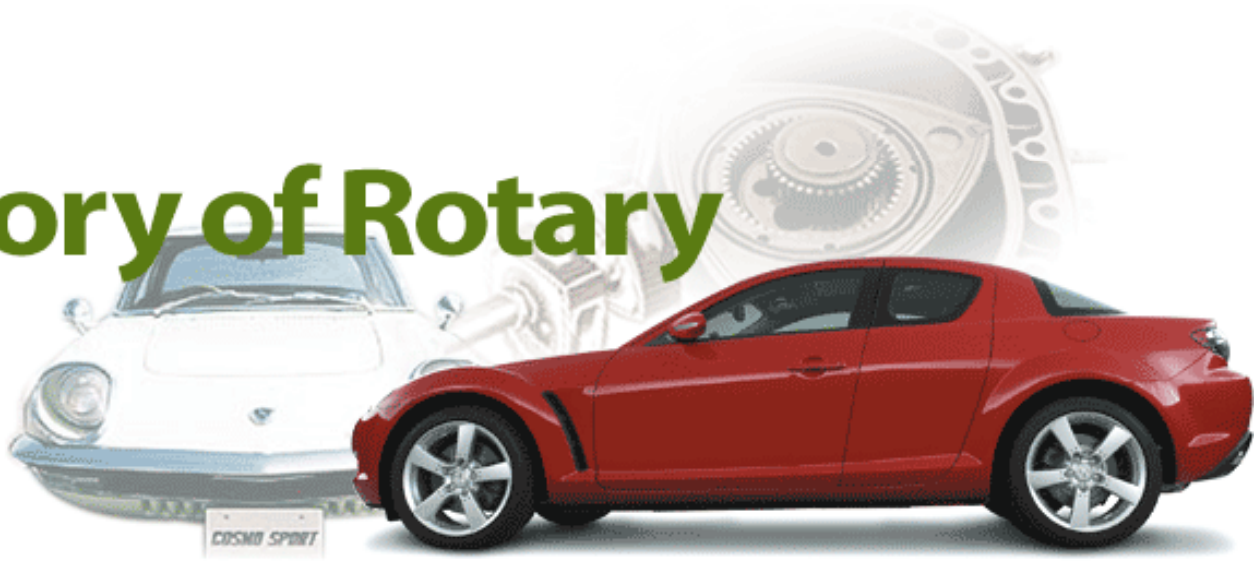
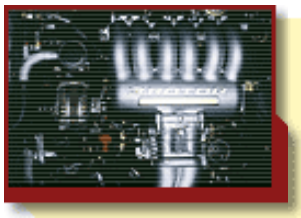
History of Rotary

Since 1967



The evolution of Mazda is synonymous with that of "rotary engine." Since Mazda's first RE-powered mass production model "Cosmo Sport" was introduced in Japan in 1967, Mazda has produced many products empowered with this unique engine, attracting many auto fans around the world.
Here introduced are various accounts for the rotary engine, such as the products, development and engineering, and motorsports that enable Mazda to make a difference from the other auto manufacturers.



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Engineering challenges and endeavors to evolve rotary engines.

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RE Graffiti

Mazda's rotary engine model lineup.

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Mazda's legendary rotary engine models involved in motorsports.

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Ranging from the very original device to Mazda's latest models.

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60's


Cosmo Sport


Familia Rotary Coupe


Luce Rotary Coupe

70's


Capella Rotary


Savanna


Luce Rotary


Rotary Pickup


Parkway Rotary 26


Roadpacer AP


Cosmo AP


Luce Legato


Savanna RX-7 (1st)

80's~


Cosmo/Luce


Savanna RX-7 (2nd)


Luce Rotary


Cosmo


Anfini RX-7 / RX-7 (3rd)

