

SECTION A8 — ENGINE

PERFORMANCE PRACTICE EXAMS

The seven full-length simulation exams in Section A8 cover the ASE A8 Engine Performance certification. Each exam contains fifty multiple-choice questions delivered in the exact format the live A8 test uses, with the same domain weighting that ASE specifies for the current version of the test:

- **General Engine Diagnosis** — 12 questions per exam (24 percent)
- **Computerized Engine Controls Diagnosis and Repair** — 14 questions per exam (28 percent)
- **Ignition System Diagnosis and Repair** — 7 questions per exam (14 percent)
- **Fuel, Air Induction, and Exhaust Systems Diagnosis and Repair** — 9 questions per exam (18 percent)
- **Emissions Control Systems Diagnosis and Repair** — 8 questions per exam (16 percent)

A8 stands apart from other ASE A-series tests because it is the diagnostic specialty test for engine drivability and emissions issues. The technician who passes A8 must be deeply skilled in engine theory (intake, compression, ignition, exhaust strokes, the relationship between air/fuel/spark/compression, volumetric efficiency, manifold absolute pressure), computerized engine control systems (PCM operation, sensor inputs, actuator outputs, OBD-II diagnostics, mode commands, freeze frame data, scan tool integration), ignition system technology (distributor systems on older vehicles, distributorless coil-on-plug systems on modern vehicles, waste-spark systems, primary and secondary ignition diagnosis, ignition timing), fuel system diagnosis (fuel pressure, fuel volume, injector function, fuel quality, fuel filter condition), air induction (mass airflow sensor, manifold absolute pressure sensor, throttle body, intake manifold, vacuum leaks, idle air control), exhaust systems (oxygen sensor function, catalytic converter operation, exhaust restriction diagnosis, modern emissions controls), and the emissions control technologies that have become essential to passing A8 in the modern era.

The defining characteristic of the A8 exam is that **computerized engine controls** is the largest single domain at twenty-eight percent. Fourteen questions per exam directly involve PCM operation, sensor and actuator diagnosis, OBD-II diagnostic theory, scan tool usage, freeze frame data interpretation, mode 6 monitor diagnosis, and the systematic approach to engine performance diagnosis. The technician who masters computerized engine controls can diagnose modern engine problems through scan tool data and systematic diagnosis. The candidate who lacks foundational understanding of computerized controls will struggle with all subsequent A8 content.

A second defining characteristic is that **general engine diagnosis** at twenty-four percent provides the foundational knowledge upon which all other A8 content builds. Twelve questions per exam involve customer concern verification, drivability complaint diagnosis (no-start, hard start, rough idle, surge, hesitation, misfire, lack of power, poor fuel economy), engine mechanical condition verification (compression testing, cylinder leakdown testing, valve timing verification), and the systematic approach to engine performance diagnosis. The technician who masters general engine diagnosis can identify the cause of most drivability complaints through systematic methodology.

A third defining characteristic is that **fuel, air induction, and exhaust** at eighteen percent reflects the integration of these three systems in modern engines. Nine questions per exam directly involve fuel system diagnosis, air induction system function, and exhaust system operation. Modern engines depend on precise integration of these systems; a fault in any one affects the others. The technician must understand fuel pressure, volume, and quality; mass airflow and manifold absolute pressure measurement; throttle body and idle air control function; vacuum leak diagnosis; oxygen sensor function and aging effects; catalytic converter operation and aging; and exhaust restriction effects on engine performance.

A fourth defining characteristic is that **emissions control systems** at sixteen percent has become essential A8 content. Eight questions per exam directly involve EVAP system function and diagnosis, EGR (exhaust gas recirculation) operation and diagnosis, secondary air injection function (where equipped), PCV (positive crankcase ventilation) function, catalytic converter operation, oxygen sensor heater operation, OBD-II monitor readiness, and the regulatory framework around emissions testing. The A8-certified technician must understand both the operation and diagnosis of modern emissions controls.

A fifth defining characteristic is that **ignition system diagnosis** at fourteen percent has evolved significantly with modern engine technology. Seven questions per exam directly involve ignition coil operation, spark plug function and condition, secondary ignition voltage analysis (using oscilloscope or scan tool), ignition timing verification (where applicable), distributorless ignition system operation, coil-on-plug system diagnosis, knock sensor operation, and modern ignition technology. The technician who understands only traditional distributor-based ignition will struggle with modern A8 content.

