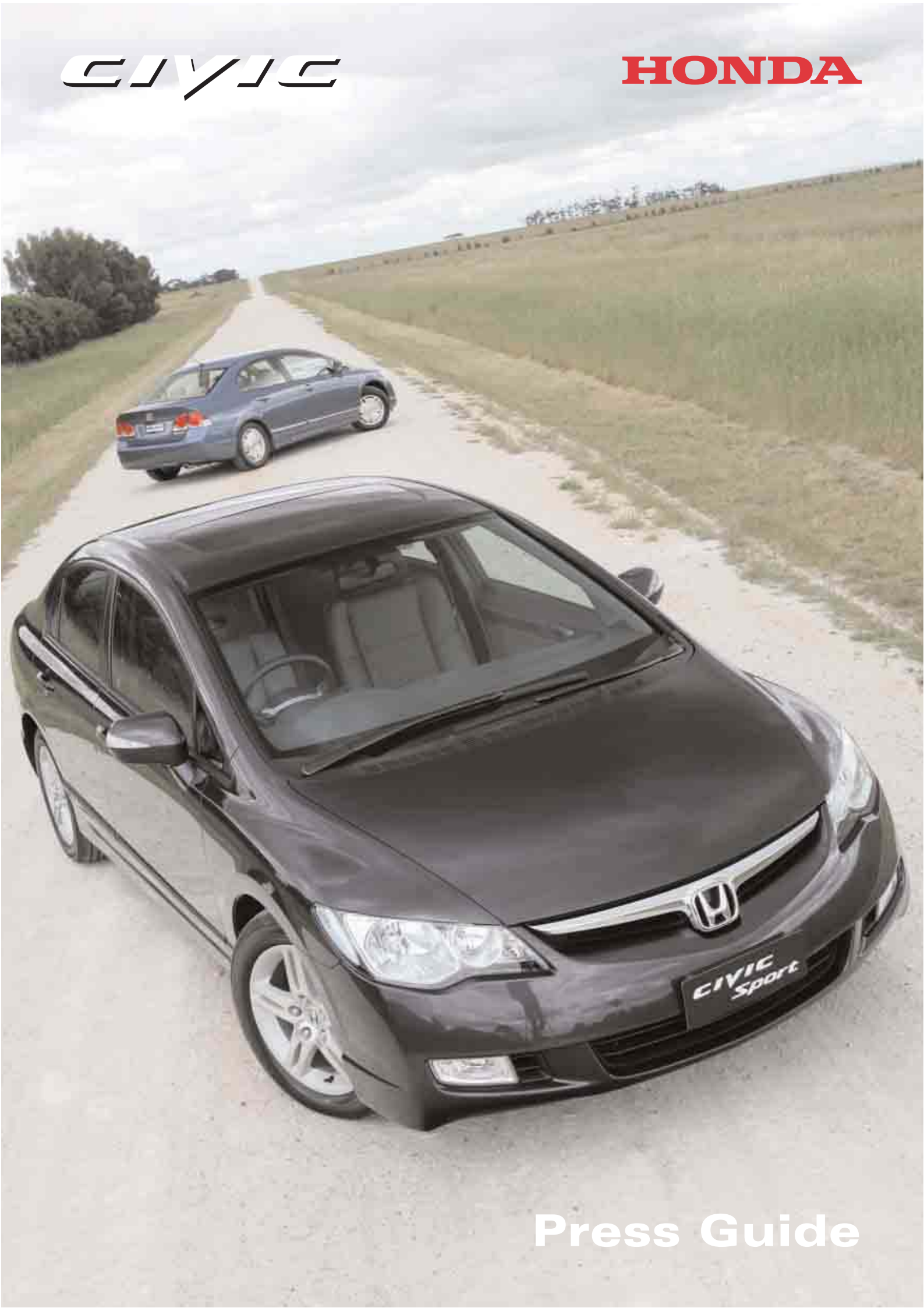
CIVIC

HONDA



Press Guide

CIVIC

HONDA

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2006 Honda Civic

Overview

The eighth-generation Civic range brings new levels of driving enjoyment, sophistication, advanced engineering and contemporary styling to the Australian small car segment.

Available as a four-door sedan, the Civic range comprises the following variants:

- 1.8-litre Civic VTi
- 1.8-litre Civic VTi-L
- 2.0-litre Civic Sport
- 1.3-litre Civic Hybrid

The engines in the new Civic range are both powerful and frugal, thanks to continuing improvements to Honda's i-VTEC engine technology. The Civic Hybrid returns with a fourth-generation Integrated Motor Assist (IMA) system delivering significant boosts in power and fuel economy.

There are three newly-developed engines in the range: a 1.8-litre i-VTEC, 103 kW (174Nm); a 2.0-litre i-VTEC, 114 kW (188Nm) and a 1.3-litre hybrid VTEC (with i-DSi) paired with the IMA system to produce 85 kW (170Nm).

The Civic range is offered with either a 5-speed manual or 5-speed automatic transmission - the latter a first for Civic - while the Civic Hybrid features an improved Continuously Variable Transmission (CVT) for greater fuel economy and smoother gear changing. The 2.0-litre Civic Sport models equipped with an automatic transmission feature F1-style steering-wheel-mounted gear shift paddles for enhanced driving response - another first for Civic.

The 2006 Civic is longer, lower, wider and more aerodynamic than its predecessor. The car's low and wide stance creates a significantly more aggressive and sporty look than the previous model.

On the inside, Honda stylists and engineers focused on sophistication to create a high-quality, advanced and spacious interior with the latest technology, expanded storage and innovative ergonomics.

The driver's instrument panel has been designed around the "Multiplex Meter" concept, in which important driving information, including vehicle speed, is displayed in the upper part of the instrument panel while other information is

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provided in the lower part. This design allows the driver to concentrate on the road while receiving vital information, enhancing the easy-to-operate and fun-to-drive character of the car.

The Civic Sedan offers a great deal of versatility thanks to the "flat floor" design, allowing large and bulky items to be carried. The boot alone can accommodate large items in its 376 litre capacity – including golf bags, several cases or even a wheel chair.

To carry even larger items, the rear seats can be folded down to create a 485 litre sized cargo space, thanks the positioning of the fuel tank underneath the floor. The rear seats also have a one-motion, dive-down feature that instantaneously creates a flat loading space. This can be done with the rear seat fold down lever located in the boot for easier loading of items.

The Civic VTi features a single-fold rear seat, while the VTi-L and Sport gain a 60/40 split fold seat. (The Civic Hybrid's IMA battery pack is mounted behind the rear seat back so the seats cannot be folded down.)

All this flexibility translates into a hidden versatility not normally found in a small sedan.

Safety for both occupants and pedestrians alike is an important goal of Honda's R&D department. The Civic range has a comprehensive array of safety equipment, including G-CON body cell, front dual stage i-SRS airbags standard on each model, with side and curtain airbags available as you progress through the range.

Anti-lock Brakes (ABS) and cruise control are standard across the range. A new rear right/left independent Electronic Brake force Distribution is used in conjunction with the ABS to maintain vehicle stability and help prevent rear-end steer in emergency braking.

The Civic Sport is the "gruntiest" Civic ever with the 2.0-litre i-VTEC engine pumping out 188Nm at 4200 rpm, while the power output at 114kW is only 4kW less than Honda's hot-hatch Civic VTi-R of the late 1990's.

The Sport gains a number of luxury and performance options over the rest of the range, including 16-inch wheels, steering-wheel-mounted gear shift paddles (auto only), leather seats and steering wheel, electric power steering, front foglights and curtain airbags.

The Civic Hybrid receives a number of mechanical upgrades for 2006, including an improved Integrated Motor Assist (IMA) system to give Honda's fourth-generation

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hybrid more power and greater fuel economy, better battery recharge and a new dual-scroll compressor driving the air conditioning system. A significant new feature is that the car is now capable of running on purely electric power at low speeds.

With a maximum combined power output of 85kW, the Civic Hybrid is the most powerful hybrid available in Australia today.

History

The Civic has been a cherished mainstay of the Honda range since its launch in 1972. Through seven generations the Civic has been one of the world's most loved cars, sold in approximately 160 countries and accounts for one third of Honda's sales worldwide.

The secret to the Civic's success has been its superior driving performance, fuel economy, safety and environmental performance combined with its spacious, useable interior.

Honda has manufactured more than 16 million Civics since 1972 – beating even the hallowed Model T Ford.

The launch of the original Civic represented an important milestone in Honda's history. Not only was the Civic Honda's first mainstream vehicle, but its success also marked the emergence of Honda as one of the world's leading car manufacturers.

The car was also important for Honda Australia, its arrival in 1973 cementing the Japanese brand's presence just four years after the company established a permanent office in Australia.

In February 1973 Australia became the third export market to receive Civic, behind the USA and Hong Kong.

Production of the Civic began at Honda's Suzuka factory in 1972 and fast developed a reputation for superior build quality and modern packaging.

The Civic was also honoured with the Japan Car of the Year Award in 1972, 1973, and 1974, becoming the first ever to win three years in a row. In Canada, the Civic remained the number-one import car in volume for 28 consecutive months from 1976 through 1978. These achievements amply demonstrated the car's design innovation and broad public acceptance, both in Japan and overseas.

The Civic's original 1.2-litre overhead cam engine has since evolved from a two-

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valve powerplant to the sophisticated four-valve engines with VTEC that are available today.

From its earliest days, the Civic showcased Honda's low emissions technology. Honda's breakthrough low-pollution CVCC engine was introduced in late 1972 to comply with the US "Muskie Act" that set stringent emissions standards. The 1992 Civic VEi featured a super-efficient lean-burn VTEC engine and represented another major breakthrough in combustion technology for Honda.

The newest Civic engines retain Honda's Low Emission Vehicle (LEV) technology and gains Euro 4 emissions standards to achieve exhaust emissions cleaner than current Australian standards.

Sales and Marketing

The Honda Civic has traditionally appealed to a broad range of customers and Honda expects the 2006 Civic to be just as popular.

Buyers who are attracted to the Civic's quality and low running costs are predominantly white collar professionals, married or in a committed relationship.

While they have no children, they are either about to start a family or have older children such as late teens living at home or young adults who have left home.

Research shows that the Civic has similar appeal to both men and women.

"The Civic has the classic Honda values of reliability, practicality, safety, power and fuel efficiency while still being fun to drive," said Honda Australia Senior Director Lindsay Smalley.

"The eighth-generation Civic will appeal to existing Civic owners as well as buyers looking for a combination of style and substance in the small-car sedan market."

Current Civic sedan owners nominate reliability, quality, practicality, value for money, running costs and resale values as strengths of the car.

Honda Australia has set a yearly sales target for the total Civic range of 12,000 units.

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Main Features

Civic VTi

- 1.8-litre, 103kW, i-VTEC engine
- 174Nm @ 4300
- 5-speed manual or 5-speed automatic transmission
- Independent front suspension
- Double wishbone rear suspension
- Four wheel disc brakes (vented front discs)
- Remote central locking
- Power windows
- Power mirrors
- Cruise control standard on all models
- Tachometer and trip meter
- 15-inch steel wheels
- Anti-Lock Brakes (ABS) with EBD standard on all models
- Driver and passenger front i-SRS airbags
- Single in-dash CD player
- Immobiliser
- Fold-down rear seat
- Full-size spare wheel
- Drive-by-wire (DBW) throttle
- Euro-4 emission compliance
- Air conditioning

Civic VTi-L

As Civic VTi, plus:

- 6-stacker MP3/CD tuner
- 60/40 split fold rear seat
- Driver and front passenger side SRS airbags
- 15-inch alloy wheels
- Climate control air conditioning

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Civic Sport

As Civic VTi and VTi-L, plus:

- 2.0-litre, 114kW, i-VTEC engine
- 188Nm @ 4200
- Front and rear curtain airbags
- 205/55 R16 tyres riding on 16-inch alloy wheels
- Electric power steering
- Variable intermittent windscreen wipers
- Additional interior colour - blue - available
- Front fog lights
- Leather interior
- Sunroof
- Automatic transmission paddle shifts mounted on steering wheel
- Exhaust pipe finishers

Civic Hybrid

- 1.3-litre, VTEC with i-DSI engine combined with IMA system to produce 85 kW (170Nm)
- 4th generation Integrated Motor Assist (IMA) hybrid system
- Continuously Variable Transmission (CVT)
- 15-inch alloy wheels
- Leather steering wheel
- Driver and passenger front i-SRS airbags
- Driver and front passenger side SRS airbags
- Front and rear curtain airbags
- 4.6 litres per 100km fuel consumption
- Cruise control
- Front fog lights
- Low rolling resistance 195/65 R15 tyres
- Climate control air conditioning

