

PRACTICE EXAM 10: ASE T8 PMI

SIMULATION

1. A diesel engine exhibits excessive fuel consumption over recent weeks, with no changes in driving patterns, routes, or loads. A PMI investigation should first evaluate:

- A. The driver's operating habits and vehicle routing patterns
- B. Diesel engine control module software for current calibration updates
- C. Air filter restriction, fuel filter condition, and aftertreatment system performance
- D. Lubricating oil specification compliance with current engine requirements

2. The correct interpretation of a commercial vehicle's air pressure gauge that reads normal at idle but drops significantly during sustained highway operation is:

- A. Compressor capacity insufficient for system demand, or significant air system leakage
- B. Normal air pressure variation during sustained highway cruise conditions
- C. Governor cut-out pressure set above the manufacturer's recommended specification
- D. Pressure gauge calibration error requiring verification with test equipment

3. A technician performing PMI finds that the commercial vehicle's windshield has a crack that extends from the driver's direct line of sight across more than 12 inches of the glass. The correct action is:

- A. Apply windshield crack repair compound and continue service
- B. Reposition the driver's seat to avoid the cracked area during operation
- C. Monitor the crack at the next service interval for progression
- D. Replace the windshield before the vehicle returns to service

4. The specified minimum tread depth at a commercial motor vehicle's steering axle tire during federal annual inspection is:

- A. 2/32 inch measured in any major tread groove
- B. 4/32 inch measured in any major tread groove
- C. 6/32 inch measured in any major tread groove
- D. 8/32 inch measured in any major tread groove

5. A driver reports that the cab's interior temperature rises above normal during sustained operation, even with A/C at maximum settings. The most likely cause is:

- A. A/C system problem: low refrigerant, compressor wear, or evaporator/condenser restriction
- B. Driver error in selecting appropriate A/C settings for the ambient conditions
- C. Normal A/C performance under sustained high-load operation conditions
- D. Cabin air filter saturation producing reduced airflow through the HVAC system

6. The correct procedure for inspecting a commercial vehicle's brake hose for internal damage is to:

- A. Remove the hose for bench testing under controlled pressure conditions
- B. Apply maximum brake system pressure and observe for external changes
- C. Visual inspection of the hose for swelling, bulging, or deformation under system pressure
- D. Measure hose dimensions and compare to specification at multiple points

7. A Class 8 tractor's trailer is connected with the service brake line leaking air audibly at the glad hand. The most likely cause is:

- A. Worn tractor protection valve requiring complete replacement
- B. Defective trailer service brake chamber internal seal

- C. Air pressure excess beyond system specification at the trailer
- D. Failed or damaged glad hand seal at the connection point

8. The correct interpretation of a commercial vehicle's exhaust system that shows visible discoloration (bluing) on the exhaust manifold is:

- A. Normal exhaust manifold color at operating temperature
- B. Engine operation at sustained elevated temperatures exceeding manifold design
- C. Paint removal from the manifold during previous service operations
- D. Chemical staining from exhaust system additives during normal operation

9. A technician inspecting a tractor's fifth wheel finds that the locking pin shows visible wear with flat spots on the surface. The correct action is:

- A. Replace the worn locking pin before the vehicle returns to service
- B. Apply grease to the worn surfaces to reduce additional wear
- C. Reposition the pin to use undamaged surface areas during operation
- D. Continue service if the pin still engages with the kingpin during coupling

10. The primary purpose of a commercial vehicle's coolant recovery tank is to:

- A. Filter contamination from the coolant during normal operation
- B. Increase coolant flow rate through the radiator during elevated temperatures
- C. Provide supplemental coolant capacity to replace coolant loss during operation
- D. Accept overflow coolant during heat expansion and return it to the system on cooling

11. The correct action when a commercial vehicle's automatic transmission fluid is found with a dark brown color and burnt odor is:

- A. Continue service and monitor for changes at the next PMI interval
- B. Service the transmission including fluid replacement and inspection for damage
- C. Add transmission fluid additive to restore color and performance characteristics
- D. Perform a simple fluid drain and refill without further inspection

