PRACTICE EXAM 16: A9 LIGHT VEHICLE DIESEL ENGINES SIMULATION (60 QUESTIONS)

1. A diesel runs well but a faint knock increases sharply with load and is loudest near the crankshaft area, easing when one cylinder is cut. The MOST likely cause is a:

A. valve adjusted with excessive lash clearance

B. glow plug that has failed open on that cylinder

C. worn main or rod bearing in the affected area

D. fuel/water separator that needs to be drained

2. A diesel's high-pressure pump uses a metering (suction control) valve. Its function is to:

A. control how much fuel enters the pump to set rail pressure

B. atomize the fuel as it leaves the injector nozzle

C. cool the fuel before it returns to the storage tank

D. open the wastegate to limit turbocharger boost

3. A diesel exhibits low power, and the scan tool shows the EGR valve commanded closed but stuck partly open. The MOST likely symptom is:

A. excessively high NOx output and lean misfire codes

B. rough running, low power, and possible black smoke

C. continuous overcharging of the starting batteries

D. a no-crank condition at the starter motor circuit

4. A diesel's cooling system is being bled after a repair. The bleeding step is necessary to:

A. raise the cetane number of the diesel fuel

B. meter diesel exhaust fluid into the exhaust

C. remove trapped air that causes hot spots and poor cooling

D. program the injector calibration codes into the ECM

5. A diesel's piston is removed and shows vertical scoring on the skirt and signs of overheating. A likely cause is:

A. coolant leaking past the head gasket into the cylinder

B. inadequate piston cooling or lubrication causing scuffing

C. a thermostat that is stuck in the open position

D. air drawn into the fuel on the suction side of the pump

6. A diesel's injectors must be coded to the ECM after replacement. Skipping this step will MOST likely cause:

A. coolant contamination of the engine oil supply

B. a no-crank condition at the starter motor circuit

C. uneven fueling and rough running across cylinders

D. overcharging of the vehicle's starting batteries

7. A diesel's exhaust back-pressure measures far above specification. A likely cause is a:

A. plugged diesel particulate filter or a crushed pipe

B. clogged engine intake air filter element

C. thermostat stuck in the wide-open position

D. glow plug control module that has failed open

8. A diesel's turbocharger compressor wheel shows damage from impact. The MOST likely source is:

A. coolant entering the intake through the head gasket

B. excessive boost pressure from a stuck wastegate

C. fuel leaking into the intake from a bad injector

D. debris passing through a failed or bypassed air filter

9. A diesel's fuel temperature sensor reads much higher than actual. The ECM may respond by:

A. raising the alternator charging output voltage

B. reducing fueling to protect against perceived hot fuel

C. commanding a no-crank condition at the starter

D. increasing the diesel exhaust fluid dosing rate

10. A diesel's valve lash is checked and found at zero on a mechanical-lifter engine. This MOST likely means the:

A. lash is correctly set within specification

B. valve spring has lost all of its tension

C. valve is being held slightly off its seat

D. camshaft lobe has worn completely flat

11. A diesel's oil analysis shows fuel dilution and a fuel smell. An internal source to investigate is a:

A. failed oil cooler letting coolant into the oil

B. clogged air filter restricting intake airflow

C. thermostat stuck in the wide-open position

D. leaking injector washing fuel past the rings

12. A diesel's glow plug "wait-to-start" time is longer on a very cold morning than on a mild one because the controller adjusts for:

A. the diesel exhaust fluid concentration in the tank

B. the boost pressure produced by the turbocharger

C. the engine coolant or intake temperature at start-up

D. the exhaust back-pressure across the particulate filter

13. A diesel's high-pressure fuel system holds pressure that can exceed safe handling limits. The PRIMARY personal hazard during service is:

A. electric shock from the glow plug circuit

B. burns from contact with hot engine coolant

C. inhaling diesel exhaust fluid vapor

D. high-pressure fuel injection injury into the skin

14. A diesel's cooling fan is electric and never runs even when the engine is hot. The technician should check the:

A. diesel exhaust fluid level and quality sensor

B. variable-geometry turbocharger vane position

C. high-pressure fuel pump for adequate output

D. fan relay, fan motor, and the temperature input

15. A diesel's intake charge-air cooler is internally restricted by oil and debris. The MOST likely result is:

A. coolant loss and a steadily overheating engine

B. reduced airflow, lower boost, and power loss

C. a no-crank condition at the starter solenoid

D. overcharging of the vehicle's starting batteries

16. A diesel's connecting-rod bearings are being installed. The bearing tabs (locating lugs) must be:

A. filed flat to allow the bearing to seat fully

B. coated with sealant before the cap is torqued

C. aligned with the notches in the rod and cap

D. installed facing the crankshaft thrust surface

17. A diesel's SCR catalyst is not reducing NOx, and the DEF, dosing, and sensors all test good. The MOST likely remaining cause is a:

A. clogged engine intake air filter element

B. thermostat stuck in the wide-open position

C. glow plug control module that has failed open

D. degraded or contaminated SCR catalyst

18. A diesel's fuel-supply pressure drops sharply only under heavy fuel demand. The MOST likely cause is a:

A. thermostat stuck in the wide-open position

B. weak lift pump or a restricted supply line

C. glow plug control module that has failed open

D. cabin HVAC blower drawing excessive current

19. A diesel's piston rings are installed with the marked side facing the wrong way. The MOST likely result is:

A. coolant contamination of the engine oil supply

B. increased oil consumption and blow-by

C. excessively high common-rail fuel pressure

D. a no-crank condition at the starter motor

20. A diesel's coolant temperature climbs steadily on a long grade despite a full system, and the fan and thermostat test good. A likely cause is a:

A. glow plug control module that has failed open

B. clogged engine intake air filter element

C. stuck-open exhaust gas recirculation valve

D. water pump with an eroded or slipping impeller

21. A diesel's compression test shows even readings slightly below spec on all cylinders with light blow-by. This MOST likely indicates:

A. moderate, even wear consistent with high mileage

B. a single burned valve in one cylinder

C. a head gasket failure between two cylinders

D. one injector dribbling into its cylinder

22. A diesel's exhaust gas recirculation passages are heavily caked with soot and oil. A common contributor besides short trips is:

A. oil vapor from the crankcase ventilation mixing with EGR soot

B. ultra-low-sulfur diesel used in the fuel system

C. high common-rail injection pressure at idle

D. a thermostat that opens at too low a temperature

23. A diesel's water-in-fuel sensor has triggered repeatedly. Beyond draining, the technician should:

A. raise the commanded rail pressure inside the ECM

B. reprogram the injector calibration codes in the ECM

C. find the water source, such as a tank leak or bad fuel

D. command a forced particulate filter regeneration

24. A diesel's turbocharger uses engine oil for lubrication and cooling. Using extended, degraded oil MOST risks:

A. coolant contamination of the engine oil supply

B. turbo bearing wear and oil coking in the housing

C. excessively high common-rail fuel pressure

D. a no-crank condition at the starter motor

25. A diesel's valve guides are worn and oil is entering the cylinders. A correct repair during a head rebuild is to:

A. replace or recondition the guides and renew the seals

B. install stiffer valve springs to hold the valves shut

C. raise the engine oil pressure relief valve setting

D. increase the valve lash to reduce the oil flow

26. A diesel's exhaust shows white smoke and the engine misfires on one cylinder only at all temperatures, with no coolant loss. The MOST likely cause is:

A. a head gasket leaking coolant into that cylinder

B. worn rings allowing oil into that cylinder

C. an injector not igniting fuel properly in that cylinder

D. normal cold-start behavior before the engine warms

27. A diesel's oil pump is gear type and driven by the engine. A worn oil pump will MOST directly cause:

A. reduced oil pressure and volume to the engine

B. coolant contamination of the engine oil supply

C. excessively high common-rail fuel pressure

D. a stuck-open exhaust gas recirculation valve

28. A diesel's DPF differential-pressure sensor reads zero difference across a clearly loaded filter. The MOST likely cause is a:

A. completely clean and freshly serviced filter

B. plugged sensor line or a failed pressure sensor

C. perfectly functioning regeneration cycle

D. high-pressure fuel pump worn beyond spec

29. A diesel's coolant is foaming and the system loses pressure, with a combustion-gas test positive at the radiator. The MOST likely cause is a:

A. radiator clogged with external road debris

B. water pump leaking from its weep hole

C. thermostat stuck in the open position

D. head gasket leaking combustion gas into the coolant

30. A diesel's injector return lines are connected with a clear sight section, and during cranking one injector's return runs much faster. This indicates that injector is:

A. operating correctly within normal tolerance

B. leaking internally more than the others

C. completely blocked and returning no fuel

D. drawing too much current from the ECM

31. A diesel's intake air heater (grid heater) draws no current when commanded on. The technician should check the:

A. heater element, relay, fuse, and supply wiring

B. diesel exhaust fluid level and quality sensor

C. variable-geometry turbocharger vane actuator

D. high-pressure fuel pump metering valve

32. A diesel's crankshaft position sensor fails completely. The MOST likely symptom is:

A. coolant contamination of the engine oil supply

B. overcharging of the vehicle's starting batteries

C. a no-start because the ECM loses the timing reference

D. a permanently plugged diesel particulate filter

33. A diesel's cylinder head is resurfaced too much, raising compression and reducing piston-to-valve clearance. A possible consequence is:

A. piston-to-valve contact and engine damage

B. coolant contamination of the engine oil supply

C. excessively high common-rail fuel pressure

D. a no-crank condition at the starter motor

34. A diesel's fuel returns to the tank through a return cooler. If the cooler is bypassed or removed, the MOST likely effect is:

A. higher fuel temperature and possible power loss when hot

B. coolant contamination of the engine oil supply

C. a no-crank condition at the starter motor circuit

D. overcharging of the vehicle's starting batteries

35. A diesel's EGR valve position sensor disagrees with the commanded position. Before replacing the valve, the technician should:

A. raise the commanded rail pressure inside the ECM

B. command a forced particulate filter regeneration

C. test the valve, actuator, wiring, and for carbon binding

D. reprogram the injector calibration codes in the ECM

36. A diesel's serpentine belt squeals and the charging system is weak. The MOST likely cause is a:

A. high-pressure fuel pump worn beyond specification

B. thermostat stuck in the wide-open position

C. loose belt or a weak tensioner allowing slip

D. glow plug control module that has failed open

37. A diesel's high-pressure pump is gear-driven and must be timed correctly to the engine. Incorrect pump timing will MOST likely cause:

A. coolant contamination of the engine oil supply

B. overcharging of the vehicle's starting batteries

C. a no-crank condition at the starter motor

D. poor running, hard starting, and reduced power

38. A diesel's oil cooler is the oil-to-coolant type. A coolant-side restriction in the cooler will MOST likely cause:

A. coolant entering the engine oil supply directly

B. higher oil temperature from reduced heat transfer

C. excessively high common-rail fuel pressure

D. a no-crank condition at the starter motor

39. A diesel's NOx sensor upstream of the SCR has failed. The MOST likely effect is:

A. coolant contamination of the engine oil supply

B. incorrect DEF dosing and an SCR-related fault

C. excessively high common-rail fuel pressure

D. a no-crank condition at the starter motor

40. A diesel's piston cooling jets are fed from the oil gallery through a pressure-controlled valve. This valve typically opens:

A. only when the coolant reaches operating temperature

B. only during diesel particulate filter regeneration

C. once oil pressure rises above a set threshold

D. when the diesel exhaust fluid tank is full

41. A diesel's compression is good, but it still cranks a long time before starting when cold, and glow plugs test open. The correct repair is to:

A. replace the failed glow plugs and verify the controller

B. raise the commanded rail pressure inside the ECM

C. replace the high-pressure fuel pump assembly

D. reprogram the injector calibration codes in the ECM

42. A diesel's turbocharger wastegate actuator diaphragm has ruptured. The MOST likely result on a boost-referenced wastegate is:

A. coolant contamination of the engine oil supply

B. a no-crank condition at the starter motor

C. excessively high common-rail fuel pressure

D. uncontrolled boost or a wastegate that cannot regulate

43. A diesel's coolant level keeps dropping with no visible external leak, and the oil is clean. A likely path to investigate is the:

A. crankcase ventilation oil separator element

B. EGR cooler or another internal coolant-to-exhaust leak

C. cabin HVAC blower motor and resistor pack

D. diesel exhaust fluid dosing injector circuit

44. A diesel's valve seat width is too wide after grinding. The MOST likely effect is:

A. reduced seat pressure and poor valve sealing and cooling

B. coolant leaking into the combustion chamber

C. excessively high common-rail fuel pressure

D. a no-crank condition at the starter motor

45. A diesel's fuel injection is described as "multiple injection per cycle." A key benefit of pilot and post injections is:

A. raising the fuel's cetane number during combustion

B. eliminating the need for a diesel particulate filter

C. removing water from the fuel before injection

D. better control of noise, emissions, and regeneration

46. A diesel's oil pressure is normal cold but drops too low when hot. A likely cause is:

A. a thermostat stuck in the open position

B. worn bearings or thinned oil losing pressure when hot

C. a clogged engine intake air filter element

D. a glow plug control module that has failed open

47. A diesel's turbo-back exhaust has a leak ahead of the particulate filter. The MOST likely effect on the aftertreatment is:

A. incorrect exhaust temperature and pressure readings affecting regen

B. coolant contamination of the engine oil supply

C. excessively high common-rail fuel pressure

D. a no-crank condition at the starter motor

48. A diesel's cylinder is found with a cracked piston ring land. A likely cause is:

A. coolant leaking past the head gasket into the cylinder

B. air drawn into the fuel on the suction side of the pump

C. a thermostat that is stuck in the open position

D. detonation or pre-ignition from over-fueling or bad timing

49. A diesel's lift pump is electric and located in or near the tank. A whining lift pump that is losing output should be:

A. tested for pressure and volume, then replaced if weak

B. ignored unless the engine fails to crank at all

C. adjusted by raising the rail pressure in the ECM

D. cleaned by flushing the cooling system thoroughly

50. A diesel's particulate filter is being replaced. The associated soot and ash data in the ECM should be:

A. left unchanged so the history is preserved

B. raised to force an immediate regeneration

C. reset or relearned so the ECM matches the new filter

D. ignored because the ECM updates it automatically

51. A diesel's exhaust temperature spikes very high during regeneration, which is normal, but the technician must ensure the vehicle is:

A. connected to a battery charger during the process

B. filled with diesel exhaust fluid to the maximum line

C. parked away from combustibles with the exhaust clear

D. driven at full throttle to complete the regeneration

52. A diesel's injector is electrically open (infinite resistance) on its solenoid. The MOST likely symptom is:

A. that injector over-fueling its cylinder badly

B. a dead cylinder because the injector will not fire

C. coolant entering the engine oil supply

D. overcharging of the vehicle's starting batteries

53. A diesel's high-pressure pump is being replaced for metal contamination. The technician must also:

A. clean or replace fuel lines, rail, and injectors as needed

B. raise the commanded boost target inside the ECM

C. flush the engine cooling system and replace coolant

D. reprogram the glow plug controller for cold starts

54. A diesel's coolant temperature gauge reads normal, but the heater blows cold and the engine warms slowly. A likely cause is a:

A. head gasket leaking combustion gas into coolant

B. water pump leaking from its weep hole

C. radiator clogged with external road debris

D. thermostat stuck open or air trapped in the heater core

55. A diesel's exhaust aftertreatment relies on the DOC to create heat for the DPF. If the DOC is degraded, the MOST likely result is:

A. coolant contamination of the engine oil supply

B. overcharging of the vehicle's starting batteries

C. a no-crank condition at the starter motor

D. poor regeneration and rising particulate-filter soot

56. A diesel's fuel/water separator must be drained periodically. Water is heavier than diesel, so it:

A. floats on top of the fuel and exits through the vent

B. settles to the bottom of the bowl to be drained off

C. mixes evenly and cannot be separated by gravity

D. evaporates harmlessly during normal engine operation

57. A diesel's turbocharger spins freely but produces no boost, and the compressor wheel is loose on the shaft. The correct repair is to:

A. raise the commanded boost target inside the ECM

B. clean the intake tract and reinstall the same turbo

C. reprogram the injector calibration codes in the ECM

D. replace the turbocharger with the failed wheel and shaft

58. A diesel's engine oil should meet the manufacturer's specification because using the wrong oil can:

A. raise the fuel's cetane number above specification

B. cause the diesel exhaust fluid to crystallize faster

C. increase the maximum boost the turbocharger builds

D. harm the aftertreatment and reduce engine protection

59. A diesel's compression is uneven, and the lowest cylinder improves with a wet (oil) test. That cylinder MOST likely has:

A. worn or broken piston rings

B. a leaking or burned valve

C. a cracked cylinder head

D. a dribbling fuel injector

60. A diesel's variable-geometry turbocharger improves both low-speed response and high-speed flow by:

A. opening a wastegate to bypass exhaust at all speeds

B. cooling the compressed intake air after the compressor

C. changing vane position to match exhaust flow to engine speed

D. recirculating exhaust gas back into the intake manifold

PRACTICE EXAM 16 — ANSWER KEY (Questions 1–60)

1. C — A knock that rises with load and quiets when the cylinder is cut indicates a worn main or rod bearing, since removing combustion load on that journal reduces the noise. Valve lash, glow plug, and separator faults do not make a load-timed knock. The cylinder-cutout response isolates the worn bearing.

2. A — The metering (suction control) valve regulates how much fuel enters the high-pressure pump, which is how rail pressure is controlled. It does not atomize fuel, cool return fuel, or open the wastegate. Controlling pump inlet volume is the primary rail-pressure strategy.

3. B — An EGR valve commanded closed but stuck partly open keeps admitting inert exhaust, displacing oxygen and producing rough running, low power, and possible black smoke. It lowers NOx rather than raising it and does not affect charging or cranking. Freeing the valve restores normal combustion.

4. C — Bleeding the cooling system removes trapped air that would otherwise create hot spots and poor heat transfer. It does not affect cetane, DEF dosing, or injector codes. Proper bleeding ensures even, effective cooling.

5. B — Vertical skirt scoring with overheating signs points to inadequate piston cooling or lubrication causing the piston to scuff in the bore. Coolant intrusion, a stuck thermostat, or suction-side air would not score the skirt this way. Restoring oil supply and cooling prevents repeat scuffing.

6. C — Without coding new injectors, the ECM cannot account for their exact flow, so fueling is uneven and the engine runs rough. The omission does not introduce coolant, prevent cranking, or affect charging. Entering the codes balances fueling across cylinders.

7. A — Exhaust back-pressure far above spec indicates a restriction such as a plugged DPF or crushed pipe blocking flow. An air filter restricts intake, not exhaust, and thermostat or glow plug faults are unrelated. Locating the exhaust blockage corrects the back-pressure.

8. D — Impact damage to a compressor wheel comes from debris that passed through a failed or bypassed air filter. Coolant, boost pressure, or fuel would not physically strike the wheel. Correcting the filtration and replacing the turbo prevents recurrence.

9. B — A fuel temperature sensor reading too high makes the ECM think the fuel is hot, so it may reduce fueling as a protective measure, cutting power. It does not change charging, cranking, or DEF dosing. Replacing the sensor restores correct fueling.