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Major Changes

2006 Civic VTi / 2006 Civic VTi-L vs. 2005 Civic GLi

Feature/Spec	2006	2005	Change
Vehicle Type	**Sedan**	Sedan	Same
Wheelbase (mm)	**2700**	2620	+ 80mm
Length (mm)	**4550**	4480	+ 70mm
Width (mm)	**1750**	1715	+ 35mm
Height (mm)	**1435**	1440	- 5mm
Engine	**1.8-litre i-VTEC SOHC**	1.7-litre SOHC	+ 0.1 L, + i-VTEC
Power (kW) @ rpm	**103 @ 6300**	88 @ 6200	+ 15kW, +100rpm
Torque (Nm) @ rpm	**174 @ 4200**	150 @ 4800	+ 24Nm, -600rpm
Transmissions	**5 MT or 5 AT**	5 MT or 4 AT	5 MT same, +1 gear AT
Weight (kgs)	**1210 Man** **1240 Auto**	1070 Man 1095 Auto	+ 140 + 145
Tyre Size	**195/65 R15**	185/70 R14	Plus 1 larger wheels & tyres
Fuel consumption (litres per 100km)	**6.9 Man** **7.2 Auto**	7.3 Man 7.5 Auto	- 0.4 litres per 100km - 0.3 litres per 100km

2006 Civic Sport vs. 2005 Civic GLi

Feature/Spec	2006	2005	Change
Vehicle Type	**Sedan**	Sedan	Same
Wheelbase (mm)	**2700**	2620	+ 80mm
Length (mm)	**4550**	4480	+ 70mm
Width (mm)	**1750**	1715	+ 35mm
Height (mm)	**1435**	1440	- 5mm
Engine	**2.0-litre i-VTEC DOHC**	1.7-litre SOHC	+ 0.3 L, + i-VTEC, +DOHC
Power (kW) @ rpm	**114 @ 6200**	88 @ 6200	+ 26 kW,
Torque (Nm) @ rpm	**188 @ 4200**	150 @ 4800	+ 38Nm, -500rpm
Transmissions	**5 MT or 5 AT**	5 MT or 4 AT	5 MT same, +1 gear AT
Weight (kgs)	**1290 Man** **1320 Auto**	1070 Man 1095 Auto	+ 220 kg + 225 kg
Tyre Size	**205/55 R16 V**	185/70 R14	Plus 2 larger wheels & tyres
Fuel consumption (litres per 100km)	**7.9 Man** **8.0 Auto**	7.3 Man 7.5 Auto	+ 0.6 litres per 100km + 0.5 litres per 100km

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Civic Hybrid Specifications: 2006 vs. 2005

Feature/Spec	2006	2005	Change
Vehicle Type	**Sedan**	Sedan	Same
Wheelbase (mm)	**2700**	2620	+ 80mm
Length (mm)	**4550**	4470	+ 80mm
Width (mm)	**1750**	1715	+ 35mm
Height (mm)	1430	1430	No change
Engine	**1.3-litre i-VTEC SOHC**	1.3-litre VTEC SOHC	+ i-VTEC
Power @ rpm (combined)	**85 @ 6000**	69 @ 5700	+ 16 kW
Torque (Nm) @ rpm (combined)	**170 @ 2500**	146 @ 2000	+ 24 @ + 500
Transmission	**CVT**	CVT	No change
Tyre Size	**195/65 R15**	185/70 R14	+ 1 inch, larger tyre
Fuel consumption (litres per 100km)	**4.6**	5.2	- 0.6
Weight	**1265**	1190	+ 75

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Technical

Drivetrain

Fast Facts:

- 2.0-litre DOHC i-VTEC (114kW & 188Nm) engine on Civic Sport
- 1.8-litre SOHC i-VTEC (103kW & 174Nm) engine on Civic VTi, Civic VTi-L
- 1.3-litre SOHC VTEC with i-DSI mated with an electric motor (85kW & 170Nm) engine on Civic Hybrid
- Choice between 5-speed automatic (a first for Civic) or 5-speed manual transmission on VTi, VTi-L and Sport
- CVT transmission for Hybrid
- Entire Civic range meets and is complied to Euro4 emissions standards

2.0-litre: Civic Sport

The Civic Sport is the performance flagship in the Civic range, powered by a new 2.0-litre DOHC i-VTEC engine that puts out 114kW - just 4kW less than the cult Civic VTi-R of the late 1990's.

However the Civic Sport takes line honours as the "gruntiest" Civic ever, with the 2.0-litre engine pumping out 188Nm at 4200rpm.

The Civic Sport incorporates a host of innovative design features to deliver a combination of performance, fuel efficiency, and low emissions. Most apparent is the i-VTEC "intelligent" valve-control system, a technology that combines VTC (Variable Timing Control) - which continuously adjusts camshaft phase-with Variable Valve Timing and Lift Electronic Control (VTEC) - which changes valve lift, timing, and duration. Combining these two systems results in impressive power and torque with good fuel economy and low exhaust emissions.

The Civic Sport engine is a double overhead cam (DOHC) all-aluminum, 2.0-litre inline four-cylinder design with 16 valves and a high-performance version of the i-VTEC system to deliver strong high-end power and low-to-middle range torque.

In keeping with Honda's proven commitment to the environment, the Civic Sport engine meets strict Low Emission Vehicle and Euro 4 emission standards. Engine, fuel tank and catalytic converter modifications made for 2006 have lowered evaporative emissions by 75 percent.

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Civic Sport: 2.0-litre i-VTEC

Honda's i-VTEC is an evolution of the innovative Variable Valve Timing and Lift Electronic Control (VTEC) system that made its debut on the NSX supercar in 1990. The i-VTEC system used on the Civic Sport is similar in design to the 2005 Integra luxury engine.

The "intelligent," i-VTEC system takes the concept of variable valve timing to new heights. The combination of VTEC and VTC provides a substantial performance increase across a broad power band while boosting fuel economy and reducing engine emissions.

Honda's VTEC system adjusts the lift and opening duration of the valves to maximise low-rpm torque and high-rpm power. At low rpm, VTEC adjusts valve timing and lift for optimum cylinder filling. The timing of the intake valves is staggered and their lift asymmetric - creating a swirl effect within the combustion chambers. The result is increased burn speed with improved combustion stability. As engine rpm builds, VTEC transitions to a high-lift, long-duration cam profile for improved high-rpm engine output.

Two roller arms are used per pair of intake valves. During low rpm operation, intake air is drawn almost exclusively through the primary intake valve, thereby creating a strong swirl effect to speed combustion. At higher rpm, the secondary rocker arm engages, causing both intake valves to open for the same lift and duration, substantially increasing airflow into the cylinder and boosting performance.

At low rpm, the valves follow low lift, short duration camshaft profiles to help boost low-end torque. At higher rpm, the intake and exhaust valves are operated by high-lift, long-duration cam profiles, for maximum high rpm horsepower.

When combined with VTC, both versions help the i-VTEC engine produce a broad and smooth power band with high torque and power.

VTC

Honda's combined VTEC and VTC provides continuously variable camshaft phasing across the engine's entire power band. As engine rpm builds, a VTC actuator - controlled by an engine-control unit (ECU) that monitors cam position, ignition timing, exhaust O2 and throttle position - advances or retards the intake cam to a maximum of 50 degrees, optimising engine output and reducing emissions.

The VTC actuator is built into the intake camshaft drive sprocket. The phasing of

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both sprockets is hydraulically controlled.

During operation, high-pressure oil flows from a spool valve through two separate passages into the first camshaft journal. From there, the oil travels through two passages in the centre of the camshaft, corresponding with the advance and retard chambers within the sprocket.

During typical operation, the intake camshaft timing is almost fully retarded at idle for more stable idling while reducing exhaust emissions (NOx). In the engine's normal operating range, the engine is controlled to achieve the best balance between high fuel efficiency and low emissions.

As revs increase, the intake camshaft is advanced, opening the intake valve sooner and providing additional valve overlap. This results in increased fuel economy by reducing pumping losses, and a further reduction in exhaust emissions by creating a large, internal exhaust gas re-circulation effect.

To generate additional power throughout the rev range, the intake camshaft also continuously varies the amount of advance or retard, instantly adjusting to provide additional power as required by the driver.

Cylinder Head

The Civic Sport engine uses an aluminium cylinder head and a double overhead cam, four-valve-per-cylinder valvetrain incorporating the new i-VTEC system. A generous "squish" area around the combustion chambers yields increased gas turbulence for faster flame propagation and increased efficiency. The camshafts are operated by a maintenance-free silent-chain drive for smoother performance.

Engine Block

The 2.0-litre engine features a compact aluminium block with cast-in iron liners - a design known for its light weight, high rigidity, and excellent durability. The block has a one-piece aluminium crankshaft carrier that has ferrous-carbon inserts in the bearing caps for additional strength.

Programmed Fuel Injection

The engine is equipped with a Programmed Fuel Injection (PGM-FI) system. The system monitors throttle position, engine temperature, intake-manifold pressure, atmospheric pressure, exhaust-gas oxygen content and intake-air temperature. It also controls fuel delivery by four newly developed, multi-holed injectors mounted in the cast-aluminium intake manifold. The ECU also tracks engine operation with position sensors on the crankshaft and both camshafts.

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Exhaust System

Standard on the Civic Sport is a stainless-steel, low heat-mass exhaust system.

The system employs a new high-density catalytic converter for improved light-off performance and reduced hydrocarbons and NOx. The new design also improves emissions performance by positioning the exhaust manifold at the rear of the engine. This shortens the distance the exhaust gases must travel to the catalytic converter, resulting in faster light-off and more complete conversion of all exhaust gases, including NMOG and NOx.

The exhaust system also incorporates an "e-shaped" dual-path pipe that improves exhaust flow for improved torque and lower emissions.

1.8-litre: Civic VTi, Civic VTi-L

The two 1.8-litre Civic sedan models both receive Honda's latest-generation i-VTEC engine that provides performance similar to a conventional 2.0-litre engine and fuel economy similar to a 1.5-litre engine - 103kW at 6300rpm and 174Nm at 4200rpm. Fuel consumption is only 6.9 litres per 100km with the manual transmission and 7.2 litres with the auto.

The engine is a Single Overhead Cam (SOHC) 1.8-litre inline four-cylinder design with 16 valves, a new version of i-VTEC, and a dual-stage intake manifold. The new i-VTEC design is certified as a Low Emissions Vehicle (LEV) and like all new Civic variants, meets Euro 4 emission standards.

The new engine offers significantly improved low rpm torque and top end power. The new 5-speed automatic transmission - a first for Civic - extracts this extra power to its fullest potential. Additional new Civic technology includes a drive-by-wire throttle control and a dual-stage air intake manifold.

High Rigidity Aluminum Block and Low Friction Engine Design

Compact, rigid, lightweight and low friction describes the end result of new engine technology that enables the new Civic to achieve high power and low fuel economy. Compared to its predecessor, the aluminum engine block is more compact, has a higher power-to-weight ratio, operates with less internal friction and creates less noise and vibration.

A narrow width cam chain, a chain case with a built-in oil pump and ferrous spin cast cylinder sleeves are used to make the engine approximately 13 mm shorter, allowing for greater packaging efficiency.

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To make the engine more rigid, extensive analysis was used to create reinforced areas in the aluminum block construction. Furthermore, a lightweight and super stiff steel crankshaft is used with a high balance ratio that also benefits from a lower block design with extremely high crank support rigidity. At the very bottom of the engine, an aluminum oil pan with integrated stiffeners further refines the rigidity. The high rigidity block design benefits low noise output and also provides the foundation for lower friction in the engine.

Low friction, a key component to producing more power, is achieved through the application of Molybdenum Di-Sulfide (MoS2) piston coatings and cylinder sleeve plateau honing. Plateau honing lowers the friction level between the pistons and the cylinders by creating an ultra smooth surface. Plateau honing is a two stage machining process that uses two grinding processes instead of the more conventional single honing process. This also enhances the long-term wear characteristics of the engine. A low friction ion plated piston ring further reduces friction. In addition low viscosity oil (10W-30) is used to reduce friction.

High Strength Connecting Rods

High strength connecting rods are used to minimise weight and size, while also increasing connecting rod rigidity and long term durability. A "cracked" connecting rod means that the rod and cap are forged as a complete unit during the manufacturing process, and then cracked apart to create a custom fit between the two matching surfaces. The use of high strength steel contributes to the connecting rod's slender shape and results in a 50 percent increase in fatigue resistance for a long lasting engine.

The design allows for the elimination of connecting rod bolt guides, since the connecting rod bolts can be precision machined to fit the cap to the rod. The end result is a connecting rod that is 13 percent lighter and has a 20 percent smaller cross section, resulting in less rotating mass inside the engine and less space occupied by the connecting rod - a significant component to creating a powerful, efficient and compact engine.