12. A Class 8 tractor's driver reports that the brakes produce a loud grinding sound during light application at low speeds. The sound is not present at higher speed braking. The most likely cause is:

- A. Normal brake sound at low speed during initial pad contact
- B. Driver technique error producing abnormal brake application
- C. Severely worn brake lining with metal backing contacting the drum or rotor
- D. Contaminated brake lining producing uneven friction during application

13. The correct procedure for verifying commercial vehicle tire inflation pressure is to:

- A. Measure pressure with a calibrated gauge with tires cold before operation
- B. Visual inspection of tire appearance and sidewall condition at each wheel
- C. Compare tire pressure readings between front and rear tires of the vehicle
- D. Measure tire pressure with the vehicle operating at highway speed

14. A technician performing PMI finds that the drive shaft has visible signs of contact or impact damage on the tube surface. The most likely consequence is:

- A. Improved driveshaft balance from impact compression during operation
- B. Surface cosmetic damage that does not affect driveshaft function

- C. Progressive corrosion at the damaged area during service
- D. Potential driveshaft imbalance, crack propagation, or structural compromise requiring evaluation

15. The correct interpretation of a commercial vehicle's engine that produces a continuous tapping sound from the valve cover area during operation is:

- A. Valve train problem: excessive valve lash, worn rocker arms, or other valve train wear
- B. Normal diesel engine valve train sound during idle and low-load operation
- C. Turbocharger bearing noise transmitted through the valve cover during operation
- D. Exhaust leak at the cylinder head interface producing sound at the valve cover

16. A driver reports that the fuel economy has decreased by approximately 10% over the past month with no changes in driving patterns. The most likely initial investigation should focus on:

- A. Engine management system reprogramming to restore fuel economy
- B. Tire alignment and wheel bearing condition at each axle position
- C. Air filter condition, fuel filter status, and basic engine tune-up components
- D. Driver training to reinforce economical driving techniques during operation

17. The correct procedure for checking a commercial vehicle's cab air filter condition is to:

- A. Visual observation of filter surface without removal from the housing
- B. Remove the filter and inspect for loading, damage, and proper fit in the housing
- C. Measure airflow through the HVAC system with a flow meter
- D. Replace the filter at each PMI regardless of current condition

18. A Class 8 tractor's engine produces a knocking sound that is most prominent under heavy load conditions and absent at idle. The most likely cause is:

- A. Normal combustion sound in a diesel engine under full load conditions
- B. Fuel injection timing problem producing premature combustion during acceleration
- C. Engine coolant boiling in the combustion chamber during heavy load operation
- D. Possible detonation or combustion-related problem requiring diagnostic investigation

19. The correct interpretation of a commercial vehicle's brake drum with blue discoloration on the friction surface is:

- A. Excessive brake heat during operation indicating possible brake drag or dragging shoes
- B. Normal brake drum appearance after sustained operation at elevated speeds
- C. Chemical discoloration from brake friction material during normal operation
- D. Paint application during previous service producing the blue color

20. A technician performing PMI finds that the commercial vehicle's air compressor pulley shows visible wear with a groove worn into the surface from belt contact. The correct action is:

- A. Apply pulley surface treatment to restore the original surface
- B. Replace the alternator drive belt to reduce friction at the worn pulley
- C. Replace the worn pulley and matching belt assembly before the vehicle returns to service
- D. Monitor the pulley condition at the next service interval

21. The correct procedure for draining a commercial vehicle's fuel-water separator bowl is to:

- A. Remove the complete filter assembly and drain the fuel system line
- B. Disconnect the outlet line of the separator and drain the entire contents

- C. Pressurize the fuel system and force discharge through the separator
- D. Open the separator bowl drain valve until clean fuel (free of water) discharges

22. A driver reports that the vehicle's cruise control engages but will not maintain constant speed — the vehicle gradually loses speed over time while cruise is active. The most likely cause is:

- A. Vacuum leak in the cruise control system, servo problem, or vehicle speed sensor fault
- B. Normal cruise control operation when the vehicle encounters grade changes
- C. Driver error in setting the cruise control at the desired speed
- D. Engine performance problem causing reduced power output during cruise

