

### Expert Answers to your Tech Questions

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#### Cone-Hugging Cayman

*A friend recently introduced me to PCA autocrossing, and I have to say I'm hooked! It's such a concentrated rush, with so many turns coming at you in such a short time. I love that I can explore my Cayman's limits in a safe, controlled environment, with the only battle scars at day's end being a cone scuff or two (I found they wipe off easily with bug & tar remover). We may only be hitting 50 mph in sections, but with the "cockpit workload" it feels much faster! I feel I drove respectably at my first event with a box-stock car, finishing ahead of some Boxsters and 944s, but a ride with an instructor was an eye-opener...he had the car perfectly sliding and dancing*

*around the cones. Other than practice, practice, practice, do you have any tips for this autocross newbie to turn some faster times?*

Congratulations on discovering the most cost-effective form of motorsport ever conceived, not to mention a real test of precision car control. You've taken the most important step already by entering and driving in an event, and pairing up with an instructor to go over the fundamentals. One of the best speed secrets is to show up early and walk the course, as many times as possible, preferably on a novice course walk with an instructor. It may be intimidating to try and memorize the entire layout at first, so make mental notes of two or three key "pinch points" on the course, which are tight slaloms or turnarounds that follow a faster section. The better you know the course, the less indecision you'll have and the faster and more aggressive you can be.

As for the driving itself, the best

piece of advice we've heard is also the title of John Buffum's book on rallying: "In like a lamb, out like a lion." Those new to autocross usually overdrive the slow corners and are too timid through the fast ones, where just the opposite is required. Charging hard and overshooting a slow 180-degree turn will kill a lap time, and seconds seem like hours as you're waiting for those front tires to regain bite. If you've done any road racing, forget about all that late-apex stuff for the really tight turns...get the car slowed to the point where you have front traction, hug the inside of the turn, and pick up the throttle aggressively on exit, but not too quickly because that will cause the understeer that you've worked so hard to avoid earlier in the turn. Tip No. 3? Look ahead, and keep your head on a swivel. It's uncanny how any vehicle has a tendency to go where we're looking, and fixating on a cone or piece of track only 50 feet ahead of

*continued on page 28*

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**PORSCHE**

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you is a sure recipe for slow times. It's also a good way to make a hexagon out of a circle; instead of driving a smooth arc through a series of cones, you're making a small steering input at each cone and scrubbing speed. Visualize that arc and look ahead 150 feet to that last cone in the sweeper, and you'll gain a tenth of a second or two. Charging into a 180-degree turnaround, your head—and, more importantly, eyes—should be 90 degrees to the direction of travel at your turn-in point, locking in on that exit cone like an F-16's target acquisition system. Last, don't be too hard on yourself and enjoy the experience. It's easy to have high expectations as you improve, which leads to overdriving and too-rapid hand motions which kill grip. Be smooth (yet aggressive), look way ahead and be super-tidy around the slowest turns, and you'll be surprised at your times.

### Factory Repair Manuals

*Do you know if it is possible to access factory repair manuals for 997 series cars? I see Porsche has PIWIS-TIS online for authorized entities including Automobile Clubs. Is there a way I can access this service through PCA? Can you suggest any alternatives? My goal is to start working on my 997 Turbo.*

We commend you for trying to obtain the correct information to service and repair your Porsche. Unfortunately, the Porsche PIWIS TSI website is only for "Authorized Companies" and is the only legitimate place we know of to obtain the correct technical information necessary to work on your Porsche. We do not believe that Porsche would agree to a subscription with the Porsche Club of America (PCA) or how it could regulate and control access by PCA's thousands of club members.

Access to the Porsche PIWIS TSI site costs \$5,000 per year plus taxes, and it is specifically intended to be used by automotive repair businesses. The information and materials on the site are writ-

*continued on page 30*



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ten for the professional mechanic and already assumes the reader has significant experience and training with Porsche cars, plus access to the full complement of specialized Porsche tools referenced in their documentation. Due to the cost for access, many independent Porsche repair shops do not subscribe to this service.

We suggest that you talk to your local professional Porsche repair facility to see if there is a way they can assist you in repairing your car.

