

## **2012 Honda Civic 5-Door**

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## **INTRODUCTION**

The Civic team led by Mitsuru Kariya, the 'Large Project Leader', were given the task to create and develop the new Civic. With the current Civic being known for its unique exterior styling and interior practicality within the C segment in Europe, Mitsuru Kariya and his team were keen to further understand the needs and desires of the European customers. The current Civic became the benchmark focus for their research to create a car that was even better.

*"... when evaluating the requirements of our customers, we recognised that the European customer desires are demanding and unique in many aspects. We have focussed our development on fulfilling these expectations and through this process we have taken our development standards even further to a new level." (Mitsuru Kariya, Large Project Leader)*

With the current increase of fuel prices across Europe and the environmental targets set to achieve low emissions, it was concluded from the European customer survey that the current Civic customer not only considers modern styling and performance to be important but also advanced technologies to create a Civic that was even more cost efficient to run and eco-friendly.

The development period for the new Civic spanned over four years. Nearly all of components are new to the Civic or have been further developed with areas of focus on the suspension set-up to improve the ride and handling, the interior materials to improve the overall interior quality, the new design styling and aerodynamics for a refreshed image and improved efficiency, and the engines for improved performance and reduced CO<sub>2</sub> emissions.

Overall the new Civic builds on the core strengths of its predecessor and takes them to an appreciably higher level. It also is one of the sector's best in performance against low CO<sub>2</sub> emissions – the diesel model produces just 110g/km with 150 PS and 350 Nm of torque.

## **WHAT'S NEW? THE MAIN CHANGES AT A GLANCE**

### **Interior styling**

- New functional cockpit layout (two control interface zones)
- Full-colour i-MID TFT screen incorporating an Eco driving support function, audio display and user support
- Premium sound system with superior 20cm 90W subwoofers and 25mm AL dome tweeters (optional)
- New touch point surface materials used throughout for an improved quality feel
- New designed steering wheel with easy operating controls finished in extra-smooth leather with more comfortable stitching (depending on grade)
- Blue interior door lining illumination (depending on grade)

### **Exterior styling**

- Lower and wider aerodynamic monoform profile
- Elegant look seamlessly unifying all surfaces including the wheel arches and the body
- Lower and wider unique look in the front area
- Wide aero management rear combination lamp
- New brake and indicator light cluster design
- New body colours

### **Comfort and convenience**

- Air chamber support seat with lumbar and side support
- Audio key-off timer and station list
- Large, smooth-operating electric sunshade with central opening
- HDD navigation system with arrow display, 11 languages and an 800x480mm WVGA screen (depending on grade)
- Power windows operated by key fob
- Coupling to keyless button function allows the door mirrors to be folded and retracted
- Hill start assist
- Multiple storage console, including USB/iPod® and AUX inputs
- Revised interior and exterior door handles
- Smoother gear shift feel

### **Fuel economy and environmental performance**

- ECO Assist
- Idle Stop
- ACG multi-stage control

- Reduced engine friction
- Optimised combustion
- Air shutter grille on diesel model

## Safety

- LED day time running lights for improved conspicuity
- Cap-less fuelling system with misfuelling guard for diesel models
- Auto high-beam support system (grade depending)
- Distinctive, high-mounted brake light
- ACC (Adaptive Cruise Control), CMBS (Collision Mitigation Brake System - grade depending)
- Variable speed limiter
- Hands-free array microphone (grade depending)
- Lowered rear extra window for better view from the driver's seat
- Improved crosswind stability

## Suspension

- Fluid-filled compliance bushings for superior damping in the rear suspension
- H-Beam Trailing Arm with even higher rigidity than the predecessor Civic Type R for road stability

## Engine

- 2.2-litre i-DTEC diesel producing 110g/km of CO<sub>2</sub> with 150 PS and 350 Nm of torque.
- 1.8-litre i-VTEC petrol producing 137g/km of CO<sub>2</sub> with 142 PS at 6500 rpm and 174 Nm of torque at 4300 rpm
- 1.4-litre i-VTEC petrol producing 129g/km of CO<sub>2</sub> with 100 PS and 127 Nm of torque at 4800 rpm

## Background and Research

The current Civic originally launched in 2006 saw a change in the type of layout approach with the development of a unique platform based on a “centre tank” layout designed to offer practical benefits such as large cabin space meeting the needs of Europe’s “C” category customers. The Civic was designed and developed for the European market receiving positive feedback in areas such as design and versatility/practicality which have helped define the current Civic as having ‘road presence’ with its ‘futuristic looks;’ and having a ‘multi-purpose’ function with the large boot space and multiple seat arrangements offered by the ‘magic seats’.

As research commenced, the development team for the new Civic team considered these key milestones achieved with the current Civic and opted to maintain and even look to enhance the current

Civic model qualities. The team wanted to create a new emotional design with the ability to surprise and provide the unexpected in terms of roominess and other practical features whilst also improving the visibility and widening the field of vision to enhance the overall ownership experience.

The current Civic had already achieved superior interior space with matching trunk capacity among its competitors. Focus now was on maintaining this class leading interior space whilst improving the overall packaging and space efficiency.

This would lead to a new exterior design, improved aerodynamic performance, reducing weight that play a role in raising the car's overall performance envelope.

Focused research was conducted to determine the latest and most important requirements for the European market. European and Japanese designers and engineers worked closely together throughout the development process. Testing was carried out first in Japan and then repeatedly in Europe to ensure suitability for the world's most demanding C-segment customers.

*"the car had to be safe and easy to handle, affordable and so on ... premium in terms of having a good balance of affordable performance."* (Mitsuru Kariya, Large Project Leader)

The Civic development team turned to drivers, dealers and the media to evaluate the existing Civic and define the essential 'must keep' features and qualities, as well as the priorities for the new model. Drivers appreciated the distinct styling and form of the car, with its futuristic looks and practicality. However their feedback suggested that the car's rear design could be more sophisticated and that rear view could be improved. Inside the Civic the modern and user-friendly cockpit design was well received, as were the spacious cabin and versatile 'magic seats', but users demanded an improvement in the quality of the materials used. Drivers were impressed with the driving experience, but noted that suspension noise could be reduced and ride comfort increased.

