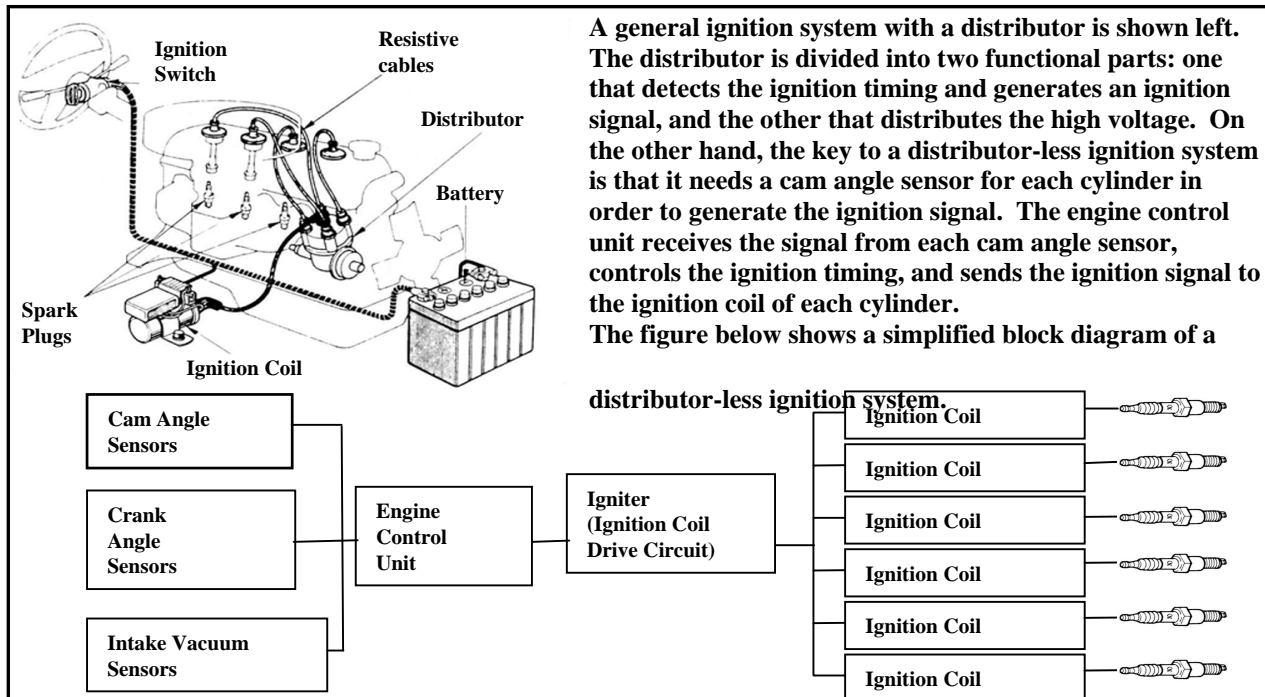


Automobile: Validation of Distributor-less Ignition Program

[Overview of Application]

In most ignition systems, a high voltage generated by a single ignition coil is distributed by the distributor to the spark plug of each cylinder sequentially at the appropriate times. However, the presence of a distributor is claimed to result in problems, such as radio interference noises that are caused by the high voltage and misfiring caused by the electric resistance of wiring cables. Hence, the use of distributor-less ignition systems is growing recently. Without a distributor, these ignition systems can be made very compact, and are therefore employed as the ignition system on most motor cycles.



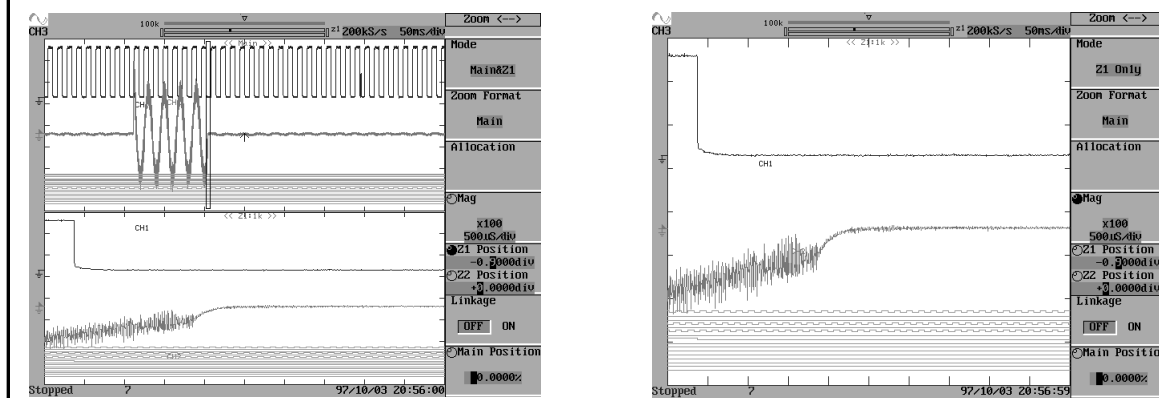
A general ignition system with a distributor is shown left. The distributor is divided into two functional parts: one that detects the ignition timing and generates an ignition signal, and the other that distributes the high voltage. On the other hand, the key to a distributor-less ignition system is that it needs a cam angle sensor for each cylinder in order to generate the ignition signal. The engine control unit receives the signal from each cam angle sensor, controls the ignition timing, and sends the ignition signal to the ignition coil of each cylinder.

The figure below shows a simplified block diagram of a

distributor-less ignition system.

In a distributor-less ignition system, the ignition timing control and current distribution are performed by the engine control unit and igniter, and hence the control program is indeed complex. When validating such a difficult program, each sensor signal to the engine control unit and the igniter drive signal from the engine control unit as well as the signals inside the engine control unit and the igniter must be monitored simultaneously. If any problems are found they must be solved also.

The figures below show examples of DL708's screens when the DL708 is installing the logic-level signal input module while at the same time monitoring the logic signals using logic probes and analog signals simultaneously. (This is not actual example, just example of logic probe)



[Key Features of the DL708]

1. Logic-level signal input module (up to 16 bits)

The DL708 has a modular structure and up to eight modules can be installed in it. So analog modules and logic-level signal input modules can be installed together.

2. Long Record Length upto 16MW

To find out the cause of trouble in igniter, long record length is very useful. You can get faster sampling speed at low speed time/div setting.