**Do I Need Spark Plugs?**

*I own a 2009 Porsche 911 Carrera S Cab. I purchased it new in April 2010, and it currently has 5,800 miles on it. I was told by the dealer that because the car is four years old I need the 40,000-mile service done now—specifically the spark plugs need to be changed. Is this true? If so, can you tell me the reasoning?*

Spark plugs are a wear item, and normally their wear is based on miles driven and how those miles were driven rather than from calendar-based time like many liquids are judged. There can be variables in the spark-plug wear equation: the quality of spark plug installed, whether the plugs were gapped correctly, the condition of the ignition coils, plus the type of engine, the mechanical condition of the engine, and the quality of fuel that is being run in the car. Is the car spending a lot of time in slow, heavily congested traffic? Or, at the other extreme, is it constantly being driven flat-out at very high revs, such as on the track? Any of these variables can affect spark-plug life.

On the newer, direct fuel-injected engines such as yours, the spark plugs can be left in for 8-10 years, because fuel delivery is very precise. On previous fuel-injection systems, the cold start and short-distance driving is best kept to a minimum. Short-distance driving may not allow the spark plugs to be cleaned up or completely recover from the very rich environment of a

*continued on page 34*



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cold-start cycle. Rich running conditions can coat the spark plug ceramic, and this coating can cause strange operating characteristics not to mention the possibility of a misfire, which is the worst scenario on any catalytic converter-equipped car.

The best action to take is to remove the spark plugs at the vehicle's major service intervals and check the physical condition. If the spark plugs are in good condition they can be reinstalled. Aside from this physical inspection, a drop in fuel mileage can be a key indicator of the need for replacement.

At 5,800 miles we expect your spark plugs will look like new; if so there should be no reason for replacement. We hope you ask the dealer the same question; we would love to know their response.

### The Right Tire Pressure

*I have a tire pressure question*

*continued on page 3*



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relative to our 2011 Porsche Targa 4. We want the softest ride. The label on the car's door frame shows tire pressures for the front at 37 psi and rear at 44 psi. However, the manual identifies 34/37, respectively. Is it okay to use 34/37 or less than 34/37 to get softest ride?

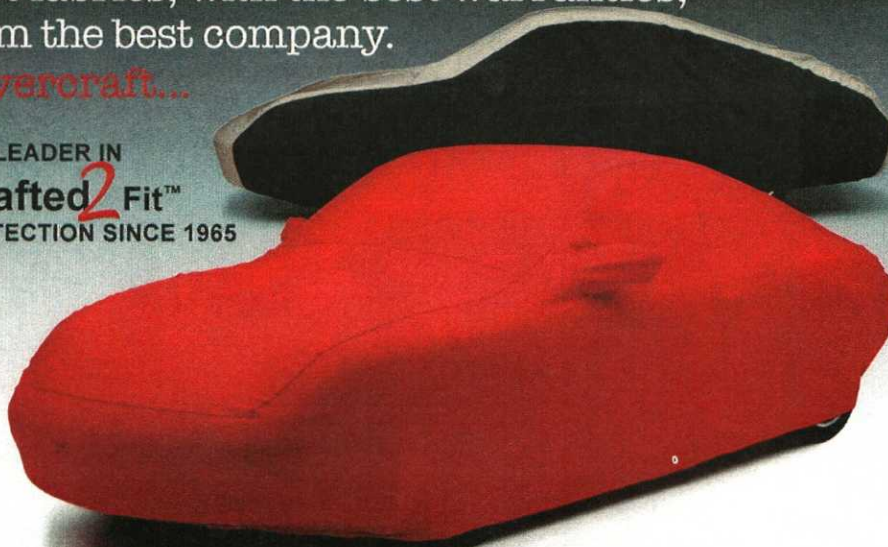
Some may not know how you obtained the tire pressure information, so we would like to clarify. The correct cold temperature (68°F) tire-pressure inflation levels are listed on the car by government mandate; a tire-pressure plaque is visible when the driver's door is open. In the case of your 2011 C4 Targa, the correct tire pressures are as you identified: 37 psi for the front tires and 44 psi for the rear tires, regardless of whether you have 18- or 19-in. wheels. (Please note that sometimes wheel sizes do impact tire pressures.) This is considered the correct tire pres-

