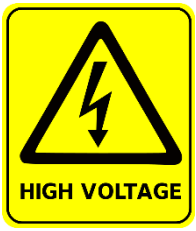
Model 911903 Gen 5 Firmware Version PA15_328 V18060



WARNING: HIGH VOLTAGE! DISCONNECT THE BATTERY BEFORE INSTALLING OR SERVICING ANY IGNITION SYSTEMS COMPONENTS.

Failure to follow these instructions and the vehicle owners' handbook and shop manual could result in serious personal injury, death and or damage to property. This part is designed to be installed by a mechanic that is familiar with European automobiles and safety standards.

The Model 911903 is the fifth generation version of the original Perma-Tune ignition system co designed by Ferdinand Porsche and Theodore Sturm in the late 1960's. The original Perma-Tune "blue box" was made in Newport Beach, California and was installed at the Porsche factory on the 1974 Porsche 911. The new Gen 5 Perma-Tune has a brand new Bosch look alike housing made in Germany. The internal components are all new parts and are of the very latest American Perma-Tune design and manufacture. This ignition module is intended for use on cars that are judged on originality and functionality and will provide increased ignition performance over the original ignition module. This Perma-Tune is ready to plug in and bolt up to the 911 engine harness. It is also Bluetooth ready for easy customization. Use the Perma-Tune 90506 Bluetooth Antenna to program it with any Android device or smart phone. Use the 90508 Bluetooth Antenna to program it with Apple devices and smart phones. The programming App is free and downloadable from the internet. Programmable features are: multiple strike (how many strikes and at what RPM), signal smoothing, soft RPM limiting, timing advance, vacuum advance and much more. **Contact Perma-Tune for firmware updates.**

General Information

If the connector does not match that of the car, you have the wrong model Perma-Tune box for that car. In either case contact Perma-Tune for assistance with exchanges. The dealer you purchased your Perma-Tune from is not authorized to issue warranty replacement or exchange units. Please contact the factory for technical and warranty assistance. If your alternator light glows slightly, chances are your vehicle has a ground fault. Refer to the factory shop manual and the Perma-Tune web site for more information on trouble shooting ground faults. Spark plug gap can be increased to .065 and copper core, unshielded copper spark plug wire can be used without causing radio noise problems. The 911903 Perma-Tune module RPM limit is preset to 7,500 RPM. Refer to the Bluetooth Antenna installation instructions on how to change this setting.

SERVICE NOTES

Warning! High Voltage may be present at the ignition coil primary AND/OR secondary circuit. Do not connect a dwell meter or test light to the coil primary terminals. Serious personal injury, death and or damage to property could result. Always disconnect the battery at the negative terminal before working on the car. **To avoid damage to your Perma-Tune and voiding your warranty**: Do not connect 12 volts to the coil. If the ignition coil shows signs of oil leakage, replace it before installing a new Perma-Tune. Do not use a test light or jumper wire on the Perma-Tune, tachometer or ignition coil. Make sure the relay panel ground cable, engine ground cable and battery negative cable connections are not defective. **Beware of misdiagnosis: Do not troubleshoot the vehicle by swapping components, you may do damage to the parts or the donor vehicle in the**

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process. If the car does not run with the Perma-Tune but does run with another brand of ignition, read the "Onboard Diagnostics" section of this document.
Remove any radio noise suppressers or condensers that may be attached to the ignition system, they are not needed and may cause intermittent ignition problems Check spark plug wires, spark plug connectors (resistor type), and distributor cap for corrosion and carbon tracking. Check the rotor for shorts, defective resistor and/or defective rotor RPM limiter components. Check fuel for water contamination; check fuel pump pressure and fuel injection settings. Unlike the stock ignition systems, Perma-Tune ignitions make no audible sounds when the ignition switch is on. The Gen 5 Perma-Tune makes no heat of its own under normal operating conditions. The aluminum fins on the housing are for aesthetic appeal only.

Installation Instructions

1. Remove the old ignition module from the car according to the shop manual for this car. Perform a bench check of the original ignition unit according to the manufacturers' specifications. Perform any maintenance procedure needed, if the bench check procedure indicates so, to prevent damaging the new ignition module upon its installation and voiding your warranty. In most cases, examining the old ignition box will reveal if a defective ignition coil or a shorted wiring harness caused it to cease functioning. Replace the ignition coil if it is defective and / or correct shorts before installing a new Perma-Tune. We recommend either the Perma-Tune coil P/N SC010 or factory German made coil with your Perma-Tune. High turns ratio "high performance" coils can cause Voltage flash over in the distributor cap and are not recommended for use with your Perma-Tune.

