



## (A8) Engine Performance Sample Questions and Answers

Answers to these questions are found beginning on page 4 of this document

1. Two technicians are discussing oil leaks. Technician A says that an oil leak can be found using a fluorescent dye in the oil with a black light to check for leaks. Technician B says that a white spray powder can be used to locate oil leaks. Which technician is correct?
  - a. Technician A only
  - b. Technician B only
  - c. Both Technicians A and B
  - d. Neither Technician A nor B
  
2. An engine is misfiring. A power balance test indicates that when the spark to cylinder #4 is grounded, there is no change in the engine speed. Technician A says that a burned valve is a possible cause. Technician B says that a defective cylinder #4 injector or spark plug wire could be the cause. Which technician is correct?
  - a. Technician A only
  - b. Technician B only
  - c. Both Technicians A and B
  - d. Neither Technician A nor B
  
3. A customer was concerned about a vibration felt during acceleration only. Technician A says that a defective fuel injector could be the cause. Technician B says that a defective spark plug wire or coil on a coil-on-plug system could be the cause. Which technician is correct?
  - a. Technician A only
  - b. Technician B only
  - c. Both Technicians A and B
  - d. Neither Technician A nor B
  
4. Technician A says that cranking vacuum should be the same as idle vacuum. Technician B says that a sticking valve is indicated by a floating valve gauge needle reading. Which technician is correct?
  - a. Technician A only
  - b. Technician B only
  - c. Both Technicians A and B
  - d. Neither Technician A nor B

5. Antifreeze (except premix) should be mixed with\_\_\_\_\_ .
- De-demineralized water
  - Clean drinking water
  - Distilled water
  - Any of the above
6. Technician A says that all spark plugs should be checked for proper gap before being installed in the engine. Technician B says that platinum spark plugs should not be regapped after having been used in an engine. Which technician is correct?
- Technician A only
  - Technician B only
  - Both Technicians A and B
  - Neither Technician A nor B
7. Typical primary coil resistance specifications usually range from \_\_\_\_\_.
- 100 to 450 ohms
  - 500 to 1500 ohms
  - 0.5 to 3 ohms
  - 6000 to 30,000 ohms
8. A no-start condition is being diagnosed on a vehicle equipped with a distributor ignition using a remotely-mounted ignition coil. The coil wire is removed from the center of the distributor cap and a spark tester is used to check for spark. There is spark out of the coil but no spark is available to any of the spark plug wires. Technician A says the rotor could be defective. Technician B says the spark plugs are fouled. Which technician is correct?
- Technician A only
  - Technician B only
  - Both Technicians A and B
  - Neither Technician A nor B
9. An engine is idling too fast when the engine reaches operating temperature. Technician A says the engine could have a vacuum leak. Technician B says that the throttle linkage or cable could be stuck. Which technician is correct?
- Technician A only
  - Technician B only
  - Both Technicians A and B
  - Neither Technician A nor B

10. Technician A says that the exhaust system can be checked for restriction by using a vacuum gauge attached to manifold vacuum and operating the engine at idle speed. Technician B says the exhaust is restricted if the vacuum increases at 2,000 RPM. Which technician is correct?
- Technician A only
  - Technician B only
  - Both Technicians A and B
  - Neither Technician A nor B
11. Excessive exhaust system backpressure has been measured. This can be caused by\_\_\_\_\_.
- A clogged catalytic converter
  - A defective AIR pump diverter valve
  - Clogged EGR valve ports
  - Excessively retarded valve timing
12. The fuel pressure drops rapidly when the engine is turned off. Technician A says that one or more injectors could be leaking. Technician B says that a defective check valve in the fuel pump could be the cause. Which technician is correct?
- Technician A only
  - Technician B only
  - Both Technicians A and B
  - Neither Technician A nor B
13. A customer complains that the throttle sticks at times. Technician A says that varnish buildup around the throttle body can be the cause. Technician B says that a kinked throttle cable could be the cause. Which technician is correct?
- Technician A only
  - Technician B only
  - Both Technicians A and B
  - Neither Technician A nor B
14. The owner of a vehicle equipped with a gasoline direct injection (GDI) system complains that the engine hesitates during acceleration, especially when the engine is cold. What is the most likely cause?
- A dirty air filter
  - A partially clogged fuel filter
  - Excessive fuel pump pressure
  - Carbon deposits on the intake valves
15. Used catalytic converters must be kept for possible inspection by the EPA for how long?
- 30 days
  - 60 days
  - 90 days
  - 6 months

