

# Testing a VeloSolex coil and condenser

## Ignition Coil tests

1. Remove the Spark Plug
2. With a length of bared electrical wire, bind the spark plug metal body tightly to the cylinder head fins or lay it on the crankcase.
3. Using a suitable Magneto Rotor/Flywheel Extractor, remove the Magneto Rotor/Flywheel.
4. Insert a piece of cardstock or Mylar between the Contact Breaker (ignition points) contacts.
5. Connect the Negative (- or Black) terminal of a 6V Battery Charger or 6V battery to the metal of the engine housing.
6. Quickly tap the positive (+ or Red) terminal of the 6V Battery Charger or 6V battery on the Condenser terminal which also has the wire connected from the Magneto Ignition Coil
7. Check for a FAT Blue, White / Purple SPARK cracking across the Spark Plug gap. An orange or yellow spark is no good.

~ The coil can somewhat be tested with a digital multi-meter:

1. Between the coil metal body and the tab on the rear of the coil, you should have approximately 2.7 k $\Omega$
2. Between the coil metal body and the terminal connector, you should have approximately 1.5  $\Omega$

Having these readings does not necessarily mean that the coil is good, but having readings that are far from these usually means that the coil is faulty.

## Condenser test

The Condenser on the VeloSoleX S 3800 is quite often unreliable, poorly made, susceptible to humidity and heat and tends to fail at the most inconvenient time!

The Capacitance of a Condenser can be measured, but it is no guarantee that it will work properly in the hot engine environment while out riding one's VeloSoleX S 3800. For those who want to check the Capacitance of a Non-Polarized High Voltage Dielectric Condenser, one can use one of the following instruments:

1. Digital Capacitance Meter
2. Digital Multi-meter with Capacitance Range
3. Analogue Ohmmeter (sensitive type)
4. Analogue Multi-meter with 3 or more Resistance Ranges

If using a Digital meter, the Capacitance of the Condenser should be in the range 0.18 uF - 0.25 uF.

If using an Analogue meter, one can still do a basic test of Capacitance and also check that other faults do not exist by following the steps below:

1. Set the meter to the most sensitive range (eg: if the meter has x1, x10 and x 1000 Resistance Ranges, then use the x1000 Resistance Range).
2. Join the RED and BLACK meter leads together and turn the Zero Adjustment Knob until the meter needle points to 0 ohms on the meter scale (NB: If not possible then put some new batteries in the meter).

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3. Warm the engine up if possible.
4. Remove the condenser from the magneto stator and set it on a non-metallic surface.
5. Connect the RED meter lead to the Condenser center terminal and the BLACK meter lead to the Condenser body.
6. Now connect the BLACK meter lead to the Condenser center terminal and the RED meter lead to the Condenser body.
7. Repeat 4 & 5 several times.
8. Check that each time you connect the meter leads, the meter needle kicks over approximately 10% of the meter scale for a fraction of a second then returns immediately to maximum resistance.
9. If the meter needle simply stays near 0 ohms with the leads connected, the Condenser has Short-Circuited and is FAULTY (this is a rare fault).
10. If the meter needle does not return immediately to maximum resistance with the leads connected but stays somewhere in the middle of the meter scale, the Condenser is Leaking Electric Current and is FAULTY.
11. If the meter needle simply stays at maximum resistance all the time, the Condenser has Open-Circuited and is FAULTY (this is a common fault).
12. If necessary, compare readings by testing a known good condenser (or any good 0.22 uF non-polarized capacitor).

Note: Do not touch the metal prods on the end of the meter leads with your fingers when testing the Condenser, otherwise you will get false readings.

The most typical Condenser faults include the Intermittent Open-Circuit Fault due to a loose internal connection caused by engine vibration and the Electric Current Leakage Fault due to the ingress of moisture. Both faults can lead to some strange engine starting or running symptoms particularly when the engine is hot! The best way to deal with a possibly faulty Condenser is to replace it with a known good or new one.

