

New Mazda RX-8

At a Glance

Exterior

- New and larger front grille and oil cooling openings for a stronger front end design
- New designs for headlamps, front fenders, rear LED lamps
- New design rear bumper with larger exhaust pipes
- New wheel designs with spokes in rotor-look
- Four new exterior colours
- Sport Pack now available (with High Power engine):
 - Integrated front spoiler, side spoilers, floating-type rear spoiler for reduced lift
 - New dark grey, extra lightweight, forged 19-inch alloy wheels
 - Recaro branded bucket seats in black half-leather with red stitching
 - Black leather steering wheel and handbrake lever with red stitching
 - Bilstein® sports suspension and urethane foam filled front suspension cross member

Interior

- Improved levels of quality craftsmanship
- New centre console design
- New variable red-zone tachometer
- New instrument cluster colour for minimised eye strain
- New steering wheel design
- Redesigned front seats for more comfort and side support
- New front seat tip and slide functionality for easier access to rear seats

Powertrain

- RENESIS naturally-aspirated dual-rotary engine in two power derivatives:
 - New Standard Power version producing 151 kW/205 PS of maximum power at 7,500 rpm and maximum torque of 211 Nm
 - High Power version producing 170 kW/231 PS at 8,200 rpm and 211 Nm of torque
- Drive shaft torsional rigidity increased by approx. 30 percent for improved driving performance and NVH
- Differential gear ratio lowered for improved performance feel
- Two knock sensor system (a Mazda first) introduced for improved engine knock control
- New lubrication system for optimised engine performance
- New oil dip-stick location for easier oil level checking
- Fuel tank volume increased by 3.6 litres to 65.4 litres
- New six-speed manual transmission for high power engine (based on 3rd-Generation MX-5 unit)

Chassis & Safety

- Front midship, rear-wheel drive configuration for ideal 50/50 weight distribution and superior handling attributes (carry-over)
- Torsional and flexural body shell rigidity increased by 5.4 and 8.7 percent respectively
- Revised steering and suspension for even better steering feel and driving stability:
 - New damper, spring, bush and stabiliser settings for enhanced ride comfort
 - New front suspension cross member for more linear steering feel
 - Optional Sport Pack with Bilstein® sports suspension and urethane foam filled front suspension cross member for optimal riding comfort
 - Reconfiguration of rear suspension geometry for increased stability
 - Body and underbody enhancements for reduced lift and improved coefficient of drag (down from 0.30 to 0.29*) for better stability at high speed
 - Two brake packages available for further improved stopping distance:
 - Standard Power with 303 mm ventilated front discs and 302 mm ventilated rear disc brakes
 - High Power with 323 mm ventilated front discs and 302 mm ventilated rear disc brakes
 - ABS, traction control and DSC standard for all versions
- Limited-slip differential that automatically distributes power between rear wheels (carry-over)
- Vertical steel pipe reinforcement in rear door that acts as a rigid B-pillar (carry-over)
- Six airbags standard (carry-over)
- Shock cone aluminium bonnet for pedestrian protection (carry-over)

Equipment

- Bluetooth® cell phone functionality (new to RX-8)
- New centre console-mounted navigation system with touch screen functionality
- Auxiliary jack for connecting MP3 player to car's audio system (new to RX-8)
- Auto light and rain sensor system (new to RX-8)
- New BOSE® audio system with AudioPilot® noise compensation and Centerpoint® surround sound

* Sport Pack Cd is 0.30

New Mazda RX-8

Evolved Sports Car Performance and Coupe Appeal

At launch in 2003, the Mazda RX-8 coupe represented an evolution of the rotary-engine sports car from the only company in the world to make them. Its dynamic and sporty design, unique centre-opening doors and room for four – along with a cleaner running, more compact and naturally-aspirated RENESIS rotary engine – made it a big hit with sports car customers around the world. Since launch, over 170,000 Mazda RX-8 have found owners and it has won 45 global awards. Now Mazda presents a new version of its sports car icon that has a refreshed design, evolved performance and aerodynamics and, for the first time on RX-8, an optional Sport Pack.

