ASE T Series - Quiz Questions with Answers

T1: Gasoline Engines

1.

An engine exhibits excessive cranking to start. Technician A says this could be caused by a stuck-open EGR valve. Technician B says this could be caused by a jumped timing belt. Who is correct?

Both A and B

Technician A

Technician B

Neither A nor B

Correct answer: Both A and B

Both technicians are correct. Extended cranking time can be caused by a timing belt that has jumped. It can also be caused by an EGR valve that is stuck open, resulting in lack of vacuum.

2.

A three-way catalytic converter is used to control several substances. Which of the following is not controlled by this converter?

NO2

HC

CO

NOx

Correct answer: NO2

Three-way catalytic converters have been used to reduce emissions since 1981. They control CO, HC, and NOx emissions.

Nitrogen dioxide (NO2) is not converted during the process.

3.

A technician notices low compression in two neighboring cylinders. Which of these is the most likely cause?

Cracked block

Bad piston rings

Inaccurate valve timing

Low oil level

Correct answer: Cracked block

A cracked block can cause low compression in neighboring cylinders, as can a blown head gasket or a cracked cylinder head.

Bad piston rings, inaccurate valve timing, and a low oil level normally lead to low compression in all of the cylinders.

4.

Generally, when performing a cylinder leak down test, leakage should not exceed:

- **20%**
- 5%
- 10%
- 30%

Correct answer: 20%

A cylinder leak down test is used to determine if a cylinder is sealing. This test is performed by introducing compressed air into the cylinder with the piston at top dead center on the compression stroke. Generally, leakage greater than 20% indicates an internal engine problem.

5.

What is Plastigauge used to measure?

Rod bearing clearance

Crankshaft end play

Piston ring end gap

Piston to cylinder wall clearance

Correct answer: Rod bearing clearance

Plastigauge is used to measure both rod and main bearing clearance. It is inserted between the bearing and crankshaft journal, then the cap is torqued to specification. The cap is then removed and the width of the crushed Plastigauge strip is used to determine bearing clearance.

6.

Technician A says cylinder head bolts should be removed in the same sequence as they are tightened. Technician B says a cylinder head should be removed only when the engine is cold. Who is correct?

Technician B

Technician A

Both A and B

Neither A nor B

Correct answer: Technician B

Technician B is correct; cylinder heads should only be removed when the engine is cold to prevent warpage. Technician A is wrong because cylinder head bolts should be removed in a sequence opposite that of tightening.

7.

Technician A says the sides of the lifter should be coated in pre-lube during installation. Technician B says the area where the lifter contacts the camshaft should be coated in pre-lube during installation. Who is correct?

Technician B

Technician A

Both A and B

Neither A nor B

Correct answer: Technician B

Lifters must be primed prior to installation. This involves applying pre-lube to the portion of the lifter that contacts the camshaft.

8.

Which of the following components is not part of the ignition system secondary circuit?

Ignition control module

Spark plugs

Distributor

Ignition coil secondary windings

Correct answer: Ignition control module

There are two sides of the ignition system: the primary side and the secondary side. The primary side is the low voltage, control side of the circuit that includes everything other than the spark plugs, distributor, and ignition coil secondary windings. These items are part of the high voltage, secondary side of the ignition system.

9.

An EGR valve that is stuck open can cause all of the following **except**:

Increased NOx emisssions

Stalling

Rough idle

Illuminated check engine light

Correct answer: Increased NOx emissions

If the EGR valve is stuck open, exhaust gases will be introduced into the engine at unwanted times. This can result in stalling and/or a rough idle. On the other hand, an EGR valve that is stuck closed can result in increased combustion temperatures, leading to increased NOx emissions.

10.

Most coils have a primary winding resistance of:

- **0.5 to 2.0 ohms**
- 0.05 to 0.2 ohms
- 3.5 to 4.5 ohms
- 6 to 8 ohms

Correct answer: 0.5 to 2.0 ohms

Most coils have a primary winding resistance of 0.5 to 2.0 ohms. On the other hand, typical secondary winding resistance is 8,000 to 20,000 ohms.

11.

A faulty PCV system is **least** likely to result in which of the following?

A misfire under load

Increased oil consumption

Dirty oil

Stalling

Correct answer: A misfire under load

A misfire under load typically indicates a problem with the ignition system. Engine performance problems that are related to the PCV system typically happen at low engine speeds. Common symptoms of a fault in the PCV system include increased oil consumption, dirty oil, excessive blow-by, rough idle and stalling.

12.

An engine noise is heard under acceleration. Which of the following is the **least** likely cause?

Worn camshaft bearings

Worn pistons

Worn cylinders

Worn main bearings

Correct answer: Worn camshaft bearings

Worn pistons and/or cylinders typically make a rapping noise during acceleration, whereas worn main bearing make a deep-sounding metallic knocking. Worn camshaft bearings, however, usually do not cause a noise unless severely worn.

13.

Piston-to-cylinder wall clearance is measured by subtracting which measurement from the size of the cylinder bore?

The size of the piston skirt

The size of the piston land

The diameter of the piston rings

The diameter of the oil control rings

Correct answer: The size of the piston skirt

Piston-to-cylinder wall clearance can be measured by subtracting the size of the piston skirt from the size of the cylinder bore. If this measurement is not within specification, the cylinder may need to be bored to accept over-sized pistons.