A sixth defining characteristic is that **OBD-II diagnostic theory** is woven throughout the test, not as a separate domain but integrated across multiple domains. Modern engine performance diagnosis requires OBD-II knowledge: monitor types (continuous and non-continuous), monitor readiness, freeze frame data, mode 6 (continuous monitor results), mode 9 (vehicle information), and the systematic interpretation of OBD-II data. The technician who treats engine performance as purely mechanical without OBD-II integration cannot pass A8.

The exams in this section progress from foundational engine performance knowledge in early exams to integrated multi-domain scenarios in later exams. Early exams focus on individual systems — engine mechanical, computerized controls, ignition, fuel and air, emissions. Middle exams introduce comparative diagnosis and the integration of multiple systems. Later exams concentrate on complex scenarios where multiple systems interact and where the technician must synthesize information across domains to identify the root cause.

Total practice questions in Section A8: **350 questions** across 7 simulation exams.

Set a timer for ninety minutes when taking each exam, work through the questions without referencing notes, and resist the temptation to peek at the answer key until you have submitted your final answer for every question. Treat each simulation as if it were the live A8 test waiting for you at a Prometric testing center. Pay particular attention to computerized engine control questions and emissions control content — these are the areas where strong A8 candidates separate themselves from those who lack foundational diagnostic skills or who struggle with modern engine performance technology.

PRACTICE EXAM 1: A8 SIMULATION

— ENGINE PERFORMANCE

1. A vehicle has been brought in with a complaint of engine performance issues. The MOST appropriate first diagnostic step is to:

- A. Verify the concern, retrieve stored DTCs, identify the approach
- B. Replace the PCM as a precaution
- C. Replace the spark plugs as the most direct repair
- D. Apply compressed air to the system

2. The proper procedure for verifying an engine performance customer concern is to:

- A. Apply compressed air to the system
- B. Replace the affected components as a precaution
- C. Visually inspect for visible damage only
- D. Drive the vehicle under matching conditions and observe the symptom

3. A vehicle has been brought in with a complaint of no-start condition. The MOST likely areas to investigate are:

- A. A worn power steering pulley
- B. Fuel delivery, ignition spark, compression, and PCM control
- C. A worn ball joint
- D. Air in the clutch hydraulic system

4. The proper procedure for performing an engine compression test is to:

- A. Apply compressed air to the cylinder
- B. Replace the engine as a precaution
- C. Replace the spark plugs as a precaution
- D. Disable fuel and ignition, install gauge, crank engine, and read pressure

5. A vehicle's compression test shows one cylinder reading significantly lower than others. The MOST likely cause is:

- A. Apply compressed air to the cylinder
- B. Replace the spark plugs as a precaution
- C. Worn piston rings, valve issues, or head gasket failure
- D. Replace the brake fluid as the only step

6. The proper procedure for performing a cylinder leakdown test is to:

- A. Apply compressed air to the system
- B. Position cylinder at TDC, apply regulated air, measure leakage percentage
- C. Replace the engine as a precaution
- D. Visually inspect for visible damage only

7. A vehicle has been brought in with a complaint of misfire under load. The MOST likely cause is:

- A. Worn spark plugs, faulty coil, fuel injector issues, or compression issues
- B. Apply compressed air to the system
- C. Replace the engine as a precaution

D. Replace the brake fluid as the only step

8. The proper procedure for diagnosing an engine misfire is to:

A. Apply compressed air to the system

B. Replace the spark plugs as a precaution

C. Replace the engine as a precaution

D. Verify the concern, retrieve DTCs, identify the affected cylinder, isolate the cause

9. A vehicle has been brought in with a complaint of rough idle. The MOST likely cause is:

A. Apply compressed air to the system

B. Replace the engine as a precaution

C. Vacuum leak, fuel issue, ignition issue, sensor issue, or compression issue

D. Replace the brake fluid as the only step

10. The proper procedure for diagnosing rough idle is to:

A. Apply compressed air to the system

B. Verify the concern, retrieve DTCs, monitor scan data, identify the cause

C. Replace the engine as a precaution

D. Replace the brake fluid as the only step

11. A vehicle has been brought in with a complaint of engine surging. The MOST likely cause is:

A. Vacuum leak, faulty MAP sensor, fuel pressure issue, or PCM control issue

B. Apply compressed air to the system

- C. Replace the PCM as a precaution
- D. Replace the brake fluid as the only step

