

# Porsche — ultimate sports machine for discerning

All Porsche engines are rugged, tested high performance power plants with extensive rpm reserves and low piston velocities. You can drive them at top speeds for hours on end or push them through the gears flat out. A governor prevents overrevving. At the other extreme, backed-up in rush-hour highway traffic or on a city's congested streets, the Porsche engine won't let you down either. It's air-cooled, so it can't boil over. In short, it's designed for punishment almost beyond belief.

All three engines — the 911T, 911E and 911S — share the same basic design. The six cylinders are horizontally opposed, and are covered with light alloy cylinder heads. On the 911E and 911S the

For special performance requirements, as an option you can have your Porsche equipped with a 5-speed transmission.

Or you can order the Sportomatic option — the automatic transmission for sports drivers. It combines the advantages of the 4-speed standard transmission with the benefits of a hydraulic torque converter.

With the Sportomatic you can shift or not shift, depending on your style and depending on the driving situation. In heavy city traffic or slow-moving lines on the highway, you simply remain in the selected gear. No downshifting, no gearing up. But on the open road and in competition driving, you can shift it like a straight stick,



Porsche 911

heads have deep ventilating ribs to prevent excessive thermal stress.

The V-patterned overhead valves are controlled by rocker arms which are actuated by overhead camshafts above each cylinder bank. The forged 8-main bearing crankshaft ensures virtually vibration-free operation. A dry-sump lubrication system guarantees uniform oil supply to all lubrication points, even when your Porsche is cornering at high speeds.

All three engines are fed by Bosch mechanical fuel injection, with horsepower ratings of 135 DIN hp (129 SAE net hp) for the 911T, 165 DIN hp (157 SAE net hp) for the 911E and 190 DIN hp (181 SAE net hp) for the 911S. The Bosch system's precise metering of the fuel-air mixture greatly reduces unburned hydrocarbons and carbon monoxide. Also helping in our efforts to detoxify exhaust emissions are our engines' low compression ratios, which permit maximum efficiency when using lead-free regular 91 octane gasoline.

The result: an engine with power enough for maximum torque versatility and exceptional performance. And an engine that is also cleaner in the bargain.

The high engine speeds and great flexibility of the 2.4 liter engines make it possible to provide all 911 models with a 4-speed transmission as standard equipment. The engine and transmission form a perfectly harmonized single unit, providing maximum power to the driving wheels. The synchronization is very fast; only short, precise movements are necessary to shift into the different gears. The gear ranges have been carefully adapted to the engine characteristics and individual model types. This means fast response in any driving situation.

but without the need to clutch. Because there isn't any clutch pedal. (When you shift gears, it clutches automatically.) So the Sportomatic not only saves wear and tear on the drive train elements, it saves wear and tear on your nerves.

But is the Sportomatic really up to standard Porsche performance? To test it, we entered a Sportomatic-equipped Porsche in the grueling 84-hour Nurburgring classic, hoping it would give a creditable showing. It exceeded our hopes by winning the overall classification, another instance of testing Porsche components at the track.

The Porsche chassis clearly shows there is no contradiction between suspension/damping comfort and sporty roadability.

The independently suspended front wheels are stabilized by wishbones, in combination with torsion-bar springs and shock absorbers. This means the wheels maintain independent contact with the road. More precisely, potholes and rough spots which affect one wheel have no influence on the smooth running of the other wheel.

Also the rear wheels are independently suspended. They are stabilized by semi-trailing arms and sprung with longitudinal torsion bars and double action hydraulic shock absorbers. Anti-roll stabilizers (standard equipment on the 911S) are available as options; they provide for even better roadholding ability.

The wide-rim wheels and tires also contribute to Porsche's high-speed curving abilities. They reinforce the braking effect of the chassis substantially, absorb lateral forces and enable increased lateral acceleration.

In addition, these wheels (15 inches on all Porsches) have a greater circumference. The advantage here is a smoother ride on rough roads and longer life for tires.

# Mazda's own pride and joy - exhaust reducing engine

## THE ROTARY ENGINE'S COMBUSTION SYSTEM

Exhaust fumes contain carbon monoxide and hydrocarbons, which are dangerous to the human body. They can, however, be eliminated by simple processes (thermal reactor, catalyzer). Nitrogen oxide which causes city smog is difficult to eliminate. The rotary engine has a unique combustion system with a movable combustion chamber which causes the least amount of nitrogen oxide — an inherent anti-pollution characteristic.

## DEVELOPMENT OF EXHAUST REACTORS

The rotary engine greatly reduces the emission of oxides of nitrogen in the process of combustion — something hitherto considered difficult to accomplish. Mazda has already developed a thermal reactor which oxidizes carbon monoxide and hydrocarbons. Some rotary cars (those exported to U.S.) are equipped with this thermal reactor and emit innocuous carbon dioxide and vapor. The size advantage of the rotary engine makes practical the attachment of such equipment.

## SMOOTH ACCELERATION AND GEAR FLEXIBILITY

The operating part of the rotary engine transfers the rotor's motion directly to the wheels, thus making high speed rotation possible. This was difficult with the reciprocating piston engine due to inertia. The intake and exhaust systems are designed to idle smoothly and to respond instantly to any rotary motion. This response is available at any speed from low to high. The flat engine torque effortlessly increases rpm and gives amazing high-speed acceleration for expressway passing. The rotary engine is ideal for high-performance automobile use.