Research revealed that the typical Civic driver is attracted to unique, fresh design with sporty performance and advanced technologies. The environment was defined as a high priority, with customers demanding high fuel economy and low emissions.

## **CONCEPT AND DEVELOPMENT**

Initial ideas for the new Civic explored the realm of the car having a 'Lean Energetic' design. 'Lean' was to emphasize the environmental-conscious world existing today, and 'Energetic' to express Honda's vitality. This design direction translated into a 'Clean-Dynamic' design concept.

The design team often referred back to their sources of inspiration to help define 'Clean- Dynamic', a 'blended body' airplane in which fuselage and wings blend into a single body for superior aerodynamic performance, quietness and habitability. Other inspiration was swimwear and track outfits worn by the athletes which provide low resistance.

Initial sketches focused on elegantly flowing designs taken from the 'blended body' airplane (a concept model designed by engineers at the University of Cambridge) and low resistance swimwear with no obvious borderlines between surfaces with bumper and fender lines blending seamlessly into the body. This concept was a clear break in a new direction, rather than relying on sheer strength and engine power to convey a sporty image, a 'blended body' with reduced resistance would demonstrate a smarter image for the new Civic.

The team returned to these sources over and over again during the design process, using them as a touchstone when they needed to reaffirm their direction.

The team faced challenges of how a relationship could be formed between design and-function; the design brief for the new Civic was that it needed to be clean, dynamic in look and premium in feel, yet function practically in all areas.

## **EXTERIOR DESIGN**

The designers of the new Civic wanted to keep the sporty and futuristic aspects of the car's character but tailor them to express the new model's even more elegant yet futuristic feel.

To embody this concept, the new car is 20mm lower and 10mm wider than the current model, with a styling that further highlights the sporty and futuristic elegance and an overall design full of practicality.

Research led the designers to consider how the new Civic 5 door design could have a sporty look that could resemble the sporty characteristics often found in 3 door cars. The new Civic's cab forward design is highlighted by a reduced amount of side glass relative to the surface of the side body in particular reducing the rear window glass area. This creates the look of having a small sleek cabin compared to more traditional looking cabins found on 5 door cars in the European C segment.

Contributing to the low and planted look is the way in which the body lines have been designed for the new Civic. Typically the peak point of the side body lines run in parallel with the door handle however the new Civic's point is lower coming just about the middle height of the door panel. The result is a low, uninterrupted line running from the front bumper, extending over the entire flank before reaching the rear bumper giving a low centre of gravity look. At the same time the upper part of the body side adopts a relatively plain design that is made to contrast with the sturdy looks of the lower part body side which, together with the side sills, serves to catch the light, emphasizing the solidly planted look.

The wheel arches have been designed to flow out more fluidly from the body surface to give the new Civic its distinctively clean and elegant look. In many designs, the wheel arch is made to bulge out from the body by about the same amount over its perimeter. In contrast, the borderline separating the body from the wheel arch in the new Civic is so smooth that it is quite difficult to say where one starts and the other one ends.

The exterior design project leader is particularly proud of the seamless integration of all the surfaces, from the wheel arches to the body.

*Each single area of the exterior design is unique in itself, but they are unified into one smooth form..."*  
(Noriyuki Ishii, Exterior Design Project Leader)

The face resembles the Honda 'DNA' and features new high and low beam HID projector-type lights. An automatic high-beam support system is integrated, controlled by a CMOS camera fitted to the windscreen in the area of the driver rear view mirror. The camera detects oncoming headlights or the taillights of a vehicle in front and automatically dips the headlights onto their normal setting if they are on high-beam. This allows the driver to fully concentrate on the road conditions, without having to manually control the high-beam setting

When looking at the car, the eye traces a flowing, elegant line which extends from the low front along the sleek side profile underneath the windows. This is accentuated by the complementary line of the aerodynamic wings. At the rear, a unique rear light combination has been optimised for maximum visual impact as well as aerodynamic efficiency. As in the current Civic, the rear design identity features strong horizontal elements which enhance the car's wide stance and strong road presence. On the new car the rear lights are placed on a higher level to ensure good visibility from following cars.

The horizontal brake light combination also works as a spoiler with an aerodynamic function, managing airflow over the top of the car. The combination lamp has an aerodynamic function too, protruding at the optimal position to cut off body-side airflow. Three distinctive lines, sculpted into the sides of the rear lights, reduce drag by minimising the amount of air turbulence at the rear of the car.

Two new wheel designs are available – a 16-inch ‘Sporty’ design and a bold 17-inch ‘Dynamic’ option. The overall exterior styling is a perfect example of design working hand-in-hand with engineering – the aerodynamics of every component have been optimised alongside the bold forms and feature lines that the designers wanted. The central fuel tank layout has been retained, allowing for more space in the cabin, and the current Civic’s much-loved ease of use and roomy interior remain uncompromised.

## **Class-leading aerodynamics**

Aerodynamics were a constant preoccupation during the design of the car. As Mitsuru Kariya points out:

*“Aerodynamics have only advantages ... if you improve aerodynamics [it] improves the fuel consumption, the driving performance, the dynamic performance and so on.”*

For this reason the design team wanted to take advantage of every possibility to improve this aspect of the car’s design. They enlisted the help of engineers with first-hand experience in Formula 1, a sport dominated by the expert management of airflow.

*“They had huge experience ... in reducing the aerodynamic drag but also pairing it with high speed stability which is very important in racing. That know-how contributed a lot.”* (Mitsuru Kariya)

The aim was to provide customers with a stable feel during high speed driving, including managing the flow of air under the vehicle by using a full-length bumper-to-bumper undertray, with flared leading edges. Together with larger covers on the rear suspension, this undertray adds to stability, particularly when overtaking long vehicles on the highway in windy conditions.

