

RX-8



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MAZDA RX-8

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1. AT A GLANCE

Evolution of the Rotary Revolution

- New Mazda RX-8 evolves the revolutionary original, launched July 2003
- RX-8 is the only mass production car with a rotary engine
- RX-8 is the only sports car with rear-hinged rear doors
- Mazda RX-8 has no direct four-seat sports coupe competitor
- Almost 5,400 Mazda RX-8s have been sold in Australia since 2003
- Worldwide sales of the RX-8 topped 170,000 in April 2008
- Mazda has produced 1,981,283 rotary engines from the first in 1967 to March 2008

Positioning

- Sharper exterior styling heightens RX-8's visual appeal
- Interior changes improve useability and refinement
- Engine modified to bolster low- to mid-range response and high-end thrills
- Suspension modifications hone RX-8's impressive handling and balance
- Mazda RX-8 is available in two models: RX-8 Luxury and RX-8 GT
- RX-8 Luxury \$55,520 (6AT + \$1,645), RX-8 GT \$57,625
- GT handling upgrades and interior make it the driver's choice
- Luxury complete with sunroof, Bose[®] sound system, leather trim and more
- Luxury's premium sound system jointly developed by Mazda and Bose[®]

Mechanical

- Major engine modifications improve low-end pulling power and smoothness
- RENESIS 1.308-litre rotary engine produces:
 - 170 kW @ 8,200 rpm with 6-speed manual (unchanged)
 - 158 kW @ 7,500 rpm with 6-speed Activematic (up 17 kW)
 - 211 Nm @ 5,500 rpm on both versions (AT was 220Nm @ 5,000rpm)
- Six-speed manual adopted from MX-5 is standard on all models
 - Unique 1, 2, 3, 4, 6 ratios better suit engine characteristics
 - Final drive shorter, now 4.777:1 (up from 4.444:1)
- New six-speed Aisin Activematic is optional on Luxury
- Suspension revisions sharpen RX-8's reflexes and deliver more compliant ride
- External dimensions, interior space and comfort essentially unchanged
- More aerodynamic: Coefficient of drag now 0.30 (was 0.31)
- Fuel tank increases 4 litres to 65 litres for greater touring range

2. OVERVIEW

The Mazda RX-8, the world's most successful rotary-powered sports car, has evolved, bringing a heightened blend of real-world performance, visual appeal and 2+2 practicality to the Australian sports car market.

This maturation or evolutionary development of the iconic Mazda RX-8 continues Mazda's 40-year love affair with the charismatic Wankel rotary engine – the only non-piston engine to win the *24 Heures du Mans* (1991).

Mazda Australia Managing Director Doug Dickson said, "The evolved Mazda RX-8 is a welcome breath of fresh air for Mazda's most iconic model. The careful maturation of the RX-8 proves the skill and craftsmanship of our engineers in enhancing the RX-8's multifaceted appeal without diluting its essence.

"More than any other, the RX-8 sports car embodies Mazda's core tenets of Stylish, Insightful and Spirited. And even after five successful years it remains unchallenged, without rival. The Mazda RX-8 truly is a sports car like no other."

The quest for evolution

RX-8 Programme Manager Noboru Katabuchi said the quest to reinvigorate the Mazda RX-8 followed the theme of "sophisticated dynamism" driven by function. By evolving design in parallel with function, Mazda further enhanced the car's dynamic presence and overall feeling of quality, with the aim of further maturing its values as a sports car for adults.

Headline changes to the drivetrain, chassis and styling heighten the no-compromise appeal of the Mazda RX-8 as Australia's only four-door, four-seat sports coupe under \$60,000. Every refinement and every modification enriches the RX-8's reputation as *A Sports Car Like No Other*.

Most significantly, Mazda engineers strove to enhance the driving enjoyment that's at the heart of the RX-8 experience by refining the RENESIS engine, whose naturally aspirated, free-revving operation up to 9,000rpm realises exhilarating performance.

The engine sits low and well back in the engine bay in a configuration Mazda calls advanced front-midship layout. The new RX-8 maintains the original's ideal 50:50 weight distribution, placing weight evenly over all four wheels and ensuring exceptional stability.

The chassis itself has been further strengthened to bolster rigidity and give the engine and suspension a tauter platform.

This highly-rigid body and modified suspension enables sharp and linear vehicle response to steering inputs, and delivers the handling of a genuine sports car as well as the high-grade ride comfort expected of a refined four-seater.

The new RX-8 has been endowed with two new transmissions to fully utilise the RENESIS engine incredible hunger for revs, a 6-speed manual transmission with new ratios and a 6-speed Activematic to replace the old 4-speed. Both transmissions are shared with Mazda's other front-engine, rear-drive sports car – the MX-5. Some internals and the gear ratios, however, are different. They have been carefully selected to work cohesively with the high-revving characteristics of the RX-8's RENESIS rotary engine.

These transmission upgrades, combined with a shorter final drive on manual models, gives the Mazda RX-8 an even greater hunger for the horizon.

The Mazda RX-8 range will consist of two models: RX-8 Luxury and RX-8 GT. Prices start from \$55,520 for the RX-8 Luxury and \$57,625 for the RX-8 GT.

The two models share the RX-8's unique RENESIS rotary engine, which produces the same 170 kW/211 Nm as the outgoing model when mated to the new 6-speed manual transmission.

In the current atmosphere of spiralling petrol prices Mazda's engineers chose not to increase the RENESIS engine's peak power figure, but instead focused on improving low- to mid-range engine response and torque delivery. The result is an RX-8 that is more responsive at lower revs, and is equally happy to explore the stratospheric reaches of its 9,000 rpm redline.

Drive is delivered to the rear wheels via a standard 6-speed manual transmission and a torque-sensing Limited Slip Differential to ensure maximum effectiveness of the engine's high-revving power output.