Civic: i-VTEC Valve Control System

To achieve more performance and improved fuel economy, the Civic's 1.8-litre i-VTEC engine uses an innovative and new valve control timing to minimise pumping losses during cruising and low engine load situations, an important factor in creating more efficient engines. Pumping losses are lowered when the variable valve timing allows an intake valve to remain open for a brief time period as the piston begins its

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compression stroke. By keeping an intake valve open during part of the compression stroke, some of the volume of unburned air/fuel mixture in the cylinder moves back inside the intake manifold, the Drive-by-Wire system closes the throttle and lowers the volume being compressed, or "pumped."

The pumping loss reduction yields enhanced fuel economy similar to an engine with a smaller displacement (the equivalent of a 1.5-litre engine) during cruising.

During cruising or other stable and low-load driving conditions, the new engine utilises a dedicated set of cams to close one of the intake valves and retard that valve's timing, exerting backpressure on the air-fuel mixture.

This reduces the actual intake air volume. Meanwhile, the throttle is opened wider to provide optimum control over engine output. Opening the throttle valve, in other words, widening the path that the air flows through - reduces pumping losses to result in a significant improvement in engine efficiency.

During high load situations, the VTEC system provides high output valve timing for maximum power. Gone is the normal valve timing, replaced by two fundamentally greater extremes.

A dual-stage air intake, a lightweight powertrain and optimised gearing further add to the performance character of the vehicle.

Whereas traditional VTEC operation changes valve opening duration based on higher oil pressure during high rpm operation at one side of the valvetrain's rocker arms, the Civic's i-VTEC system can switch valve timing duration at low rpm and low oil pressure using two hydraulic actuators on both sides of the intake rocker arm. This engagement method is similar to that used on the Civic Hybrid and Odyssey i-VTEC systems.

This Civic's i-VTEC valve timing reacts to driving conditions related to throttle opening, vehicle speed, engine rpm and gear selection. A sophisticated drive-by-wire throttle control, air flow meter and dual-stage air intake allow the Engine Control Unit (ECU) to create seamless transitions between the two modes of engine operation.

Civic: Lightweight Composite Intake Manifold Chamber

The engine's intake manifold chamber is constructed of composite resin instead of aluminum alloy in order to save weight. The individual pieces that make up the manifold chamber are permanently connected with a die-slide welding technique.

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Civic: Composite Resin Dual Stage Air Intake Manifold

A composite resin dual-stage intake manifold utilises two intake runners for each cylinder, one longer than the other. Below 5200 rpm, only the longer of the two runners delivers air to the cylinder-taking advantage of the inertia effect of the long intake path. Above 5200 rpm, however, a rotary valve in the bore of the short runner opens to redirect the air to the cylinder. This has the effect of boosting midrange and high-rpm power by utilising the inertia effect at both low and high rpm.

Civic: Drive-by-Wire Throttle Control

An electronic drive-by-wire system enhances the driving character of the Civic. With smart electronics connecting the throttle pedal to the throttle butterfly valve in the intake system, the engine response can be optimised to suit the driving conditions and to better match the driver's expectations. Combined with the dual stage air intake, the drive-by-wire throttle control system is an important component to the new i-VTEC system that makes switching between the low pumping loss mode and the high performance mode seamless to the driver. By eliminating the direct throttle cable connection to the engine, the ratio between pedal movement and throttle butterfly movement can be continuously optimised. This adjustable "gain" between throttle and engine is a significant step forward in driveability. A highly responsive DC motor moves the throttle butterfly position in the intake system to change actual throttle position. To establish the current driving conditions, the system monitors pedal position, throttle valve opening position, vehicle speed, engine speed, and engine vacuum. This information is then used to define the throttle control sensitivity.

The throttle system also works to improve the 5-speed automatic transmission's ability to make shifts faster and smoother. By coordinating the throttle opening with the transmission's shifting functions, engine power can be precisely tailored to the needs of the transmission at every point during the shifting process. That means less shift shock and delay, no matter the driving situation.

Civic: Exhaust System

The Civic is equipped with a stainless steel, low heat-mass exhaust system integrated into the cylinder head, eliminating the need for a separate exhaust manifold, contributing to the engine's compact design and light weight. The system employs a high-density catalytic converter for improved light-off performance and reduced hydrocarbons and NOx. For emissions performance, the exhaust manifold

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is positioned on the front of the engine-which shortens the distance that the exhaust gases must travel to the catalytic converter, resulting in faster light-off and more complete conversion of the exhaust gases.

Civic VTi, VTi-L: 5-Speed Manual Transmission

The 5-speed manual transmission has also been redesigned into a more lightweight and compact unit that minimises power-robbing rotating mass and adds a rotating select link for quick and direct gear changes. Additional features include a low friction design with single cone synchronisers in all gears and high capacity bearings throughout. From a performance standpoint, the new manual transmission has a higher torque capacity and a shorter, firmer and more direct shift feel.

Civic VTi, VTi-L: 5-Speed Automatic Transmission

The Civic Sedan is available with an electronically controlled 5-speed automatic transmission. This all-new transmission - a first for the Civic - improves on the previous 4-speed with a wider overall ratios to maximise acceleration in gears one through four and optimise fuel economy in its fifth gear. The computer controlled direct control transmission provides amazingly smooth shifts.

The direct control coupled with gear ratios that are matched to the engine's output help extract more power at just the right time to provide overall vehicle performance competitive to vehicles with 4-speed automatic transmissions and more horsepower.

The 5-speed automatic transmission uses a wide variety of technology that provides smoother shifting as well as reduced friction for enhanced efficiency. Those technologies include a low-friction clutch and a special super-thin torque converter. The thin torque converter results in a compact transmission unit. Other space saving measures include a double-row idle gear and a tightly packaged second-gear clutch.

To improve powertrain smoothness and reduce gear "hunting" on steep grades, the 5-speed automatic transmission is also equipped with a standard Grade Logic Control system. Using sensors that monitor throttle position, vehicle speed, and acceleration/deceleration and then comparing these inputs with a map stored in the transmission computer, the system is able to determine when the vehicle is on an incline and adjust the shift schedule for improved climbing power or downhill engine braking.

To maximise fuel economy while maintaining high levels of driveability, the 5-speed automatic transmission includes an active lockup torque converter. With the precise

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control afforded by a linear solenoid, the system expands the speed and throttle setting range in which lockup can be engaged.

1.3-litre Civic Hybrid

Honda's fourth-generation hybrid retains the space and utility of the previous Civic Hybrid and adds vast improvements in power and fuel economy.

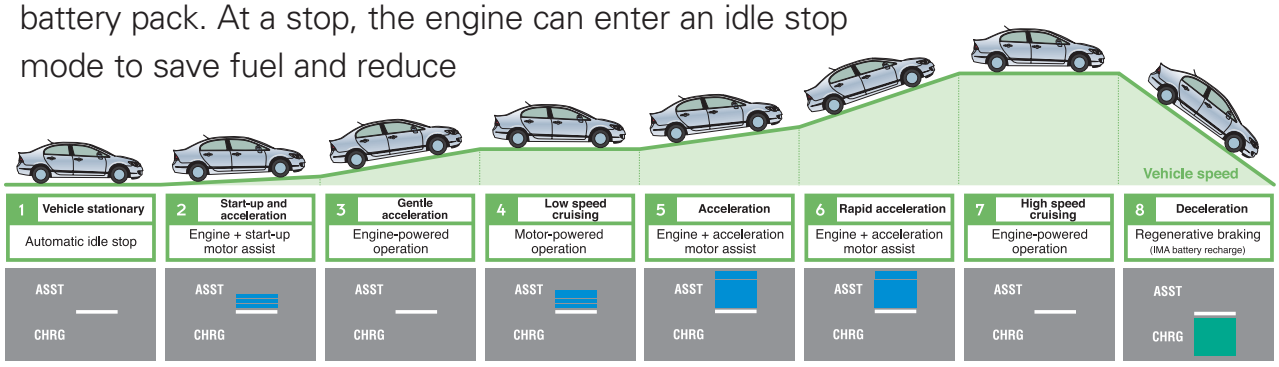
The Civic Hybrid combines a petrol-powered engine with a high power electric motor to boost power and cut fuel consumption and exhaust emissions. A Nickel-Metal Hydride (NiMH) battery pack is used to capture and store electricity for the electric motor.

A major new innovation is that the improved Integrated Motor Assist (IMA) system now allows the Civic Hybrid to drive on electric power alone, provided the vehicle is travelling at less than 40 km/h.

Thanks to a new-generation 1.3-litre VTEC petrol engine and IMA system the Civic Hybrid now has a combined output of 85kW and puts out 170Nm.

Despite the increase in power, the Civic Hybrid's fuel consumption drops to 4.6 litres per 100km, a saving of 0.6 litres per 100km over the previous model. The Civic Hybrid is the only vehicle in the Civic range to be equipped with a Continuously Variable Transmission (CVT) which keeps the IMA system operating at its peak efficiency.

During acceleration, the engine or the engine working in tandem with the electric motor propel the vehicle. During cruising, the petrol engine and/or the electric motor can propel the vehicle, depending on conditions. During braking, the petrol engine deactivates and the electric motor acts as a generator to replenish the battery pack. At a stop, the engine can enter an idle stop mode to save fuel and reduce



1. **Vehicle stationary (automatic idle stop*1 mode)**: Engine automatically stopped. Zero fuel consumption and zero exhaust emissions. Automatic Idle Stop warning lamp on. Engine automatically re-starts as driver releases brakes.
   *1 Under certain circumstances, the engine might not stop.
2. **Start-up and acceleration (engine + motor assist):** Engine running in low rpm mode. Motor assist provides necessary additional power to accelerate.
3. **Gentle acceleration (engine only):** Engine running in low rpm mode.
4. **Low speed cruise (motor assist only):** When cruising at around 40 km/h, all 4 cylinders are de-activated and fuel supply is stopped. The vehicle runs on power from the motor alone.
5. **Acceleration (engine + motor assist):** Engine running in low rpm mode. Motor assist provides necessary additional power to accelerate.
6. **Rapid acceleration (engine + motor assist):** As speed rises, engine switches to high rpm mode for higher power output. Motor assist provides additional power for strong, powerful acceleration.
7. **High speed cruise (engine only):** Engine running in low rpm mode.
8. **Deceleration (IMA battery recharge mode):** All 4 cylinders are de-activated and fuel supply is stopped. The motor switches to regenerative braking mode and energy recovery is maximized to recharge the IMA batteries.

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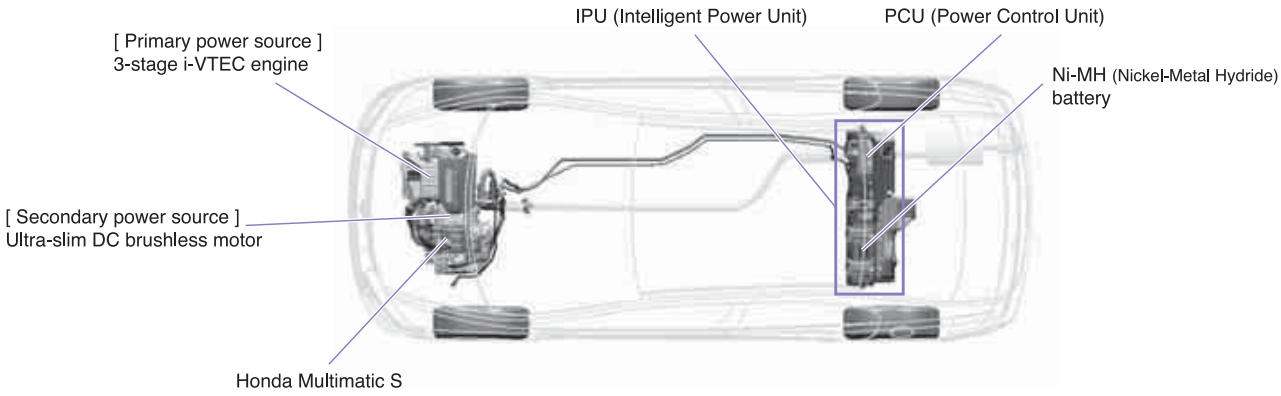
emissions, and the engine is turned off until the brake pedal is released.



Civic Hybrid: Engine Block Construction, Pistons and Connecting Rods

The aluminum engine block and its internal components create a lightweight package with extremely low friction qualities. To save weight, the block incorporates a thin sleeve construction. Friction reducing measures include plateau honing, low friction pistons, low tensile force piston rings and an offset cylinder bore.

Thin sleeve cylinder wall construction results in a reduction of the total amount of aluminum used in the engine for a lightweight engine block. Plateau honing lowers the friction level between the pistons and the cylinders by creating an ultra smooth surface. Plateau honing is a two stage machining process that uses two grinding processes instead of the more conventional single honing process. This also enhances the long-term wear characteristics of the engine.

Low friction pistons made of aluminum alloy are lightweight and have "micro-dimples" on the cylinder walls for improved lubrication. Offset cylinder bores help minimise friction by positioning the crankshaft axis in a more efficient alignment to the cylinder bore axis. This reduces friction caused by the side thrust of the pistons against the cylinder walls, just after top-dead-centre, as each piston begins its descent on the firing stroke.

