

BEAT - 1991.05



Introduction

Wouldn't it be nice to have a car that is more free, small, familiar, and truly enjoyable to ride and drive ?

This desire led us at Honda to create a completely new vehicle. **Midship** Amusement BEAT. We 've packed fresh appeal and dreams that are not bound by conventional car value standards, as well as the mechanisms to make them a reality, into a small, fully open two-seater body, and now it's time to start driving.



The origin of the name BEAT: BEAT [bi:t] means strong rhythm (such as jazz) or heartbeat in English. We named it "BEAT" because we wanted it to be a car that exudes the thrill of cutting through the wind and the joy of driving.

CONCEPT

We wanted to create a car that lets you honestly experience the joy of looking at it, driving it, and operating it.

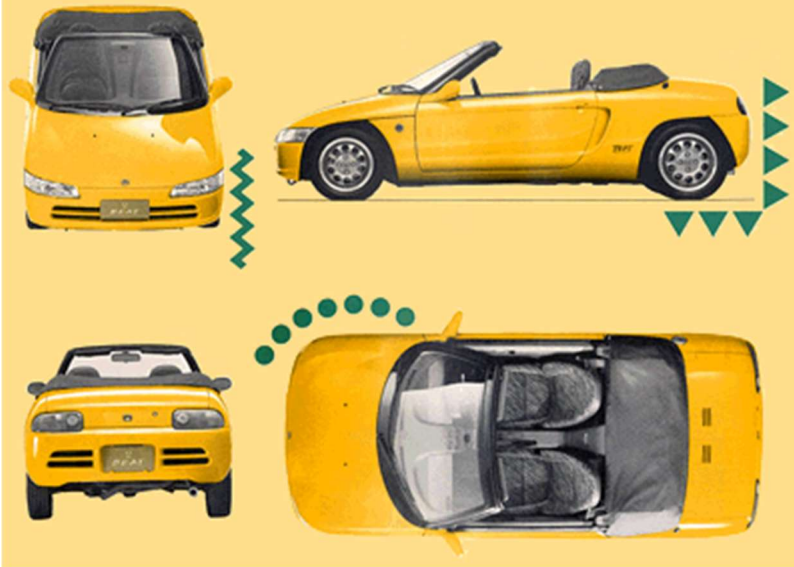
Just seeing it makes you feel happy. Driving it gives you a refreshing feeling.

And above all, there is the joy of operating it. BEAT aims to create a car that is fun without any reason and can be used as a commuter in the city.

So, first of all, we chose a fully open two-seater body shape that is suitable for active personal use.

In a compact size, we have densely combined a low center of gravity M.R. (midship engine, rear drive) that provides high stability and excellent maneuverability. With this fully open two-seater midship packaging, BEAT has obtained an unprecedented driving experience that feels like an amusement, where people, cars, and nature are one, along with a cute style. However, no matter how much fun is prioritized in this car, there is no compromise on safety performance or fuel economy. Advanced technology has been generously poured into it, and it is equipped with the first SRS airbag system for a minicar (available on some vehicles), and maintains a high level of fuel efficiency. By wrapping advanced technology in the software of "fun," BEAT has created a completely new, warm relationship between people and technology.

BEAT 誕生



Audio system, aluminum wheels, fuel lid, exhaust pipe finisher, cigarette lighter and ashtray are available as custom equipment.



Development Leader

"The car society is showing a trend towards diversification, but is it possible to create a car that can express a sense of spaciousness and richness that has never been seen before? We discussed this issue extensively. We came to the conclusion that while we do not reject the idea of a convenient space for travel, it would also be good for the car to have a familiar and enjoyable space for travel. To achieve this, we aimed to create a car that was familiar and enjoyable without any logic, and all of our development team, which was made up of relatively young staff, focused their attention on this point. We decided on the concept of this car as a "high-density personal open car." We boldly incorporated technology appropriate for the coming era, and developed a fully open two-seater midship car with a strong presence that can be integrated into your life like a tool."

BEAT is like a friend that makes your car life more enjoyable .



What we wanted for BEAT was a free and uncomplicated enjoyment that wasn't tied down by the value standards of cars up until now. So we took on the challenge of developing it by straying from the idea of car manufacturing and looking at it from the perspective of a tool for simply enjoying life .



The cute two-seater style catches your eye wherever you are. Enjoy refreshing open-air cruising with the wind as your friend and the light as you play.

And the midship layout gives you a driving experience that strongly unites you with the car. Making the most of the advantages of being small, the BEAT has acquired a clear and friendly personality that larger cars cannot have . That's why the BEAT never overreaches itself. It doesn't compete in luxury either. It's like a friend that you can easily spend a long time with. The Honda BEAT. A more enjoyable life for you and your car begins with this one car .

EXTERIOR

An exuding sense of dynamism. A cute presence.

Styling that expresses the joy of driving throughout the entire car.

Exterior image sketch



The BEAT is a car that can be enjoyed without thinking too much. What we wanted to express with its exterior is the completely new driving pleasure that comes from its compact two-seater midship open-top car.

To achieve this, we thought it was important for the design to be not only unique, but also dynamic and to assert the car's driving performance. So we incorporated bold, dynamic lines into a solid form . Styling that is full of a sense of amusement , only possible with a car that prioritizes fun .

The audio system, aluminum wheels, and exhaust pipe finisher are available as custom-made equipment.



Exterior Design Team

"The joy of cutting through the wind with the car open and enjoying the sun. A sharp and lively image. The exterior design of the BEAT is a compilation of these elements. The entire body is composed of sharp lines that cut through the wind, further emphasizing the richness of the surfaces. Moreover, this impression is not limited to the form, but extends to the details such as the headlights, door mirrors and door handles. Please take the time to appreciate and appreciate this fresh form."

INTERIOR

A sense of openness and envelopment. And a unique look.

An interior that evokes the world of driving that only an open-top car can offer.

Interior image sketch



The most important thing about an open-body interior is to give the passengers a refreshing feeling of openness and a gentle feeling of envelopment.

Only by achieving both can the person, the car, and nature become one.

Of course, BEAT is particular about this. A sturdy crossbar instrument panel.
A two-tone color interior divided into upper and lower parts. We paid particular attention to design and color to create an interior that allows you to truly enjoy open-air cruising.
And one more thing. Considering that there is no roof, an impressive look is also essential.
The light and distinctive meter and seats further accentuate the fun individuality.
When you sit in this cockpit, even the scenery will look different than usual.



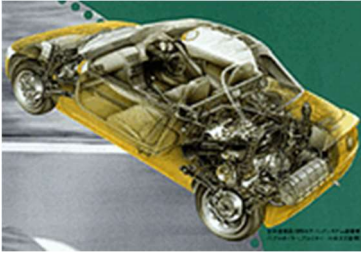
Vehicle equipped with SRS airbag system (audio system is available as an order)



Interior Design & Fit-out Team

"In order to convey a new world of driving pleasure that combines the exhilaration of an open-top car with the pleasant driving feel of an M&R car, the interior design aimed to achieve both a sense of openness and a feeling of being enveloped. Based on a crossbar instrument panel that gives the impression of a sturdy vertical and horizontal framework and firmly embraces the low driving position, the two-tone color coordination creates a soft and open space. In addition, the distinctive independent three-eye meter with a light feel, bucket seats with a refreshing upholstery, and push-type air conditioning mode switches are among the carefully selected equipment that further accentuate the lively and fun personality of the BEAT."

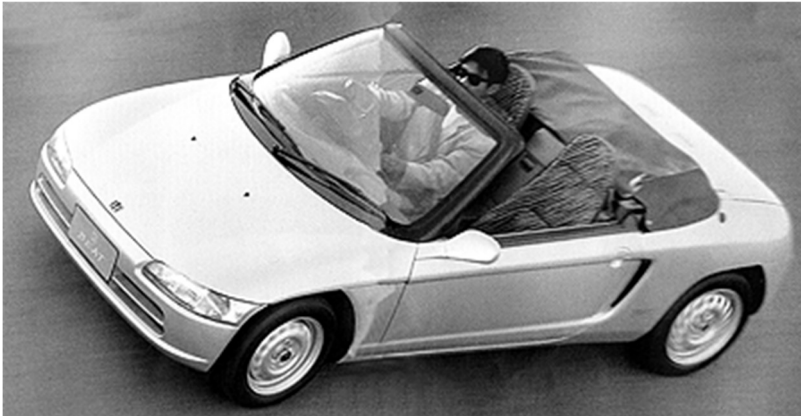
MIDSHIP



Overall perspective view/Vehicle equipped with SRS airbag system (rear spoiler and aluminum wheels are optional)

A full-fledged M/R layout built into a small body. Our goal was to create driving performance that is perfectly linked to the driver's will. We

wanted to create a car that allows the driver to fully enjoy the fun of being one with the car. To achieve this, the BEAT uses the same M/R system as the NSX. This engine layout and drive system not only provides excellent power performance, but also braking performance and handling stability. The suspension is tuned to maximize the excellent driving performance of the M/R. To match this, different sized tires are used front and rear, and a four-wheel disc brake system has also been introduced, a first for a minicar. The car handles in a way that is faithful to the driver's will.



Vehicle equipped with SRS airbag system (audio system is available as an order option)



Chassis Development & Road Test Team

"Our aim was to bring out the best in a midship layout and to embody the joy of driving. So we carefully adjusted the basic specifications, such as weight distribution and center of gravity height, and then adopted different-sized tires for the front and rear that were appropriate for the weight distribution, and developed

the suspension geometry to bring out the full performance. In order to achieve the desired weight distribution, we also took measures such as equipping a spare tire at the front, and set the seat layout so that the passenger weight is distributed evenly between the front and rear. We achieved a brisk ride."

ENGINE

The newly developed 660 MTREC 12-valve engine's highly sensitive response makes it fun to drive.