The RX-8 Luxury can be optioned with the new 6-speed Activematic transmission which brings improvements in performance and fuel economy over the 4-speed Activematic it replaces.

Three models encapsulate Mazda RX-8's distinct personalities

All Mazda RX-8 models come with a comprehensive list of equipment to further cement their positions as exciting, comfortable and refined sports cars. This includes climate control air-conditioning, cruise control, a 6-disc, MP3-compatible CD player with 6 speakers (9 on Luxury grade) and AUX jack, and a leather-wrapped steering wheel and gear knob.

The Mazda RX-8's safety portfolio is comprehensive: front and side airbags for driver and front passenger, and curtain airbags for all occupants. Dynamic Stability Control (DSC), Anti-lock Braking System (ABS) and Electronic Brake-force Distribution (EBD) are standard.

The Mazda RX-8 rides on 18-inch alloy wheels and high-performance Bridgestone Potenza 225/45R18 tyres. With the launch of the new Mazda RX-8, Mazda offers two higher-specification models.

As its name suggests, the RX-8 Luxury is the prestige flagship of the Mazda RX-8 range. Features and equipment have been carefully chosen to create the luxury and grand touring credentials of this refined sports car.

The RX-8 Luxury also enjoys leather seat trim, 8-way electric driver's seat adjustment with 3-position memory, a premium Bose® sound system with 300 Watt amplifier and 9 speakers, a power sliding sunroof and front fog lamps.

The RX-8 Luxury carries a price tag of \$55,520. A 6-speed Activematic transmission with steering-wheel-mounted paddle shifters is a \$1,650 option.

The RX-8 GT (\$57,625) is the performance pinnacle of the Mazda RX-8 range. Its features have been tailored to meet the demanding needs of enthusiastic drivers more intent on the journey than on arriving.

Lightweight 19-inch alloy rims with super-sticky Bridgestone Potenza 225/40 aspect 19-inch tyres combine with Bilstein shock absorbers to sharpen the RX-8's already quick reflexes and deliver prodigious grip. In independent testing the Mazda RX-8 GT achieved an impressive 1.06g of lateral grip on a dry bitumen race track.

All manual models get a special trapezoidal double front strut brace. The GT goes one step further with a urethane-filled front suspension crossmember designed to hone its steering attack and provide greater feedback.

The GT's striking sports body kit consists of side skirts, a ground-hugging front bumper with integrated fog-lamps and a rear deck-lid spoiler give it the looks to match its abilities.

The RX-8 GT is also lighter than the RX-8 Luxury. Careful attention to detail outside and in has saved 23 precious kilograms, giving the GT another performance edge over its more luxurious brother. Lightweight alloy wheels and body-hugging RECARO leather/cloth sports bucket seats are two examples of the weight-saving measures employed on the RX-8 GT.

The lithe kerb weight of the RX-8 GT combined with the carefully-honed skills of its race-bred chassis and tenacious sports tyres make it the fastest point-to-point model in the rejuvenated RX-8 range and the obvious choice for enthusiastic drivers.

Sales targets

Mazda Australia expects to sell 75 Mazda RX-8s a month. The standard RX-8 is expected to account for 10 per cent of demand, the GT for 40 per cent, and the Luxury for 30 per cent (manual), 20 per cent (Activematic).

2. SALES AND MARKETING

Still a Sports Car like no other

Almost all of the world's car makers have built sports cars. Some lack comfort and functionality, while others are prohibitively expensive. Mazda has been one of the most successful in this market segment. It builds the world's most popular sports car, the MX-5, and has produced many rotary-powered classics including the now legendary RX-7 and iconic RX-8.

Since 1967 Mazda has sold more than 1.98 million rotary-powered cars, and 40,897 of those were sold in Australia – R100, RX-2, RX-3, RX-4, RX-5, RX-7, RX-7 SP and RX-8. The RX-7 remains the most successful rotary to date in Australia; more than 11,000 were sold during its two-decade life.

As for the Mazda RX-8, more than 170,000 have been sold worldwide since the revolutionary four-door, four-seater sports car launched in 2003. Almost 5,400 have been sold in Australia during that time. In fact, since its launch in 2003, the Mazda RX-8 has averaged better than 90 sales per month – well ahead of its nearest Japanese rival's average of 60pm, and proof of its enduring and broad appeal with consumers.

The revitalised RX-8 stays true to Mazda's rich sports car heritage, which began with the rotary Cosmo – a car that was developed to make sports car driving more widely accessible.

The RX-8 inherits Mazda's pure-bred sports car DNA which manifests itself as a super-stiff, purpose-built chassis, light weight, 50:50 weight distribution and class leading ride, handling, steering and brakes. It also looks like a Mazda sports car, another vital part of the company's DNA.

The Mazda RX-8's combination of striking looks, dynamic performance, space for four adults and a practical boot ensures that the RX-8 is a sports car like no other. To this day the Mazda RX-8 remains without a direct rival able to match its style, exhilaration and practicality at such an affordable price.

The new RX-8 is the fifth new Stylish, Insightful and Spirited Mazda to be launched in the last nine months. It follows hot in the tyre tracks of the wildly successful Mazda2 5-dr and 3-dr, the Mazda CX-9 seven-seat SUV and the sporty and refined Mazda6 medium car range.

The unique four-door, four-seat RX-8 appeals to a much broader range of buyers than traditional sports cars.

With its class-leading handling, steering and braking, and performance from its 170kW RENESIS rotary engine, Mazda's flagship will appeal to traditional sports car buyers looking for a "pure" driving experience.

