

## WHY WON'T IT RUN? -VI

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One reason we have observed is the improper use of the timer lever.

Twenty-seven two-stroke Fairmonts have climbed the long three percent grade and disappeared over the top, but your car has bogged down, unable to get moving again. What's wrong?

Some operators adjust the timer lever only according to the limited information on the timer instruction plate. This has only two points--START and RUN--for each direction. The instruction plate elaborates: "Partially advance spark for slower car speeds. Use full advance only for higher speeds." The last sentence is overlooked by some operators who don't realize that excessive spark advance costs engine power at low speeds.

It helps to understand just how timing affects engine performance. When the spark ignites the mixture, it does not explode, but instead burns in a finite amount of time. The burning causes a rapid rise in pressure in the cylinder, which, of course, is the desired objective.

The greater the pressure, the more push on the piston and the more torque at the axle to get you up the hill.

If the mixture is ignited when the piston is at the top of the stroke, burning will take place while the piston is moving downward, which reduces the maximum pressure. For this reason, it is beneficial to start the ignition and mixture burning process a little early so that the pressure rise peaks out when the piston is at top center. This gives the greatest push on the piston. As engine speed increases, it is necessary to start sooner, which translates into increased timing advance.

Thus, the rule of using full advance only at maximum engine speed.

Do you ever accidentally reverse the engine while starting or on a grade crossing? This is the engine telling you that the timing is too far advanced.

If you use excessive advance at low speed on a hill, the car may eventually stall. This is because the high pressures in the cylinder, caused by igniting the mixture too soon, is trying to run the engine backward! More energy is consumed by working against this

pressure on the upward stroke than is recovered by expansion on the downward stroke.

In addition, the plug can overheat and foul. Even though it looks okay, the high temperature has caused the center insulator to become conductive.

An experiment which you can perform will clearly demonstrate the value of proper spark advance. With the timer lever well forward of where you usually run, slow the car to the lowest possible speed, and then open the throttle all the way. You will detect very slow acceleration. Now bring the timer lever back toward center and notice that your motorcar now accelerates quickly. This assumes that your timing is accurately centered. If not, we'll cover that in a future installment.

Question: How can you tell an operator who has mastered the proper use of the timer lever?

Answer: You can't. They have all disappeared over the hill and into the distance.