Design – Enhanced Quality and Sports Car Appeal

Mazda RX-8 has always had the appearance of a classic sports car with a powerful-looking and dynamic exterior design that makes it seem to move even when parked. The new version enhances this with a new front bumper design that has a larger five-point grille and oil cooling openings (below the front fog lights), that are nearly twice as large as on the original model for an even stronger look and improved oil cooling (see Powertrain section below). Added to this are new front headlamps, new front fender designs, new LED rear lamps and a redesigned rear bumper with larger exhaust pipes (now 90 mm in diameter) all carried out with a further improvement in build quality.

For even more sporty appeal, new designs for the car's 17, 18 and 19-inch wheels are introduced with distinctive spokes that resemble the engine's rotor; and four new exterior colours are added as well (Aurora Blue Mica, Diamond Grey Metallic, Sparkling Black Mica, and Crystal White Pearl Mica).

The interior of the new RX-8 is just as sporty and sophisticated as its predecessor, and adds new trim materials for a further improvement in quality look and feel. For the driver, the cockpit is even sportier with a new centre console design, a tachometer that now has a variable red-zone that rises as the engine comes to operating temperature, an instrument cluster with a newly developed colour to help minimise eye strain, and a new steering wheel. Redesigned front and rear seats are also added, with the driver's seat optimised for improved side support. They are offered in black leather (depending on grade) or in black fabric.

For the first time, the Mazda RX-8 will be available with a Sport Pack (depending on market) designed to give a near race-car feel to the facelift version. It includes an integrated front spoiler, side spoilers and a floating-type rear spoiler that work together to reduce front and

rear lift even further and to improve high-speed stability. Adding to the sporty, race-car feel are specially designed, dark grey, extra lightweight forged 19-inch alloy wheels and exclusive Recaro® branded bucket seats in black half-leather with red stitching, delivering superior side support.

Steering wheel and handbrake lever also come with black leather and red stitching. The Sport Pack is available with the High Power engine only. It features special sports suspension tuning with Bilstein® dampers, and a front suspension cross member filled with urethane foam for a quieter and smoother ride.

Comfort, Functionality and Convenience

The RX-8's "freestyle" centre-opening door system is just as unique in its segment today as it was in 2003. It makes getting into and out of the back seats of Mazda's sporty coupe easy. For the new RX-8, this feature is even more practical. One new button is added to the outer side of the electrically adjustable driver's seat (depending on grade) for automatic forward tilting and front slide when accessing the back seats. Memory function is also new, which stores the driver seat settings for three people (depending on grade).

Both front seats have a new form for improved side support and better overall seat comfort. Regular models of the new RX-8 also give rear seat passengers better forward visibility, because the front head restraints – still in the shape of a rotor – are now smaller than in the original RX-8.

Added to these improvements to comfort are several new features that make Mazda's sports flagship more convenient and exclusive. These include hands-free Bluetooth® cell phone functionality, a new centre console-mounted navigation system with touch screen functionality, an auxiliary (AUX) jack for plugging in an MP3 player and Mazda's auto light and rain sensor system, a first for the RX-8.

A new BOSE® audio system – with Centerpoint® surround and an improved Audio-Pilot® function that automatically adjusts the sound to ambient noise – is also introduced (depending on grade). This exclusive audio system was developed especially for the RX-8 with a new-generation, eight-channel BOSE® digital amplifier, five speakers and four woofers for premium sound regardless of driving speed.

Powertrain – Enhanced Sports Car Performance

The twin-rotor RENESIS rotary engine of the original Mazda RX-8 won eight awards globally after it was introduced in 2003, including four International 'Engine of the Year' awards in July 2008

2003 and 2004. And there were good reasons for this high recognition: the RENESIS rotary engine delivered major improvements in emissions and fuel efficiency while retaining the rotary engine's unique smooth, high-rev nature to deliver true sports car performance without the use of a turbo-charger, which had been a feature of Mazda's rotary engine from 1983 until 2002 on the RX-7. No wonder Mazda engineers chose to call the engine RENESIS (short for Rotary Engine genesis).