23. The correct interpretation of a commercial vehicle's trailer that pulls to the right during normal operation is:

- A. Driver technique error producing apparent trailer pull during operation
- B. Normal trailer behavior with asymmetric load distribution on the trailer
- C. Trailer brake drag, tire pressure variation, alignment issue, or tandem axle problem
- D. Tractor alignment problem transferred to the trailer through the fifth wheel coupling

24. A technician inspecting a commercial vehicle's battery finds visible cracks in the case with small amounts of electrolyte seepage. The correct action is:

- A. Apply battery case sealant to the cracks and continue service with monitoring
- B. Replace the battery before the vehicle returns to service
- C. Transfer the battery to a different vehicle with less demanding service conditions
- D. Continue service if the electrolyte level remains above the minimum specification

25. The correct method for inspecting a commercial vehicle's fuel tanks and lines is to:

- A. Visual inspection of tanks only, with line inspection reserved for diagnostic service
- B. Pressure testing of fuel tanks and lines at each annual inspection for integrity
- C. Replacement of fuel tanks and lines at scheduled intervals regardless of condition
- D. Visual inspection for leaks, damage, secure mounting, and proper routing of all components

26. A Class 8 tractor's driver reports that the steering system feels "heavy" during parking maneuvers but operates normally at highway speeds. The most likely cause is:

- A. Low power steering fluid, pump wear, or steering gear problem affecting low-speed assistance
- B. Worn steering linkage producing low-speed binding during maneuvers
- C. Tire pressure below specification at the steer axle during cold-weather operation
- D. Normal steering effort during parking maneuvers with a heavy tractor

27. The correct response when a commercial vehicle's engine compression brake (Jake brake) has reduced effectiveness during operation is:

- A. Increase the brake control setting at the dashboard to compensate for the reduction
- B. Replace the compression brake solenoid assembly preventively at the service center
- C. Investigate engine oil condition, valve adjustment, and compression brake system components
- D. Apply additional engine oil to the brake mechanism to improve operation

28. A technician inspecting a tractor's exhaust system finds that the exhaust clamp at the muffler is loose, allowing the muffler to move during engine vibration. The correct action is:

- A. Apply sealant around the loose clamp and continue service
- B. Tighten or replace the exhaust clamp before the vehicle returns to service

- C. Continue service if the exhaust is not producing excessive noise
- D. Monitor the clamp condition at the next service interval

29. The specified maximum leakage rate for a tractor-alone air brake system with service brakes released is:

- A. 4 psi per minute pressure drop
- B. 3 psi per minute pressure drop
- C. 1 psi per minute pressure drop
- D. 2 psi per minute pressure drop

30. A commercial vehicle's parking brake fails to hold on a moderate grade during testing. The most likely cause is:

- A. Worn spring brakes, contamination in the parking brake mechanism, or incorrect adjustment
- B. Driver technique error during parking brake application
- C. Grade beyond the parking brake's holding capacity specification
- D. Normal parking brake behavior during initial application at idle

31. The correct procedure for testing a commercial vehicle's brake warning lamp function is to:

- A. Disconnect the lamp and test with external 12-volt power supply
- B. Replace the warning lamp at each annual inspection as preventive service
- C. Apply the parking brake or create low brake fluid/air pressure condition and observe warning lamp illumination
- D. Measure voltage at the lamp terminal with continuity testing

32. A driver reports that the vehicle has developed a vibration at highway speed that did not exist at the previous PMI. The most likely cause is:

- A. Tire imbalance, wheel damage, wheel bearing wear, or driveline imbalance developing since previous inspection
- B. Driver perception error during sustained highway operation
- C. Normal vehicle vibration at highway speeds increasing with age
- D. Engine mount wear producing increased vibration at highway operating conditions

33. The correct interpretation of a commercial vehicle's fuel filter water separator bowl showing a dark, slimy residue is:

- A. Normal water separator operation accumulating contamination during operation
- B. Incorrect fuel additive producing particulate precipitation in the system
- C. Microbial (bacterial) fuel contamination requiring decontamination of the fuel system
- D. Fuel tank interior corrosion producing contamination in the separator bowl

34. A technician inspecting a tractor's rear axle finds the gear oil level below the fill plug opening. The correct action is:

- A. Drain the existing oil completely and refill with fresh specification oil
- B. Apply sealant to the fill plug to prevent further oil loss during service
- C. Add specified gear oil to bring the level to the fill plug opening, then investigate for leaks
- D. Replace the axle assembly due to insufficient lubrication during operation

35. The correct procedure for verifying a commercial vehicle's backup lamp function is to:

- A. Replace the backup lamp bulb at each annual inspection as preventive service

- B. Place the transmission in reverse and verify that backup lamps illuminate
- C. Measure voltage at the backup lamp terminal with the shifter in reverse
- D. Observe the backup lamp reflector condition during visual inspection

36. A Class 8 tractor exhibits reduced engine power during operation, with normal idle behavior. The engine diagnostic shows no stored fault codes. The most likely cause is:

- A. Driver technique producing apparent power reduction during operation
- B. Normal engine power variation based on operating conditions
- C. Engine operation at altitude above the design range
- D. Air intake restriction, fuel delivery problem, aftertreatment backpressure, or turbocharger issue

37. The correct method for inspecting a commercial vehicle's HVAC system for cooling performance is to:

- A. Activate the A/C at maximum cold setting with high fan speed and check outlet air temperature
- B. Visual inspection of A/C components during vehicle operation
- C. Measure refrigerant pressures at the high and low service ports with gauges
- D. Replace A/C components on a scheduled basis as preventive maintenance

38. A driver reports that the engine has difficulty starting in cold weather, requiring extended cranking and producing white smoke. The most likely cause is:

- A. Driver technique requiring adaptation for cold-weather starting
- B. Normal diesel behavior during severe cold-weather starting conditions
- C. Inadequate intake air heater function, glow plug problems, or cold-weather fuel issues
- D. Engine oil viscosity insufficient for cold-weather operation

39. The correct action when a commercial vehicle's air dryer cartridge shows evidence of saturation is:
- A. Replace the air dryer cartridge and investigate the cause of premature saturation
 - B. Continue service until the cartridge produces complete failure
 - C. Apply heat to the cartridge to evaporate accumulated moisture during operation
 - D. Replace the complete air dryer assembly as preventive service
40. A technician inspecting a tractor finds that the DEF injector shows crystalline deposits (white residue) around the injection point. The most likely cause is:
- A. Normal DEF system operation with minor deposit accumulation
 - B. Excessive DEF concentration in the stored fluid above specification
 - C. DEF system operating temperature too low for complete atomization
 - D. DEF system leak or improper injection producing external deposits
41. The correct interpretation of a commercial vehicle's headlamp that illuminates with reduced brightness during operation is:
- A. Driver technique error operating with incorrect dimmer switch position
 - B. Headlamp problem: burned bulb, high resistance in circuit, or grounded wiring affecting current flow
 - C. Normal headlamp aging producing gradual brightness reduction over service life
 - D. Oncoming traffic dimming the headlamp through automatic controls
42. A Class 8 tractor's air brake system chamber push rod stroke measurement exceeds the specified maximum. The correct action is:
- A. Apply additional grease to the slack adjuster to extend service life
 - B. Monitor the stroke at the next service interval for comparison

- C. Adjust the slack adjuster manually to reduce stroke within specification
- D. Investigate the cause of excessive stroke and make appropriate repairs before return to service

43. The correct procedure for verifying a commercial vehicle's engine charge air cooler (CAC) integrity is to:

- A. Pressurize the CAC to specified test pressure and observe for leaks and pressure retention
- B. Remove the CAC and inspect internally for debris accumulation
- C. Visual inspection of CAC fins and housing without pressure testing
- D. Replace the CAC at scheduled intervals as preventive maintenance

44. A technician inspecting a tractor's brake chambers finds one chamber producing an audible air leak from the chamber body itself during brake release. The most likely cause is:

- A. Normal chamber operation producing audible air exchange during release
- B. Excessive air system pressure affecting the chamber during operation
- C. Failed chamber diaphragm allowing air to escape through the chamber body or breather
- D. Incorrect chamber mounting position producing audible air leakage

