

PRACTICE EXAM 7: ASE T8 PMI

SIMULATION

1. During PMI, a technician inspects a medium-duty truck equipped with a vacuum brake booster. The brake pedal produces firm resistance and requires substantially more force than on a recent PMI. The engine is running and is at operating temperature. The most likely cause is:

- A. Worn brake pad material below the replacement threshold on the front calipers
- B. Loss of vacuum supply from a failed check valve, vacuum line leak, or booster problem
- C. Contaminated brake fluid with reduced hydraulic transmission of pedal force
- D. Excessive brake pedal free play producing delayed engagement

2. The correct sequence for performing an air brake system leak test after the vehicle has been running is:

- A. Reach full pressure, shut off the engine, release the service brakes, wait one minute, then observe pressure drop
- B. Reach full pressure, keep the engine running, apply service brakes, observe pressure drop over 30 seconds
- C. Partially pressurize system, shut off engine, test leakage at reduced pressure for safety
- D. Observe pressure drop only when actively accelerating to evaluate compressor performance

3. The primary reason a tractor's dash-mounted primary and secondary air pressure gauges should read approximately equal during normal operation is:

- A. Both gauges are powered by the same sending unit and will always read identically
- B. Normal system balance requires primary pressure at 125 psi and secondary at 85 psi

- C. The compressor supplies both reservoirs through a shared initial distribution network
- D. Gauge accuracy is verified only when readings match exactly across all conditions

4. A driver reports that the cruise control disengages unexpectedly during highway operation even when no pedal input is made. The most likely cause is:

- A. Cruise control system software requiring update at the manufacturer service network
- B. Normal cruise control behavior when approaching set speed tolerance limits
- C. Driver action interpreted as pedal input by the cruise control system
- D. Intermittent fault in a brake or clutch pedal switch producing false disengagement signals

5. The correct procedure for adjusting a fifth wheel slide position is to:

- A. Release the slide lock, drive the tractor forward or backward against the coupled trailer, lock the slide at the new position
- B. Physically push the fifth wheel assembly to the new position with the tractor parked
- C. Use mechanical stops integrated into the slide mechanism to prevent misadjustment
- D. Request service center adjustment — fleet technicians should not adjust slide positions

6. A diesel engine is observed producing a whining sound from the turbocharger area during normal operation. The sound increases in pitch with engine RPM. The most likely cause is:

- A. Normal turbocharger operation across the engine RPM range
- B. Failed turbocharger wastegate producing abnormal boost control
- C. Turbocharger bearing wear producing noise at specific operating conditions
- D. Exhaust leak upstream of the turbocharger creating whistling sound

7. The specified operating range of a properly functioning air brake system governor is:

- A. Cut-in at 80 psi and cut-out at 100 psi for most heavy trucks
- B. Cut-in at 100-105 psi and cut-out at 120-125 psi with appropriate differential
- C. Cut-in at 60 psi and cut-out at 90 psi for emergency braking systems
- D. Cut-in and cut-out at identical pressures for consistent operation

8. A tractor's dash-mounted ABS warning lamp illuminates briefly during key-on prove-out and then extinguishes. This behavior indicates:

- A. The ABS system has detected a fault that must be diagnosed before the vehicle can move
- B. The ABS system is intermittently operating during key-on self-test
- C. Normal ABS warning during initial power-up that requires no further action
- D. The ABS system is functioning normally; the prove-out cycle has verified the bulb and system health

9. The correct interpretation of oil accumulation inside the intake ducts downstream of the CCV (crankcase ventilation) connection is:

- A. Small amounts are normal, but excessive accumulation indicates CCV system failure
- B. Any visible oil accumulation requires immediate engine shutdown for safety
- C. Oil in the intake indicates the air filter is bypassing and must be replaced
- D. Oil in the intake is always from turbocharger seal failure and requires turbocharger service

10. A commercial vehicle's coolant recovery tank shows coolant level has risen substantially from the COLD mark to well above the HOT mark after a single trip. The most likely cause is:

- A. Normal thermal expansion that will settle after the engine cools
- B. Overfilled coolant reservoir at the previous service interval