14.

A starter current draw test is being performed. Technician A says low current draw may be caused by excessive resistance in the starter circuit. Technician B says high current draw may be caused by an internal engine problem. Who is correct?

- **Both A and B**
- Technician A
- Technician B
- Neither A nor B

Correct answer: Both A and B

Both technicians are correct. High starter current draw indicates a worn starter or internal engine problem. On the other hand, low starter current draw indicates excessive resistance in the starter circuit.

15.

An engine vacuum test is being performed. The gauge reading is steady and low. Which of the following could be the cause?

Late ignition timing

Burnt valves

Weak valve springs

A leaking head gasket

Correct answer: Late ignition timing

Late ignition timing will result in a vacuum reading that is low and steady. A blown head gasket, weak valve springs or burnt valves would result in a vacuum reading that fluctuates.

16.

A high fuel trim could indicate what?

A vacuum leak

A leaking fuel injector

A fouled spark plug

A restricted fuel return line

Correct answer: A vacuum leak

A high fuel trim reading indicates a lean condition where the ECM is adding fuel to bring the mixture back to stoichiometric. On the other hand, a low fuel trim reading indicates a rich condition where the ECM is trying to subtract fuel.

17.

A valve head is found to be cupped. Technician A says this is the result of the valve contacting the piston. Technician B says the valve can be machined and reused. Who is correct?

Neither A nor B

Technician A

Technician B

Both A and B

Correct answer: Neither A nor B

Both technicians are wrong. When repairing a cylinder head, the valves should be closely examined to determine if they can be reused and to determine the cause of failure. A valve that is cupped indicates that it was exposed to excessive heat. In this case, the valve should be discarded.

18.

Technician A says camshaft bearings should always be installed with the insert positioned toward the back of the bore. Technician B says most OHV camshafts are removed and installed with a camshaft bushing driver and hammer. Who is correct?

Technician B

Technician A

Both A and B

Neither A nor B

Correct answer: Technician B

Technician B is correct that OHV camshafts are removed and installed with a camshaft bushing driver and hammer. Technician A is wrong because the way the bearing insert is installed depends upon the location of the oil passages in the bearing bore. This means that the bearing may be installed with the insert positioned toward the back of the bore, the front of the bore, or even the center of the bore, depending on oil hole location.

19.

A cylinder balance test is being performed. Cylinder #3 shows little change in engine RPM when the analyzer causes it to cut out. Technician A says low compression on that cylinder could be the cause. Technician B says a bad fuel injector could be the cause. Who is correct?

Both A and B

Technician A

Technician B

Neither A nor B

Correct answer: Both A and B

Both technicians are correct. If a cylinder is functioning normally, a noticeable decrease in engine RPM will occur when that cylinder is cut out by an analyzer. Anything that causes a misfire could be the cause. This includes compression problems, as well as ignition and fuel delivery issues.

20.

Technician A says most purge solenoids are normally open. Technician B says most vent solenoids are normally closed. Who is correct?

Neither A nor B

Technician A

Technician B

Both A and B

Correct answer: Neither A nor B

Both technicians are wrong. Most purge solenoids are normally closed in order to block engine vacuum to the canister until opened. On the other hand, most vent solenoids are normally open to allow air to pass through the solenoid until closed.

21.

All of the following are methods of adjusting valve lash **except**:

Lifter shim adjustment

Adjustable nut attaching the rocker arm to the stud

Adjustable screw located in the end of the rocker

Pushrod length adjustment

Correct answer: Lifter shim adjustment

There are several methods for adjusting valve lash, including an adjustable nut attaching the rocker arm to the stud, an adjustable screw located in the end of the rocker, pushrod length adjustment, shims positioned between the camshaft lobes and followers, and removing material from the valve tip.

22.

Pushrod runout should not exceed:

.003"

.001"

.002"

.005"

Correct answer: .003"

Runout can be checked by rolling the pushrod across a flat surface, such as a piece of glass. If runout exceeds .003", the pushrod should be replaced.

23.

Technician A says coolant freeze protection level can be checked with litmus paper strips. Technician B says coolant freeze protection level can be checked with a refractometer. Who is correct?

Technician B

Technician A

Both A and B

Neither A nor B

Correct answer: Technician B

Only technician B is correct. Coolant freeze protection can be checked using a hydrometer or refractometer. Litmus paper strips are used to check coolant pH levels.

24.

Technician A says roller lifters should be checked for roller bushing wear. Technician B says that they need to be checked for alignment device problems.

Who is correct?

- **Both A and B**
- Technician B
- Neither A nor B
- Technician A

Correct answer: Both A and B

Both technicians are correct. Most engines have roller lifters and should be checked for roller bushing wear and alignment device problems.

The bushing must prevent excessive play on the axle pin of the lifter. Alignment devices must retain the lifter in the bore to keep the roller axle centerline parallel with the cam lob centerline.

25.

Technician A says that cylinder wall tapers are usually worn more at the bottom. Technician B says that any movement from zero on the dial bore gauge shows cylinder bore wear. Who is correct?

Technician B

Technician A

Both A and B

Neither A nor B

Correct answer: Technician B

Techncian A is incorrect. Typically, cylinder wall taper occurs at the top where ring loading is the highest.