MTREC12VALVE 64PS/8,100rpm
6.1kgm/7,000rpm(NET)

Midship amusement. It is a car that prioritizes the fun of driving.

To achieve this, an engine with sufficient power, light weight, compact size, and low fuel consumption is required.

In addition, outstanding responsiveness that is directly linked to the driver's feelings is also required.

To meet this challenge, BEAT chose a naturally aspirated engine, and introduced a newly developed engine control system with multiple throttles and a completely new fuel injection control method.

660 MTREC 12-valve engine.

Along with highly sensitive response, it achieved a maximum output of 64 horsepower and a high level of economy with a 10-mode fuel efficiency of 17.2 km/L.





Engine and Transmission Development Team

"This time, we developed the car with the motto, 'Enjoyable to ride, drive and operate.' To achieve this, we focused not only on numerical values, but also on what humans can feel, such as a sharp response in the engine and torque that extends naturally up to high revolutions. In the transmission, we paid close attention to a well-connected ratio, snappy shifting and a smooth clutch. Because of this, when I got home, I couldn't distinguish between work and hobbies, and I couldn't spend as much time with my family or girlfriend as I wanted. I'm sure that if you drive this car, which has been put together with so much of our heart and soul, you will realize just how much fun it is."

BODY

Midship, full-open monocoque body that fully supports the potential of the BEAT.

We want to be able to freely control all the movements of the car. To achieve this, a solid body rigidity is very important. No matter how excellent the car's mechanism is, if the body that supports it is not solid, the potential cannot be fully realized. In addition to being related to driving performance, it also has a major role that can be said to be the basics of a car, which is to protect the occupants in the event of a collision. Moreover, the BEAT is an open body.

Since there is no roof, it is very difficult to ensure the rigidity of the body. Therefore, we developed the world's first* midship, full-open monocoque body designed using the latest computer analysis technology. The ingenious structure achieves extremely high rigidity without sacrificing weight or living space.

*Mass-produced car





Body Development Team

"With high rigidity and safety as our themes, we took on the challenge of creating the world's first * midship, fully open monocoque body. We gave top priority to the cabin, which is the driver's living space, and then designed the engine room and trunk. The cabin area has been reinforced with three pillars: an enlarged cross-section of the frame, double-structure side sills on the left and right, and a box-section floor tunnel. Furthermore, the efficient joining of each component ensures high rigidity and suppresses lateral sway and unpleasant vibrations. This body maximizes the crisp driving performance of the M.R."

SAFETY

The SRS airbag system (for the driver's seat) is also adopted (available on select vehicles), a first for a minicar.

Along with the exhilarating ride, we also paid special attention to safety.

A truly comfortable sense of unity between the driver and the car. This is not something that comes from simply an exhilarating ride or a comfortable interior space, but can only be achieved with the support of high safety. At Honda, we believe that "safety is what should be given the most importance regardless of class," and we are actively working on this theme even in minicars.

Above all, with the BEAT, we thoroughly pursued the basic performance of the engine and brakes to prevent accidents. Furthermore, we have taken detailed measures to protect the occupants in the event of an accident, such as adopting the first SRS airbag system and door beams in this class.



This is a composite photo of the SRS airbag system in operation. (Audio system, cigarette lighter & ashtray are available as custom equipment)



Safety Test Team

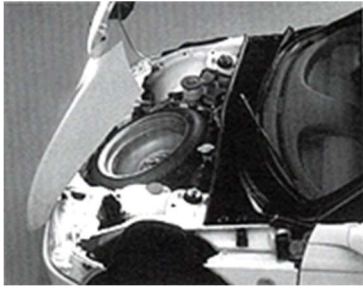
"Because we carry out so many crash tests, people at the company call us 'destroyers' and 'crushers.' But that hasn't stopped us from thoroughly analyzing safety. This time, we have adopted an SRS airbag system for the first time in a minicar, which has a highly reliable structure with an integrated system of collision sensors. However, we ask that all drivers drive safely and enjoyably without using this system. BEAT also uses door beams, seat belt warnings, etc. It is packed with a full range of safety equipment in a small body."

TECHNICAL NOTES



The exterior design not only expresses a unique look, but also asserts driving performance.

In order to give the body a large and wide impression, and to express the high driving performance of the M.R., the whole car is formed into a monolithic form with a sense of solidity, incorporating bold and dynamic lines. The side view is designed to emphasize the large air intakes, which are a hallmark of the M.R., with straight lines connecting the headlights to the air intakes in the rear fenders. The pillars and soft top are black. The vivid contrast with the body color creates an impressive flowing body line. The low bonnet, unique to the M.R. system, is cut off from the side, and the bonnet line is smoothly connected to the door mirrors. The door mirrors and round door handles are also designed to be integrated with the body. Furthermore, the headlights with integrated turn signals are wrapped around to the wheel arches. The styling is as if the unnecessary parts have been trimmed away by the wind that is blowing through it. The compact two-seater midship open-top allows you to feel a completely new driving pleasure with your whole body.



The side-cut bonnet creates a wide-looking body.

The opening and closing line of the bonnet is at the top of the front wheel arch on the side of the body. Furthermore, the M/R system and the small diameter tires used on the front make for a lower, wider-looking nose. The bonnet has a front hinge structure that opens from the bottom of the front window.

Emphasizing the M.R. Air intakes and outlets.

The air intakes on the body sides and the outlets on the rear end are proof of the M.R. system. They give a strong impression of the BEAT's brisk and nimble driving.

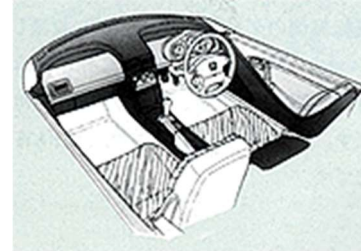
Manual soft top.

The BEAT soft top is a manual top that can be opened and closed by one person. It is lightweight and has excellent weather resistance. The PVC rear window can be opened, closed, and removed with a zipper. Not only can you perform maintenance on the engine with the top closed, but it also improves ventilation when the top is closed, making driving on sunny days more comfortable.



Audio system is custom-fitted

TECHNICAL NOTES



Two-tone interior
(vehicles equipped with SRS airbag system)

Achieving both a sense of openness and protection. High-density interior.

The feeling of openness that comes with driving with the wind as your friend is the real pleasure of an open-top car. The interior of the BEAT is designed to make you feel even more at one with nature. First of all, the entire interior is two-tone, including the top and bottom of the door linings and the upper and lower parts of the instrument panel. The dark gray gives a sense of firm support from the waist down, while the soft gray from the waist up gives a sense of spaciousness. In addition, the uniquely designed meter that is completely independent of the instrument panel, the crossbar instrument panel that emphasizes horizontal lines and crosses vertical lines, and the console that flows smoothly from the front to the center and then to the rear create a sporty space.



Independent three-eye meter layout creates a light and airy cockpit. A

three-eye meter layout is adopted, with the tachometer in the center, the speedometer to the right, and a

combination meter with a circular arrangement of the water temperature gauge, fuel gauge, etc. to the left. The highly accurate electric needle type tachometer and speedometer have red needles on a white background, improving visibility and giving the car a sporty feel. Furthermore, the meter panel is mounted on the steering column. The meter is completely independent from the instrument panel, giving it a unique design reminiscent of a motorcycle. Placing the meter forward enhances the sense of unity between the driver, steering wheel, and meter, giving the cockpit a mechanical impression and a light and airy look.

The crossbar instrument panel envelops each passenger with a sense of spaciousness and security.

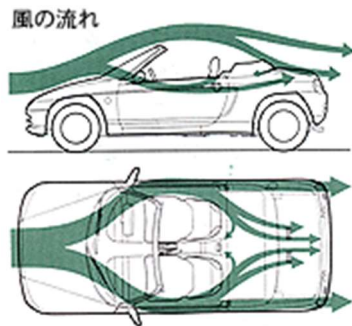
Function is elevated to design. The crossbar instrument panel is one of the things that most strongly expresses Honda's design concept. To ensure the rigidity of the body, the BEAT uses a box-structure floor tunnel with pipes running from pillar to pillar. The horizontal lines of the instrument panel are emphasized along with this, and the vertical lines of the console are crossed, creating a design that softly yet firmly envelops the driver and passenger. It creates a sense of firm rigidity and a spacious horizontal expanse.



Driver's seat

The bucket seats are designed to blend in with the interior and feature a unique skin design.

The seats are designed to give the impression of the freshness of the open-top and the lightness of the midship. The material is a jersey material that is gentle on the skin and has been treated to be flame-retardant and water-repellent. The skin pattern is designed to emphasize the individuality of the open-top body. The monochrome base is an impressive pattern with a zebra running refreshingly through the savanna. The seat form is a bucket type with an integrated headrest that enhances the sense of unity between the driver and the car, and the hip point is set extremely low. A sporty driving position is obtained. The cushioning material uses soft pads in the center of the seat and harder pads on the sides of the seat. It combines excellent holding power and a comfortable ride. The driver's seat can be slid 180 mm and reclined 5° forward and 10° backward, and the passenger's seat can be slid 130 mm. In addition, the three-point ELR seat belt is designed to be fastened via the seat belt guide on the side of the seat, and if the driver's seat belt is not fastened, a warning sound will be emitted for six seconds and a warning light will come on in the instrument panel.



Achieves wind flow that prevents unpleasant wind from being drawn in.

If the wind that circulates around the sides is drawn into the cabin when driving with the top down, the passengers will feel the wind blowing in from behind, causing discomfort. However, completely shutting out the wind would mean that you would not be able to enjoy the sense of freedom that comes with an open-air experience. The ideal wind flow is one that allows a refreshing breeze to flow from the front to the rear, while keeping the center of the cabin as windless as possible. BEAT appropriately sets the inclination and roundness of the front windshield. Despite not having a front quarter window, it has achieved a wind flow that blows comfortably in the face from the front.