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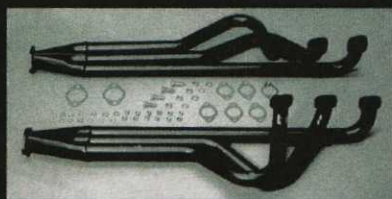
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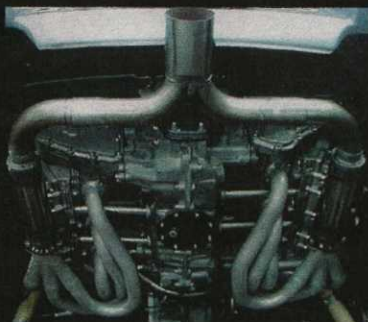
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sure for a fully loaded vehicle meaning passengers, luggage and a full tank of fuel.

There should also be a small yellow plaque on the door or a notation on the tire-pressure plaque that refers you to the owner's manual for additional tire-pressure information. The owner's manual should have the additional information of recommended tire pressures for lighter load conditions, which you have also correctly identified for your model at 34 psi front and 37 psi rear. This would be the minimum tire pressures acceptable for this car. Setting or allowing the tire pressures to operate at lower pressures than those identified could have an extremely negative impact on the life of the tire and the handling of the car.

If the inflation is set to a lower level, the rolling resistance of the tires will increase. This in turn will cause a drop in fuel mileage, and the tires will wear significantly faster. According to Porsche documentation, tire wear can be increased by as much as 25 percent if the tire pressure is lowered by as little as 4.5 psi under recommended levels. The tire will lose stability and traction in cornering, and steering response will also become sluggish. However, even more importantly, as the rolling resistance increases, the heat generated within the tire also goes up significantly. This type of heat generation can be extremely damaging to the tire's internal structure and has the potential to cause the tire to fail.

You did not mention the tire brand and model currently on the car; however, we assume that it is a Porsche-recommended N-specification tire as delivered from the factory. We suggest that any car under a factory warranty program have N-specification tires installed, as Porsche dealer service department's generally react negatively to tires not on Porsche's approved list—and often with good reason. Having said that, there are new high-performance tires coming into

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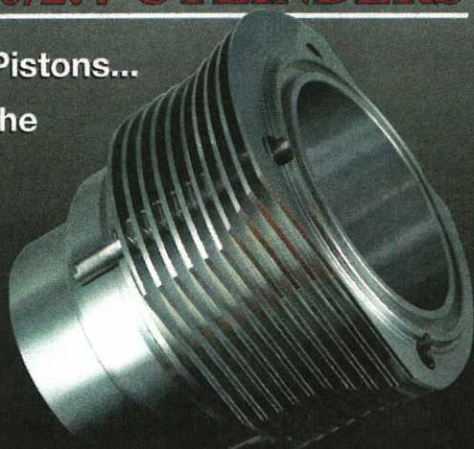
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### 993 Valve Guide Problem

*I manage a vintage racing prep shop and took the Porsche plunge last week by purchasing a 1998 911 Carrera Cabriolet with 95,000 miles. I wanted a sensible, practical, everyday alternative to the less practical Italian cars I am accustomed to. Porsche reliability has always impressed me, so this car's mileage didn't scare me and its price reflected the mileage quite fairly. I bought the car from the*

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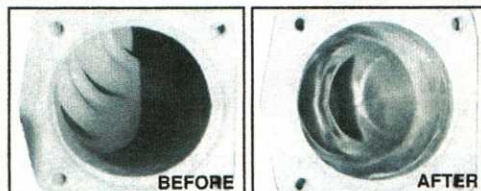
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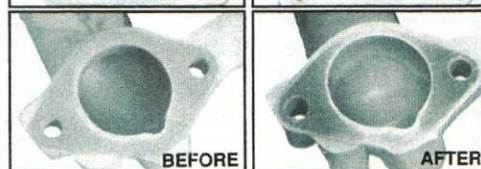


