

2005 Escape Hybrid Chassis

No-Compromise Driving Enjoyment

"With the Escape Hybrid, we're putting fun into hybrid driving for the first time. Escape Hybrid is a no-compromise SUV."

Driving The World's Most Fuel-Efficient SUV

The 2005 Ford Escape Hybrid achieves its high fuel economy, clean emissions and spirited performance feel thanks to an advanced powertrain that combines the best elements of gasoline and electric vehicles. This hybrid-electric vehicle:

- Is fueled by unleaded gasoline and never needs to be "plugged in" for charging
- Is driven like a conventional vehicle with an automatic transmission
- Automatically manages the electric drive system and gasoline engine for maximum efficiency and acceleration
- Makes no compromises in the acceleration performance and versatility expected from the Ford Escape, the compact SUV sales leader

"In addition to its extremely quiet operation, the most apparent difference between driving the Escape Hybrid and any other SUV is how few stops you'll make for fuel, especially in city driving," said Mary Ann Wright, director, Sustainable Mobility Technologies and Hybrid Vehicle Programs. "We've worked very hard to make the driving experience as familiar as possible."

The Escape Hybrid experience begins conventionally: Turn the key, and the engine starts. Shift to Drive, press the accelerator, and you're off.

"The first thing you'll notice is the smoothness," said Tom Watson, Ford Escape powertrain supervisor. "The Escape Hybrid's transmission can change its gear ratio seamlessly and continuously. There's no feeling of gear shifts as you increase speed."

Teamwork Produces Powerful, Smooth Acceleration

The Escape Hybrid's 70-kilowatt traction motor can launch the vehicle on clean electric power - up to 25 mph. When needed, the generator can smoothly start the gasoline engine in less than 400 milliseconds, without the increased emissions produced in starting up a conventional engine. The combination of the gasoline engine and electric traction motor provides seamless, strong response similar to a V-6 engine.

Braking System Saves Energy

When coming to a stop, Escape Hybrid's electric motor and regenerative braking system capture energy that normally would be lost as heat developed by the four-wheel disc brakes. As the driver presses the brake pedal, Escape Hybrid's electric drive system transforms the vehicle's momentum into electric energy. This energy gets transferred to the hybrid battery, where it is stored for later use, saving gasoline and eliminating the need to plug the vehicle into an electric outlet.

Engine Stops, Starts Automatically

Escape Hybrid features a fuel-saving engine stop/start function. As the vehicle comes to a stop, the system automatically checks the battery to ensure it has adequate power. If it is sufficiently charged, the gasoline engine rests to save fuel, and the vehicle operates on electricity alone, achieving the highest fuel economy and emissions benefits. There's no need to restart before hitting the accelerator.

In pure electric mode - indicated on the tachometer by a "green" zone below 0 rpm - the Escape

Hybrid's gasoline engine rests to save fuel. It automatically switches in and out of this rest state depending on the driving situation and vehicle demands.

"One of our biggest challenges was calibrating the vehicle so that automatic engine stop doesn't seem as though the engine has stopped at all," said Watson. "After a lifetime of driving conventional vehicles, the sensation of the engine stopping takes some getting used to."

To ease the transition, the engine typically stops while the vehicle is still coasting, so the vehicle becomes quiet gradually. Because the engine is started by a high-voltage electric motor instead of the typical small, 12-volt starter, it springs to life almost instantly when necessary.

"After just a few laps around the block, drivers become very comfortable with engine stop-start," Watson said. "The quiet operation simply becomes second nature." Conventional vehicles use the gasoline engine to provide energy for power braking and steering. In pure electric mode, the Escape Hybrid's electric power-assisted steering and advanced electro-hydraulic braking systems continue to function normally.

Capability Expected From a Ford SUV

Proving that efficiency and utility can go hand-in-hand, the 2005 Ford Escape Hybrid not only is the world's most fuel-efficient SUV, it's the only hybrid vehicle to offer four-wheel drive, a manufacturer's towing rating and a maximum 65.5 cubic feet of cargo room.

The Ford Escape leads its class in total sales since its introduction, in part because of its outstanding roominess and cargo-handling capability. For the Escape Hybrid, engineers carefully packaged the hybrid powertrain components so as to maintain this utility. The electric traction motor and power controller fit in approximately the same space as a conventional transmission, while the slim hybrid storage battery fits neatly under the rear cargo floor, completely sealed against the kinds of wet, dirty gear adventurous owners sometimes carry there.

In fact, the only difference between the Escape Hybrid and other Escape models from a packaging standpoint is the unobtrusive integrated ductwork in the driver-side rear quarter window for the battery's temperature-management system. It occupies only a little more than one cubic foot of space, distributed along the side panel for minimal loss of effective storage space. With a maximum 65.5 cubic feet available inside the Escape Hybrid cargo area, it is easily the most spacious hybrid electric vehicle ever made.

Intelligent 4WD System Offers Unprecedented Hybrid Capability

The Escape Hybrid is the only hybrid to offer the off-pavement advantage and all-weather security of optional four-wheel drive. For 2005, all Escape models offer an all-new, fully automatic four-wheel-drive system.

The new Intelligent 4WD System requires no driver interaction and is so seamless in operation that most drivers will never notice that it has engaged - except being impressed by Escape Hybrid's capability in slippery conditions.

The Intelligent 4WD System has a fully computer-controlled clutch that engages the rear wheels as needed; in normal conditions Escape is driven by its front wheels. Using sensors at each wheel and the accelerator, the system's computer can calculate up to 200 times per second exactly how much torque to send to the rear wheels to minimize slip; it can also predict slip and preclude it from happening at all.

The Intelligent 4WD System eliminates one of the drawbacks of other four-wheel-drive systems that are tuned aggressively for maximum traction: a binding effect during tight turns and driveline harshness when the system engages. The Escape Hybrid's Intelligent 4WD System can sense tight turns and continuously varies the torque to the rear wheels at all speeds, offering the benefits of a

"locked" four-wheel-drive system without any of the drawbacks.

An Environmental Vehicle That Pulls Its Share

As the hybrid market's only vehicle rated by its manufacturer for towing, Escape Hybrid further distinguishes itself as the most practical hybrid. Properly equipped, it can tow up to 1,000 pounds - enough to pull a small boat, personal watercraft or utility trailer. This is the same tow rating as a standard Escape powered by the I-4 engine.

Fun-to-Drive Dynamics

At its launch in 2000, Escape quickly became known as Ford's fun-to-drive SUV, for its dynamic on-road capability. The Escape Hybrid shares ride and handling improvements with the other 2005 Escape models, and the suspension also is tuned specifically for the unique weight distribution of the hybrid system.

A new front stabilizer bar system with low-friction links provides a subtle improvement to Escape's already agile, predictable and inspiring driving character. This performance stems from Escape's solid unitized body construction, its MacPherson strut front suspension, rack-and-pinion steering and independent rear suspension (IRS).

IRS once was a rarity among SUVs, but now is used in the Ford Escape, Ford Explorer and Ford Expedition as a key element of Ford's SUV leadership. The responsive IRS architecture gives Escape precise steering and handling through dynamic toe control and the ability of each wheel to react separately to road imperfections.