Our recent testing showed the RX-8 GT laps the Calder Park racing circuit an impressive

1.9 seconds quicker than the superseded model in back-to-back testing, testament not only to the engine's greater strength, but also the tenacious grip and well-balanced handling

The RX-8's dynamic ability coupled with its centre-opening Freestyle Doors and virtual B-pillar, space for two adults in the back and a decent boot, ensures the car appeals to customers that desire a sports car but need extra space to accommodate kids or friends.

On the other hand, sports sedan and coupe buyers craving something more exotic have been tempted by its great looks and on-road ability – including its ride quality, interior layout and craftsmanship.

Mazda Australia's national marketing manager, Alastair Doak, said: "The Mazda RX-8 is more than just another great driver's car from Mazda. It is the physical embodiment of Mazda's unique rotary heritage, and as such its importance goes beyond mere numbers on a sales chart.

"The unique features of the RX-8 ensure that its sales remain strong for a longer period than conventional sports cars, which traditionally have a very limited 'shelf life'."

Buyers have a choice of seven exterior colours, including Crystal White Pearl, Velocity Red, Aurora Blue, Metropolitan Grey, Aluminium Sparkling Black and Brilliant Black.

Mazda Australia expects to sell 75 Mazda RX-8s a month. The standard RX-8 is expected to account for 10 per cent of demand, the GT for 40 per cent, and the Luxury for 30 per cent (manual), 20 per cent (Activematic).

The RX-8 is protected by Mazda's comprehensive three-year unlimited kilometre warranty and RX-8 buyers will also enjoy 24-hour roadside assistance for the same period.

4. PRICING

Prices listed in this press kit were correct as at the time of launch. For any updates to pricing go to www.autonews.net.au or www.autodeadline.com.au

RX-8 Luxury	\$55,520
RX-8 GT	\$57,625
6-sp Activematic (Luxury only)	\$ 1,645

5. MODEL BY MODEL

The Mazda RX-8 Luxury comes with:

Mechanical

- 1.308-litre RENESIS twin-rotor rotary engine
- 6-speed sportshift manual transmission
- 6-speed Activematic (optional)
- torque-sensing Limited Slip Differential
- 18-inch alloy wheels
- sports-tuned suspension
- trapezoidal front strut brace (manual models only)

Safety

- Anti-lock Braking System (ABS)
- Electronic Brake-force Distribution (EBD)
- Traction Control System (TCS)
- Dynamic Stability Control (DSC)
- front SRS airbags
- front-seat-mounted side SRS airbags
- front and rear curtain SRS airbags
- front seatbelt pretensioners with load limiters
- anti-whiplash front seats and intrusion-minimising brake pedal

Features

- remote central locking with deadlock function
- engine immobiliser
- in-glass radio antenna
- flip-open rear windows
- heated and power operated mirrors
- power windows with accessory delay function
- exterior temperature gauge
- map reading lamps
- climate control air-conditioning with ventilation pollen filter
- wheel-mounted cruise control
- AM/FM tuner with wheel-mounted controls
- 6-disc in-dash CD player
- 3.5mm MP3 player compatible auxiliary input jack

- Leather-wrapped steering wheel and gear knob
- leather seat trim
- driver's seat height adjustment
- four cupholders
- illuminated vanity mirrors
- glasses storage
- lockable and removable rear boot-through box
- driver's footrest
- puncture repair kit and compressor
- space saver spare tyre
- power sliding glass sunroof
- Xenon low beam headlamps with auto levelling and pop-up washers
- front fog lamps
- 300 Watt Bose[®] premium sound system with 6-disc, in-dash CD player and nine speakers
- 8-way power adjustable driver's seat with 3-position memory and power fold function

The RX-8 GT (manual only) adds:

- lightweight 19-inch alloy wheels
- Bridgestone Potenza 225/40 R19 tyres
- Bilstein shock absorbers
- urethane-foam-filled front suspension crossmember
- Sports body kit: Aero bumper (front), side skirts and rear deck lid spoiler
- RECARO leather/cloth front bucket seats
- aluminium pedals and footrest
- leather handbrake handle

6. DESIGN

Sophisticated Dynamism driven by function

The new Mazda RX-8 takes the evocative and unique design of the original to the next phase of evolution. It further enhances the RX-8's reputation as a sports car like no other.

Exterior design takes sports car values to a new level

Even after five years on the road, Mazda's brand icon, the original RX-8, turns heads with its uniquely striking shape. In further refining the RX-8, Mazda aimed to retain the most outstanding aspects of the original design while pursuing a further evolution of the RX-8's sports-car functionality and a higher level of exterior and interior refinement.

In pursuit of these goals, Mazda established a theme of "sophisticated dynamism" and, in line with this theme, refreshed the RX-8's shape to create a stronger impression of energy and a more distinct overall look of quality within a design evolution that fully embodies Mazda's Stylish, Insightful and Spirited brand DNA.

By evolving design in parallel with function, Mazda further enhanced the car's dynamic presence and overall feeling of quality, with the aim of further maturing its values as a sports car for adults. As a result, the newly refined RX-8 has a well-evolved look that stands up to evaluation by even the most exacting sports-car lovers.

The new RX-8 design has the additional merit of combining superior cooling performance (for even greater powertrain reliability) and superior aerodynamic efficiency with dynamic looks.

Inbuilt quality is evident in the finer details bringing a higher quality feel. At the same time, this gives a more dynamic and powerful visual impression.

Exterior design changes

The air intakes to the left and right in the front bumper are almost doubled in size and the central opening has been enlarged not only to boost visual presence and dynamism but also increase cooling airflow to the RX-8's mechanical components.

The sleeker, sharper headlamp shape adds to the RX-8's more purposeful front graphic, lending an unmistakable air of aggression. These wider units also feature new materials for their internal parts for a shinier, higher-quality look.

The side air-intake now includes an integrated turn indicator lamp, which emphasises the clean, classy feel of the RX-8's side profile and accents the RX-8's bold front wheelarch flares.