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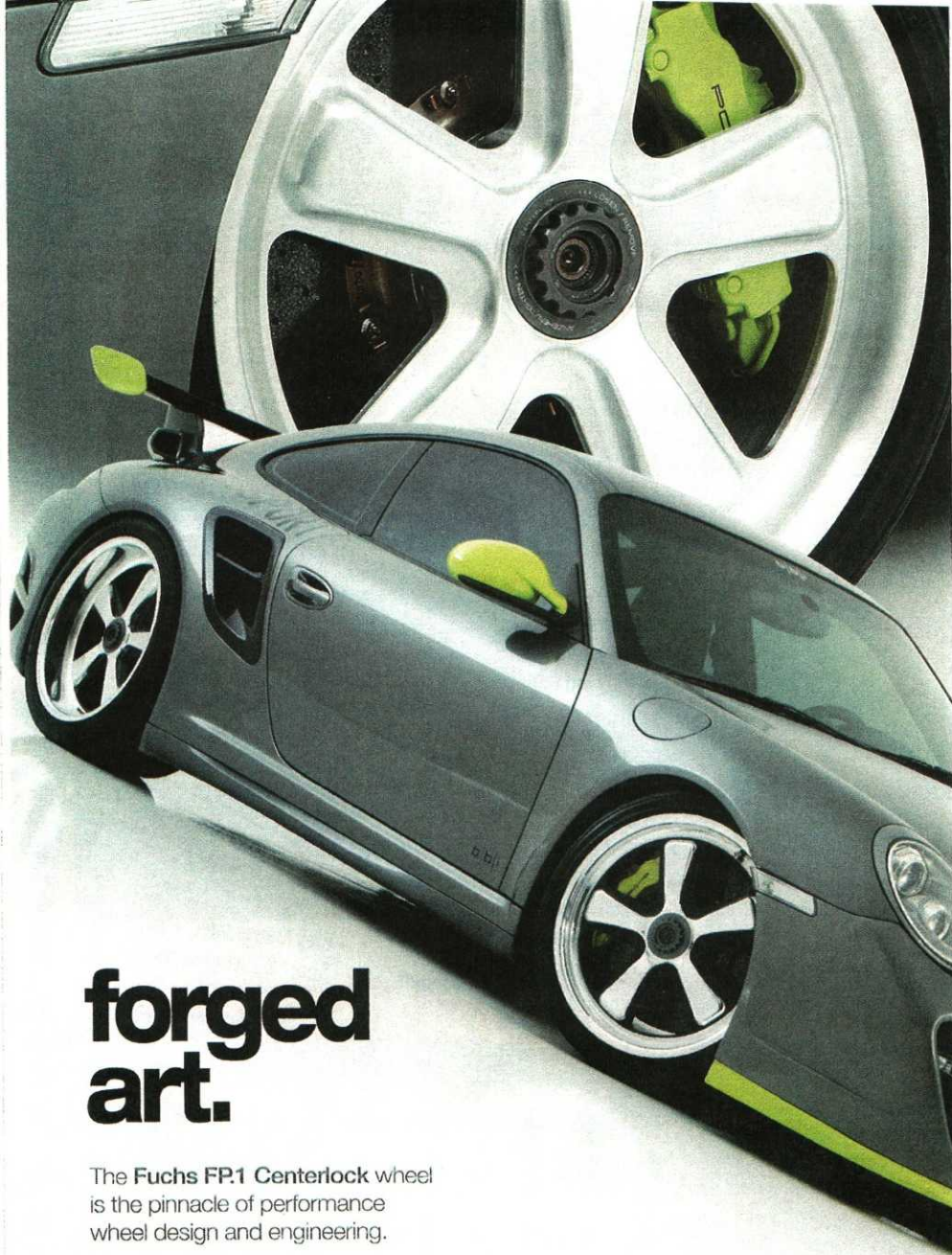
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second owner, researched the car's history, talked to the original selling dealer, and performed a thorough pre-purchase inspection. Cylinder leakdown was about eight percent in all cylinders except for one, which was 13 percent.

I thought I'd done my homework, but I ran into a problem when I tried to smog my 993. It passed the tailpipe test but failed due to a trouble code logged in the OBD system indicating a fault in the secondary air-injection system. This really caught me by surprise, as the car showed excellent power and driveability, no Check Engine light indications, and it had normal tailpipe emissions.