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1.1951-1970

Year	Month	Event	
1951		Felix Wankel collaborated with NSU to promote his rotary engine research and development	
1957		Wankel/NSU built prototype DKM rotary engine	
1958		Wankel/NSU built prototype KKM rotary engine	
1959		Wankel completed Type KKM250 rotary engine	
1960		Wankel/NSU publicly tested their rotary engine	
1961	7	Mazda made technical contract with NSU and Wankel	
	11	First prototype rotary engine completed at Mazda	PHOTO
1963	4	Rotary Engine Research Department established in Mazda	
1964	9	Prototype rotary-engine-powered sports car showcased at Tokyo Motor Show	
1967	5	Mazda's first rotary engine model 'Cosmo Sport' [aka. 'Mazda 110S'/engine type: 10A (491cc x 2)] introduced in Japanese market	PHOTO
1968	7	'Familia Rotary Coupe' [aka. 'Mazda R100 Coupe'/engine type: 13A (491cc x 2)] introduced	PHOTO
1969	9	Export of rotary engine cars to Australia and Thailand started	
	10	'Luce Rotary Coupe' [aka. 'Mazda R130 Coupe'/engine type: 13A (655cc x 2)] introduced	PHOTO
	10	Mazda's rotary engine car cleared the emission test by US Federal Government	
1970	4	Japanese Mechanical Engineering Society awarded Mazda for commercialization of rotary engine	
1970	5	Export of rotary engine cars to Switzerland started	
	5	'Capela Rotary' [aka. 'Mazda RX-2'/engine type: 12A (573cc x 2) introduced	PHOTO

6	Export of rotary engine cars to the United States started
12	Accumulative production of rotary engine cars reached 100,000 units

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Engineering History

1.The Birth of the Rotary Engine

Dream of Young Wankel

Felix Wankel

In 1957, in cooperation with NSU, Dr. Wankel completed the type DKM engine. It was the world's first prime mover by rotating motion alone. In 1958, he completed a more practical type KKM that became the basis of the current rotary engine.

The rotary engine began with an improbable dream one summer in 1919 by a 17-year-old German boy named Felix Wankel. In the dream, he went to a concert in his own handmade car. He even remembers boasting, in the dream, to his friends; "my car has a new type of engine: a half-turbine half-reciprocated engine. I invented it!" When he woke up in the morning, he was convinced that the dream was a premonition of the birth of a new type of gasoline engine. He had at the time no fundamental knowledge about internal combustion engines, but he intuitively believed that the engine could achieve four cycles-intake, compression, combustion, and exhaust--while rotating. This intuition actually triggered the birth of the rotary engine, which had been attempted countless times by people all over the world since the 16th century. The rotary engine has an almost perfectly smooth operation; it also meets the most stringent technical standards. His dream and intuition had steered his entire life.

In 1924, at the age of 22, Felix Wankel established a small laboratory for the development of the rotary engine, where he engaged in research and development. During World War II, he continued his work with the support of the German Aviation Ministry and large civil corporations, both of whom believed that the rotary engine would serve the national interest once it were fully developed. They held that the rotary engine, if fully exploited, could move the German nation and its industries toward greatness.

After the war, Wankel established the Technical Institute of Engineering Study (TES) and continued his work on the research and development of the rotary engine and the rotary compressor for commercial use.

One prominent motorcycle manufacturer, NSU, showed a strong interest in Wankel's research. NSU generated a great deal of enthusiasm among motor-sports fans; they were repeat winners of many World Grand Prix championships. NSU was also attracted by the ideal concept of the rotary engine. A fter creating partnership with Wankel, NSU promoted Wankel's research and focused on the rotary engine with trochoid housing as most feasible.

First Wankel Engine

Before that, however, NSU completed development of the rotary compressor and applied it to the Wankel-type supercharger. With this supercharger, an NSU motorcycle set a new world speed record in the 50cc class, marking a top speed of 192.5 km/h. In 1957, Wankel and NSU completed a prototype of the type DKM rotary engine, which combined a cocoon-shaped housing with a triangular rotor. The rotary engine was first invented here.
The DKM proved that the rotary engine was not just a dream. The structure, however, was complicated because the trochoid housing itself rotated; that made this type of rotary engine impractical. A more practical KKM with a fixed housing was completed a year later, in 1958. Although it had a rather complicated cooling system that included a trochoid with an oil-cooled rotor, this new KKM was a prototype of the current Wankel rotary engine. Forty-nine years had already passed since young Felix Wankel dreamed of The NUS-built single-rotor the rotary engine.