12. The proper procedure for retrieving stored DTCs is to:

- A. Apply compressed air to the system
- B. Replace the PCM as a precaution
- C. Visually inspect for visible damage only
- D. Connect a scan tool to the OBD-II port and retrieve all stored codes

13. A vehicle's scan tool shows DTC P0300 (random/multiple cylinder misfire detected). The MOST likely cause is:

- A. Apply compressed air to the system
- B. Replace the PCM as a precaution
- C. Vacuum leak, fuel system issue, ignition system issue, or low compression
- D. Replace the brake fluid as the only step

14. The proper procedure for diagnosing a P0300 DTC is to:

- A. Apply compressed air to the system
- B. Verify the concern, monitor misfire counters, identify affected cylinders
- C. Replace the PCM as a precaution
- D. Replace the brake fluid as the only step

15. A vehicle's scan tool shows DTC P0171 (system too lean, bank 1). The MOST likely cause is:

- A. Vacuum leak, low fuel pressure, faulty MAF sensor, or oxygen sensor issue
- B. Apply compressed air to the system
- C. Replace the PCM as a precaution
- D. Replace the brake fluid as the only step

16. The proper procedure for diagnosing a P0171 DTC is to:

- A. Apply compressed air to the system
- B. Replace the affected components as a precaution
- C. Replace the PCM as a precaution
- D. Verify the concern, monitor fuel trims, inspect for vacuum leaks, verify fuel pressure

17. A vehicle's PCM monitors freeze frame data when a DTC is set. The proper purpose of freeze frame data is to:

- A. Apply compressed air to the system
- B. Replace the PCM as a precaution
- C. Capture engine operating conditions when the DTC was set
- D. Filter contaminants from the system

18. The proper procedure for using freeze frame data is to:

- A. Apply compressed air to the system
- B. Read the conditions, attempt to recreate them, observe the symptom
- C. Replace the PCM as a precaution

D. Visually inspect for visible damage only

19. A vehicle's MAF sensor has been brought in for diagnosis. The proper purpose of a MAF sensor is to:

- A. Measure airflow into the engine for fuel calculation
- B. Apply compressed air to the system
- C. Replace the sensor as a precaution
- D. Filter contaminants from the system

20. The proper procedure for testing a MAF sensor is to:

- A. Apply compressed air to the sensor
- B. Replace the sensor as a precaution
- C. Replace the PCM as a precaution
- D. Monitor scan data for grams per second at idle and varied RPM, compare to spec

21. A vehicle's MAP sensor has been brought in for diagnosis. The proper purpose of a MAP sensor is to:

- A. Apply compressed air to the system
- B. Replace the sensor as a precaution
- C. Measure intake manifold pressure for fuel and timing calculation
- D. Filter contaminants from the system

22. The proper procedure for testing a MAP sensor is to:

- A. Apply compressed air to the sensor
- B. Monitor scan data for pressure at idle and varied conditions, compare to spec

- C. Replace the sensor as a precaution
- D. Visually inspect for visible damage only

23. A vehicle's oxygen sensor has been brought in for diagnosis. The proper purpose of an oxygen sensor is to:

- A. Apply compressed air to the system
- B. Replace the sensor as a precaution
- C. Replace the PCM as a precaution
- D. Measure exhaust oxygen content for fuel trim feedback

24. The proper procedure for testing an oxygen sensor is to:

- A. Monitor scan data for switching activity at varied conditions, compare to spec
- B. Apply compressed air to the sensor
- C. Replace the sensor as a precaution
- D. Visually inspect for visible damage only

25. A vehicle's upstream oxygen sensor shows fixed voltage of 0.45 V regardless of conditions. The MOST likely cause is:

- A. Apply compressed air to the sensor
- B. Replace the PCM as a precaution
- C. A failed oxygen sensor not switching properly
- D. Replace the brake fluid as the only step

