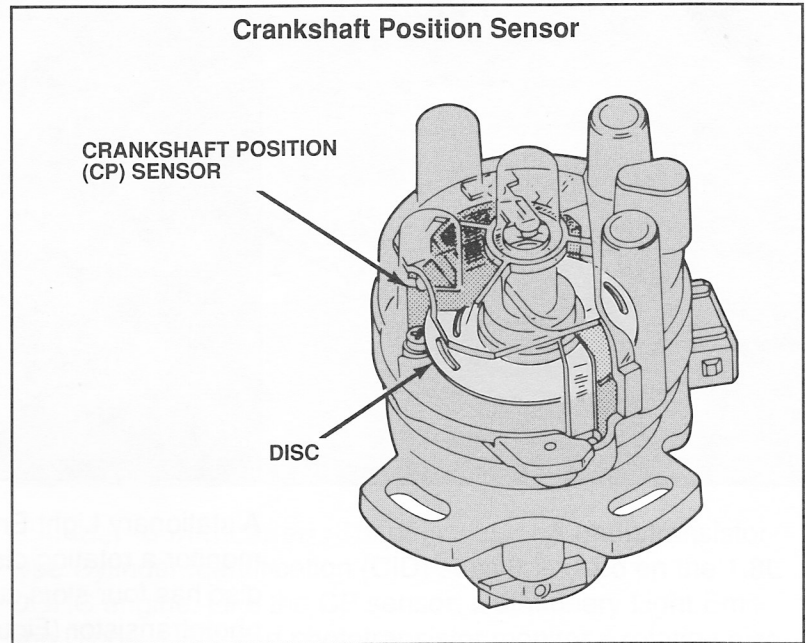


# NON-NAAO AND EEC-IV COMPARISON

Figure 14



## Phototransistor-Type Sensors

There are two phototransistor-type sensors used in Non-NAAO engine control systems:

- Crankshaft Position (CP) Sensor (1990-92 1.3L EFI and 1.8L DOHC)
- Cylinder Identification (CID) Sensor (1.8L DOHC)

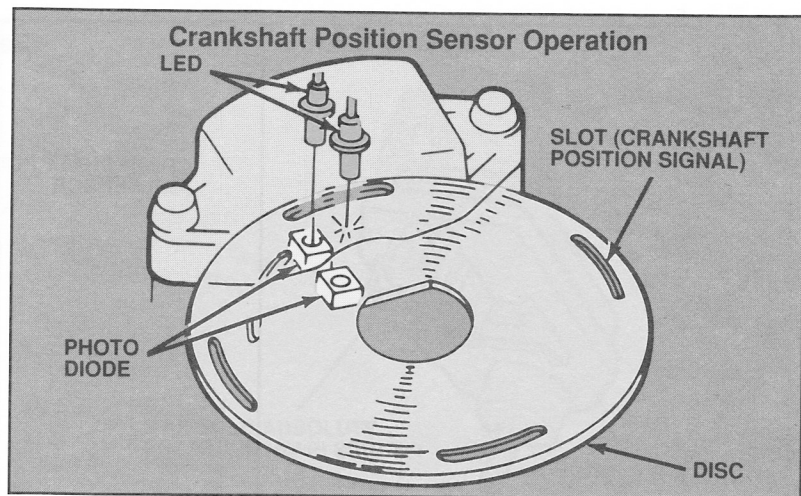
The phototransistor sensors are used in the ignition system and act as inputs to the ECA for engine control. The sensors are contained inside the distributor and provide crankshaft position and speed information to the ECA.

The phototransistor sensors work similarly to traditional Hall effect devices used on Ford NAAO ignition systems. On applicable Non-NAAO vehicles, these sensors rely on a stationary Light Emitting Diode (LED) and phototransistor to transmit information in the form of voltage signals as slots on a rotating disc to open and close a circuit.

**Crankshaft Position (CP) Sensor** — A phototransistor-type Crankshaft Position (CP) sensor is included on the 1990-92 1.3L EFI and 1.8L DOHC engines (Figure 14).

## NON-NAAO AND EEC-IV COMPARISON

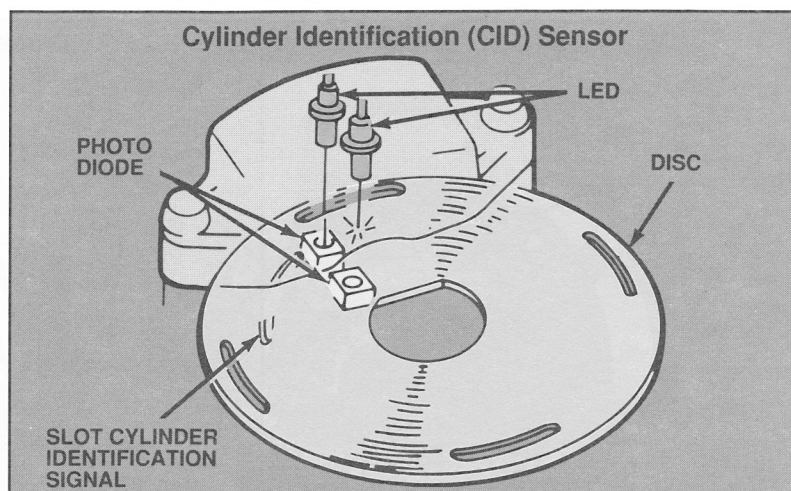
Figure 15



A stationary Light Emitting Diode (LED) and phototransistor monitor a rotating disc inside the distributor unit. The rotating disc has four slots cut into it that pass between the LED and phototransistor (Figure 15). For ignition system purposes, this process sends a Profile Ignition Pickup (PIP) signal to the ECA. For engine control purposes, voltage signals are sent to the ECA as the LED and phototransistor monitor the slots in the disc. The ECA is then able to take these voltage signals and determine engine speed (rpm). The signal received from this sensor influences several different outputs.

## NON-NAAO AND EEC-IV COMPARISON

Figure 16



**Cylinder Identification (CID) Sensor** — A phototransistor-type Cylinder Identification (CID) sensor is used on the 1.8L DOHC engine. Like the CP sensor, a stationary Light Emitting Diode (LED) and phototransistor monitor a rotating disc inside the distributor unit. The rotating disc has one slot cut into it that passes between the LED and phototransistor (Figure 16). The slot provides a reference point indicating when a cylinder pair will reach Top Dead Center (TDC). As the slot passes the transistor, voltage signals indicating this information are sent to the ECA. These voltage signals affect ECA's output signal to the fuel injectors for timing of fuel injection and for the air/fuel ratio.

### Magnetic Pickup-Type Sensors

Magnetic pickup-type sensors used on Non-NAAO engine control systems use transistor sensors similar to those previously discussed, except they use magnetic pickups instead of photocells. Sensors that fall into this category are:

- Crankshaft Position (CP) Sensor (2.2L Turbo)
- Cylinder Identification (CID) Sensor (1.6L DOHC, 1.6L DOHC Turbo, 2.2L Turbo)

Like the phototransistor sensors previously covered, the magnetic pickup-type sensors are ignition system components that also act as inputs to the ECA. The sensors are contained in the distributor and provide crankshaft position and speed information to the ECA.