Cam Sensor Diagnostic and Timing Procedure

The following descriptions and procedures apply to all turbocharged 1984-1985 VIN 9 and 1986-1987 VIN 7 Engines.

Camshaft sensor timing is very important for proper fuel delivery. The cam sensor is a direct input to the ignition module. The Ignition Module uses this signal to synchronize the ignition events and determine which coil to fire. The ignition module conditions the cam sensor input and sends a similar signal out to the ECM. The ECM uses this signal from the ignition module to determine which injector to fire.

During cranking, the ignition module WILL NOT energize the coils (NO SPARK) WITHOUT this signal. In Fact, The Ignition module will not fire any coil during cranking without a cam sensor signal *and* a crank sensor signal. However, once the engine is running, the cam signal can be lost and the engine will continue to run. You can prove this to yourself by starting your engine and then unplugging the sensor. The engine will continue to run, but will not restart if the engine is stopped. When the engine runs without a cam signal, the ECM will store a code 41.

How do I Properly set my Cam Sensor?
CAMSHAFT SENSOR TIMING PROCEDURE

1. With the timing marks lined up (compression stroke #1 cylinder) rotate the crankshaft so the timing mark is 25 degree past top dead center.

2. Take a paperclip or safety pin and backprobe the cam sensor connecter pin B (middle wire). Hook up your volt meter to the clip and to ground. Put your voltmeter on the 12 volt DC scale.

3. Ignition on engine stopped.

4. Loosen camshaft sensor retainer bolt, rotate camshaft sensor counter clockwise until the sensor switch just closes. This will be indicated when the voltmeter reading goes from a high of (5 to 7) volts to a lower voltage. This voltage drop indicates that the switch is closed. The camshaft sensor at this point should be rotated very slowly back clockwise until voltage on the volt ohm meter goes back to its high reading noted previously. This step insures the camshaft sensor is perfectly positioned in the edge of the on/off window.

5. Tighten camshaft sensor retaining bolt.

6. Reinstall #1 plug and spark plug wires to coil.

7. Remove paperclip or safety pin.

How can I check for a cam sensor that is 180 degrees out of phase?

1. Remove #1 spark plug.

2. Take a paperclip or safety pin and backprobe the cam sensor connector pin B (middle wire). Hook up your voltmeter to the clip and to ground. Put your voltmeter on the 12 volt DC scale.

Some early 1984 engines may have been produced without the timing indicator tab installed on the front timing cover. You will need a timing tab to check and set the sensor. The timing tab part number is: 1264952

3. Turn ignition on, engine stopped.

4. Facing the front of the engine, manually rotate crankshaft clockwise to get #1 cylinder on TDC compression stroke. With timing marks lined up monitor volt-ohm meter, slowly continue to rotate the crankshaft until the reading on the volt-meter goes from a high (5 to 7 volts) to a lower voltage (.7-.5 volt). The TDC mark on the crankshaft should be at 25 degree past TDC when voltage drops If voltage drops before or after the 25 degree mark past TDC position the sensor must be retimed. If the voltage does not drop until the crankshaft is rotated on around another 360 degree(1 revolution) the cam sensor is 360 degree out of time.
(If removal of sensor is required follow R&R camshaft sensor procedure in this bulletin).
(If voltage drops before or shortly after the crankshaft balancer mark is at 25 degree Past TDC #1 cylinder on compression stroke follow camshaft timing procedure.

INSTALLATION OF CAMSHAFT SENSOR

NOTICE: Proper positioning of cam sensor into the engine is critical due to wire length on cam sensor to wire harness.

If it is determined that the can sensor is 360 degree out of time, Remove (2) screws retaining hall effect switch and cover assembly from cam sensor. NOTICE: Care must be used to prevent bending of cam sensor cup.

Remove #1 spark plug if not already removed, turn engine over by hand until #1 cylinder is on top dead center compression stroke. Note position of window (opening) in cam sensor cup. (Sensor cup opening should be pointing at the power steering pump assembly.

Remove cam sensor retainer lock down bolt and washer. Pull cam sensor up until it disengages from oil pump shaft and timing gear, rotate cup window 180 degree, reinstall sensor into position. Reinstall retainer bolt and washer assembly, leave loose for final positioning of cam sensor for exact timing.

Refer to cam sensor timing procedure for timing of cam sensor.