

# Ignition Locks

BY TONY CALLAS AND TOM PRINE

You insert the ignition key and apply pressure to turn it but it doesn't budge. You apply more pressure. Still no movement. You rock the steering wheel to make sure the problem isn't the steering wheel lock. Nothing. You push and pull on the key while applying more and more pressure and...finally the key turns and the engine comes to life.

This is an annoyance for many owners of 993s, 964s, and earlier 911s. The other, and possibly even worse, scenario occurs when the key won't turn to the off position — so you can't remove it! This can and does happen, though usually in higher-mileage cars. Generally, there will be some warning as the problem develops, so it's important to recognize the symptoms. One is when the key seems to encounter a slight but noticeable or significant increase in resistance when turning the ignition on and/or off. Another is that it can become difficult to insert or remove the ignition key.

Such symptoms indicate wear or damage within the lock assembly — or to the key. If you experience either, it's best to take action because the problem may get worse and, in time, your ignition switch might stop working completely, predictably at an inconvenient time. This *Tech Forum*, then, will examine issues associated with the ignition-lock assembly, targeting the 964- and 993-based 911s but with relevance to all Porsche models.

## Ignition-Lock Enemies #1, #2, and #3

What's the best way to avoid the problem? It starts with your key ring. We're not kidding; too many keys apply pressure to the assembly's internal tumblers. Over time, this accelerates wear to lock components. You want a small key ring or fob for your Porsche, not a janitor's key ring.

The ignition-lock assembly is made up of the following components: a mechanical lock or tumbler assembly, the electrical switch behind the tumbler, the con-



tact connection for the ignition buzzer, and the steering wheel lock that operates like a deadbolt for the steering column. Additionally, many (but not all) Porsches with the optional Tiptronic transmission have a mechanical means to lock the gearshift lever in the Park position when the ignition is switched off.

To check your ignition lock's condition, start with the ignition key. Its blade portion should still have sharp or abrupt directional changes in its cut surface, especially at the highest points. If the surfaces are worn or rounded, this may contribute to problems. Hopefully, you have another key in near new or far less used condition. If not, you need to find a locksmith experienced with automotive locks and specifically Porsche locks to have a new key made. If your second or new key works easily, drive down to the local Lotto ticket retailer and hope your luck continues. If not, keep reading.

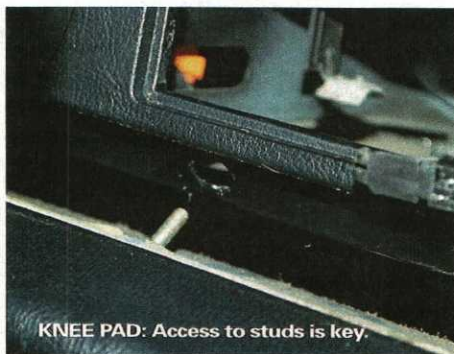
Even if the key looks acceptable, it may be a good idea to spray some Polytetrafluoroethylene (PTFE) dry film lubricant into the keyway of the ignition lock. Over time, internal lock tumblers wear. They can also gum up as small amounts of dirt and debris find their way into the lock mechanism, causing the tumblers to stick and no longer align properly with the cut shape of the key. This, in turn, may prevent the lock from operating.

PTFE was accidentally discovered by Dr. Roy Plunkett of Kinetic Chemicals Laboratory in 1938 while attempting to make a new Freon-type refrigerant. While storing perfluorethylene under pressure in an iron container, it polymerized into a substance that had incredible characteristics. PTFE was patented in 1941 and trademarked in 1945 under a name that revolutionized cooking: Teflon.

