

by Bill Sanders

Japan has Haiku poetry, Mt. Fuji, Toshiro Mifune, who can play a Samurai the way Gary Cooper could play a cowboy, and the largest city in the world. Japan also has the Mazda R 100 coupe. So, big deal. Maybe not. Poetry, mountains, actors, cities and cars aren't really unique in themselves. But, they *are* unique in kind. The latter, the Mazda R 100 coupe, is very unique indeed.

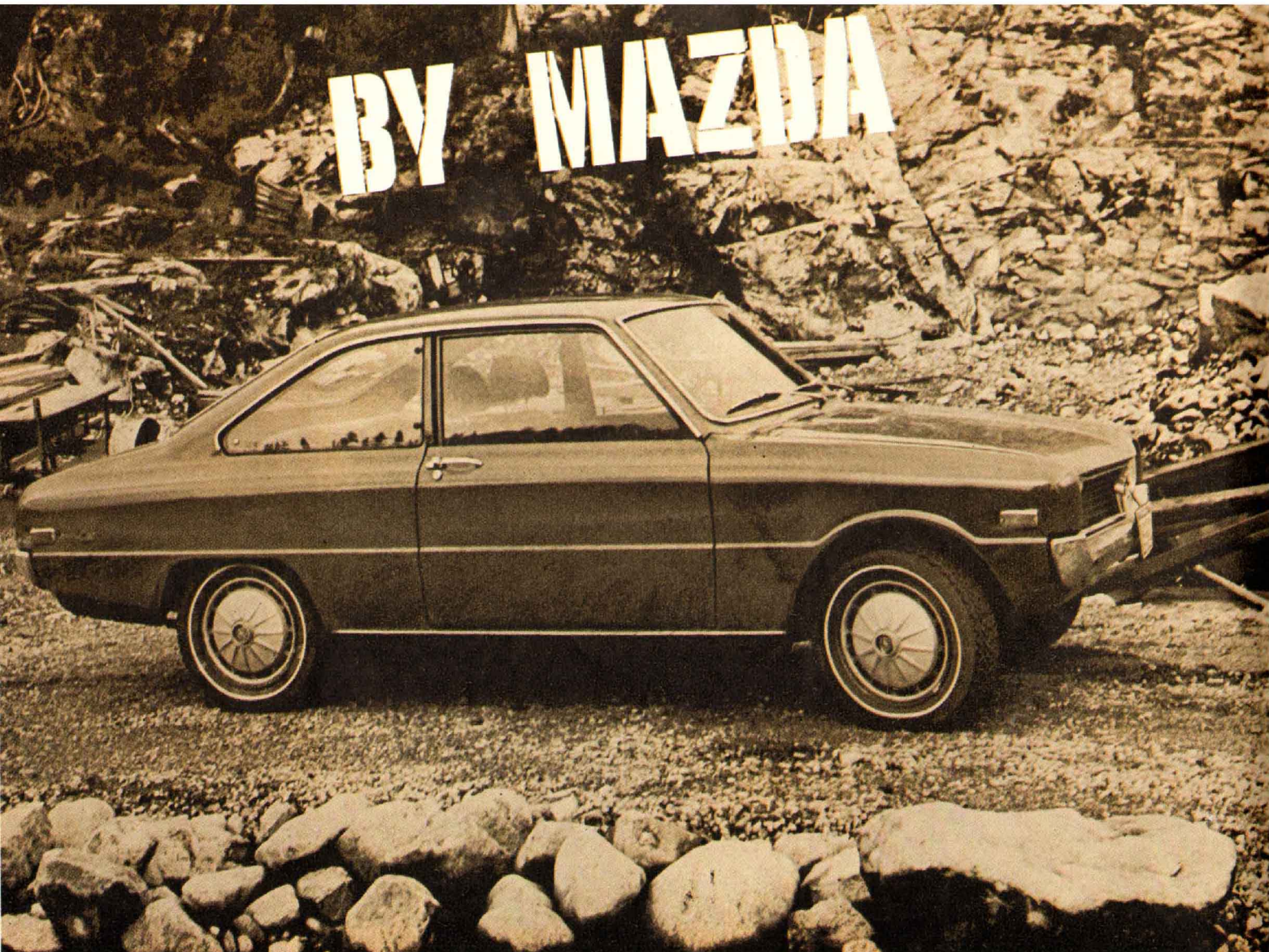
In case you didn't know, Mazda is a Japanese car built by Toyo Kogyo in Hiroshima. They produce sedans and station wagons with 1500 and 1800cc engines and the R 100 coupe: the only Japanese production passenger car powered by a Wankel twin-rotor engine. The rotary engine isn't new. NSU has it. Mercedes has it. Toyo Kogyo even won a *Motor Trend*

achievement award in 1968 for their work on the twin-rotor engine. What is new is the fact that the R 100 coupe may become the first rotary-powered car sold in the U.S. At the present, Mazda distribution in North America is centered only in Canada. That situation will probably change in the near future and Mazda will make their debut in the U.S. Because that fact seems imminent, *Motor Trend* was able to arrange one of the first road tests on the R 100 in Vancouver, British Columbia.