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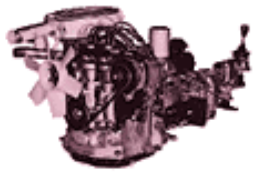
Engineering History

2.From Cosmo Sport to RX-7

From Dual-Rotor to Multi-Rotor

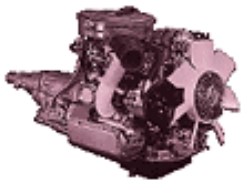


First Two-Rotor Engine
In 1967 Mazda announced the world's first commercialized two-rotor unit, the type 10A. It developed 110PS.

In the early 1960s, during the initial development stage of the rotary engine, Mazda designed and investigated three types of rotary engine: those with two rotors, three rotors, and four rotors. The singlerotor version, prototypes of which were completed by NSU, could run smoothly at high speeds, but in the low speed range, it tended to be unstable, causing vibrations and a lacking of torque. This was due to the fundamental characteristics of singlerotor engines, which had large torque fluctuations.
Mazda then decided to develop a two-rotor engine, in which the torque fluctuations were expected to be at the same level as a 6-cylinder 4-cycle reciprocating engine. The rotary engine could also further enhance the smoothness of revolution.
The first two-rotor test engine, type L8A (399cc unit chamber volume), was Mazda's original design, and mounted on a prototype sports car (type L402A, early prototype of the Cosmo Sport) exclusively designed for the rotary engine. Test drives began soon afterward. In December 1964, another two-rotor test engine, type 3820 (491cc unit chamber volume) was designed. It soon evolved to the mass-production trial-type L10A.
Moreover, in recognition of the large potential of the rotary engine, Mazda invested heavily in imported and exclusive machine tools, and proceeded with the trial manufacturing of multi-rotor rotary engines, including three and four-rotor versions. Those prototypes were installed on a prototype midengine sports car, Mazda R16A; test drives began soon afterward. Those driving tests were performed on a high speed test circuit at Miyoshi Proving Ground that was completed in 1965. The course was the most advanced in Asia at that time.

World's First Two-Rotor Rotary Engine

On May 30th 1967, Mazda began selling the world's first two-rotor rotary engine car, the Cosmo Sport.
It featured a 110-horsepower type 10A engine (491cc unit chamber volume) equipped with newly developed apex seals made with pyrographite, a high-strength carbon material, and specially processed aluminum sintering. This type of apex seal resulted from Mazda's independent development work and was proven durable through 1,000 hours of continuous testing. Even after a 100,000 km test drive, it showed only slight wear and an absence of chatter marks.
For the intake system, the side-port configuration, coupled with a two-stage four-barrel carburetor, was adopted to keep combustion stable at all speeds. For the ignition system, each rotor was equipped with spark plugs so that stable combustion could be maintained in cold and hot weather conditions alike, as well as on urban streets and expressways.
The Cosmo Sport recorded more than 3 million kilometer of test drives in six years. Its futuristic styling and superb driving performance delighted car buffs throughout the world.



Low-Emission 13B
Type 13B is a two-rotor engine with a 672cc unit chamber volume. First introduced in 1973 with full low-emission packages.

Cosmo Sport (S110)
Launched in 1967, the Cosmo Sport powered by a 10A rotary engine amazed people with its performance and unique design.

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3.Advanced Rotary Engine

Turbo and Dynamic Supercharger

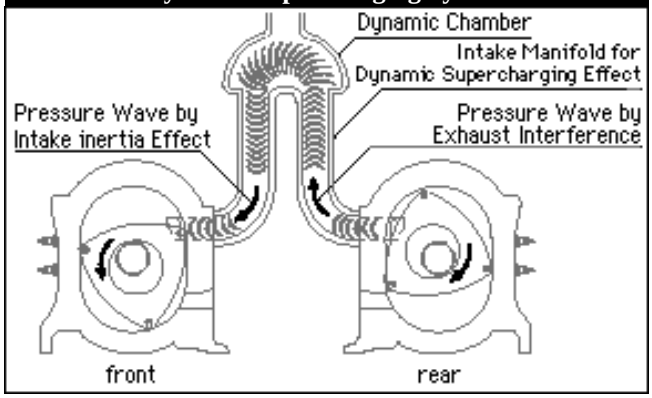
The Cosmo RE Turbo, which went on sale in 1982, was the world's first rotary engine car with a turbocharger. The rotary engine's exhaust system inherently had more exhaust energy to drive the turbocharger turbine compared with the reciprocating engine; the rotary engine was better suited to the turbocharger. Moreover, the Cosmo RE Turbo was the world's first series-production rotary engine car equipped with an electronically controlled fuel injection system.