Technician B is correct. When measuring cylinder bore wear, any movement from zero indicates wear and should be checked with the manufacturer's specifications.

26.

Battery power must be removed from a circuit before using a DMM to check:

Resistance

Voltage

Amperage

Frequency

Correct answer: Resistance

Ohmmeters are self-powered; therefore, prior to checking resistance, battery power must be removed from the circuit.

27.

Technician A says valve springs should be checked for squareness. Technician B says valve spring length should be checked. Who is correct?

Both A and B

Technician A

Technician B

Neither A nor B

Correct answer: Both A and B

Both technicians are correct. The valve springs should be check for both squareness and length. Valve springs that are not square can cause side loading of the spring and rapid wear. The valve spring should also be measured for length, then tested for correct spring pressure to ensure the valve will seal properly and maintain seated pressure.

28.

Generally, cylinder head warpage should not exceed:

0.003"

0.001"

0.002"

0.005"

Correct answer: 0.003"

Whenever a cylinder head is being repaired, it should be checked for warpage. This is done using a straight edge and feeler gauge. Generally, warpage should not exceed 0.003". The OEM repair information should be checked for the exact specification.

29.

Technician A says the ECM will turn on the viscous cooling fan when the A/C is switched on. Technician B says some trucks have more than one electric cooling fan. Who is correct?

Technician B

Technician A

Both A and B

Neither A nor B

Correct answer: Technician B

Technician B is correct that some trucks have more than one cooling fan. In some applications, the ECM will turn on the second fan if the primary fan fails to bring engine temperature down enough. Technician A is wrong because a viscous fan is a mechanical device that is not controlled by the ECM.

30.

Blue exhaust smoke comes out of the tailpipe during deceleration. Which of the following does this condition indicate?

Excessive oil consumption

A rich condition

Coolant entering the combustion chamber

Condensation

Correct answer: Excessive oil consumption

Blue exhaust smoke indicates oil consumption, possibly from bad valve seals or guides.

White exhaust smoke indicates either coolant entering the combustion chamber or condensation. Black exhaust smoke is a tell-tale sign of a rich condition.

31.

A catalytic converter is being tested. Technician A says if the outlet temperature is 10 percent greater than the inlet, the converter is probably okay. Technician B says if the oxygen storage test shows less than a 1.2 to 1.7 percent increase in oxygen readings during a snap throttle test, the converter is probably okay. Who is correct?

Both A and B

Technician A

Technician B

Neither A nor B

Correct answer: Both A and B

Both technicians are correct. Two ways of testing a catalytic converter are measuring the inlet and outlet temperatures and performing a snap throttle test. If the outlet temperature is 10 percent greater than the inlet, the converter is probably okay. Likewise, if the oxygen storage test shows less than a 1.2 to 1.7 percent increase in oxygen readings during a snap throttle test, the converter is probably okay.

32.

A cylinder head has excessive carbon buildup. All of the following could be cause **except**:

Worn valve keepers

Worn valve guides

Worn valve seals

Worn valve rings

Correct answer: Worn valve keepers

Worn valve keepers could eventually fail, allowing the valve to fall into the cylinder. However, they would not result in excessive carbon buildup. All of the other options would.

33.

Technician A says the timing belt or chain must be removed when replacing cylinder heads on an OHV engine. Technician B says the timing belt or chain must be removed when replacing cylinder heads on an OHC engine. Who is correct?

Technician B

Technician A

Both A and B

Neither A nor B

Correct answer: Technician B

The timing chain or belt is routed around the camshaft gears. Since the camshaft must be removed during cylinder head replacement in an OHC engine, the timing chain or belt must also be removed. In an OHV engine, the camshaft is mounted in the engine block, making timing chain or belt removal unnecessary.

34.

Which of the following should be done **first** when reprogramming an ECM?

Check the calibration history of the vehicle

Make sure the battery is fully charged

Connect the scan tool to the diagnostic connector

Validate the VIN

Correct answer: Check the calibration history of the vehicle

Before doing anything else, you should check the calibration history of the vehicle. If the programming has already been updated, that information will be displayed on the website.

35.

Technician A says iron powder must be sprinkled over the area to inspect for cylinder head cracks using magnetic particle detection. Technician B says cracks in a cylinder block cannot be found with a dye penetrant. Who is correct?

Technician A

Both A and B

Technician B

Neither A nor B

Correct answer: Technician A

Technician A is correct. Iron powder is sprinkled on the area when performing magnetic particle detection, and magnetic fluid disruption is observed.

Technician B is incorrect because the dye penetrant will find cylinder head cracks. Dye is sprayed on the surface, and the excess is wiped off after it dries.

36.

At sea level, typical engine vacuum at idle should be between:

17 and 22 in. Hg

14 and 19 in. Hg

19 and 26 in. Hg

15 and 20 in. Hg

Correct answer: 17 and 22 in. Hg

At sea level, a healthy engine should produce between 17 and 22 in. Hg at idle. Anything else indicates a potential engine performance problem.

37.

All of the following can cause low oil pressure **except**:

Worn piston rings

An improperly sealed pickup tube

Improper oil viscosity

Worn connecting rod bearings

Correct answer: Worn piston rings

Worn piston rings can result in an engine that burns oil, but not low oil pressure. All of the other options can result in low oil pressure.

38.