The front-engined R 100, while not outwardly different than most compacts, is a little gem in its own way. Styling-wise, it can be compared to the Toyota Corolla fastback. Power and performance are something else.

The rotary club is growing, and one of the charter members is about to invade America with a Wankel coupe.

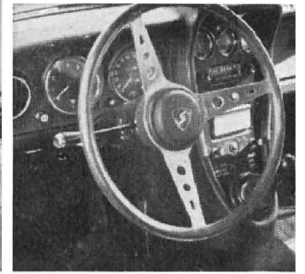
MADE IN JAPAN...



Mercedes may have their 280 horsepower C111 bomb that does zero to 60 in five seconds, but they are about as rare as a date with Susan Oliver. Good luck. The R 100 is built for everyday use and economy. That last point is a good one to remember come the revolution. The rotary engine has no valves, no cam, no lifters, no rods, no rings, no crankshaft... well, you get the idea. Each chamber has one triangular piston. These are held together by an eccentric shaft. That's all there is. The sides and the three corners of the triangular pistons are sealed by a secret formula carbon compound that takes the place of rings. Seals at the three apexes are 10.0 millimeters thick. Horsepower at 6500 rpm is 110.

A Mazda 110 S sports car, powered by the same rotary engine, and used by the Japanese highway patrol, was torn down after 66,000 miles and the seals showed only 0.06 millimeters wear. Mazda engineers estimate the life of the car at about five years and suggest that the engine should outlast the car. And that's without valve grinds or ring jobs. One of the first things we noticed about the R 100 was the lack of vibration and noise in the engine, especially at higher rpm. It is red-lined at 7000 rpm, but unlike reciprocating engines, gets its power at the top end, about the time most engines are starting down. And, because there is no valve train, the engine won't bog down at the top—especially great for passing. But, because of the danger of over revving,

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SPECIFICATIONS

MAZDA R 100

Engine: Rotary piston. **Displacement:** R.E. 30 x 2 cu. in. **HP:** 110 @ 7000 RPM. **Torque:** 100 lbs.-ft. @ 4000 rpm. **Compression Ratio:** 9.4:1. **Carburetion:** 1 4-bbl. **Transmission:** 4-speed synchro. **Final Drive Ratio:** 3.70:1. **Steering Type:** ball-nut. **Ratio:** variable, 17-19:1. **Turning Diameter:** 13 ft. 6 ins. curb-to-curb. **Tire:** Dunlop Japan Radials 145x14. **Brakes:** disc front, drum rear. **Suspension:** Front: McPherson Strut coil springs. Rear: Live axle leaf springs. **Body/Frame Construction:** Semi-monocoque. **Wheelbase:** 89 ins. **Overall Length:** 151 ins. **Width:** 59 ins. **Height:** 53 ins. **Front Track:** 47 ins. **Rear Track:** 47 ins. **Curb Weight:** 1775 lbs. **Fuel Capacity:** 15.8 gals. **Oil Capacity:** 5.25 qts.

PERFORMANCE

Acceleration: (2 aboard)