## Answers to Sample Questions

- The correct answer is c.** Technician A is correct that a fluorescent dye can be added to the engine oil and allowed to circulate. A black light is then turned on and any leaks will show as a bright yellow-green area. This is the preferred method for locating fluid leaks. Technician B is correct because a white powder spray (such as foot spray) will show the location of leaks by turning dark where the liquid contacts the white powder. Answers a, b, and d are not correct because both technicians are correct.
- The correct answer is c.** Both technicians are correct. Technician A is correct because a burned valve will cause the cylinder to produce less than normal power. Technician B is correct because a fault in either the injector or the spark plug wire can cause the cylinder to misfire. Answers a, b, and d are not correct because both technicians are correct.
- The correct answer is c.** Both technicians are correct. Technician A is correct because a clogged or defective fuel injector would result in an engine misfire that would be most noticeable during acceleration. Technician B is correct because a defective spark plug wire or coil on a coil-on-plug type of ignition system would cause a misfire that would be most likely to occur and be noticeable during acceleration. Answers a, b, and d are not correct because both technicians are correct.
- The correct answer is d.** Neither technician is correct. Technician A is not correct because the specification for cranking vacuum is greater than 2.5 in. Hg. Even though a sound engine with a completely closed throttle may be able to produce 17 in. Hg to 21 in. Hg vacuum (at sea level) during cranking, it is not the specification for cranking vacuum. Technician B is not correct because a floating vacuum gauge needle is an indication of an overly rich or lean air-fuel mixture, not a sticking valve. A sticking valve will cause the vacuum gauge needle to move rapidly up and down. Answer c is not correct because neither technician is correct.
- The correct answer is d.** Using water that is free from chemicals or mineral is best for the cooling system and will help prevent rust and corrosion. While most experts recommend using de-mineralized (purified) water (answer a), any of the types of water can be used. Answer b is correct because many vehicle manufacturers state that good clean drinking water can be used safely. Some experts recommend the use of distilled water (answer c), because it is readily available and cost effective and does not contain any chemicals such as chlorine or minerals that could cause rust or corrosion in the cooling system.
- The correct answer is c.** Both technicians are correct. Technician A is correct because all spark plugs should be checked for the proper gap before installing in the engine. Most spark plugs are gapped at the factory but may not be the correct gap for the vehicle or the gap may have changed during shipping and handling. Technician B is also correct because platinum becomes brittle when used in an engine and could break off if a gapping tool is used to reset the gap after the spark plugs have been run in an engine. Answers a, b, and d are not correct because both technicians are correct.
- The correct answer is c.** The best answer is 0.5 to 3 ohms. Answers a, b, and d are not correct because they are not close to being the resistance of a typical ignition coil primary winding.

8. **The correct answer is a.** Technician A is correct because there is spark from the coil and no spark to the spark plugs, the distributor rotor is likely defective allowing the spark to travel to the steel distributor shaft. Technician B is not correct because while fouled spark plugs could cause a no-start condition, they cannot be the cause of no spark reaching the spark plugs.
9. **The correct answer is c.** Both technicians are correct. Technician A is correct because a vacuum leak can cause the engine speed to increase especially on those engines equipped with a speed density-type fuel injection system. Technician B is also correct because the throttle plate itself could be partially stuck open due to binding throttle linkage or cable. Answers a, b, and d are not correct because both technicians are correct.
10. **The correct answer is d.** Technician A is not correct because while a vacuum gauge can be used to check for an exhaust restriction, the engine speed should be at 2000 – 2500 RPM and not at idle. Technician B is not correct because the vacuum will decrease (not increase) if there is an exhaust restriction. Answers a, b, and c are not correct because neither technician is correct.
11. **The correct answer is a.** A clogged or restricted catalytic converter can cause excessive exhaust system backpressure. Answer b is not correct because a defective AIR pump diverter valve would cause airflow from the secondary air injection (SAI) system to flow to the wrong location, but would not have any effect on the flow of the exhaust through the exhaust system. Answer c is not correct because, while a clogged EGR valve exhaust port(s) could cause the exhaust gas recirculation system not to function correctly, it would not have any effect on the flow of the exhaust from the engine itself. Answer d is not correct because even though retarded valve timing could cause reduced engine performance, it would not have any effect on the flow of the exhaust gases through the exhaust system.
12. **The correct answer is c.** Both technicians are correct. Technician A is correct because the fuel pressure would drop if one or more fuel injectors were leaking. Technician B is correct because the fuel pressure would drop if the check valve in the outlet of the fuel pump was leaking. Answers a, b, and d are not correct because both technicians are correct.
13. **The correct answer is c.** Both technicians are correct. Technician A is correct because the buildup of varnish on the backside (engine side) of the throttle plate can create a ridge that can cause the throttle to stick. Technician B is correct because a kinked throttle cable can cause the throttle to stick. Answers a, b, and d are not correct because both technicians are correct.
14. **The correct answer is d.** The most likely cause of the problem is due to carbon deposits on the backside of the intake valves which is a common occurrence on engine equipped with gasoline direct injection (GDI) systems. Answer a is not correct because even though a clogged air filter could cause a drivability problem, it is not the most likely to cause a hesitation when cold only. Answer b is not correct because while a clogged fuel filter could cause a problem especially at high engine speeds and loads, it is not likely to be the cause of a hesitation when cold. Answer c is not correct because excessive fuel pressure will tend to richen the air-fuel mixture, which would tend to help eliminate or reduce a hesitation.
15. **The correct answer is b.** A used catalytic converter must be kept for 60 days to be available for inspection by state or federal agency personnel to be sure that it required replacement based on the published standards. Answers a, c, and d are not correct because they are not the specified time that the unit must be kept before being scrapped or sold for recycling.