PRACTICE EXAM 12: A9 LIGHT VEHICLE DIESEL ENGINES SIMULATION (60 QUESTIONS)

1. Two technicians discuss diagnosing an intermittent diesel no-start. Technician A says a wiring diagram is unnecessary once a trouble code is stored. Technician B says the complaint should be verified and the conditions documented before testing. Who is correct?

A. Technician A only

B. Technician B only

C. Both Technicians A and B

D. Neither Technician A nor B

2. On a common-rail diesel, which component meters how much fuel the high-pressure pump delivers to the rail?

A. The rail-pressure relief valve

B. The fuel/water separator bowl

C. The return-line check valve

D. The fuel metering (suction-control) valve

3. All of the following can cause low turbocharger boost EXCEPT:

A. an over-rich injector calibration code

B. a leaking charge-air cooler core

C. carbon-bound variable-geometry vanes

D. a restricted exhaust after the turbine

4. Two technicians discuss valve-train wear. Technician A says a worn rocker or follower changes valve lash and can alter lift. Technician B says valve lash never affects engine performance. Who is correct?

A. Technician A only

B. Technician B only

C. Both Technicians A and B

D. Neither Technician A nor B

5. What is the primary purpose of a charge-air cooler on a turbo-diesel?

A. To filter abrasive particles from the intake air

B. To raise exhaust temperature for regeneration

C. To cool compressed intake air and raise its density

D. To recirculate exhaust gas into the intake

6. A diesel shows low oil pressure only when hot at idle but normal pressure when cold. The MOST likely cause is:

A. a pressure-relief valve stuck in the closed position

B. worn bearings increasing clearance as the oil thins

C. a plugged piston oil-cooling jet passage

D. an overfilled crankcase aerating the oil

7. Which condition would MOST likely set a "rail pressure too low" code under heavy load?

A. An intake air temperature sensor reading high

B. A plugged diesel particulate filter

C. A stuck-open exhaust gas recirculation valve

D. A worn high-pressure pump low on volume

8. A diesel has a knock that worsens under load and is loudest at the lower block. This MOST likely indicates:

A. a sticking upper valve-train component

B. a loose turbocharger compressor wheel

C. worn connecting-rod bearings

D. a glazed accessory drive belt

9. Why is fuel lubricity a concern with ultra-low-sulfur diesel?

A. Low sulfur reduces lubricity, risking pump and injector wear

B. Low sulfur raises lubricity, causing injector flooding

C. Low sulfur increases cetane beyond safe limits

D. Low sulfur lowers the fuel's energy content sharply

10. Blue smoke at idle on a turbo-diesel, with oil found in the intake tract, MOST likely indicates:

A. a plugged engine air filter element

B. failed turbocharger oil seals

C. a thermostat stuck in the open position

D. a contaminated mass airflow sensor

11. Two technicians discuss low-pressure fuel supply. Technician A says a suction-side air leak can cause hard starting and rough running. Technician B says the lift pump's job is to atomize fuel in the cylinder. Who is correct?