26. The proper procedure for performing an ignition spark test is to:

- A. Apply compressed air to the system
- B. Use a spark tester, crank the engine, and observe for proper spark
- C. Replace the ignition coil as a precaution
- D. Visually inspect for visible damage only

27. A vehicle has been brought in with a no-spark condition. The MOST likely cause is:

- A. Apply compressed air to the system
- B. Replace the ignition coil as a precaution
- C. Replace the PCM as a precaution
- D. Faulty crank/cam sensor, ignition coil, ignition module, or PCM control

28. The proper procedure for testing fuel pressure is to:

- A. Connect a fuel pressure gauge, run the engine, and read pressure at idle and varied conditions
- B. Apply compressed air to the system
- C. Replace the fuel pump as a precaution
- D. Visually inspect for visible damage only

29. A vehicle has been brought in with a complaint of low fuel pressure. The MOST likely cause is:

- A. Apply compressed air to the system
- B. Replace the fuel pump as a precaution
- C. Faulty fuel pump, restricted fuel filter, faulty fuel pressure regulator, or wiring fault
- D. Replace the brake fluid as the only step

30. The proper procedure for testing a fuel injector is to:

- A. Apply compressed air to the injector
- B. Test injector resistance, balance, and operation per spec
- C. Replace the injector as a precaution
- D. Visually inspect for visible damage only

31. A vehicle has been brought in with a complaint of vacuum leak. The MOST likely diagnostic approach is:

- A. Apply compressed air to the system
- B. Replace the affected components as a precaution
- C. Replace the PCM as a precaution
- D. Use a smoke machine, propane, or carb cleaner to identify the leak source

32. The proper procedure for using a smoke machine to identify vacuum leaks is to:

- A. Block intake openings, introduce smoke, observe leak points
- B. Apply compressed air to the system
- C. Replace the affected components as a precaution
- D. Visually inspect for visible damage only

33. A vehicle's catalytic converter has been brought in for diagnosis. The proper purpose of a catalytic converter is to:

- A. Apply compressed air to the system
- B. Replace the converter as a precaution
- C. Convert harmful exhaust emissions into less harmful gases through catalytic reaction

D. Filter contaminants from the brake fluid

34. The proper procedure for testing catalytic converter efficiency is to:

- A. Apply compressed air to the converter
- B. Compare upstream and downstream oxygen sensor activity, evaluate efficiency
- C. Replace the converter as a precaution
- D. Visually inspect for visible damage only

35. A vehicle has been brought in with a complaint of low catalytic converter efficiency (P0420). The MOST likely cause is:

- A. Apply compressed air to the converter
- B. Replace the converter as a precaution
- C. Replace the PCM as a precaution
- D. Worn catalytic converter, fuel system issue, or upstream oxygen sensor issue

36. The proper procedure for diagnosing a P0420 DTC is to:

- A. Apply compressed air to the converter
- B. Replace the converter as a precaution
- C. Verify the concern, monitor oxygen sensor activity, identify the cause
- D. Replace the brake fluid as the only step

37. A vehicle's EVAP system has been brought in for diagnosis. The proper purpose of the EVAP system is to:

- A. Capture and store fuel vapors, preventing release to the atmosphere

- B. Apply compressed air to the system
- C. Replace the system as a precaution
- D. Filter contaminants from the brake fluid

38. The proper procedure for diagnosing EVAP system DTCs is to:

- A. Apply compressed air to the system
- B. Verify the concern, identify the specific DTC, perform required tests, identify the cause
- C. Replace the EVAP system as a precaution
- D. Visually inspect for visible damage only

39. A vehicle's EGR system has been brought in for diagnosis. The proper purpose of the EGR system is to:

- A. Apply compressed air to the system
- B. Replace the system as a precaution
- C. Replace the PCM as a precaution
- D. Recirculate exhaust gases to reduce combustion temperatures and NOx emissions

40. The proper procedure for diagnosing EGR system DTCs is to:

- A. Apply compressed air to the system
- B. Replace the EGR system as a precaution
- C. Verify the concern, identify the specific DTC, perform required tests, identify the cause
- D. Visually inspect for visible damage only

41. A vehicle's PCV system has been brought in for diagnosis. The proper purpose of the PCV system is to:

- A. Vent crankcase blowby gases back to the intake for combustion
- B. Apply compressed air to the system
- C. Replace the PCV valve as a precaution
- D. Filter contaminants from the system

