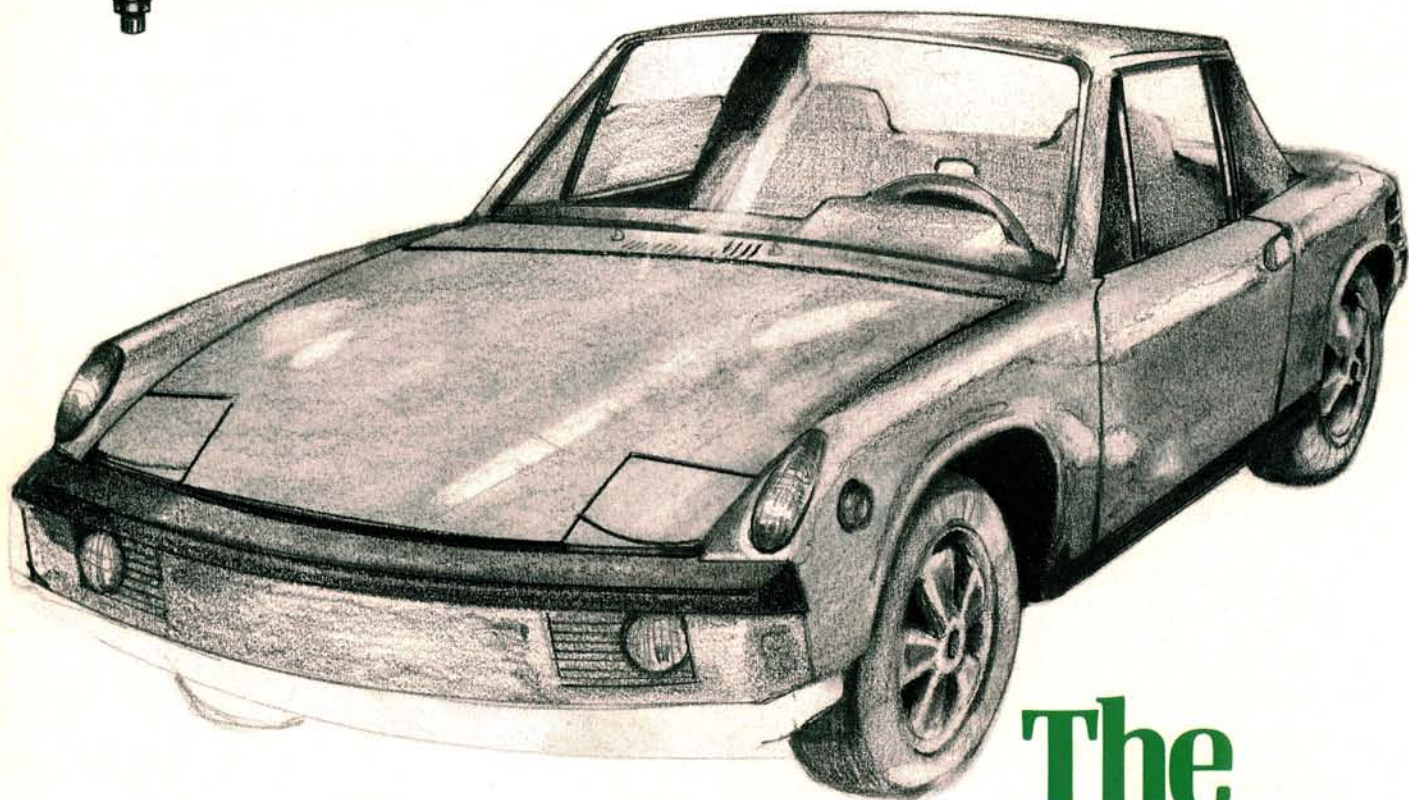


Porsche 914



The Amazing Adjustable Car

Does it ever seem to you that we've been forced into being "parts changers?" There was a time when those two words were snarled by an aging master mechanic as he watched an apprentice bolt on new parts until the car got fixed.

But many newer cars make no provision for adjustments to parts which have developed a little extra free play. Many of these parts would still be serviceable if only, **ONLY** someone had added an adjustment screw here and there to take up that tiny bit of slop.