Further investigation, however, revealed that the Check Engine indicator lamp had been removed. It promptly illuminated upon installation.

I took the car to our local dealer. The service department confirmed the trouble codes and cleared them, extinguishing the Check Engine light. I was stunned by their diagnosis. They also said this 993 needs valve guides — and that they had seen this problem before.

We build our engines in-house—from Ferrari V12s to Cosworth DFVs—so I understand engine theory. I cannot fathom how a valve guide problem (assuming one exists) can cause a secondary air-injection system trouble code. When I questioned my service rep about this, the response was that the secondary air-injection system works fine, so it must be the valve guides! I'd very much like a second opinion, and I am happy to pay to have the car inspected again.

The previous owner of the car is willing to take the car back and refund my money, but I really do like this 993 and I feel it's otherwise sound. I spent a lot of time searching for this one and I'm willing to spend a reasonable sum to resolve what I see as an isolated problem. The previous

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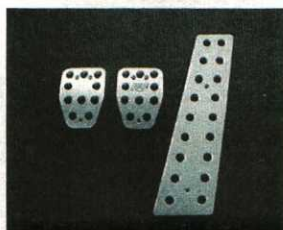
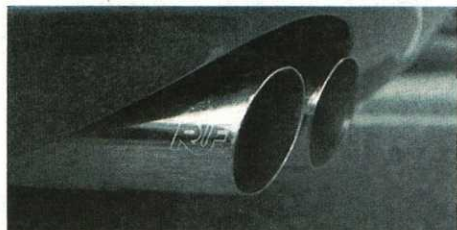
## tech notes

*owner is also willing to contribute to any repair costs. I am quite motivated to solve this problem sooner rather than later, given the financial implications.*

Sorry to hear that your first experience with Porsche has been an unpleasant one. Clearly, someone has committed fraud by eliminating the check engine light. Someone clearly knew the car had a problem, since the light was circumvented before the car was sold to you. Your cleanest way out probably is to take your money back and look for another car.

The 3.6-liter engines *do* tend to wear their valve guides out—particularly the exhaust-side guides. This wasn't much of a problem until OBD II came along and the secondary air-injection was added to the 1996 993 engines. What happens is that just enough

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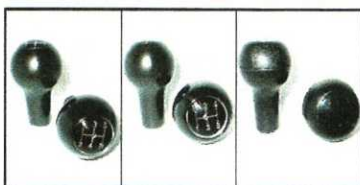
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oil gets by the guides to coke up the secondary air-injection ports in the cylinder heads, resulting in the fault you are experiencing.

Porsche started using an air-injection system with the introduction of the 993 in 1995. Unlike earlier air-injection systems—which ran all the time—the purpose of the 993 air-injection setup is to ensure quicker catalytic converter heat-up during cold starts. During cold start (between 59°F and 158°F), a DME-controlled auxiliary air pump blows air into the exhaust ports through passages in the camshaft housing and cylinder heads, which initiates the catalyst “light off” on a cold engine.

The engine management monitors the operation through the voltage values from a single oxygen sensor on early 993s or left-and-right oxygen sensors on later 993s (1996-on) with Motronic 5.2