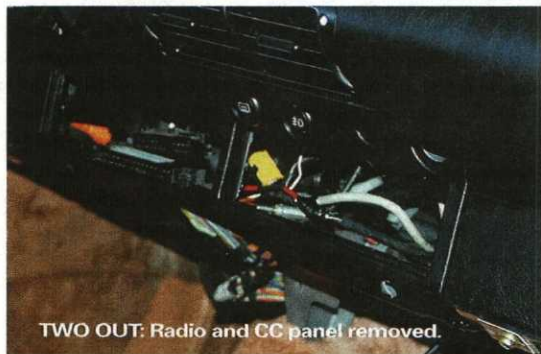
PTFE dry powder in spray form is an ideal lubricant for mechanical locks. The



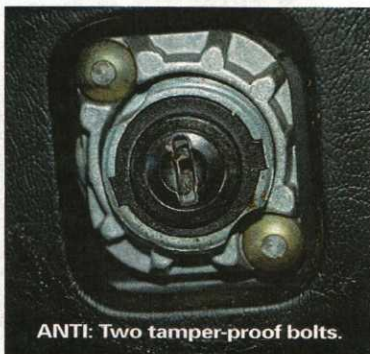
**RADIO KEY:** Makes removal easy.



**KNEE PAD:** Access to studs is key.



**TWO OUT:** Radio and CC panel removed.



**ANTI:** Two tamper-proof bolts.



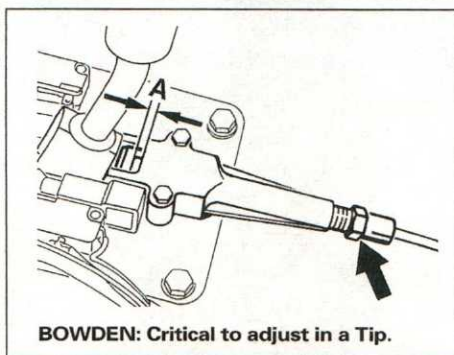
**CONQUERED:** By a good bolt extractor.



**SAVIOR:** A new factory ignition switch.



**BREAKAWAY:** New one-time bolts.



**BOWDEN:** Critical to adjust in a Tip.

aerosol spray contains sub-micron-sized particles of dry PTFE powder carried in a solvent base. When sprayed into the keyway of a lock assembly, the solvent carrier cleans the internal area of sticky build-up while the PTFE powder coats the internal lock-tumbler components. PTFE dry film lubricant has a friction coefficient that is one of the lowest of any material available. Because it is a dry film, PTFE is extremely durable. It provides excellent lubrication, remains in place for a long time, and does not attract dirt. Locks that

are serviced regularly with PTFE lubricant last longer due to the significant reduction in friction among internal parts. Additionally, keys will last longer. Graphite or light penetrating-oil sprays are not recommended in the lock assembly because they can leave a gummy residue that can affect the tumblers and attract dirt.

Following the use of PTFE lubricant in the lock assembly, insert and remove the key multiple times to work the lock tumblers. Operate the lock, turning it to the on and off positions several times. If

operation is improved, the cleaning and lubrication has done its job. If lock problems persist while using a good key in a manual-transmission car, the ignition-lock assembly is most likely seriously worn and must be replaced.

### Replacing the Lock Assembly

It's a good idea to disconnect a car's battery before performing any work where its electrical components will be removed or replaced. This ensures that control units and other electronic systems or equipment are not damaged during repairs.

If you have a factory radio, make sure you have its theft-prevention radio code. Some aftermarket radios also utilize codes, so it's a good idea to check. Porsche uses a four-digit code that must be entered into the radio when battery power is restored. The code is supplied with each car's factory documentation; if you don't have it, contact your Porsche dealer.

Unfortunately, the On Board Diagnostics 2 (OBD-2) monitors will be erased when power is disconnected on 1996-and-later 993s. The monitors should come back in time while driving the car, but those who have a mandatory emissions inspection test coming due should realize that the car will not pass without enough monitors being present. So long as the ignition lock works, doing the smog check first is a good idea.