The Cosmo RE Turbo was the fastest commercial car in Japan at that time. It clearly demonstrated the attractiveness of the rotary engine. Thereafter, the "Impact-Turbo," developed exclusively for the rotary engine, made its debut. It was responsible for even further improvements in response and output.

The "Dynamic Supercharging" system was adopted in 1983 for the naturally aspirated (NA) rotary engine, type 13B. This system dynamically increased the intake air volume without turbo or mechanical supercharger, by utilizing the induction characteristics peculiar to the two-rotor rotary engine.

With the six-port induction system and the dual injector system, which had two fuel injectors in the chamber for each rotor, the 13B rotary engine came equipped with this dynamic supercharging system and achieved significant output increases regardless of the speed range. The dynamic supercharging system was further improved in 1985 through changes in the surge tank configuration.

Dynamic Supercharging System

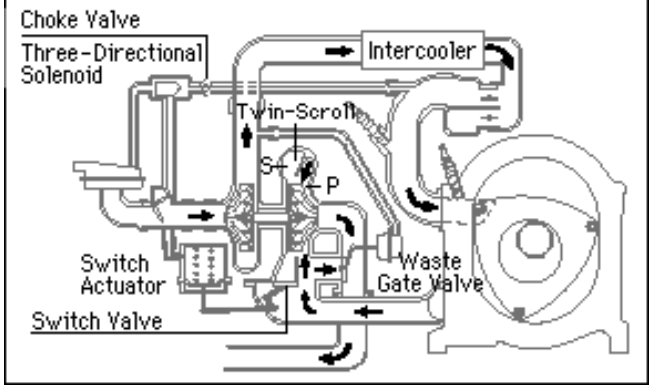


This system used neither turbo nor supercharger, but filling efficiency could be drastically increased over the conventional design, by utilizing pressure waves generated inside the intake tracts by the sudden opening and closing of the ports.

Twin-Scroll Turbo

To improve the driving performance of the turbo rotary engine, the second generation Savanna RX-7 adopted the type 13B engine with a Twin-Scroll Turbo which would minimize turbo lag. The Twin-Scroll Turbo divided the exhaust intake scroll of the turbine into two passages so that exhaust could be supplied step-wise. With this configuration, the single turbocharger acted as a variable turbo and sufficiently covered a wide range of speeds. In 1989, The Twin-Scroll Turbo evolved into the Twin-Independent-Scroll Turbo, which had a more simplified configuration. When this new turbocharger was coupled with improvements in the engine internals, it provided more outstanding low-speed torque, improved responsiveness, and upgraded driving performance.

Twin-Scroll Turbo System



This system helps reduce the turbo-lag, a traditional drawback of the turbo-charged engine. The duct leading the exhaust gas to the turbine was split into two passages, one of which was closed by a valve to accelerate exhaust gas flow at low speeds.

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Engineering History

1.The Birth of the Rotary Engine

In search of Ideal Engine

Tsuneji Matsuda
As the President of Mazda, he took the initiative in proposing a technical cooperation plan with NSU for the development of the rotary engine and obtained the approval.

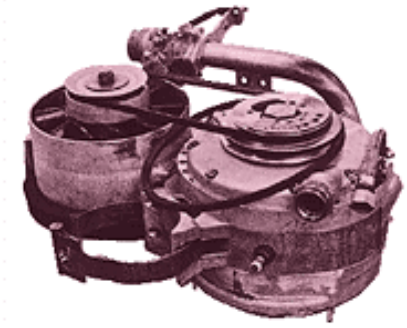
In November 1959, NSU officially announced the completion of the Wankel rotary engine. Approximately 100 companies throughout the world scrambled to propose technical cooperation plans; 34 of them were Japanese companies.
Mazda's president, Mr. Tsuneji Matsuda, immediately recognized the great potential of the rotary engine, and began direct negotiations with NSU himself. Those negotiations resulted in the formal signing of a contract in July 1961. The Japanese government gave its approval. The first technical study group was immediately dispatched to NSU, while an in-house development committee was organized in Mazda. The technical study group obtained a prototype of a 400cc single-rotor rotary engine and related drawings, and saw that the "chatter mark" problem-traces of wavy abnormal wear on the rotor housing that caused the durability of the housing to significantly deteriorate was the most critical barrier to full development. It remained a problem even inside NSU.
Mazda, while testing the NSU-built rotary engine, made its own prototype rotary engine in November, 1961. The engine was independently designed in-house. Both engines, however, were adversely affected by chatter marks. Practical use of the engine was not possible without solving that problem first.