Connecting rods are high strength forged steel units that have been treated with a special carbon process that hardens the surface and allows engineers to use a design that weighs less than a traditional connecting rod.

Civic Hybrid Cylinder Head: 3-Stage i-VTEC with Variable Cylinder Management (VCM)

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The Civic Hybrid uses a 3-Stage i-VTEC valve control system that provides normal valve timing, high output valve timing and cylinder idling functions to the benefit of low fuel consumption, high output and greater electrical regeneration capabilities. The previous generation system in the 2005 Civic Hybrid uses 2-stage VTEC that provides normal valve timing and 3-cylinder idling. The 3-stage system adds high output valve timing and 4-cylinder idling. The high output valve timing contributes to the engine's output increase of 9 percent, while the added cylinder deactivation reduces pumping losses by 66 percent to help improve electrical regeneration capability by 1.7 times.

The Civic Hybrid's single overhead camshaft (SOHC) cylinder head uses a compact chain drive and a compact, low friction VTEC system. It uses a common rocker shaft for both the intake and exhaust rocker arms. Placing all the rocker arms on one shaft eliminates the need for a second rocker-arm shaft, so the valve mechanism can be lighter and more compact. To reduce friction, the rocker arms have rollers built-in.

The compact valvetrain allows for a desirable narrow angle (30-degrees) between the intake and exhaust valves, which helps supply a more powerful direct charge into the cylinder chamber.

The narrow angle valvetrain also allows for a more compact combustion chamber. The intake ports create a swirl effect in the cylinder chamber that promote a well balanced and even air fuel mixture as it enters the engine. This optimises the air fuel mixture for a cleaner, more efficient combustion.

The new VCM (Variable Cylinder Management) system is an advanced form of the three-cylinder Cylinder Idling System used on the previous generation. VCM allows the regenerative braking system to reclaim as much energy as possible during deceleration, while also allowing the electric motor to propel the vehicle in certain steady cruising situations.

Since the electric motor, which also acts as an electric generator, is attached directly to the crankshaft of the engine, the engine needs to provide as little resistance as possible during deceleration to allow the generator to produce high levels of electricity and charge the batteries. In a traditional engine, the pumping action of the cylinders will actually provide a moderate amount of resistance, or "engine braking," during deceleration. VCM virtually eliminates that effect.

From a mechanical standpoint, the three stage VTEC switching capabilities are made possible by a rocker arm design with three hydraulic circuits that accommodates a) low rpm VTEC switching on each cylinder's intake and exhaust

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valve and b) high speed switching on the [intake] valve. Three oil passages inside the rocker shaft receive oil from an external spool valve (controlled by the ECU based mostly on throttle and rpm). The oil pressure from one of the three passages activates a combination of push pins inside the rocker arms for each of the intake and exhaust valves. By moving the pins, the intake valve rocker arms can follow one of two lobes on the camshaft (normal or high profile). Or, to deactivate the valves and leave them closed, the pins are pushed in a direction that allow part of the intake and exhaust rocker arms to move with the camshaft and not move the closed valves.

Civic Hybrid: Dual & Sequential Ignition with Twin Plug Sequential Ignition Control

The twin plug sequential ignition control is part of the i-VTEC system and helps facilitate an intense and rapid combustion process in the engine. The ignition control has eight ignition coils that are independently controlled according to a dynamic engine map program. The benefits are more power, less fuel consumption and reduced emissions. Honda's patented twin plug sequential control system is programmed to respond to engine rpm and load conditions. Since the system has eight individual ignition coils, it can manipulate the ignition timing of each iridium-tipped spark plug.

When the air/fuel mixture enters the combustion chamber, the first plug located near the intake port ignites. Shortly thereafter, the second plug located near the exhaust port ignites, accelerating the combustion process by forcing the flame to more rapidly propagate. The spark plugs can also ignite simultaneously under certain circumstances. This process results in a more complete combustion compared to a single plug system.

Civic Hybrid: Drive-by-Wire Throttle Control

An electronic drive-by-wire system enhances the driving character of the Civic Hybrid. With smart electronics connecting the throttle pedal to the throttle butterfly valve in the intake manifold, the engine response and IMA operation can be optimised to suit the driving conditions and to better match the driver's expectations. By eliminating the direct throttle cable connection to the engine, the ratio between pedal movement and throttle butterfly movement can be continuously optimised. This adjustable "gain" between throttle and engine is a significant step forward in driveability, which also allows for VCM to cut all cylinders and drive with the electric motor only during some cruising situations. A highly responsive DC motor moves the throttle butterfly position in the intake manifold to

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change actual throttle position. To establish the current driving conditions, the system monitors pedal position, throttle position, vehicle speed, engine speed, calculated road slope and engine vacuum. This information is then used to define the throttle control sensitivity.

Civic Hybrid: Programmed Fuel Injection (PGM-FI)

The Civic Hybrid is equipped with a Programmed Fuel Injection (PGM-FI) system. The system monitors throttle position, engine temperature, intake-manifold pressure, atmospheric pressure, exhaust-gas oxygen content, and intake-air temperature. It controls fuel delivery by multi-holed injectors mounted in the plastic intake manifold. The ECU also tracks the operation of the engine with position sensors on the crankshaft and camshaft.

Civic Hybrid: Lightweight Composite Resin Intake Manifold Chamber

Upstream from the aluminum intake manifold, the engine's intake manifold chamber is constructed of a composite resin instead of aluminum alloy in order to save weight. The individual pieces that make up the manifold chamber are permanently connected with a vibration welding technique.

Civic Hybrid: Hybrid Dual Scroll Air Conditioning Compressor

A dual scroll hybrid air conditioning system reduces the load on the gasoline engine by using a combination of engine power and an internal electric motor to drive two air conditioning compressors. These compressors can act independently or together as dictated by the cooling needs of the Civic Hybrid's automatic climate control system.

Under normal conditions, either of the two compressors cools the interior cabin individually depending upon cooling needs and the charge state of the IMA's battery pack. On warmer days, the 75cc engine-mounted compressor acts as the sole source of air-conditioning, while the 15cc motor-driven compressor is in action when the climate control is maintaining a steady temperature or the car is idle-stopped.

Under extreme ambient conditions, cooling is provided by the 75cc belt-driven compressor attached to the engine and the 15cc, 144V motor-driven by an internal electric motor. When the air conditioning system is forced to use both the petrol engine and electric motor, the Civic Hybrid's idle-stop feature is temporarily disabled until cooling needs are reduced.

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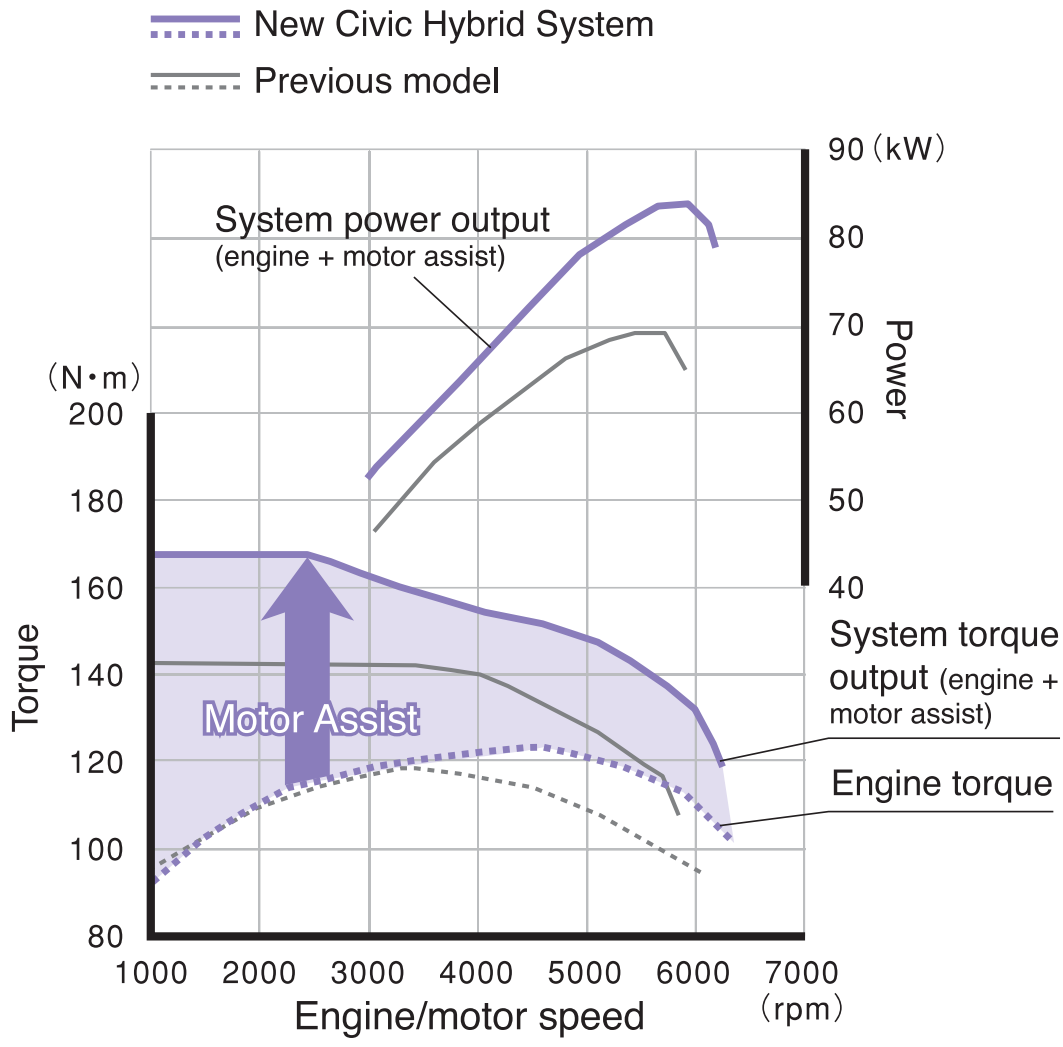
Civic Hybrid: Engine Mounts

A new torque rod damper system added to the subframe helps reduce rocking and isolate powertrain NVH from the passenger compartment. Engine mounts, one of which is hydraulic, and reinforcements in the engine compartment help further reduce engine noise and vibrations.

These features significantly reduce vibration and result in a more comfortable ride.

Civic Hybrid: IMA System

The 4th generation IMA system is the most powerful and most efficient to come out of Honda's hybrid development program. (1st generation: Insight; 2nd generation: Civic Hybrid; 3rd generation: Accord Hybrid.) As with previous versions, the IMA system consists of an ultra-thin DC brushless electric motor mounted between the petrol engine and the continuously variable transmission, and an Intelligent Power Unit (IPU) that stores electric power in a compact battery box and controls the flow of electricity to and from the electric motor.



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Civic Hybrid: IMA Electric Motor

Providing a supplemental power boost to the 1.3-litre 4-cylinder engine and giving the Civic Hybrid the capability to cruise on its electric motor in certain situations, the IMA's electric motor is designed to provide up to 20 horsepower (15 kW) and (89Nm) of additional torque to the Civic Hybrid's engine. Mounted between the engine and the CVT transmission, the IMA motor is an ultra-thin (70 mm) DC brushless design and provides a substantial amount of low-end torque to aid acceleration, while also assisting in steady-state cruising and hill climbing.

In addition to providing supplemental motive power, the IMA motor acts as a generator during deceleration and braking to recapture kinetic energy and recharge the IMA's battery pack during regenerative braking. For this fourth generation of IMA motor, a new internal permanent magnet was designed to increase output density and make the motor more efficient than previously. It also uses flat wire construction to increase wire density. The electric motor has increased output horsepower by 46 percent and maximum torque by 14 percent compared with the 2005 Civic Hybrid IMA motor. The electric motor is also more efficient, now converting 96 percent (versus 94.6 percent efficiency of the 2005 Civic Hybrid IMA motor) of the available electricity into motive energy in assist mode.

Civic Hybrid: IMA Intelligent Power Unit (IPU)

Power for the IMA system is controlled through the Civic Hybrid's Intelligent Power Unit. Located directly behind the rear seatback, the IPU consists of the Power Control Unit (PCU) - or the IMA's command centre, a rechargeable Nickel Metal-Hydride battery module, and an integrated cooling unit.

The Power Control Unit (PCU) electronically controls the flow of energy to and from the IMA's electric motor. Using the latest computer chip technology, the PCU's response time is quicker than the previous versions, and a new inverter and DC/DC Converter help contribute to the IMA's overall increase in power.

The battery pack stores electricity in a bank of Nickel Metal-Hydride cells. This bank of 132 1.2-volt units stores up to 158 volts of electrical energy for the IMA motor compared to 144 in previous versions. A new Panasonic dual module casing reduces weight from previous hybrid battery packs and also allows it to increase efficiency of the electrical flow. The 12 percent smaller battery pack provides more cargo space.