To remove the ignition-lock assembly on a 964 or 993 with a manual transmission, first remove the radio and climate control ECU panel. If you have a factory radio, the job is much easier with interlock keys that defeat the spring hinges holding the unit in place. The interlock keys are available from multiple sources on the internet, and most automotive tool shops carry them. After pulling the radio out, disconnect its wiring, taking time to mark any wiring you feel needs identification for reassembly. With the radio and climate-control panel out, it's possible to access the dash's knee guard-attaching hardware; remove the guard completely.

Next, remove the circular ignition-lock trim cover by turning it counter-clockwise. Once removed, two of three fasteners holding the lock assembly in place will be exposed. These attaching bolts are tamper-proof fasteners, shear bolts that have breakaway heads which separate when installation torque has been achieved. Following installation, there is no longer any tool-attaching means for removal. These bolts also come from the factory with micro-encapsulated thread-locking compound applied to their threads — so be prepared for a fight to get them out!

We recommend drilling into the center of the bolt heads using a 2.8–3.5-mm drill bit. Then, with a corresponding-size bolt extractor hammered into place, turn the extractor with a wrench to remove each bolt. There are other methods for removing these bolts — such as with a punch and hammer — but we prefer the drill-and-extractor method because the (expensive) facing of the dashboard may be damaged if the punch slips.

Loosen the two shear bolts at the ignition-key location but do not remove them. Before you do, it's time to loosen and remove the under-dash stud (as there is no bolt head) holding the right side of the lock assembly in place at the steering column for the steering wheel lock. This is where things get a little tricky, as you're working under the dash and the stud is located above the lower dash frame rail that holds the knee guard in place. Hint: It may be worth the time spent to remove the driver's seat so that access and visibility can be improved.

Drilling a hole through the lower dash frame rail may allow better access for the purpose of drilling into the stud and the use of the extractor; check and evaluate accessibility for your tools. If needed, drill a 10-mm hole in the rail. Drill into the center of the stud — making sure drill depth is adequate to get a good grip with the extractor. Then tap the extractor into place. Once the stud has broken free, loosen it but do not remove it. Note: If the threads are damaged in the steering column when removing this stud, Porsche makes a threaded bushing replacement kit, part number 964.347.811.01, that will properly repair the damage. It does, however, add more complexity to the project.

Now insert the ignition key and turn it (hopefully) to the on position. The ignition-lock deadbolt will be released from the steering column. Once it is, remove the ignition-lock assembly's two attaching bolts and the stud. Move the assembly slightly away (to the left) from the steering column so that the assembly will clear its interface with the steering column. Turn the ignition key back to the off position and remove the key. The ignition-lock assembly can now be removed from below the dash. Unplug the large electrical harness connector from behind the lock tumbler as well as the two-prong connector for the buzzer.

Ignition-lock assemblies are available from Porsche in two configurations, which are priced the same; each is supplied with two new keys. The first is part number 964.347.917.00, described as "Steering Lock with stipulation." That means the keys supplied with the assembly are

cut to fit the car's original door locks. The other version is 964.347.917.01, referred to as "Steering Lock without stipulation." It includes keys that work in the new lock assembly but will of course not work in the doors (or glovebox or, in the case of a Cabriolet or Targa model, keyed hood release handle for the front trunk).

To obtain a steering lock with stipulation, be prepared to wait about five to six weeks — and only consider this version if you're sure your car has never been re-keyed. If it has been re-keyed, or if this waiting period is not an option, you can take the non-stipulated lock assembly to a locksmith experienced with Porsches to have the new ignition lock re-keyed to work with your existing key. Generally, re-keying the ignition lock is the best option. And, if your original keys are looking moderately worn — or worse — it's the perfect time to purchase new factory key blanks and have a locksmith cut new keys from a good original.

Some locksmiths and Porsche dealers have invested in special key-cutting equipment that makes a new key by utilizing the original key code. You can also order a code-cut key through any authorized Porsche dealer. This is the most accurate and desirable way to have a key made. If you don't have the key code for your car, visit the parts or service department of your local dealer. Bring your current driver's license, vehicle registration, and, if possible, the car for verification; they should be able to help.