Nail Marks of the Devil

In April 1963, Mazda newly organized its RE (Rotary Engine) Research Department. Under Mr. Kenichi Yamamoto, chief of the department, 47 engineers in four sections--investigation, design, testing, and material-research--began exhaustive efforts in research and development. Its main objective was the practical use of the rotary engine: namely, mass production and market sales. The most critical engineering issue, the chatter mark problem, had to be solved.
The chatter marks were made inside the trochoid housing at the wall, where the apex seals on the three vertexes of the triangular rotor glided while juddering.
The apex seal itself caused abrasive vibration and the inside wall of the trochoid housing was marked as traces of abnormal wear. The RE Research Division called them Devil's Nail Marks and found that they were made when the apex seal vibrated at the inherent natural frequency.
To eliminate this phenomenon, a cross-hollow seal was developed, which helped a

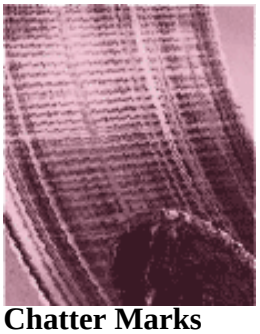
prototype engine to complete 300 hours of high-speed continuous operation. This technique, however, was not adopted in the mass-produced rotary engines, but served to promote further research of the apex seal in the areas of materials and structure.
Moreover, in the initial stage of rotary engine development, another problem caused thick white smoke to pour out when the engine oil consumption and was regarded as another barrier against commercialization.
The cause of the problem was inadequate sealing. With cooperation of the Nippon Piston Ring Co. and the Nippon Oil Seal Co. Mazda designed a special oil which proved to be a solution.

Kenichi Yamamoto
As the chief of the RE research department, he played a key role in developing Mazda's rotary engine. Later served as President and then Chairman of the company.



KKM 400 Rotary Engine

The NUS-built single-rotor prototype engine sent to Hiroshima from Germany with its technical drawings. This had a chamber volume of 400cc.



Chatter Marks
The durability of early rotary engines was severely affected by these wavy traces of abnormal wear on the inside surface of the trochoid housing.

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1.Dawn of Mazda Racing History ~ Participation in Motor Racing Events and Its Challenges ~

Cosmo Sport 110S and Races

Mazda came up with the plan to participate in motor racing to prove that the rotary engine, the world's first mass-produced engine of its kind, ensured high-performance, reliability and durability. This was when the company launched the Cosmo Sport, the first vehicle in the world powered by a multi-rotor rotary power unit. The two racing-trim Cosmo Sports were baptized at the Nordshleife, Nurburgring where the "Marathon de la Route," an 84-hour endurance event, was held on August 21, 1968.

The heart of the racing Cosmo Sport was based on the twin-rotor Type 10A engine featuring a single-port capacity of 491cc, aluminum housing and side port. The competition powerplant featured an innovative combination port system that utilized the side portconfiguration for low-rpm operation and, for the high-speed range a peripheral port was used to improve the engine's breathing. The fuel-air mixture was supplied by a Weber-type carburetor and the port switching mechanism was provided by a shutter valve located inside the intake manifold. The maximum power output was intentionally restricted to 130ps/7,000rpm after taking into consideration the long distance the car needed to cover during a race spanning three and a half days.

During the event, two Porsches and a Lancia made up the top-three with two Cosmo Sports playing aggressive catching up roles. In the 81st hour, just three hours before the chequered flag, one of the Cosmo pair suffered a broken rear axle and had to retire. The other, however, endured the 84-hour challenge, and was classified fourth overall. This wonderful achievement proved that the rotary engine, a power unit unknown in the ordinary world, had enormous potential in power, reliability and durability.