Two power derivatives of this award-winning rotary engine make up the engine line-up for the new Mazda RX-8 – a new Standard Power version producing 151 kW/205 PS of maximum power at 7,500 rpm and maximum torque of 211 Nm, and a High Power version with 170 kW/231 PS at 8,200 rpm and 211 Nm of torque.

The RENESIS engine of the new RX-8 is evolved to deliver even more sports car performance and driving fun – an attribute that Mazda's sports icon has always possessed. Drive shaft torsional rigidity of the RX-8 facelift is improved by approximately 30 percent.

Combined with the car's high-mount backbone frame at the top of transmission tunnel, this improves driving performance and reduces NVH. The differential gear ratio is lowered for the facelift version from 4.444 to 4.777 for improved performance feel, and the RENESIS rotary engine's acclaimed smoothness and cultivation is enhanced by the introduction of a two knock sensor system, a first for Mazda, which detects and prevents knock better.

Engine oil cooling properties have been greatly improved as well, which also contributes to optimised engine performance, especially at high speed. New features here include a larger front grille and oil cooler intake areas, which provide an opening area that is 50 percent larger than the outgoing model. This translates into a 6° C drop in oil temperature at maximum speed mode. For constant oil pressure and a permanent oil surface during sporty driving, the size of the oil pan was increased at the right side and a newly designed baffle plate No. 2 was introduced.

Several measures have been taken to enhance engine lubrication. A third centre oil supply has been added, and the metering oil pump drive is now electromagnetic (mechanical in the outgoing model). The pump is now mounted semi-directly at the oil-supply position and the old system's bleed passage has been abolished as well, which reduces possible oil splash into the combustion chamber. All these new features help to optimise overall performance of new RX-8's high-revving rotary engine.

Checking the oil level is now easier as well. The oil dip-stick has been moved from the side of the engine to the top of the engine cover, for quick and easy checking of the oil level.

Engine oil capacity has been increased to 7.0 litres (from 6.1 litres Standard Power and from 6.9 litres High Power).

And owners can now enjoy driving the new Mazda RX-8 longer between fuel fill ups. It has a larger petrol tank holding 3.6 litres more fuel (increased from 61.8 litres to 65.4 litres).

Driving performance is further enhanced by a newly-introduced six-speed manual transmission for the High Power versions. Based on the acclaimed six-speed manual transmission developed for the third generation MX-5, it has been revised to optimally handle the higher output and torque of the RENESIS rotary engine. For the new RX-8, it uses specially designed 1st and 2nd gear synchronisers made of carbon and enlarged triple-cone synchronisers for 3rd and 4th gears, also made of carbon. The bearing cover is strengthened as well, and the transmission case size is slightly reduced for an improvement in internal lubrication performance.

The result is an improvement in overall shift feel, making the High Power versions of the new RX-8 even more fun to drive. The Standard Power version retains the five-speed manual transmission from the previous model, which has earned high praise from customers and experts alike.

Rotary + Hydrogen – the Perfect Match

First shown at the Tokyo Motor Show in 2003, the Mazda RX-8 Hydrogen RE features a dual-fuel RENESIS rotary engine that uses either hydrogen or petrol at the push of a button in the dashboard.

In 2006, after extensive testing on public roads in Japan, Mazda began corporate leasing of the RX-8 Hydrogen RE – a first in the automotive industry. It premiered with test drives in Europe at the ONS 2006, an energy exhibition and conference held in Stavanger, Norway. Impressed by what they saw, the Hydrogen Road of Norway (HyNor) organisation agreed to lease 30 RX-8 Hydrogen RE vehicles beginning this year in its efforts to establish a hydrogen fuel infrastructure in Norway.