The first generation's mesh rear-bumper insert has been eschewed for a more cleaner and classier design that reflects the RX-8's heightened refinement and sense of quality.

Together with the larger diameter dual tailpipes and four-element rear combination lamps, this gives a bolder look to the rear view.

The alloy wheels fitted as standard on all versions have been redesigned to further emphasise each model's personality. Both the 18-inch and 19-inch alloys have been designed to include a rotor-shaped motif signifying the rotary engine, while the lightweight 19-inch alloy wheels fitted to the RX-8 GT boldly point to the enhanced performance lurking within.

Seven body colours

Buyers have a choice of seven exterior colours, including Crystal White Pearl, Velocity Red, Aurora Blue, Metropolitan Grey, Aluminium Sparkling Black and Brilliant Black.

Interior design enhances the sense of dynamism and quality

The interior offers more dynamic forms along with an enhanced feel of quality, creating a space that appeals to adult sensibilities. In addition, the shape of the control system has been modified to make it easier to use.

The shape of the instrument panel's central section has been redesigned to augment a sense of dynamic movement, further reinforcing the impression of sportiness and high quality.

The steering wheel is wrapped in genuine, highly tactile leather for a more comfortable feel. The door trim, armrests, floor console lids and other areas also feel better to the touch.

The centre panel uses Action Illumination matched to the operation of audio volume and other controls. This lets the user know immediately an operation has occurred, giving an enjoyable sense of interaction with the car.

Sporty and refined seat colours and materials

On the RX-8 Luxury new genuine leather seats use fine-pitch perforations in the central sections, changed from the previous two-tone type to black monotone to create a sportier and more refined ambience.

7. ENGINE AND TRANSMISSION

Heightened intensity and real-world performance

The pleasure that comes from the feeling of oneness between car and driver is the result of faithful and linear response to the driver's intentions. As expected of a Mazda sports car, new RX-8 has this attribute in full measure.

More than is shown in the specifications, new RX-8's wide-ranging advances and careful maturation yield a dramatic increase in the car's ability to handle just as the driver intends.

RENESIS rotary engine—key to the RX-8's original values

The original RENESIS power plant was a new-generation power plant that further advanced the inherent lightweight, compact and high power attributes of the rotary engine. Without it, the innovative Mazda RX-8 four-door four-seat sports coupe would not have been possible.

For the new RX-8, Mazda engineers have striven to further evolve the RENESIS as a more user-oriented, high-performance rotary engine, to meet the dramatically changing environment for sports-car driving.

Big number peak power or torque figures were deemed an unnecessary and irresponsible use of development time in a car already capable of accelerating from 0-100km/h in the low-6-second bracket. Instead engineers pursued with single-minded zeal enhancements that would benefit owners in the majority of real-world driving situations.

That is; a broader, more robust supply of low-end to mid-range torque designed to enhance the mundane city-driving scenario.

It should never be forgotten, however, that a rotary engine's unique rotating internals love nothing more than to explore a stratospheric rev range beyond the reach of reciprocating piston engines. Nothing gets a driver's adrenaline pumping like a RENESIS rotary engine spinning furiously and silkily at 9,000 rpm.

Mazda's drivetrain engineers clearly understood the twin challenges that faced them in attempting to improve low-end acceleration while not sacrificing the RENESIS rotary's unique high-revving character.

So, under the development theme of "improved acceleration and matured fundamental engine performance", the refined RENESIS has achieved both the pleasurable driving of a rotary sports car and high practicality and cost efficiency.

Original RENESIS technologies:

Side intake/side exhaust port layout

Locating intake and exhaust ports in the side housing is a key RENESIS technology, permitting elimination of intake/exhaust port timing overlap. Exhaust gas is not retained and carried over to the next intake cycle, encouraging more stable combustion. RENESIS also assures a large cross-sectional area for the intake/exhaust ports, contributing to increases in both power and fuel economy.

Sequential Dynamic Air Intake System (S-DAIS) and electronic throttle

With a total of six ports, RENESIS optimally controls the propagation of intake pressure to each port by governing the opening/closing of variable intake valves in response to engine speed. This assures ample torque in the low-to-mid speed range and maximizes torque and power up to high rpm. The system also uses an electronic throttle for more precise intake control.

Technologies for improving fuel economy

The side exhaust system eliminates intake and exhaust port timing overlap. Also, the inclusion of a cut-off seal between the oil seal and side seal yields excellent sealing with negligible blow-by of gas between intake and exhaust ports. A Jet Air-Fuel Mixing system is also employed to further promote atomisation, vaporisation and mixing of fuel. Combined, these technologies promote exceptional combustion efficiency that contributes to improved fuel economy.

RENESIS and powertrain advances in the new RX-8:

A significant advance in the engine oil feed system and knock control

The precision of the engine oil supply is improved by employing an Electric Metering Oil Pump (E-MOP) in place of the previous mechanical unit, and installing it semi-directly in the rotor housing.

The previous engine used a side feed system that supplied oil mist to both sides of the combustion chamber through two oil feed holes per rotor. In contrast, the new system adds an independently governed centre oil feed to the side feeds, giving a total of three oil feed holes that supply oil in liquid form, thereby controlling oil dispersion within the combustion chamber (see the drawing below). Taken together, these advances improve oil feed precision and the lubricity of the gas seals.

Furthermore, the capacity of the oil pan was increased to suppress air suction when the oil level is low, and the position of the baffle plates was optimised to control oil level fluctuations. These modifications counteract engine oil pressure drop during fast cornering and assure the lubrication performance demanded by sportier driving. For improved maintenance, the location of the oil filler pipe has also been changed and checking of oil level made easier.

