

# Pre-purchase Inspections 101

Today, as throughout Porsche's history, when a new Porsche passes its final inspections and leaves the factory, it meets a quality standard that is among the highest in the world. Once sold, the first owner and all that subsequently follow become the responsible caretakers of these extraordinary and complex machines.

Some Porsche owners maintain their cars to the highest standards to preserve their aesthetic and mechanical condition. Others may extend out services and accept a higher degree of wear and tear. There are also those who cannot truly afford the car and allow it to fall into disrepair. Over years of operation, each Porsche develops a unique history based on use, maintenance, repair, modifications, and/or accidents. What all of these cars have in common is that, at some point in time, each will be offered for sale.

As a prospective Porsche buyer, you should consider that any pre-owned Porsche has the potential for significant cost to you beyond its purchase price. Any car can have problems, disclosed or not. Having the right questions in mind can go a long way toward protecting you from nasty surprises. How did the owner — and any previous owner(s) — maintain the car? Was it properly serviced? Were high-quality parts and correct mechanical and accident repair practices utilized? Were corners cut to save money?

If you're looking for a popular but rare model, a specific exterior color, or a particular group of options, you may find your dream car is located far away, in another state. If you buy on emotion, you might find yourself in a situation where you're paying big repair bills to correct previous neglect, abuse, substandard workmanship, and/or collateral damage. A better solution: Make your purchase contingent on the car passing a comprehensive pre-purchase inspection, commonly referred to as a "PPI."



**The Porsche hood crest—and the hood itself—can be damaged when pressure is applied to the emblem to close the hood.**

A comprehensive PPI is a process somewhat like that of a forensic investigation, where experience and technology are utilized to investigate and establish facts. The PPI should be performed at a professional Porsche repair facility, and conducted by a technician who is highly experienced with the year and model you are looking at. Through an in-shop evaluation and extended test drive, a technician collects and documents empirical data on all areas and systems of the car.

These areas may include performance, mechanicals, chassis/body/paint, safety systems, and electronic and electrical equipment/systems. A compression and leak-down test of each cylinder is needed to indicate the mechanical condition of the engine. For computer-controlled cars, the PPI should also include a complete electronic interrogation of the onboard computers to confirm the car's operating history and the presence of any system faults at the time of the

PPI. Sometimes, additional diagnostic time is needed for specific problems, such as unusual running issues, electronic faults, oil leaks, etc.

A PPI may even reveal things about a car that the owner/dealer doesn't know or is trying to hide. If the price can be established for the work needed to rectify any problems, these findings can sometimes be utilized to negotiate a lower selling price. That said, if you have already negotiated the price with the seller, he or she may or may not be willing to go down further on price regardless of the issues.

Sellers, whether private parties or dealers, will discuss price — but they know that there's always another buyer out there who may be impulsive and buy the same car without asking for the PPI.

In this *Tech Forum*, we'll take a general look at buying a used Porsche and more specifically at the Pre-purchase Inspection, what it is, and how it can save you far more money than it costs.

## Pre-PPI advice

Prior to even getting to the PPI, you should consider a few things to ensure that the car being looked into is worthy of your pursuit — including your investment of time and money. Give some thought to what Porsche model really interests you. That may sound somewhat odd, but for a first-time Porsche buyer or even a current owner, it is well worth taking the time to test-drive different models to help you decide what you really like.

Understand that Porsches are expensive to maintain. Porsche has always produced well-balanced, high-performance cars utilizing quality components and workmanship throughout. That said, as the miles add up, standard maintenance items will be needed. Tires, brakes, hoses, belts, struts/shocks, clutch, fluid changes and/or flushes, minor and major services, and other repairs all add up. Be prepared to set aside a minimum of \$2,000-3,000 per year for maintenance. You may not spend this full amount each year, but in the long run it will balance out. This is something first-time Porsche buyers often underestimate.

Do your due diligence; learn as much as you can about the model(s) you are pursuing. Any car can have an unexpected breakdown, but be sure you understand any underlying issue you may face and how to avoid those potential problems. There are many sources of information available online and, of course, here in the pages of *Excellence*. You can also utilize the knowledge of your local Porsche repair facility; generate a list of questions and make an appointment to meet with the staff and let them address your concerns.