45. The correct interpretation of a commercial vehicle's coolant temperature gauge that fluctuates between normal and slightly below normal during operation is:

- A. Normal coolant temperature variation during operating conditions
- B. Driver error in monitoring coolant temperature during operation
- C. Instrument cluster problem producing fluctuating readings from accurate data
- D. Thermostat sticking partially open or intermittent failure of the thermostat function

46. A driver reports that the vehicle produces a metallic squealing sound during initial brake application that disappears after the brakes are warm. The most likely cause is:

- A. Driver technique requiring adaptation to cold brake application
- B. Brake pad wear indicator contact, or moisture on brake friction surfaces producing initial squeal
- C. Normal brake sound during operation at any temperature condition
- D. Excessive brake hardware vibration during cold brake application

47. The correct procedure for checking a commercial vehicle's fuel level sensor function is to:

- A. Compare fuel gauge readings with visual tank inspection or dipstick measurement
- B. Replace the fuel level sensor at each annual inspection as preventive service
- C. Measure resistance at the sensor terminals during different fuel levels
- D. Disconnect the sensor and test with laboratory equipment

48. A Class 8 tractor's driver reports that the engine oil level has dropped significantly between service intervals. The most likely initial investigation should include:

- A. Engine management system programming for oil consumption indicators
- B. Driver behavior and vehicle operation patterns affecting oil consumption
- C. External engine oil leaks, PCV system, and combustion chamber oil consumption indicators
- D. Oil quality specification adjustments for extended service intervals

49. The correct interpretation of a commercial vehicle's power steering system that produces an audible whine at all operating speeds is:

- A. Normal power steering pump operation during active steering input
- B. Driver technique error producing excessive steering loads
- C. Steering system component vibration transferred through the steering wheel
- D. Low power steering fluid level, aerated fluid, pump wear, or air in the system producing the whine

50. A technician performing PMI discovers that the commercial vehicle's spare tire (if carried) is significantly underinflated and shows visible age-related deterioration. The correct action is:

- A. Ignore the spare tire condition since it is not in active service during operation
- B. Inflate the spare tire to specification, inspect for damage, and replace if deterioration indicates end of service life
- C. Remove the spare tire entirely to reduce vehicle weight and fuel consumption
- D. Store the spare tire indoors to prevent further deterioration during service

PRACTICE EXAM 10: ANSWER KEY AND EXPLANATIONS

1. C — Excessive fuel consumption without operational changes should first be investigated through air filter restriction, fuel filter condition, and aftertreatment system performance. Restrictions in these systems reduce combustion efficiency and fuel economy. Driver habits, ECM updates, and lubricant specification are secondary considerations after confirming basic system health.
2. A — Air pressure that reads normal at idle but drops during sustained highway operation indicates compressor capacity is insufficient for system demand, or significant air system leakage is consuming output faster than the compressor can maintain. The pattern reflects the system losing ground against continuous demand. Investigation targets the compressor and leak sources.
3. D — A windshield with a crack crossing the driver's line of sight and extending more than 12 inches must be replaced before the vehicle returns to service. Driver vision is a safety-critical function, and cracks in the line of sight compromise visibility and may propagate further during operation. Repair compounds, seat repositioning, and monitoring are not appropriate responses.
4. B — Appendix G specifies a minimum tread depth of 4/32 inch on steering-axle tires, measured in any major tread groove. This is higher than the 2/32 inch requirement for non-steering positions because steering tire failure produces immediate loss of directional control. The 4/32 inch minimum is both an Appendix G specification and a CVSA out-of-service criterion for steering axle tires.
5. A — Elevated cab temperature with A/C at maximum settings indicates A/C system problems: low refrigerant charge, compressor wear, or restriction at the evaporator or condenser. Each reduces the system's ability to remove heat from the cab. Driver technique, normal high-load operation, and cabin filter problems produce different symptom patterns.
6. C — Brake hose inspection for internal damage uses visual observation for swelling, bulging, or deformation under system pressure. These external signs indicate internal reinforcement failure, layer separation, or structural compromise. Removal for bench testing, maximum pressure application, and dimensional measurement are not standard PMI procedures.
7. D — An audible air leak at the glad hand during operation typically indicates a failed or damaged glad hand seal at the connection point. The seal is a consumable component that deteriorates with service and exposure to road debris. Replacement of the seal is the standard remedy; tractor protection valve or chamber issues would produce different symptom patterns.