42. The proper procedure for diagnosing PCV system issues is to:

- A. Apply compressed air to the system
- B. Verify the concern, inspect the PCV valve, identify any restrictions or leaks
- C. Replace the PCV system as a precaution
- D. Visually inspect for visible damage only

43. A vehicle has been brought in with a complaint of poor fuel economy. The MOST likely cause is:

- A. Apply compressed air to the system
- B. Replace the affected components as a precaution
- C. Replace the PCM as a precaution
- D. Multiple potential causes (fuel system, ignition, sensors, mechanical, or driving habits)

44. The proper procedure for diagnosing poor fuel economy is to:

- A. Apply compressed air to the system
- B. Replace the affected components as a precaution
- C. Verify the concern, retrieve DTCs, monitor fuel trims, identify the cause

D. Replace the brake fluid as the only step

45. A vehicle has been brought in with a complaint of hesitation on acceleration. The MOST likely cause is:

A. Apply compressed air to the system

B. Fuel delivery issue, ignition issue, or sensor issue affecting acceleration

C. Replace the PCM as a precaution

D. Replace the brake fluid as the only step

46. The proper procedure for diagnosing hesitation on acceleration is to:

A. Verify the concern, monitor fuel trims and sensor data during acceleration

B. Apply compressed air to the system

C. Replace the affected components as a precaution

D. Replace the brake fluid as the only step

47. A vehicle has been brought in with a complaint of lack of power. The MOST likely cause is:

A. Apply compressed air to the system

B. Replace the affected components as a precaution

C. Replace the PCM as a precaution

D. Multiple potential causes (fuel, ignition, mechanical, exhaust restriction, or electrical)

48. The proper procedure for diagnosing lack of power is to:

A. Apply compressed air to the system

- B. Verify the concern, retrieve DTCs, perform diagnostic tests, identify the cause
- C. Replace the affected components as a precaution
- D. Replace the brake fluid as the only step

49. A vehicle has been brought in with a complaint of black smoke from exhaust. The MOST likely cause is:

- A. Apply compressed air to the system
- B. Replace the affected components as a precaution
- C. Rich fuel mixture from sensor failure, fuel pressure issue, or injector issue
- D. Replace the brake fluid as the only step

50. The proper procedure for diagnosing exhaust smoke conditions is to:

- A. Identify the smoke type, retrieve DTCs, perform diagnostic tests, identify the cause
- B. Apply compressed air to the system
- C. Replace the affected components as a precaution
- D. Replace the brake fluid as the only step

PRACTICE EXAM 1: A8 SIMULATION

— ANSWER KEY, EXPLANATIONS, AND TASK REMEDIATION

1. A — Verify the concern, retrieve stored DTCs, identify the approach. Engine performance diagnosis begins with concern verification and DTC retrieval. These steps establish the foundation for systematic diagnosis before any component replacement. *ASE Task Reference: A8 Domain A — General Engine Diagnosis. Review subsection 8.1.*
2. D — Drive the vehicle under matching conditions and observe the symptom. Customer concern verification requires reproducing the symptom under the conditions described. Without verification, technicians cannot confirm what they are diagnosing. *ASE Task Reference: A8 Domain A — General Engine Diagnosis. Review subsection 8.1.*
3. B — Fuel delivery, ignition spark, compression, and PCM control. No-start diagnosis requires evaluating the four essentials of engine operation. Each must be present in proper quantity for the engine to start. *ASE Task Reference: A8 Domain A — General Engine Diagnosis. Review subsection 8.1.*
4. D — Disable fuel and ignition, install gauge, crank engine, and read pressure. Compression testing requires preventing fuel and spark to obtain accurate readings. The gauge captures the maximum pressure as the cylinder is cranked. *ASE Task Reference: A8 Domain A — General Engine Diagnosis. Review subsection 8.1.*
5. C — Worn piston rings, valve issues, or head gasket failure. Low compression on a single cylinder indicates a sealing problem within that cylinder. Each potential cause produces this diagnostic signature. *ASE Task Reference: A8 Domain A — General Engine Diagnosis. Review subsection 8.1.*
6. B — Position cylinder at TDC, apply regulated air, measure leakage percentage. Cylinder leakdown testing identifies where leakage is occurring (rings, valves, head gasket). The audible leak location reveals the source. *ASE Task Reference: A8 Domain A — General Engine Diagnosis. Review subsection 8.1.*
7. A — Worn spark plugs, faulty coil, fuel injector issues, or compression issues. Misfire under load indicates the cylinder cannot maintain proper combustion under stress. Multiple potential causes contribute to this condition. *ASE Task Reference: A8 Domain A — General Engine Diagnosis. Review subsection 8.1.*