To install a new lock assembly, first connect the electrical plugs and place it under the dash so that the keyway of the lock is visible through the opening in the dash. Insert the ignition key and turn it to the on position so that the steering wheel lock is released. The assembly can now be moved into position and the three new shear bolts can be installed finger-tight. Do not torque the bolts down yet, however. Remember that the thread-locking compound becomes active once these bolts are installed — so the rest of the job must be completed quickly at that point.

At this time, check the operation of the steering wheel lock by turning the key to the off position. The steering wheel should lock and then release when the key is again turned to the on position. If it does, tighten the three shear bolts with a socket or wrench until the heads break off. You can now reinstall all of the dash trim pieces, the center console, the climate control panel, and the radio.

### The 1992-on Tiptronic Difference

Starting with the 1992-model-year 964

and continuing through to the end of the 1998 993s, all 911s manufactured with Tiptronic transmissions were equipped with Porsche's Keylock and Shiftlock Systems. The Keylock System requires the Tiptronic gear selector to be in the Park position before the ignition key can be removed. The gear selector remains locked in Park until the key is re-inserted and turned to the on position.

The interface between ignition lock and gear selector lever is accomplished with a bowden cable (943.426.073.01), which ties the two components together mechanically. Like the manual-transmission cars, 964s manufactured in 1990 and 1991 with the Tiptronic transmission have no mechanical or electrical interface between the ignition-lock assembly and the gear-shift selector mechanism.

The Shiftlock system does not affect operation of the ignition-lock assembly, but it does provide another level of safety by preventing any gear selector movement until the brake pedal is applied. The system operates by means of an electrical solenoid energized when the ignition is turned on, thus preventing movement of the selector. When the brake pedal is applied, the solenoid is released and the selector can be moved to the desired position. The solenoid is de-energized when the ignition is off, but the mechanical interface of the Keylock System then becomes active.

In the case of 1992 (or later) Tiptronic-equipped Porsches, there is a *chance* the Keylock System bowden cable could be damaged, worn, or in need of adjustment. If pressure is applied from the shifter when it's placed in the Park position via the bowden cable, it can prevent the lock assembly from turning on or off properly. It's rare, however, to find a bowden cable that has an issue. That said — and just in case — you may want to check it for operation and adjustment before you replace an ignition-lock assembly.

To check the adjustment, disconnect the battery and then remove the complete center console and dash-mounted knee guard pad. Remove the Central Information System control unit but leave its wiring connected. Next, look at the bowden cable housing mounted in front of the shift-lever assembly. With the ignition off and the shift lever in Park, free play between the bowden cable end and the lock slide at the latch lever should be 2.0 mm ± 0.5 mm. If observed free play is more or less than that, turn the cable sleeve on the bowden cable housing until the free play is within tolerance. Try the ignition key in the lock



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assembly — and be certain to if you made an adjustment. Hopefully, the ignition lock will work without binding.

If the lock assembly's operation is not improved, try to get the ignition key to turn to the on position (failure to do so could damage the lock assembly and/or the bowden cable) and then unscrew the bowden cable from the lock assembly and remove it. If the bowden cable's end is damaged, or if the cable binds when pulled through the cable sleeve, replace the cable. Note: There should be slight resistance from the spring on the cable. If there is no problem with the bowden cable, removal and replacement of the ignition-lock assembly is required.

With the bowden cable removed, ignition-lock assembly replacement is the same as described for manual-transmission cars. Following replacement, the cable must be reinstalled. To do so, turn the ignition key to the on position, insert the bowden cable into the lock assembly, and tighten its sleeve bolt to a maximum of 2.5 Nm (or 24 inch-pounds). If the cable was removed from the shift selector, install the body end at the shift mechanism; use the bolt sleeves and hexagon bolts and then torque the bolts to 2.5 Nm (or 24 inch-pounds).