NOTE: On some cars, the relay panel where the ignition box is located must be unbolted from the car so that the nuts can be retained while the bolts for the ignition box are unscrewed. One of the screws for the relay panel mounting also holds the braided ground strap that provides the ground for the relay panel. This ground strap can be easy to forget to hook back up because when it is removed from the relay panel it will fall forward between the fuel filter and fuel accumulator where it cannot be seen. It is extremely important that this ground strap be reconnected when the relay panel is bolted back to the car. Failure to reconnect this ground strap may result in damage to the car or your new ignition box and will void your warranty.

2. Perform an ignition coil resistance test. Replace the coil if the coil does not test to specifications or if there is evidence of oil or tar leaking from the coil.

Note: To avoid potential damage to your new ignition box and voiding your warranty, we recommend that you replace the ignition coil when the ignition box is replaced. Use only the Perma-Tune coil part number SC010 or the original German made OE coil.

3. Perform the distributor breaker points resistive test and mechanical wear tests as instructed in the Porsche 911 shop manual. If the tests indicate a fault or excessive wear exists, repair the distributor before you plug in your new Perma-Tune. If the distributor and electrical connections are OK, plug in your new Perma-Tune and reconnect the battery.

Note: Remove any condenser that may have been added to your breaker points. The condenser is not needed and may cause intermittent ignition problems.

4. Perform the onboard diagnostics checks as described below, then disconnect the battery again.
5. Bolt the ignition box to the relay panel. Then reconnect the battery. Start the engine and verify ignition timing with a strobe light according to the shop manual and engine bay placards for this car. **Note: Some brands of dial back timing lights may not be compatible with Perma-Tune ignitions.**

Onboard Diagnostics

The Gen 5 Perma-Tune makes diagnostics easier by providing onboard diagnostics. The Perma-Tune runs diagnoses programs automatically that are displayed by two colored LED function lights viewable from underneath the Perma-Tune. These LED lights assist the mechanic in diagnosing your ignition system. There are three PTC Self Resetting fuses that assist in troubleshooting while protecting your Perma-Tune from damage.

Green Status Indicator

The green LED indicates the status of the controller inside your Perma-Tune. When the LED flashes ½ second off and ½ second on, the controller is signaling that all is normal. No green light indicates that the controller is not powered up. A steady green light indicates that the controller is getting power but is detecting a fault that prevents it from operating.

Red Discharge Indicator

The red LED light illuminates every time your Perma-Tune discharges energy to the ignition coil. It is useful for setting the trigger point when static timing the engine, it indicates when the Gen 5 is receiving a trigger signal, and it indicates when the RPM limit has been reached or exceeded.
During very slow cranking RPM, the light appears to flash because the time between the pulses is long enough that human eye can distinguish each flash. At faster RPM, as when the engine is idling, the light appears to be dimly lit because the human eye cannot distinguish each flash of the LED. When viewing the red LED under normal conditions, the light will appear to be flashing during cranking of the engine, it will appear dimly lit when the engine is running at low RPM and will appear brighter as the RPM increases. When the programmed RPM limit is reached, the discharge pulses will be curtailed by the Perma-Tune controller and so the LED appears to flash. At this point the controller has sensed an over rev situation and so the soft RPM function becomes active to hold the engine at the programmed RPM. If the engine exceeds 3% of the programmed RPM limit, then the controller senses that the rear wheels of the vehicle are over accelerating the engine, as in a missed shift situation. At this point the controller will shut off the discharge pulses completely and so the LED will not illuminate at all. The reverse happens as the engine RPM falls. The default RPM setting for the 911SC903 is 7,500 RPM. Refer to the Bluetooth Antenna installation instructions on how to change this setting.

PTC Self Resetting Fuses

These are the orange components that stick out of the bottom of the Perma-Tune and are labeled power, and points. They are thermistor type, self-resetting fuses that indicate problems by getting hot. Under normal conditions they will be no warmer than the housing that surrounds them. We recommend that you use an infrared thermometer to test them.