8. D — Verify the concern, retrieve DTCs, identify the affected cylinder, isolate the cause. Misfire diagnosis requires systematic isolation. The PCM identifies the affected cylinder; the technician identifies the specific cause. *ASE Task Reference: A8 Domain A — General Engine Diagnosis. Review subsection 8.1.*
9. C — Vacuum leak, fuel issue, ignition issue, sensor issue, or compression issue. Rough idle has multiple potential causes. Each affects the engine's ability to maintain smooth operation at idle. *ASE Task Reference: A8 Domain A — General Engine Diagnosis. Review subsection 8.1.*
10. B — Verify the concern, retrieve DTCs, monitor scan data, identify the cause. Rough idle diagnosis requires systematic approach. Scan data and DTCs together reveal the cause. *ASE Task Reference: A8 Domain A — General Engine Diagnosis. Review subsection 8.1.*
11. A — Vacuum leak, faulty MAP sensor, fuel pressure issue, or PCM control issue. Engine surging indicates inconsistent fuel or air delivery. Multiple potential causes contribute to this condition. *ASE Task Reference: A8 Domain B — Computerized Engine Controls. Review subsection 8.2.*
12. D — Connect a scan tool to the OBD-II port and retrieve all stored codes. DTC retrieval is the standard first step in modern engine diagnosis. The scan tool provides direct access to PCM diagnostic data. *ASE Task Reference: A8 Domain B — Computerized Engine Controls. Review subsection 8.2.*
13. C — Vacuum leak, fuel system issue, ignition system issue, or low compression. P0300 indicates random/multiple cylinder misfire. Multiple potential causes affect multiple cylinders simultaneously. *ASE Task Reference: A8 Domain B — Computerized Engine Controls. Review subsection 8.2.*
14. B — Verify the concern, monitor misfire counters, identify affected cylinders. P0300 diagnosis requires identifying which cylinders are misfiring. Misfire counters provide cylinder-specific data. *ASE Task Reference: A8 Domain B — Computerized Engine Controls. Review subsection 8.2.*
15. A — Vacuum leak, low fuel pressure, faulty MAF sensor, or oxygen sensor issue. P0171 indicates the fuel system is too lean. Multiple potential causes can produce this condition. *ASE Task Reference: A8 Domain B — Computerized Engine Controls. Review subsection 8.2.*
16. D — Verify the concern, monitor fuel trims, inspect for vacuum leaks, verify fuel pressure. P0171 diagnosis requires systematic approach. Fuel trim data and physical testing together reveal the cause. *ASE Task Reference: A8 Domain B — Computerized Engine Controls. Review subsection 8.2.*
17. C — Capture engine operating conditions when the DTC was set. Freeze frame data records the conditions at DTC setting. This information aids reproduction and diagnosis of the symptom. *ASE Task Reference: A8 Domain B — Computerized Engine Controls. Review subsection 8.2.*