The Integrated Cooling Unit offsets the heat generated by the constant flow of electricity to and from the battery pack with an integrated cooling system mounted

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directly on the battery pack's outer box. Interior cabin air is continually flowed over the battery pack and re-circulated via a small vent placed on the rear seat shelf.

Civic Hybrid: Cooperative Regenerative Brake System

Hybrid-powered vehicles recapture kinetic energy via regenerative braking and store this energy as electricity in rechargeable battery packs. The Civic Hybrid is no different, as its IMA electric motor also acts as a generator that can recharge its battery pack during braking, steady cruising, gentle deceleration, or coasting.

New for 2006, a cooperative regenerative braking system debuts on the Civic Hybrid with the added capability to intelligently proportion braking power between the hydraulic brakes and the electric motor to extract even more electricity from the vehicle's kinetic energy. Less reliance on the traditional braking system and reduced engine pumping losses translate into greater electrical regeneration (170 percent more than the 2005 Civic Hybrid) and ultimately improved fuel economy.

When braking, a brake pedal sensor sends a signal to the vehicle's IMA computer (IPU). The computer activates a servo unit in the brake system's master cylinder that proportions braking power between the traditional hydraulic brakes and the electric motor to maximised regeneration. Previous versions of Honda's IMA systems proportioned braking power at a pre-set rate below the maximum regeneration threshold and with no variable proportioning.

Civic Hybrid: Continuously Variable Transmission

Honda's Continuously Variable Transmission (CVT) is standard equipment on the Civic Hybrid and provides a 9 percent wider range between the maximum and minimum gear ratios to enhance acceleration and minimise engine rpm at high speeds. The transmission provides smooth and predictable transitions and helps keep the IMA system operating at its peak efficiency.

Unlike a conventional transmission with four of five gears that change the final drive ratio in steps, a CVT uses a steel belt and a variable pulley to infinitely change the final drive ratio between a minimum and maximum setting. The variable pulley with its angled internal sides moves in and out by hydraulic pressure to expand or reduce the radius travelled by the steel belt.

Improvements to the new CVT include:

- 9 percent wider ratio range of 2.52 - 0.421:1 (previously 2.36 - 0.407:1)
- Final drive ratio of 4.94:1 (previously 5.58:1)
- Expanded pulley axial distance from 143 mm to 156 mm

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- Expanded pulley ratio range to 6.0 mm from 5.8 mm
- Double hydraulic piston used on variable pulley increases pressure by 170 percent
- Improved low friction construction for overall efficiency increase
- Torque handling capacity increases by 18 percent

Overall, a CVT provides a greater fuel economy benefit than a conventional automatic transmission with gears. It helps the engine stay in its most efficient operating range for both performance and economy, and the need to shift gears is eliminated.

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Body Style and Dimensions

Fast Facts:

- All-new body shape.
- Lower, longer, wider and sleeker than out-going model.
- Clever interior packaging for more useable space.
- Incorporates Honda's G-CON crash protection technology.

Body Styling

The new Civic is longer, lower and more aerodynamic than the outgoing four door Civic sedan. The car's low and wide stance creates a significantly more aggressive and sporty look than the previous model.

On the inside, Honda stylists and engineers focused on refinement to create a high-quality, spacious and versatile interior with the latest technology, expanded storage and innovative ergonomics.

The "MultiPlex meter" instrument panel positions priority gauges like the speedometer, temperature and fuel up high in the driver's field of vision. The increased body width allows wider and more supportive seats, and a spacious "Super Utility" centre console accommodates up to 27 compact discs and features an armrest.

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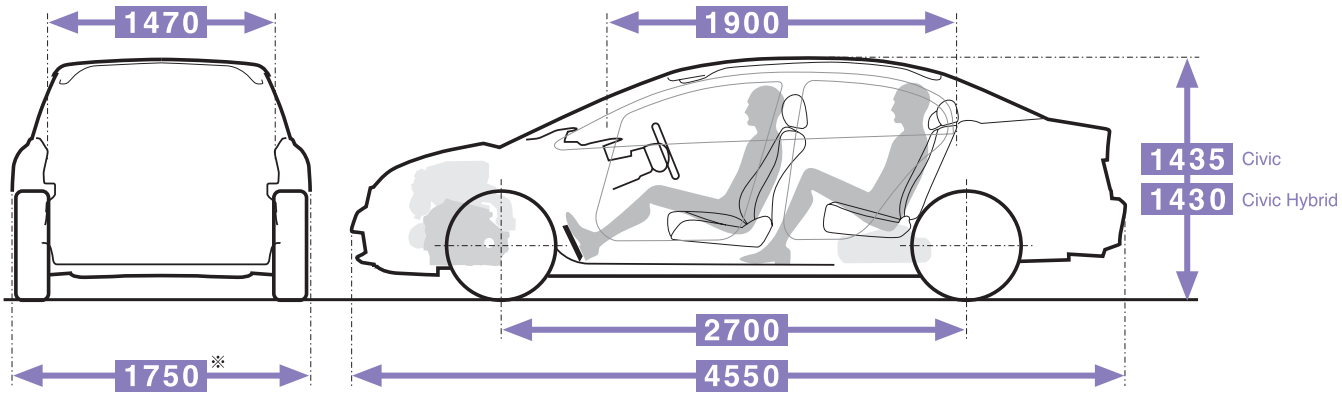
Key interior dimensions on the sedan remain similar to the generous proportions of the 2005 model, with improvements in hip room and shoulder room due to its smart packaging and careful attention to detail.

Dimensions

Compared to its four-door sedan predecessor, the Civic has grown to 4550 mm in overall length (+70 mm) and 1750 mm in width (+35 mm), while the overall height of the VTi, VTI-L and Sport has been reduced to 1435 mm (-5 mm).



mm
* Vehicle equipped with door mirror turn signals (1755 mm for vehicles without door mirror turn signals-equipped vehicle

To boost aerodynamic performance and thus increase fuel economy, the Civic Hybrid retains it's already low height of 1430 mm (no change). Combined with a rear boot spoiler and the improvements to the floor under-cover and front and rear strakes under the vehicle, the Civic Hybrid's Cd figure is now 0.27, down from 0.28.

Its 2700 mm wheelbase is 8.0 cm longer, while the rear overhang is 7.75 cm shorter and the front overhang is 4.5 cm longer. The front track is 2.75 cm wider and the rear track is 5.5 cm wider.

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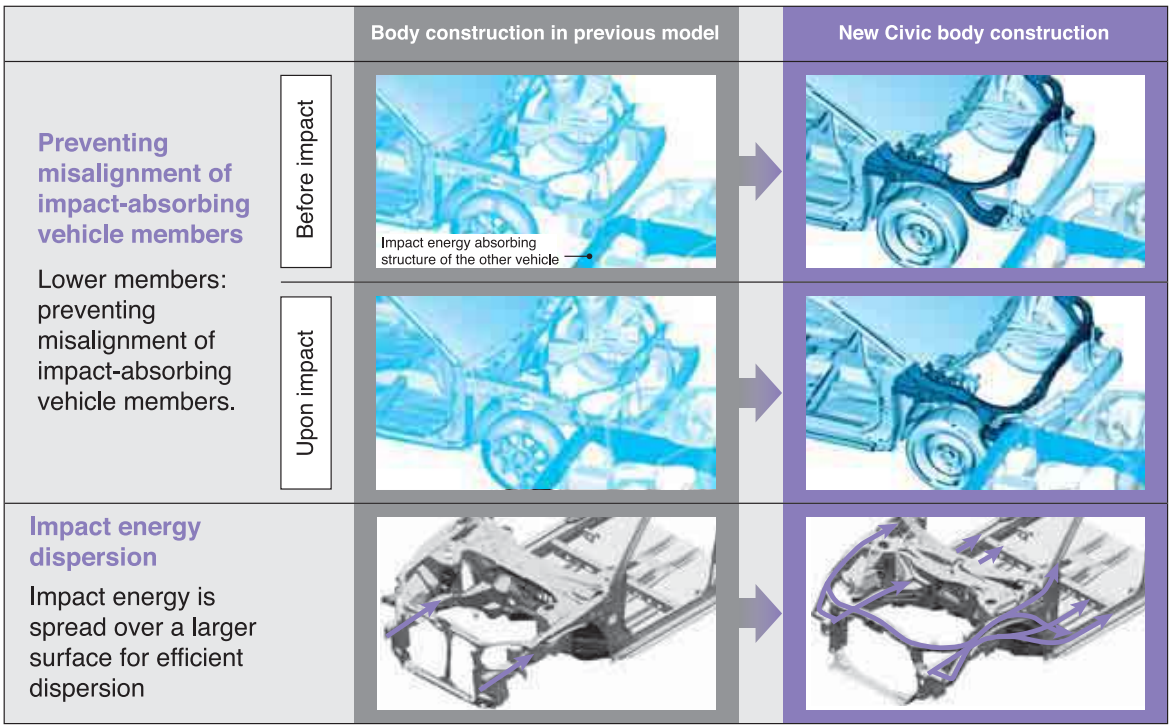
Next Generation Global Compact Platform

The Civic is built on an all-new version of Honda's Global Compact Platform. The solid unit body of the Civic was designed from the outset to define a new standard for torsional and bending rigidity in its segment. The new Global Compact Platform implements advanced body construction technologies for enhanced safety, better rigidity, improved ride comfort and a quieter cabin. Advanced new structural engineering and manufacturing methods utilising 50 percent high-strength steel despite the fact the wheelbase and width have grown. The body structure, including the important mid-floor cross members and floor gussets, are also made of high-grade high-strength steel. The longer wheelbase serves to improve its ride as well as increase its stability during straight-line running, as well as when braking and turning.

The Civic features 4-wheel independent suspension that, for 2006, has been completely reengineered to provide more agile handling and refined ride comfort. Up front, the Civic features a compact Control-Link MacPherson Strut suspension for superior handling, ride and packaging. The Control-Link MacPherson Strut design delivers quick, responsive handling by helping to maximised each front tyre's contact with the road throughout the range of suspension travel. In the rear, the Civic is equipped with a double-wishbone multi-link suspension that helps provide a smooth ride, excellent handling, and good cargo space.

Body construction incorporates Honda's GCON (G-Force Control Technology) that enhances frontal collision energy management through a network of load bearing structures in the front of the vehicle. This newly developed front-end frame



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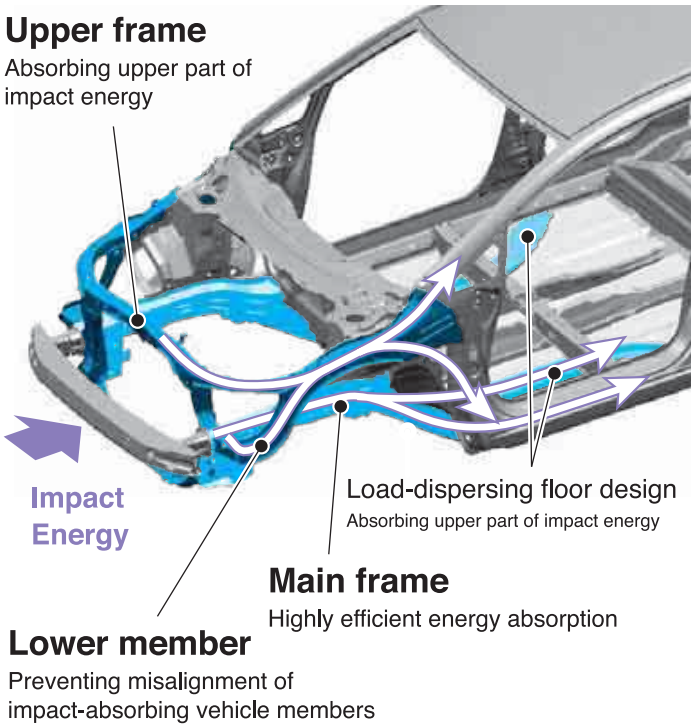
structure incorporates new upper and lower frame members to significantly enhance energy dispersion in a frontal collision throughout the upper and lower load bearing channels in the body.

The concept differs from traditional crash designs that guide a high percentage of collision force through a vehicle's two lower channels in a collision. The design with its polygonal front structure helps reduce the potential for misalignment with the frame of the opposing vehicle. Taken together, these features are designed to increase compatibility between vehicles of different size categories for enhanced occupant protection in the event of a collision.



The Civic's body structure is configured for high energy absorption. In the event of a frontal collision, the body structure with its front-mounted polygonal main frame is designed to prevent structural penetration while distributing forces evenly through multiple major load bearing pathways - and away from the passenger compartment. For comparison, a conventional body structure generally concentrates the loads from a collision through two pathways running longitudinally through the lower portion of the frame. In the body structure for example, frontal impact force can be distributed from the front of the vehicle through the side sill, floor frame and A-pillar in order to reduce the cabin deformation.