Rotary technology is ideally suited to burning hydrogen. With separate chambers for intake, combustion and exhaust – formed as the disc-like rotor spins inside a specially shaped rotary housing – hydrogen gas can be injected at low temperatures and is only subjected to extremely hot temperatures at the very last moment before combustion.

Thanks to this, when the RENESIS rotary engine runs on hydrogen, it performs better in terms of knock control than a hydrogen-fuelled reciprocating engine. To overcome hydrogen's low density in its gaseous state – which would mean having to inject large amounts of the fuel – the dual-fuel engine injects hydrogen directly into the combustion chamber. And the petrol RENESIS engine is relatively easy to adapt. It is equipped with hydrogen injectors in each inlet chamber, in addition to the existing petrol injectors in the inlet pipes. In hydrogen-fuel mode, the RX-8 Hydrogen RE produces no toxic emissions and is an ideal zero-emissions vehicle in areas where there is a hydrogen-fuel infrastructure.

Body and Chassis – Enhanced Body Rigidity, Steering Feel and Driving Stability

The new RX-8 continues to feature the front-midship engine, rear-wheel drive configuration of the original, delivering an ideal 50/50 weight distribution between the front and rear axles for fantastic handling characteristics. This acclaimed attribute is taken to a new level with improved overall body shell rigidity, steering feel and handling stability.

Body shell rigidity was further improved with a trapezoidal strut tower bar added at the front to enhance local rigidity of the front suspension tower areas. Together with other local rigidity enhancements, torsional (twisting) rigidity was improved by 5.4 percent and flexural (bending) rigidity by 8.7 percent.

Steering feel is further improved and more linear as well, with an enhancement of the main bar joint of the instrument panel for more rigidity of the steering mount area, and the addition of a new front suspension cross member. In vehicles with Sport Pack this member is filled with urethane foam for optimal ride comfort. Overall driving stability is also increased with a reconfiguration of the rear suspension geometry and by increasing the size of the upper lateral link's joint section by 7.5 mm for better control of toe-out change at rebound.

Also contributing to the evolved handling of the new Mazda RX-8 is its exterior design, which is updated for improved aerodynamic performance and reduced lift for an overall improvement in performance feel and high-speed stability. The shape of the projecting area at the lower sides of the new front bumper is optimised, as are the shapes of rear lamps and the rear spoiler, and a larger front tyre deflector and a 'double panel' rear tyre deflector are introduced. Underbody airflow is optimised as well by a redesigned and extended floor covering. All these measures reduce lift and improve the coefficient of drag (Cd) from 0.30 to 0.29* for standard models.

* Sport Pack: Cd = 0.30

Mazda Rotary Engine History – The Legend Continues

During the 1960's, most carmakers gave up developing rotary engines (RE), due to the challenges the technology posed. Not so Mazda, which continued to evolve the RE built by German engineer Felix Wankel and the German manufacturer NSU. On 30 May 1967, Mazda astounded the automotive industry when the world's first dual-rotor RE car, the Cosmo Sport, went on sale. This sports car was followed by a series of RE production models that have since reached cult status – the Familia Rotary Coupe, the Eunos Cosmo and the legendary Savanna RX-7, just to mention a few.

With a number of improvements in fuel economy and environmental performance over the years, Mazda vehicles equipped with RE engines continued to be produced. Then in 2003, Mazda's RE development team introduced the RX-8 sports car equipped with a naturally-aspirated RENESIS rotary engine, which was more compact, cultivated and environmentally friendly than any of its predecessors.

RENESIS went on to win the coveted International Engine of the Year award in 2003 as well as successive awards for its engine class in 2003 and 2004. By Mazda's 40th RE anniversary in May 2007, Mazda had sold 1.97 million RE vehicles world wide.