Aerodynamic efficiency is also improved by the introduction of a shutter grille for the diesel model. This results in both cooling performance and low-drag aerodynamics in all instances. The new diesel Civic reads water temperature, speed and outside air temperature, and opening and shutting the shutter accordingly. At low speeds, when aerodynamics are less critical, the shutter is open. It is also open at high speeds, contributing to secure steering stability by reducing front-end lift. At medium speeds the shutter is generally closed but opens where necessary to enhance cooling and reduce air resistance, thus promoting fuel efficiency.

The overall aerodynamic improvement of the new Civic diesel has a CdA value of 12.6% compared to its predecessor and a 10.8% improvement with the petrol models.

## **The safest Civic yet**

The very highest safety standards are a basic requirement in the European premium category. The new Civic’s safety innovations include a load distribution cabin structure, a resin tailgate panel and a new aluminium bumper beam.

The wing mirrors have been replaced by stylish new units with integrated LED indicator lights. The mirror surface is wider than those of the current model, enhancing rearward visibility for the driver.

In combination with reduced A-pillar width, this improves all-round visibility – a key aspect of vehicle safety.

### **Everyday convenience**

The new Civic features a redesigned outer door handle which is comfortable and a glass roof has also giving a greater sense of space in the cabin.

The diesel model also features a new cap-less filling system. The initial motivation for this innovation was to eliminate mis-fuelling incidents which could damage the engine over time.

The rear window has been restyled and receives a rear wiper and a de-icer. The bottom edge of the extra window is now lower, improving visibility for the driver when reversing. The C-pillar has been moved back by approximately 100mm, further enhancing the view and reducing the size of the rear blind spot. The twin exhausts have been replaced by a single integrated exhaust pipe which is disguised from the rear styling.

### **A colour for all tastes**

*“Through an analysis of the current situation in Europe and future trend projections, we tried to accurately grasp customer needs and present cutting-edge, premium colours a step ahead of the marketplace.”*

*“The car contour consists of plain surfaces as well as distinctive edges. We have chosen the colours specially to present the shape of the car in the best way.” (Noriyuki Ishii, Exterior Design Project Leader)*

The new Civic will be available in nine colours, three of which are new and all of which can be combined with either a black or a grey interior. The 3 new colours are; Yellow Topaz Metallic, White Orchid Pearl and Woodland Green Pearl. These colours help to accentuate the clean, dynamic and sophisticated styling. The range contains vibrant Deep Sapphire Blue Pearl and Milano Red colours, as well as the sophisticated Alabaster Silver Metallic, Crystal Black Pearl, Polished Metal Metallic and Urban Titanium Metallic.

## **INTERIOR DESIGN**

### **Spacious and driver focused**

The current Civic is known for its unique futuristic interior design and sporty exterior styling yet also with spacious and versatile interior. These core design characteristics were to be maintained in the development of the new Civic but with a focus to refine the feel for the inside of the car. Sources of inspiration came from the control panel layout from a jet fighter plane cockpit and a race car cockpit that enables natural and intuitive operation of all controls. The feeling of sitting in the driver's seat reflects a driver focused space with a comfortable feeling of relaxation and control. The feeling is of a car designed around the driver – the ultimate expression of Honda's 'man maximum, machine minimum' principle.

This new functional cockpit has two control zones which separate the control areas known as the Information Interface zone and the Driver Interface zone.

The Driving Interface zone gathers essential information at the natural point of focus; and an Information Interface zone positioned closer to the centre of the dash. The area directly in front of the driver's eyes is deep and spacious, mirroring the sleek exterior design, while the Information Interface zone offers the easiness of operation by placing information devices such as audio and navigation system, heater and A/C controls within the reach of both the driver and the passenger.

These areas are clearly defined by a low and smooth upper visor and a sweeping side visor that together define the driver's space, giving something of the focused feel of a jet fighter cockpit or a single-seat racing car.

Between the front seats there is storage for two 1-litre bottles and two 350ml bottles. Plug outlet, USB and AUX-in ports are also included. For ease of use, these storage spaces have been carefully placed in the driver's natural line of movement. Similarly, the gear lever has been moved closer to the rim of the steering wheel, and gear lever movement altered to be more ergonomically sound. The handbrake has been moved next to the passenger seat, where it can be operated more easily by the driver.

A new driver's seat increases the feeling of connection with the car and features an air cell lumbar and side support meaning the seat that can be adjusted to comfortably support drivers of any size and shape. A compact pump pressurises two air cells in the lower seat back on demand, offering adjustable levels of lumbar support, while further air cells in the side bolsters of the seat base can be pressurised to improve lateral support and fit the seat to smaller, slimmer drivers. Shoulder and knee support have also been improved.

The driver displays retain Dual Link concept of the current Civic – an intuitive design that places the most essential information such as the digital speedometer at the top of the dashboard where the driver can consult it frequently without impeding concentration on the road ahead. Secondary information and controls are then placed below. The centrepiece is the 3-meter arrangement of tachometer, engine temperature gauge and fuel gauge. The large meters are surrounded by metallic rings that enhance the high precision sporty feeling:-

The Civic's wider and lower exterior form contains the roomiest interior of any C-segment car. It has 1431mm of shoulder room between driver and front seat passenger and 795mm of tandem distance (between driver and rear seat passenger). The boot volume is also class leading, with 401 litres of luggage space. The easily accessed under-floor compartment increases this by a further 76 litres.

## **Reduced noise and quality materials**

In the research phase it became clear that low levels of interior noise are critical to creating a relaxed and enjoyable driving experience. A quiet car also helps make the occupants feel safer at high speeds, as well as reducing fatigue.

Honda engineers conducted exhaustive testing to identify the sources of noise, as well as the types of noise that cause most discomfort. They focused not only on reducing road noise at peak levels, but also on minimising the contrast between the different frequencies of noise reaching the driver's ear from outside the cabin due to varying road surfaces, for example.