8. B — Blue discoloration on the exhaust manifold indicates sustained operation at temperatures exceeding the manifold's thermal design. The bluing is thermal color change in the iron from heat exposure. Common causes include sustained heavy load operation, exhaust restrictions, lean fuel conditions, or other factors producing elevated exhaust temperatures.
9. A — A fifth wheel locking pin with visible wear and flat spots requires replacement before the vehicle returns to service. The pin provides kingpin retention during coupling and its worn condition compromises the reliability of the coupling mechanism. Grease application, repositioning, or continued service are not acceptable responses to worn safety-critical components.
10. D — The coolant recovery tank accepts overflow coolant during heat expansion and returns it to the system on cooling through the radiator cap's valve mechanism. This maintains a sealed cooling system that operates at designed pressure without coolant loss during normal operation. Filtering, flow increase, and supplemental capacity are not the primary function.
11. B — Automatic transmission fluid with a dark brown color and burnt odor indicates significant transmission overheating or extensive internal wear. Simple fluid drain and refill without investigation produces recurring contamination. The transmission requires service including fluid replacement and inspection for internal damage to address the underlying cause.
12. C — A loud grinding sound during light brake application at low speeds indicates severely worn brake lining with metal backing contacting the drum or rotor. The metal-to-metal contact produces the characteristic grinding sound. The condition is a safety concern requiring immediate attention before the vehicle returns to service.
13. A — Commercial vehicle tire pressure must be measured with a calibrated gauge when tires are cold (before operation or after extended rest). Hot tire pressure is elevated and does not accurately reflect the service pressure. Visual inspection and comparison alone are inadequate; measurement at highway speed is impractical and does not match specification conditions.
14. D — Visible impact damage to the driveshaft tube surface is a serious concern because it may have produced imbalance, initiated crack propagation, or compromised structural integrity. The driveshaft requires evaluation to determine whether continued service is safe. Surface cosmetic characterization ignores the potential for hidden structural damage.
15. A — A continuous tapping sound from the valve cover area indicates a valve train problem: excessive valve lash, worn rocker arms, worn pushrods, or other valve train wear. The sound occurs at each valve event, typically produced by mechanical interference. Normal valve trains operate quietly; audible tapping warrants diagnostic investigation.
16. C — Approximately 10% fuel economy decrease over a month typically traces to air filter condition, fuel filter status, and basic engine tune-up components. These affect combustion

efficiency and fuel delivery rate. ECM reprogramming, alignment, and driver training are secondary considerations after verifying basic engine health.

17. B — Cabin air filter inspection requires removing the filter to inspect for loading (dirt accumulation that restricts airflow), damage (tears or holes), and proper fit in the housing. Visual observation without removal provides incomplete information. Airflow measurement and scheduled replacement do not leverage the condition-based inspection that is the standard method.
18. D — A knocking sound under heavy load absent at idle indicates possible detonation or combustion-related problems: incorrect injection timing, poor fuel quality, injector issues, or pre-ignition conditions. The sound occurs under load when combustion demand is highest. Investigation identifies the specific cause to guide repair before engine damage occurs.
19. A — Blue discoloration on the brake drum friction surface indicates excessive brake heat during operation. Possible causes include brake drag, dragging shoes, over-adjusted brakes, or sustained brake application beyond design. The blue color is thermal discoloration indicating the drum reached elevated temperatures. Investigation identifies the specific cause.
20. C — A worn air compressor pulley with a groove worn into the surface from belt contact requires replacement of both the pulley and the matching belt. The worn pulley cannot maintain proper belt contact, and the belt may have been damaged by running in the worn groove. Replacement restores reliable operation.
21. D — The fuel-water separator bowl drainage is performed by opening the drain valve until clean fuel (free of water) discharges. This is the approved method for removing accumulated water. Filter removal, outlet disconnection, and pressurization are not correct procedures. The drain valve provides the intended discharge path.
22. A — Cruise control that engages but gradually loses speed indicates a vacuum leak in the cruise control system, servo problem, or vehicle speed sensor fault. The system cannot maintain the set speed because the control signal is not fully reaching the throttle actuator. Grade changes, driver error, and engine performance produce different symptom patterns.
23. C — Trailer pull to the right during operation typically indicates trailer brake drag at one side, tire pressure variation, alignment issue, or tandem axle problem. Each produces asymmetric forces that cause the trailer to track off-center. Investigation identifies the specific cause to guide repair; normal operation does not produce pulling.
24. B — A battery with visible case cracks and electrolyte seepage must be replaced before the vehicle returns to service. The case is a pressure vessel that must contain the electrolyte; compromised case integrity indicates imminent battery failure. Sealant, transfer to another vehicle, and continued service with electrolyte at minimum level are not acceptable responses.
25. D — Fuel tank and line inspection is a visual procedure examining for leaks, damage, secure mounting, and proper routing. This identifies the conditions that affect fuel system integrity and