- C. Internal cooling system problem producing excessive pressure and coolant displacement
- D. Ambient temperature increase beyond the recovery tank's design range

11. The specified test pressure for measuring pushrod stroke on most heavy truck air brake systems is:

- A. 40-50 psi at the brake chamber to confirm minimum adjustment
- B. 150-160 psi for maximum system pressure verification
- C. 60-70 psi to evaluate partial brake application
- D. 90-100 psi to simulate typical operating brake application

12. A tractor-trailer combination exhibits delayed trailer brake application when the tractor service brake is activated. Tractor brakes respond normally. The most likely cause is:

- A. Low primary reservoir pressure at the tractor affecting trailer brake signal
- B. Trailer service brake chamber leakage reducing available braking force
- C. Restricted service line between the tractor and trailer, or failed relay valve at the trailer
- D. Normal delay in trailer brake response due to air line distance

13. The primary function of a trailer service brake signal emergency valve is to:

- A. Automatically apply trailer brakes when tractor air supply is lost or a supply line is severed
- B. Allow manual trailer brake operation independent of the tractor service brake
- C. Proportion brake signal strength between tractor and trailer during application
- D. Filter contamination from the service brake signal reaching the trailer

14. The correct response when a technician finds the air compressor discharge line insulation showing heat damage and charring is to:

- A. Continue service and monitor at the next PMI interval
- B. Replace the damaged discharge line and investigate the source of excessive temperature
- C. Apply additional insulation over the damaged area
- D. Test the compressor output temperature at operating conditions to verify the problem

15. A Class 8 tractor is equipped with a tire pressure monitoring system (TPMS) that indicates low pressure on one trailer tire. The visual inspection shows the tire is properly inflated. The most likely cause is:

- A. Normal TPMS variance during cold weather operation
- B. Driver error interpreting the TPMS display incorrectly
- C. Air temperature causing fluctuation in the TPMS reading during operation
- D. Failed TPMS sensor, depleted sensor battery, or wiring problem

16. Technician A says that an engine coolant temperature gauge reading below normal can indicate a stuck-open thermostat. Technician B says that an engine temperature gauge reading above normal can indicate a stuck-closed thermostat, low coolant, or failed fan. Who is correct?

- A. Technician A only
- B. Technician B only
- C. Both A and B
- D. Neither A nor B

17. The primary inspection criteria for a brake chamber clamp band is:

- A. Visual examination for clamp integrity, cracks, deformation, and secure hardware torque

- B. Disassembly for internal inspection of the clamp mechanism
- C. Pressure testing the chamber to verify clamp retention at maximum system pressure
- D. Replacement of the clamp at each annual inspection as preventive service

18. A technician performing PMI discovers a diesel engine's fuel filter water separator bowl with dark, slimy sludge accumulation. The most likely cause is:

- A. Normal condensation that has turned to sludge during extended service
- B. Microbial (bacterial) contamination in the fuel system requiring decontamination
- C. Fuel additive precipitation at the filter bowl requiring additive change
- D. Fuel aging beyond the manufacturer's recommended storage time

19. The SAE J560 pin 3 on a 7-way trailer connector, identified by the yellow wire, carries:

- A. Stop (brake) lamp circuit to the trailer
- B. Right turn signal circuit to the trailer rear lamps
- C. Clearance and marker lamp circuit to the trailer
- D. Left turn signal circuit to the trailer rear lamps

20. A tractor's driver reports difficulty engaging low gear during initial startup in cold weather. After driving for 30 minutes, shifting becomes normal. The most likely cause is:

- A. Incorrect shift linkage adjustment producing cold-weather binding
- B. Driver technique error during initial cold-weather shifting
- C. Gear oil viscosity too thick for cold conditions, requiring warm-up for proper flow
- D. Normal cold-weather transmission operation that requires operator adaptation

21. The correct interpretation of a diesel engine producing a slight whitish haze from the exhaust at idle, which clears as RPM increases, is:

- A. Normal cold-idle combustion that clears with sufficient combustion temperature
- B. Excessive fuel delivery at low speeds producing unburned fuel in the exhaust
- C. Failed DEF system allowing ammonia slip at low engine loads
- D. Low coolant level causing combustion temperature fluctuation

22. A technician performing PMI discovers a broken leaf in an auxiliary (non-main) leaf of a rear leaf spring bundle. The correct action is:

- A. Release the vehicle to service since only auxiliary leaves are affected, with repair scheduled
- B. Reject the vehicle for service until the broken auxiliary leaf is replaced
- C. Apply temporary bracing to support the spring until service can be scheduled
- D. Adjust the air suspension to compensate for the broken leaf during operation

23. The correct air brake system leak test specification for a tractor-trailer combination with service brakes released is:

- A. 1 psi per minute maximum pressure drop
- B. 5 psi per minute maximum pressure drop
- C. 2 psi per minute maximum pressure drop
- D. 3 psi per minute maximum pressure drop

24. A commercial vehicle's windshield wipers leave streaks across the glass during operation, with no mechanical binding. The most likely cause is:

- A. Failed wiper motor producing insufficient blade pressure on the glass

- B. Incorrect wiper arm tension applied against the windshield surface
- C. Worn wiper blades or blade rubber deterioration producing streaking
- D. Windshield contamination requiring cleaning before blade replacement

25. The primary function of a diesel engine's exhaust brake (flap-type retarder) is to:

- A. Create exhaust backpressure that the engine must work against, producing braking torque
- B. Inject additional fuel into the exhaust to generate retarding heat
- C. Disengage the drivetrain from the engine during downhill operation
- D. Increase exhaust flow rate for improved engine braking response

26. During PMI, a technician finds a loose wheel lug nut on one wheel position. All other lug nuts on that wheel are at specification torque. The correct action is to:

- A. Apply specified torque to the loose nut and continue service
- B. Apply specified torque and inspect the other wheels for similar issues
- C. Replace the loose lug nut with a new fastener and torque to specification
- D. Remove the wheel, inspect the studs and mounting surface, replace damaged hardware, and retorque all lug nuts

27. Technician A says that cleaning the fifth wheel grease with brake cleaner at each PMI removes accumulated contamination. Technician B says that fresh grease should be applied to replace or supplement existing lubrication at each service interval. Who is correct?

- A. Technician A only
- B. Technician B only
- C. Both A and B
- D. Neither A nor B

28. A Class 8 tractor's driver reports that the engine compression brake (Jake brake) provides normal retarding force initially but decreases significantly during an extended grade descent. The most likely cause is:

- A. Normal retarder behavior during extended operation at maximum retarding effort
- B. Excessive engine oil consumption during retarder operation beyond normal limits
- C. Overheated retarder components requiring cool-down before full capacity returns
- D. Incorrect retarder control switch setting for extended grade operation

29. The correct action when a diesel engine's exhaust produces a persistent white cloud of smoke during operation, not just at startup, is to:

- A. Perform diagnostic investigation for cooling system leak, injector problem, or fuel system issue
- B. Increase engine RPM to clear the condition temporarily
- C. Add a fuel system treatment to resolve the white smoke condition
- D. Continue service if the smoke is not dense enough to affect vision

30. The correct procedure for inspecting a brake chamber diaphragm for damage is to:

- A. Remove the diaphragm assembly for visual inspection at each annual inspection
- B. Replace the diaphragm preventively at every 100,000 miles
- C. Pressurize the chamber to maximum pressure and observe for external leakage
- D. Inspect for signs of air leakage from the chamber breather vent and verify proper function

31. A technician performing PMI finds that the trailer tires on the tandem axle show wear significantly different between left and right sides of the vehicle. The most likely cause is:

- A. Normal variation in tire wear between tandem axle positions over extended operation

- B. Driver handling patterns causing uneven wear during normal operation
- C. Alignment problem at the trailer tandem axle producing asymmetric tire wear
- D. Tire manufacturing variance producing different wear rates between positions

32. The correct interpretation of a truck's dash-mounted voltmeter reading 12.4 volts with the engine running at idle is:

- A. Normal operation with the charging system producing regulated output
- B. Battery voltage reading indicating the alternator is not producing output
- C. Normal reading for a charging system operating at optimal efficiency
- D. Below-normal charging system output indicating potential alternator problem

33. Technician A says that a commercial vehicle's lights should illuminate briefly during key-on prove-out to verify bulb function. Technician B says that the prove-out cycle verifies only the dashboard warning lamps. Who is correct?

