MS1-Extra and MS2-Extra

There appears to be 2 different types of COP that manufacturers use:

A) One is a directly driven coil and has 2 or 3 wires, these have no integral amplifier (ignitor) and need to treated like a standard ignition coil. The standard MegaSquirt VB921's would be needed to fire these devices.
Please note: You would need to figure out what the pins were, there will be a 12V ignition feed, may be a ground and the fire signal (Spark A, B, etc) this should be apparent from the workshop manual where the pins connect.

B) The other type has 4 or 5, sometimes more, pins. These have a built in amplifier (Ignitor) so they can be fired with a smaller transitor if necassary
(Note: You may still be able to use the standard MS ECU VB921 spark output driver, it may just need a pull up resistor depending on how your cop is designed.)
Some of the COPs with built in ignitors need a 5V signal, some need a 12V signal to fire them, others needs a switched ground to fire them. Without some experimenting it's difficult to tell which way around it needs unless you can measure a working setup with a scope or meter or if you can find the information from people who have already got a set like you have running.

If you simply can't find any info then a little bench testing is called for. You will, however, need to know the pin out for the COP.
Start by measuring the resistance from the spark signal pin (this was the pin that connected to the ECU on the original setup and will connect to the MS ECU Spark out) and the ground pin of the COP. If theres a high resistance, say greater than 1k ohm, then the chances are the COP needs a **Ground Switching Pulse** to make it fire a spark. If the resistance is low, say lower than 500 ohms, then the chances are it has an internal resitor that holds the input signal low untill it fires, the fireing signal will be a **Positively Going Pulse** (e.g. 5V or 12V)

VW COPs:

So lets take a look at the VAG 06B 905 115 type COPs as used on the VW 1.8t and many other VAG engines, thanks to Woh, Evolotion, Slow_Hemi6 and a few other for a lot of this info!

The COP connections:
Pin 1: Connects to Pin 1 on all other coils and then to +12v ignition feed (or fuel pump relay).
Pin 2: Signal ground (connect to ground at MegaSquirt's ECU ground)
Pin 3: Spark Signal from ECU
Pin 4: Power ground (Engine Earth)

Dwell for these COPs are:

Cranking = 4.0mS
Running = 3.0mS

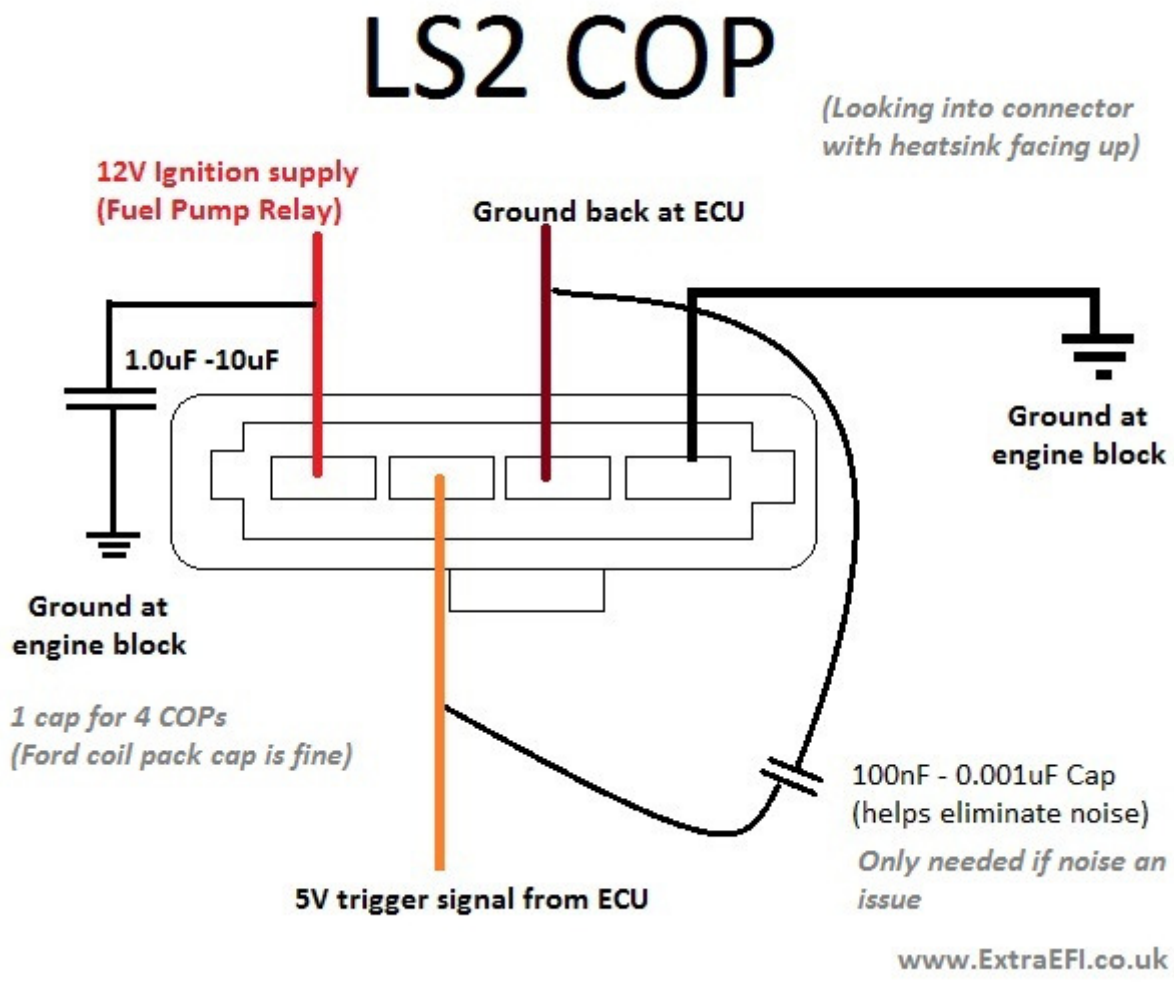
Start by checking if you have a 120 -500 ohm resistor in the cop to gound. Using a multimeter set to resistance, check between pin 2 and 3 (this is the Spark Signal Input and Ground).
If you have a reading of around 120-500 ohms you need to have a **Positively Going Pulse**
If the impedance is higher, say ~1k then signal will probably be a **Ground Switching Pulse**