A new testing program was developed whilst evaluating the overall quietness of the new Civic. Quietness was measured by the following 8 scenarios; A solid feeling upon entering the car, when starting the engine, when pulling away, whilst crawling in traffic, whilst cruising at slow speeds in urban environments, whilst accelerating, driving on rough surfaces, and motorway cruising. This enabled the total evaluation of how the drivers experience in relation to the types of sound produced by the car in these areas. Then they conducted exhaustive testing to identify the sources of noise, as well as the types of noise that cause most discomfort. The team focused not only on reducing road noise at peak levels, but also on minimising the contrast between the different frequencies of noise reaching the driver's ear. For example, noise created by varying road surfaces that is created outside the cabin.

Noise reduction was carried throughout the chassis and powertrain components. For example, large noise-absorbing panels were added to the rear wheel arches, the roof was specially engineered to eliminate vibration and sound-deadening glass wool was used in the engine bay. Inside the cabin, a new sound-insulating material was interlayered in the windscreen, thicker window glass in the front doors and new seals were introduced throughout. As a result the driver and passengers can have an even quieter travel experience within the cabin.

In addition to improving the quietness and comfort at cruising speed, stress-free conversation capability on the hands-free telephone system is essential to modern passenger car. Honda has been keen to realise true comfort quality in every aspect with the new Civic. Engineers have boldly adapted a new array microphone system for the first time in the Civic range. This unique digital technology captures the driver's voice and back ground sound with multiple microphones and digitally process the sound to effectively cut out ambient noise. Noise is also cut completely when the driver is not speaking. This greatly improves sound quality and voice recognition, effectively reduces the stress of conversation while at high speed cruising or with windows open. Both the driver and the person you are talking to over the phone will enjoy stress-free conversation.

The materials throughout the interior have been carefully selected for a soft, highly tactile feel. The cockpit uses a plastic chosen for its specific grain, which combines a leather look with a geometric pattern that compliments the interior's high-tech image. The door lining is illuminated by a cool blue ambient. Two interior colour options are available: Glamorous Black and Cool Grey.

The new Civic also features a completely smooth leather steering wheel. The stitching is finer and has been moved to the back for minimal contact with the fingers. The grip shape has been improved for a more comfortable fit in the hands, and the steering wheel diameter is increased for optimum control.

The gear shift knob has also been tailored for sporty dynamics with smooth, proficient gear shifting, to match advances in the new Civic's powertrain. It has been moved closer to the driver and the angle of operation is more natural.

## **i-MID**

The Information Interface zone features Honda's i-MID Intelligent Multi-Information Display – a colour LCD QVGA displaying information on fuel consumption, an outside temperature gauge, a clock and a trip meter, it allows the driver to see extra entertainment information such as album artist. It also provides a wide range of user support information such as the ECON button (see below), audio volume, seatbelt warning, climate control data, etc. The Idle Stop system status can also be displayed on the i-MID.

## **Versatility and convenience**

A major challenge for the Civic engineers was to improve the handling of the car.

The easy solution would have been to abandon the torsion beam in the rear suspension, however this would have resulted in losing a lot of boot space and the rear 'magic seats'. Following a personal experience of the development team during a customer feedback survey in France where a customer had shown his dog nestled in the space where the seat was. The engineers decided that the practicality offered the magic seats was a real benefit and so they kept them.

The Civic's centre fuel tank layout means almost endless flexibility when it comes to seat arrangements. With a simple 'dive-down' motion the rear seat backs can be folded down completely to give a flat boot space that is 1600mm long and 1350mm wide. The resulting space is large enough to carry for example three mountain bikes (with the front wheels removed), three extra large Samsonite cases or three large golf bags. This is possible even with the front seats in their rearmost position. The rear seat bases can also be flipped up to reveal a large floor for carrying tall objects. A 60:40 split in the seat base offers even more options for carrying both people and cargo. It also offers an alternative load area if access via the tailgate is limited. A third option is provided by placing the boot board in the bottom of the boot to be used as a shelf for carrying tall items. With multiple load-carrying possibilities the new Civic will prove a practical choice for families, sports enthusiasts and anyone who needs plenty of flexible space.

## **Rear Visibility**

Customer feedback suggested that the car's rear design could be more sophisticated and that rear visibility could be improved. Often, a strong design and practicality (in this case rear visibility) are difficult to combine. With the new Civic the designers managed to integrate the tail light clusters in to the rear spoiler making it a dominant feature of the car and at the same time providing improved rear visibility.

The bottom edge of the rear window is lowered on the new Civic to expand the rear visibility while the position of the high-mount-stop-lamp has also been lowed, allowing the driver to see the headlights and indicators of following cars in the rear view mirror, while a rear-facing camera gives absolute confidence when reversing (Optional).

### **Keyless entry and one-motion door handles**

The new Civic's keyless entry system is designed to be as easy to use as possible. Combined with new, more convenient bar type door handles and the engine start/stop button, the result is easy entrance and one-touch engine starting. Exiting has also been made more user-friendly. A locked door can now be opened from the inside by simply pulling the handle.

## **ENGINES AND TRANSMISSIONS**

### **An engine for everyone**

The new Civic will be offered with three engine options: a 1.4 l i-VTEC petrol unit, a 1.8 l i-VTEC petrol unit and a 2.2 l i-DTEC diesel unit. All the engines are combined with a 6-speed manual gearbox, ECO Assist, and Idle Stop. They are also equipped with Hill Start Assist. The 1.8 l engine can be paired with a specially designed 5-speed automatic transmission.

While enhancing the performance, the 2.2 l i-DTEC unit achieved nearly 20% better fuel economy and the 1.8 i-VTEC 10% in comparison with their predecessors.

The chief goal in the engine and transmission development was to maintain the high performance driving experience whilst improving the overall efficiency of the engine resulting in lower running costs.

### **Eco Assist**

During the development of the Insight Hybrid, Honda has found that the difference in driving style may create 15% variance in fuel economy. Featured on the Civic for the first time, ECO Assist optimises fuel efficiency by minimising the differences in fuel consumption caused by varying driving styles. Originally developed to assist drivers of the Insight, CR-Z and Jazz Hybrid models, it uses the car's speedometer illumination to advise drivers on how their driving style is impacting fuel economy. This helps drivers to get the best economy from their car in everyday situations and gives real time feedback on how their use of throttle affects their fuel costs and environmental footprint. It also coaches drivers by showing them how it is possible to decrease fuel use by maintaining momentum and avoiding excessive acceleration or deceleration. The speedometer lighting is blue when the car is idle and stays blue during sudden acceleration and deceleration. It turns to green if the car is driven in an economical manner. In between, blue-green lighting shows during gentle acceleration and deceleration when the driver is slightly exceeding the best level of throttle.