Excuse me, but it's nostalgia time. This month's glance in Time's rear view mirror will focus on a car which had an adjustment for darned near everything—the Porsche 914.

Some hardball Porsche purists scoffed at the car when it was introduced. To many, the car just wasn't a 911 (what Porsche which was not a 911 hasn't fought that accusation?)

But the 914 had a simple, honest design and a reputation for dependability. Here's a quick overview of the 914's history, with a list of pertinent characteristics:

Production years—1970-76

Engine Options—1.7, 1.8, and 2.0 liter four cylinder engines. The 914/6 was equipped with a 2.0 liter six cylinder engine.

Fuel Systems—Manifold Pressure Control on 1.7 and 2.0 liter four cylinder engines. Air Flow Control (L-Jetronic) on 1.8 liter four cylinder engines. The 914/6 used two triple throat Webers, one for each bank.

Brakes—Four wheel disc. Mechanical hand brake cables attached to rear caliper to lever pistons to apply hand brake.

Transmission Options—A 5-speed manual transmission or a 4-speed Sportomatic were available.

The Sportomatic was a very unusual transmission. A conventional 4-speed transmission was coupled to the engine through a torque converter as well as a dry clutch and pressure plate. The torque converter provided torque multiplication at low end. The dry clutch was activated by a vacuum servo, which was in turn controlled by a vacuum valve. The vacuum valve applied or released vacuum at the servo in response to a set of contact points in the shifter. As a result, even though there was no clutch pedal, all gears were selected manually by the driver.

Suspension—Front torsion bars and shocks. Rear independent suspension with trailing arms and coil springs over shocks.

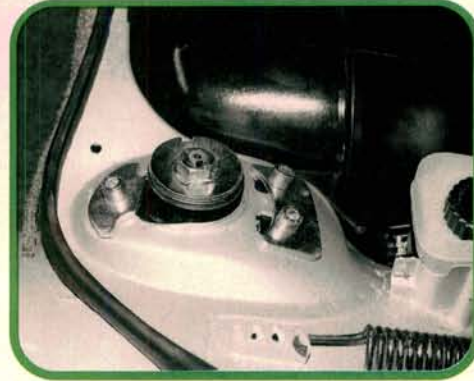
Steering—Manual Rack and Pinion

PORSCHE 914 ADJUSTMENTS

Here's a list of some of the adjustments on the 914.

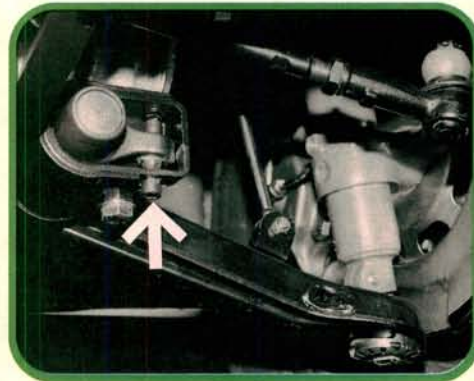
- Clutch cable free play
- Clutch pedal travel adjustment
- Brake swivel pin adjustment (swivel pin-to-master cylinder clearance)
- Brake light switch adjustment—This is a mechanical switch, not a hydraulic switch. The switch is adjusted from inside the car, at the brake pedal mechanism.
- Rear disc brake venting clearance
- Handbrake cable adjustment
- Ignition point dwell and timing
- Idle speed (all cars)
- Webers Carburetors 914/6—Just about everything—idle speed, fuel mix, and idle air
- Potentiometer adjustment for CO on some MPC control boxes.
- CO adjustment on AFC cars
- Fuel Pressure on MPC cars
- Camshaft timing adjustments (914/6)
- Valve lash adjustments (all engines)
- Alternator belt adjustment
- Front suspension ride height adjustment (front torsion bars)
- Front caster and camber adjustment (strut towers) as well as toe adjustments
- Rear camber adjustment (shims)
- Track adjustment using rotation of rear control arms
- Sportomatic—An adjusting screw on the Vacuum Control Valve to the Vacuum Servo could be turned to adjust how quickly the Control Valve applied or released vacuum to the servo.
- A basic adjustment of the relay rod between the vacuum servo and clutch release arm on the Sportomatic was similar to a conventional clutch adjustment.
- Shift forks on manual transmission vehicles had to be adjusted with the gears and shafts all installed on the intermediate plate, and the plate mounted to a fixture. Improper adjustment resulted in over-engaging or underengaging gears.
- Throttle cable adjustments
- Heater box control cables
- Windshield wiper motor adjustments (free play at worm and armature end play both adjustable)
- Headlight door height adjustments