safety. Pressure testing and scheduled replacement ignore condition-based assessment; line-only inspection is insufficient for tank conditions.

26. A — Heavy steering during parking maneuvers with normal highway operation typically indicates low power steering fluid, pump wear, or steering gear problems affecting low-speed assistance. At low speeds, the steering system requires maximum hydraulic assistance; at highway speeds, less assistance is needed and the problem is less apparent.
27. C — Reduced compression brake effectiveness requires investigation of engine oil condition, valve adjustment, and compression brake system components. Each affects the brake's operating mechanism. Simply increasing the control setting does not address the underlying problem; solenoid replacement without diagnosis is premature; oil addition to the brake mechanism is not correct procedure.
28. B — A loose exhaust clamp at the muffler must be tightened or replaced before the vehicle returns to service. The clamp secures the exhaust connection; a loose clamp allows movement that can cause joint separation, exhaust leakage, or component damage. Sealant application, noise-based tolerance, and monitoring are not acceptable responses.
29. D — The specified maximum leakage rate for a tractor-alone air brake system with service brakes released is 2 psi per minute pressure drop. Different specifications apply for combination vehicles, brakes applied, and brakes released. The 2 psi/min standard reflects the tighter tolerance for tractor-alone systems with fewer connections.
30. A — A parking brake that fails to hold on a moderate grade typically indicates worn spring brakes, contamination in the parking brake mechanism, or incorrect adjustment. The parking brake must have sufficient holding force at design specifications. Investigation identifies the specific cause; driver technique and grade characteristics do not typically explain inadequate holding.
31. C — Brake warning lamp function is verified by creating the condition that should trigger the warning (parking brake applied, or low brake fluid/pressure) and observing that the warning lamp illuminates as designed. This functional test confirms the complete warning circuit. Lamp disconnection and scheduled replacement ignore the functional verification.
32. A — A new vibration at highway speed that developed between service intervals typically indicates tire imbalance, wheel damage, wheel bearing wear, or driveline imbalance that has developed over time. The vibration is not present at the previous inspection but appears now, indicating progressive condition. Investigation targets each possibility to identify the source.
33. C — Dark, slimy residue in a fuel-water separator bowl indicates microbial (bacterial) fuel contamination. Bacteria grow at the fuel-water interface in contaminated fuel tanks, producing the characteristic slime. Decontamination requires fuel system cleaning, fresh fuel, biocide treatment, and filter replacement to prevent recurring contamination.