Ventilation flow diagram



Air conditioning (standard equipment) enhances comfort when driving with the top down.

To ensure that you can always enjoy a comfortable open-air drive, the BEAT comes standard with a manual air conditioning system. The heater capacity has been significantly increased to cope with cold days in particular. Moreover, the air distribution is set to envelop both the driver and passenger in comfortable warmth. The mode switch is a push-type, a first for a minicar. The high-quality control panel harmonizes with the high-density interior.

The design also takes unexpected rain into consideration.

The computer unit is installed on top of the center bulkhead to prevent flooding. The meters, switches, etc. are also waterproofed in many places. In the unlikely event that rain falls when the cabin is open, it will be ready for use.

Left-right offset interior gives the driver more space.

The center tunnel and driver's seat are offset 25mm to the left in an asymmetrical layout. This space allocation creates more space for the driver.



For vehicles equipped with SRS airbag system

Sporty small diameter steering wheel.

Equipped with a small diameter $\phi 360\text{mm}$ three-spoke steering wheel. Gives a sporty feel. A $\phi 360\text{mm}$ four-spoke steering wheel is also used for vehicles equipped with the SRS airbag system.

Multi-functional storage space.

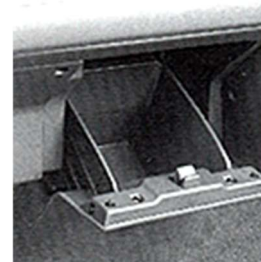
Three storage spaces have been provided by cleverly utilizing the interior space. An assistant box with space for six CDs is installed under the dashboard. A document box with a key is installed behind the passenger seat back. This space can store A4-sized items and is convenient for storing vehicle inspection certificates, maps, etc. The rear console located between the left and right seat backs also has a cassette tape holder and can store six tapes.



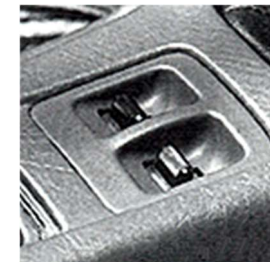
Rear console



Document Box



Assistant Box



Power window switch

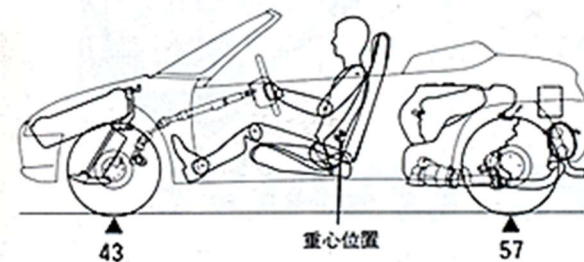
Power windows are standard equipment.

Because the open body requires frequent opening and closing of windows, power windows are standard equipment. The switch is installed in the center console. Both can be operated from either the driver's seat or the passenger seat.

Interior lamp

Installed at the bottom of the dashboard on the driver's side. Turns on and off when the door is opened and closed. Lights up the floor area and is convenient for getting in and out at night. Can also be turned on and off with a switch.

!! TECHNICAL NOTES !!



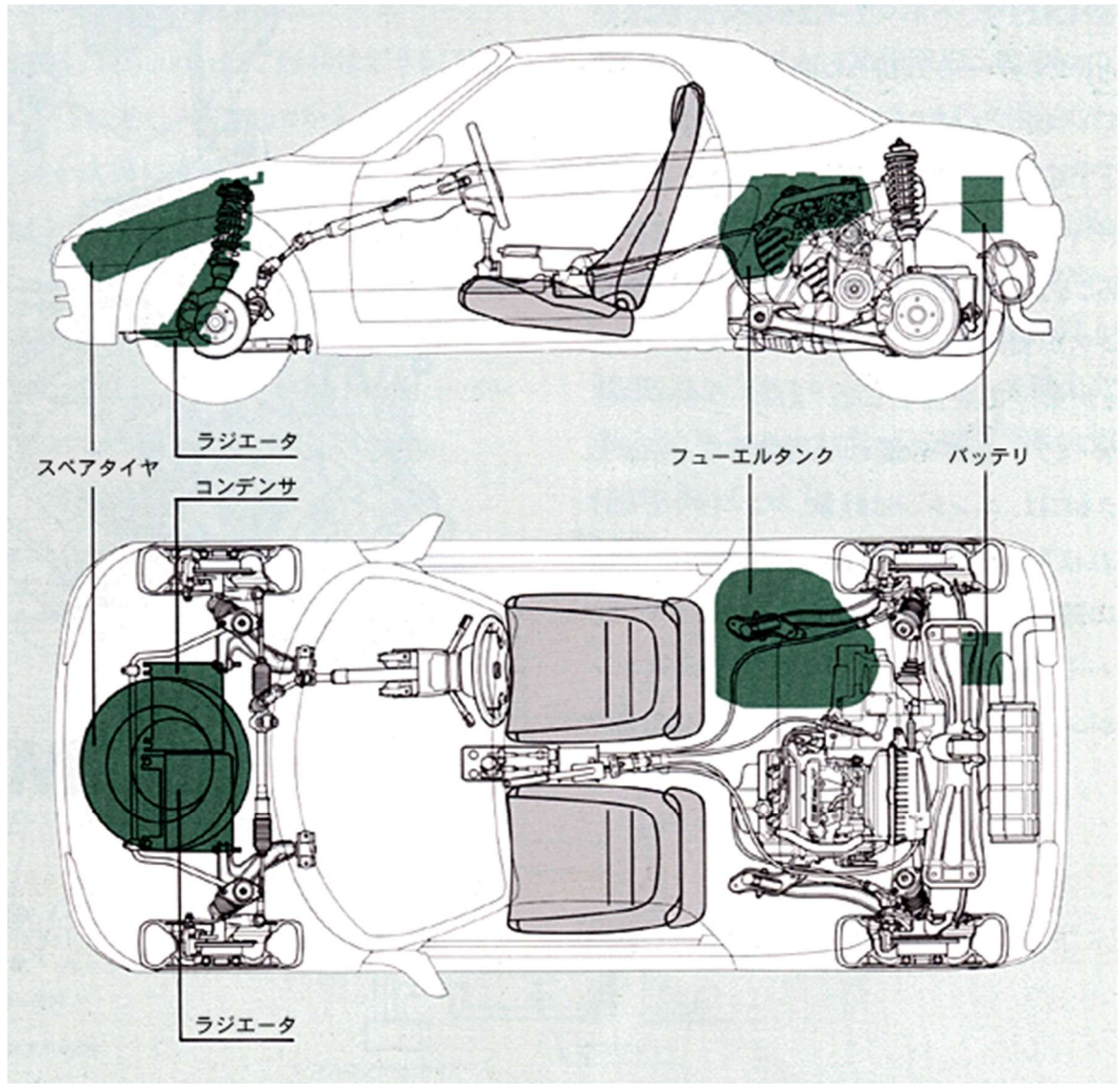
A low center of gravity and ideal front-rear weight distribution. The M/R system creates a strong sense of unity between the driver and the car. The car runs, turns, and stops exactly as the driver intends, as if the driver and the car were one. We want this car to be full of the joy of driving, and to be able to enjoy a fun drive without any excuses. That's why BEAT chose M/R for its engine layout and drive system. By thoroughly exploring the basic performance,

we arrived at this system that achieves a low center of gravity and ideal front-rear weight distribution. Despite its compact body size, the high-density packaging that incorporates this authentic layout gives BEAT extremely high performance and controllability.

A clever packaging that realizes M.R. in a compact body.

Although the M.R. system has high basic qualities, there were big problems that had to be solved before it could be introduced to the BEAT. It is not easy to realize M.R. in this compact body size, and in an open-top format, without compromising driving performance while ensuring adequate living space even for a two-seater. Honda overcame this difficult challenge with clever packaging that was based on a transverse engine and involved ingenious placement of the transmission, fuel tank, radiator, battery, etc., and body frame layout. With an extremely low center of gravity of 440mm (unladen), an ideal body balance of 43:57 front-to-rear weight distribution (with one passenger) was achieved. As a result, the car achieved excellent traction performance that accurately and efficiently transmits the engine's power to the road surface as driving force, as well as handling stability that brings about light and stable cornering performance. Furthermore, the front-to-rear load change is kept small during braking, efficiently demonstrating the braking ability of the front and rear wheels, greatly increasing the driving potential.

Engine and chassis layout diagram



Vehicles equipped with SRS airbag system

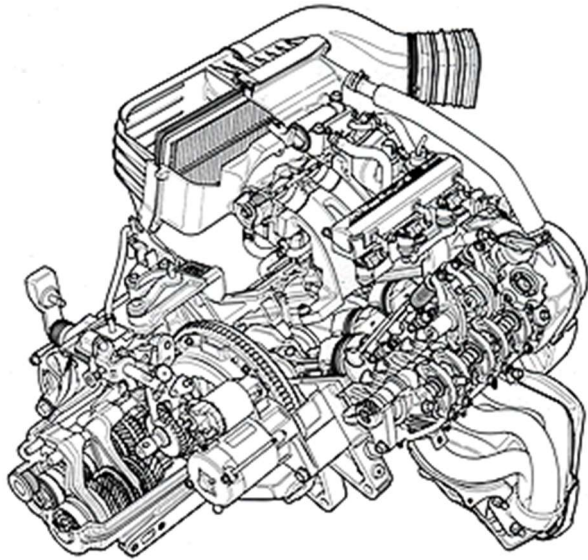
TECHNICAL NOTES



The newly developed 660 MTREC 12-valve engine was born from the application of F-1 engine technology.