When you find a car that interests you, do not get emotional. Instead, look at the car as if you were checking it out for your best friend. Be discriminating. If there are obvious problems, there may be more lurking that you cannot see. The goal here is to find a good car, not to become a professional PPI customer and have car after car inspected. Everyone wants a bargain, which most people equate to an inexpensive purchase price. However, in the world of Porsche ownership, you are far better off buying a car in exceptional condition and maintaining it that way. Be prepared to walk away from a car if it suffers from neglect. You can fix many things about a car, but, in these cases, bigger and more expensive issues can be waiting.

Ask the seller to let you review the factory maintenance book and repair receipts going back to when the car was new. These records validate the car's service and repair history, thus giving you the proof of when and where the work was performed. Of



**Top: The Cabriolet top, over time and exposure to the elements, can develop dry rot and separate. There is no "repair," except to install an expensive replacement top.**

**Middle: The numbering seen on this tire is its manufacture date; "5204" indicates the 52nd week of 2004.**

**Bottom: When old tires are dried out and cracked, they should be replaced ASAP.**

course, some owners may remove selective receipts regarding items deemed to be embarrassing or problematic.

If the owner has only a few receipts or none at all, this should be viewed as a negative. It does not necessarily mean the car is bad, however seeing and having this documentation is an important data point to you as a prospective buyer. The owner's memory and stories are not good enough; there will be a day when you too will be selling the car, and having the full records makes your car more desirable and potentially valuable to a selective buyer.

A stamped and dated factory mainte-

nance book can provide some basic information, but these are usually filled in only if the owner requests it. Services like Car-Fax *can* be a source of information — especially accident history — but data on service and repairs can be sketchy depending on where the car was serviced.

You can also contact Porsche Cars North America at 1 (800) PORSCHE. You will need to provide the complete Vehicle Identification Number (VIN). If the car was dealer-serviced they should be able to direct you to that dealer. Keep in mind, a Porsche dealer or independent repair facility will not disclose a previous owner's personal information — but they may be willing to verbally discuss with you the details of the work they performed.

A PPI may uncover maintenance or repair issues that should be addressed soon after purchasing the car. Be prepared to invest a few thousand dollars or more to bring the services current and make any repairs that have the potential of getting worse or causing collateral damage to other components or systems.

## Setting up a PPI

It is best to find and contact the shop you want to perform the PPI a few days prior to when you need the work completed. If the car you are considering is outside your local area, out of state, or cross-country, you should enlist the help of your local or national Porsche club to assist you in finding a well-known and well-recommended repair facility.

Not all repair facilities will perform a PPI; this is generally due to the potential for liability should they make a mistake and/or the disruption of their customer scheduling. Most repair facilities can appreciate that the PPI can be time-sensitive and will usually work you into their schedule as soon as possible.

The Porsche repair facility you hire to perform a PPI should not be the same company where the seller normally does business. Even if this facility is conveniently located to the seller, it may not be in your best interest. While there may be no issue of impropriety, you should have fresh eyes doing this work.

Call and discuss what the shop normally inspects during a PPI and, if this differs from your needs, explain what areas you want them to focus on. If you cannot be present during the PPI, it is very important that you inform the repair facility of anything that is a "deal killer" for you — noting that the PPI should be stopped if such a problem is encountered. Our experience with some buyers' "deal killer" conditions include partially or fully repainted

bodywork, accident damage, non-original engine, internal engine damage, and an excessive amount of metal in the oil filter, just to name a few.

Additionally, the repair facility should stop and contact you if any serious or expensive problems are discovered during the PPI — even if they're not on your list. Why ask the shop to spend more time if it finds a glaring problem right away? Ask if photos will be taken during the PPI and forwarded to you, as this can be very helpful. Also, schedule your PPI on a day when you can be easily reached — no important meetings or airline travel.

The information obtained in the PPI should be provided only to the person who ordered it, which is usually the potential buyer. If you, as the potential buyer, choose to share the information with the seller, that is your prerogative — you paid for the work and information. Your feelings on this should be expressed to the repair facility doing the PPI.