10. C — Zero lash on a mechanical-lifter engine means there is no clearance, so the valve is being held slightly off its seat instead of closing fully. It is not correct, a weak spring, or a flat lobe by itself. Resetting lash restores proper valve closing and sealing.

11. D — Fuel dilution with a fuel smell in the oil comes from a leaking injector washing raw fuel past the rings into the sump. A failed oil cooler adds coolant, not fuel, and air filter and thermostat faults are unrelated. Finding the leaking injector stops the dilution.

12. C — The glow plug controller lengthens preheat time on colder mornings based on engine coolant or intake temperature at start-up. DEF, boost, and back-pressure are not used for this. Temperature-based timing tailors preheat to the conditions.

13. D — The chief personal hazard servicing a high-pressure fuel system is high-pressure fuel injection injury, where fuel can pierce the skin. Glow plug shock, coolant burns, and DEF vapor are lesser concerns here. Relieving pressure before service prevents this serious injury.

14. D — An electric fan that never runs when hot calls for checking the fan relay, fan motor, and the temperature input that triggers it. DEF, turbo vanes, and the fuel pump are unrelated to fan operation. Testing the control path locates the fault.

15. B — A charge-air cooler restricted internally by oil and debris reduces airflow, lowering boost and power. It does not lose coolant, prevent cranking, or overcharge batteries. Cleaning or replacing the cooler restores airflow.

16. C — Bearing tabs (locating lugs) must align with the notches in the rod and cap so the bearing seats correctly and cannot spin. Filing, sealing, or facing them toward the thrust surface would be wrong. Proper tab alignment locks the bearing in place.

17. D — With DEF, dosing, and sensors all good but no NOx reduction, the remaining cause is a degraded or contaminated SCR catalyst. Air filter, thermostat, and glow plug faults do not affect SCR conversion. Replacing the catalyst restores NOx control.

18. B — Supply pressure that drops only under heavy demand points to a weak lift pump or a restricted supply line that cannot keep up. Thermostat, glow plug, and HVAC faults are unrelated to fuel supply. Restoring supply volume returns full power.

19. B — Compression rings installed upside down do not seal or control oil correctly, increasing oil consumption and blow-by. The error does not introduce coolant, raise fuel pressure, or prevent cranking. Reinstalling the rings correctly restores sealing.

20. D — Steady overheating only under load, with a full system and good fan and thermostat, points to a water pump with an eroded or slipping impeller that cannot move enough coolant at high demand. Glow plug, air filter, and EGR faults are unrelated. Replacing the pump restores circulation.

21. A — Even, slightly low compression on all cylinders with light blow-by reflects moderate, uniform wear from high mileage. A burned valve, head-gasket failure, or bad injector would affect specific cylinders. The uniform pattern points to general wear.

22. A — Heavy soot-and-oil caking in the EGR passages is worsened when oil vapor from the crankcase ventilation mixes with EGR soot, forming sticky deposits. ULSD, injection pressure, and a low-opening thermostat are not the cause. Managing oil vapor and drive cycles reduces fouling.

23. C — Repeated water-in-fuel alerts mean the technician must find the water source, such as a tank leak or contaminated fuel, beyond just draining. Raising rail pressure, reprogramming codes, or forcing a regen ignores the source. Eliminating the source prevents repeat alerts.

24. B — Degraded, extended oil in a turbocharger promotes bearing wear and oil coking in the hot bearing housing. It does not introduce coolant, raise fuel pressure, or prevent cranking. Using fresh, correct oil protects the turbo bearings.

25. A — Worn valve guides letting oil into the cylinders are corrected by replacing or reconditioning the guides and renewing the seals. Stiffer springs, higher oil pressure, or more lash would not fix guide wear. Restoring guide clearance stops the oil consumption.

26. C — White smoke and a misfire on one cylinder at all temperatures with no coolant loss indicate an injector not igniting fuel properly, sending unburned fuel out as white smoke. A gasket leak loses coolant, ring wear gives blue smoke, and cold-start smoke clears. Servicing the injector fixes the misfire.