34. C — Gear oil below the fill plug opening requires adding specified gear oil to bring the level to the fill plug opening, then investigating for leaks that caused the low level. Simply adding oil without investigating the loss addresses only the immediate symptom; axle replacement is premature without diagnosis; sealant is not appropriate for a fill plug.
35. B — Backup lamp function verification is performed by placing the transmission in reverse and observing that the backup lamps illuminate. This is a direct functional test confirming the complete circuit and lamp operation. Preventive replacement, voltage-only measurement, and reflector observation are not adequate verification methods.
36. D — Reduced engine power without diagnostic fault codes typically indicates air intake restriction, fuel delivery problems, aftertreatment backpressure, or turbocharger issues. These conditions reduce the available combustion capacity or exhaust flow. Driver technique, normal variation, and altitude produce different patterns or are generally quantifiable through other means.
37. B — HVAC cooling performance is verified by activating the A/C at maximum cold setting with high fan speed and checking the outlet air temperature. This is a direct functional test that reveals the system's cooling capacity. Visual inspection, pressure measurement (typically for diagnostic work), and scheduled replacement do not verify actual cooling performance.
38. C — Cold-weather starting difficulty with extended cranking and white smoke typically indicates inadequate intake air heater function, glow plug problems, or cold-weather fuel issues. These conditions prevent the combustion chamber from reaching the temperature needed for proper diesel combustion. The symptoms are characteristic of cold-weather starting problems rather than routine driver issues.
39. A — An air dryer cartridge showing saturation evidence requires replacement combined with investigation of the premature saturation cause. Possible causes include excessive system demand, increased air system leakage, or high ambient humidity. Simply replacing the cartridge without investigating the cause leads to recurring problems.
40. D — White crystalline deposits around the DEF injector indicate a DEF system leak or improper injection producing external deposits. DEF evaporation at exhaust temperatures leaves urea crystals that accumulate where the fluid has leaked or been improperly dispensed. The condition requires investigation of the leak source and repair.
41. B — A headlamp with reduced brightness during operation indicates a headlamp problem: burned or degraded bulb, high resistance in the supply circuit, or grounded wiring affecting current flow. The headlamp receives inadequate power to produce full brightness. Investigation of the specific cause guides repair.
42. D — Excessive pushrod stroke requires investigation of the underlying cause and appropriate repairs. Possible causes include worn linings, maladjusted components, foundation brake

problems, or failed slack adjusters. Manual adjustment of slack adjusters is not the correct response because it masks the underlying problem. Investigation identifies and addresses the root cause.

43. A — Charge air cooler (CAC) integrity verification is performed by pressurizing the CAC to specified test pressure and observing for leaks and pressure retention. This is a direct test that confirms the CAC's ability to contain pressurized boost air. Visual inspection alone cannot verify internal integrity or identify small leaks that affect engine performance.
44. C — A failed chamber diaphragm allows air to escape through the chamber body or breather vent during release. The diaphragm is the dynamic seal separating the pressurized side from the non-pressurized side; its failure permits air to bypass normally. The condition requires chamber replacement to restore proper operation.
45. D — Coolant temperature fluctuating between normal and slightly below normal during operation indicates the thermostat is sticking partially open or failing intermittently. A healthy thermostat maintains consistent temperature; intermittent opening allows additional coolant flow and temperature reduction. The condition requires thermostat service or replacement.
46. B — A metallic squealing sound during initial brake application that disappears when brakes are warm typically indicates brake pad wear indicator contact, or moisture on brake friction surfaces producing initial squeal. As brakes warm, moisture evaporates and the sound clears. Wear indicators produce persistent sound; moisture-related squeal is temporary and resolves with brake use.
47. A — Fuel level sensor function is verified by comparing fuel gauge readings with visual tank inspection or dipstick measurement. This direct comparison confirms whether the gauge accurately reflects actual fuel level. Preventive replacement, resistance measurement in isolation, and laboratory testing are not standard verification methods for routine PMI.
48. C — Significant oil level drop between service intervals requires investigation of external engine oil leaks, PCV system condition, and combustion chamber oil consumption indicators (oil smoke, spark plug fouling, etc.). These are the primary pathways for oil loss. ECM programming, driver behavior, and oil quality specification are not the initial investigation focus.
49. D — Power steering whine at all operating speeds indicates low power steering fluid level, aerated fluid, pump wear, or air in the system producing the whine. Each condition produces the characteristic sound; correction requires diagnosis to identify the specific cause. Normal operation, driver technique, and component vibration produce different patterns.
50. B — A significantly underinflated spare tire with age-related deterioration requires inflation to specification, damage inspection, and replacement if deterioration indicates end of service life. A usable spare tire is essential safety equipment when it's needed. Ignoring condition, removing the spare entirely, or storing indoors without service does not address the requirement for a functional spare.