Now move the gear selector to the Park position and turn the ignition key to the off position. If the key will not turn to the off position, the bowden cable needs to be re-adjusted as described earlier. When the cable is correctly adjusted and the shifter is in the Park position, the ignition lock should turn on and off easily. With the ignition switch off, the shifter should not move from the Park position. Now reassemble the interior components in the reverse order of disassembly.

### Maintenance and Advice

Porsche locks are precision-made pieces and provide long-term, trouble-free service. Unlike some manufacturers, Porsche uses internal tolerances that make it imperative to use correctly cut keys. In time, as wear to the key and lock tumblers takes place, problems begin to crop up.

Having keys in good condition on a lightweight key ring is your first defense against lock problems. If the lock assembly sticks, try pulling the key out, turning it over, and reinserting it before trying again. The slightly different wear pattern on the opposite side will sometimes work.

As part of the normal service on your Porsche, the use of an aerosol PTFE dry lubricant in all (mechanical) keyed locks should be done at least twice per year.



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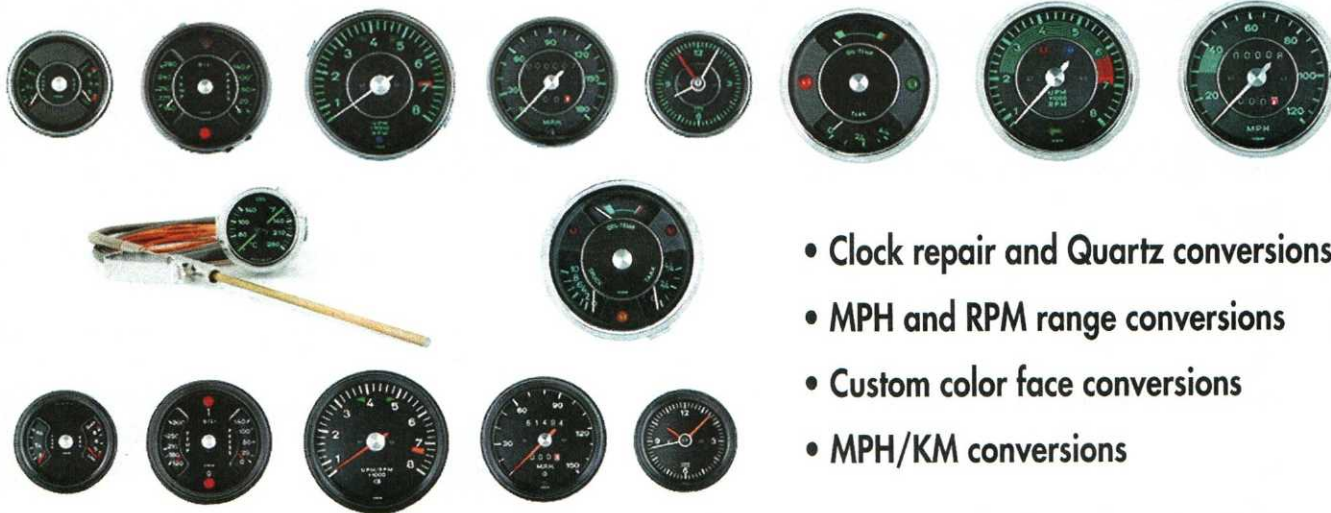
This may slow the internal wear of the lock assembly, as it provides the proper lubrication for the lock components.

Only use high-quality tools when performing this and other work on your car. There can be a significant difference in cost between brands, but using anything less than top-quality drills, punches, and extractors will increase the frustration factor and possibly jeopardize the successful completion of the job. If you are performing this or other repairs yourself, be sure to have the factory repair documentation available, as space limitations here prevent the ability to address every possible repair scenario. Also, only perform repairs within your mechanical ability.

If you have only one ignition key for your Porsche, have another made and test it to make sure it works. There's a good chance that, at some point, you'll need it for one reason or another. And remember: Enjoy your Porsche! ♣

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