27. A — A worn gear-type oil pump delivers reduced oil pressure and volume to the engine. It does not introduce coolant, raise fuel pressure, or stick the EGR valve. Replacing the pump restores proper lubrication.

28. B — A loaded filter that reads zero differential pressure points to a plugged sensor line or a failed pressure sensor, since a loaded filter should show a pressure drop. A clean filter or perfect regen would not fit a clearly loaded filter. Repairing the sensor or line restores accurate readings.

29. D — Foaming coolant, lost pressure, and a positive combustion-gas test at the radiator confirm a head gasket leaking combustion gas into the coolant. A clogged radiator, weak pump, or stuck thermostat would not add combustion gas. Repairing the gasket stops the contamination.

30. B — An injector whose return runs much faster than the others is leaking internally more than the rest. Normal tolerance, complete blockage, or excess current would show different behavior. The faster return identifies the leaking injector.

31. A — A grid heater drawing no current when commanded requires checking the heater element, relay, fuse, and supply wiring for the open in the circuit. DEF, turbo vanes, and the pump metering valve are unrelated. Finding the open restores heater operation.

32. C — A failed crankshaft position sensor robs the ECM of its timing reference, producing a no-start. It does not introduce coolant, overcharge batteries, or plug the DPF. Replacing the sensor restores the timing signal and starting.

33. A — Removing too much material when resurfacing the head raises compression and reduces piston-to-valve clearance, risking piston-to-valve contact and damage. It does not introduce coolant, raise fuel pressure, or prevent cranking. Correct deck height and clearance must be maintained.

34. A — Bypassing or removing the fuel return cooler lets fuel temperature climb, which can cause power loss when the engine is hot. It does not introduce coolant, prevent cranking, or overcharge batteries. Keeping the cooler in service maintains proper fuel temperature.

35. C — An EGR position disagreement calls for testing the valve, actuator, wiring, and for carbon binding before replacing the valve. Raising rail pressure, forcing a regen, or reprogramming injectors would not address it. Verifying the valve and its circuit avoids unnecessary replacement.

36. C — A squealing belt with weak charging is caused by a loose belt or weak tensioner allowing slip on the pulleys. The fuel pump, thermostat, and glow plug module are unrelated to belt noise. Restoring tension stops the squeal and the charging loss.

37. D — A gear-driven high-pressure pump mistimed to the engine shifts injection timing, causing poor running, hard starting, and reduced power. It does not introduce coolant, overcharge batteries, or prevent cranking. Correct pump timing restores performance.

38. B — A coolant-side restriction in an oil-to-coolant cooler reduces heat transfer, so engine oil temperature rises. It does not put coolant directly into the oil, raise fuel pressure, or prevent cranking. Clearing the restriction restores oil cooling.

39. B — A failed upstream NOx sensor feeds the ECM bad data, leading to incorrect DEF dosing and an SCR-related fault. It does not introduce coolant, raise fuel pressure, or prevent cranking. Replacing the sensor restores correct dosing.

40. C — The piston cooling jet valve opens once oil pressure rises above a set threshold, ensuring the jets spray only when adequate pressure is available. It is not tied to coolant temperature, regeneration, or DEF level. Pressure-based opening protects oil pressure at low speed while cooling pistons at higher pressure.

41. A — Good compression but long cold cranking with glow plugs testing open is corrected by replacing the failed plugs and verifying the controller. Rail pressure, the fuel pump, and calibration codes are not the cause. Restoring preheat fixes the cold-start delay.

42. D — A ruptured boost-referenced wastegate actuator diaphragm cannot move the wastegate, so boost goes uncontrolled or the wastegate cannot regulate. It does not introduce coolant, prevent cranking, or raise fuel pressure. Replacing the actuator restores boost control.

43. B — Coolant disappearing with no external leak and clean oil points to an internal coolant-to-exhaust path such as an EGR cooler leak. The CCV separator, HVAC blower, and DEF circuit do not consume coolant. Pressure-testing and inspecting the EGR cooler locates the loss.