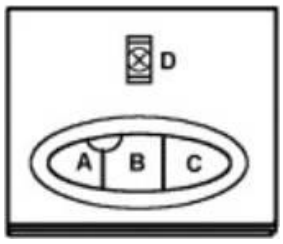
Troubleshooting Using the Onboard Diagnostics

The diagnostics displays are concealed under the ignition module so as to keep the appearance of the original equipment. This requires that you dismount the Perma-Tune to observe the diagnostics components. When performing diagnostics, a jumper must be placed between the Perma-Tune housing and the relay panel where the ignition box is usually mounted. Failure to connect this jumper may result in a misdiagnosis. After dismounting the Perma-Tune, lay it in a secure location on the air dam. Then connect the battery and start the engine and observe the LEDs. Shut off the engine and disconnect the battery and then check the PTCs to see if they got hot.
Warning: Do not drive the car while the ignition module is dismounted. Do not touch anything under the hood of the car while performing diagnostics. CAUTION: The PTC parts protrude from the bottom of the Perma-Tune and may become hot to the touch. Avoid bending the PTC parts or they may become damaged.
Flashing green light: All systems normal and the controller is ready for operation, diagnostics or programming.
No green light: This could be caused by no power applied to the Perma-Tune or that the Perma-Tune has no ground connection. If power and ground of at least 8 VDC is present and the light still fails to illuminate,

then there is an internal fault that is preventing the controller from functioning. Note: this reading must be made while your Perma-Tune is plugged into the car.
Steady green light: A steady green light indicates that the controller is powered up but is detecting a fault that is preventing it from operating. See Power PTS below.
No red light: There is no trigger signal is being received from the distributor.
Power PTC: This is a thermistor type, self-resetting fuse that will cut off power to the ignition system in case of a power overload without effecting the rest of the ignition circuit. There are several conditions that could cause this PTC to trip but the most common on is if reverse DC power has been accidentally applied to the vehicle battery. Refer to our online guide for the 911SC for more information. Once the fault has been corrected, the PTC will automatically reset itself allowing your Perma-Tune to continue functioning without being damaged. You can tell when the PTC has tripped by its temperature. When the PTC has initially tripped it will be very hot to the touch. After it trips it will stay off but remain slightly warmer than ambient temperatures as long as the circuit fault and power are still present. When the power to the circuit is cut or when the wiring fault is corrected, the PTC cools down to ambient temperatures and will automatically resume operation.
Points PTC: This is a thermistor type, self-resetting fuse that will cut off the trigger connection from your Perma-Tune in case the wiring on your 911 has shorted to ground or to power. Refer to our online guide for the 911 for more information. Once the wiring fault on the car has been corrected, the PTC will automatically reset itself allowing your Perma-Tune to continue functioning without being damaged. When the PTC has initially tripped it will be very hot to the touch. After it trips it will stay off and cool down to ambient temperatures. Whenever the ignition key is cycled, and, if required, the wiring on the car is corrected, the PTC will self-reset.
Tach PTC: A tachometer output is provided on pin 4 of the Bluetooth connector. This output can be used to trigger an aftermarket tachometer or shift light. It is also useful as a diagnostic connection for checking the operation of the ignition system. The Tach PTC is a thermistor type, self-resetting fuse that will cut off the tachometer connection from your Perma-Tune in case the tachometer wiring has shorted to ground or to power. Once the wiring fault on the car has been corrected, the PTC will automatically reset itself allowing your Perma-Tune to continue functioning without being damaged. When the PTC has initially tripped it will be very hot to the touch. After it trips it will stay off and cool down to ambient temperatures. Whenever the ignition key is cycled, and, if required, the wiring on the car is corrected, the PTC will self-reset.

Bluetooth Connector: This is a serial communications port used for diagnostics and programming of all Gen 5 Perma-Tunes. It is Bluetooth ready and compatible with RS232 serial communications protocol host computers. You can use your smart phone to set special ignition functions like an RPM limit. Order the P/N 90506 Bluetooth Antenna for Android phones and the P/N 90508 for I Phones. Refer to your Bluetooth Antenna instructions on what settings are available to you and how to change them.
NOTE: No program changes are required to use your Perma-Tune as a repair / replacement part, it is preprogrammed for the stock 911 Porsche 2.0 and 2.2 L engine.
The connector pin outs below are provided for trouble shooting purposes on the Perma-Tune module. Note: The diagram is of the ignition module sitting on the work bench.

No rewiring of the vehicle is required.



A = + or 15 or terminal A, the coil hot primary terminal. Note: the coil - or 1 or B terminal should be connected to ground at the coil mounting bracket. On mechanically injected cars, this is also where the tachometer isolator is connected. Note: this is ONLY connected to the tachometer isolator on the MECHANICAL injection 911 cars.
B = Power from ignition switch.
C = Distributor breaker points. On carbureted and CIS injection cars, this is also where the tachometer is connected.
D = Ground. **Connect to the engine ground at the coil mounting bracket.**

Bench Check

The only bench check that can be done is between pins A and D. It should read 3,700 Ohms plus or minus 100 Ohms. Any other reading indicates that the Perma-Tune has been damaged by a defective ignition coil.

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