Twin knock-sensors

For heightened combustion efficiency, the refined RENESIS employs a twin-knock-sensor system which allows appropriate control of ignition timing to suppress knocking. Both front and rear rotor housings have an independent knock sensor to achieve significantly better knock-detection performance than the previous system.

New 6-speed manual transmission with improved shift feel

The previous 6-speed manual transmission was replaced with a new unit based on the highly rated 6-speed manual transmission used in the Mazda MX-5, but matched to rotary engine characteristics.

In practical terms, this means improved synchronisers for all gears. Particularly, 1st to 4th gears use carbon triple-cone synchromesh, and upsized triple-synchromesh is used to change between 3rd and 4th gears.

In addition, the materials for bearing covers and hub between 3rd and 4th gears have been changed, yielding increased strength to match the high power and high rpm rotary engine.

The final gear ratio was changed from the previous RX-8's 4.444 to 4.777:1. This improves acceleration performance and yields finer response to accelerator pedal inputs. Further, shift feel is improved by better shift moderation through optimised selection load characteristics, and balanced shift effort with suppressed deviation between gear positions.

New electronically controlled 6-speed Activematic transmission with Direct Mode

A new electronically-controlled Aisin 6-speed Activematic transmission — which delivers smooth and linear acceleration at all engine speeds by virtue of a wider range of selectable gear ratios and cross-linkage between gears — has replaced the previous 4-speed Activematic transmission. Not only does it offer a wider range of gear ratios, but the new unit also includes the newly-developed Direct Mode.

When operating the shift switches on the steering wheel during D-range driving, Direct Mode instantaneously selects the right gear for the driving circumstances. Typical scenarios include

- 1) decelerating using the engine brake when driving downhill,
- 2) decelerating on entering a corner, and
- 3) preparing to accelerate for overtaking.

Under these kinds of conditions, Direct Mode quickly selects the optimal gear while still running in the D-range without the driver having to switch to manual mode. Normal transmission is resumed when the particular driving scenario has ended. Thanks to this function, the driver need only use the steering wheel-mounted shift switches to assure smooth and positive acceleration or deceleration as required.

The 6-speed Activematic also incorporates Active Adaptive Shift (AAS). AAS judges the driver's intent (to accelerate or brake) in the particular road environment (gradient, winding road, etc.), and makes the optimum shift, providing driving support in a linear and dynamic manner.

New variable red zone system

The standard blackout instrumentation available on all versions of the new RX-8 comes with an additional variable red zone system. This switches the tachometer red zone in three stages in accordance with the current engine conditions. The new system prevents over-revving when the engine temperature is low, such as immediately after starting the engine.

Exceptional body and chassis performance designed into the RX-8 from the beginning

From the very start of development, RX-8 was designed to achieve body rigidity and handling stability that would belie its centre pillarless structure. In addition, through a range of measures including the following technologies, the body exhibits high flexural and torsional rigidity as well as exceptional local stiffness.

- The front and rear parts of the main frame are connected by a highly rigid closed-section high-mount backbone frame located in the upper part of the transmission tunnel with the same height from front to back. This reinforces flexural and torsional rigidity while minimising weight gain.
- A cross-member located towards the back of the engine compartment assures high lateral support rigidity for the suspension.
- Three cross-members located across the opening at the bottom of the transmission tunnel link the left and right sides. The cross-members reduce the time lag occurring during the body's torsional deformation peak when steering, thereby achieving a linear handling feel.
- Tailor-welded-blank (TWB) technology—whereby several types of steel sheet each of different thickness are welded together before being pressed—is used around the door openings, yielding a lightweight, highly rigid cabin structure.
- A high rigidity V-shaped diagonal brace extends from the rear end of the high-mount backbone frame and is attached to the top mounting of each rear suspension damper, assuring rigid damper support and greatly promoting torsional rigidity at the rear of the body.

8. CHASSIS AND DYNAMICS

Exhilaration through precision and excellence

Advances in body and chassis performance in the new RX-8

The following measures were introduced to further upgrade the original RX-8's excellent body performance and bring out more of its dynamic potential and sports driving pleasure.

A trapezoidal strut brace links the front suspension towers and engine firewall on manual models only. In addition, the thickness of sheet steel used in both suspension towers and the rear of the wheel apron is increased to bolster the torsional rigidity of the body against suspension inputs.

Steering mount rigidity is improved by reinforcing the dash panel member coupling on the passenger's side.

Spot welding points have been added as reinforcement to the hinge pillar in the front door opening, improving stiffness and car body hysteresis*.

These measures yield improvements of 18.5 per cent in car body hysteresis, 5.4 per cent in static torsional rigidity and 8.7 per cent in static flexural rigidity compared with the previous model, giving exceptional body performance.

** Car body hysteresis: Percentage of car body plastic deformation due to repeated applications of torsional load.*

Double wishbone front suspension

Front suspension is an in-wheel type double wishbone that achieves linear alignment changes during front wheel jounce and rebound.

Upper and lower arm bushes feature zero stopper clearance construction to control fore and aft movement generated in the arms due to external forces acting on the front wheels. It does this by exhibiting linear bushing characteristics from initial force input. Since the construction allows linear increase in bush spring rate from the initial stage, it enables optimal compliance control behaviour at all times.

The gas-filled mono-tube damper lever ratio* is increased to improve damper operating efficiency. This assures damping force even with slight strokes and exhibits excellent road-surface tracking in all driving environments. With the new RX-8, characteristics of front and rear dampers, coil springs, bushes and stabilisers have been optimised to deliver balanced handling and ride comfort.

** Ratio of damper stroke against front wheel jounce/rebound stroke.*

Multi-link rear suspension for enhanced braking stability

The rear suspension's links have been lengthened and the layout optimised to achieve a high measure of both handling stability and ride comfort. The gas-filled mono-tube dampers are located so as to yield an ideal damper ratio which gives excellent tracking capability in a range of driving circumstances.