18. B — Read the conditions, attempt to recreate them, observe the symptom. Freeze frame data guides symptom reproduction. Recreating conditions enables direct observation of the fault. *ASE Task Reference: A8 Domain B — Computerized Engine Controls. Review subsection 8.2.*
19. A — Measure airflow into the engine for fuel calculation. The MAF sensor provides airflow data to the PCM. The PCM uses this input to calculate proper fuel delivery. *ASE Task Reference: A8 Domain B — Computerized Engine Controls. Review subsection 8.2.*
20. D — Monitor scan data for grams per second at idle and varied RPM, compare to spec. MAF sensor testing requires comparison of reported values to specifications. Each operating condition has expected values. *ASE Task Reference: A8 Domain B — Computerized Engine Controls. Review subsection 8.2.*
21. C — Measure intake manifold pressure for fuel and timing calculation. The MAP sensor provides manifold pressure data to the PCM. The PCM uses this input for fuel and timing calculations. *ASE Task Reference: A8 Domain B — Computerized Engine Controls. Review subsection 8.2.*
22. B — Monitor scan data for pressure at idle and varied conditions, compare to spec. MAP sensor testing requires comparison of reported values to specifications. Each operating condition has expected values. *ASE Task Reference: A8 Domain B — Computerized Engine Controls. Review subsection 8.2.*
23. D — Measure exhaust oxygen content for fuel trim feedback. The oxygen sensor provides exhaust feedback to the PCM. The PCM uses this input for closed-loop fuel control. *ASE Task Reference: A8 Domain B — Computerized Engine Controls. Review subsection 8.2.*
24. A — Monitor scan data for switching activity at varied conditions, compare to spec. Oxygen sensor testing requires verification of switching behavior. The switching activity indicates proper sensor function. *ASE Task Reference: A8 Domain B — Computerized Engine Controls. Review subsection 8.2.*
25. C — A failed oxygen sensor not switching properly. Fixed voltage at 0.45 V indicates the sensor is not switching between rich and lean. Without proper switching, closed-loop fuel control is compromised. *ASE Task Reference: A8 Domain B — Computerized Engine Controls. Review subsection 8.2.*
26. B — Use a spark tester, crank the engine, and observe for proper spark. Spark testing requires direct observation of the ignition output. The tester provides a controlled gap to evaluate spark quality. *ASE Task Reference: A8 Domain C — Ignition System Diagnosis and Repair. Review subsection 8.3.*
27. D — Faulty crank/cam sensor, ignition coil, ignition module, or PCM control. No-spark condition has multiple potential causes. Each cause prevents proper ignition operation. *ASE Task Reference: A8 Domain C — Ignition System Diagnosis and Repair. Review subsection 8.3.*

28. A — Connect a fuel pressure gauge, run the engine, and read pressure at idle and varied conditions. Fuel pressure testing requires measurement under operating conditions. Pressure varies with operating conditions. *ASE Task Reference: A8 Domain D — Fuel, Air Induction, and Exhaust. Review subsection 8.4.*
29. C — Faulty fuel pump, restricted fuel filter, faulty fuel pressure regulator, or wiring fault. Low fuel pressure has multiple potential causes. Each cause reduces the system's ability to deliver proper pressure. *ASE Task Reference: A8 Domain D — Fuel, Air Induction, and Exhaust. Review subsection 8.4.*
30. B — Test injector resistance, balance, and operation per spec. Injector testing requires multiple verification methods. Each method evaluates a different aspect of injector function. *ASE Task Reference: A8 Domain D — Fuel, Air Induction, and Exhaust. Review subsection 8.4.*
31. D — Use a smoke machine, propane, or carb cleaner to identify the leak source. Vacuum leak diagnosis requires methods that reveal the leak location. Each method provides a different way to identify the source. *ASE Task Reference: A8 Domain D — Fuel, Air Induction, and Exhaust. Review subsection 8.4.*
32. A — Block intake openings, introduce smoke, observe leak points. Smoke machine usage requires sealing the system and pressurizing with smoke. Smoke escaping from the leak points reveals the source. *ASE Task Reference: A8 Domain D — Fuel, Air Induction, and Exhaust. Review subsection 8.4.*
33. C — Convert harmful exhaust emissions into less harmful gases through catalytic reaction. The catalytic converter is the primary emission control device. The catalytic reaction converts CO, HC, and NO_x into less harmful gases. *ASE Task Reference: A8 Domain E — Emissions Control Systems. Review subsection 8.5.*
34. B — Compare upstream and downstream oxygen sensor activity, evaluate efficiency. Catalytic converter testing requires oxygen sensor data comparison. The downstream sensor should show stable activity if the converter is functioning. *ASE Task Reference: A8 Domain E — Emissions Control Systems. Review subsection 8.5.*
35. D — Worn catalytic converter, fuel system issue, or upstream oxygen sensor issue. P0420 indicates low catalytic converter efficiency. Multiple potential causes can produce this condition. *ASE Task Reference: A8 Domain E — Emissions Control Systems. Review subsection 8.5.*
36. C — Verify the concern, monitor oxygen sensor activity, identify the cause. P0420 diagnosis requires oxygen sensor analysis. The sensor activity reveals whether the converter or the sensors are at fault. *ASE Task Reference: A8 Domain E — Emissions Control Systems. Review subsection 8.5.*
37. A — Capture and store fuel vapors, preventing release to the atmosphere. The EVAP system controls fuel vapor emissions. The vapors are captured, stored, and burned in the engine when

conditions allow. *ASE Task Reference: A8 Domain E — Emissions Control Systems. Review subsection 8.5.*