Technician A says that a cylinder wall taper should be measured using a dial bore gauge. Technician B says that the cylinder bore should be measured at the highest point of piston ring travel, moving gradually to the lowermost point. Who is correct?

Technician A

Technician B

Both A and B

Neither A nor B

Correct answer: Technician A

Technician A is correct. The cylinder wall taper results in a piston ring gap that changes as the piston travels up and down in the cylinder. The taper can be measured by inserting a dial bore gauge into the cylinder.

Technician B is incorrect. The cylinder bore should be measured starting at the lowest point of piston ring travel, gradually moving to the uppermost point.

39.

What type of crankshaft sensor creates AC voltage?

Magnetic pulse generator

Hall-effect

Optical pick-up

Reed switch

Correct answer: Magnetic pulse generator

Magnetic pulse generators use a magnet to sense notches in a reluctor wheel. This is one method of determining crankshaft position. Magnetic pulse generators create their own AC voltage, whereas the other types of crankshaft sensors output a DC signal.

40.

An engine cranks normally but doesn't start. Which of the following is the **least** likely cause?

A discharged battery

A faulty fuel pump

A failed crankshaft position sensor

A bad ignition module

Correct answer: A discharged battery

A discharged battery will most likely result in an engine that cranks slowly or doesn't crank at all. Ignition and fuel delivery problems, as well as compression issues, typically result in an engine that cranks normally but doesn't start.

41.

Technician A says floating piston pins are retained in the connecting rod by an interference fit. Technician B says press-fit pistons have a replaceable bushing. Who is correct?

Neither A nor B

Technician A

Technician B

Both A and B

Correct answer: Neither A nor B

Both technicians are wrong. Press-fit piston pins are kept in the connecting rod by an interference fit. On the other hand, rods with floating piston pins use a bushing that is pressed into place and then honed to fit the pin.

42.

Technician A says that when a coil fails on a distributorless ignition system (DIS), it is typically caused by a bad ignition wire. Technician B says if the DIS vehicle won't start, the most likely reason is that a coil has failed. Who is correct?

Technician A

Neither A nor B

Technician B

Both A and B

Correct answer: Technician A

Technician A is correct. Typically coil failure in a DIS is caused by a bad ignition wire.

Technician B is incorrect. The DIS usually has multiple coils, so the failure of one shouldn't keep the engine from starting.

43.

Two adjacent cylinders have low compression. Compression on the other cylinders is normal. Which of the following is the **most** likely cause?

A blown head gasket

A snapped timing belt

Worn rings

A stuck-open valve

Correct answer: A blown head gasket

Low compression on two adjacent cylinders can be caused by a leaking head gasket. A snapped timing belt would result in low compression on all cylinders, as would rings that were evenly worn. A stuck-open valve would cause low compression on just one cylinder.

44.

Generally speaking, a cylinder leakage greater than what percentage usually indicates a problem?

- **20%**
- 15%
- 25%
- 10%

Correct answer: 20%

If a technician notices cylinder leakage of more than 20%, it could indicate a problem. If all cylinders are low, it could indicate that the engine has a lot of miles and wear on it. However, all leakage readings should be referenced against manufacturer specifications.

45.

Generally, exhaust back pressure should be less than:

2 psi

1 psi

5 psi

10 psi

Correct answer: 2 psi

Exhaust back pressure can be tested using a dedicated gauge in place of the oxygen sensor. A reading greater than 2 psi indicates a restricted exhaust that must be repaired.

46.

Technician A says an aftermarket amplifier may cause problems with the OEM onboard computer controls. Technician B says all onboard monitors have the same enabling criteria. Who is correct?

Technician A

Technician B

Both A and B

Neither A nor B

Correct answer: Technician A

Only technician A is correct. Aftermarket accessories, such as an amplifier, can cause electrical interference with the onboard computer controls. Technicians B is wrong because each monitor's enabling criteria are different.

47.

Generally, how much drive belt deflection should there be per foot of free span?

1/2"

1/4"

3/4"

1"

Correct answer: 1/2"

It's important that a drive belt have proper tension to ensure correct performance and to prevent damage to the pulley bearings. Belt tension can be checked by measuring deflection. Generally, there should be 1/2" of drive belt deflection per foot of free span.

48.

Voltage drop across the battery positive cable should not exceed:

0.5 volts

0.1 volts

0.2 volts

0.4 volts

Correct answer: 0.5 volts

The resistance in an electrical wire or cable can be checked by measuring voltage drop. To check voltage drop across the positive battery cable, connect the multimeter to both ends of the cable. Then crank the engine. The voltage reading on the meter should not exceed 0.5 volts. If it does, the cable has excessive resistance and should be replaced.

49.

All of the following are methods for locating vacuum leaks **except**:

Adding dye to the system

Using a smoke machine

Listening for leaks

Using propane

Correct answer: Adding dye to the system

There are three basic methods of vacuum leak detection: listening for leaks, spraying propane around the suspected area while observing engine RPM, and using a smoke machine. Dye is not used to detect vacuum leaks.

50.

On most modern vehicles, what is considered excessive parasitic draw?

A value greater than 100 milliamps

A value greater than 30 milliamps

A value greater than 50 milliamps

A value greater than 80 milliamps

Correct answer: A value greater than 100 milliamps

Most vehicles have a number of onboard computers that draw current even when the vehicle is turned off. Because of this, generally, only a parasitic draw greater than 100 milliamps is considered excessive.