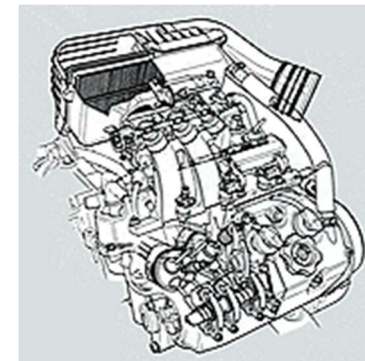
BEAT aimed to realize a light and exhilarating ride that makes the driver and the car feel one. To achieve this, the power unit was required to have not only high power but also a snappy response that directly connects to the driver's feelings. Therefore, the first requirement was that the engine be naturally aspirated, which provides a natural and sharp response without relying on a turbocharger or other supercharging system to obtain the necessary power and torque. In addition, the engine must be lightweight and compact to fully utilize the excellent dynamic performance of the lightweight midship. Of course, ensuring high fuel economy is also an indispensable theme. A high-response, high-power naturally aspirated engine with the smallest possible displacement, which is advantageous in both weight and fuel efficiency. As a technical approach to meet this challenge, BEAT's engine development project team focused on the intake system and fuel injection control system of F-1 engines, which demonstrate extreme intake efficiency and show extremely sharp response to throttle movement. We have developed a new high-response engine control system, MTREC, which utilizes Honda F-1 technology and employs multiple throttles and two fuel injection control map switching methods. With this revolutionary system at its core, we have incorporated a number of high-revving, high-output technologies to create the all-new 660 MTREC 12-valve engine, a three-cylinder engine with a total displacement of 656 cm³. This further refines the sharp response that only a naturally aspirated engine can provide, and achieves a

maximum output of 64 horsepower, despite being a naturally aspirated 660 engine. Moreover, it also achieves a high level of fuel economy, with a 10-mode fuel economy of 17.2 km/L.



660 MTREC 12VALVE MTREC (

M-Trek) = Multi Throttle Responsive Engine Control System Total displacement 656 cm³ Maximum power (net value) 64 PS/8,100 rpm Maximum torque (net value) 6.1 kgm/7,000 rpm 10 mode driving fuel consumption rate (Ministry of Transport approved value) 17.2 km/L 60 km/h constant speed driving fuel consumption rate (Ministry of Transport reported value) 27.0 km/L * "Net" is measured with the engine installed in the vehicle.



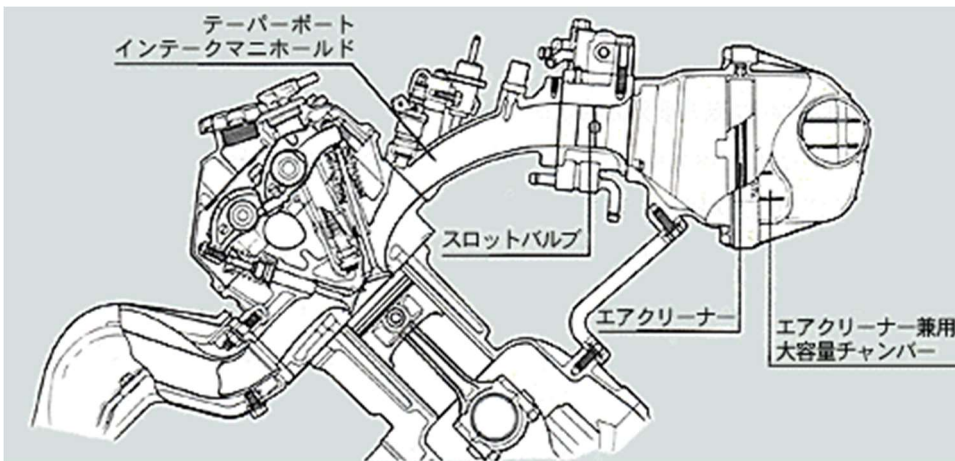
Triple throttle structure diagram

A triple throttle dramatically improves intake efficiency.

The basis of high performance is how quickly and in large quantities of air can be drawn into the combustion chamber, and one of the features of the MTREC is the introduction of a multiple throttle to improve this intake efficiency. Mass-produced engines generally have a single-bore throttle body. In contrast, the newly developed 660MTREC 12-valve engine has a throttle valve installed in each cylinder's intake manifold, just like an F-1 engine. In addition, a triple throttle body with integrated 3-bore valve operation has been adopted to perform throttle synchronization accurately with a simple mechanism. This has significantly enlarged the throttle bore diameter to $\varnothing 36\text{mm} \times 3$, and by installing a large-capacity chamber that also serves as an air cleaner just before the intake manifold, intake interference between each cylinder has been reduced, dramatically improving intake efficiency. High power and high torque have been achieved. In addition, this layout allows the length from the throttle valve to the combustion chamber to be shortened, so the amount of intake air into the combustion chamber quickly follows changes in the throttle opening. It also contributes to improved throttle response.

Tapered port intake manifold that draws out high intake pulsation effect and inertia effect.

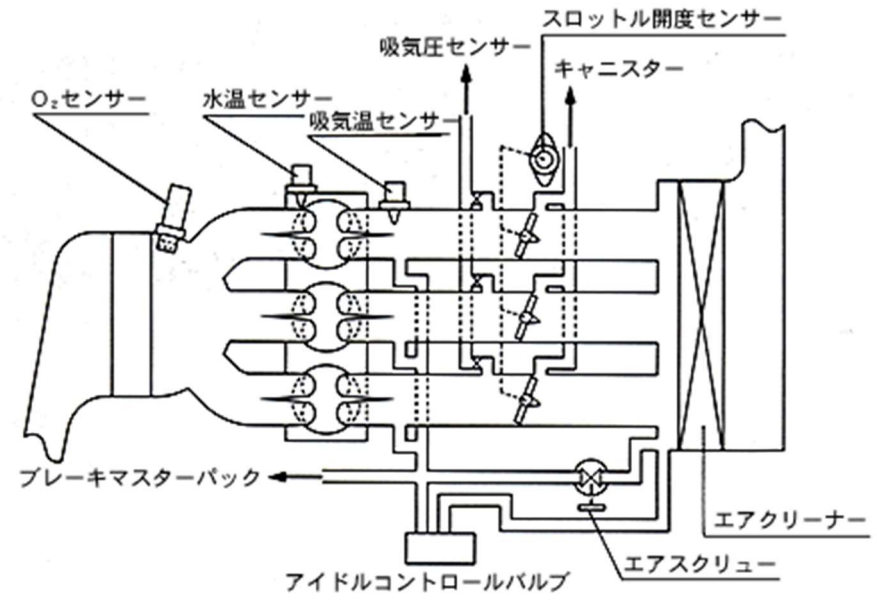
In order to utilize the intake system pulsation effect and inertia effect of the triple throttle to draw air into the cylinder efficiently and smoothly, the intake manifold has been thoroughly tuned. A new tapered port intake manifold has been developed that is 200mm long, as straight as possible in shape, and gradually changes in inner diameter from $\varnothing 36\text{mm}$ to $\varnothing 29\text{mm}$. At the same time, the port cross section on the exhaust side has been enlarged, making the flow from intake to exhaust as smooth as possible. This contributes greatly to achieving high power, high torque, and high response.



Cylinder and manifold cross section

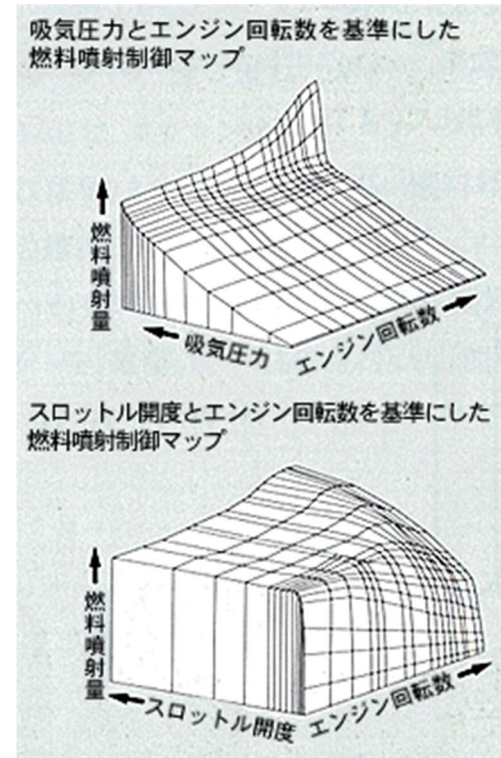
A large-capacity chamber that doubles as an air cleaner to effectively utilize the triple throttle function.

Even if the intake manifold has a shape and length that creates a high intake inertia effect and pulsation effect, if there is intake resistance on the way to it, you cannot expect to improve intake efficiency or response. Therefore, in this MTREC engine, a large-capacity chamber that doubles as an air cleaner, 5L, the same as a compact car, is installed just before the intake manifold. As a result, the area before the intake manifold is set up almost the same as an open-to-air state without an air cleaner, maximizing the excellent intake efficiency and high response that the triple throttle provides.