The R-100 (Familia Rotary Coupe) Knocked on the Door of European Touring Car Races

In July 1968, the mass-production Familia Rotary Coupe, equipped with a rotary engine as its name implied, was launched and took over the position of a volume seller for the Mazda stable from the Cosmo. The racing Familia Rotary Coupe featured Type 10A engine identical to the preceding Cosmo Sport but the use of a peripheral port allowed it to generate peak power approaching the 200ps mark.
The Familia Rotary Coupe R-100 recorded its maiden victory at the Grand Prix of Singapore in April 1969 but this was just the beginning. It finished the Spa-Francorchamps 24-hour race in fifth and sixth places after four Porsche 911s, vehicles that were fundamentally in a different category. One month later, it finished in the points _ fifth overall _ in the "Marathon de la Route."
The following season saw the presence of the evolutionary version of the racing Familia. The car participated in three events within two months; the RAC Tourist Trophy Race in June 1970 (GB, eighth overall), the West German Touring Car Grand Prix in July (fourth overall) and the Spa-Francorchamps 24-hour Race. There were 58 entrants including BMW2800CSs and Alfa Romeo GTAs in the Belgian endurance race. The four Familia Rotary Coupes that had been entered displayed a good rhythm from the very beginning. At the 12th hour, the entry driven by Yoshimi Katayama and Toshinori Takechi overtook a BMW to take the lead in the event for the first time. The other three siblings maintained third, fourth and eighth places. The fierce battle between the first- and second-place cars from Japan and West Germany lasted until the 18th hour when the Familia suddenly had to pull out for good. This might have been an omen of misfortune for the marque from Hiroshima as two more Familia Rotary Coupes were added to the retirement list. The last remaining survivor was classified fifth, a disappointment considering the superb performance up until the 18th hour.
Though the Familias did not win the race, the promotional effect was so great that most of the spectators present at the event were aware of the brilliance of the rotary engine. The awe-inspiring performance of the new comer was highly acclaimed and the Mazda Familia Rotary Coupe was nicknamed the "Small Giant."

A scene from the Spa-Francorchamps 24-hour Race

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2.Domestic Battlefield ~ Breathtaking Performance in Debut Race ~

100 wins by the Savanna RX-3

Fuji 500-mile Tourist Trophy Race

The Familia Rotary Coupe, after a series of strong performances in Europe under its belt, made its sensational debut in the Japanese race in November 1969. At the All-Japan Suzuka Automobile Grand Cup Race, the first participation on home soil for the Small Giant, the Familia Rotary Coupe won the event with ease due to the continuous upgrading during the fierce European competitions. It also posed a serious challenge to the Nissan Skyline GT-Rs, the defending champion at that time by finishing fourth overall and signaling that Mazda's presence threatened the Skyline's dominance.

The Capella Rotary, the successor of the Familia, failed to win the championship though it showed strong promise.

A major boost was gained when the first-generation Savanna was introduced to the road-going market in September 1971. The racing variant participated in the Fuji 500-mile Tourist Trophy Race and achieved an astonishing debut win. What is more, the Savanna is remembered by Japanese race-historians as the car that prevented the Skyline GT-R from winning 50 consecutive races. In the following 1972 season, the Savanna RX-3 (the road-going version was known as the "Savanna GT") with the more powerful Type 12A engine, burst onto the scenes. The RX-3 troops dominated the qualifying session of the Japanese Grand Prix (TS-b Race) in May with one of the cars achieving an easy run-away victory in the main event.

After the sweep in the TS-b Race, the Savanna RX-3 was in high demand from privateer customers in addition to the factory-backed teams. The secret behind the successful sales, the secondary target for the vehicle, included the rotary engine ensuring reliability, durability and dynamism and the variety of sports kits that could be used to customize it for sprints and endurance races. As a result of its natural racing characteristics plus its potential for being easily adaptable to various racing scenes, the RX-3 has stood out in racing history since recording its 100th win in the JAF Grand Prix (TS/GTS Race) in May 1976.