T2: Diesel Engines

51.

Technician A says engine protection systems are designed to limit horsepower and torque when the ECM recognizes engine overspeeding. Technician B says engine protection systems are designed to limit horsepower and torque when the DPF becomes full. Who is correct?

Technician A

Technician B

Both A and B

Neither A nor B

Correct answer: Technician A

Only technician A is correct. The engine protection systems are designed to limit horsepower and torque when the ECM recognizes engine overspeeding, engine overheating or low oil pressure.

52.

Technician A says supplemental coolant additives are not needed with wet cylinder liners. Technician B thinks that leaking liner seals may cause coolant in the crankcase and an overheating engine on diesel with wet cylinder liners.

Who is correct?

Technician B

Technician A

Both A and B

Neither A nor B

Correct answer: Technician B

Technician A is incorrect because certain supplemental coolant additives (SCAs) are needed to prevent the pitting and wear of wet cylinder liners.

Technician B is correct because leaking liner seals would lead to overheating and coolant leaking into the crankcase.

53.

If alternator voltage rises above 15.0, all the following could be to blame EXCEPT:

Overcharged battery

Defective regulator

Bad ground connection

Shorted components

Correct answer: Overcharged battery

A defective regulator, bad ground connection, and shorted components can all cause the alternator voltage to rise above 15.0, leading to overcharging of the battery.

An overcharged battery is a symptom of high voltage coming from the alternator, not the cause.

54.

Which of the following is used to ensure antifreeze is within normal operating specs and does not need to be serviced?

Refractometer

Polarimeter

Hydrometer

Manometer

Correct answer: Refractometer

A refractometer is used to measure antifreeze concentration and determine whether service is required.

The polarimeter measures the rotation of polarized light to check the purity of optically active compounds. It has no place in antifreeze inspection. Hydrometers are used to check the battery cells, and manometers are pressure meters.

55.

Technician A says barometric pressure is used to calculate glow plug on time. Technician B says the oxygen sensor signal is used to calculate glow plug on time. Who is correct?

Technician A

Technician B

Both A and B

Neither A nor B

Correct answer: Technician A

Only technician A is correct. Typically, the main inputs to the ECM for calculating glow plug on time are battery voltage, engine oil temperature and barometric pressure. The oxygen sensor signal is not used.

56.

A voltage drop test is being performed on the alternator circuit. Typically, the drop on the positive side of the circuit should not exceed:

0.2 volts

0.1 volts

0.3 volts

0.5 volts

Correct answer: 0.2 volts

Voltage drop testing can be used to find unwanted resistance in the charging system. Typically, voltage drop on the positive side of the circuit should not exceed 0.2 volts and voltage drop on the negative side of the circuit should not exceed 0.3 volts.

57.

Cylinder head warpage is measured using a:

Feeler gauge

Micrometer

Dial indicator

Plastigauge

Correct answer: Feeler gauge

Cylinder head warpage is measured using a straight edge and feeler gauge. The measurements should be taken at each end of the head, between each cylinder, between the center line of the valves, and at the outer edge of the fire deck. Compare the measurements to the manufacturer's specifications to determine if the head needs to be resurfaced.

58.

What is the typical pressure on the high side of a high-pressure common rail system?

5,000 to 30,000 PSI

500 to 1000 PSI

1000 to 2000 PSI

25,000 to 35,000 PSI

Correct answer: 5,000 to 30,000 PSI

In high pressure common rail system, the high pressure fuel pump pressurizes fuel in the range of 5,000 to 30,000 PSI.

59.

Technician A says the EGR valve is turned off during passive regeneration. Technician B says the vehicle may be either parked or moving during active regeneration. Who is correct?

Technician B

Technician A

Both A and B

Neither A nor B

Correct answer: Technician B

Technician B is correct. During active regeneration, the ECM turns off the EGR valve and injects fuel into the exhaust stream to raise the temperature and clean the soot. This can happen while either driving or parked. During passive regeneration, regeneration can occur without fuel being injected and without the EGR valve being turned off.

60.

What color of exhaust smoke indicates a potential injector misfire?

White

Black

Blue

Gray

Correct answer: White

White exhaust smoke indicates an internal coolant leak or injector misfire.

Blue or black smoke indicates the engine is burning oil, whereas gray or black smoke indicates unburned fuel or an improper grade of fuel.

61.

What is the definition of an inactive code from the electronic engine diagnostic system?

Code that was once active in the past

Code indicating a current fault that isn't critical

Code that will not set in the ECM

Code that indicates a problem with a system not currently in use

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Correct answer: Code that was once active in the past

An inactive code is one that was active in the past. The malfunction may have been corrected, but the code has not been reset.

An active code shows a failure that is currently happening.

62.

Typically, liner taper and out-of-round should not exceed how many inches?

.001

.003

.010

.100

Correct answer: .001

Cylinder walls or liners should be checked for taper and out-of-round using a micrometer, snap gauge or dial-bore gauge. Generally, liner taper and out-of-round should not exceed .001". If the measurement is greater than that, some manufacturers allow the cylinders to be bored oversized. Another method is boring and resleeving to the original diameter.

63.