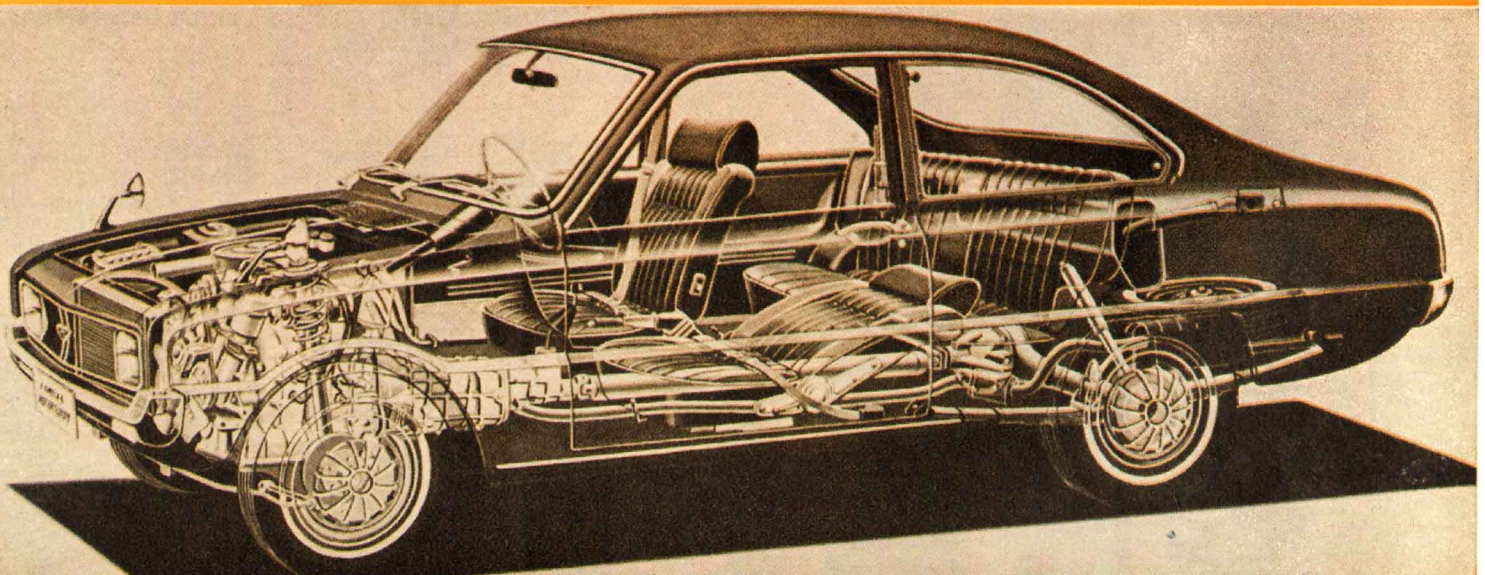
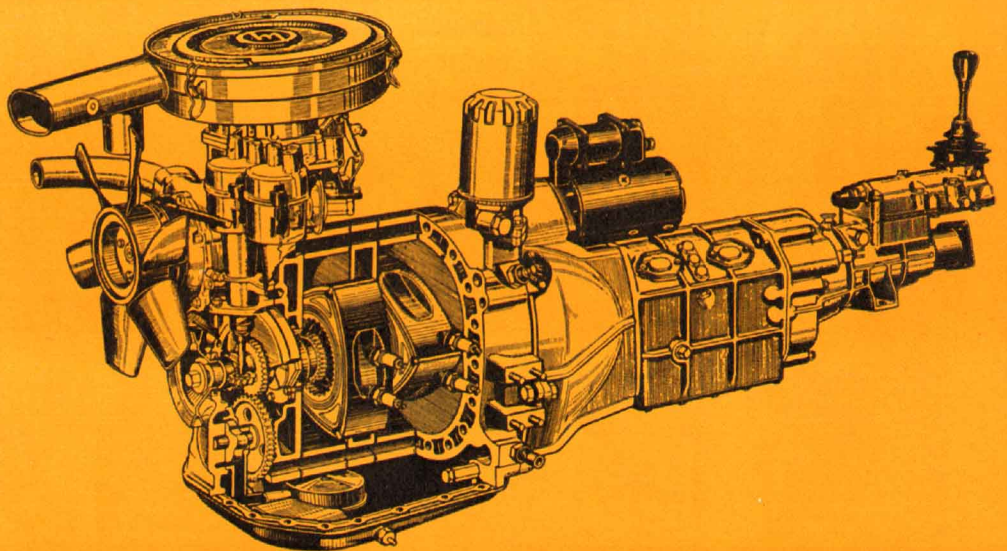
0-30 mph	4.3 secs.
0-45 mph	8.5 secs.
0-60 mph	13.1 secs.
0-75 mph	17.7 secs.

Speeds in Gears

1st	30 @ 7000
2nd	54 @ 7000
3rd	83 @ 7000
4th	112 @ 6700



Unlike the Germans, Japan's Toyo Kogyo decided to make their rotary powered Mazda R 100 a front-engine car. Mazda's engine (right) is a two-rotor version and puts out 110 hp. One four-barrel handles the carburetion and power is transmitted through a four-speed, all synchromesh transmission. Cutaway (below) shows right-hand-drive Japanese version and the coupe's semi-monocoque construction. Performance, for what is essentially a 60-cubic-inch engine, is impressive: the car will accelerate to 60 in 13.1 seconds and top at 112 mph.



MADE IN JAPAN

continued

Mazda has installed a governor, which not only sounds a warning buzzer at seven grand, but cuts off the fuel supply so the engine automatically backs down—not so great for passing. The danger of over-revving is heightened because of the lack of noise or vibration, though Mazda engineers have bench tested the engine to 13,000 rpm with no ill effects. Two spark plugs are used per rotor, four in all, with a separate distributor and coil for each rotor.

