My '79 Euro 928 track car wasn't running properly. When warm, it would lose power at 4,000 RPM and rev no higher. While the specialty of Electronik Repair, Inc. is rebuilding electronic control modules for Porsche 928s, I felt confident to undertake rebuilding the K-Jetronic CIS fuel distributor thanks to the help of my friends Jay Kempf and Dennis Wilson, who are both experienced with CIS injection system.

The following photos describe the process of rebuilding the Porsche 928 fuel distributor. My car is a 1979 Euro model with the original injection system. Prior to this problem, all fuel injectors, injector grommets, fuel pumps and fuel filter were replaced and the car was running very strong.

The Bosch K-Jetronic CIS fuel distributors are common on all 928s that use these systems. Other Bosch CIS systems may be similar, however later model cars were upgraded with electronics for emissions control.
To determine if a CIS is working properly, it is necessary to measure system pressure, control pressure, and fuel pump output. Specific test gauges are necessary. I purchased mine from JC Whitney [catalog no. 123617 Star Hoffman, SKU ZX123617U].

If you don’t want to purchase CIS test gauges, I found that SpecialTauto rents them. [See their webpage at http://www.specialtauto.com/fuel-distributors.html]

System Test Modes: System and Control Pressure*

The CIS test gauge has a valve that enables testing of both System and Control pressure. These are the two key indicators of CIS health.

**The CIS tests recommended are:**
a) **Check the pressures:** Cold start control pressure measurement. The vacuum line to the WUR was removed and plugged.

To measure control pressure, the test valve is open in WUR loop. The following pressures were observed:

<table>
<thead>
<tr>
<th>Time(sec)</th>
<th>RPM</th>
<th>Control pressure lbs/in² (bar)</th>
</tr>
</thead>
<tbody>
<tr>
<td>0</td>
<td>1400</td>
<td>28 (1.9 bar)</td>
</tr>
<tr>
<td>20</td>
<td>1500</td>
<td>34 (2.3 )</td>
</tr>
<tr>
<td>40</td>
<td>1600</td>
<td>38 (2.6)</td>
</tr>
<tr>
<td>60</td>
<td>1400</td>
<td>44 (3.0)</td>
</tr>
<tr>
<td>80</td>
<td>1400</td>
<td>50 (3.4)</td>
</tr>
<tr>
<td>100</td>
<td>1200</td>
<td>52 (3.5)</td>
</tr>
<tr>
<td>120</td>
<td>1100</td>
<td>54 (3.7)</td>
</tr>
<tr>
<td>140</td>
<td>1000</td>
<td>54 (3.7)</td>
</tr>
</tbody>
</table>

The test was conducted on a relatively warm morning; it was about 70F. I still observed that the control pressure started low and ramped up to steady state, so I believe that my less than one-year old rebuilt Warm Up Regulator (WUR) is functioning properly.

In a steady state warm condition, the control pressure remained at 54 lb (3.7 bar). The book specifies a pressure (with no vacuum on the WUR) of 2.8 (41 psi) to 3.2 bar (46 psi), so my 928's control pressure was high.

To measure system pressure, the test valve is closed in the WUR loop. The reading was 78 lbs (5.4 bar). The spec is 5.2 to 5.8 bar so my 928 was within specification.

b). **Fuel pump delivery:** I have two fuel pumps, and the book says the specifications are to pump within 30 seconds a minimum of 1120 cc for one pump and 1360 cc for two fuel pumps. My 928 delivered 1597 cc, so it is passed on fuel delivery.

c) **Leak test:** With engine off, the system should hold pressure for a specified amount of time. I passed the test. The specs are 2.0 bar after 10 minutes, 1.7 bar after 20 minutes and 1.6 bar after 30 minutes.

**Diagnosis:** Based upon these test results, rebuilding the fuel distributor is recommended. A store bought rebuilt fuel distributor costs over $500. I felt that a careful cleaning and replacement of the O-rings was the proper way to go.

**Parts for a Rebuild**

I located the replacement O-Rings at a local ACE hardware store. Nitrile Rubber or BUNA-N (trade name) are fuel compatible. The O-rings that I purchased are
from SERV A LITE PRODUCTS, East Molene, IL) and can be purchased for less than $10.00.

The O-Ring sizes that I used are:
1. Fuel Distributor Base O-Ring (1 required) 35mm ID X 39mm OD x 2 mm thick
2. Control Plunger Barrel (2 required) 22mm ID x 26mm OD x 2 mm thick
3. Cylinder Housing Nozzles (8 required) 8mm ID x 12 mm OD x 2mm thick

There is a greenish colored O-ring in the base of fuel distributor that the control plunger barrel slides into. It is a size that couldn’t be replicated, so I reused that old ring. The size that I measured was 27.5 mm ID x 30 mm OD x 2.5 mm thick.

