Used Car Classic: 1993-1995 Mazda RX-7

“Fragile, fussy, but one heck of a driver's car.”

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Extraordinary things were going on at Mazda in the early 1990s. The Japanese economy was booming, and Mazda was continuing at full throttle to develop its oddball rotary engine with increasingly exotic — and expensive — versions.

It was a time when Mazda's corporate culture seemed to be ruled by wild-eyed engineers rather than the stingy accountants and marketing mavens that typically dominate most of the world's automakers.

From this period emerged not only another iteration of the Wankel engine, but one with a highly unusual sequential twin-turbo system. In a nutshell, the system consists of a small turbo that provides boost to the 1.3-liter twin-rotor at low engine speeds, plus a second turbo that comes into play only in the upper half of the rev range.

Porsche had already built something similar for its exotic 959. But Mazda's system was to be mass-produced. The fact that it was fiendishly complex and costly didn't seem to matter much to Mazda management. The company was determined to build one of the world's best sports cars, and the sequential twin-turbo rotary engine was to be its centerpiece.

Unfortunately, it did matter to the marketplace. American sports-car fans, who had come to love the first two generations of Mazda's cheap-and-cheerful RX-7s, left showrooms stunned with sticker shock after viewing the all-new, third-generation twin-turbo RX-7 when it made its debut for 1993.

A $32,000-plus price tag doomed the third-gen RX-7 to a brief life span in the U.S. market. At the same time, the bursting of Japan's bubble economy also sent Mazda into a financial tailspin, leading to a takeover by Ford in late 1995 and a complete reevaluation of the company's products and rotary engine plans.

The third-generation RX-7 was sold here for only three years, although it did soldier on in its native Japan until mid-year 2002.
Altogether, Mazda sold just 13,879 cars in the U.S. — 9976 for the 1993 model year, 3403 for 1994 and 500 for 1995, according to the website www.turborx7.com.

But what a car it was — and still is. "(It's) an addicting blend of power, roadholding and exquisite sheet-metal curves…a driver's car, if there ever was one," we said in a 1993 review. An extreme weight-loss program (the seats are just 33 lb. each, for instance) meant the third-gen car came in at an anorexic 2800 lb. or so. This, combined with the twin-turbo rotary that makes 255 bhp, meant 0-60-mph times in the mid-5-second range and a top speed of 160 mph. Supercar territory at the time, in other words.

The last of the RX-7s is a rare flower indeed: a no-compromise enthusiast's car built in small numbers and with little thought given to the mundane practicalities that automakers usually obsess over. And thanks to the magic of depreciation, third-gen RX-7s are no longer particularly pricey. All of which make this fascinating car a natural Used Car Classic.

RX-7 Selection

Changes were few to the third-gen RX-7 during its brief run in the American market. Introduced as an early 1993 model, the car came in three trim levels. Even the base edition was rather well equipped with ABS, air conditioning, central locking, electric window lifts and a driver-side airbag. A Touring package added such amenities as leather upholstery, a power sunroof, an upgraded sound system and cruise control.

As if the cooking-version RX-7 didn't handle well enough, there was also an R1 package that included such performance upgrades as Z-rated tires, dual oil coolers, a modest rear spoiler, a front air dam and special suspension tuning. The latter, however, was so stiff that it could "leave you feeling distinctly beaten up" after 15 minutes on less-than-perfect roads, as we commented in the 1993 road test.

Model year 1994 brought a few improvements, the most important of which was a passenger-side airbag. Mazda also tweaked the suspension to give a little softer ride on Base and Touring cars, and the sunroof was now made of steel instead of glass. The performance package moniker became R2. And the automaker added a Popular Equipment package that included the sunroof and leather seats.

The Touring package disappeared for 1995, supplanted by the Popular Equipment package. And for the same year, the air-conditioning system switched to a Freon-free refrigerant.

So which is the best to choose? That's easy — any third-gen RX-7 that is clean, sound and reasonably original, no matter its trim or year of manufacture. Considering that a decade has passed since the last new car sat on a showroom floor, and that fewer than 14,000 were sold here, the pickings are likely to be slim.

But there are still other factors working against these cars surviving the ravages of time. Even when new, they weren't robust vehicles. Furthermore, few dealers had technicians adept at repairing the complex sequential turbo system. This, combined with relatively high repair costs meant that many cars were parked and left to a quiet death from decomposition and neglect, says Cam Worth, owner of Pettit Racing in Lake Park, Florida, and one of two RX-7 experts we consulted for this Used Car Classic.

Others have fallen into the hands of young motorists who possess more enthusiasm for the RX-7's blistering perform-ance than the skill necessary to safely handle it. As a result, there are plenty of these cars on the market with salvage titles, warns Nick Van Nugteren, owner of Rotary Reliability & Racing in Santa Ana, California, our other RX-7 expert.

And finally, many have been "hacked and ruined," says Worth. With some relatively simple modifications, horsepower gains can be considerable — but they come at the expense of durability. It's also common to see the twin turbos removed and replaced by a single turbo, which can make the cars a handful to drive in street use.

But a diligent search — most likely with a good Internet connection — can turn up worthy examples still lurking in the garages of RX-7 aficionados who have been conscientious about maintaining and driving them. It also should be encouraging to know that most OEM parts — including such things as trim pieces — for third-gen RX-7s are as close at hand as the nearest Mazda dealership. And both of our rotary specialists point out that a few simple fixes and maintenance procedures can help make the cars much more reliable.