Triple throttle layout diagram

TECHNICAL NOTES



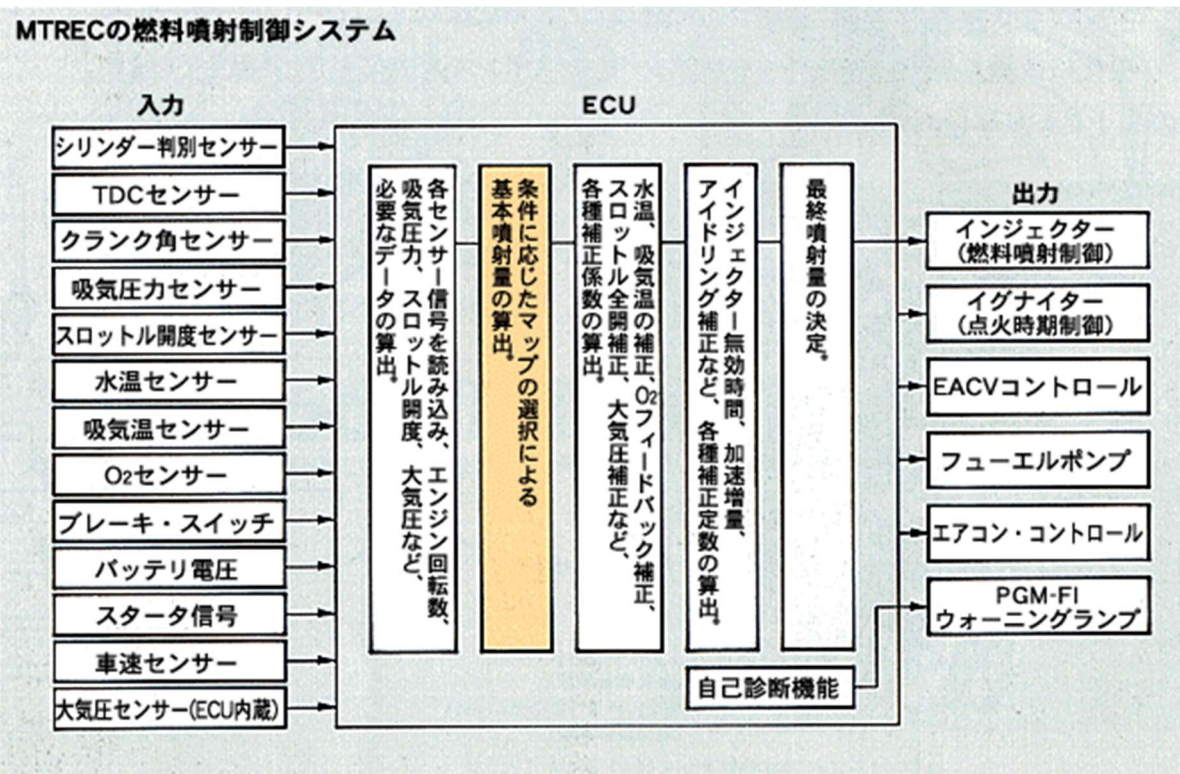
A fuel injection control map switching method that achieves both sharp throttle response and stable idling. PGM-FI

detects various conditions during driving, instantly calculates the optimal air-fuel ratio based on that information, and accurately controls the amount of fuel injected. This highly accurate electronic fuel injection system is widely used in mass-produced cars, including Honda F-1, but another feature of MTREC's mechanism is the control method of this fuel injection amount. Conventional PGM-FI for mass-produced engines has used a "fuel injection control map based on the intake pressure in the intake

manifold and engine speed" to ensure the appropriate fuel injection amount under a wide range of driving conditions. On the other hand, since stability during idling is not necessary for F-1 engines, a "fuel injection control map based on the throttle opening and engine speed" is used, which provides quicker fuel tracking during sudden acceleration. The MTREC engine, which has the same multiple throttles as the F-1 engine, can achieve high response by using the same control map as the F-1 engine, but sacrificing stability during idling is not allowed. What we are trying to develop is not a racing engine, but an engine for passenger cars. Therefore, in order to achieve both, we have established a world-first control method for mass-produced passenger car engines that combines these two fuel injection control maps and switches between them depending on the conditions. We have created a system that can always instantly inject the optimal amount of fuel under all conditions.

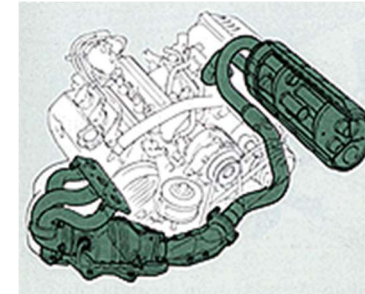
Switching control by high-precision electronic technology.

In addition to idling, at constant speed, gentle acceleration/deceleration, and low load, the "fuel injection control map based on intake pressure and engine speed" is used. During rapid acceleration/deceleration and high load, the "fuel injection control map based on throttle opening and engine speed" is used. MTREC electronically controls the switching between the two maps according to the throttle opening, engine speed, and throttle movement. This switching control enables more accurate fuel supply using the high-precision areas of each control map, and improves response by providing faster fuel volume response to throttle movement from partial to full throttle. In addition, MTREC's ECU (electronic control unit) is the first in this class to have a built-in atmospheric pressure sensor, and the O₂ sensor is equipped with a heater to keep the element temperature constant and always provide stable air-fuel ratio feedback. We have carefully selected only those sensors with extremely low error, including the throttle sensor, to create a highly accurate and reliable engine control system.



Intake and exhaust efficiency and combustion efficiency are thoroughly improved. Tuned for high performance.

The valve system uses large-diameter valves, $\phi 24.5\text{mm}$ on the intake side and $\phi 21\text{mm}$ on the exhaust side, with both the valve lift and valve opening angle set relatively large. Excellent intake and exhaust efficiency is achieved by taking full advantage of the effects of MTREC. In addition, the combustion chamber is a compact pent roof shape, and the piston head is flattened. By improving combustion efficiency, a high compression ratio of 10.0 has been achieved, even with regular gasoline specifications. This provides high power, high torque, and good fuel economy.



Triple Exhaust Manifold

The exhaust system contributes to high power output and produces a pleasant exhaust sound. In

order to utilize the exhaust pulsation effect to ensure a quick exhaust, a stainless steel triple exhaust manifold with a large bend in the pipe and sufficient length is adopted. The exhaust pipe has also been made thicker to improve exhaust flow and achieve high power output. In addition, exhaust sound was also an important element for the BEAT in making the ride more pleasant. Therefore, thorough tuning, such as increasing the silencer capacity, has been carried out to achieve high soundproofing performance while producing an exciting exhaust note.

Response to high revolutions and high power output, and heat countermeasures.

With the introduction of MTREC, the engine body was based on the 660 Hyper 12-valve engine, but thorough review was carried out in detail, focusing on response to high revolutions and high power output, and heat countermeasures. Except for the cylinder block and crank, almost everything was redesigned. <

Main response to high revolutions and high power output> ● Valve spring load increased. ● Connecting rods and metal parts strengthened. ● High oil circulation performance is ensured by expanding the oil pan capacity and lowering the oil level. <Main heat countermeasures> ● The same material as the 1.6L DOHC VTEC engine is used to improve the heat resistance of the piston. ● The radius of the back corner of the piston head has been enlarged to improve the heat dissipation of the piston ring. ● A water jacket is installed so that the cooling water can circulate to the bottom of the exhaust port, suppressing the rise in exhaust temperature. In addition

, the capacity of the AC generator has been increased, making it possible to downsize the battery and making the vehicle lighter as a whole, improving the potential in total.

A snappy shift feeling. Short-shift-stroke 5-speed manual transmission.

In order to realize the fun of driving by taking advantage of the engine's characteristics, the feel of the transmission, which can be considered an interface with the driver, is one of the important factors. In order to obtain a snappy shift feel that allows you to shift quickly with your wrist, the BEAT uses a short-stroke 5-speed manual transmission with a wire-change system that has low friction and a shift stroke of 40 mm, the same as the NSX. By incorporating the know-how of the NSX, such as reducing the moment of inertia of the clutch disc and reducing the synchro load, we have achieved light operability despite the short stroke. In addition, sufficient rigidity is ensured to suppress the rattling of the shift lever, providing an operation feel similar to that of a direct shift with a click. Of course, the gear ratio is a close ratio. You can enjoy driving that makes effective use of the engine's power and torque. You can bring out a sporty driving feeling.

Hydraulic clutch for a light and smooth feel. The hydraulic clutch allows for greater freedom in settings compared to a wire-type clutch, optimizing pedal force and shortening pedal stroke for a smooth feel.

Numerous measures have been implemented to make the most of the engine's characteristics.

The flywheel has been made lighter to ensure the engine's high response without compromising it. Furthermore, the same diaphragm spring with balance weight as the 1.6L DOHC VTEC engine has been adopted to improve the clutch feeling at high revolutions. In addition, the clutch has ample capacity and is strong enough.



Front strut and rear dual-link strut suspensions support the driving performance of the M.R.

The suspensions that support the light driving are equipped with struts in the front and newly designed dual-link struts in the rear. High-damping dampers, firm springs, and increased spring rates for the damper mounts have been adopted. In addition, thorough tuning has been implemented to maximize the excellent driving performance of the M.R. The front and rear suspensions are simple, but have achieved high-level potential. In addition, by adopting a method in which the body frame structure and layout are determined after optimizing the suspension geometry, there is no interference with the link arrangement, and the rigidity of the mounting parts is sufficiently secured, making this a system that matches extremely well with the body.