Low oil pressure can be caused by all of the following **except:**

Worn rings

Diluted oil

A restricted pump pickup screen

Excessive bearing clearance

Correct answer: Worn rings

Worn rings may result in oil consumption, but they will not cause low oil pressure. Low oil pressure is typically caused by diluted oil, excessive bearing clearance, a restricted oil pickup screen or internal oil leaks.

64.

The skirt of a piston is heavily scored diagonally. Which of the following is the **most** likely cause?

A bent connecting rod

A faulty harmonic balancer

Worn piston rings

A spun rod bearing

Correct answer: A bent connecting rod

The wear pattern found on a piston skirt should be slight and centered on the skirt in a vertical line. A bent or twisted connecting rod will result in scoring that is diagonal, not vertical.

65.

A battery load test is being performed. A good battery will remain above:

9.6 volts

12.6 volts

11.6 volts

8.6 volts

Correct answer: 9.6 volts

During a load test, the battery is loaded for 15 seconds. During this time, a good battery will remain above 9.6 volts when the temperature is 70 degrees or above.

66.

A diesel engine exhibits lack of power. Which of the following is the **least** likely cause?

Fuel pressure too high

Failed fuel heater

Low fuel volume

Failed fuel cooler

Correct answer: Fuel pressure too high

Fuel pressure that is too low would lead to lack of power, but not fuel pressure that is too high. A failed fuel cooler, a failed fuel heater or low fuel volume are all common reasons for lack of power.

67.

A common-rail diesel engine cranks but doesn't start. Which of the following could be the cause?

Worn fuel injectors

A loose battery positive cable

A worn camshaft lobe

A hyrdo-locked engine

Correct answer: Worn fuel injectors

If all or most of the fuel injectors are worn, a crank-no-start condition may result. A loose battery cable would result in an engine that doesn't crank at all, as would a hydro-locked engine. A worn camshaft lobe would result in an engine misfire.

68.

What type of diesel fuel system uses a cam-actuated, integral metering injector that is controlled by the ECM?

EUI

HEUI

High pressure common rail

Mechanical injector pump

Correct answer: EUI

An electronic unit injection (EUI) diesel fuel injection system uses injectors that are cam-actuated, integral metering and controlled by the ECM.

69.

Technician A says when the diesel particulate filter becomes full, the ECM will introduce fuel to burn the particulate matter. Technician B says when the filter is full, it must be removed and cleaned to get rid of the particulate matter. Who is correct?

Technician A

Technician B

Neither A nor B

Both A and B

Correct answer: Technician A

Only technician A is correct. When the particulate filter becomes full of particulate matter, the ECM will introduce fuel to burn it. The filter only needs to be removed for cleaning if it becomes clogged with ash.

70.

Technician A says exhaust brakes are hydraulically actuated. Technician B says most engine brakes are electronically controlled. Who is correct?

Technician B

Technician A

Both A and B

Neither A nor B

Correct answer: Technician B

Only technician B is correct. Exhaust brakes are controlled electronically and actuated pneumatically, whereas engine brakes are controlled electronically and actuated hydraulically.

71.

Which of the following applies the force needed to actuate an HEUI injector?

High pressure oil pump

Camshaft

Gerotor pump

High pressure fuel pump

Correct answer: High pressure oil pump

The high pressure oil pump provides pressure to each injector in an HEUI system. The ECM activates a solenoid on top of the injector to allow oil pressure to enter, causing the injector to fire.

72.

What can be used to check a mechanical waste gate?

Dial indicator and shop air

Vacuum pump and feeler gauge

Vacuum gauge

Scan tool

Correct answer: Dial indicator and shop air

A mechanical waste gate can be checked using a dial indicator and shop air. Air pressure is used to open the gate and a dial indicator is used to measure waste gate arm travel.

73.

An engine oil sample has been taken for analysis. Technician A says if the oil has a high copper content, a cylinder liner may have failed. Technician B says if the oil has a high iron content, a rod bearing may have failed. Who is correct?

Neither A nor B

Technician A

Technician B

Both A and B

Correct answer: Neither A nor B

Both technicians are wrong. An oil sample with high copper content indicates a failed engine bearing, such as a rod bearing. On the other hand, an oil sample with a high iron content indicates failure of a cylinder liner or crankshaft.

74.

All of the following are true regarding no-start conditions **except**:

An engine that doesn't crank indicates a lack of fuel

Some ECMs will prevent engine cranking if the exhaust system has overheated

Air in the fuel system can prevent the engine from starting

A failed turbo may prevent the engine from starting

Correct answer: An engine that doesn't crank indicates a lack of fuel

Lack of fuel to a diesel engine will result in an engine that cranks but doesn't start. All of the other options are true: some ECMs will prevent engine cranking if the exhaust system has overheated, air in the fuel system can prevent the engine from starting, and a failed turbo may prevent the engine from starting (due to lack of combustion pressure buildup).

75.

All the following should occur if a thermostat is working, EXCEPT:

The upper radiator hose remains cool to the touch

The upper radiator hose gets hot

The thermostat closes when the engine is cold

The thermostat opens when the engine is hot

Correct answer: The upper radiator hose remains cool to the touch

When a thermostat is working normally, the upper radiator is hot to touch. The thermostat closes when the engine is cold to prevent coolant flow but opens when the engine is hot.

Once the engine is running at normal temperature, the upper radiator hose should not be cool enough to touch.

76.

