Honda Develops “SPORT HYBRID Intelligent Dual Clutch Drive” – A New Lightweight and Compact Hybrid System

Honda has pioneered a new lightweight and compact one-motor hybrid system for small vehicles, called the SPORTS HYBRID Intelligent Dual Clutch Drive system.

This new hybrid system will be the latest addition to the Earth Dreams Technology series of new generation powertrain technology that combines excellent driving performance and high levels of fuel economy.

Together with the SPORT HYBRID Intelligent Multi Mode Drive for mid-sized vehicles and the SPORT HYBRID SH-AWD® (SPORT HYBRID Super Handling - All Wheel Drive), the newly developed SPORT HYBRID Intelligent Dual Clutch Drive will join the line up of three SPORT HYBRID systems that can accommodate different vehicle sizes and characteristics.

One-motor SPORT HYBRID Intelligent Dual Clutch Drive
This new system will offer high levels of fuel economy¹ and acceleration that is more powerful than that of existing models to ensure driver enjoyment and performance is not sacrificed.

This new drive unit combines a newly developed inline 4-cylinder 1.5L Atkinson cycle engine with a 7-speed DCT² system. The built-in high-output motor and lithium-ion battery improve efficiency by more than 30 per cent compared to a conventional one-motor hybrid system.

Outline of the system
- The combination of the one-motor hybrid system and the engine offers sporty driving during acceleration and high-speed cruising by using the clutches to engage the engine
- Highly efficient electric vehicle (EV) driving is utilised during start up and low- to medium-speed cruising by using the clutches to disengage the engine
- This system contributes to the improvement of fuel economy by increasing energy regeneration using the clutches to disengage the engine during deceleration

Two-motor SPORT HYBRID Intelligent Multi Mode Drive / Plug-in - the world’s most efficient³ two-motor hybrid system optimised for mid-sized vehicles
The adoption of high-efficiency /high-output motors offers quick acceleration with an EV-like driving feel and high fuel economy.

This hybrid system achieves the world’s highest efficiency by combining the following:
- A newly-developed engine dedicated for hybrid vehicles - the Earth Dreams Technology new 2.0L Atkinson cycle engine
- An electric CVT coupled with two built-in motors and a lock-up clutch
- A lithium-ion battery
- A smart system which can switch modes to match driving styles and situations
Outline of the system

The system switches the operation among the following three driving modes depending on driving conditions and the battery charge level:

- “EV Drive” for driving by the electric motor using electricity from the battery and regeneration during deceleration
- “Engine Drive” for medium-to-high-speed cruising with the engine and axle directly connected by a lock-up clutch and engine power is mechanically transferred to the wheels
- “Hybrid Drive” for urban driving and powerful acceleration using the motor with electricity generated by the engine

This hybrid system, which is also suitable as a plug-in hybrid system, will be installed to the North American version of the Accord, scheduled to be introduced to the market in January 2013.

Three-motor SPORT HYBRID SH-AWD® (SPORT HYBRID Super Handling - All Wheel Drive)

The combination of a V6 engine and this high-output three-motor system achieves acceleration performance equivalent to that of a V8 engine with fuel economy better than that of an inline 4-cylinder engine.

A new V6 3.5L direct-injection engine is installed in the front of the vehicle and combined with a newly-developed 7-speed DCT system with a built-in motor. This unique Honda technology uses two motors installed in the rear to control torque distribution to the right and left rear wheels.

Outline of the system

- Using independent motors for the right and left rear wheels, positive torque is applied to the outside wheel and negative torque is applied to the inside wheel, making independent control of torque distribution to the rear wheels possible without relying on engine output
- Depending on the radius of the curve, the energy generated by the inside wheel is recovered electrically and applied to the outside wheel to self-generate torque necessary for the vehicle to make the turn

These latest advancements in electric vehicle technologies further progress Honda towards making the Sport Hybrid, such as the forthcoming new NSX model, a reality. It also further highlights Honda’s continued commitment to reducing the impact of its products on the environment, as well as working towards a lower carbon lifestyle and ensuring the sustainability of its vehicles.

Ends

Notes to Editors

1 Hybrid system for a 1.5L engines
2 Dual Clutch Transmission
3 Honda’s internal research (as of August 2012)