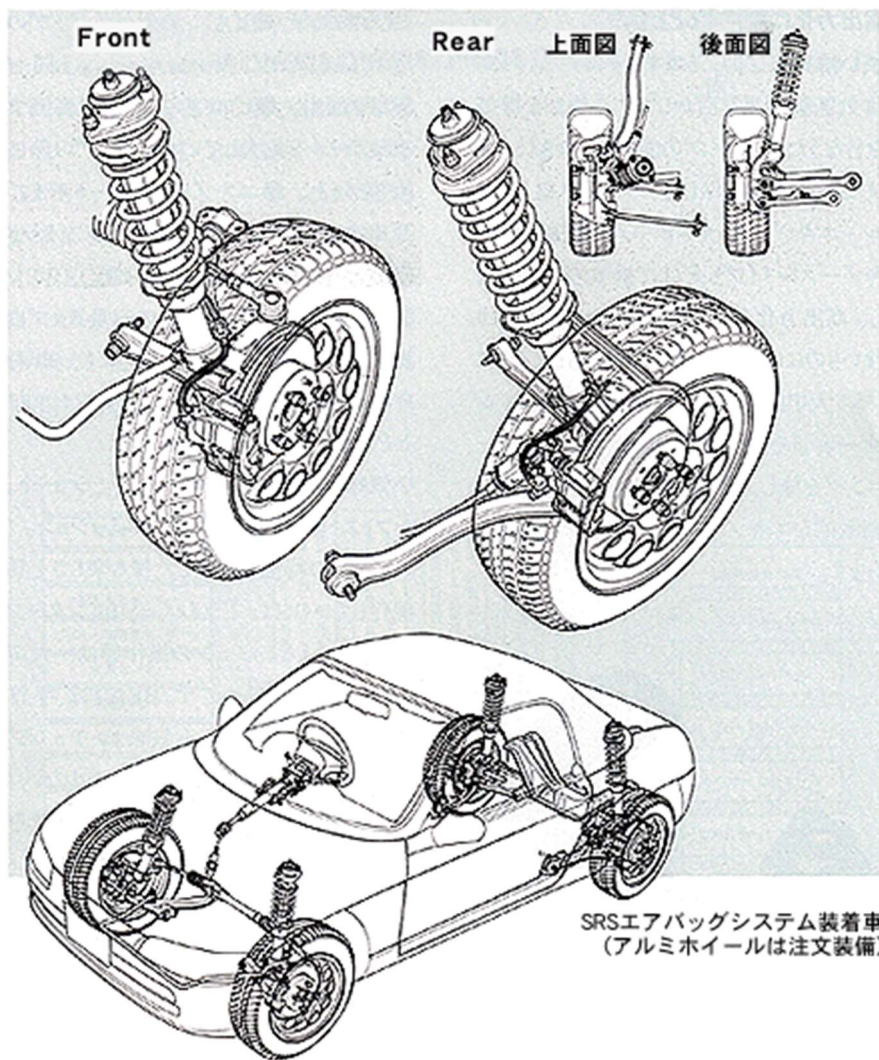
<Front strut suspension>

The adoption of high caster and short trail provides excellent straight-line stability and a linear and solid steering feeling. In addition, negative scrub is set to improve steering response while maintaining high stability. The steering gearbox is also high ratio, realizing light steering and turning. On the other hand, to obtain crisp response to steering operation and linear steering feeling, high mounting rigidity of the lower arm is required, and this rigidity is also ensured at a high level by adopting a lower arm rod that connects the left and right mounting points. The suspension setting creates a strong sense of unity between the driver's operation and the movement of the car.

<Rear dual link strut suspension>

Based on the strut type, the lower arm and radius arm are separated, and a slightly longer control arm is

laid out almost parallel to the upper rear part of the lower arm. This link arrangement sets the tire to always be in a stable direction weak in against changes in side force, brake force, and driving force. The toe change is optimized to obtain high stability when cornering, while the rebound stroke is extended to improve road holding. In addition, the mechanical compliance that smoothly releases the tire to the rear when bumping improves ride comfort. This suspension system provides excellent dynamic stability and is well suited to the M/R layout.





Different diameter tires

Different diameter tires for front and rear improve straight-line stability and cornering performance.

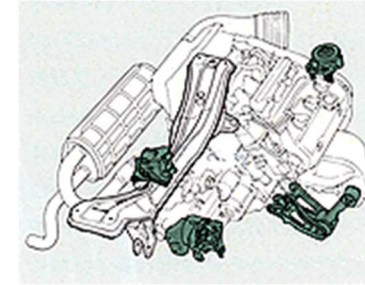
To fully utilize the high maneuverability brought about by the M/R system, different diameter tires are used for front and rear, with a combination of 13x4 1/2J wheels and 155/65R13 73H tires on the front and 14x5J wheels and 165/60R14 74H tires on the rear. Thorough tuning was carried out, including the compound and structure. Considering the front/rear weight distribution, the balance of cornering power and lateral rigidity applied to the front and rear tires, the grip performance of the rear was set higher than that of the front, improving straight-line stability and cornering performance.



Deceleration $G1.0+\alpha$. A four-wheel disc brake system that provides the highest level of braking performance.

The M/R layout and low center of gravity keep the front-rear load change during braking to a minimum,

allowing for efficient braking force. Combined with the adoption of four-wheel disc brakes, the first for a minicar, with 12-inch front and 13-inch rear, it achieves top-level braking performance of deceleration $G1.0+\alpha$. It is a high-potential brake system that provides a relaxed ride. In addition, the low brake pedal ratio and optimized master power specifications provide a high-rigidity, highly linear brake feeling.

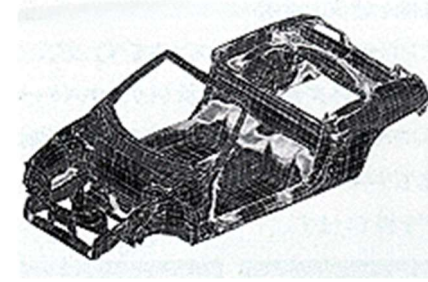


4-point engine mount system

Four-point engine mount for crisp handling.

A four-point engine mount system is used, which adds a torque rod to the three-point support of the rear engine mount, transmission mount, and side mount. To further enhance the excellent handling, the system is designed to minimize changes in vehicle behavior caused by torque fluctuations during acceleration and deceleration, while maintaining a sense of unity between the engine and body.

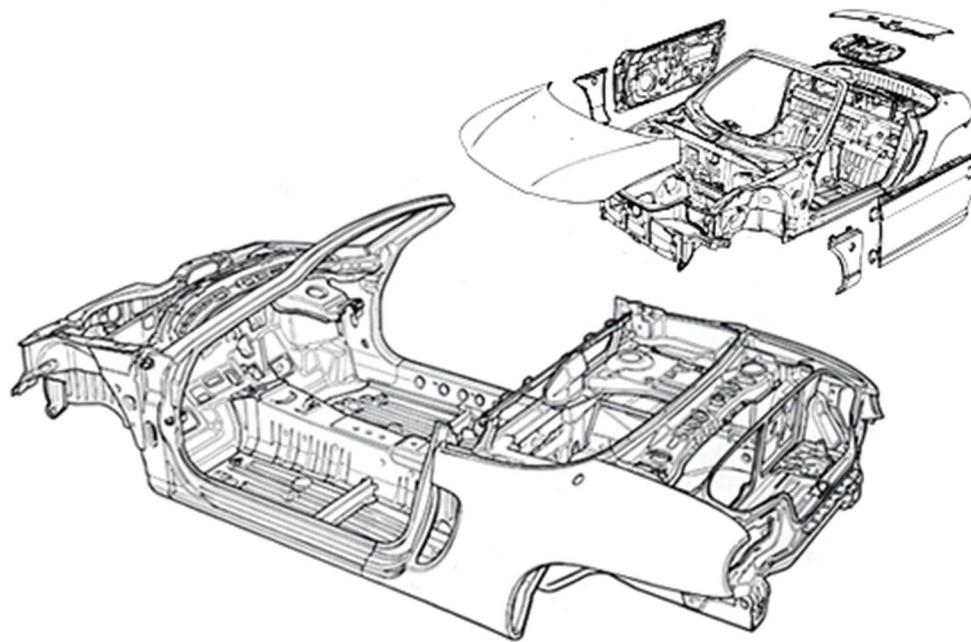
TECHNICAL NOTES



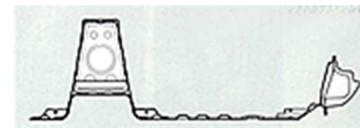
Computer-aided stress analysis

A midship, fully open monocoque body that combines high rigidity and light weight.

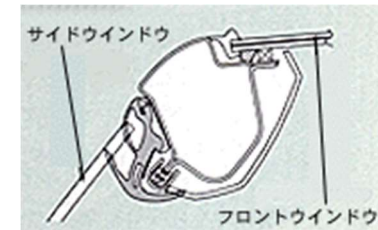
If sufficient body rigidity is not ensured, no matter how high-performance the mechanism, its potential will not be fully realized. Moreover, the rigidity of the body is greatly related to various performances of the car, such as basic driving performance, as well as collision performance in the event of an accident. However, if the cross-section of each component is made unnecessarily large in order to ensure body rigidity, the interior will become narrow, and on the other hand, if we rely solely on plate thickness, the car will become heavy. It is necessary to ensure adequate living space while increasing body rigidity and minimizing weight increase. With a compact-sized open body, this becomes even more difficult to achieve. Therefore, Honda reviewed the frame itself and achieved a high level of strength for each component. Furthermore, by making full use of computer analysis, we realized a body frame layout that suppresses weight increase and ensures adequate living space. We developed a highly rigid monocoque body exclusively for midship open cars.