A. Technician B only

B. Both Technicians A and B

C. Neither Technician A nor B

D. Technician A only

12. After grinding valve seats, the seat width and angle must be correct primarily to:

A. increase the valve-spring installed height

B. raise the camshaft lobe lift slightly

C. ensure proper sealing and heat transfer

D. reduce the cylinder-bore taper

13. A diesel injector leak-off test returns far more fuel on one cylinder than the others. This identifies:

A. a worn injector leaking off excessively

B. a properly sealing new injector

C. a contaminated engine air filter

D. a stuck-closed EGR cooler valve

14. Freeze-frame data is MOST useful to a technician because it:

A. lists the labor time for the repair

B. captures the conditions present when the code set

C. names the exact failed component

D. records the total cost of the repair

15. Which step is LEAST appropriate as the first action when a diesel sets a sensor circuit code?

A. Verifying the customer's described symptom

B. Reviewing freeze-frame and live data

C. Replacing the named sensor immediately

D. Inspecting the wiring and connectors

16. A plugged diesel particulate filter affects the turbocharger by:

A. raising the low-pressure fuel supply

B. overcooling the intake air charge

C. increasing the alternator output

D. raising back-pressure and lowering boost

17. Which is the correct reason a fuel/water separator is drained on schedule?

A. To raise the fuel's cetane rating

B. To protect high-pressure parts from corrosion

C. To cool the fuel returning to the tank

D. To remove ash before the fuel filter

18. Low-SAPS engine oil is specified on after-treatment diesels mainly to:

A. protect the particulate filter and catalysts

B. raise the fuel's cetane number

C. increase the coolant's boiling point

D. remove the need for piston oil-cooling jets

19. Which fuel property most directly affects cold-weather filter plugging?

A. The fuel's cetane number

B. The fuel's energy content

C. The fuel's cold filter plugging point

D. The fuel's sulfur concentration

20. Connecting-rod side clearance is correctly measured with a:

A. micrometer on the rod journal surface

B. bore gauge inside the rod big end

C. dial indicator against the piston crown

D. feeler gauge between the rod and crank cheek

21. A HEUI injector is actuated by:

A. fuel from a shared common rail

B. high-pressure engine oil via the IPR valve

C. a camshaft lobe at each injector

D. compressed air from the intake

22. Selective catalytic reduction lowers NOx by:

A. using ammonia from DEF to form nitrogen and water

B. trapping the NOx as soot in the filter

C. recirculating the NOx back to the intake

D. oxidizing the NOx into carbon dioxide

23. Two technicians discuss a no-rail-pressure no-start. Technician A says excessive injector leak-off can bleed the rail. Technician B says the metering valve should be checked for proper response. Who is correct?

A. Technician A only

B. Technician B only

C. Neither Technician A nor B

D. Both Technicians A and B

24. To separate an air-side from a fuel-side cause of black smoke with low boost, the technician compares:

A. coolant temperature to engine oil temperature

B. battery voltage to alternator output

C. actual boost to commanded boost

D. DEF level to the NOx sensor readings

25. A diesel runs rough with a cylinder-balance code right after an injector swap, though the injector tests good. The technician forgot to:

A. flush the engine cooling system

B. program the injector calibration code

C. replace the low-pressure lift pump

D. bleed the cooling system of air

26. Torque-to-yield head bolts should generally be:

A. reused after cleaning the threads

B. replaced when the manufacturer specifies

C. tightened to one low value only

D. left finger-tight before final run-down

27. A pilot injection ahead of the main event mainly serves to:

A. soften the pressure rise and cut combustion noise

B. burn ash in the particulate filter

C. cool the SCR catalyst before dosing

D. build rail pressure faster while cranking

28. A variable-geometry turbocharger can support exhaust braking because it can:

A. add fuel to the exhaust stream

B. cool the intake charge on demand

C. recirculate exhaust to the intake

D. close its vanes to raise back-pressure

29. Electronic unit injectors (EUI) create high injection pressure by being driven:

A. from a shared common rail manifold

B. by high-pressure engine oil

C. mechanically by a camshaft lobe

D. by the low-pressure lift pump alone

30. A blocked piston oil-cooling jet will MOST likely cause:

A. piston overheating and scuffing

B. a no-crank starting condition

C. excessively high common-rail pressure

D. an overcharged battery condition

31. Coolant dripping from the water-pump weep hole indicates:

A. a thermostat stuck in the closed position

B. a failed water-pump shaft seal

C. a cracked radiator end tank

D. a leaking EGR cooler core

32. Cylinder bore taper is found by measuring the bore diameter:

A. at one point near the bottom only

B. across to an adjacent cylinder bore

C. at the crankshaft main journal

D. at the top and bottom of ring travel

33. Biodiesel can plug a fuel filter soon after first use because it:

A. raises the fuel's sulfur content

B. lowers injection pressure permanently

C. loosens existing deposits as a solvent

D. cannot pass through a standard filter

34. All of the following are functions of the EGR system EXCEPT:

A. raising the peak combustion temperature

B. lowering the peak combustion temperature

C. reducing NOx formation in the cylinder

D. recirculating a measured amount of exhaust

35. A noise occurring at one-half crankshaft speed on a four-stroke diesel points to the:

A. connecting-rod bearings

B. valve-train components

C. crankshaft main bearings

D. turbocharger center section

36. Aggressive abrasive pads on an aluminum cylinder head are avoided because they can:

A. raise the valve-spring installed height

B. increase the camshaft lobe lift

C. remove metal and ruin surface flatness

D. lower the fuel's cetane number

37. Two technicians discuss vibration diagnosis. Technician A says a driveline vibration changes with engine speed while the vehicle is stopped. Technician B says an engine vibration changes with road speed. Who is correct?