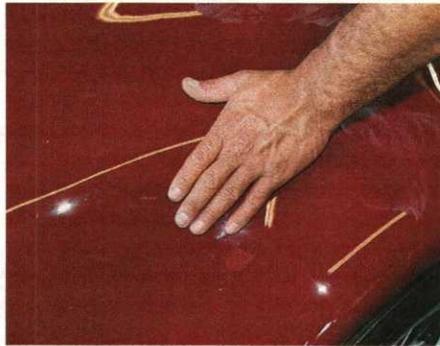
The buyer normally finalizes the logistics of the PPI. If the seller is dropping the car off and needs a rental car, or if the car must be towed to and from the inspection, the prospective buyer normally pays for this. Dealers will usually have their salesperson or a lot porter drop off and pick up the car at the inspecting repair facility.

The cost of a PPI will vary based on the time spent and the hourly labor rate of the repair facility plus any parts (oil filter, spark plugs, gearbox oil, etc.) replaced during the PPI. A basic safety inspection can be done in a half hour, while a comprehensive PPI can take six to twelve hours. Standards differ according to buyers, shops, budgets, and cars. A 996/997 Turbo, for instance, requires that the rear bumper and intercoolers be removed to perform the compression and leak-down tests — thus putting these models at the high end of the PPI price range.

## The PPI begins

When a car arrives, it is usually checked in and the buyer is contacted (if not present) and informed that the PPI is commencing. An initial visual check is done, which will note any aesthetic issues with the exterior or interior. This can include dings, dents, scratches, and scrapes in the bodywork, noticeable paint chips, interior wear or damage, windshield or other glass damage, cracked plastic lenses, and wheel finish issues like curb rash. This is not the detailed body/chassis inspection, which will take place later.

The first order of business is to start the engine to check to see if any exhaust



**Top: The cost to repair body/paint damage often exceeds expectations. A full, quality repaint will cost you north of \$15,000.**

**Middle: This wheel was repainted improperly; the paint on the valve stem indicates the wheel was touched up to hide flaws.**

**Bottom: When a 911, especially a wide-body car, is hit from behind, rear wheel arches often bend and are hard to repair.**

smoke is present. If so, how much and does it appear to be oil-based — or is the engine running excessively rich? It should be noted if the engine is cold or at operating temperature when started. On 986/996 or 987/997 models, oil smoke could be caused by an air-oil separator issue. It can also be a valve guide issue, which would be suspect on most air-cooled engines.

The engine's oil level is checked next. If the engine is at operating temperature, this is done prior to the test drive or following the test drive if the engine is cold. Any air-cooled 911 engine has a dry sump oiling system that utilizes a dipstick with mini-

mum and maximum marks. The oil level should be in the middle between these two marks at operating temperature at idle. Water-cooled engines should have the oil level at the identified maximum mark.

If the oil level is low, this in itself does not identify that the engine has an oil consumption issue — but it is a data point and will be considered with other information obtained during the PPI. Sometimes it is found that the oil level has been overfilled, which can be a serious situation if oil is getting into the intake system.

Prior to the test drive, tire pressures are checked and corrected if needed — after being noted.

## The test drive

Some shops like to have two technicians in the car for the test drive. The primary tech responsible for the PPI is in the driver's seat, and a second tech rides along as an observer and to take notes. Any item or function that doesn't appear to be correct will be noted.

At the beginning of the test drive, the vehicle's mileage is noted. The speedometer, odometer, and trip odometer operation will be checked during the test drive. The distance the car will be driven may vary and may be extended if an anomaly is identified — but, normally, the car will be driven about four to six miles once it is at full operating temperature.

The ignition key is first turned to the on position, but the engine is not started. All instrument cluster warning lights should illuminate. Once the engine is started, the instrument cluster is again scanned, this time for any warning lights that remain illuminated. Cars equipped with a central information display (986/996 and later) should have all screen fields reviewed and any warning or irregularities noted.

All electric windows are operated and checked for failed or slow motors, binding, and broken switches. Seat heaters, if present, should be turned on, and all manual and electric articulation functions of the seats will be tested. The exterior electric mirrors are operated in all directions and then set to the driver's preference. The interior rearview mirror is also checked for attachment. Its ball cup adjusting socket should be tight and the day/night (anti-glare) toggle switch should be operational.

As the test drive begins, the air-conditioning is turned on to high with air recirculation activated. A thermometer is then placed in the center vent. It is noted how quickly and how cold the A/C gets. As the air temperature reaches its coldest point, all fan speeds are checked. Depending on

the ambient temperature and humidity level, vent temperatures should drop to or below 45° F on 964-and-later Porsches with a healthy A/C system. The A/C is then turned off and the heater is turned to full heat. The transition from cold to hot should be fast and become uncomfortable; with heat coming from the footwell, dash vents, and windshield defroster vents.

