

# **SPYDER ENGINE DISTRIBUTOR:**

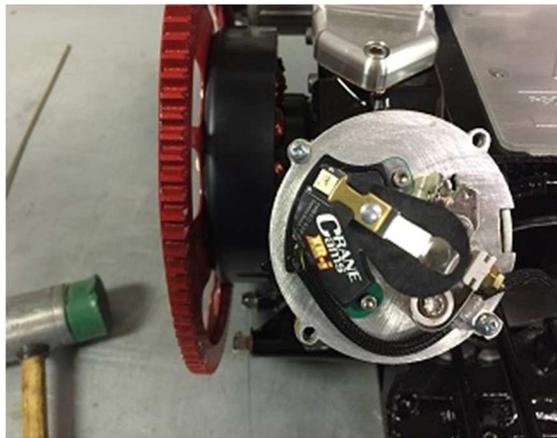
## **Installation, Timing and Servicing Information**

### **Distributor Installation:**

The first step in installing your distributor is to set the engine at TDC (top dead center) for the #1 cylinder. The #1 cylinder is the rearward cylinder on the passenger side. The easiest way is to remove the #1 spark plug and place your finger over the hole as you rotate the propeller in correct direction. When you feel compression on your finger you are nearing TDC. Line up the mark on the harmonic balancer or alternator drum to 0 degrees on the accessory housing. The housing has five marks - 0 - 4- 8- 12- and 16. Line up the 0 mark to the harmonic balancer or alternator drum line. This should be TDC #1. (See Pic 1)



Pic 1



Pic 2

Before installing the distributor look at the bottom of the distributor housing and see if there is any timing information written there. Make note of this information and copy into your logbook or other paperwork that can be accessible later. Remove the cap from the distributor and line up the rotor to #1 spark plug tower location (should be marked on the cap). Make sure the gasket is installed on the distributor base and install into the accessory housing. As you slide it in make sure the #1 tower and rotor are pointing to the 10 o'clock position. The notch in the points plate should be at the 3 o'clock position. The shaft will rotate a bit as the teeth on the drive gear engage the crank gear. (Pic 2) The distributor may not drop down all the way as the oil pump drive may not be aligned. Gently rotate crankshaft via the prop until the distributor drops all the way into place and then rotate the prop back to the #1 TDC location. Install the distributor hold down clamp and nut. Don't tighten yet. Connect the wires according to the installation diagram. Identify and label your points on the dual points system as to which is primary and secondary, or A - B, or #1 - #2 to be in agreement with your switch on the panel. This helps with troubleshooting later. On the electronic point setup install the grounding wire to the engine or airframe.

### **Setting Timing:**

Now that the distributor is in position it is time to statically set the timing. Look at your notes about the timing information on the distributor. For example: If the timing on the bottom said 20 degrees (internal mechanical advance of the distributor) then we can statically set the timing to 10-12 degrees. You are looking for a maximum timing advance of 32 degrees (100LL) so a static timing of 12 degrees plus 20 (marked on distributor) equals 32 degrees total. If you want to run 93 octane then set maximum advance for 30 degrees (or about 10 at idle).

There are a couple ways to set static timing:

1) Set the prop at 12 degrees BTDC (third mark)(assuming a 20 degree distributor). Turn on the ignition on the points side (or secondary), ground the center spark plug wire, then slowly turn distributor until the points open. You should be able to hear and see the small spark from the points. This gets the

setting close. Now back the propeller up about 20 degrees and then slowly move the prop forward until the points “pop” open. You should be at the 12 degree mark. If not then move the distributor slightly and retry. Do this as many times as it takes until the points open at the 12 degree mark.

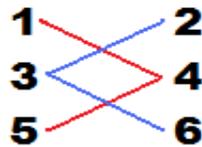
2) Another way is to install a 12V test light on the negative side of the coil that is “ON” to ground. The light will be on until the points open. The procedure is basically the same as above but using a light to see when the points open.

3) You can leave the ignition off and use a continuity tester in the points circuit to see when the points open.

When you have the timing set tighten the hold down nut and check the timing one last time in case it moved. Now check that the wires are attached properly and nuts on the points tight and reinstall the distributor cap. The distributor is now set for start-up and initial testing. Full advance testing will be done later.

### **Plug wire installation:**

The Firing order of the Corvair distributor is 1-4-5-2-3-6. An easy way to remember this is that the firing order looks like two overlapping “V”s. Starting at #1, you move to the point of the first “V” on the opposite side of the engine (#4) and then back to the other side to finish the “V” at #5. The next “V” starts at cyl #2...Got it? Once you see it is hard to forget. Here is a diagram.



As an option mark the plug wires using a marking kit from most auto stores. They have shrink wrap numbers that go on the plug wires when you install them. It helps to write the numbers on the Distributor cap. At least put the #1 on the cap. The numbers are in a clockwise rotation. Be sure to consider your baffling pass through when you make your plug wires up.