A. Technician A only

B. Technician B only

C. Both Technicians A and B

D. Neither Technician A nor B

38. A valve face may be reground only if the valve retains:

A. adequate margin after grinding

B. a slightly bent stem within limits

C. a worn keeper groove at the tip

D. extra clearance in the valve guide

39. Oil found pooled inside the charge-air cooler MOST likely points to:

A. a clogged engine air filter element

B. a stuck-closed EGR valve

C. leaking turbocharger compressor seals

D. a thermostat stuck in the open position

40. A diesel particulate filter accumulates ash that regeneration cannot burn. This ash comes mainly from:

A. soot formed during normal combustion

B. engine oil additives

C. condensed exhaust water

D. unburned post-injection fuel

41. An internally leaking oil-to-coolant oil cooler will MOST likely produce:

A. a no-crank starting condition

B. excessively high common-rail pressure

C. a plugged diesel particulate filter

D. cross-contamination of oil and coolant

42. The low-pressure (lift) pump's primary job is to:

A. ensure the high-pressure pump has an adequate supply

B. atomize the fuel inside the combustion chamber

C. store high-pressure fuel for the injectors

D. cool the SCR catalyst during dosing

43. A bent connecting rod will MOST likely cause:

A. excessive crankshaft end-play

B. a stuck variable-geometry turbocharger

C. uneven bearing and cylinder wear on that cylinder

D. low common-rail fuel pressure

44. The rail-pressure sensor allows the ECM to:

A. measure the returning fuel temperature

B. control rail pressure in closed loop

C. count the injection events per cycle

D. detect water in the separator bowl

45. A diesel oxidation catalyst (DOC) aids regeneration by:

A. trapping soot particles physically

B. dosing diesel exhaust fluid into the flow

C. recirculating exhaust to the intake

D. oxidizing hydrocarbons to generate heat

46. Two technicians discuss diagnostic trouble codes. Technician A says a code names a circuit, not always a failed part. Technician B says the named part should always be replaced first. Who is correct?

A. Technician A only

B. Technician B only

C. Both Technicians A and B

D. Neither Technician A nor B

47. A return-line fuel cooler is used primarily to:

A. raise the fuel's cetane rating

B. add lubricity additives to the fuel

C. shed heat from the hot returning fuel

D. separate water from the fuel supply

48. A diesel cylinder-head deck is checked with a straightedge and feeler gauge to measure:

A. the valve-guide-to-stem clearance

B. the head warpage or flatness

C. the camshaft lobe lift value

D. the valve-spring seat pressure

49. A water-in-fuel warning lamp means the technician should:

A. drain the water from the separator bowl

B. replace the high-pressure pump at once

C. raise the commanded rail pressure

D. reprogram all of the fuel injectors

50. Downstream and upstream NOx sensors reading nearly equal on an SCR system indicates:

A. fully effective NOx reduction

B. an overfilled DEF storage tank

C. excessive turbocharger boost

D. poor NOx conversion from a fault

51. Cetane number describes a diesel fuel's:

A. resistance to autoignition

B. energy content per gallon

C. readiness to autoignite

D. sulfur concentration level

52. Before condemning the oil pump for low pressure, the technician should FIRST check:

A. the camshaft lobe lift values

B. the oil level, condition, and viscosity

C. the charge-air cooler for leaks

D. the rail-pressure sensor signal

53. Multiple injection events per cycle in a common-rail system primarily improve:

A. control of noise, emissions, and combustion

B. separation of water from the fuel

C. cooling of the after-treatment system

D. charging of the batteries at idle

54. During bottom-end reassembly, rotating the crank by hand after each torque stage is done to:

A. seat the piston rings to the bores

B. prime the high-pressure fuel pump

C. set the camshaft-to-crank timing

D. confirm the assembly turns without binding

55. A main bearing with embedded grit and fine scratches across its face indicates:

A. oil starvation and film breakdown

B. fatigue from high combustion loads

C. abrasive dirt contamination in the oil

D. correct clearance with a strong film

56. A vague "lacks power" complaint should first be handled by:

A. replacing the most likely worn part

B. defining when and how it occurs

C. estimating the repair's resale impact

D. clearing all of the stored trouble codes

57. A variable-geometry turbo gives low boost off idle with heavily sooted vanes. The MOST likely cause is:

A. a cracked charge-air cooler core

B. a thermostat stuck in the open position

C. a failed low-pressure lift pump

D. carbon binding the variable vanes

58. A persistent low reading from the low-pressure supply to the high-pressure pump will MOST likely cause:

A. inability to build proper rail pressure

B. overcharged starting batteries

C. excessively low coolant temperature

D. a stuck-open exhaust gas recirculation valve

59. A thermostat stuck open on a diesel MOST likely produces:

A. rapid overheating under heavy load

B. coolant loss from the weep hole

C. cold running, white smoke, and failed regens

D. oil and coolant cross-contamination

60. A diesel loses power only under load, with rail pressure dropping below command at high flow. The MOST likely faulty part is the:

A. intake air temperature sensor

B. exhaust back-pressure sensor

C. return-line fuel cooler

D. high-pressure fuel pump

PRACTICE EXAM 12 – ANSWER KEY (Questions 1–60)

1. B — Verifying the complaint and documenting the conditions before testing is the correct first step, and a wiring diagram remains essential for circuit-level diagnosis even when a code is stored. A code names a circuit, not always a failed part, so Technician A is wrong. Confirming the fault first prevents chasing the wrong problem.

2. D — The fuel metering valve (suction-control valve) regulates how much fuel the high-pressure pump sends to the rail, letting the ECM control rail pressure. It is the main pressure-control actuator on the supply side. Diagnosing rail-pressure faults starts with this valve's command and response.

3. A — Low boost is an air-system condition; an injector calibration code is a fueling item and does not reduce boost. A leaking cooler, sticking VGT vanes, and an exhaust restriction all genuinely lower boost. Recognizing which faults belong to the air side keeps diagnosis on track.

4. A — A worn rocker or follower changes valve lash, which alters effective lift and timing and hurts performance, so Technician A is right. Technician B is wrong because lash directly affects how the valves open. Correct lash is essential to proper breathing and power.

5. C — A charge-air cooler cools the compressed intake air to raise its density, packing more oxygen into the cylinder for more power and lower combustion temperature. It works on intake air, not exhaust. Denser charge air is the reason intercooling improves output.

6. B — Low oil pressure that appears only when hot at idle points to worn bearings whose clearance lets thinned hot oil escape faster. Cold, thicker oil masks the wear. Bearing clearance is the controlling factor in hot idle oil pressure.

7. D — A worn high-pressure pump low on volume cannot keep rail pressure up at high load, setting a low-rail-pressure code. The shortfall appears under demand, not at idle. Comparing commanded to actual pressure across load isolates the pump.

8. C — A knock that worsens under load and is loudest low in the block indicates worn connecting-rod bearings. Load increases the cylinder force on the loose bearing. Locating the noise by load and position points to the bottom end.

9. A — Removing sulfur from diesel also lowers its natural lubricity, risking accelerated high-pressure pump and injector wear, which is why lubricity additives are blended in. Low-lubricity fuel wears precision parts quickly. Adequate lubricity protects injection-system durability.

10. B — Blue smoke with oil in the intake tract indicates failed turbocharger oil seals letting oil into the charge air. The oil then burns in the cylinders. Finding oil upstream of the intake directs diagnosis to the turbo.

11. D — Technician A is correct that a suction-side air leak causes hard starting and rough running; Technician B is wrong because injectors, not the lift pump, atomize the fuel. The lift pump only supplies fuel to the high-pressure pump. Knowing each pump's role prevents misdiagnosis.

12. C — Correct seat width and angle ensure the valve seals tightly and transfers heat into the head, which is the seat's main job. An incorrect band prevents sealing and lets the valve overheat. Width and angle are checked after every seat grind.

13. A — A cylinder returning far more fuel than the others on a leak-off test has a worn injector leaking off excessively. The excess return isolates the failing unit. The test pinpoints the bad injector without removing it.

14. B — Freeze-frame data captures the operating conditions present at the moment the code set, helping reproduce the fault. It is a snapshot, not a repair, part name, or cost record. This makes it especially valuable for intermittent problems.

15. C — Replacing the named sensor immediately is the least appropriate first step, since a code names a circuit that may fail from wiring or connector faults. Verifying the symptom, reviewing data, and inspecting wiring should come first. Testing before replacing avoids installing unneeded parts.

16. D — A plugged particulate filter raises exhaust back-pressure that starves the turbine, so boost falls. The restriction limits the turbo's drive energy. This is why a plugged DPF belongs on any low-boost differential.

17. B — The fuel/water separator is drained to keep collected water from reaching and corroding the high-pressure components. Water is diesel fuel's most damaging contaminant. Scheduled draining protects the injection system.

18. A — Low-SAPS oil limits ash, phosphorus, and sulfur to protect the particulate filter and catalysts from contamination and plugging. The correct oil preserves after-treatment life. The wrong oil accelerates ash loading.

