

## Automotive Electrical and Engine Performance 8th Edition

### Chapter 17 – MAP and MAF Sensors

#### Quiz A

1. What is the function of the manifold absolute pressure (MAP) sensor in an engine?
  - a. To regulate fuel injector pulse width
  - b. To measure exhaust gas recirculation flow
  - c. To sense engine load by detecting pressure changes in the intake manifold
  - d. To calculate the temperature of intake air
  
2. How does barometric pressure affect the MAP sensor's readings?
  - a. Lower barometric pressure decreases MAP voltage
  - b. Barometric pressure does not influence MAP readings
  - c. Barometric pressure is used as a baseline for absolute pressure calculation
  - d. Higher barometric pressure increases manifold vacuum
  
3. Which MAP sensor design uses piezoresistive technology to detect pressure?
  - a. Ceramic disc design
  - b. Strain gauge design
  - c. Capacitor capsule design
  - d. Silicon diaphragm strain gauge
  
4. What happens to the manifold vacuum and MAP sensor voltage during wide-open throttle (WOT)?
  - a. Manifold vacuum decreases, and MAP sensor voltage increases
  - b. Manifold vacuum increases, and MAP sensor voltage decreases
  - c. Both manifold vacuum and MAP sensor voltage remain constant
  - d. Both manifold vacuum and MAP sensor voltage decrease

5. What is the expected MAP sensor signal voltage at idle on a typical General Motors engine?
- a. 4.5–4.8 volts
  - b. 2.5–3.5 volts
  - c. 0.88–1.62 volts
  - d. 0.1–0.5 volts
6. Why is a ceramic disc MAP sensor preferred in certain applications?
- a. It operates with higher precision under extreme temperature conditions
  - b. It uses a barometric pressure baseline for altitude calculations
  - c. It converts manifold pressure into a digital signal for PCM communication
  - d. It is designed to detect both atmospheric and manifold pressure simultaneously
7. What condition is likely to trigger a diagnostic trouble code (DTC) for the MAP sensor?
- a. An intake air leak causing a drop in manifold vacuum
  - b. A shorted MAP sensor signal circuit
  - c. Incorrect throttle position sensor input
  - d. Excessive fuel injector pulse width
8. What is the purpose of the burn-off circuit in a hot-film mass airflow (MAF) sensor?
- a. To reduce dust and debris buildup on the sensing element
  - b. To calibrate airflow readings during idle operation
  - c. To synchronize MAF sensor output with MAP sensor readings
  - d. To increase the operating temperature range of the sensor
9. What is considered "false air" in a MAF system?
- a. Air measured as part of the exhaust gas recirculation system
  - b. Air that enters the engine due to a cracked manifold
  - c. Airflow data that exceeds the maximum frequency range of the MAF sensor
  - d. Air that passes through the intake without being measured by the MAF sensor

10. What is the correct method to test the voltage output of a MAP sensor?
- a. Using a hand-operated vacuum pump while monitoring signal voltage with a digital multimeter
  - b. Disconnecting the MAP sensor and observing engine performance changes
  - c. Applying high-pressure air to simulate manifold pressure changes
  - d. Monitoring injector pulse width adjustments via a scan tool

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**Correct Answers:**

1. c

2. c

3. d

4. a

5. c

6. a

7. b

8. a

9. d

10. a