The bottom line is that the body structure enhances energy distribution during a collision because impact forces can be distributed through more vehicle mass and away from the passenger compartment.

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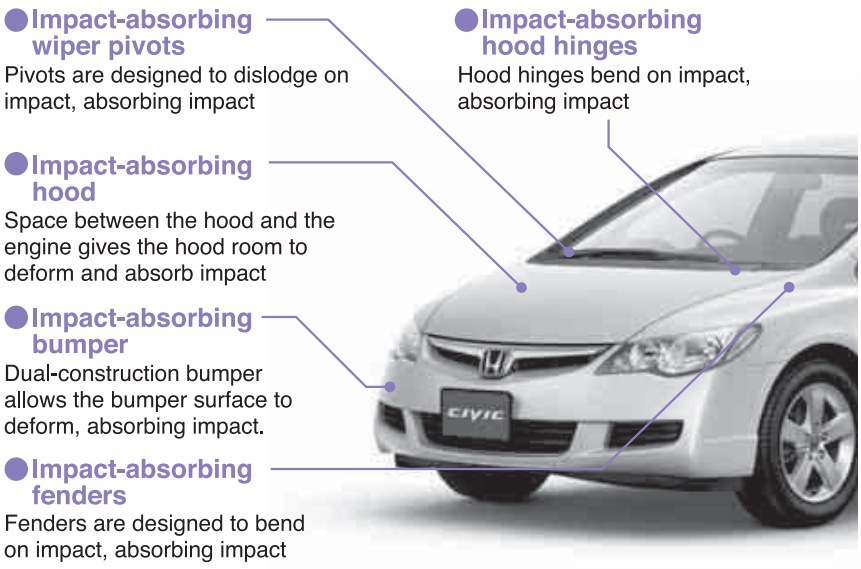
For side impacts, all models incorporate a new design high-grade, high-strength steel body side frame structure.

Door Construction

All Civic doors feature side impact protection beams. For quality, the doors are built on a robust structure that provides a solid feel and sound when closing. The door latches themselves are carefully engineered to latch securely with a light closing pressure, and to emit a quality sound. Additionally, the Civic's front doors use triple-stage stopper construction for ease of ingress/egress in tight parking situations.

Pedestrian Safety

Honda's commitment to safety extends to pedestrians as well as vehicle occupants. To help reduce pedestrian injuries in the event of a collision, the Civic's bonnet and bumper areas are designed to deform in the event of an accident involving an adult or child pedestrian. Energy-absorbing collapsible bonnet supports, wiper arm pivots and bumper mounts are designed to allow substantial deformation in an impact.



Front Subframe

To maximise gains derived from its stronger body, the front subframe of the new Civic has structural enhancements that improve ride and handling characteristics, while reducing noise and vibration. The front subframe is a completely new design with hydro-formed elements that substantially increase both strength and rigidity. Hydro-forming is the state-of-the-art method of creating complex shapes from steel. To make Civic's major subframe components, hydraulic water pressure forces the

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steel tube into rigid dies (moulds) under tremendous pressure. The result is a precisely made part that is stronger where necessary and precisely the right size and shape. The subframe is attached to the Civic's body using special rubber floating mounts that minimise the level of road and engine noise and vibration transferred to the passenger compartment.

Aerodynamics

The Civic conveys an aerodynamic presence on the surface, but many aerodynamic improvements exist in areas that may not be obvious. All models feature a chin spoiler and multiple undercovers that reduce air turbulence near the engine, rear wheels and rear bumper.

The Civic's airflow has been improved to a coefficient of drag (Cd) figure of 0.31 (Hybrid Cd 0.27) thanks to the design of items such as the A pillar, side mirrors, wiper layout and the use of underfloor pans which have all been designed to minimise air turbulence. These designs result in improved fuel economy and less wind noise. Other measures contributing to reduce wind noise levels include dramatically reducing the width of body seams, mounting glass flush with the surrounding body panels, and using double seals around all doors.

As a result of the steeply raked windscreen and its significant surface area, opposable windscreen wipers are used to cover more surface area than conventional wipers while the blade bodies feature a flat design that makes the air flow push the wiper blades firmly against the glass.

The Civic Hybrid has a lip spoiler on the boot lid that cleans up the airflow behind the vehicle for better fuel economy. It also has additional engine and front floor undercovers for even cleaner aerodynamics (Cd 0.27).

Rear Flat Floor

An integral part of all Civic models is its unique rear flat floor. Normally rear flat floor reduces rigidity (because a flat sheet flexes more readily than a formed one). To overcome this, the Civic has a "tunnel side frame" with a large, flat cross section instead of a typical tunnel structure. This improves torsional rigidity and makes the body stronger.

Spacious Boot

The boot of the sedan is big enough to accommodate a broad variety of items including four golf bags, a 19-inch mountain bike (with the rear seat folded), a 3-piece luggage set, or a full size wheel chair.

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The boot capacity of the Civic Sedan is 376 litres, with a wider aperture to allow easier loading and unloading of bulky items. There is also a rear seat fold down lever in the boot to make loading longer items easier.

The boot now features a rigid and fully hinged spare tyre cover with a laminated mat surface, and a moulded tyre spacer with integrated storage for small items. Additionally, Civic Hybrid features lining and covers on the boot hinges.

Tight Tolerances

Honda vehicles have long been synonymous with outstanding fit and finish. This attention to detail is evident in the body panel fit accuracy that produces significant reductions in the sizes of gaps between body panels and interior components. The entire Civic lineup features what is known as a "zero" gap for the front and rear bumpers, or less than a single millimetre. This gives the bumpers a more integrated appearance, yet keeps collision costs to a minimum by isolating various body components so fewer components require replacing in the event of an accident.

Noise and Vibration Dampening

Significant effort to reduce interior noise and vibration has been put into the Civic platform. The Civic offers low levels of passenger compartment engine noise during acceleration. This is due in part to the high levels of torsional rigidity of the Civic platform and the application of high-energy noise and vibration absorption materials.

The Civic utilises "melt sheets" on the floor, around the tunnel, and around the spare tyre in the boot. This asphalt insulation material is literally "melted" into place on the floor to ensure a precise fit and to help reduce interior noise.

- Rubber-backed floor mat insulators help stop road noise before it reaches the interior.
- A dashboard insulator reduces engine noise in the interior.
- Urethane foam is applied inside the pillars to fill the gaps and reduce the amount of noise transmitted to the interior.
- The doors now have two seals for reduced noise intrusion.

Exterior Lighting

The Civic headlight design uses sharp and wide dual halogen bulbs. The bulb assemblies feature a clear one piece outer lens that wraps around the vehicle's front corners with the turn signals housed inside. The round inboard lamps provide

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high beam illumination, while the outboard lamps are for normal driving. The halogen headlights offer class-leading performance, casting a beam wide and far, while also providing brighter illumination of objects in closer proximity, than any other Civic before it.

The sedan's rear taillights feature a reflective inner-cube design as the background pattern during illumination. The lenses are solid red for brake lights, with a clear outer lens for turn signals. A large back-up-lamp reflector provides extra illumination when in reverse. Civic Hybrid and Civic Sport models also feature turn signal lamps integrated into the side-view mirrors.

Available Colours

The Civic range features 11 exterior colours (Taffeta White, Alabaster Silver Metallic, Silver Moss Metallic, Nighthawk Black Pearl, Neutron Blue Metallic, Sparkle Gray Pearl, Bright Red Pearl, Bluish Silver Metallic, Misty Violet Pearl, Royal Ruby Red Pearl, Shoreline Mist Metallic), and 3 interior colours (Grey, Ivory, Blue) in the following combinations:

Colours

	VTi	VTi-L	Sport	Hybrid
Exterior	**Interior**	**Interior**	**Interior**	**Interior**
Taffeta White	Grey	Grey	Grey	Ivory
Alabaster Silver Metallic	Grey	Grey	Grey	Ivory
Silver Moss Metallic	Grey	Grey	Blue	-
Nighthawk Black Pearl	Grey	Grey	Grey	-
Neutron Blue Metallic	-	-	-	Ivory
Sparkle Gray Pearl	-	-	-	Ivory
Bright Red Pearl	-	-	-	Ivory
Bluish Silver Metallic	Grey	Grey	Blue	-
Misty Violet Pearl	-	-	Grey	-
Royal Ruby Red Pearl	Grey	Grey	Grey	-
Shoreline Mist Metallic	-	-	-	Ivory

Opposable Windscreen Wipers

The Civic windscreen wiper system uses an innovative outboard-mounted opposable wiper design that maximises blade coverage and visibility on the windscreen created by the sleekly angled vehicle profile. Each wiper uses a flat blade design for improved wiping capabilities in rain and freezing weather, and the

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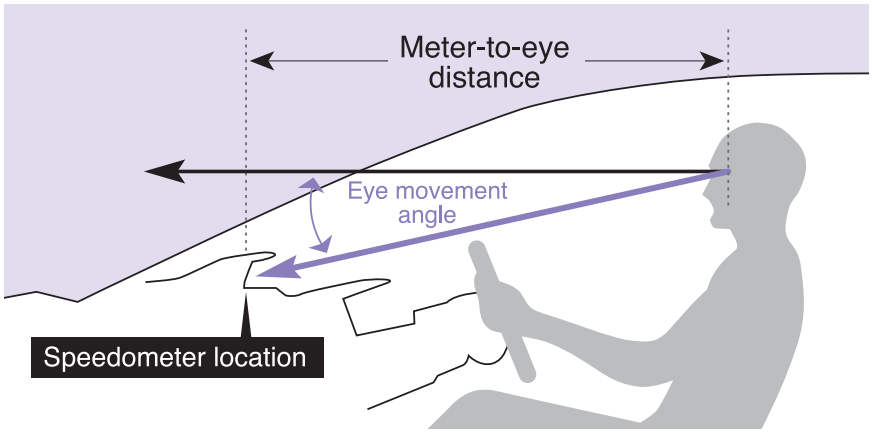
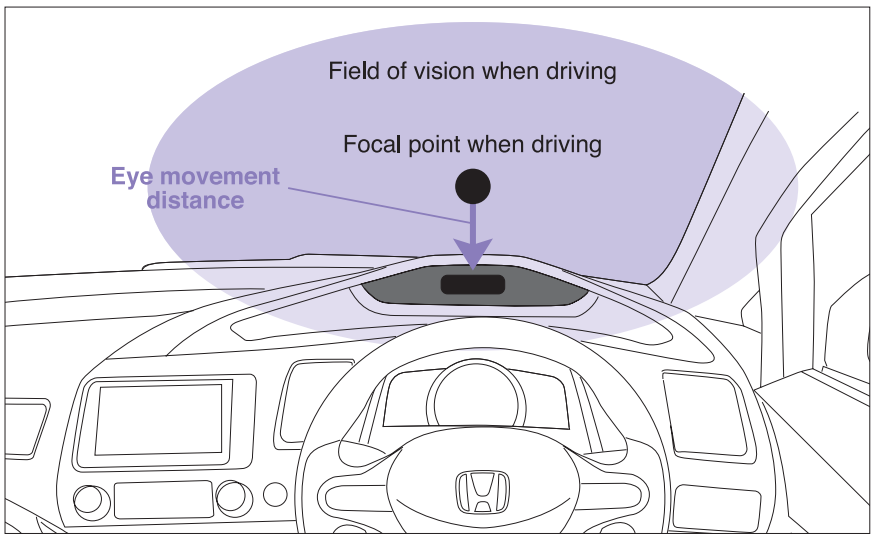
arm shape is aerodynamically configured to provide good blade downforce at high speeds. The superior flat blade construction features long lasting durability, yet is also easy to service with a rubber insert that requires no special tools or high cost items to replace. Another benefit includes a clean appearance from inside the vehicle with the wiper profile neatly conforming to the base of the windscreen.

"Multiplex" Meter Concept

Honda researchers conducted several studies that tracked the eye movements of drivers and prioritised the Civic's gauges and their placement for quick recognition time. Based on this research, a two-tier instrument panel was devised that also takes advantage of the generous dashboard space from the steeply raked windscreen.