19. C — The cold filter plugging point is the temperature at which wax crystals begin plugging the fuel filter, directly governing cold-weather operability. Exceeding it starves the engine. Winter fuel and a fuel heater address this property.

20. D — Connecting-rod side clearance is measured with a feeler gauge between the rod and the crankshaft cheek. Micrometers and bore gauges measure journal or bore dimensions instead. Correct side clearance ensures proper rod lubrication and movement.

21. B — A HEUI injector is actuated by high-pressure engine oil regulated by the injection pressure regulator (IPR) valve. Injection therefore depends on the high-pressure oil system and oil condition. This distinguishes HEUI from common-rail and unit-injector designs.

22. A — SCR uses ammonia derived from DEF to chemically reduce NOx into harmless nitrogen and water vapor. It is the primary NOx-control technology on modern diesels. Proper DEF dosing and catalyst function are required for compliance.

23. D — Both technicians are correct: excessive injector leak-off can bleed the rail and prevent pressure buildup, and the metering valve should be verified for proper response. Both are valid causes of a no-rail-pressure no-start. Checking each isolates the fault.

24. C — Comparing actual boost to commanded (desired) boost separates an air-side from a fuel-side cause of black smoke. A gap points to the air system; matching values shift suspicion to fueling. This comparison directs diagnosis efficiently.

25. B — A new injector that runs rough and sets a balance code despite testing good was installed without its calibration code programmed. The ECM cannot compensate for the injector's variation without it. Programming the code resolves the rough running.

26. B — Torque-to-yield bolts are stretched into yield and are usually single-use, so they should be replaced when the manufacturer specifies. Reusing them when replacement is required risks lost clamping force. Following the spec prevents a gasket failure.

27. A — A pilot injection introduces a small fuel charge before the main event to soften the rapid pressure rise and reduce combustion noise. Common-rail pressure control enables these multiple events. It is a noise- and emissions-control strategy.

28. D — A variable-geometry turbo can close its vanes to raise exhaust back-pressure, providing the resistance used for exhaust braking. The same vane control also supports regeneration. This dual capability is unique to VGTs.

29. C — Electronic unit injectors generate high pressure mechanically, with a camshaft lobe driving each injector under electronic control. They do not use a shared rail or high-pressure oil. Identifying this architecture shapes the diagnostic approach.

30. A — A blocked piston oil-cooling jet lets its piston overheat, causing localized overheating and scuffing. The jet normally carries combustion heat from the piston underside. Clearing the jets is a required rebuild step.

31. B — Coolant weeping from the water-pump weep hole is the designed indication of a failed pump shaft seal. It confirms the pump as the leak source. Replacing the pump restores cooling-system integrity.

32. D — Bore taper is found by measuring the bore diameter at the top and bottom of ring travel and comparing the two. The difference is the taper value. Detecting it determines whether the bore can be honed or must be machined.

33. C — Biodiesel's solvent effect loosens existing deposits in the fuel system, and that debris quickly plugs the filter after first use. It does not raise sulfur or block all filtration. Anticipating early filter plugging is part of servicing biodiesel vehicles.

34. A — Raising peak combustion temperature is not an EGR function; EGR lowers peak temperature by diluting the charge, which reduces NOx formation. Lowering temperature, cutting NOx, and recirculating measured exhaust are its real functions. EGR is fundamentally a NOx-reduction system.

35. B — A noise at one-half crankshaft speed points to the valve train, because the camshaft turns at half crank speed on a four-stroke engine. Rod and main bearing noises track crankshaft speed instead. This timing clue localizes the source.

36. C — Aggressive abrasive pads can remove metal from an aluminum head and ruin the flatness needed to seal, especially with MLS gaskets. Preserving flatness and finish protects the seal. Careful cleaning avoids ruining the head.

37. D — Neither technician is correct: a driveline vibration tracks road speed, not engine speed at a stop, and an engine vibration tracks engine speed, not road speed. Both statements reverse the relationships. Correlating vibration to engine versus road speed is what separates the sources.

38. A — A valve face can be reground only if it retains adequate margin afterward; too thin a margin overheats and burns. Without enough margin the valve must be replaced. Checking margin determines serviceability.

39. C — Oil pooled in the charge-air cooler comes from leaking turbocharger compressor-side seals upstream pushing oil into the intake. It signals a failing turbo, often with blue smoke. Finding oil in the cooler directs diagnosis to the turbocharger.

