## **K-Series Static Ignition Timing**

Symptoms of improper timing include hard starting, backfiring through the carb, lack of power, stalling on throttle-up, overheating, and rough running, to name a few. This particular engine started hard and backfired through the carb while cranking. It also would not throttle up without stalling. Due to varying wear and tolerances in the cam, pushrod, and points, gapping the points to 0.020" rarely results in proper timing. I have always used this static timing method, as it is just as accurate as a timing light, and the engine does not need to be in running condition. This makes this method great for engines that will not start or have not been started. Before doing anything, disconnect the battery and the spark plug wire. The process for this requires you to turn the engine by hand, and you want to ensure that it cannot start. Also, disconnect the wire from the points to the coil at the coil. Remove the two screws holding the points cover to the engine, taking care not to lose them. Locate the sight hole in the flywheel shroud and try to clean up the timing marks so that they are visible. Rubbing paint in them with a Q-tip will help make them more visible. There are two marks, an "S" and a "T". The "T" mark indicates top dead center, and the "S" mark indicates when the points begin to break, firing the spark plug. The "T" mark isn't necessary for this, so it will be ignored.



First, the points should be gapped to 0.020" to get it in the ballpark. Note the adjustment screw in the picture above. Loosen it just enough to allow you to move the adjustable contact with a flat screwdriver. Gap the points to 0.020".

Next, multimeter 101: Everyone should have one of these, either an analog style like this, or a digital multimeter. They're like \$3 at Harbor Freight, so there is no excuse. Set the multimeter to 1K (1000) Ohms. Note that when there is no connection between the leads, the resistance is infinity, as indicated on the display.



Similarly, when the leads are touched, the resistance is zero.



Now, rotate the engine by hand in the direction of normal rotation until the points close. Place the multimeter leads on the points as shown; ground one lead (red lead in the picture below) and place the other lead on the contact that goes to the coil (black lead in the picture below). I've done this a few times so I can do it with one hand, but you may need alligator clips to hold the leads onto the engine.



Now, rotate the engine SLOWLY by hand in the direction of normal rotation. When the points just begin to break, the meter will fluctuate from zero resistance to infinite resistance. When this fluctuation occurs, stop rotating the engine, and look in the sight hole to see where the "S" mark is. If you did it right, the "S" mark should be centered in the sight hole (shown below) at this time.



If it isn't, vary the point gap ever so slightly to either side and repeat until the "S" mark is centered in the sight hole when the points just begin to break. When this is accomplished, tighten the adjustment screw on the points, bracing the adjustable contact with a flat screwdriver to avoid changing the timing when tightening the screw. (Yes, I know you can't see the timing mark in the hole on my picture...it's hard enough to shine a light and see it, let alone have it show up on a camera. I tried.) Ironically, this engine was timed perfectly with the points gapped at 0.020", but I want to emphasize that this is HIGHLY UNUSUAL. Most engines will not run right with the points gapped at 0.020".

Put the points cover back on, and reconnect all wires that were disconnected. The engine should now start very easily and run smoothly if all other parts are in working order. The hard-starting engine pictured started and ran on the first revolution after engaging the starter.