--By Ralph Birnbaum



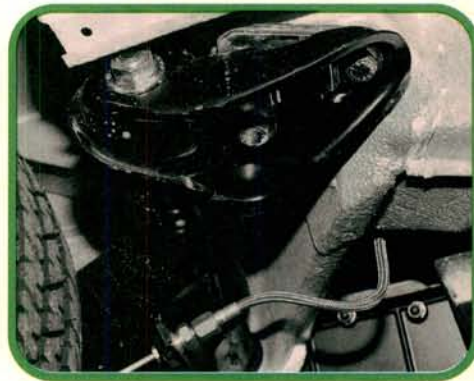
1

Let's start with the suspension. Front caster and camber are adjustable by loosening the upper strut mount Allen® head bolts and shifting the strut fore and aft for caster adjustment, and port to starboard to change camber. But before we start moving the strut we should check and correct ride height.



2

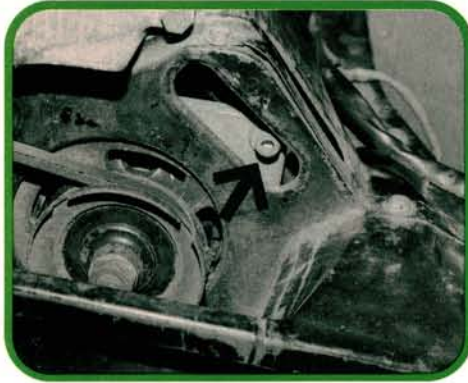
Front ride height is adjustable. A threaded bolt (arrow) pivots the cap on the torsion bar, raising or lowering the front end. Torsion bars are marked for right and left and should not be interchanged. Be careful not to scratch the protective coating on new torsion bars or they may rust and fail.



3

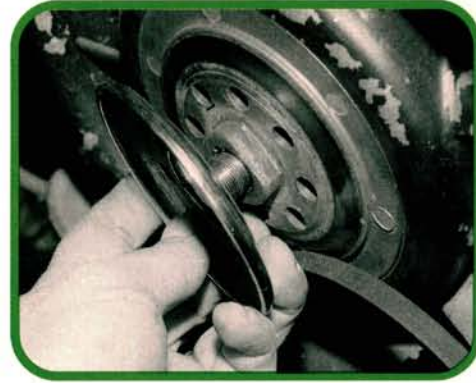
The rear suspension is also adjustable. The trailing arms bolt to the underbody. Loosen the three mount bolts and add shims between the outboard trailing arm mount and the body to increase camber. Or pivot the arm by moving the mount fore or aft to set rear wheel toe as well as track for a complete alignment.

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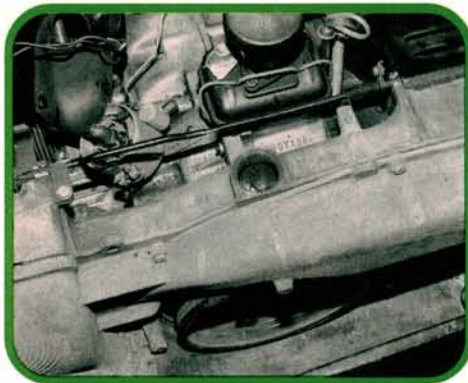
4

At a Porsche training school 20 years ago they referred to the Allen head bolt on the alternator adjustment slide as a “cheesehead” bolt. The hex in the bolt loved to round out, so we decided that these bolts were named for their inventor. The bolt is hidden behind a plastic protector, but it doesn't help.



5

Alternator belt adjustment on the six cylinder car is a different proposition. If you've ever adjusted belt tension on an old VW engine, the procedure is the same. Remove the nut on the alternator shaft, and remove shims between the split drive pulley to tighten the belt, add shims to loosen it.



6

Access to the valve covers was from below the car, but the timing marks were up in the engine compartment. Rather than raise and lower the car to set each cylinder for valve adjustments, Porsche techs learned all about the importance of complementary cylinders. Let's speed up a typical four cylinder valve adjustment.