The audio system is activated next, with all audio controls (balance, fader, tone, and volume) checked for operation and any noisy (scratchy) controls. Audio distortion or rattles from the speakers at reasonably high volume settings are noted. AM and FM bands and other audio sources such as cassette, CD, CD changer, and iPod operation are checked if present. If the car is equipped with a navigation system, it is activated and set for a return trip to the Porsche repair facility. If the system is CD-based, the presence of the CDs are verified.

When the car is in motion, any unusual noise, rattle, or vibration is noted along with the generalized area or source of the anomaly. A tire balance issue can be fairly common, as some owners do not rebalance or rotate tires as they wear. However, worn control-arm bushings can also cause a vibration that could be mistaken as a tire-balance issue. Rattles and other noises are usually linked to loose fasteners. Varied types of road surfaces and driving speeds can sometimes bring out surface-activated wheel-balance issues — though the problem may not reveal itself during the drive if it is intermittent.

Testing the performance of the car by someone very familiar with how it should operate is critical to the PPI process. The goal is to make sure that the suspension, tires, powertrain, and brake systems are all performing at a level consistent with their design intent. This can be achieved within speeds of normal day-to-day driving.

Power delivery from the engine during full-throttle acceleration should be constant and without surging. In most Porsche models, first-gear acceleration is dramatic and quick thanks to the transaxle's extremely low first-gear ratio multiplied by the final-drive ratio, thus allowing a not-so-great running engine to impress with seemingly good power. Applying full throttle at around 3000 rpm while in sec-



**Top: A badly bent 993 steering tie rod is usually caused by an improper tie-down location when the car is being towed.**



**Bottom: A broken 993 heater air duct. Normal thermal cycling and aging commonly cause this problem.**

ond or third gear will place a higher load demand on the engine, thus making it rely on its torque curve and work harder to pull the load. If a running issue is present, it should be discovered under these conditions. The engine will likely be down on power and/or have an inconsistent power delivery with surging and possible smoke from the exhaust.

Additionally, during full-throttle testing at high rpm, the throttle should be abruptly closed. Deceleration and high cylinder vacuum result, which can also trigger exhaust smoke usually caused by worn valve guides, faulty valve stem seals, and/or an air-oil separator issue. Often, a seller will suggest that the car just needs to be driven some; a technician should say the problem needs to be diagnosed.

The gearbox should shift smoothly, with no binding in the linkage and no drama of any kind. Any difficulty or problems with shifting or noise should be diag-

nosed, as this is not normal. The clutch should operate smoothly; any chatter or slipping indicates a worn clutch that needs replacement. If excessive pressure is needed to depress the clutch pedal, this can be a sign that the clutch disc is worn and/or that there is a broken clutch pedal power (helper) spring in the pedal assembly. Any problems should be diagnosed.

Tiptronic transmissions normally work flawlessly. If there is a long pause between placing the shift lever into gear and feeling the transmission react — or any slipping, surging, or vibration — the problem should be diagnosed. Lack of servicing is the biggest problem for Porsche's Tiptronic transmissions, causing abnormal wear and possible early failures. Remember those service records?

The suspension system should feel firm and react immediately to steering input and/or road-surface irregularities. There should be no vibrations, rattles, or bangs when a dip, pothole, or bump is encountered. Handling should be great with any Porsche, though it goes without saying that these parts do wear over time and mileage. Tires are a critical component to handling and will be checked in detail during the in-shop inspection.

Brakes are important to the performance of any car, and Porsche brakes are amazing. The brakes should be tested to ensure the car stops straight, with no spongy pedal. If the car is equipped with anti-lock brakes (ABS), the pulsation of the system can be felt during its operation. Multiple stops should be performed so the brakes get hot enough to determine if any issues are present.

Once back at the Porsche repair facility, the test driver should review his or her list of observations. Any concerns or potential issues should be highlighted to discuss with the customer before diagnosing further. After that, it's time to roll the car into the shop for the second phase of the PPI, which we'll explore in our next issue. In the meantime, enjoy your Porsche. ▀

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Sellers know that there's always another buyer out there who may buy the same car without asking for a pre-purchase inspection.