As for these coils PN 06B 905 115 L and R have been tested with a 5V **Positively Going Pulse**.
Use the 'R' revision if possible, since the earlier 'L' revision has reliability issues.

Earlier than 2001 coils, PN - 06B 905 115, 06B 905 115 B and E have not been tested but have been reported to work using the **Ground Switching** route.

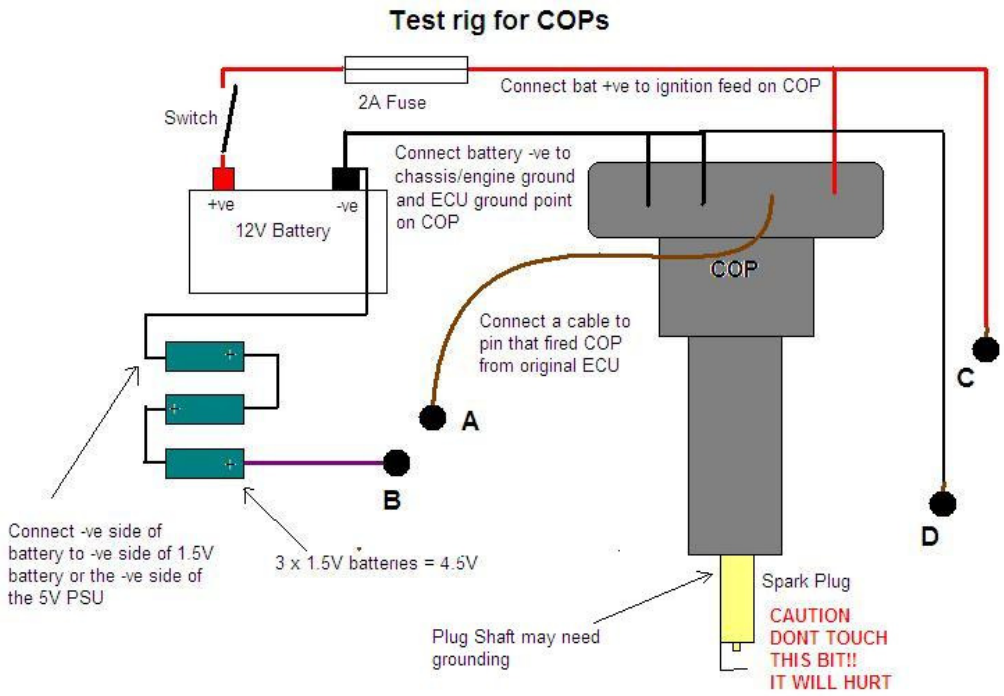
If your not sure what voltage you need to fire the COPs it is better to start with 5V, this can be done on the bench, if you get no spark with 5V then try 12V.

LS2 COPs: *(Type shown here are those with the heatsink on the top. There is another LS2 COP without the heatsink thats not as powerful but works the same. There is also an LS1 COP which is a 2 wired device and not worth using)*



Dwell for these COPs are:

Cranking = 6.0mS
Running = 5.0mS



CAUTION must be used as the Spark Plug may fire and it HURTS!!!!

If you wire this up you can try test firing your COP, Point **A** is the COPs trigger input, **B** is a 4.5V source, **C** is a 12V source and **D** is a ground source. By quickly tapping and releasing the wire **A** onto **B** or **D** you can see if the spark plug fires (remember it will only need a 3-4mS pulse so be very quick and dont try it too many times), obviously be very careful how you do this as the plug may fire!! The spark plug may need its shaft grounding to spark, but try it without first. If you have measured as above and found you have a COP that needs a Positively Going Pulse and the 5V source doesnt fire it then try it on the 12V source (C), but only do this if your sure it doesnt need 5V!

Now you know which way round your Spark output needs to go to fire your COP just let me know when you order the MegaSquirt ECU and I can sort out the ECU to give you that trigger.

For Setting the SPARK OUTPUT or SPARK INVERTED in MegaTune simply turn on the ignition once everything is connected to the ECU and feel the COPs, if they get hot at all then this means they are either wired wrong or the SPARK OUPUT or SPARK INVERTED (depending on if your using MS1 or MS2) is the wrong way round, try it with the other setting (e.g. Normal - Inverted or YES - NO) if it still gets warm then you have a wiring fault.