



## Honda Accord Hybrid - Road Tests

### ***Haul ass and save gas.***

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The hybrid that always *could have* happened finally did. This is a performance car that gets excellent mileage, too.

In the Honda line, this is the best Accord, just as the Civic hybrid is the best Civic. But the Accord pushes the envelope to include 0-to-60 in 6.7 seconds in a comfy five-passenger sedan while, according to the EPA, achieving 30 mpg city, 37 highway. Yes! Consider: The four-cylinder automatic Accord does only 24 city and 34 highway. With today's technology, only a hybrid could hit *all* of these marks.

This primo Accord naturally has the highest price, about \$30,000 base, Honda says, including automatic, leather, heated seats, AM-FM-satellite radio and six-CD changer, anti-lock brakes, and curtain airbags; the only option is a nav system.

It also has the best performance of any Accord four-door, outrunning the V-6 automatic by 0.3 second to 60 mph and 1 mph in the quarter, to 93 mph in the end zone.

The only sacrifices: You give up 2.8 cubic feet of cargo space (leaving 11.2) to make room for the traction battery and its ventilation system; the rear backrest no longer folds forward for access to the trunk; and the spare tire is replaced by a small air compressor and a can of sealant (Honda pioneered this approach to repairing flats on the original NSX). And, of course, you get whacked by something over three grand on the sticker, too.

From the driver's seat, you see what you always see in Accords, except for some subtle

details in the HVAC controls and Honda's unique hybrid gauges positioned low in the cluster. The "charge" and "assist" indicators are miniature bar graphs extending horizontally, and a separate battery-level graphic is off by itself to the right. There's also an indicator labeled "ECO" that often glows green. ECO? Call it the "good news" light celebrating your propulsion on only the three front cylinders.



Except for this small array of unusual graphics in the cluster, there's little about this car to say it's a hybrid, or that it's the best Accord. There's a small "hybrid" badge on the decklid, less conspicuous than the V-6 emblem below it, a token decklid spoiler, special five-spoke alloy wheels, a different grille color, and tires upsized one notch to 215/60R-16. The eye is hardly grabbed.

Honda is low-profiling this one. We think average folks wouldn't notice anything about the way it drives, either. Okay, engine off at idle might raise flags, except, "Is it really off? What's that little noise? There's a vibration, too." Until you read the manual, the small green "AUTO STOP" blinking on the cluster is cryptic to the point of *huh?*

During our summer test motoring, the A/C was always running. The belt-drive compressor (75cc displacement) stops with the engine, but the electric compressor (15cc) maintains cabin coolness and keeps the Accord alive with enough vibration that you could think—in a Lexus anyway—the engine were still idling.



The 2997cc V-6 has a system to deactivate all the valves on the rear bank. It's programmed to shrink back to three-cylinder operation below 3500 rpm when cruising or coasting, and the others don't come alive even for mild acceleration. Instead, the electric motor readily and seamlessly kicks in to help. Only at higher revs, or if the battery is down, or if significant acceleration is ordered, will all six cylinders join in. One staffer thought he could feel some rough running on three, but most of us could not. This feature is highly successful, effectively cutting consumption in half when the green glows.

The mechanical layout is typical of Honda hybrids, with a thin wafer of a motor/generator (Honda calls it Integrated Motor Assist) sandwiched between the sideways engine and transmission. The five-speed automatic was shortened by 2.4 inches to allow room between the frame rails for the extra 2.7 inches of the IMA.

On full acceleration, the IMA contributes up to 16 horsepower and 100 pound-feet of torque. Motor power, with its peak torque highest at low revs, teams particularly well with a reciprocating engine that must spin up into the midrange for best torque, delivering a net output within 90 percent of the peak anywhere in the range up to 4000 rpm. So this Accord has lots of lunge on tap in metro traffic. We tried a full-power launch one morning on damp—but definitely not wet—pavement; the tires stayed on the squealing side of full traction all the way to 30 mph.

The IMA, of course, changes its act to become a generator on deceleration, acting as a brake and sending the recaptured energy back to the battery. Progress keeps coming. Honda says the 2005 Accord's regen efficiency is 95.2 percent, up from the 2003 hybrid Civic's 93.5 percent.

Only one aspect of driving roused disapproval. The steering has an unwelcome numbness on-center, either from the electric assist or the high-mount tie rods used in this application. Normally, Hondas earn high marks from us for path accuracy. The hybrid's extra torque makes modest tugs on the steering, too, the notorious torque steer that afflicts quick front-drivers.



