

Technical Service Bulletin

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GROUP: Electrical

DATE: Aug. 4, 2000

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SUBJECT:

4.7L Camshaft Position Sensor Contacts Tone Wheel

OVERVIEW:

This bulletin involves the measurement and possible adjustment to the 4.7L camshaft position sensor.

MODELS:

2000 (AN)	Dakota
2000 (DN)	Durango
2000 (WJ)	Grand Cherokee

NOTE: THIS BULLETIN APPLIES TO VEHICLES EQUIPPED WITH A 4.7L ENGINE. ENGINES BUILT WITH AN ENGINE DATE CODE FROM NOV. 01, 1999 (JULIAN DATE OF 3059) TO NOV. 03, 1999 (JULIAN DATE OF 3079) MAY BE EFFECTED. THE ENGINE BUILD DATE CAN BE FOUND ON THE ENGINE BAR CODE LABEL, AFFIXED TO THE OIL FILL HOUSING.

SYMPTOM/CONDITION:

The customer may notice a lower than expected engine performance due to a possible loss or intermittent loss of the camshaft position sensor (CMP) signal. The loss of the CMP signal may be the result of the CMP physically contacting the tone wheel. If this occurs, the internal electronic circuitry of the CMP may become damaged. This condition may cause the illumination of the Malfunction Indicator Lamp (MIL).

The camshaft position sensor may make contact with the tone wheel because the pad on the cylinder head, which the CMP attaches to, was over-machined.

NOTE: THE POSSIBILITY OF THIS CONDITION OCCURRING IS LIMITED TO A VERY SMALL QUANTITY OF 4.7L ENGINES. VERIFY THE ENGINE BUILD DATE.

Most of the suspect engines were inspected and repaired by the engine assembly plant. If required, a select fit shim was installed between the CMP sensor and the cylinder head pad, and around the CMP sensor attaching bolt. The shim may have been glued in place to either the pad on the cylinder head or to the mounting tang on the camshaft position sensor.

A technician making repairs in the area of the CMP sensor may overlook or lose the previously installed shim. This may then cause the camshaft position sensor to contact the tone wheel when the CMP sensor is reinstalled or replaced.

DIAGNOSIS:

1. Using the DRB III® and the respective vehicle 2000 model year Powertrain Diagnostic Procedures manual, determine if the driveability or MIL condition is caused by a loss of the camshaft position sensor signal.
2. If the problem is determined to be the cam position sensor, then inspect the Engine Bar Code Label affixed to the oil fill housing. The label may be white, pink, or green in color.
3. From the Engine Bar Code Label, read the top line of alpha-numeric numbers (the engine identification number) to determine if the engine in question falls on or within the Julian day and calender year of 3059 to 3079.

The engine identification number is in the following format: TPCEKDDDYSSSSS

T = Traceability number (T = T)

P = An internal code to be used at the discretion of the engine plant.

C = An internal code to be used at the discretion of the engine plant.

EK = Mack Avenue Engine Plant

DDD = Julian Day of engine build (0 to 365 days)

Y = Calender year of engine build (0 to 9. A number 9 = the year 1999)

SSSSS = A unique sequential engine block serial number (00000 to 99999).

An example would be TPCEK305912345. Looking at the first four numeric characters (3059) in this engine identification number, we know that the engine was built on the 305th day of 1999.

4. Perform the Repair Procedure, if the condition is the result of a failed cam position sensor, and if the production day of the engine is on or between 3059 to 3079.

PARTS REQUIRED:

- | | | |
|-----|-----------------|--|
| 1 | 05019089AA | Kit, Camshaft Position Sensor Shim (.010" / .020" / .031" / .047") |
| **1 | (AR) 53020878 | Gasket, Engine Cylinder Head Cover (right side) ** |
| 1 | (AR) 56028133AD | Sensor, Camshaft |

EQUIPMENT REQUIRED:

- | | | |
|---|-------------|----------------------|
| 1 | CH6000 | Scan Tool (DRB III7) |
| 1 | CH7000/7001 | J1962 Cable |

REPAIR PROCEDURE:

1. Observe how the cam position sensor is mounted to the engine cylinder head. Inspect for the presence of a shim between the CMP sensor and the engine cylinder head. Figure 1.