- Reduced focal point differential for easier focus adjustment
- Reduced eye movement for quick, easy reading



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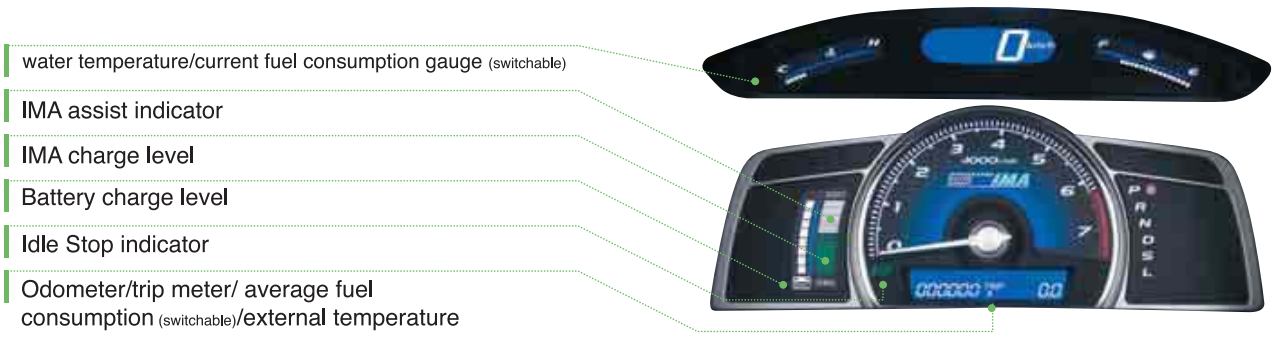
A digital speedometer, fuel gauge and engine temperature gauge are housed in the upper level to be more in-line with the driver's line-of-sight, resulting in shorter eye movements between the most commonly referenced gauges and the road. A digital readout on the speedometer was chosen to further enhance the cognition times during meter viewing. The lower level of the instrument panel houses a tachometer, odometer with trip meter and a variety of warning indicators. On vehicles with an automatic transmission, the gear selector position is also displayed. Instrument panel illumination on all models use blue colour scheme with white backlit buttons.

The Civic Hybrid incorporates unique instrumentation that can display instantaneous fuel economy in the upper level of the instrument panel. The lower level displays battery charge level along with instantaneous IMA "charge" and "assist" displays, and "AUTO STOP" to indicate when the engine is in idle stop mode. The odometer will also display average fuel economy for Trip A and Trip B.



Steering Wheel

The steering wheel on the Civic is a smaller diameter (360 mm) that accents the vehicle's quick ratio steering and is the same size as that used in the Honda S2000. All models feature manual tilt and telescope steering wheel adjustment in order to better accommodate drivers of various sizes and the Civic Sport and Civic Hybrid have audio controls on the left side of the steering wheel for volume and channel selection. Cruise control buttons are located on the right side of the steering wheel. The steering wheel is a three spoke design with the Civic Sport steering wheels wrapped in leather.

Front Seats

The front seats of the Civic have been completely redesigned with wider (+2 cm) and more supportive seat construction thanks to progressively tuned foam bolsters. The driving position has been optimised in relation to the steering wheel and

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vehicle controls. An innovative front seat active head restraint system enhances the seat's ability to minimise the potential for a neck injury in the event of a rear collision.

The driver's seat features a ratchet-style manual height adjustment control with 5 cm of travel.

Seat construction integrates several new technologies. High strength steel now comprises the majority of the seats internal steel framework. Composite components are used in the base and the seatback to minimise weight and proactively influence seat cushion feedback. The foam cushions employ various densities in the bolsters compared to other areas in the seat to provide the right level of comfort (softness) and support (firmness) in all the right places. The Civic Hybrid also has open front headrests.

Rear Seats

The rear seats provide generous seating surfaces that are both comfortable and functional. To increase storage space, the seats can be folded down (except Civic Hybrid) to extend the boot's storage space and accommodate long, bulky items like a snowboard, a 19-inch mountain bike or moving boxes.

The Civic VTi models features a one-piece folding rear seat. Civic VTi-L and Sport models feature a 60/40 split folding rear seat for enhanced people/cargo functionality. A boot-mounted handle allows the seat to be folded more conveniently. The interior has a flat floor, eliminating the typical tunnel that runs the length of the interior. This is most noticeable in the back seat as the flat floor design provides considerably more foot room for middle passengers.

Centre Storage Console with Armrest and Cup Holders

A generous centre storage console with a large sliding armrest (similar to Euro) offers greater storage functionality. Even when extended forward its full 8 centimetres, the armrest still provides enough clearance for the cupholder to accommodate a large-size cups.

The gearshift lever is positioned centrally and within easy reach, and its compact size allows for thoughtful packaging of additional features on the console such as a storage tray in front of and behind the shifter (with room for mobile phones) and a business card holder on the right side. The instrument panel provides multiple storage zones - a spacious glove box, a centre stack lower pocket/tray. Additionally, every door on the sedan has a large pocket ideal for maps and papers.

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Civic Hybrid: Automatic Climate Control

The Civic Hybrid is equipped with a standard high-efficiency automatic climate control system that delivers year-round comfort and ease-of-use. Operated by two large easy-to-use dials, this integrated system delivers good cool-down performance. The system has an "Automatic" mode that varies fan power, air distribution and automatically controls the temperature inside the vehicle according to sensor readings inside and outside. The climate control integrates with the hybrid dual-scroll A/C compressor that enhances economical operation when the air conditioner is used.

Manual Climate Control

The Civic range has air conditioning as standard equipment. The climate controls on the Civic are mounted centrally on the instrument panel for easy accessibility and feature rotary knobs for temperature settings and fan control (7-speeds), replacing the rotary dials in the out-going model. A new feature for 2006 is the addition of push button selection for directing air through the various vents inside the vehicle, i.e. defrost, heater, split level, etc. The new controls simplify mode selection. The high capacity condenser with integral receiver drier runs the liquid refrigerant through a sub-cooling condenser, after the main condenser. The system is efficient and lightweight compared to traditional setups.

Interior Lighting and Progressive Illumination

The Civic's new instrument system uses progressive illumination similar to Accord Euro. When the door is opened, the instrument brightness clicks on at 20 percent and when the key is put in the ignition, the illumination ramps up to 100 percent in one second. When the ignition is turned on, the illuminated instrument needles and annunciator lights come on, indicating the status of all systems

Audio Systems

All audio units feature Speed Sensitive Volume Control (SVC) that automatically adjusts the volume based on vehicle speed and feature CD/MP3 players as standard. Civic Sport and Civic Hybrid models have steering wheel-mounted audio controls. The Civic VTi-L, Sport and Hybrid gain a six in-dash CD stacker.

Power Windows and Locks

All Civic models receive power windows as standard equipment, including auto up and down operation on the driver's window. The driver's side door features a lock-

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out button to disable power window switches on the three passenger door to prevent use by children.

Keyless Entry System

Keyless entry is standard equipment on all Civic models. The wave key design has an integrated transmitter in the handle with the familiar lock and unlock buttons.

Engine Immobiliser

Complementing the keyless entry system is an improved engine-immobiliser system. A special electronically coded key prevents the car from being started - even if a mechanical duplicate of the key is used. A transponder, built into the key, signals the immobiliser control unit that the key is genuine. If the car is hot-wired, or an unauthorised key is used, the engine will not start.

12V DC Accessory Outlets

All Civic models have a 12V DC accessory outlet and cigarette lighter located on the lower portion of the instrument panel's centre stack for recharging mobile phones, powering personal media players, etc.

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Safety Technology

Fast Facts:

- Front driver and passenger airbags standard for all models
- Front driver and passenger side airbags standard on Civic VTi-L, Sport and Hybrid
- Front and rear curtain airbags standard on Civic Sport and Civic Hybrid
- Anti Lock Brakes (ABS) with a new version of the Electronic Brake force Distribution technology standard on all models
- Full 3-point seatbelts in all seating positions standard on all models
- Incorporates Honda's G-CON crash protection technology
- Front seatbelt pretensioners
- Five head rests

Overview

Occupant and pedestrian safety is a high priority at Honda. Designing motor vehicles that minimise the effects of an accident on occupants and pedestrians alike and to assist the driver to avoid an accident in the first place is a serious design goal. With this objective in mind, Honda takes occupant and pedestrian protection to a new level in the Civic range.

Honda designs and engineers its safety equipment from the ground up to be specifically tailored for each vehicle application. By keeping the design and engineering of advanced safety equipment in-house, this allows for the highest standards to be maintained and minimises the potential for compromises that can come from applying generic safety systems, such as airbags designed for multiple vehicle platforms and supplied by an outside supplier. Few manufacturers dedicate the resources to developing solutions not only meeting safety regulations, but also addressing real world safety concerns to the extent that Honda does. While the number and type of airbags on a vehicle can certainly influence safety, a more complete picture of safety performance includes how those airbags are designed to work with the vehicle, how they deploy and how they interact with the occupants.

Advanced Dual-Stage, Dual-Threshold Front Driver's and Front Passenger's Airbags

The Civic is equipped with dual-stage, dual-threshold supplemental restraint system (i-SRS) airbags for the driver and front passenger. These airbags are designed to

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minimise the potential for airbag injury while providing head and chest protection for the occupants in the event of a frontal collision.

The driver's airbag is located in the steering wheel hub and the passenger's airbag is located on top of the dash. As in all Honda vehicles, the front passenger's airbag is designed to deploy upward toward the windshield and then back toward the occupant. This provides a large cushion to help protect the front passenger while reducing the likelihood of injury resulting from airbag deployment.

Driver's Front Side Airbag and Front Passenger's Side Airbag with Occupant Position Detection System (Civic VTi-L, Sport, Hybrid)

Like many other Honda models, the Civic VTi-L, Sport and Hybrid models are equipped with front seat-mounted side airbags to help safeguard the driver and front passenger from side-impact injury.

An innovative occupant position detection system (first seen on the MDX) is used to ensure that the passenger's side airbag has a clear path for deployment. In the event a child (or a small-statured adult) leans into the deployment path of the side airbag, a seven-segment "antenna" system built within the backrest signals this condition to an electronic control unit (ECU) also located within the seat. The ECU then deactivates the side air bag from functioning and triggers the side airbag off indicator light in the instrument cluster. After the front occupant returns to a normal seating position, the side air bag module automatically resumes full-functional status.

Curtain Airbags (Civic Sport, Hybrid)

The front and rear seats are protected by Honda's Curtain Airbag system, which is standard equipment on the Civic Sport and Hybrid models. The side curtain airbags deploy from modules in the roof in the event of a sufficient side impact, providing a significant level of head protection in the window area.

The curtain airbag system utilises sensors located in the side of the vehicle to determine the most appropriate timing and rate of deployment of the airbags in the event of a side impact.

Seatbelts

As part of the effort to achieve the high levels of occupant safety, the Civic features dual seat belt pre-tensioners on both front seat belts. Typically, a pre-tensioner is

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used to pull the shoulder belt tightly in the event of a collision. In addition to the shoulder belt pre-tensioner, an inner buckle lap belt pre-tensioner is used for both front seats. Accordingly, in an accident, both the shoulder portion and the lap portion of the belt are pulled tightly, firmly securing the occupant in the seat. The Civic has had this feature since 2001 and was one of the first vehicles in the world to implement dual pre-tensioners on the front seatbelts. The front seat belts provide adjustable shoulder anchors and load limiters. A seat belt reminder system detects when the driver is not using a seat belt and prompts the driver with both audible and visual warnings.

All rear seating positions feature three point seatbelts.

Child Safety Seat Anchors

All Civic models have three child safety seat anchor points.

Braking System with Advanced Logic 4-Channel Anti-Lock Braking System (ABS)

All Civics are equipped with a new 4-channel ABS with Electronic Brake Distribution (EBD). A new rear right/left independent Electronic Brake Distribution is used in conjunction with the ABS to maintain vehicle stability and help prevent rear end steer in emergency braking.

The 4-channel ABS with EBD independently modulates braking power at each wheel, as opposed to the more common 3-channel system that modulates the front wheels independently and the rear wheels with equal braking force. The new 4-channel capability allows the rear wheels to react independently while cornering, representing a significant enhancement to the ABS system's ability to influence vehicle stability and safety. Electronic Brake Distribution proportions brake power to the rear wheels based on vehicle weight distribution. Further additions to the braking system include a new ABS control module (that applies the new 4-channel features) and a large power brake booster that improves pedal feel. Higher pedal rigidity with a decreased pedal stroke provides a more immediate braking response. Bottom line, the Civic stops with greater authority and added control.

Front and Rear Brakes

Four wheel disc brakes are used on the Civic VTi, VTi-L and Sport models; rear drum brakes are used on Hybrid model.