The dash also features a green "ECON" switch which activates the most economical and environmentally friendly settings for the car. It does so by creating the best throttle position for the accelerator pedal position to smoothly increase torque. ECO Assist also improves the efficiency of the air conditioning system. According to conditions such as temperature and humidity it controls the compressor and decreases the voltage of the fan drive to reduce the load on the engine, improving fuel efficiency.

The Civic's ECO Assist system has been extensively tested on city, extra-urban and motorway test routes to optimise its performance for European driving conditions.

### **Idle Stop**

Idle Stop has been applied across the Civic range and is a large contributor to the advances made in the fuel efficiency and CO<sub>2</sub> emissions of all three engines in the range – in fact it makes a contribution of about 5 g/km for a diesel engine. Feedback on existing Idle Stop systems indicated that their purpose and operation sometimes cause confusion for drivers. Therefore the Civic development team placed a lot of focus on creating an easily operated system that adds to the driver's confident feeling of control. The result is consistently smooth and reliable restarts. The system is also optional so that the driver can switch it off when it is not required.

Idle Stop status and operation guidance are clearly displayed on the vehicle's standard i-MID screen, preventing the driver from confusing Idle Stop with an engine failure. The system was extensively tested in European cities to ensure high-quality performance in all traffic conditions.

## **2.2-litre i-DTEC**

### **Clean diesel with high fuel economy and high performance**

*"We achieved a very good CO<sub>2</sub> level of 110 g/km while maintaining the driveability which was so important to our goal of positioning the Civic as a dynamic car which is fun to drive ..."* (Christoph Karger, Powertrain Engineer)

The new 2.2-litre i-DTEC engine created for the Civic tops the C-segment in its balance of performance and emissions management. In fact, in spite of its impressively low CO<sub>2</sub> output (only 110 g/km and nearly 20% improvement from the previous model), it takes only 8.5 seconds to reach 100 km/h-from a standstill. Maximum power is up by 10PS from the previous engine to 150PS, and torque has also increased (to 350 Nm at 2000-2750 rpm).

The engine is a transversely mounted four-cylinder unit with DOHC, four valves per cylinder, a balancer shaft, 3<sup>rd</sup> generation common rail direct injection, a new shallow bowl combustion chamber and a variable turbo with lift sensor. It features a DC-driven EGR valve with a highly efficient EGR cooler system. The intake and exhaust parts are tailored for optimum performance and a compact design. The intercooler system is also reconfigured in a unique design with the DPF (Diesel Particulate Filter) moved to the engine side for lower weight.

Fuel consumption of only 4.2 litres per 100 km ensures the new Civic is easy on the pocket as well as the environment. In fact, the new Civic 2.2 i-DTEC may be of particular interest to company car buyers – not only is it economical to run, but it meets EURO 5 emissions regulations.

The impressive fuel economy was reached by a number of measures, encompassing aerodynamics and gear ratios. However, the biggest contribution is of course down to the i-DTEC engine which features a new Idle Stop system and optimum common-rail fuel injection control. Most importantly, the engine has been refined to reduce engine friction as much as possible. This was tackled from two angles: optimised oil flow and reduced friction.

### **Optimised oil flow:**

- Optimisation of the piston jet
- Introduction of a new bearing metal with an eccentric shape for the oil groove, reducing oil leakage
- Reduced balancer bearing clearance
- Elimination of the balancer chain jet
- The diameter of the rocker arm jet hole has been reduced.
- Crank oil supply has been reduced through offset oiling.
- Overall oil supply has been reduced and redistributed, boosting efficiency.
- Reduced oil pump capacity for less friction and lost energy

## Reduced friction:

- The cylinder block and bearing cap journal diameter has been reduced.
- The piston height and the crankshaft pin and crankshaft main journal diameters have been decreased in order to reduce weight.
- Pressure on the piston side has been reduced and a thinner conrod introduced.
- Piston ring tension has been reduced.
- The diameter of the balancer weight has been reduced for less resistance.
- The high pressure fuel pump flow rate has been reduced.
- Cam journal surface roughness has been decreased to reduce friction loss.
- Earlier intake valve closing has been introduced to decrease pressure loss at low revs.
- A new diesel engine oil has been introduced for improved fuel saving performance.
- Water pump efficiency has been optimised.

Fuel economy was further improved by implementing a low pressure fuel pump system to reduce power consumption and the ACG multi-stage control system using a battery monitor.

It is worth noting that Honda fuel economy figures are based on real world figures. In this case a special test cycle was developed by European engineers. This Honda-unique mode enabled engineers in Japan to measure how the car would perform on European roads, taking into account different road surfaces, characteristics and speeds.

## 1.8 litre i-VTEC

### High fuel economy and clean emissions

The Civic's 1.8 litre i-VTEC showcases Honda's finest VTEC technology and engine management systems. From the outset, the new engine was designed to function as part of a high quality, easy-to-handle powertrain, with improved operation at every stage of the drive, including start-up, shifting, acceleration and deceleration. Starting is quick and easy, gear shifts are seamless and accelerator control is effortless and predictable. Acceleration and deceleration are always smooth and comfortable whether in the city or the suburbs. The same is true of acceleration and high-speed cruising on motorways. Noise and vibration have been greatly reduced and in this area the new 1.8 litre i-VTEC overall a more efficient engine than its predecessor.

Delivering 142 PS at 6500 rpm and 174 Nm of torque at 4300 rpm, the engine is highly responsive at low to medium engine speeds, as well as being smooth and refined throughout the range. The intake system was tuned to increase output.