NOTE: IT MAY BE EASIER TO INSPECT AND SERVICE THE CAM POSITION SENSOR FROM UNDER THE VEHICLE

2. Disconnect the cam position sensor from its wire harness connector.
3. Remove the cam position sensor from the engine. If a shim is present, it may be glued to the CMP sensor tang, glued to the pad on the engine cylinder head, or it may be loose. Do not lose the shim.
4. Inspect the end of the CMP sensor that is closest to the tone wheel. Note if there is any evidence of damage to the CMP sensor due to contact with the tone wheel.
5. If there is no evidence of damage to the cam position sensor, then replace the CMP sensor. If originally equipped with a select fit shim, then reuse the same shim when a new cam position sensor is installed.

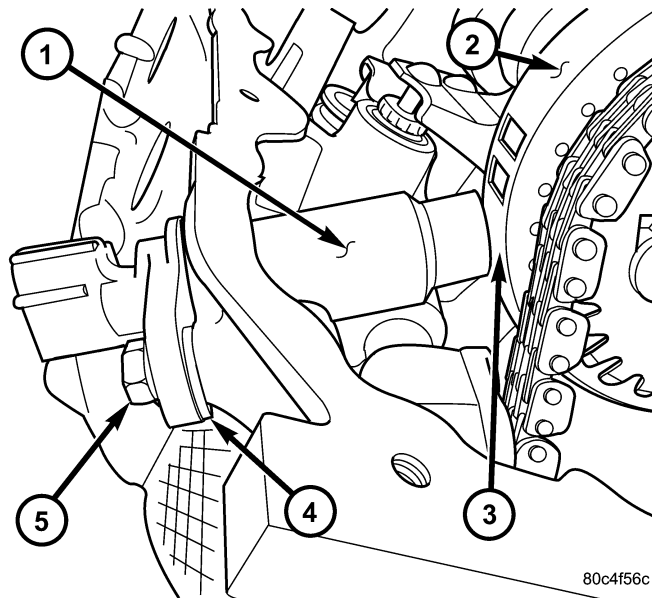


FIGURE 1

- 1 - Cam Position Sensor (CMP)
- 2 - Tone Wheel
- 3 - Air gap (.030 in. +/- .010 in.)
- 4 - Select fit shim used to adjust air gap
- 5 - CMP sensor mounting bolt

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6. If there is evidence of damage to the CMP sensor, due to contact with the tone wheel, then the correct amount of air gap between the CMP sensor and tone wheel must be verified.
 7. Remove the right engine cylinder head cover and gasket. Refer to the 2000 model year WJ Service Manual – Group 9 (Engine) page 97 for additional technical assistance.

- 8. Install a new cam position sensor to the engine cylinder head. Refer to the 2000 model year WJ Service Manual – Group 8D (Electrical Ignition) page 18 for additional technical assistance. Make sure the CMP sensor is full seated. The mounting bolt may be used temporarily to hold the CMP sensor in place and tight against the pad on the engine cylinder head.
- 9. If necessary, use the appropriate select fit shim (p/n 05019089AA) to adjust the air gap between the cam position sensor and the tone wheel so that an air gap of 0.76 mm +/- 0.25 mm (.030 in. +/- .010 in.) is achieved. Note that an air gap of 0.76 mm (.030 in.) is preferred.
- 10. Install and tighten the cam position sensor mounting bolt to 12 Nm (106 in. lbs.). Connect the wire harness terminal to the cam position sensor.

NOTE: BEFORE TIGHTENING THE SENSOR MOUNTING BOLT, BE SURE THE SENSOR IS COMPLETELY FLUSH TO THE CYLINDER HEAD. IF THE SENSOR IS NOT FLUSH, DAMAGE TO THE SENSOR MOUNTING TANG MAY RESULT.

- 11. Verify the air gap between the cam position sensor and the tone wheel is correct.
- 12. Clean and inspect the engine cylinder head cover gasket and mating surfaces.

NOTE: THE CYLINDER HEAD COVER GASKET MAY BE USED AGAIN, PROVIDED NO CUTS, TEARS, OR DEFORMATION HAS OCCURRED.

- 13. Install the cylinder head valve cover and gasket to the engine.
- 14. Complete remaining assembly of engine components that may have previously been removed during this repair procedure.

POLICY: Reimbursable within the provisions of the warranty.

TIME ALLOWANCE:

Labor Operation No:

- 08-15-79-92 (Sensor, CMP Inspect and Replace) 0.3 Hrs.
- 08-15-79-93 (Sensor, CMP Inspect, Replace, and Verify Air Gap) 1.7 Hrs.

FAILURE CODE: P8 – New Part