40. B — Ash that regeneration cannot burn comes mainly from engine oil additives, gradually filling the particulate filter. Unlike soot, it is not combustible. Low-SAPS oil slows this accumulation.

41. D — An internal leak in an oil-to-coolant oil cooler cross-contaminates the oil and coolant, producing milky oil or oil in the coolant. It does not cause a no-crank or rail-pressure fault. This finding points to the oil cooler or another internal crossover.

42. A — The low-pressure lift pump's primary job is to ensure the high-pressure pump always has an adequate fuel supply so it can build rail pressure. The injectors, not the lift pump, atomize the fuel. Inadequate supply causes hard starting and low power.

43. C — A bent connecting rod misaligns the piston and journal, causing uneven bearing and cylinder-wall wear on that cylinder. The misalignment loads the parts unevenly. Detecting it explains one-sided wear and prevents a repeat failure.

44. B — The rail-pressure sensor lets the ECM control rail pressure in closed loop by adjusting the metering and pressure-control valves to hold the commanded value. Comparing commanded to actual pressure is central to high-pressure diagnosis. The sensor enables precise control.

45. D — The diesel oxidation catalyst aids regeneration by oxidizing hydrocarbons to generate the heat that burns soot in the filter. It also converts CO and HC. Its heat-generating role is essential to active regeneration.

46. A — Technician A is correct that a trouble code names a circuit, not always a failed part; Technician B is wrong because replacing the named part first wastes parts and time. The circuit and monitored system must be tested first. Testing before replacing is the professional standard.

47. C — A return-line fuel cooler sheds heat from fuel returning hot from the high-pressure system, protecting tank and pump components and maintaining fuel density. Excess fuel heat can damage those parts. The cooler manages return-fuel temperature.

48. B — A straightedge and feeler gauge across the deck measure head warpage (flatness) by revealing any gap against the maximum specification. This determines whether the head can be reused or must be machined. It does not measure guide clearance or lobe lift.

49. A — A water-in-fuel warning means the separator has collected water that must be drained before it reaches the injection system. Draining removes the damaging contaminant. Ignoring it allows water to corrode high-pressure components.

50. D — A downstream NOx sensor reading nearly equal to the upstream sensor shows little NOx is being converted, indicating a dosing or SCR catalyst fault. Effective reduction would show a much lower downstream value. Comparing the two sensors directly measures conversion efficiency.

51. C — Cetane number measures the fuel's readiness to autoignite; higher cetane shortens ignition delay for smoother starting and combustion. It is the opposite of gasoline octane, which resists ignition. Cetane directly affects cold-start and noise behavior.

52. B — Before condemning the oil pump for low pressure, the technician first checks oil level, condition, and viscosity, since low or wrong oil is a common, easily verified cause. These simple checks rule out the most frequent causes. Confirming them prevents replacing a good pump.

53. A — Multiple injection events per cycle in a common-rail system improve control of noise, emissions, and combustion quality independent of engine speed. The stored rail pressure enables this flexibility. These multiple events are a defining advantage of common rail.

54. D — Rotating the crankshaft by hand after each torque stage confirms the assembly turns freely with no binding, catching a misassembly before startup. A bind found by hand is far cheaper than one found running. This check is standard reassembly discipline.

55. C — Embedded grit and fine scratches across the bearing face indicate abrasive dirt contamination carried in the oil. A wiped, heat-discolored surface would instead mean oil starvation. Reading the pattern identifies the root cause.

56. B — A vague "lacks power" complaint must first be defined by establishing when and how it occurs so it can be reproduced and later confirmed as repaired. A reproducible fault is a diagnosable fault. Vague descriptions hide the actual problem.

57. D — Low boost off idle with heavily sooted vanes indicates carbon binding the variable vanes so they cannot close to build boost early. Sticking vanes are a common VGT problem. Cleaning or replacing the affected parts restores boost response.

58. A — A persistently low low-pressure supply starves the high-pressure pump, so it cannot build proper rail pressure, causing hard starting and low power. The pump can only pressurize the fuel it receives. This is why supply pressure is checked before suspecting high-pressure parts.

59. C — A thermostat stuck open keeps the engine from reaching operating temperature, producing cold running, white smoke, poor economy, and failed regenerations. The engine never warming up is the defining clue. The other choices cause overheating or contamination.

60. D — Power loss under load with rail pressure dropping below command at high flow points to a worn high-pressure fuel pump that cannot supply enough volume. At light load the pump keeps up. Comparing commanded and actual pressure across load isolates the fault.