resistance and increased energy efficiency.

The Mira e:S, due to be reintroduced this August with subtle improvements, will be equipped with these improved features in addition to the existing technology, and is expected to achieve fuel efficiency of 33.4 km/L^{*1}, the top figure among all gasoline cars^{*2}.

Daihatsu developed e:S Technology in July 2011 as its core technology in producing fuel-efficient, affordable and eco-friendly cars. The Mira e:S, released in September 2011 and equipped with this technology, achieved fuel efficiency of 30 km/L^{*1} while keeping a low starting price, below 800,000 yen, and winning the support of a broad range of consumers. The technology has made its way into other models including the Move and Tanto, contributing to greater fuel efficiency and affordability of Daihatsu compact cars.

Summary of latest improvements

Better power train

- ◆ Improved combustion efficiency with Cooled i-EGR, a further-improved version of i-EGR
- ◆ Comprehensively reduced friction loss using low-friction chains

More advanced vehicle

- ◆ Achieved ideal wind flow and improved aerodynamics through design and use of aerodynamic parts that boost fuel efficiency

Better energy management

- ◆ Improved Eco IDLE
- ◆ Improved on Eco Power Generation Control

*1: 2WD models; JC08 mode

*2: As of July 2013, based on Daihatsu survey

Summary of technologies

Better power train

- ◆ Improved combustion efficiency with Cooled i-EGR, a further-improved rendition of i-EGR
 - The EGR Cooler lowers the temperature of emissions due to be recycled, which keeps the intake temperature low and restricts abnormal combustion. By optimizing the ignition timing to match the lower intake temperature and reducing the amount of gasoline injected, the system helps improve fuel efficiency.
Restricting combustion temperature sustains clean emissions.

- ◆ Comprehensively reduced friction loss using low-friction chain
 - The shape of the back of the new timing chain was changed from a conventional straight shape to curved, thereby reducing the area of contact with the chain guide.

- ◆ Reduced engine load by optimizing CVT control and achieving more optimal shifting to higher gears
 - The continuously variable transmission (CVT) control was reworked to achieve more optimal shifting of gears compared to the previous rendition. This increases fuel efficiency and driving performance.

More advanced vehicle

- ◆ Achieved ideal wind flow and improved aerodynamics through design and use of aerodynamic parts that boost fuel efficiency
 - The front bumper adopts a new design, called Aero Corner, which quickly and smoothly directs wind from the front of the car to the rear.
 - An under-floor cover settles air turbulence beneath the floor to reduce running resistance^{*3}.
 - Tire deflectors restrict air curls into the front tires.
 - A low-down suspension lowers vehicle height by 10 mm and reduces air entering beneath the floor^{*3}.

*3: Only on 2WD models

- ◆ Improved rear differential gears to heighten fuel efficiency on 4WD models
 - The gear shape was changed from the conventional hypoid to a non-offsetting spiral type to minimize teeth gliding between gears and reduce frictional resistance. Accompanying this change in gear shape is a change in lubricant oil within the differential gear from a high-viscosity type with greater resistance to low-viscosity, which reduces stirring resistance. These improvements heighten transmission efficiency^{*4}.

*4: Only on 4WD models

Better energy management

- ◆ Improved Eco IDLE to allow engine to stop from 11 km/h as car comes to a stop
 - The Eco IDLE system that previously activated at 7 km/h or 9 km/h as the car comes to a stop revised its control on how it restarts the engine before the car stops to now allow activation at a speed of 11 km/h. The system improves fuel efficiency by cutting fuel injection upon release of the gas pedal and restricting it to extreme levels as the car slows and stops.

- ◆ Improved Eco Power Generation Control to heighten power generation when car slows
 - Use of a high-performance alternator with high-power-generating efficiency improved power generation when the car slows down. Further restriction of power generation during acceleration and cruise reduces engine load and helps boost fuel efficiency.