Automotive Electrical and Engine Performance 9th 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