The condenser can be replaced with a 0.22 uF 1000V DC Metallized Polypropylene Film Non-Polarized Capacitor with a minimum temperature rating of 105°C. This high-quality capacitor is available from most good electronic component stores and has the following features:

1. High Voltage Rating of 1000V DC (500V AC) able to handle the Contact Breaker peak voltages of 300V to 400V DC
2. Very Low ESR (Effective Series Resistance) and so introduces minimal self-heating
3. Extremely Low Di-electric Loss over a wide frequency range and so has excellent pulse handling
4. Self-Healing Recovery Ability by vaporizing the metallized film at the point where a short-circuiting puncture occurred

**Solex Magneto Stator 1700, S 2200, S 3300, S 3800, 4600 V1, 5000, Micron**



- A - Ignition Coil
- B - Lighting Coil
- \* Coils may be different colors than shown.
- C - Condenser
- D - Ignition Points adjusting eccentric screw
- E - Lock screws
- F - Ignition Points
- G - Rupture Mark
- H - Ignition Coil - Points connection
- I - wiper
- J - bolt, M4 - 0.7
- K - Lighting Coil connection

**Flywheel / Rotor Puller**

- Do not use a standard two - , three - , or four - jaw puller to remove the flywheel (rotor).

- Use a puller that makes use of the three M6 tapped holes in the flywheel (rotor).
- <http://briansolex.free.fr/toolkit.html>

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### **Spark Plug:**

Champion	L86C
Bosch	W7AC
NGK	B6HS
Denso	W16FS-U
AC	44 L, 45 L
Motorcraft	AE32
Autolite	2656
Marchal	V36A
XLG	FF 70 Y
Cyklon	43
Flashpoint	FP5CR

### **Spark Plug gap:**

0.020" (0.5 mm)

### **Ignition Points / Points Gap:**

The ignition points must be adjusted so that they just begin to open when the "RUPTURE" marks on the flywheel (rotor) and engine (G in above photo) line up, rotating the flywheel (rotor) clockwise. There is no set points gap on a Solex engine. The amount that the points open is irrelevant. To adjust the fixed contact of the ignition points, loosen lock screws (E) and turn the adjustment eccentric screw (D).

Remove the flywheel using a special Solex flywheel puller, then disconnect the ignition coil wire at the points terminal (H). It is necessary to disconnect this wire to isolate the points and make it into a simple switch. To this points terminal (H), attach a wire, then feed the wire through one of the flywheel windows and reinstall the flywheel. To this wire, attach one lead of a continuity meter that has a beeper sound. Attach the other meter lead to the stator plate or crankcase using an alligator clip. The beeper will sound when the points are closed. Slowly rotate the flywheel *clockwise* until the beeper sound stops. This is the exact point at which the Rupture marks should line up. If it is not so, loosen the two anvil lock screws (E) and adjust the center eccentric screw (D) this way or that, and then repeat the test until all is perfect.

### **No Spark troubleshooting procedure:**

1. Install a NEW spark plug...not almost new, good as new, only used once, etc. NEW, NEW, NEW.

\* Check for spark by carefully holding the threaded portion of spark plug against the cylinder head or crankcase and spinning the flywheel clockwise, looking and listening for a blue / white / purple spark to crack across the spark plug gap.

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See video: <http://www.youtube.com/watch?v=MevTYVxWnd8>

~ An orange / yellow spark is no good.

~ Feeling a jolt while holding the end of the spark plug wire means nothing.

2. still no spark...install a new copper-core spark plug wire (length 14") . Be sure that the end of the spark plug wire has a good clean connection against the tab on the back of the ignition coil.

Check for spark as above\*.

3. still no spark...remove flywheel (rotor) using special Solex flywheel puller; clean the ignition points (F) (search online for instructions on cleaning ignition points). Disconnect the ignition coil from the points (H) and test the points for continuity when closed, no continuity when open. Reconnect the ignition coil wire (H). Install flywheel. Adjust the points as described above under **Ignition Points / Points Gap**. Check for spark\*.

4. still no spark...install new condenser ( C ), check for spark\*

5. still no spark...install new ignition coil (A), check for spark\*

6....install new flywheel / rotor.

(On a Solex, the flywheel key is part of the flywheel casting. The key fits into the keyway slot on the crankshaft to correctly position the flywheel on the crankshaft. You must verify that the flywheel key has not been sheared off.)

Instructions for making a simple Solex flywheel puller (magneto rotor extractor) can be found on this page:

<http://briansolex.free.fr/toolkit.html>