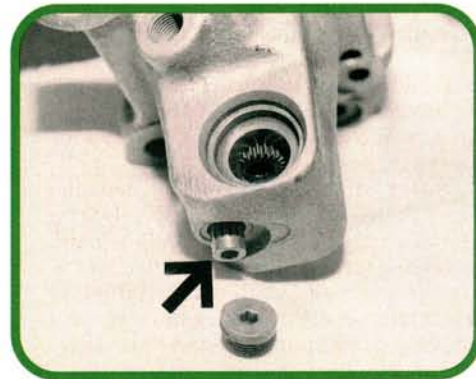
7

Drop the car into 5th gear and then raise it. Use a C-clamp to pull forward on one of the rear hand brake levers to lock one rear wheel. Turn the other rear wheel to spin the engine over. When the valves on a cylinder lap, adjust the one directly across from it. This saves a lot of up and down with the lift.



8

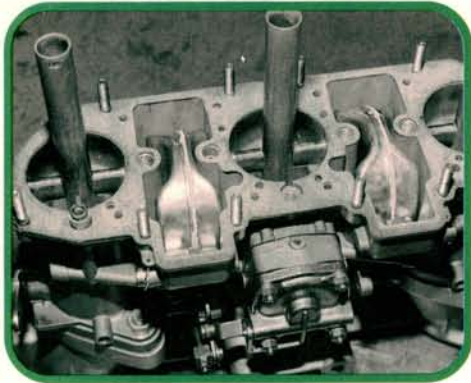
Rear brake pad replacement on the 914 was unique. After removing the old pads, a special tool (or block of wood) was used to tension each piston as an Allen head screw was turned to retract it. The inboard screw was accessed through a hole in the trailing arm. The outer screw is shown through the wheel at right.



9

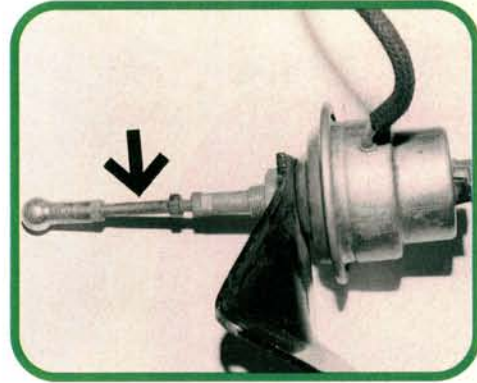
After installing new pads, the Allen screws are turned and feeler gauges were used to set the “venting clearance” between pads and rotor at 0.20 mm. This partially disassembled caliper shows how an offset gear drive meshes with the geared end of the piston screw. This system is in use again—on Mazda's Miata!

Porsche 914



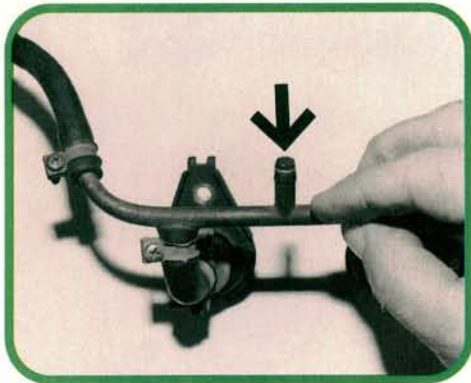
10

Each bank on the 914/6 was fed by a triple-throat Weber carb assembly. The three throats shared two float chambers. Adjustments were provided for idle speed, idle mixture, and an idle air adjusting screw allowed for synchronization of the air flow through the throats. Beauty, eh?



11

To avoid over-rich closed throttle decel emissions, a throttle positioner was fitted to the Webers. Voltage was applied to the positioner for about 5 seconds during decel to delay the drop in engine speed from 3000 to 1000 RPM. Range of operation is adjusted by shortening or lengthening the rod (arrow).



12

Manifold Pressure Control systems used on 1.7 and 2.0 liter fours had several interesting features. Fuel pressure was checked at this port on the fuel loop, and was adjustable at the pressure regulator. Trigger points inside the distributor told the control box when to fire the injectors (in pairs).