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The brake sizes for the Civic models are:

	Front (mm)	Rear (mm)
Civic VTi	282	260
Civic VTi-L	282	260
Civic Sport	282	260
Civic Hybrid	262	220 (drum)

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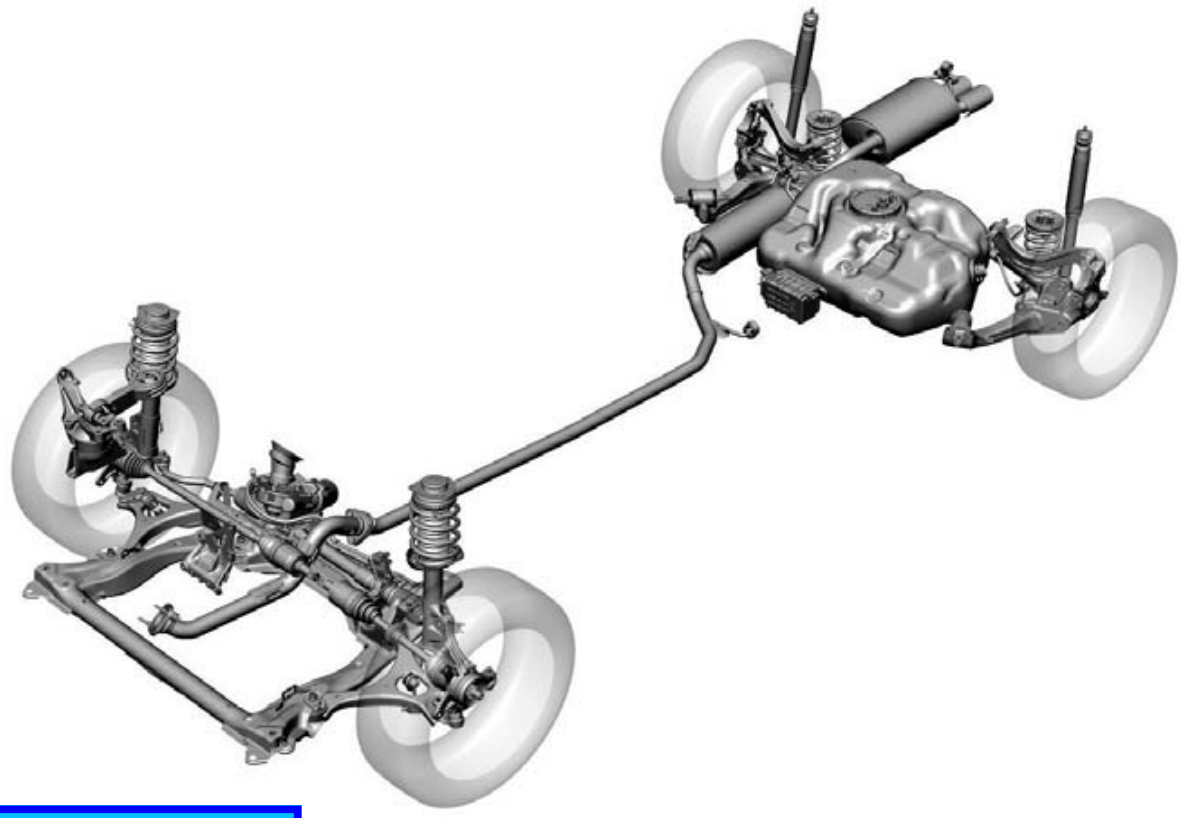
Chassis and Suspension

Fast Facts:

- Control-Link MacPherson Strut Front Suspension with improved caster angle and toe-control dynamics
- Multi-link compact double wishbone rear suspension with improved damper size and location
- Wider track for sedan (+3.25 cm front/+6.25 cm rear)
- Advanced Logic 4-channel Anti-Lock Braking (ABS) System with EBD

Overview

Honda has a legendary reputation for making its vehicles fun-to-drive with precise steering and responsive suspension tuning with refined road manners. Precise and sharp handling performance also contributes to accident avoidance maneuverability - one of the key reasons Honda pays so much attention to handling performance. The 2006 Honda Civic chassis delivers higher levels of sportiness and ride comfort with improvements in three key areas - enhanced suspension geometry with larger wheels and tyres, a longer wheelbase, and a new generation 4-channel anti-lock braking system (ABS). The changes add up to a new Civic that is even more responsive and sporty in demanding situations while also maintaining a smooth and comfortable ride.



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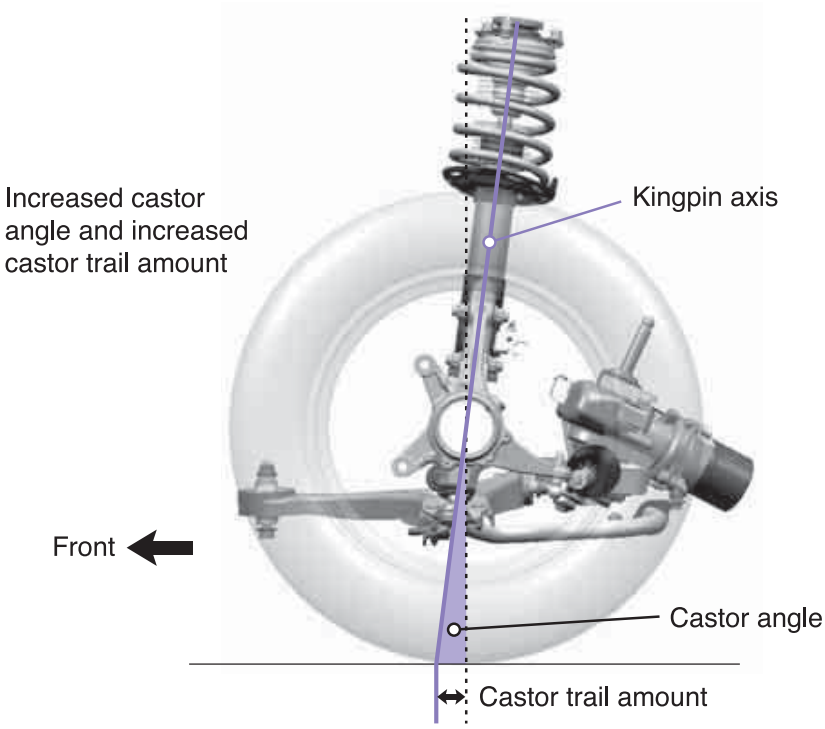
MacPherson Strut Front Suspension

The MacPherson strut front suspension incorporates new geometry with a high caster angle, and inversely wound springs for straight line stability, along with improved toe-control dynamics for sharp and responsive steering. To improve steering rigidity, and reduce friction, the steering gear box was mounted lower. Significant changes to steering angles, bushings, material rigidity, and spring and shock tuning result in amazingly linear suspension movement at the upper limit of vehicle dynamics and flatter cornering. When cornering, the inner wheel remains closer to perpendicular (relative to the ground plane) throughout a greater range of travel, which improves tyre adhesion. To improve ride comfort, the compliance angle on the lower control arm was optimised to transmit less harshness. Further enhancements include less centre offset with the wheel to minimise the potential for torque steer and shimmy (i.e. the tyres' ability to transmit pavement irregularities into the suspension).



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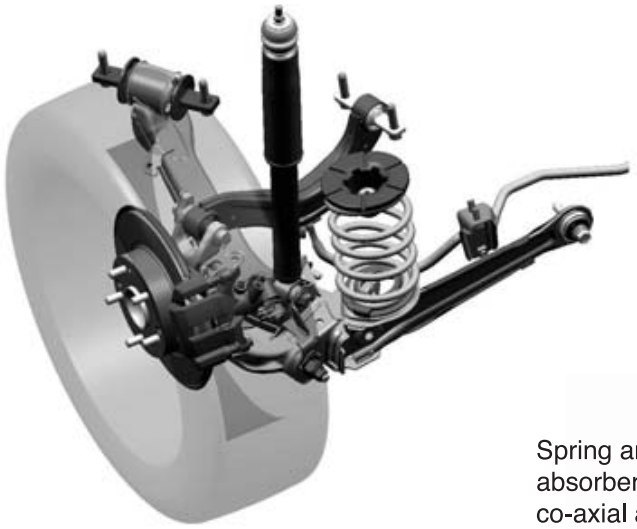
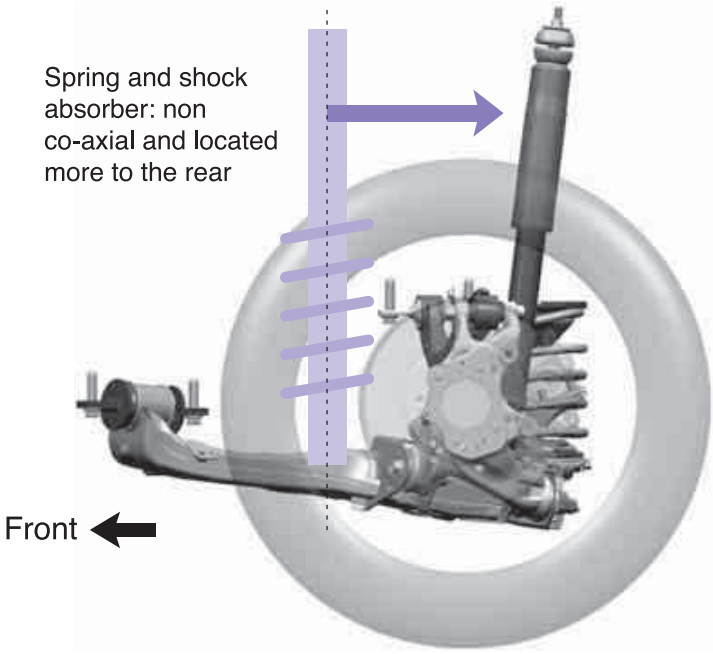
Multi-Link Double Wishbone Rear Suspension

Honda engineers have also revisited the rear suspension to improve the Civic's handling precision and ride. The multi-link double wishbone rear suspension benefits from a new design that facilitates more rebound stroke and improved positioning of the damper. The improved rebound stroke allows the vehicle to soak up bumps and harsh road surfaces with quietness and ease, while also enhancing overall stability. The damper is mounted closer to the wheels for a more favourable 1.1:1 lever ratio between suspension movement and the distance that the damper actually travels (the previous ratio was 1.7:1). The more direct relationship means the dampers are able to provide better damping and control throughout the full range of suspension travel. These enhancements combined with sport-oriented spring and damper settings greatly increase the overall sporty feel of the vehicle and increase the feeling of coordination between the front and rear suspensions (a surprisingly uncommon trait in many vehicles).





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Steering System

The variable speed sensitive rack-and-pinion power steering system features quick gear ratios for sharp and rapid transitions. Previously a high-mounted steering box, the entire steering system is located lower in the vehicle to improve input geometry into the front suspension for a more direct feel. The Civic Sport and Civic Hybrid feature a sport-oriented speed sensitive Electric Power Steering (EPS) that increases power assist at low speeds and reduces power assist at high speeds. The Civic VTi and Civic VTi-L use a speed sensitive hydraulic power steering system. All models have a tilt and telescope steering wheel.

The turning circle (diameter) for the Civic VTi and VTi-L is 10.6 metres, Civic Sport and Hybrid is 10.8 metres.

Turns, lock-to-lock:

- Civic Sport, VTi-L and VTi: 2.7
- Civic Hybrid: 2.5

The tuning of the suspension is designed to minimise front-end dive during braking and squat under acceleration, as well as reduced body roll when cornering. The spring rates, combined with precision damper tuning, provide a good balance between its fun-to-drive character and everyday ride comfort.

As with every vehicle that utilises a front strut suspension design, the strut bears the load of the weight of the vehicle. Drive forces during the suspension's compression stage can sometimes influence steering precision because as the springs compress, they exert torsional force in the opposite direction on the steering mechanism and sometimes make the car pull to the side. To neutralise this effect, Honda engineers applied inversely wound (wound in the opposite direction) coil springs to the front struts. Because the two front springs compress in opposite directions, the torsional force they produce cancels each other out, minimising their effect on steering.

Damper construction is a progressive valve design that significantly contributes to a smooth ride and precise handling characteristics. These gas-pressure dampers use a stacked disc-valve arrangement that yields easily and progressively to high-velocity damper piston movement, such as those created by bumps and road impacts; however, the same velocity-sensitive valves present more resistance to the small, low-velocity movement associated with body transient motion at high speed.

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All models feature front and rear stabiliser bars to reduce body roll during cornering. The diameter of the front stabiliser bar measures 24.2 mm (tubular with a wall thickness of 3.0 mm).

Civic Hybrid Suspension Tuning

The Civic Hybrid has the following exclusive suspension tuning compared to the 2006 Civic Sedan that optimises the vehicle's unique specifications:

- Solid rear 12 mm stabiliser bar (change from 10 mm)

Wheels and Tyres

Larger wheels and tyres contribute to the Civic's enhanced ride and handling. The Civic range gains a wheel-size increase to 15-inches over the outgoing four door sedan. All Civic models except Civic hybrid have full size spare tyres.

The Civic VTi has 195/65 R15 tyres on steel wheels, the Civic VTi-L rides on the same tyre size but gains alloy wheels.

The Civic Sport has exclusive 205/55 R16 V tyres on alloy wheels. The Civic Hybrid features 195/65 R15 low rolling resistance tyres with lightweight and aerodynamic 15x6 inch alloy wheels.

Towing

All models except the Civic hybrid can be fitted with an optional tow-bar. The maximum weight the Civic can tow is affected by whether the trailer is fitted with brakes and whether the optional Automatic Transmission Fluid Cooling pack has been fitted by an authorised Honda Dealer (see specifications).

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