

All engines use a sequential port fuel injection system. This means that the injectors have a specific firing order and fuel injection is timed to piston movement. The spark plugs and injectors are fired in the same order: 1-3-4-2 on 2.5L and 1-5-3-6-2-4 on 4.0L.

In order for the PCM to fire the injectors in a specific order timed to crankshaft and piston movement, it has to establish a reference point. Establishing the reference point requires PCM inputs from the crankshaft position sensor and camshaft position sensor.

The crankshaft position sensor is located on transmission bellhousing and provides the PCM with crankshaft angle and speed. The PCM converts crankshaft speed into engine RPM and crankshaft angle into piston position.

On 2.5L engine, the slotted flywheel/drive plate, rotating past the sensor, contains 2 groups of 4 slots located 180 degrees apart. Each group of slots represents the position of 2 of the pistons. Pistons No. 1 and 4 approach TDC at the same time and use the same flywheel slot, while piston No. 3 is matched with piston No. 2.

On 4.0L engine, the slotted flywheel/drive plate, rotating past the sensor, contains 3 groups of 4 slots located 120 degrees apart. Each group of slots represents the position of 2 of the pistons. Pistons No. 1 and 6 approach TDC at the same time and use the same flywheel slot. Pistons No. 2 and 5 are matched, while piston No. 3 is matched with piston No. 4.

The PCM, through the crankshaft position sensor, knows that 2 pistons are approaching TDC and uses the sync signal generator on the camshaft position sensor to determine which injector/spark plug to fire. See Fig. 1.

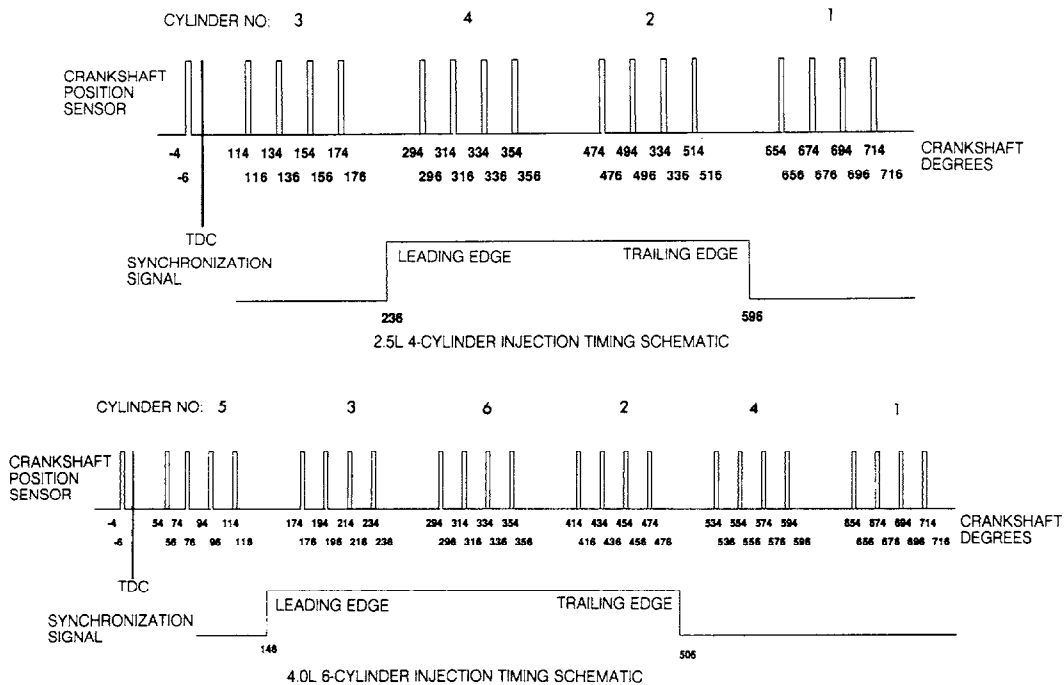


Fig. 1: Sequential Port Fuel Injection (SPFI) Timing

IDLE SPEED

Idle Air Control (IAC) Motor

The IAC motor is mounted on throttle body and is used by the PCM to adjust engine idle speed. The throttle plate regulates off-idle