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3. Major Achievements of the Savanna RX-7 in the IMSA Series

IMSA Activities

Daytona 24-hour Race

Racing enthusiasts throughout the world were jubilant in welcoming the first-generation Savanna RX-7 when it was introduced to the market in March 1978. The vehicle's potential for motoring activities was highly appreciated.
Of particular note was its storming performance in the IMSA (International Motor Sports Association) Series in the United States. In February 1979, it won the GTU class and classified fifth overall in the famous Daytona 24-hour Race when it was driven in anger for the first time in America. The maiden victory in the GTU class was followed by an astonishing series of wins, which extended from 1980 to 1987, the first-ever such achievement in the IMSA Series. In addition, Mazda outperformed all its rivals in the Series in 1989 and 1990, resulting in a superb record of ten Manufacturer's titles, trumpeting the name of its brand as a major actor in international racing.
Another important aspect of Mazda's IMSA involvement was the strong performance of RX-7 privateers. Irrespective of geographical borders, enthusiasts dedicated their passion and expertise to the rotary engine. This was undoubtedly a major contributory factor in Mazda's gaining the unprecedented record of 100 IMSA wins in a decade.

The First Japanese Overall Win at the 1981 Spa-Francorchamps 24-hour Race

In 1981, Mazda embarked on the bold challenge to participate in the Spa-Francorchamps 24-hour Endurance Race, one of the three major endurance events in the world, where it sewed up an overall win with more than a two-lap margin over the BMW530i in second place.
This was the first-ever great achievement by a Japanese car. That year's RX-7 was simply unstoppable; clinching Championship titles in the IMSA Series, the SCCA (Sports Car Club of America) Pro-rally Series, the British Saloon Car Championship (1,600 - 2,300cc class, three years in a row) and the Belgian Touring Car Championship.

An Unprecedented 100 Wins in the IMSA Series

The true moment of glory was when the RX-7 won its 100th IMSA race in the 1990 season. The IMSA Series consists of 15 stages held at various venues throughout the United States. Mazda participated in the 1979 Daytona 24-hour, the season opener of the Series, outpacing the rest of the GTU-class (Engine displacement equal to or less than 3,000cc) for a surprising 1-2 finish. From that time, the company remained committed to the Series for just over one decade.
It was the eleventh round of the 1990 season, held at San Antonio in September, in which the RX-7 clinched its anniversary 100th win. The history of the IMSA during the 1980s almost paralleled that of Mazda, one of the many proofs of the dynamism and reliability of the Savanna RX-7.

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4.Le Mans and Racing Rotaries ~ the Le Mans Challenge and Win ~

Le Mans Challenge

Mazda won the Group C Junior class

1984

1985

The first clarion call of a rotary-engined vehicle at Le Mans was sounded in 1970. A Belgian team installed Mazda's Type 10A unit in a Chevron B16, which, unfortunately, stopped four hours after the start due to a coolant pipe failure. Three years later, the first Japanese team with a Mazda engine entered a Sigma MC73, assembled by Sigma Automotive and powered by a Mazda Type 12A rotary unit. It lasted longer than the previous challenger but met the same fate in the eleventh hour. The following year's event saw Type 12A engine installed in the Sigma MC74, a modified version of the MC73. It completed the whole 24-hour slog for the first time only to be classified as DNF due to not having completed enough laps.

In 1979, the Motorsport Division of Mazda Auto Tokyo developed and assembled the Mazda 252i, based on the Savanna RX-7 for participation in Le Mans. The qualifying hurdle was, however, too high for the vehicle. The Savanna RX-7 prepared by an American private team completed the event and ranked 21st, which was the first successful classification for a rotary-engined challenger.

The 1981 Mazda 253, an evolutionary version of the 252i, failed to meet its goal. In 1982, two Mazda 254s were taken to the Sarthe classical racetrack where one retired and the other finished 14th overall.

The technical regulations were revised for the 1983 24-heures du Mans resulting in a new category called Group C Junior (renamed "Group C2" from 1984). Mazda engineered the pure and genuine Mazda 717C sports car, fitted with a Type 13B engine in accordance with the new rules. Despite an engine volume handicap, the Mazda 717C performed strongly against rivals of much larger capacity. It won the Group C Junior class and ranked 12th overall. Meanwhile back home in Japan, the Motorsport Division of Mazda Auto Tokyo was reorganized and became Mazda Speed Co., Ltd.