Producing only 137g of CO<sub>2</sub> per km, a 10% reduction from the predecessor, the new engine meets EURO-5 emissions standards. This improved CO<sub>2</sub> level places it among the leaders in its class, enabling tax savings for owners. It is also achieved alongside improved dynamic performance; it requires 9.1 seconds to accelerate from a standstill to 100 km/h.

As well as benefiting from the introduction of Idle Stop, fuel economy has been improved by a number of additional methods:

- Decreased piston ring pressure and a new piston coating reduce friction.

- ACG multi-stage control has been introduced.
- The knock control system has been improved.
- The cylinder head adopts a swirl port to improve combustion and a long reach dual needle spark plug introduced for better fuel economy and cleaner emissions.
- Weight has been reduced with a lighter camshaft and a lighter radiator.
- The catalyser material has been altered for more effective emissions reduction and heat resistance.
- A low fuel consumption engine oil has been introduced.

In addition to the above changes, several other upgrades have been made. The intake system including the air cleaner has a simplified structure for a lighter unit, increasing power and reducing noise and vibration. The starter motor has also been revised for extended durability to handle the increased number of starts that go with Idle Stop

## **1.4 litre i-VTEC**

### **High fuel economy and clean emissions**

The Civic's 1.4 litre SOHC engine also benefits from Honda's advanced VTEC technology for efficient fuel management. Like the rest of the engines in the range, it has been fine-tuned and updated to boost both its dynamic performance and its environmental qualities. CO<sub>2</sub> emissions have been reduced to just 129 g/km, ensuring EURO-5 compliance. The engine delivers a maximum power figure of 100 PS and a torque figure of 127 Nm at 4800 rpm.

The engine also has the new Idle Stop system and receives the same upgrades as the 1.8 litre engine, including new, low-viscosity engine oil, improved catalyser material, ACG multi-stage control and an improved knock control system. A new piston coating has been applied to reduce friction, boosting performance and reducing fuel consumption.

Like the other new Civic engines, the 1.4 litre unit receives a new, more durable starter motor to cope with the increased number of starts that go hand-in-hand with the adoption of Idle Stop.

The 1.4 litre engine will hold particular appeal for younger customers and downsizers who are attracted to the Civic's stylish looks and spacious practicality with lower purchase and running costs. The addition of Hill Start Assist will strengthen its appeal to entry level drivers even further.

### **i-VTEC – How it works**

Honda's VTEC variable valve timing system permits levels of efficiency and power output that would be impossible with conventional, fixed valve timing. Depending on engine load and engine speed, an electronic controller chooses between two different cam profiles to determine how the intake valves will operate, maximising economy and performance.

### **Hill Start Assist**

Hill Start Assist is applied across all manual transmission models. This system prevents the car rolling back when the driver releases the brake pedal and presses the accelerator. It holds the brakes for about a second, allowing a smooth start and adding to the smoothness of the overall ride quality. The system has been specifically set and fine-tuned to contribute to the smooth, comfortable driving experience offered by the new Civic.

## **6-speed manual transmission**

In line with improvements throughout the powertrain, the Civic's compact and lightweight 6-speed manual transmission has been updated contributing to increased performance and fuel efficiency. The gear ratios have been optimised with higher 5<sup>th</sup> and 6<sup>th</sup> gears and a taller final drive ratio to improve the quietness of the engine at high speeds and deliver better fuel efficiency. The synchronizer specifications for the 2<sup>nd</sup> and 3<sup>rd</sup> gears have been improved to improve the shift feeling. The transmission has also been adapted to support Idle Stop, with a smooth-starting clutch and a neutral sensor.

Manual transmission models feature a Shift Indicator Light (SIL) function in the driver display area. The engine management system detects whether the level of torque is appropriate to the current driving conditions and provides the driver with a visual prompt of the best point at which to change gear to maximise economy.

## **5-speed automatic transmission (1.8 litre only)**

Since 2009 a conventional automatic transmission has been available for the 1.8 litre petrol engine. This system was developed exclusively for Civic 5-door customers and offers smooth, easy operation in line with the vehicle's overall development principles. For the latest evolution of the Civic, the system has advanced even further in the direction of clean emissions, and has achieved a 2% improvement in fuel economy through a number of measures. These include improved line pressure control, a high capacity torque converter, reduced clutch friction and earlier shifts into the higher ratios, reducing engine speeds.

## CHASSIS

*“The motivation to really refine the new Civic came when I drove to my home town, which is quite far away from the place where I live. It’s about 1,600 km using the highway so it takes quite a long time.*

*I have a small child of almost 2 years and of course I get very tired if the car is noisy, or if the ride quality is poor, or if there is insufficient sense of security for the occupants. During this trip I strongly felt that a car needs to be comfortable and quiet in order to really provide value to the customer. And it’s not just making a car which is stable and quiet in Japan – it needs to maintain that high quality and high performance at high speeds.” (Mitsuru Kariya, LPL)*

*“Normally if we develop a new model there is always a natural amount of evolution and improvement in quality and performance; but in the new Civic, in terms of ride quality, I believe that the improvement is two generations ahead.” (Kazuo Sunaoshi, Assistant LPL)*

*“The amount of times we have visited and driven this car on European roads is outstanding in the history of Honda. We have never done such extensive testing in Europe with any previous models ... we could really visually see the improvement every time we visited Europe.” (Kazuo Sunaoshi, Assistant LPL)*

### **Superior handling and stability**

The new Civic’s rear suspension system has been totally revised, whilst retaining the basic torsion beam axle layout for maximising the interior space and keeping the practicality offered by the magic seats. With a focus on developing the new Civic for the various road conditions experienced on European roads, high speed stability was a focus to give the sense of safety and increased rigidity without sacrificing riding comfort, these were key to enhance stability.

The rear suspension of the new Civic receives a new fluid-filled compliance bushing, replacing the standard rubber type. It has the advantages of a lower spring rate, reducing road noise while also offering high damping characteristics to effectively absorb shock and vibrations on bumps. This component also featured on the Honda Legend is unique in C-category car when combined with torsion beam axle suspension. The H-Beam Trailing Arm that holds the compliance bush and the beam axle has been strengthened. This arm is now thicker than that of the previous model and even has higher rigidity than the arm used on the Civic Type R.