At the same time, the coil springs are located below floor level, minimising damper rod lateral force due to the spring and reducing friction.

Further, rubber mounts with a zero stopper clearance construction are used to attach the rear subframe to the car body in a 6-point mount system. This arrangement assures high link stiffness for excellent handling stability while maintaining a high-quality ride with low road noise.

With the new RX-8, the upper long lateral link's attachment point on the hub support side has been raised 7.5 mm to control toe-out changes during rebound, further improving stability when braking.

Improved aerodynamics with Cd of 0.30

Working to a theme of "evolution of design driven by function", Mazda optimised the new RX-8's key styling locations and the underfloor shape with the twin goals of heightening visual appeal and smoothing airflow in and around the body. This was done by optimising the shape of bottom-edge front bumper protrusions and the corner sections of the rear combination lamps, and utilisation of wider front tyre deflectors.

Also, the adoption of a new engine undercover for the underfloor as well as a larger centre floor cover and increased number of attachment points smooths airflow.

These measures yield an excellent aerodynamic package with an improvement in coefficient of drag (Cd) from 0.31 to 0.30.

9. FUNCTIONS AND COMFORT

More Comfort, more utility

For greater cabin comfort, front seat functionality is enhanced and an improved audio system with newly-developed Bose® surround-sound function is installed.

Front seats with improved side support and convenience

New front seat side bolsters modify the inner shape to yield optimum contact pressure, particularly around the hips, improving support for cornering. The front seat headrests have been downsized to improve rear seat forward visibility.

The genuine leather driver's seat on the RX-8 Luxury is 8-way power adjustable, enabling finer control of seat position, and uses a 3-position memory function. Stored positions can be recalled at the push of a button.

A new switch-operated forward folding mechanism is used for the driver's seat. Depressing a switch on the driver's seatback shifts the seat forward and folds the seatback, making entry and exit easier for rear seat passengers.

Further evolved Bose® premium sound system

The premium sound system, which Mazda jointly developed with Bose® (RX-8 Luxury), has been evolved in line with the new RX-8's acoustic characteristics to realise dynamic, live-sounding reproduction that enhances the sports-car experience. The main amplifier has been upgraded from a 6-output-channel, 6-equaliser-channel type to an 8-output-channel, 8-equaliser-channel digital amplifier that allows more precise acoustic tuning.

The system newly incorporates Bose® Centerpoint™ signal-processing circuitry, which gives a surround-sound effect with a convincing sense of depth and width. Also, its AudioPilot™ function, which continuously adjusts the music to compensate for background noise, has been enhanced by the addition of a vehicle-speed sensor, which makes the listening experience even more enjoyable at high speeds.

With these refinements, RX-8 Luxury buyers can enjoy audio quality far exceeding that of aftermarket systems regardless of driving conditions. In addition, a new auxiliary input jack, standard on all versions, allows connection of a portable audio device and enjoyment of a music collection via the car speakers.

10. SAFETY

Ticks all the boxes

World-class safety performance supporting RX-8's driving excitement

The RX-8's high level of dynamic performance is backed by active safety that includes exceptional braking performance essential to the enjoyment of sports driving. A high level of passive safety is also evident in the stylish and comfortable 4-door 4-seater cabin and centre pillarless body construction that achieve exceptional side impact crashworthiness. The RX-8 aims for world-standard safety performance befitting a sports car.

Four-wheel ventilated disc brakes, four-wheel ABS and EBD fitted as standard on all versions, achieves class-leading braking distances

The new RX-8 comes with 4-wheel ventilated disc brakes, 4-wheel Anti-lock Braking System (ABS) and Electronic Brake-force Distribution (EBD) standard on all models. The 4-wheel ventilated disc brakes deliver excellent response and provide strong and progressive braking.

The new RX-8 exhibits excellent fade resistance with its large diameter discs (323 mm at the front), and uses a 10-inch booster for ample servo limit, resulting in a class-leading braking distance.

Dynamic Stability Control (DSC)

Fitted as standard equipment on all models, DSC integrates 4-wheel ABS and traction control to suppress skidding by governing engine power output and brake force on all four wheels. The system maintains a stable vehicle attitude when cornering on slippery surfaces, steering around hazards or in other tricky circumstances, providing precise control according to running conditions and maintaining natural vehicle control and behaviour.

High-rigidity, ultra-safe Mazda Advanced Impact Distribution and Absorption System (MAIDAS) body, even with centre pillarless construction

The high-rigidity, crashworthy Mazda Advanced Impact Distribution and Absorption System body features crushable zones to absorb impacts, and suppresses cabin deformation with a triple-H structure that unifies the floor, sides and roof.

The innovative MAIDAS body was specifically developed by Mazda to absorb crash impacts from all directions. In spite of RX-8's centre pillarless construction which leaves a wide opening in the body sides, this body concept was realized to assure side strength comparable to that of a regular 4-door sedan.

Frontal impact safety

To absorb crash energy from the front, each side member has an octagonal section beam made of high-tensile steel at the front. A 3-fork structure behind each side member distributes crash energy in three directions before it reaches the cabin, thereby suppressing cabin deformation in an offset frontal collision.

Side impact safety

A vertical reinforcing member made of high-tensile steel pipe is located inside each rear door towards the front edge. This structure is joined to the top and bottom of the body by extremely robust door latches. The reinforcing member and latches together form a built-in pillar that's stronger than a conventional centre pillar.

The body itself, which receives impact energy from the doors, has ring-shaped reinforcements that stiffen the door openings. Above these, there's a roof gusset and roof reinforcement, and the floor below is supported by two cross-members.

Combined, these structures efficiently disperse crash energy over the entire body, thereby suppressing cabin deformation during a side impact.