In 1984, in addition to two Mazda 727Cs, evolutionary versions of the 717C, two Mazda Lola T616s (powered by Type 13B engines) supported by BF Goodridge participated in that year's endurance classic. One of the T616s was first in class and 10th overall. Its sister car was classified third in class and 12th overall. The Mazda 727Cs were fourth (15th overall) and sixth (20th overall) in Group C Junior. All the rotary-engined contenders completed the 24-hour event, showing again that the rotary unit ensured high-performance and reliability at the same time.

In 1985, the third consecutive category win by a rotary-engined car was expected especially due to fact that the company's challenger, which had been renamed the Mazda 737C, had received further upgrades. Although they saw the chequered flag, the two Mazdas were confined to third (19th overall) and sixth (24th overall) in class. In the following season, two Mazda 757s with new power plants made up of three rotors and codenamed "Type 13G" (renamed "Type 20B" as of November 1987). Unfortunately, because of driveshaft problems, they were unable to reach the final goal.

Two Mazda 757s participated in the French event in 1987. One of them absented itself from the race early on whereas the other showed good pace to achieve the a new best-ever classification for a Japanese manufacturer with seventh overall.

Mazda's Le Man challenge was not to stop. It came up with a brand-new quad-rotor engine, Type 13J-M (M standing for "modified") in 1988. Two Mazda 767s with the new engines and one Mazda 757 with a three-rotor version participated in Le Mans. The two 767s were in good form in the early stages, leading the Japanese challengers from the fourth to 16th hours. Expectations went up in smoke when they both sustained exhaust manifold problems leading to significant loss of pace. They were classified 17th and 19th. The 757, on the other hand, only managed 15th overall due to a crack in a brake rotor.

Mazda was determined and committed to "Operation Rollback" in the following year. Three 767Bs with Type 13J-Ms were dispatched to France. Two out of the three crashed in the qualifying session, taking the luster off the performance in the actual race. Fortunately, no major problems occurred during the weekend and one finally crossed the finish line in 7th place with a total mileage of 4,980km, the longest distance covered by a Japanese car at the Sarthe circuit. The other two also completed the event, coming in 9th and 12th overall.
The 1990 Mazda Le Man challenger was the Mazda 787 with a brand-new R26B quad-rotor engine. Expectations for an overall win were high but both machines were sidelined: one due to fuel problems, the other electrical. The remaining 767Bs survived the long, tortuous distance both for man and machine. The result, however, was only mediocre, a disappointing 20th overall.

First Le Mans Win by a Japanese Car in 1991

First Le Mans Win by a Japanese Car

The 1991 Le Mans was a historic moment for the rotary engine. It was in this year that a Mazda 787B finally secured an overall win at the 24-heures du Mans, the first time for a Japanese challenger to realize such an achievement. The action of the memorable 59th event began at 4:00 PM on June 22nd. Three rotary-engined contenders, featuring one additional rotor for a four-rotor configuration, aggressively hunted out their spaces among the legendary rivals of Mercedes-Benz, Jaguar, Peugeot and Porsche.
It was 1:03 PM on the 23rd when the number 55 Mazda 787B passed the defending champion Mercedes to take the lead. When the small hand of the clock pointed at four, it was the Mazda crew that was the first to see the chequered flag. The winner's siblings also saw out the full 24 hours crossing the finish line to glory in sixth and eighth place. The dream, long cherished but one that had remained elusive for 13 years, had at last come true.

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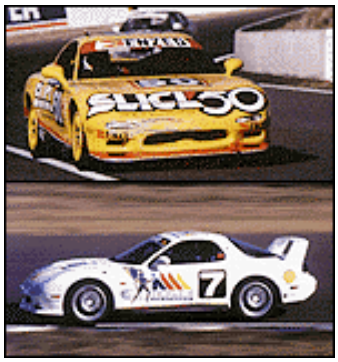
5.Racetrack Activities of the New RX-7 ~ Endurance Battlefield ~

Bathurst 12-hour Endurance



The Bathurst 12-hour Endurance Race is a tough Australian battlefield where the very limits of man and production-car-based machines are severely tested. The Enfini RX-7 participated in the event in 1992 outperforming the famous rivals of Porsche 968, Honda NSX and Nissan Skyline GT-R.
Mazda dominated the event for three consecutive years until 1994 with a racing car very close to the road-going version when the host track was changed to Eastern Creek in 1995. The company also won that year's race.

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