Buyer's Checklist

It's always wise to be cautious when buying any used car, and even more so when buying a creature as unusual as a third-gen Mazda RX-7, say Cam Worth and Nick Van Nugteren.

Look for a complete set of repair receipts so you can judge a car's service history and verify its odometer reading. Consider ordering a title report, such as one from CarFax (www.carfax.com), which might reveal a tainted past — a prospective purchase could be one of those dreaded salvage vehicles, for instance. And a thorough pre-purchase inspection by a technician familiar with Mazda rotary-engine cars is a must.

Any inspection should include the usual checks for cosmetic flaws, body and chassis corrosion, accident damage, malfunctioning accessory items, leaking fluids and so on. In addition, here are some special points to keep in mind when inspecting a third-gen RX-7:

1. Check for proper turbo operation. Problems with the secondary turbo are common. On a test drive with a warm engine at full throttle, the second turbo should kick in with the punch of a jet aircraft's afterburner. Though Mazda didn't install a boost gauge, it's easy to hook up a temporary gauge to the intake manifold. The dial should read 10 psi, then drop to 8 psi at 4500 rpm, then quickly recover to 10 psi. Turbo housings are difficult to obtain, which means that pooped-out turbos can't be rebuilt and must be replaced with new turbos — a pricey proposition.

2. Inspect vacuum lines and wiring. Malfunctioning turbos may also be caused by problems with the RX-7's complex array of vacuum lines and solenoid valves. High under-hood temperatures from the turbos often cause the lines to harden and break, and the solenoids to fail. Ditto for engine-bay wiring and electrical connections.

3. Perform a compression check. Rotary engines require special test equipment available at a dealer or rotary specialist. But a check is especially important as these engines often need rebuilding after only 50,000 or 60,000 miles because the aluminum engine housing warps and/or seals fail and allow coolant to enter the rotor chambers.

4. Examine the cooling system. Rotary engines run hotter than piston engines, and the turbos only add to the heat generation. Proper engine cooling is critical, and if the needle on the temperature gauge rises to "Hot" even once, the engine's probably cooked. On a cold engine, the coolant level should be full and the coolant should be green with no signs of oil. White smoke or the sweet smell of coolant from the tailpipe indicates trouble. The electric fans — there are two — frequently come apart, perhaps launching a blade into the radiator. And the cooling system's plastic air separator often splits, dumping out coolant.

5. Read the service history. The records should show oil-change intervals of no longer than 2000 to 3000 miles. Gasoline residue is more likely to contaminate the oil of a rotary engine than a piston engine, and the oil breaks down more quickly because it's used to cool the turbos, so frequent changes are a must. Oil consumption of a quart per 1500 miles is normal. Oil pressure at idle should be at least 20 psi.

6. Check gearbox for smooth shifting. The manual transmission is generally strong, but a damaged 5th-gear synchro is not uncommon on these RX-7s. Note any crunching when going into 5th gear.

7. Listen for suspension clunks. Noises from the aft end of the car may come from one or more of a dozen deteriorated bushings in the rear suspension, while clunks at the front probably come from an upper A-arm bushing. Any can be replaced with upgraded bushings.

8. Check for completed recalls. The third-gen RX-7 has been subject to several recalls involving the cooling, braking and fuel systems. Mazda's customer assistance line ([800] 222-5500) will have the records for any particular car.

Last Longer, Run Better

Some suggestions from Worth and Van Nugteren:

• Replace the OEM plastic air separation tank with an aftermarket metal tank.

• Install a "turbo timer," a device that lets the driver walk away from the car but keeps the engine running for two or three minutes before shutting it off. This gives the turbos a chance to cool down.

• Install a boost gauge to monitor the turbo system.

• Replace the OEM radiator with a more efficient aftermarket aluminum radiator.

• Always use premium fuel, and promptly replace dirty fuel filters which can restrict fuel delivery, causing detonation and engine damage.

• Use a fuel lubricant with every tankful of gasoline to extend the life of the engine seals. Worth recommends a product called Protek-R, but using "even salad dressing is better than nothing at all," he says.

• Re-torque the engine tension bolts to help keep seals tight. This is typically done when the clutch is replaced, as the bolts are located behind the flywheel.

• Replace the front ("pre-cat") catalytic converter if it hasn't been replaced; it often clogs, eventually causing engine damage.

The Market

Typical retail prices for cars in condition ranging from presentable to excellent.

1993 RX-7 Turbo: $9350-$18,200
1994 RX-7 Turbo: $10,350-$19,300
1995 RX-7 Turbo: $11,375-$20,300

Source: Black Book CPI Value Guide (www.blackbookusa.com)

Performance Data — 1993 RX-7

0-60 mph, sec: 5.5
Standing 14 mile, sec: 14.0
EPA city/highway, mpg: 17/25
Road test date: April 1992

Typical Repair and Upgrade Prices*

Install turbo timer	$200
Replace electric cooling system fans	$300
Replace water pump	$300
Replace radiator with upgraded aluminum unit	$400
Replace clutch	$600
Repair worn 5th-gear synchro	$800
Replace wiring loom	$1000
Replace all rear-end bushings	$1000
Complete rebuild of manual transmission	$1500
Replace both turbochargers with OEM units	$3000
Rebuild rotary engine	$5000
Rebuild rotary, replace turbos and vacuum lines	$9000
2000-mile service (oil change)	$20
15,000-mile service (oil, sparkplug, air filter changes)	$120
30,000-mile service (oil, sparkplug, air filter, fuel filter, coolant changes)	$260

*Prices include parts and labor at $80 an hour.