13

A fairly common source of problems with the MPC system was bad connections between the edgeboard at the control box and the carside harness. This resulted in unnecessary replacement of boxes and a lot of "tinkering" by DIYers. Most of us kept a can of TV tuner cleaner handy. All wires on the harness are numbered.



14

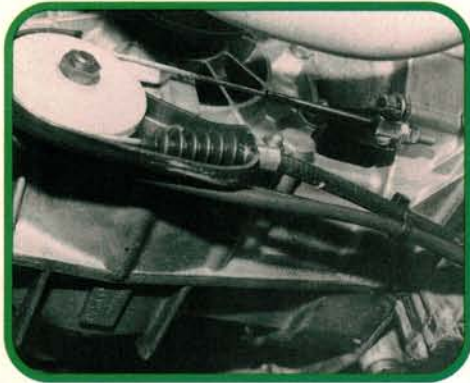
All sorts of adjusting here. Even the gas pedal height was adjustable for height. The brake light switch was inside the car, and adjusted at the brake pedal linkage. The swivel pin between the brake pedal mechanism and the master cylinder was adjusted to provide a clearance of 1 mm.



15

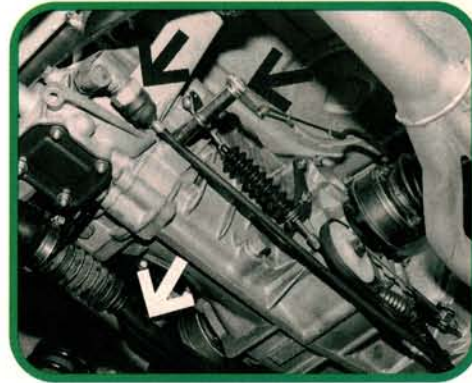
In addition to the clutch cable adjustment at the release arm, clutch pedal travel was adjusted by sliding a steel stop (arrow). The Porsche microfiche describes the adjustment as follows: "When the clutch pedal is depressed to the stop, reverse gear should be engaged without gear clash." Okay.

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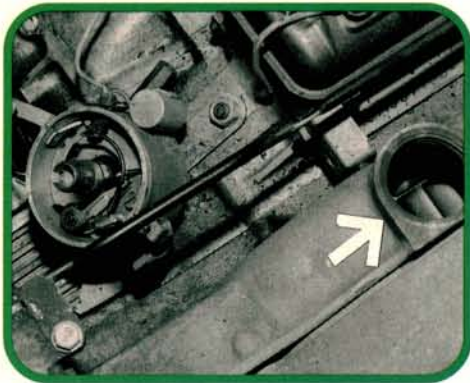
16

The mid-engine design of the 914 placed the transmission all the way aft. This required the clutch cable to do a 180 on its way to the release arm. The throttle linkage was also forced to take a round about route through an intermediate linkage. Cleaning and adjustment were part of a good maintenance.



17

Here's a look at the underside of the transaxle. Note the position of the pivot arm for the throttle linkage (black arrow right) and the speedo cable (black arrow left). But the shift rod (white arrow) has the longest distance call of all, reaching all the way from the shifter inside the car to the rear of the trans.



18

Remember tune ups? Plugs, points, and condensers were good profit maintenance items. A small wick in the top of this distributor shaft received a drop of oil to lube the centrifugals. Timing on this four cylinder was set using timing marks on the engine fan viewed through the timing hole (arrow).



19

Setting ignition timing. In addition to setting static timing, 1.7 and 2.0 liter fours were checked for 27 degrees of advance at 3500 RPM. AFC 1.8 liter fours were checked at idle (7.5 degrees BTDC at 850 RPM). Check sixes for 35 degrees of advance at 6000 RPM (vacuum hose disconnected at distributor).



20

Camshaft timing was adjustable on sixes. Real performance nuts not only swapped cams, but fine tuned camshaft timing to modify performance characteristics of the engine for different types of driving. For a detailed explanation of cam timing and valve adjustment on sixes, see *Import Service* October 1990.



21

You say that your Sportomatic engages with a bang? Or maybe it engages too slowly? Remove the cap on the adjustment screw at the Vacuum Control Valve. To make the clutch engage more quickly, turn the screw counterclockwise. Turn it in to make the clutch engage more slowly. Go a quarter turn at a time.