Rear impact safety

The rear crushable zone efficiently absorbs impact energy from a rear-end collision thanks to straight rear side members made of dual-phase steel which deforms under high load to soak up crash energy. To disperse impact energy and minimize deformation of the fuel tank, the rear side members are reinforced in this area by joining them to the high-mount backbone frame.

Comprehensive airbag system and seatbelts with pretensioner and load limiter

In addition to the airbag system fitted as standard for the driver's seat and front passenger seat, all RX-8 models also offer as standard front-side airbags to protect the thorax of front seat occupants in the event of a side collision, as well as curtain airbags that deploy to cover the front/rear side windows and protect the head.

Front seatbelts are equipped with a pretensioner that instantly tightens the belt during the initial stage of an initial impact from the front, to restrain forward movement of the body. A load limiter loosens the belt in a controlled manner so the belt continues to restrain the occupant without applying undue pressure to the chest.

Baggage intrusion prevention

The V-shaped diagonal brace used to reinforce torsional rigidity of the body is positioned between the rear seats and the trunk. This prevents baggage in the trunk from penetrating the cabin and injuring occupants in the event of a frontal collision.

Shock Cone Aluminium Bonnet

The risk of pedestrian head injuries in a vehicle-pedestrian collision is minimized partly by assuring adequate space between the engine and bonnet, and partly by the use of a Shock Cone Aluminium Bonnet. This

aluminium bonnet is supported by multiple shock-absorbing cones with multiple indentations in its inner panel to promote efficient energy absorption, permitting the use of thinner aluminium sheet.

Fully equipped for safety

- Xenon headlamps (low beam: auto-levelling [optical axis adjustment])
- Crushable brake pedal
- Whiplash-minimising front seats
- Impact-absorbing soft interior
- Child seat anchor system with top tether anchorages on rear seats

11. ENVIRONMENTAL INITIATIVES

Protecting the Environment and promoting Recyclability

The RENESIS rotary engine pursues exhaust gas purification, while Mazda's innovative measures for improving recyclability, including bumper-to-bumper recycling, promote the re-use of scrap plastic and effective use of resources.

Exhaust gas purification in the rotary engine

The RENESIS rotary engine greatly reduces the volume of unburned gas in the exhaust and is equipped with an exhaust gas re-combustion system. A double-skin manifold further promotes emissions performance by maintaining a high exhaust gas temperature. In addition, the high-performance catalytic converter and precise control of the air-fuel ratio at all engine speeds help reduce the volume of pollutants in exhaust gas to one-tenth that of the previous rotary engine (13B-REW).

Improving recyclability

Currently, most of an automobile's structural components, including mainly metals such as iron and aluminium, are recycled. At Mazda, with the aim of realising a future recycling society, we are advancing measures to make recycling easier for the remaining plastic parts and glass, etc. In accordance with material descriptions for plastic parts laid down by the ISO, Mazda facilitates separating and collection before cars are scrapped, and from the development stage we work to make our cars easy to recycle.

The new RX-8 uses easily recycled polypropylene (PP) for front/rear bumpers, dash panel, trim and other areas. PP is also the main component of olefin thermoplastic elastomer used in the shift knob cover in automatic-transmission cars.

In addition, since 2005 Mazda has been engaged in full-scale application of the world's first bumper-to-bumper recycling technology, which reclaims damaged bumpers and re-uses them in the bumpers of new cars. Bumper-to-bumper recycling technology is also used on the new RX-8.

Reduction of environmentally harmful chemicals

Mazda is positively committed to reducing the use of lead, hexavalent chromium, cadmium, mercury and other environmentally harmful chemicals. With the RX-8, we discontinued the use of lead in the fuel tank, harnesses and electro-deposition of undercoat, and eliminated the use of hexavalent chromium and cadmium in all parts.

12. SPECIFICATIONS

		RX-8 Luxury		RX-8 GT
Powertrain				
Engine type		Front-midship RENESIS – 2 rotors in-line, naturally aspirated, multi-sideport		
Engine capacity		1,308 (654 x 2) cc		
Compression ratio		10.0 : 1		
Maximum power	man	170 kW @ 8,200 rpm	170 kW @ 8,200 rpm	
	auto	158 kW @ 7,500 rpm	-	
Maximum torque	man	211 Nm @ 5,500 rpm	211 Nm @ 5,500 rpm	
	auto	211 Nm @ 5,500 rpm	-	
Fuel system		Multipoint electronic fuel injection		
Fuel tank capacity		65 litres		
Recommended fuel		Premium unleaded (min. 95RON)		
Fuel consumption*1	man (combined)	12.9 litres per 100 km		
	auto (combined)		12.1 litres per 100 km	-
Manual transmission			6-speed	6-speed
Activematic (auto) transmission			6-speed	-
Gear ratio – man/auto	1st		3.815/3.538	3.815/-
	2nd		2.260/2.060	2.260/-
	3rd		1.640/1.404	1.640/-
	4th		1.259/1.000	1.259/-
	5th		1.000/0.713	1.000/-
	6th		0.787/0.582	0.787/-
	reverse			3.603/3.168
	final drive		4.777/4.300	4.777/-

		RX-8 Luxury	RX-8 GT
Chassis			
Brake type	front	Ventilated disc	
	rear	Ventilated disc	
Brake diameter	front	323 mm	
	rear	302 mm	
Shock absorbers	type	Standard	Bilstein
Steering type		Electric power assist steering	
Suspension	front	Double wishbone	
	rear	Multi-link	
Turning circle	Kerb to kerb	10.6 m	
Tyre size		225/45 R18 91W	225/40 R19 89W
Weight distribution	front : rear	50:50	
Wheel size		18 x 8.0 J	19 x 8.0 J
Wheel type		Alloy	
Wheel type (spare)		Space-saver (T125/70 D17 98M)	

*1 Fuel consumption figures are based on ADR81/01 test results. They are useful in comparing the fuel consumption of different vehicles. They may not be the fuel consumption achieved in practice. This will depend on traffic and road conditions and how the vehicle is driven.