A new urethane damper mount further improves driving comfort. Stability under braking has also been improved by opposing the windings of the two rear springs.

The sub frame structure has been changed from a rear beam to a cradle type to increase safety under collision impact. In order to control resonance and reduce noise and vibration, the sub frame also features a new mass damper.

The Civic’s front suspension and steering system have been completely revised to improve handling and stability. One of the significant changes that has contributed to this revision is the more direct steering ratio which reduces the steering wheel angle required to change direction on winding roads. The engineers also focused on having a good balance between tension and compression in the damper settings and creating the optimum axle geometry for a more comfortable drive.

The engineers also worked to optimise the forces generated on the tyres during turning, giving a smooth turning feel. This has been achieved by carefully considering the caster trail, knuckle arm length and compliance bushings. The tried and tested MacPherson struts remain, contributing to the car's sporty dynamics, and they're combined with a retuned EPS (Electric Power Steering) system for a more direct and linear driving feel.

### **Reduced levels of noise and vibration**

The chief priority for the new Civic chassis design was the reduction of noise and vibration in every possible component, in order to enhance the quality of the drive and eliminate any fatigue. Road, suspension and wind noise were all significantly reduced, with components checked meticulously for weaknesses and noise-generating tendencies.

### **New brakes and tyres**

All the Civic models come equipped with ABS, controlled by a compact and lightweight VSA modulator. It is complemented by Electronic Brake force Distribution (EBD) which adjusts front-to-rear brake effort to achieve maximum braking performance and stability based on the vehicle's speed. Brake performance has been improved on the new model with disc and calliper sizes optimised at the front and rear. The callipers have been changed to a hammer-head type, reducing friction and boosting efficiency.

## **HONDA GENUINE ACCESSORIES**

### **Personalize the new Civic with a selection of Genuine Accessories.**

Following Honda's launch of the exciting and dynamic new Civic, Honda Access Europe announces a comprehensive range of Genuine Accessories to personalize and enhance the car. Genuine Accessories have been developed directly alongside the Civic concept and development programme to ensure that each product augments the new model with perfect fit, safety, security and durability.

To facilitate the customer's choice in personalizing his new Civic, accessories will be available in three customer packs. These packs do not come with less diversity. On the contrary, whether a customer is more into comfort or practically, or whether a customer is more into looks and exterior, these 3 packs offer the perfect combination to meet his or her wishes.

### **Sports pack**

Perfect for the customer who wants to enhance Civic's sporty looks!

Next to a body-coloured tailgate spoiler, an illuminated doorstep garnish - with blue illuminated Civic logo, front, rear and side skirts come in a carbon-inspired finish and provide an exciting edge to the car.

### **Design pack**

Perfect for the individual-minded customer, offering the great balance between dynamics and styling!

A sports tank lid, air intake garnish, tailgate decoration, door mirror covers and a front sports grille come in a matte metallic silver finish.

### **Convenience pack**

Perfect for the practical-minded customer, offering even more comfort and protection!

A doorstep garnish, side body trims, mudguards and a trunk tray provide even more functionality to new Civic.

Next to customer packs, it is of course possible to personalize the Civic with a series of individual accessories.

### **New Honda SD navigation system**

A 6.1" touchscreen operates on i-Mid connection. Honda dealers are included as Points of Interest. Voice commands and menus come in 12 languages with map coverage in 34 EU countries. Map updates are possible via SD card. This versatile navigation system also offers USB and iPod® connectivity.

### **Alloy wheels**

Next to the existing Civic alloy wheels, four new designs have been created to give the Civic that superior look.

Two 18 inch alloy wheels are both available with a carbon-inspired centre cap - Hydrogen and Krypton. Also, two 17 inch alloy wheels - Radium and Cobalt – give the new Civic an even more powerful appearance.

### **Detachable trailer hitch and new bicycle carrier**

Designed and tested to match the Civic's bodywork, performance and towing capacity, a full-automatic detachable trailer hitch is available. Thanks to its integrated design the housing becomes invisible when detached. Furthermore, a new compact bicycle carrier with folding function and anti-theft mechanism can now be installed on both fix and detachable trailer hitches.

To discover more Genuine Accessories for Civic, go to [www.honda-access.com](http://www.honda-access.com).

## **CIVIC HERITAGE**

### **1st Generation (1972-1979)**

The Civic was launched as Honda's vision of an affordable yet comfortable and fun to drive car. It was the first car in the world to pass the pioneering US 'Muskie' Clean Air Act and achieved the highest fuel economy ratings issued by the US Environmental Protection Agency for four successive years.

### **2nd Generation (1979-1983)**

Sales of the Civic passed the 2.5 million milestone. 3, 4 and 5-door versions were sold in all the major markets and engines ranged from 1.3 to 1.5 litres. The CVCC engine was further developed for even higher combustion efficiency and a catalytic converter was also added.

### **3rd Generation (1983-1987)**

The 'Wonder Civic' evolved around a design concept called 'Man-Maximum, Machine Minimum', with the customer as the focus and served by the vehicle.

### **4th Generation (1987-1991)**

This Civic saw the introduction of four-valve-per-cylinder engines across all models. For the first time the double wishbone suspension system used on the Accord and Prelude was incorporated front and rear for excellent stability and handling. The DOHC VTEC was the first engine in the world to electronically control both valve timing and lift.

### **5th Generation (1991-1995)**

Aerodynamics and economy were key elements behind the 5th generation Civic. The engine line-up included 1.3, 1.4, 1.5 and 1.6-litre units. The acclaimed VTEC technology was also applied to the SOHC engine, thus further enhancing the balance between fuel economy and performance. Further developments came with VTEC-E which was geared towards improved fuel efficiency. Civic production passed the 10 million mark during this period.