It was recommended to use Permatex Indian Head Shellac as the sealer

**Fuel Distributor Removal from the car.**

Let the engine sit and cool, preferably for several hours so the residual fuel pressure is at a minimum. The first fuel line that you disconnect is the fuel inlet, it is the easiest to access (see above, the fitting in the lower left). There may be
pressure in the system, so have a rag around the fitting to catch any fuel that may spray out when the line is loosened.

Use the proper fuel line wrenches and back-up wrenches. First remove the top lines at the banjo fittings. Be careful not to drop the bottom banjo washers! Next remove all fuel lines from the fuel distributor.

Loosen the three flat blade screw heads at the top of the fuel distributor that hold it in place. If they’re too tight for a round handle grasp, use a crescent wrench on a square bladed screwdriver shaft or a ratchet driver. Once the lock tension is overcome, the screws loosen easily.

In my car, there is a tab in place that retains the control plunger in place. When removing the fuel distributor, feel to see if there is a tab. If it is not, please exercise extreme care to not drop the control plunger, it is light metal and it and its sleeve are machined under fine tolerances. Dropping it would destroy the fine tolerance necessary for proper metering.

**Disassembly:**

Plug all the lines and clean the fuel distributor case to eliminate contamination after the case is opened.

The fuel distributor underside bolts are Torex T-27 size. The large nut on the underside of the fuel distributor is 30mm
The control plunger can be removed by gently bending the tab back, bending the lock plate up, and then removing the 30 mm bolt. Use extreme care not to drop the control plunger.

Remove all the Torex bolts, turn the unit over and insert the top section it into the vice. Carefully split the fuel distributor halves. Be careful not to drop any of the springs, washers and spring bases as you separate the case.

For proper reassembly, it is important to note that the top control pressure line points in the opposite direction of the lines in the bottom half of the fuel distributor. The thin plate between the halves has a small index hole. The control plunger barrel must line up with the fuel slits and O-rings.

Note the proper orientation of the spring base, spring, and shims (small washers not shown in the photo) that fit on top of the springs. Keep each spring, base and shim set located so they may be installed in the same chamber upon reassembly.

The top fuel return line points in the opposite direction of the lines in the bottom half of the fuel distributor. The thin plate between the halves has a very small
WUR metering passage. The control plunger barrel must line up with the fuel slits and O-rings. The thin metal plate that fits between the fuel distributor acts as a diaphragm for each chamber. Remove it very carefully from the base. Do not pry or bend it in a manner to crease the metal.

![Fuel Distributor base with stainless steel plate](image1)

![Fuel Distributor base with stainless steel plate removed.](image2)

**Cleaning:**

I used spray brake cleaner and rubbed the parts with a soft towel to clean all the fuel deposits off all parts. I sprayed into each line to be sure no particles were clogging a passage.

**Assembly:**

Install the replacement O-rings. Use a light assembly oil to enable the O-rings to slide over the control plunger barrel.

![Control Plunger Barrel and Plunger: O-Ring placement*](image3)
Carefully paste the Indian Head Shellac onto the top and bottom of the fuel distributor. Be very careful not to get any shellac into the fuel cylinders or WUR meter circuit path. Let it dry for several minutes.

![Top with Shellac](image1)
![Base with Shellac](image2)

The key task is to align is the WUR circuit and metering hole in the stainless steel plate with the distributor top and base. The metering hole is so small, you may not notice it. If the metering hole is not aligned, the car will not run properly. These pictures show the proper alignment.

![Fuel Distributor base with metal plate and O-Rings](image3)
Top Row: very small WUR meter hole in the stainless steel plate
Bottom Row: WUR passage in top (left) and base (right)

Place fuel distributor top in the vice and put the washer, springs and seat in place. Install the Stainless steel plate on the fuel distributor base. Install the eight O-rings onto the control barrel slits. Carefully install the fuel distributor base into the top. Before pushing down all the way, inspect the eight O-rings to be sure they remain in place. I uniformly tightened the Torex bolts to 48 in-lbs torque.
Replace O-Ring “7”

If you can locate the O-rings for on the pressure relief and residual pressure valve, replace them too. I could not locate the proper size O-ring for the one on the valve assembly (item 1). My measurement was 7 mm ID x 2.5 to 3 mm thick.

Next, insert the control plunger. Use a light assembly oil and slide it into place, note that the pointed end goes to the bottom of the fuel distributor. Install the restraining tab and 30 mm bolt. Bend the restraining tab back into place, be careful bend the tab so it allows the control plunger to move to the bottom of its travel.

The fuel distributor is now ready for re-installation into your 928!

Note, these procedures are based upon recommendations from other parties. If you rebuild your fuel distributor, YOU are responsible for the success.

* Illustrations with a star were obtained from Bosch Fuel Injection & Engine Management by Charles O. Probst, SAE. Robert Bently is the publisher. ISBN 0-8376-03005.

Another recommended text is How to Tune and Modify Bosch Fuel Injection by Ben Watson.