Always double check your plug routing and wiring. If you have crossed wires you will not have a smooth running engine or at worst backfiring that can cause internal damage. Make sure that the wires will not chafe or be too loose in the engine compartment. Secure them with wire ties and clamps if necessary. A clean and careful installation will give you years of good service

### **Plugs:**

Make sure the plugs (R44F) are installed and torqued. We use copper washers with the plugs as they provide a better sealing surface and don't tend to bind on an insert and unthread it if you have them installed. Call about these or make them from 14mm oil drain plug washers from your auto parts store. Be sure to torque your spark plugs properly. We use 16-18 foot lbs as a standard.

### **Final timing checks:**

Once you know that the engine runs you need to perform the final timing checks. Using an automotive style timing light (preferably with a timing dial) check the idle timing for the 12 degrees that you set the distributor for. With the dial on the light set at 0 the strobe should light up the timing mark at

the 12 degree mark on the accessory housing. If not, then adjust accordingly until it does. The next test should be performed with the airplane tied securely and chocked and preferably with someone at the controls. Set the timing light to 32 degrees on the dial and run up the engine to full throttle. The timing should say 0. If you don't have a dial type timing light you can make an extra mark on the harmonic balancer or Alternator drum at 32 degrees and use that for your reference. Now adjust the distributor for the total advance of 32 degrees. If the idle timing moves only a degree or two that is fine. Just make sure that you don't have more than 32 degrees at full throttle. This could cause overheating and detonation. If you are going to run 93 octane then set your max timing to about 28-30 degrees. Check both ignition circuits to make sure they are in agreement with each other. A 2 degree variation is okay as long as neither is over the 32 degrees. We have set up some distributors so that the primary is at 32 degrees max and secondary is at 28 degrees...sort of a limp-back mode. The engine still runs good but less chance of overheating and detonation. And allows the use of lower octane fuel. In our shop we have been using 30 degrees as our goal advance to allow for a slight safety margin. There is no noticeable power loss and engine temperatures seem to be slightly lower.

(NOTE:) If you have a turbocharged engine from us then we provide a custom distributor specific for this use. The internal advance is set up differently and total advance is set to 24 degrees. Information for this installation will be provided with those distributors.

### **Troubleshooting:**

1. One ignition circuit does not work:
  - Check for power to the coils when turned on.
  - Check for burned out points <Replace points>
  - Check for loose wire at points - install a ground wire <check schematic>
  - Selector switch may be defective <Replace and check>
  - If the electronic module is not installed correctly the module may get "fried"
2. Erratic behavior in flight:
  - Check all connections
  - Look for wear in the distributor shaft - too much causes timing to shift <replace bushings>
  - Coil breaking down <replace coil>
  - Plug fouling <not common - replace plug - check why-EX: indication of broken rings...>
  - Defective plug wire - use timing light to find <replace wire or repair>
3. Two ignitions not in agreement -(too much rpm drop)
  - The electronics are fixed so adjust the point gap on the points
  - On dual points set one at .016-.019 point gap and set timing. Adjust other to match timing. The point gap may be slightly different. <See points installation section>
  - If you cannot reconcile the two sources, contact our shop.
4. Rotor is hitting cap.
  - Always check to see if the rotor is all the way on the shaft. Sometimes a bit of plastic or trash is in the rotor and preventing it from seating.
5. There may be other issues, please refer to Corvair Green book or call distributor technician...

## **INSPECTIONS:**

**100 Hr. Inspection:** If you fly more than 100 hrs a year it is good to perform this check.

-Check point gap to see if within tolerances. Don't adjust if not necessary as this changes your timing. If contacts appear worn or damaged - replace the points and re-time the distributor. Contact us for help in this.

- Check the timing at full throttle - again make sure to secure the aircraft.
- Check for timing differential between primary and secondary. (2 degree tolerance)
- Look for obvious signs of wear. Check for shaft wear by trying to move it from side to side. Too much wear is cause for overhaul as timing becomes erratic. Our new Ball Bearing units should eliminate most of this play that bushings typically get,

**Annual Inspection:**

- same as above but part of your condition inspection.

**500 Hr. Inspection:**

Remove the distributor to check bushing wear, replace points, check for wear on the counterweights and pins, re-grease and re-time. This may be better done at our service center by a distributor technician. Azalea Aviation also provides an exchange program for distributors. If you have any questions about any technical aspects, installation or exchanges, please contact us.

### **Contact Information:**

**Azalea Aviation LLC  
170 Airport Rd, Adel GA 31620  
(229)834-8996**

## Ignition Wiring Diagram

DUAL POINTS: If wiring in a dual points distributor copy the Coil "A" wiring side for your secondary points. Points require a condenser and the electronics do not. Insure wires will not contact rotor or get pinched in cap.

