Automotive Electrical and Engine Performance 9th Edition
Chapter 15 – Variable Valve Timing and Displacement Systems
Quiz A

1. What is the purpose of the camshaft position actuator oil control valve (OCV) in a VVT system?

a. To adjust fuel injection timing for optimal combustion

b. To control the flow of oil to the camshaft position actuator

c. To measure engine oil pressure for diagnostic purposes

d. To regulate crankshaft speed during idle

2. Which variable valve timing system allows exhaust gas recirculation (EGR) without a separate valve?

a. Intake-only VVT

b. Dual-camshaft VVT

c. Exhaust-only VVT

d. Cam-in-block VVT

3. What is the primary function of the spline phaser in an overhead camshaft (OHC) engine?

a. To control fuel economy during low RPM

b. To retard or advance the camshaft timing using oil pressure

c. To synchronize crankshaft and camshaft operation

d. To enable smooth transitions between low and high-speed cams

4. How does the vane phaser operate in a variable valve timing system?

a. By utilizing engine vacuum to control camshaft timing

b. By switching between intake and exhaust cams

c. By rotating the crankshaft to adjust timing

d. By varying oil pressure on either side of rotor vanes

5. What condition typically triggers a diagnostic trouble code (DTC) related to variable valve timing?

a. Engine coolant temperature exceeding 200°F

b. Low oil pressure or a clogged filter screen

c. Fuel injection misalignment with the crankshaft

d. Misfiring in multiple cylinders

6. What is the primary purpose of the high overlap mode in a VVT system?

a. To increase engine performance during high RPM

b. To minimize fuel consumption during highway cruising

c. To enable smooth idling in low-speed conditions

d. To reduce NOx emissions by trapping exhaust gases in the combustion chamber

7. Which VVT component uses a pulse-width-modulated (PWM) signal for precise control?

a. Spline phaser

b. Vane phaser

c. Magnetically controlled vane phaser

d. Camshaft position sensor

8. How does a variable displacement system improve fuel economy?

a. By deactivating half the cylinders under low-load conditions

b. By optimizing valve overlap for each cylinder

c. By retarding the timing of the intake valve during cruising

d. By advancing the crankshaft angle during acceleration

9. What is the function of the locking pin in a variable displacement system lifter?

a. To lock the camshaft in a fixed position during deactivation

b. To secure the inner and outer lifter sleeves during normal operation

c. To regulate oil pressure across the camshaft actuator

d. To prevent spark plug fouling during deactivation

10. What sensor data does the PCM rely on to determine camshaft timing adjustments?

a. Engine speed (RPM) and crankshaft position (CKP) sensor

b. Barometric pressure (BARO) and camshaft position (CMP) sensor

c. Both a and b

d. Only engine load sensor

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Correct Answers:

1. b

2. c

3. b

4. d

5. b

6. d

7. c

8. a

9. b

10. c