This revolution in RE technology in 2003 would never have been possible without hard-fought experience from Mazda RE motor sports activity, which began back in 1968 following the launch of the Cosmo Sport. One of Mazda's first big wins came in Belgium in 1981 at the Spa endurance race, when a Mazda RX-7 took first and a second RX-7 finished fifth, giving Mazda the King's Cup as overall team winner. In 1991, the Mazda 787B made RE history when it became the only Japanese car ever to claim victory at the 24 Hours of Le Mans.

Outside Europe, Mazda RE cars have over 100 wins in both the touring car series in Japan and in the International Motor Sports Association (IMSA) series in the United States. In fact, Mazda has won 22 championships since 1975 at the 24-hour endurance race at Daytona in the USA. The latest came just three months ago when the SpeedSource Castrol Syntec Mazda RX-8 won the Rolex 24 Hours of Daytona, beating a Porsche by five laps.

Safety

Active and passive safety always has top priority at Mazda and the new RX-8 is no exception. Still onboard for the new RX-8 are two all-disc brake packages. The Standard Power version has 303 mm ventilated front disc brakes and 302 mm ventilated rear disc

brakes, while the High Power versions have larger, 323 mm ventilated front discs and 302 mm ventilated rear discs. ABS, traction control and DSC systems are standard equipment on all versions. Still onboard is the limited slip differential, which automatically distributes the power between the rear wheels and ensures best possible acceleration and traction.

Passive safety is based on a stiff body shell designed to distribute crash energy away from the passenger cell, including a vertical steel pipe reinforcement built into the rear door that, when the door is closed, acts as a rigid B-pillar.

Further protection is provided by three-point seat belts, with pretensioners and load-limiters, six airbags and ISOFIX child safety seat mounts in the rear. New Mazda RX-8's freestyle door system has an opening mechanism that, in case of accident, allows rear passengers to open the back doors from the inside of the car. A latch at the left lower side of the front passenger seat releases the front seat backs, which allows access to the front doors, making getting out of the back seats possible. And the new RX-8 inherits the original model's shock cone aluminium bonnet structure that disperses impact energy when struck, which improves pedestrian safety.

New Mazda RX-8

Dimensions

		Standard Power	High Power	High Power with Sport Pack
Body Type		Monocoque	Monocoque	Monocoque
Doors		4, centre-opening	4, centre-opening	4, centre-opening
Seats		4 bucket-type	4 bucket-type	4 bucket-type, RECARO front seats
Coefficient of drag	Cd	0.29	0.29	0.30
Overall length without / with licence plate holder	mm	4,460 / 4,470	4,460 / 4,470	4,460 / 4,470
Dimensions				
External				
Overall width	mm	1,770	1,770	1,770
Overall height	mm	1,340	1,340	1,340
Wheelbase	mm	2,700	2,700	2,700
Track front	mm	17" tyre 1,500 18" tyre 1,500	18" tyre 1,500	19" tyre 1,505
Track rear	mm	17" tyre 1,500 18" tyre 1,505	18" tyre 1,505	19" tyre 1,510
Ground clearance	mm	120	120	120
Interior				
Front head room w/o sunroof	mm	970	970	970
Rear head room w/o sunroof	mm	935	935	935
Front shoulder room	mm	1,393	1,393	1,393
Rear shoulder room	mm	1,395	1,395	1,395
Front leg room	mm	1,084	1,084	1,084
Rear leg room	mm	817	817	817
Boot Measurements				
Volume all seats up (VDA)	l	290	290	290
Load floor to 2nd row	mm	878		
Boot lid / liftgate opening width	mm	1,350	1,350	1,350
Distance between rear wheel housings		784	784	784
Boot load width at widest point	mm	878	878	878