13. FEATURES

			RX-8 Luxury	RX-8 GT
Exterior				
Aerial printed into rear glass			✓	✓
Body kit comprising:	aero bumper (front)		-	✓
	rear spoiler		-	✓
	side skirts		-	✓
Fog-lamps (front)			✓	✓
Freestyle door system			✓	✓
Front and rear bumpers (body coloured)			✓	✓
Green tinted windscreen, side and rear windows			✓	✓
Headlamps (halogen)			-	-
Headlamps (xenon low beam) with auto-levelling and washer function			✓	✓
Power mirrors (body coloured and heated)			✓	✓
Power sliding glass sun-roof			✓	-
Power windows with accessory delay function			✓	✓
Rear door flip-type quarter window			✓	✓
Suspension strut tower brace bar (front)			✓	✓
Interior				
Air-conditioning (climate control)			✓	✓
Aluminium pedals and footrest			✓	✓
Ambient temperature display			✓	✓
Blackout instrument cluster			✓	✓
Centre armrest consoles (front and rear)			✓	✓
Cigarette lighter and ashtray			✓	✓
Cruise control			✓	✓
Cupholders			✓	✓
Digital clock			✓	✓

			RX-8 Luxury	RX-8 GT
Door ajar warning light			✓	✓
Door courtesy lamps (front)			✓	✓
Door map pockets (front)			✓	✓
Driver's left footrest			✓	✓
Glasses storage compartment			✓	✓
Glove box (lockable and illuminated)			✓	✓
Illuminated entry system with delayed fade			✓	✓
Instrument panel light dimmer			✓	✓
Interior illumination:	cargo room lamp		✓	✓
	ignition key surround		✓	✓
	map reading spot lamps		✓	✓
	power window switch (driver)		✓	✓
Interior release for fuel filler door and boot lid			✓	✓
Leather-wrapped:	gear shift knob		✓	✓
	handbrake handle		-	✓
	steering wheel		✓	✓
Lights-left-on audible warning			✓	✓
Low fuel warning light			✓	✓
Oil pressure gauge			✓	✓
Paddle shift gear control			auto only	-
Passenger assist grip (front)			✓	✓
Puncture repair kit and compressor			✓	✓
Seat trim:	cloth		-	-
	leather*2		✓	-
	leather*2/cloth		-	✓
Seat type (front):	RECARO		-	✓
Seats (front) with:	3-position memory function (driver)		✓	-

*2 Leather interior includes some Maztex material on selected high impact surfaces.

			RX-8 Luxury	RX-8 GT
Seats (front) with:	8-way power adjustment (driver)		✓	-
	height adjustment (driver)		✓	-
	integral head restraints		✓	✓
	lumbar adjustment (driver)		✓	-
	power fold function (driver)		✓	-
	quick fold function (driver)		-	-
	quick fold function (passenger)		✓	-
	rake and slide adjustment		✓	✓
	seat back pocket (passenger)		✓	-
Seats (rear) with:	integral head restraints		✓	✓
	lockable and removable boot through box		✓	✓
Tachometer, temperature gauge, electronic, speedometer and odometer/tripmeter			✓	✓
Tilt adjustable steering wheel			✓	✓
Vanity mirrors (driver and front passenger) with illumination			✓	✓
Ventilation pollen filter			✓	✓
Window demister (rear)			✓	✓
Wipers (front) 2-speed with variable intermittent function			✓	✓

			RX-8 Luxury	RX-8 GT
Audio				
AM/FM tuner			✓	✓
Auxiliary input (3.5mm MP3 player compatible)				
and 12 volt power outlet			✓	✓
CD player, in-dash 6-disc (MP3 compatible)			✓	✓
Premium Bose® 300 watt amplifier and speakers			✓	-
Speakers, number of			9	6
Steering wheel mounted audio controls			✓	✓
Safety				
Airbags SRS:	front (driver and passenger)		✓	✓
	side (front)		✓	✓
	curtain (front and rear)		✓	✓
Anti-lock Braking System (ABS)			✓	✓
Child restraint anchor points			✓	✓
Day/night rear vision mirror			✓	✓
'Double lock' door deadlock function			✓	✓
Dynamic Stability Control (DSC)				
switchable on/off			✓	✓
Electronic Brake-force Distribution (EBD)			✓	✓
Engine immobiliser			✓	✓
High mount stop lamp			✓	✓
Intrusion-minimising brake pedal			✓	✓
Left-hand-side convex (wide angle) exterior mirror			✓	✓
Limited Slip Differential (LSD) torque-sensing			✓	✓

			RX-8 Luxury	RX-8 GT
One touch (up and down) power window (driver)			✓	✓
Remote central locking and boot release				
(2 transmitters with retractable key)			✓	✓
Seat belts (front) with pretensioners and load-limiters			✓	✓
Seat belts 3-point lap-sash (all seats)			✓	✓
Side impact door beams			✓	✓
Traction Control System (TCS)			✓	✓
'Triple H' safety construction with front and rear crumple zones			✓	✓
Whiplash-minimising front seats			✓	✓

14. DIMENSIONS

		RX-8 Luxury	RX-8 GT
Ground clearance	laden	101 mm	
Overall height		1,340 mm	
Overall length		4,470 mm	
Overall width		1,770 mm	
Track	front	1,500 mm	1,505 mm
	rear	1,505 mm	1,510 mm
Wheelbase		2,700 mm	
Cargo room*3	volume (VDA)	290 litres	
Kerb weight	man	1,402 kg	1,379 kg
	auto	1,412 kg	-

*3 When spare wheel not carried.