Most manufacturers recommend air filter replacement when inlet restriction measures how many inches of vacuum?

25

10

15

30

Correct answer: 25

Most diesel engines are equipped with re-settable inlet restriction gauges. Most manufacturers recommend filter replacement when the gauge reads 25 inches of vacuum.

77.

Technician A says when an engine compression brake is energized, it opens the intake valves before the compression stroke is complete. Technician B says during engine braking, the compressed air from a cylinder is released into the exhaust system. Who is correct?

Technician B

Technician A

Both A and B

Neither A nor B

Correct answer: Technician B

Only technician B is correct. During engine braking, the compression brake opens the exhaust valves before the compression stroke. This prevents combustion from occurring in the cylinder. The compressed air is then diverted to the exhaust system.

Technician A is wrong because it's the exhaust valves that are held open, not the intake valves.

78.

The suction side and the charge side of the fuel system are divided by the:

Fuel transfer pump

Primary filter

Fuel tank

Secondary filter

Correct answer: Fuel transfer pump

The diesel fuel system is divided into two sections: the suction side and the charge side. The fuel transfer pump is the clear divide between the two.

79.

A flywheel is being checked for runout. The clutch face is 14 inches in diameter. What is the maximum allowable runout?

.007"

.014"

.0014"

.0035"

Correct answer: .007"

The typical allowable runout is .001" per inch of clutch radius. A 14" clutch would have a radius of 7"; therefore, the maximum allowable runout would be .007".

80.

Diesel fuel drains back into the tank after the vehicle has been sitting overnight. Technician A says a stuck-closed return check valve may be the cause. Technician B says a restricted supply line may be the cause. Who is correct?

Neither A nor B

Technician A

Technician B

Both A and B

Correct answer: Neither A nor B

Both technicians are wrong. A stuck-closed return check valve may result in lower power and overheated fuel, but it will not result in fuel that drains back into the tank. Likewise, a restricted supply line may result in lower power, but it will not result in fuel that drains back into the tank.

81.

Technician A says the cooling system can be bled using a vacuum tool. Technician B says the cooling system can be bled by loosening a hose or fitting on top of the cooling system. Who is correct?

Both A and B

Technician A

Technician B

Neither A nor B

Correct answer: Both A and B

Both technicians are correct. There are several methods for bleeding a cooling system, including opening a bleeder valve, opening a hose or fitting on top of the engine, or using a vacuum tool.

82.

Technician A says too much valve lash will cause the valve to open less than what is specified. Technician B says too much injector lash may result in a piston-to-valve contact. Who is correct?

Technician A

Technician B

Both A and B

Neither A nor B

Correct answer: Technician A

Only technician A is correct; too much valve lash will cause the valve to open less than what is specified. Technician B is wrong because too much injector lash can result in injector damage, but it will not cause piston-to-valve contact.

83.

Technician A says head gasket surfaces can be checked with Magnaflux. Technician B says a cylinder block can be checked for cracks using a comparator. Who is correct?

Neither A nor B

Technician A

Technician B

Both A and B

Correct answer: Neither A nor B

Both technicians are wrong. Magnaflux can be used to check for cracks in a cylinder block, or dye penetrant may be used. Head gasket surfaces should be checked with a comparator to ensure they are machined correctly.

84.

Technician A says an obstructed breather tube can result in engine oil leaks. Technician B says a loss of oil through the breather tube indicates excessive crankcase vacuum. Who is correct?

Technician A

Technician B

Both A and B

Neither A nor B

Correct answer: Technician A

Only technician A is correct. A restricted breather tube can cause excessive crankcase pressure, resulting in engine oil leaks. Technician B is wrong because a loss of oil through the breather tube indicates excessive crankcase pressure, not vacuum.

85.

Technician A says that torque-to-yield (TTY) cylinder head bolts can only be used once. Technician B says that some cylinder head bolts require measuring the bolt stretch during installation to ensure proper tightening.

Who is correct?

Both A and B

Technician A

Technician B

Neither A nor B

Correct answer: Both A and B

Both technicians are correct. Some cylinder head bolts are torqued to yield stretch when they are tightened. This type of bolt can only be used once. Some bolts also have torque plus angle specifications that require the bolt to be torqued and then turned a specific number of degrees. In some cases, the bolt stretch must be measured during installation to ensure proper tightening.

86.

What is the internal resistance rating of most high-impedance meters?

10,000,000 ohms

1,000 ohms

10,000 ohms

100,000 ohms

Correct answer: 10,000,000 ohms

A high-impedance meter is recommended when testing sensitive computer management systems. This type of meter typically has an internal resistance of around 10,000,000 ohms.

87.

A DPF filter is found to be clogged. Which of the following is the **most** likely cause?

The incorrect engine oil has been used

The wrong air filter has been installed

Low urea level

Low oil level

Correct answer: The incorrect engine oil has been used

A diesel vehicle equipped with a DPF filter requires the use of low-ash oil. Any other type of oil may cause the DPF to clog.

88.

Technician A says rubber-bonded vibration dampers should be checked for lateral and radial runout. Technician B says some manufacturers recommend heating viscous-filled dampers in the oven for 30 minutes to check for leaks. Who is correct?