Going through the gears is quite an experience. The R 100 is standard with a four-speed manual transmission and, as mentioned, low-end torque isn't equal to any big V-8s. Still, you can lay a distinguished stretch of rubber if you desire. It's best to keep the engine at higher rpm for peak operating efficiency, so it is great fun to be able to up- and down-shift continuously. That isn't to say continuous shifting is necessary. It isn't. In fact, the rotary allows much more latitude within each gear range, for people who don't like to shift, than most four- or six-cylinder engines.

The range in each gear is fantastic. Our test car would go from about zero to 50 in low. Top gear would run from 20, without lugging, to a top speed of about 112 mph. In any gear, the engine ran up to 7000 without any vibration. Servicing should cause no fits either. Plugs, distributors and coils are all in plain view and within easy reach. The four-barrel Stromberg carburetor sits off on the side manifold similar to an in-line engine. A final interior piston seal is accomplished by a thin film of oil, so a separate, small oil pump supplies a minute amount of oil through the carburetor, as in a two-stroke engine.

Suspension and chassis design aren't revolutionary, but handling and roadability are remarkable. The front suspension is a coil spring, strut-type independent system. Rear suspension combines leaf springs with a live axle. The R 100 has a fairly low center of gravity, but still retains good road clearance. Handling characteristics are flat-out fun. We took our car on a fairly lengthy trip on a day that saw heavy rains, snow and sunshine. Standard tires are Dunlop (Japan) 145x14 radials, which we feel are too skinny though they did an excellent job.

Handling is precise and flat. Even in the tightest turns there is surprisingly little or no roll. Curves marked for 35 mph were taken easily at 55 mph, in the wet. Only when intentionally pushed

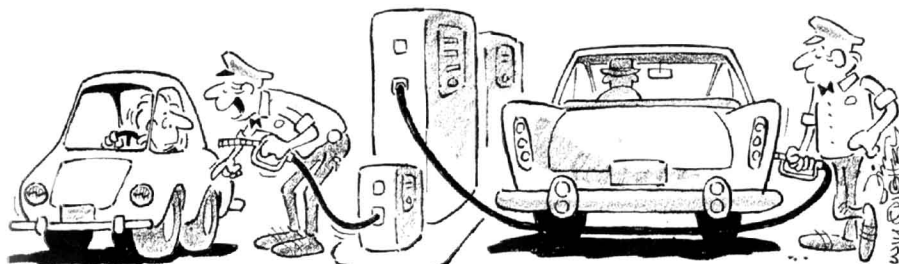
too hard did the car give any indication of breaking loose and then it came back with great response after a touch of the wheel and throttle. Front wheel disc brakes showed no signs of fade in the rainy British Columbia mountains.

It's been said that form follows function, and that's true with the R 100 interior. Bucket seats seem slightly narrow, but comfortable, even after hours behind the wheel. Contoured backs hold you in, surround you so there's no slipping or rolling. Head room is excellent, too... you could wear a top hat in the front seats. Front seat legroom is surprisingly good for such a short wheelbase car, but the short length of the engine adds to that. Even a six-footer will find all the legroom he needs in the front seats. Rear seat legroom is restricted, especially with the front seats in a full aft position. Door and window handles are easy to reach and operate. On the dash a huge speedometer and tachometer face you and are in a perfect location.

With the rotary engine you soon find yourself driving only with the tach, seldom looking at the speedometer, because the engine is so versatile. Three gauges, for fuel, amps and water temperature, are located in the center of the dash just above the radio and ash tray. Oil pressure is a light. The radio has a power antenna that has to be the fastest in the world. It's all the way up or down in about a second. A clock is also standard. The shift lever protrudes from the center of the dash console and is in a perfect location for light, precise shifts no matter how far forward or rearward you have the bucket seat.

In late October, Toyo Kogyo announced that the Mazda R 100 coupe, the 1800 sedan and the 1200 sedan had successfully passed the exhaust gas emissions tests set up by HEW, and that all three had gained final approval. This is the first time that a rotary-engine car has passed U.S. federal exhaust gas tests. They plan to begin exporting the Mazda to the U.S. this spring, after establishing their sales network. However, it is our understanding that the R 100 can't meet California's evaporative standards as of now. A solution should be forthcoming, though.

Even if the R 100 became the Model T of the 70s, Toyo Kogyo Company Ltd. of Hiroshima, Japan, doesn't plan on living with it alone as long as Henry Ford did with his car. The Mazda R 130 coupe, larger than the R 100 and with a bigger capacity rotary engine, is already a marketing reality. Next the rotary sedan. Get ready, America. /MT



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PERFORMANCE

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