### **6th Generation (1995-2000)**

This Civic was a top seller with over 3.2 million units built. Available in 2, 3, 4, and 5-door variants the 6th generation engine choice included the Civic's first diesel – a 2.0-litre. The petrol choice was between 1.3, 1.4, 1.5, 1.6 and 1.8-litre capacities. The possibility of improving engine output without adversely affecting fuel consumption was clearly demonstrated by the three-stage VTEC engine. CVT transmission offered stepless, automatic gear changing for the first time.

### **7th Generation (2000-2005)**

2 million 7th generation Civics were produced between 2000 and 2005, featuring a more spacious interior, a totally new flat floor and a dashboard-mounted gear lever. By coupling VTEC with VTC (Variable Timing Control), Honda engineers created better performing engines. Growing environmental concerns led to the creation of the Civic IMA (Integrated Motor Assist). An electric motor coupled to a frugal i-DSI engine generated something very unique: a 1.3-litre engine with fuel efficiency similar to a 1.0-litre engine and with the performance of a 1.6-litre engine. This generation saw Honda introduce their first Civic Hybrid, powered by a 1.3 litre engine. In terms of safety the Civic had been awarded the highest ever score by Euro NCAP for pedestrian safety (old protocol).

### **8<sup>th</sup> generation 2006-2011**

For the 2006 generation Honda split the model into two different platforms, one primarily for the home market and North America and the other designed for the European market.

The European version is available with a 1.8-litre i-VTEC, a 1.4-litre i-DSI or a powerful and economical 2.2-litre diesel engine. It excelled in blending good handling and performance with a spacious interior and impressive fuel efficiency. In 2009 the Civic was updated with a fresh look, a new, economical 1.4-litre i-VTEC engine and bespoke automatic transmission. Since 1973, more than 20million Civics have been sold worldwide.

## SPECIFICATIONS

ENGINE		2.2 litre i-DTEC	1.8 litre i-VTEC	1.4 litre i-VTEC
Bore x stroke	mm	85.0 x 96.9	81.0 x 87.3	73.0 x 80.0
Capacity	cc	2199	1798	1339
Compression ratio		16.3	10.6	10.5
Max. power (Engine)	kW/PS	110kW / 150PS	104kW / 142PS	73kW / 100PS
@ rpm		4000rpm	6500rpm	6000rpm
Max. torque (Engine)	Nm	350Nm	174Nm	127Nm
@ rpm		2000rpm	4300rpm	4800rpm
Fuel system		Common rail	PGM-F1	PGM-FI
Fuel rating		Diesel	Unleaded 95	Unleaded 95
ELECTRICAL				
Battery (Engine)		12V-70Ah	12V-60Ah	12V-60Ah
Alternator		12V-150A	12V-95A	12V-95A
DRIVETRAIN				
Front-wheel drive		Synchronised 6-speed forward, 1 reverse		
Clutch		Single plate dry, diaphragm spring	Single plate dry, diaphragm spring	Single plate dry, diaphragm spring
Gear ratios	1 <sup>st</sup>	3.933	3.142	3.461
	2 <sup>nd</sup>	2.037	1.869	1.869
	3 <sup>rd</sup>	1.250	1.303	1.235
	4 <sup>th</sup>	0.928	1.054	0.948
	5 <sup>th</sup>	0.734	0.853	0.809
	6 <sup>th</sup>	0.634	0.727	0.727
	Reverse Final Drive Ratio	4.008	3.307	3.307
		3.045	4.111 / 4.294 Electronically controlled 5-speed automatic, 1 reverse	4.750
Front-wheel drive			Torque converter	
Clutch				
Gear ratios	1 <sup>st</sup>		2.666	
	2 <sup>nd</sup>		1.534	
	3 <sup>rd</sup>		1.066	
	4 <sup>th</sup>		0.760	
	5 <sup>th</sup>		0.551	
	Reverse Final Drive Ratio		1.956	
			4.437	
SUSPENSION				
Front		MacPherson strut		
Rear		Torsion beam axle		
STEERING				
Type		Electric power steering		

Turns lock to lock	16" wheel/17"wheel	2.81 / 2.66	2.62 / 2.47	2.62 / 2.47
<b>TURNING RADIUS</b>				
At wheels (at wheel centre) 15" · 16" / 17" wheel		5.24 / 5.54	5.24 / 5.54	5.24 / 5.24
At Body 15" · 16" / 17" wheel		5.62 / 5.91	5.63 / 5.91	5.63 / 5.63
<b>BRAKES</b>				
Front		Ventilated disc		
Rear		Disc		
<b>DIMENSIONS, WEIGHTS, CAPACITIES</b>				
Overall length	mm	4285		
Overall width (with door mirrors)	mm	1770		
Overall height (with antenna)	mm	1472		
Wheelbase	mm	2605		
Ground clearance	mm	150		
Luggage Space (Seats Folded)	litres	1210		
Luggage Space (To Roof)	litres	1378		
Luggage space (Seats Up)	litres	477		
Kerb weight	kg	1363	1205 (MT) / 1238 (AT) 1720 – 1750 (MT) /	1181
		1910	1720 – 1790 (AT)	1680
Max. permitted weight	kg			
Fuel tank capacity	litres	50		
<b>FUEL CONSUMPTION (1999/100/EC)</b>		* Internal Honda figures (16inch tyre)		
Urban	l/100km	5.1	7.3 (MT) / 8.7 (AT)	6.7
Extra Urban	l/100km	3.7	4.9 (MT/AT)	4.7
Combined	l/100km	4.2	5.8 (MT) / 6.3 (AT) 137 (MT) / 148	5.4
CO <sub>2</sub> emissions	g/km	110	(AT)	129
<b>PERFORMANCE</b>				
Top Speed	km/h	217	215 (MT) / 210 (AT)	187
Acceleration 0-100km/h		8.5	9.1 (MT) / 10.9 (AT)	13.4
<b>WHEELS AND TYRES</b>				
Wheels		16×6 1/2J, 17×7J	15×6J, 16×6 1/2J, 17×7J	15×6J, 16×6 1/2J, 17×7J
Tyres		205/55R16 91V, 225/45R17 91W	195/65R15 91T, 205/55R16 91V, 225/45R17 91W	195/65R15 91T, 205/55R16 91V, 225/45R17 91W