This Honda's hybrid machinery is relatively simple, but a densely wound motor and an Ni-MH battery pack of 13.8 kilowatt-hours add pounds. To at least partly offset the gains, the hybrid substitutes aluminum for the hood, bumper beams, and rear suspension uprights; magnesium for the intake manifold and head cover; and remember, there's no spare tire.

The usual question about hybrids—"Can you save enough gas to pay back the extra initial cost?"—doesn't apply here. What would you pay for a darn quick and quiet family car that also gets great mileage? Honda has tossed out a new choice.

## THE VERDICT Honda Accord Hybrid



Highs: Thrusty midrange punch, about 600 miles on a tankful, comfy space for five, a hushed voice.

Lows: Honda's involving hybrid gauges shrank to squint size, no fold-forward rear seat, vague steering.

The Verdict: Saving gas has never been so painless.

## COUNTERPOINT

### AARON ROBINSON

Honda's new hybrid has a major—perhaps crippling—disadvantage to the Toyota Prius: It looks exactly like a common household Accord. That's dandy to those who prefer to save the planet in private, but many buyers expect the hybrid's extra cost to at least earn them public recognition as active do-gooders. It beats what Hummer owners pay extra to be recognized as, but only the squinters will notice the Accord hybrid's extra badge. Alas, for Accord owners, perhaps it's enough just to leave ordinary cars in the technological dust. This Honda's swifter punch, marvelous handling, and absent fuel penalty are delights, even when savored in secret.

### BARRY WINFIELD

If anybody's idea of a hybrid vehicle is a small, slow, economical runabout, the Accord hybrid will come as a real surprise. It has a V-6 that, with the assistance of the electric motor, makes more power than the standard car, and the hybrid car feels faster and more responsive. On our 10Best loop, there is an uphill right turn at a stop sign, and if you goose the throttle in the hybrid Accord, the right front wheel will spin so determinedly that you have to back off the pedal to stop the wheel from spinning halfway up the hill. Add to the plentiful torque Honda's usual refinement, poise, and balance, and you have a brilliant new take on what hybrid technology can achieve.

### JOHN PHILLIPS

I've been hot for 51 years. When I was born, I told the delivery-room doc, "Hey, pal, find the air conditioner in this joint and *turn it on.*" As a result, I operate any given car's A/C from March to New Year's Eve. In previous hybrids I've sampled, the engines could rarely sustain max compressor and max fan speed in auto-stop mode, so the thing continued to idle through even the briefest traffic lights, working counter to the whole fuel-saving exercise. But not this baby. Even when the tach reads "0," a cool northeasterly blows relentlessly, and all is right in my overheated world. Big surprise that Honda figured it out first, right?

#### It's Not Just One Thing

Regenerative braking is the big payoff of hybrids, the ability to recapture the energy of vehicle motion that's ordinarily wasted as heat to the brakes. Feeding that "saved" energy back into forward motion accounts for 60 percent of the Accord's mileage gain in city and 38 percent in highway operation, Honda says. But there are many small losses besides braking, and Honda has attacked them, too.

Why run the engine at idle? The Accord doesn't, accounting for 25 percent of its improvement in city mpg.

Why fuel all six cylinders when three would be enough for much of your trip? The Accord doesn't, for another 15 percent of its city increase, 57 percent highway.

Aerodynamic improvements, to 0.29 Cd from 0.30, add another five percent of the

highway gain.

Easy to say all of this, but daunting to do properly. Idle stop interrupts A/C and steering power. The Accord hybrid changes to electric steering and two A/C compressors, a small electric unit supplementing a larger belt-driven one. Electric drive has smaller losses than belt drive, too. Idle stop also means the torque converter loses oil pressure, followed on restart by lags in forward motion. The Accord has an electric transmission pump to keep pressure up.

Deactivating three cylinders is not as easy as interrupting the spark, either. Even when the rear bank is shut down by deactivating all the valves, the Accord V-6 keeps firing the plugs. Three-cylinder power is inherently rough, all wrong for buyers spending 30 large. So the Accord has "active" engine mounts that are electrically powered to counteract the vibrations of three-cylinder operation, a system of clutching the torque converter in harmony with the power pulses, and an anti-noise system plays through the radio speakers to counter the booming interior sounds.

On the aero side, wheels with less drag and a small decklid spoiler add highway streamlining.