## QUIET-RUNNING, VIBRATION-FREE ENGINE

In reciprocating piston engines, the rectilinear and rotary motion of the connecting rod and the up and down motion of the piston causes inertia. Unavoidably therefore, the engine itself vibrates in all directions. Also, this type of engine's valves and other complicated parts of the intake and exhaust systems are quite noisy which makes quiet, high-speed performance impossible. The rotary



An R100 Coupe, (front) and a new Mazda.

engine has no parts that cause inertia and mechanical noise. The unique operating principle of the 2-rotary engine in Mazda cars equals the smoothness and performance of a six-cylinder piston engine.

## LIGHTWEIGHT AND COMPACT

The rotary engine's external size is about 50 per cent smaller than

that of comparably powerful reciprocating piston engines. It also weighs about half as much. This low weight/high performance ratio becomes very advantageous in larger engines and brings about many new possibilities in the layout of cars.

## FEWER PARTS AND SIMPLE CONSTRUCTION

The rotary engine is

inherently simple in construction and has fewer parts than the reciprocating piston engine. Therefore, there is less chance of trouble. And should anything go wrong, it can easily be repaired. Its production efficiency can be greatly streamlined making it ideal for mass production. Thus, the rotary engine has many producer/user advantages.

# More than just an engine

Mazda wants the world to know there is more in a Mazda than its Rotary engine.

For instance, Mazda RX-2 has a dual brake system with power assisted disc brakes in front and drums in the rear for fail-safe stopping power. A collapsible

safety steering column is another safety feature in Mazdas.

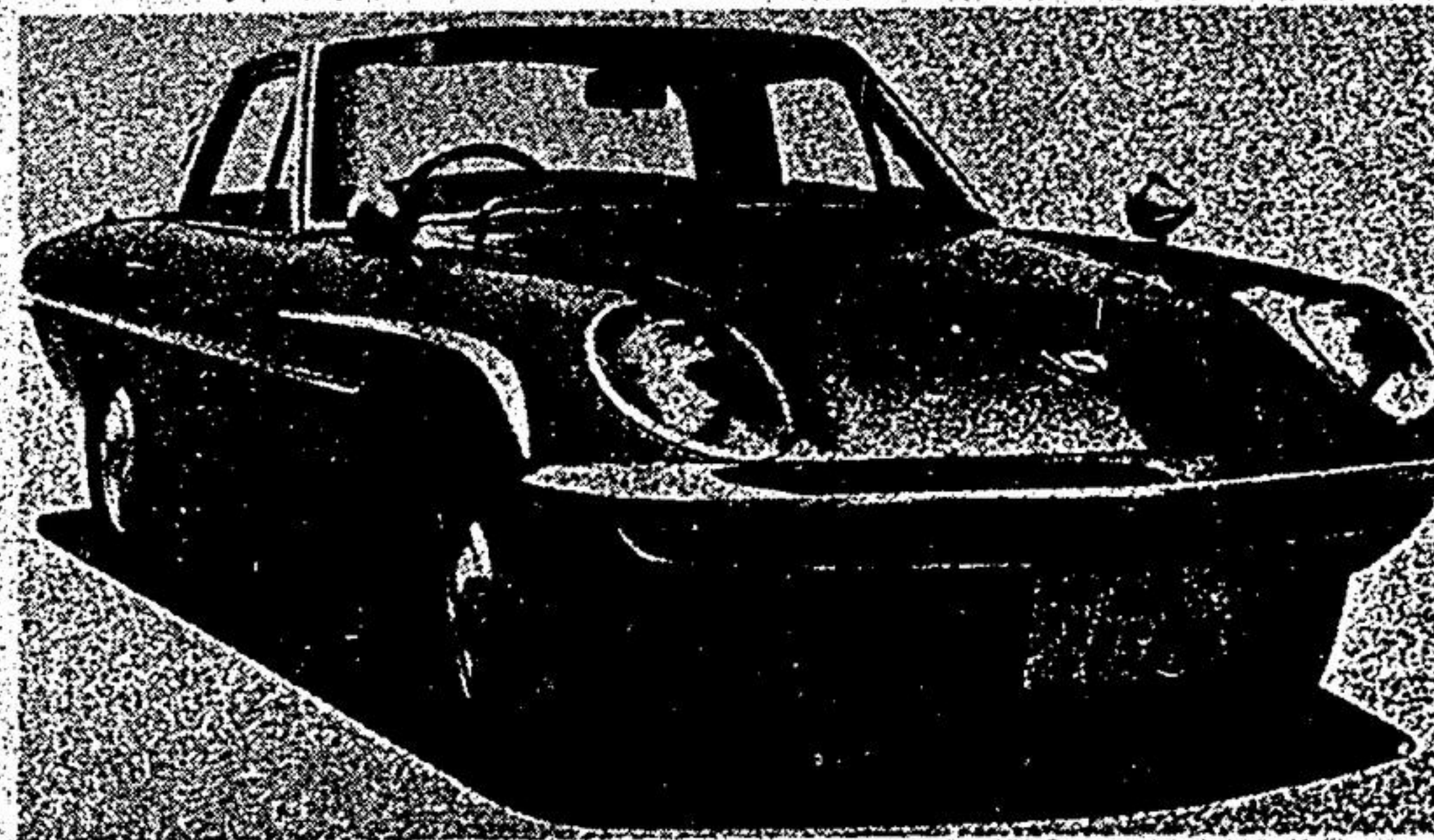
They also offer laminated safety-glass windshields with see-through shatter pattern and a strong unitized construction chassis.

For smoother rides there is a semi-floating

rear axle with a lateral road.

And there is a dual flow-through ventilation system and an oil cooler for safer engine operation.

Mazda has a slogan for its RX-2. "It isn't only quieter, smoother and quicker. It's a safer car too."



Cosmo (Mazda 110S), laboratory vehicle.



Mazda RX-2