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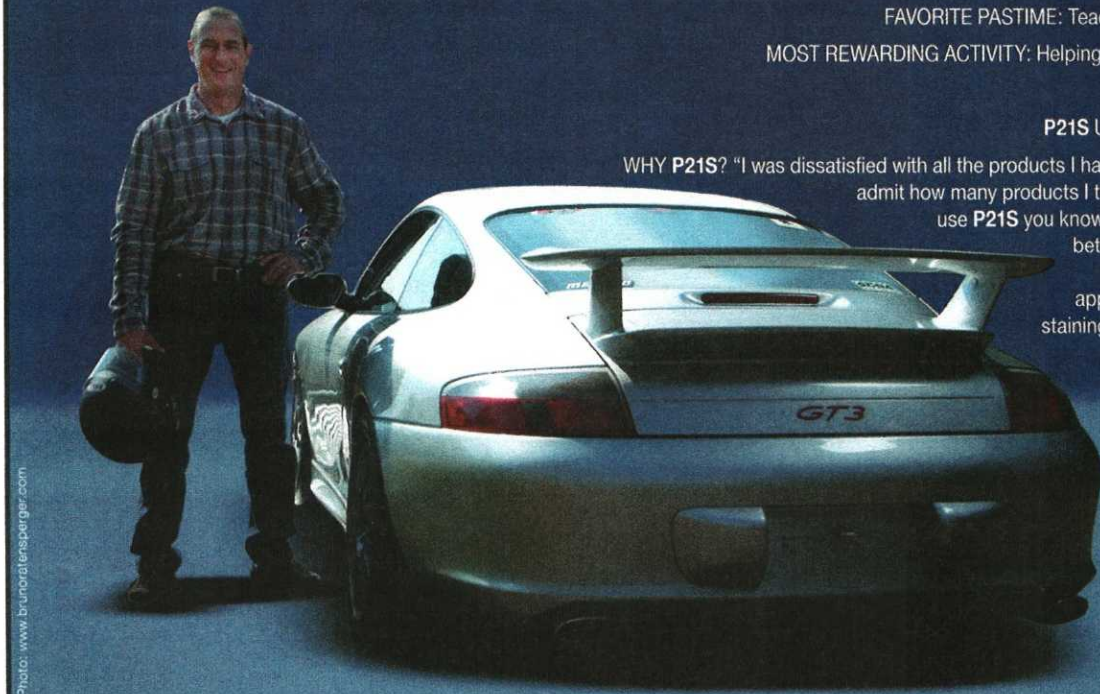
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The problem can have a variety of sources and, unfortunately, the hardest part of diagnosis is access to all of the components involved. Simple repairs would involve air pump seizure or vacuum line problems. The diagnosis and repair can be far more difficult if it involves the internal air passages in the cam housing or the bores to the exhaust ports in the cylinder heads.

Porsche says there is no official repair procedure in this area. Cars

with this issue have been repaired by various means of cleaning out the ports and reopening the air passages. These repairs are often performed only to the blocked side of the engine since both sides are seldom blocked. The blockage usually consists of "coked" oil residue. It is thought that the level of contamination of the motor oil may have an effect on this form of coking and blockage. This may be an argument for more frequent oil changes than the "15,000 miles or once a year" recommendation by Porsche AG.

Most of the cases have occurred in the warmer climates, when the cars also have a lot of city driving. These conditions produce extra heat and can create the right conditions to overheat the engine's oil in this area and then cause the coking. If this happened when the cars were newer or still under warranty, the dealers

*continued on page 50*

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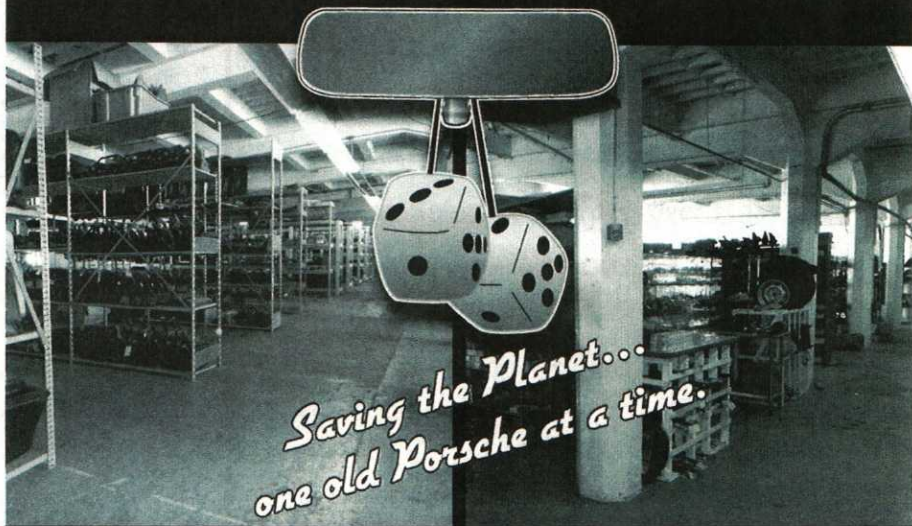
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