## HONDA ACCORD HYBRID

**Vehicle type:** front-engine, front-wheel-drive, 5-passenger, 4-door sedan

**Estimated price as tested:** \$32,000 (estimated base price: \$30,000)

**Options on test car:** navigation system

**Major standard accessories:** power windows, driver seat, and locks; remote locking; A/C; cruise control; tilting and telescoping steering wheel; rear defroster

**Sound system:** Honda AM-FM-XM satellite radio/CD changer, 6 speakers

### ENGINE

Type: V-6, aluminum block and heads

Bore x stroke: 3.39 x 3.39 in, 86.0 x 86.0mm

Displacement: 183 cu in, 2997cc

Compression ratio: 10.5:1

Fuel-delivery system: port injection

Valve gear: belt-driven single overhead cams, 4 valves per cylinder

Power (SAE net): 240 bhp @ 6000 rpm

Torque (SAE net): 217 lb-ft @ 5000 rpm

Redline: 6500 rpm

### ELECTRIC MOTOR

Type: 3-phase AC permanent-magnet synchronous electric motor powered by 120 1.2-volt nickel-metal hydride batteries

Power (SAE net): 16 bhp @ 840 rpm

Torque (SAE net): 100 lb-ft @ 840 rpm

### DRIVETRAIN

Transmission: 5-speed automatic

Final-drive ratio: 4.38:1

Gear, Ratio, Mph/1000 rpm, Max test speed

I, 2.69, 6.5, 42 mph (6500 rpm)

II, 1.57, 11.1, 72 mph (6500 rpm)

III, 1.02, 17.0, 110 mph (6500 rpm)

IV, 0.73, 23.8, 131 mph (5500 rpm)

V, 0.53, 32.8, 131 mph (4000 rpm)

## **DIMENSIONS**

Wheelbase: 107.9 in

Track, front/rear: 61.1/61.2 in

Length/width/height: 189.5/71.5/57.1 in

Ground clearance: 6.1 in

Drag area, Cd (0.29) x frontal area (25.3 sq ft, est): 7.3 sq ft

Curb weight: 3513 lb

Weight distribution, F/R: 61.3/38.7%

Curb weight per horsepower: 13.8 lb

Fuel capacity: 17.1 gal

## **CHASSIS/BODY**

Type: unit construction

Body material: welded steel stampings

## **INTERIOR**

SAE volume, front seat: 57 cu ft

rear seat: 46 cu ft

luggage: 11 cu ft

Front-seat adjustments: fore-and-aft, seatback angle; driver only: front height, rear height, lumbar support

Restraint systems, front: manual 3-point belts; driver and passenger front, side, and curtain airbags

rear: manual 3-point belts, curtain airbags

## **SUSPENSION**

Front: ind, unequal-length control arms, coil springs, anti-roll bar

Rear: ind, 3 lateral links and 2 diagonal links per side, coil springs, anti-roll bar

## **STEERING**

Type: rack-and-pinion with electric power assist

Steering ratio: 16.3:1

Turns lock-to-lock: 3.2

Turning circle curb-to-curb: 36.9 ft

## **BRAKES**

Type: regenerative electric and electrohydraulic by wire with anti-lock control

Front: 11.1 x 0.9-in vented disc

Rear: 10.2 x 1.4-in disc

## **WHEELS AND TIRES**

Wheel size/type: 6.5 x 16 in/cast aluminum

Tires: Michelin Energy MXV4 S8, P215/60R-16 94V M+S

Test inflation pressures, F/R: 32/32 psi

Spare: none

## *C/D* TEST RESULTS

### **ACCELERATION** Seconds

Zero to 30 mph: 2.5

40 mph: 3.5

50 mph: 5.0

60 mph: 6.7

70 mph: 8.7

80 mph: 11.5

90 mph: 14.4

100 mph: 17.6

110 mph: 22.6

120 mph: 29.0

130 mph: 37.2

Street start, 5-60 mph: 7.6

Top-gear acceleration, 30-50 mph: 4.0

50-70 mph: 5.1

Standing 1/4-mile: 15.2 sec @ 93 mph

Top speed (governor limited): 131 mph

### **BRAKING**

70-0 mph @ impending lockup: 193 ft

### **HANDLING**

Roadholding, 300-ft-dia skidpad: 0.78 g

Understeer: minimal **moderate** excessive

### **FUEL ECONOMY**

EPA city driving: 30 mpg

EPA highway driving: 37 mpg

*C/D*-observed: 26 mpg

### **INTERIOR SOUND LEVEL**

Idle (internal-combustion engine off): 32 dBA

Full-throttle acceleration: 69 dBA

70-mph cruising: 68 dBA