44. A — A valve seat ground too wide reduces the unit seating pressure, hurting valve sealing and heat transfer to the seat. It does not introduce coolant, raise fuel pressure, or prevent cranking. Correcting the seat width restores sealing and cooling.

45. D — Pilot and post injections in a multiple-injection strategy give better control of combustion noise, emissions, and regeneration. They do not raise cetane, remove water, or eliminate the DPF. The added injection events refine combustion and aftertreatment.

46. B — Oil pressure that is fine cold but too low hot indicates worn bearings or oil that thins excessively at temperature. A thermostat, air filter, or glow plug fault would not behave this way. New bearings or correct oil restore hot pressure.

47. A — An exhaust leak ahead of the DPF skews the exhaust temperature and pressure readings the aftertreatment relies on, affecting regeneration. It does not introduce coolant, raise fuel pressure, or prevent cranking. Sealing the leak restores accurate aftertreatment data.

48. D — A cracked piston ring land typically results from detonation or pre-ignition caused by over-fueling or incorrect timing hammering the piston. Coolant, suction-side air, or a stuck thermostat would not crack the land. Correcting fueling and timing prevents repeat damage.

49. A — A whining lift pump losing output should be tested for pressure and volume and replaced if weak, since failing supply starves the high-pressure pump. Ignoring it, raising rail pressure, or flushing coolant would not address it. Verifying and replacing the pump restores fuel supply.

50. C — After replacing a DPF, the soot and ash data must be reset or relearned so the ECM matches the new filter. Leaving old data, forcing a regen, or assuming auto-update would misrepresent the filter's state. Resetting the data ensures correct regeneration management.

51. C — Because regeneration exhaust temperatures are very high, the vehicle must be parked away from combustibles with the exhaust outlet clear. A charger, full DEF, or full throttle are not the safety requirement. Keeping the area clear prevents burns and fire.

52. B — An injector with an electrically open solenoid cannot fire, producing a dead cylinder. It does not over-fuel, introduce coolant, or overcharge batteries. Replacing the injector restores that cylinder's firing.

53. A — Replacing a high-pressure pump for metal contamination requires cleaning or replacing the fuel lines, rail, and injectors as needed, since debris spreads throughout the system. Boost targets, coolant, and glow plug programming are unrelated. Thorough cleanup prevents repeat failure.

54. D — A normal gauge but cold heater and slow warm-up suggest a thermostat stuck open or air trapped in the heater core preventing proper heat. A gasket leak, weak pump, or clogged radiator would show other symptoms. Replacing the thermostat or bleeding the core restores heat.

55. D — A degraded DOC cannot generate the heat the DPF needs, so regeneration is poor and particulate-filter soot rises. It does not introduce coolant, overcharge batteries, or prevent cranking. Replacing the DOC restores effective regeneration.

56. B — Because water is heavier than diesel, it settles to the bottom of the separator bowl where it can be drained off. It does not float, mix permanently, or evaporate away. Draining the settled water protects the injection system.

57. D — A turbo whose compressor wheel is loose on the shaft has internal failure and must be replaced; it cannot be repaired by cleaning or reprogramming. Raising boost targets or reprogramming injectors would not fix the mechanical failure. A new turbo restores boost.

58. D — Using oil that does not meet specification can harm the aftertreatment, through excess ash, and reduce engine protection. It does not raise cetane, crystallize DEF, or increase boost. The correct low-ash diesel oil protects both the engine and the emissions system.

59. A — A low cylinder that improves on a wet test has worn or broken piston rings, because the added oil temporarily seals them. A valve leak, head crack, or injector dribble would not improve with oil. The wet-test result points to the rings.

60. C — A variable-geometry turbocharger changes its vane position to match exhaust flow to engine speed, giving quick low-speed response and good high-speed flow. It does not rely on a wastegate at all speeds, intercooling, or EGR for this. Variable vane geometry is what broadens the effective range.