Midship, fully open monocoque body



Highly rigid floor tunnel and side sill cross section

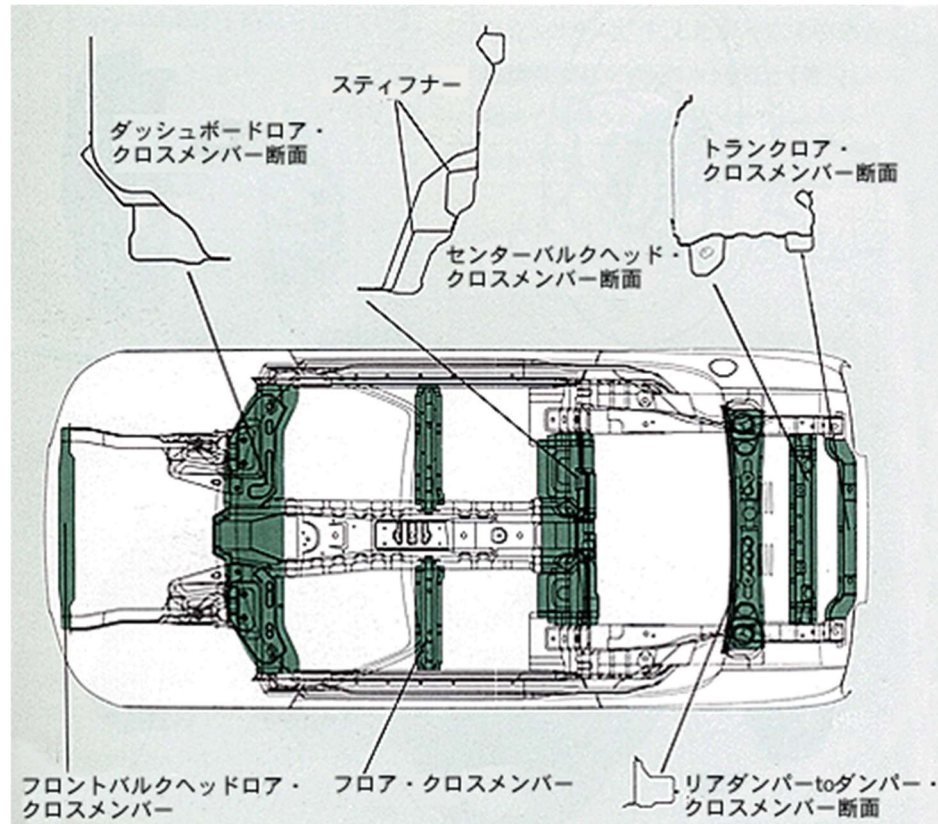


Thoroughly improved bending and torsional rigidity.

To maximize the driving potential, it is necessary to achieve high levels of strength against bending and torsion. However, in the case of an open body, it is extremely difficult to increase these rigidities because there is no roof. Therefore, BEAT solves this problem by thoroughly increasing the rigidity of the floor tunnel and side sills. The floor tunnel adopts a box cross section with a closed bottom, and the side sills are also made thicker and have a double structure with a box cross section reinforcement inserted, and are extended forward and backward. In particular, the rear is extended to the wheel arch. As a result, it achieves bending and torsional rigidity equal to or greater than that of a small open body. In addition, the front pillars have a generous thickness and cross section, and stiffeners are placed at the base to minimize lateral sway and unpleasant vibrations.

Effective use of reinforcing materials.

The BEAT employs a skeletal layout that combines increased plate thickness in key areas with effective use of reinforcing materials in areas subject to force. Specifically, cross members are placed in the front dashboard lower and between the rear damper bases, and pillar-to-pillar steering hanger pipes are also used. Furthermore, there is a generous amount of overlap at the joints between the front and rear of the frame. These features have resulted in a highly rigid body that allows the M/R to be fitted into a compact body size while still providing adequate living space.



Excellent sound insulation and heat insulation.

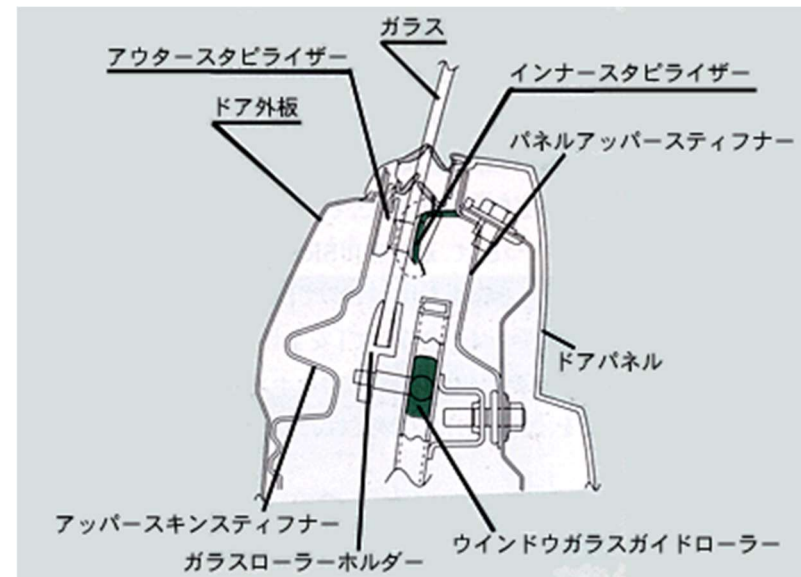
In the M/R system, where the engine is located directly behind the seats, it is also important to prevent the sound, vibration, and heat generated by the engine from being transmitted into the cabin. Therefore, soundproofing material is used under the storage space of the hood, and the center bulkhead is double-walled, etc., to ensure sound insulation and heat insulation.

Rust prevention treatment applied to every corner.

To achieve a long-life body, we not only use cathodic electrocoating, which has high rust prevention capabilities, but also devise a structure that allows electrocoating to be applied to every corner of the body cross section, and apply a generous amount of rust prevention wax. This maintains a beautiful appearance and excellent durability.

Side windows with minimal rattle.

To further enhance the exhilarating feeling of open-top cruising, the BEAT door design does not have a front quarter window. To improve the seal when the side windows are closed and to prevent unpleasant vibrations, stabilizers (glass holders) are installed to suppress glass shaking, and rubber bushings are used for the window glass guide rollers. This reduces rattle that tends to occur at the joints of the guide rails. The simple structure also reduces weight.

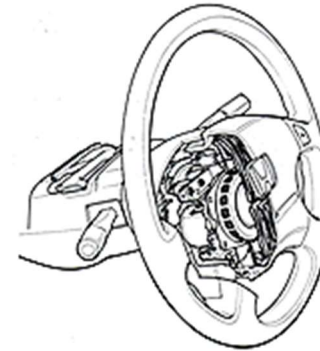


Door section



The first minicar to be equipped with an SRS airbag system (for the driver's seat) (available on select vehicles).

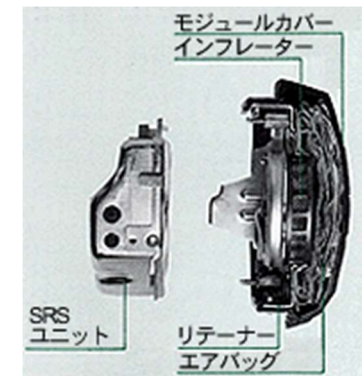
The basis for protecting occupants in the event of an accident is to wear seatbelts correctly. Based on this premise, the SRS airbag system has presented new possibilities as an occupant protection system. This system supports a correctly worn seatbelt and activates in the event of a strong frontal collision, such as when the driver's face hits the steering wheel and is injured, to protect the driver. Honda was one of the first to begin research and development, and in 1987 it was put into practical use as the first Japanese automobile manufacturer. Since then, we have continued to actively work on the evolution of technology, and have striven to make it compatible with a wide range of vehicle models. And now, as one of the results, the BEAT is the first minicar to be equipped with an SRS airbag system for the driver's seat. Honda's attitude of always considering "safety" as the most important issue in car manufacturing is reflected in this car as well.



SRS airbag system structure diagram

**Newly developed
Honda SRS airbag system (TYPE II).**

The BEAT is equipped with the newly developed Honda SRS airbag system (TYPE II). This system was recently completed by bringing together all the technical know-how that Honda has accumulated over many years regarding airbag systems. The system is made up of an SRS unit with a built-in sensor that detects the impact of a frontal collision, an inflator that generates nitrogen gas, and an airbag that cushions the impact to the face. All of these parts are centrally laid out in a single module, and are built into the pad in the center of the steering wheel.



[Type II Features]

A highly integrated system.

All airbag system functions are centrally located, resulting in an extremely simple and compact system. This not only increases vehicle mountability, but also provides various benefits, such as reliability, ease of maintenance, and cost reduction.

An electric ignition method established by Honda and with a proven track record.

Although the system is compact, the ignition method uses an electric method that Honda has established and proven to be effective. The electric ignition method, which operates through the process of "when the sensor detects an impact, power is supplied to the inflator's electric ignition device, which generates nitrogen gas and inflates the airbag," has earned a high reputation for its reliability due to its reliability in operation and the ability to constantly diagnose any abnormalities.

A highly reliable design has been established to ensure reliable operation.

■Always checks for abnormalities. A warning light has also been installed.

The system is equipped with a function to constantly check for abnormalities in the entire system. If an abnormality occurs, the warning light in the meter panel will notify you immediately.

■Guaranteed operating voltage.

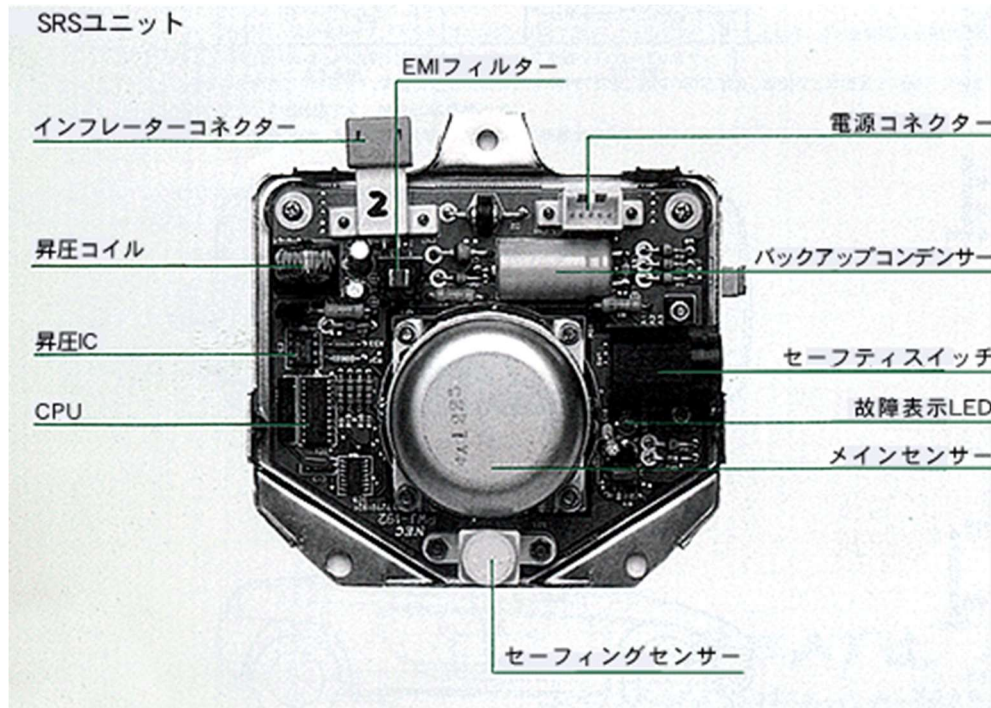
To compensate for electrical problems, a backup power source (capacitor) and a boost circuit to cover battery voltage drops are installed.