New Mazda RX-8

Engine & Chassis

		Standard Power	High Power	High Power with Sport Pack
Engine Type		RENESIS twin rotary	RENESIS twin rotary	RENESIS twin rotary
Displacement	cc	654 x 2 Rotors	654 x 2 Rotors	654 x 2 Rotors
Mixture preparation		Electromagnetic pump	Electromagnetic pump	Electromagnetic pump
Compression ratio		10 : 1	10 : 1	10 : 1
Ignition system		Distributorless	Distributorless	Distributorless
Max. Power	kW	151 at 7,500rpm	170 at 8,200 rpm	170 at 8,200 rpm
	PS	205 at 7,500 rpm	231 at 8,200 rpm	231 at 8,200 rpm
Max. torque	Nm	211 at 5,500 rpm	211 at 5,500 rpm	211 at 5,500 rpm
Fuel type		Unleaded 95RON	Unleaded 95RON	Unleaded 95RON
Fuel tank capacity	l	65	65	65
Battery		80D26L / 12V	80D26L / 12V	80D26L / 12V
Transmission		5-speed manual	6-speed manual	6-speed manual
Powertrain		Longitudinal front-midship, rear-wheel	Longitudinal front-midship, rear-wheel drive	Longitudinal front-midship, rear-wheel drive
Gear Ratios				
1 st		3.483	3.815	3.815
2 nd		2.015	2.260	2.260
3 rd		1.484	1.640	1.640
4 th		1.000	1.259	1.259
5 th		0.719	1.000	1.000
6 th		---	0.787	0.787
Reverse		3.288	3.603	3.603
Final Drive Ratio		4.777	4.777	4.777
Suspension and Wheels				
Front Suspension		Double wishbone	Double wishbone	Double wishbone
Rear Suspension		Multilink (5 links per side)	Multilink (5 links per side)	Multilink (5 links per side)
Damper front		Monotube	Monotube	Monotube (Bilstein)
Damper rear		Monotube	Monotube	Monotube (Bilstein)
Stabilizers (front / rear)	m	25.4 / 15.9	26.5 / 15.9	26.5 / 16
	m			
Tyre size		225/50 R17 225/45 R18	225/45 R18	225/40 R19
Wheel size		17 x 7.5J 18 x 8J	18 x 8J	19 x 8J
Steering				
Type		Direct drive electric power assist	Direct drive electric power assist	Direct drive electric power assist
Steering wheel turns (lock to lock)		2.99	2.99	2.99
Turning circle diameter (curb to curb)	m	10.6	10.6	10.6
Turning circle diameter (wall to wall)	m	11.4	11.4	11.4
Brakes				
Type front		Ventilated discs	Ventilated discs	Ventilated discs
Type rear		Ventilated discs	Ventilated discs	Ventilated discs
Diameter front	m	303	323	323
	m			
Diameter rear	m	302	302	302
	m			
Vacuum booster diameter	m	254	254	254
	m			
Scheduled maintenance		Every 20,000 kilometres / 12 months	Every 20,000 kilometres / 12 months	Every 20,000 kilometres / 12 months

Performance and Weights

		Standard Power	High Power	High Power with Sport Pack
		5-speed manual	6-speed manual	6-speed manual
Performance				
Top speed	km/h	227 (226*)	237	234
Acceleration 0-62 mph**	s	7.2	6.4	6.4
Fuel Consumption***				
Urban	l/100 km	15.1	15.7	15.7
Extra urban	l/100 km	8.2	9.1	9.1
Combined	l/100 km	10.7	11.5	11.5
CO ₂ emissions (combined)	g/km	274	299	299
Emissions ranking		Euro Stage IV	Euro Stage IV	Euro Stage IV
Weight and Payload				
Min, kerb weight (without driver)	kg	1,300	1,315	1,315
Min. kerb weight****	kg	1,375	1,390	1,390
Max. permissible weight	kg	1,820	1,815	1,815
Permissible front axle weight	kg	860	860	860
Permissible rear axle weight	kg	1,030	1,030	1,030
Permissible tow weight, trailer without brakes	kg	685	695	695
Permissible tow weight, trailer with brakes (12% slope)	kg	1,200	1,200	1,200
Max. roof load capacity	kg	75	75	75

* With sunroof

** Under Mazda test conditions

*** According 80/1268/EEC in its latest version

**** According to 92/21/EEC in its latest version (including 75 kg driver)