Technician B

Technician A

Both A and B

Neither A nor B

Correct answer: Technician B

Only technician B is correct that some manufacturers recommend heating viscous-filled dampers in the oven for 30 minutes to check for leaks. Technician A is wrong because viscous-filled dampers should be checked for runout, whereas rubber-bonded dampers should be checked for missing or swollen rubber.

89.

Electrical connector diagnosis is being discussed. Technician A says weather pack seals can be probed through. Technician B says failed molded-on connectors typically require complete replacement of the connector. Who is correct?

Technician B

Technician A

Both A and B

Neither A nor B

Correct answer: Technician B

Only technician B is correct; failed molded-on connectors typically require complete replacement of the connector. Technician A is wrong because weather pack seals should never be probed through. To test a connector with this type of seal, a special connector adapter should be used.

90.

A fuel system is being bled of air. Which of the following steps should be performed **first**?

Locate and crack open the bleed point in the system

Actuate the hand pump until all bubbles exit the system

Crank the engine in 30-second segments

Remove the fuel filter

Correct answer: Locate and crack open the bleed point in the system

To bleed the fuel system of air, first start by locating and cracking open the bleed point in the system. Then, actuate the hand pump until all the bubbles exit the system. Finally, close the bleed point and crank the engine in 30-second intervals with two minute segments in between until the engine starts.

91.

Technician A says the engine oil temperature sensor (EOT) is an input to the ECM for fan control. Technician B says the intake air temperature sensor (IAT) is an input to the ECM for fan control. Who is correct?

Technician A

Technician B

Both A and B

Neither A nor B

Correct answer: Technician A

Only technician A is correct. Typical inputs to the ECM for fan control include the engine oil temperature sensor, coolant temperature sensor and air conditioning pressure switch.

92.

The SCA concentration of a cooling system is being tested. An acidity reading below 7.5 on the pH scale typically indicates what?

Corrosion

Low acidity

Normal coolant condition

Oil/coolant intermix

Correct answer: Corrosion

Generally, manufacturers recommend that the coolant SCA be tested at each oil change. Typically, a normal pH reading falls between 7.5 and 11 on the pH scale. A reading of less than 7.5 indicates corrosion, coolant exposure to combustion gases, or coolant degradation.

93.

Technician A says all diesel engines use 15W-40 oil. Technician B says it is not recommended to pour oil into a new filter prior to installation. Who is correct?

Technician B

Technician A

Both A and B

Neither A nor B

Correct answer: Technician B

Technician B is correct that it is no longer a general recommendation to pour oil into a new filter prior to installation. This practice may result in unfiltered oil entering the engine. Technician A is wrong because many diesel engines do require 15W-40, but others require different weights such as 5W-30. The only way to know for certain is to check the manufacturer's recommendations.

94.

To measure the assembled connecting rod and cap bore, what directions should be checked?

Four

Three

Two

Six

Correct answer: Four

The assembled connecting rod and cap bore need to be measured for concentricity (out-of-round). To verify the specifications, all measurements should be taken from a minimum of four directions.

These readings should be compared with the manufacturer's guidelines.

95.

All the following are part of an engine braking system EXCEPT:

Master cylinder

Exhaust valve

Master piston

Slave piston

Correct answer: Master cylinder

A master cylinder would be found in a traditional brake system. It is not needed with the engine brake system.

All the other components are part of an engine braking system.

96.

All of the following are true regarding exhaust brakes **except**:

All of the cylinders are continuously used for brake operation

Braking force is the greatest at high engine speeds

Most engine brakes are adjustable

Some engine brakes can be be checked for clearance between the slave piston and crosshead

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Correct answer: All of the cylinders are continuously used for brake operation

Engine brakes allow the driver to select the desired amount of control. Some or all of the cylinders may be selected for brake operation.

97.

An EGR valve is stuck open. All of the following may result **except**:

Increased combustion temperatures

Surging

Lower power

Illuminated check engine light

Correct answer: Increased combustion temperatures

Exhaust gases are used to lower combustion temperature and reduce NOx emissions. An EGR valve that is stuck closed will raise combustion temperatures, whereas a valve that is stuck open will have the opposite effect.

98.

A diesel engine is found to have fuel in the radiator. Which of the following is the **most** likely cause?

A cracked cylinder head

A leaking fuel injector

A cracked fuel cooler

A damaged radiator

Correct answer: A cracked cylinder head

Some diesel engines have both fuel passages and coolant cast into the cylinder head. A crack in one of these fuel passages could result in coolant/fuel intermix in the radiator.

99.

A diesel engine emits black smoke and lacks power. Technician A says a restricted air intake hose could be the cause. Technician B says excessive exhaust back pressure could be the cause. Who is correct?

Both A and B

Technician A

Technician B

Neither A nor B

Correct answer: Both A and B

Both technicians are correct. Air starvation will generally result in incomplete combustion, which results in black smoke, a decrease in power and heat buildup in the cylinder. Two potential causes of air starvation are a restricted air intake hose and excessive exhaust back pressure.

100.

Technician A says an ECM with incorrect programming can result in a blown head gasket. Technician B says a stuck-closed thermostat can result in a blown head gasket. Who is correct?

Both A and B

Technician A

Technician B

Neither A nor B

Correct answer: Both A and B

Both technicians are correct. An ECM with incorrect programming could result in excessive cylinder pressure and a blown head gasket. A stuck-closed thermostat could result in engine overheating and a blown head gasket.