38. B — Verify the concern, identify the specific DTC, perform required tests, identify the cause. EVAP diagnosis requires DTC-specific testing. Each EVAP DTC has specific diagnostic procedures. *ASE Task Reference: A8 Domain E — Emissions Control Systems. Review subsection 8.5.*
39. D — Recirculate exhaust gases to reduce combustion temperatures and NOx emissions. The EGR system reduces NOx through combustion temperature management. Recirculated exhaust dilutes the intake charge. *ASE Task Reference: A8 Domain E — Emissions Control Systems. Review subsection 8.5.*
40. C — Verify the concern, identify the specific DTC, perform required tests, identify the cause. EGR diagnosis requires DTC-specific testing. Each EGR DTC has specific diagnostic procedures. *ASE Task Reference: A8 Domain E — Emissions Control Systems. Review subsection 8.5.*
41. A — Vent crankcase blowby gases back to the intake for combustion. The PCV system controls crankcase emissions. Blowby gases are routed to the intake for proper combustion rather than being vented. *ASE Task Reference: A8 Domain E — Emissions Control Systems. Review subsection 8.5.*
42. B — Verify the concern, inspect the PCV valve, identify any restrictions or leaks. PCV diagnosis requires component inspection and system verification. Each step provides different diagnostic information. *ASE Task Reference: A8 Domain E — Emissions Control Systems. Review subsection 8.5.*
43. D — Multiple potential causes (fuel system, ignition, sensors, mechanical, or driving habits). Poor fuel economy has multiple potential causes. Each affects the engine's efficiency in different ways. *ASE Task Reference: A8 Domain A — General Engine Diagnosis. Review subsection 8.1.*
44. C — Verify the concern, retrieve DTCs, monitor fuel trims, identify the cause. Fuel economy diagnosis requires systematic approach. Fuel trim data reveals fuel system efficiency. *ASE Task Reference: A8 Domain A — General Engine Diagnosis. Review subsection 8.1.*
45. B — Fuel delivery issue, ignition issue, or sensor issue affecting acceleration. Hesitation on acceleration has multiple potential causes. Each cause produces this symptom under acceleration conditions. *ASE Task Reference: A8 Domain A — General Engine Diagnosis. Review subsection 8.1.*
46. A — Verify the concern, monitor fuel trims and sensor data during acceleration. Hesitation diagnosis requires monitoring during the symptom. The data reveals which system is at fault during acceleration. *ASE Task Reference: A8 Domain A — General Engine Diagnosis. Review subsection 8.1.*

47. D — Multiple potential causes (fuel, ignition, mechanical, exhaust restriction, or electrical). Lack of power has multiple potential causes. Each affects the engine's ability to produce full output. *ASE Task Reference: A8 Domain A — General Engine Diagnosis. Review subsection 8.1.*
48. B — Verify the concern, retrieve DTCs, perform diagnostic tests, identify the cause. Lack of power diagnosis requires systematic approach. Each step provides different diagnostic information. *ASE Task Reference: A8 Domain A — General Engine Diagnosis. Review subsection 8.1.*
49. C — Rich fuel mixture from sensor failure, fuel pressure issue, or injector issue. Black smoke is the diagnostic signature of rich fuel mixture. Multiple potential causes can produce this condition. *ASE Task Reference: A8 Domain D — Fuel, Air Induction, and Exhaust. Review subsection 8.4.*
50. A — Identify the smoke type, retrieve DTCs, perform diagnostic tests, identify the cause. Exhaust smoke diagnosis requires identification of smoke type and systematic testing. Different smoke types indicate different causes. *ASE Task Reference: A8 Domain D — Fuel, Air Induction, and Exhaust. Review subsection 8.4.*