

# Valve Timing

by Paul Bouchard



**FOR DUMMIES**

**T**iming is every thing in life, as it is with automobiles. While almost every piston driven engine in the world today features and overhead cam, Singer was a leader in that technology for its time. This was both good and bad. With fewer parts involved in the “works”, there were fewer things to go wrong. On the other side, overhead cam (OHC) was a “new” technology at the time, and your local mechanic was unfamiliar with the timing arrangements. The latter resulted in Singer owners having to return to their dealer for the servicing of their engines. Perhaps this was an interesting ploy to increase after sales profits, but with the profusion of OHC engines today, I like to think that they were well ahead of their time.

Well, that was then, this is now, and the question is: How does this affect me? It does if you have had, or plan to have, any major engine work done. Valves, pistons, head, bearings, any operation where the head is removed can lead to the cam and crank being out of “synch”. Today’s OHC engines are fairly idiot proof as far as cam alignment is concerned, but Singer engines have a seemingly infinite combination of possibilities for adjustment.

When I purchased the Roadster almost a year ago, it was a complete mystery to me. The only experience I had working on engines was on my

own “beaters” that provided basic transportation to and from school/work. Part of my reasoning to buy the Roadster was to get down and dirty with its mechanics... and this would certainly come true!

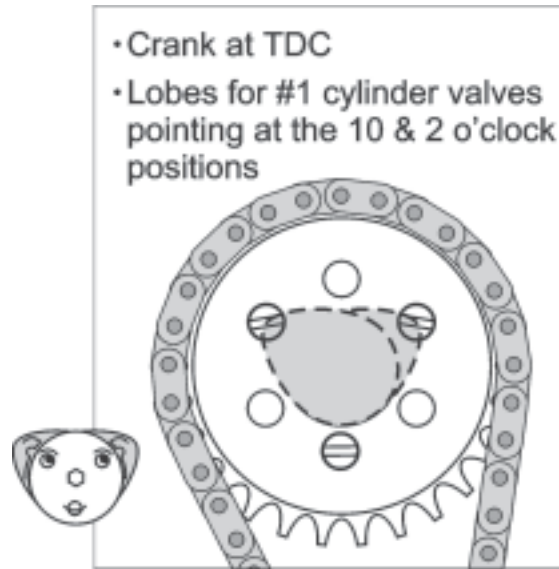
While the first 9 months of restoration focused on cleaning, stripping engine ancillaries (starter, generator, fuel pump, carburettor) as well as “running gear” (brakes, transmission, clutch) I had always counted on the engine internals to be correct. When I was first preparing to start the car, I made my first discovery that things were not as they seemed. Using my general knowledge of 4 stroke engines (Intake, Compression, Power, Exhaust) I would turn the crank and examine the opening and closing of the valves. Something was off, but I was not sure where. As luck would have it, Bill Haverly (Singer enthusiast/expert and World Traveler) was in town for the Montreal Grand Prix. I first met Bill on a trip to England with Phillip. He was truly a gentleman and gracious host, providing transpor-



I watch as Bill works his "magic"

tation (in the only Singer SMX on the road!) and lodging for the weekend trip. This was in my “pre-Singer” days. Bill also is a parts supplier for Singer cars (Roadsters in particular), and many a shipment has found its way into my garage. While Bill was in town, I invited both he and Phillip to visit and take a peek at my Roadster. During that time, I mentioned my doubts about the cam timing, which he confirmed. It looked like some unknown work in the past led to the head being removed and not being replaced properly. I felt a sinking feeling at that point, but thankfully all fears were soon dashed. Bill showed me the trick he used to align the cam and crank to their rightful places. He referred to it as the “Smiley Face” method. Simply put, he used the adjustment holes in the “face” of the cam gear to provide the eyes and mouth, and the cam lobes for the inlet and exhaust valves (cylinder #1) as the ears.

Our first step was to find Top Dead Center (TDC) for the crank. Then, with the valve cover off, we checked the cam gear to see if the “eyes” were parallel to the top edge of the head and the “ears” (cam lobes) were up. They were not. To adjust the cam, we slackened the timing chain tensioner, removed the bolt securing the gear in place, and removed the gear from the cam. DO NOT REMOVE THE CHAIN FROM THE CAM GEAR. Doing so could allow the chain to drop down the front of the engine. Plus, part of the next step involves ensuring that there is no slack in the chain between the crank gear and the cam gear



(exhaust manifold side). We also secured the timing chain to a bolt on the head with a wire so that it would not be lost into the bottom of the engine! The next step was to rotate the gear until the “eyes” lined up AND there was no slack in the timing chain.

Another item that can be set up at this point is the distributor drive. With the distributor out, the slot in the gear should be parallel to the engine block. With the distributor back in, the rotor should be pointing to the front of the engine. Should it be necessary to rotate the gear, you must first remove the fuel pump and pin that runs between the fuel pump and the cam on the distributor drive.

This method sounds and is simple! The total time involved in determining that my cam timing was off to its being set correctly was 30 minutes. Care must be taken to ensure that the timing chain is not lost AND that there is no slack in the chain (exhaust manifold side).

Thanks to Bill for sharing this bit of knowledge, and my next order request is on its way!

**- Paul Bouchard**