■Sensor system that detects impact during a collision.

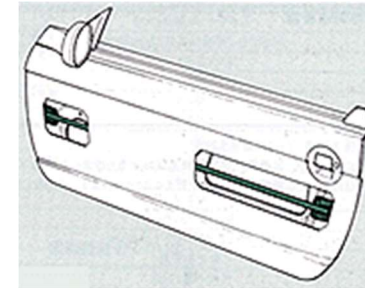
The main sensor uses a damping sensor that does not react to impacts from hands, etc. In addition, a safing sensor is installed to prevent malfunction in the event of a main sensor failure.

■Considerations are also given to safety when removing the unit. A

safety switch in the SRS unit that works in conjunction with the module fastening bolt to cut off the ignition circuit prevents malfunction when removing the unit. This improves maintainability.



SRS = Supplemental Restraint System (a passenger protection device that supplements seat belts) The SRS airbag system was developed on the premise that seat belts are fastened. Therefore, please be aware that the occupant protection effect can only be achieved if the seat belt is fastened correctly.



Door beam



We have enhanced safety equipment from various perspectives.

■Door beam

The doors are thin, which allows for a lighter body and sufficient interior width, but many considerations have been made to protect against side impacts. First, door beams are installed inside the doors. Honda's unique safety philosophy is reflected in other features, such as the generous amount of lap (overlap) between the door and the side sill and the larger door upper frame.

■Seat belt warning

A friendly design that warns the driver of the seat belt by a warning light and a warning sound in the meter.

■High-mount stop lamp (custom equipment)

Built into the rear spoiler. Improves visibility from following vehicles.

Other safety measures include the use of flame-retardant materials for the seats and a screw-type fuel cap.

Main Equipment

Comfortable equipment	Power windows	●	
	Air conditioning	● Manual	
	Side Demister	●	
	Push-type air conditioner mode switch	●	
instrument panel	SRS Airbag System (TYPE II) (Driver's seat)	◎	
	Small diameter 3 spoke steering wheel	●	
	Small diameter 4 spoke steering wheel	◎For SRS airbag system (TYPE II)	
	Independent 3-eye meter (with trip meter)	●	
	Buzzer to prevent forgetting to remove ignition key	●	
	Assistant Box	●	
Sheet	Seat covering	Jersey	
	Bucket seats	●	
	Driver's seat	Slide: 180mm Reclining: 5° forward, 10° backward	
	Assistant seat	Slide: 130mm	
	Headrest (integral)	●	
	3-point ELR seat belt	- With warning buzzer and warning light for forgetting to tighten (for driver's seat)	
	Seat-integrated seat belt anchor	●	
interior	Sun visor	●	
	console	front	●
		Center	●

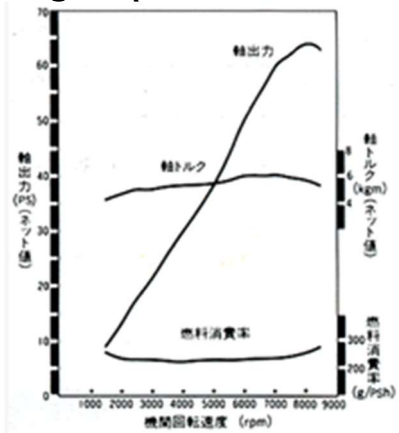
		Rear (with cassette holder)	●
	Document box with key		●
	Interior lamp (driver's side/with door switch)		●
	Footrest (driver's side)		●
	Fuel Lid Opener		●
Exterior	Soft top (folding type)		●
	Door beam		●
	Front laminated glass		●
	Side tempered glass		●
	Day/night switching rearview mirror (adhesive type)		●
	Irregular 2-lamp halogen headlights		●
	Independent side turns		●
	Body-colored door mirrors		●
	Body-color door handles		●
	Front wiper with mist mechanism (intermittent)		●
Driving related equipment	Stabilizer (front)		●
	4-wheel disc brakes (with servo)		●
	Steel radial tires	front	155/65R13
		rear	165/60R14
	Steel Wheels	front	13×4 1/2J
		rear	14×5J

● Indicates standard equipment © indicates equipped vehicles

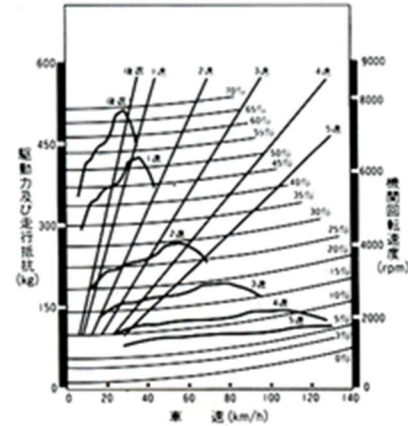
■ Vehicles equipped with fender mirrors and speed warning devices are also available.

■ Please note that the specifications and equipment may change without prior notice.

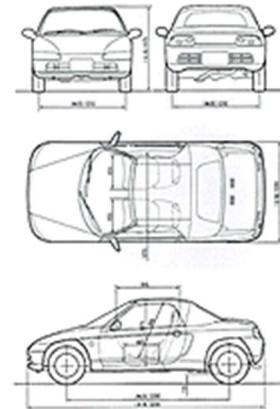
Engine performance curve



Driving performance curve



Four-sided view (unit: mm)



Main specifications

Body Type		2-door convertible	
Car name and model		Honda E-PP1	
transmission		5-speed manual	
Dimensions & Weight	Total length (m)		3.295
	Overall width(m)		1.395
	Total height (m)		1.175
	Wheelbase(m)		2.280
	Tread(m)	Before	1.210
		rear	1.210
	Minimum ground clearance(m)		0.135
	Vehicle weight (kg)		760
	Passenger capacity (persons)		2
	Room interior dimensions (m)	length	0.915
width		1.215	
height		1.015	
engine	Mounting position/drive wheel		Midship/rear wheel
	Engine type		E07A
	Engine Type		Water-cooled inline 3-cylinder horizontally mounted (uses unleaded regular gasoline)
	Combustion chamber type		Pent roof type
	Valve mechanism		SOHC belt drive, 2 intakes, 2 exhausts
	Total displacement (cm ³)		656
	Inner diameter x stroke (mm)		66.0×64.0

	Compression Ratio	10.0	
	Fuel supply system type	Electronically controlled fuel injection (Honda PGM-FI)	
	Fuel Pump Type	Motorized	
	Fuel tank capacity(L)	twenty four	
	Lubricating oil capacity (L)	3.0	
	Lubrication Method	Pressure feed type	
	Ignition device type	Fully transistorized battery ignition	
Performance	Maximum power (PS/rpm) net value	64/8,100	
	Maximum torque (kgm/rpm) net value	6.1/7,000	
	Fuel consumption rate (km/L)	10 mode driving (Ministry of Transport inspection value)	17.2
		60km/h constant speed (Ministry of Transport notified value)	27.0
	Minimum turning radius (m)	4.6	
	Braking distance (m) at initial speed of 50km/h	13.0	
Power transmission and running gear	Clutch type	Dry single plate diaphragm	
	Transmission type	Constant mesh type (reverse is selective sliding type)	
	Transmission operation method	Floor change type	
	Gear ratio	1st gear	3.428
		2nd speed	2.166
		3rd speed	1.576
		4-speed	1.172
5-speed		0.941	
Gear ratio	Recession	4.300	

	Reduction ratio	5.714
	Steering system type	Rack and pinion type
	Tires (front and rear)	155/65R13 73H · 165/60R14 74H
Main brake type and format	Brake booster	Vacuum boosting type
	Before	Hydraulic disc
	rear	Hydraulic disc
	Operating system and brake wheels	Dual system: 2 front wheels - 2 rear wheels
Suspension method	Before	McPherson system
	rear	McPherson system
	Stabilizer Type	Torsion bar type (front)

* Engine output is indicated as either a net or gross value. "Gross" is measured using the engine alone, while "net" is measured under almost the same conditions as when the engine is installed in a vehicle.

When measured using the same engine, "net" is approximately 10% lower than "gross" (according to the Japan Automobile Manufacturers Association).

Fuel consumption rates are values under specified test conditions. During actual driving, these conditions (weather, road, vehicle, driving, maintenance, etc.) will vary, so fuel consumption rates will vary accordingly.

PGM-FI is a registered trademark of Honda Motor Co., Ltd. MTREC is a trademark.

Type designation application values according to the Road Transport Vehicle Act ■Manufacturer/Honda Motor Co., Ltd.



The H mark Honda emblem represents Honda's identity around the world as a company that always delivers cutting-edge quality cars.