- A. Technician A only
- B. Technician B only
- C. Both A and B
- D. Neither A nor B

34. A tractor's engine exhibits rough idle, with uneven combustion producing vibration that can be felt in the cab. The engine runs smoothly at elevated RPM. The most likely cause is:

- A. Normal diesel engine idle characteristics that improve with higher RPM
- B. Worn engine mount producing sustained cab vibration transfer
- C. Failed injector or injector problem producing uneven combustion at idle
- D. Low engine oil pressure at idle creating mechanical interference

35. The correct interpretation of an HVAC system blowing cold air from some outlets but warm air from other outlets is:

- A. Normal A/C operation with temperature-zoned control across the cab
- B. Mode or blend door actuator failure producing inconsistent air routing
- C. Refrigerant charge deficiency requiring recharge to restore full cooling
- D. Failed cabin air filter producing inconsistent airflow across outlets

36. A Class 8 tractor has just received an air dryer cartridge replacement. The technician performs a system test and finds normal air dryer function. The correct next step is:

- A. Document the service and release the vehicle to normal operation
- B. Run the engine for 30 minutes to ensure the new cartridge has properly conditioned
- C. Replace all air system filters as companion service to the cartridge replacement
- D. Verify that the air system builds full pressure in the specified time before releasing to service

37. The correct interpretation of a brake chamber with visible dents or impact damage on the housing is:

- A. Replace the damaged brake chamber before returning the vehicle to service
- B. Monitor the chamber for leakage at the next service interval
- C. Sand and repaint the damaged area to prevent corrosion
- D. Apply external reinforcement to the damaged area for structural support

38. A commercial vehicle's transmission exhibits fluid leaking from the rear output shaft seal at a rate of approximately 1 ounce per week. The correct action is:

- A. Monitor the leak rate and schedule service at the next routine interval
- B. Replace the transmission output shaft seal as a critical service item

- C. Add transmission fluid to compensate for the leak rate until the next service
- D. Apply transmission stop-leak additive to reduce the seal leak rate

39. The correct action when a technician finds a diesel engine's turbocharger compressor wheel has visible blade damage is:

- A. Clean the compressor wheel and rebalance it for continued service
- B. Replace the turbocharger assembly before the vehicle returns to service
- C. Install a compressor wheel protector to prevent further damage
- D. Monitor turbocharger performance through operational testing

40. A Class 8 tractor with automated mechanical transmission (AMT) exhibits hesitation and jerky engagement during shifts, particularly when starting from a stop. The most likely cause is:

- A. Normal AMT behavior during cold-weather operation before warm-up
- B. Driver pedal input conflicting with AMT shift logic during startup
- C. Transmission fluid level below specification reducing shift response
- D. Worn clutch friction material or incorrect clutch adjustment affecting AMT engagement

41. The primary purpose of an engine crankcase ventilation (CCV) filter is to:

- A. Separate oil from blowby gases before they pass to the intake stream
- B. Filter incoming intake air before the turbocharger compressor wheel
- C. Remove moisture from the crankcase gases before atmospheric release
- D. Catalyze combustion byproducts for cleaner emissions

42. During PMI, a technician finds a trailer's upper coupler plate has visible wear grooves on the contact surface. The grooves appear to match the fifth wheel top plate shape. The correct action is:

- A. Apply fresh fifth wheel grease to compensate for the wear pattern
- B. Adjust the fifth wheel position to reduce contact on the worn area
- C. Inspect for wear limits and schedule trailer coupler plate service as needed
- D. Continue normal operation since minor wear is expected at this service point

43. The correct method for verifying trailer brake chamber pushrod stroke during a tractor-trailer PMI is to:

- A. Use visual estimation of stroke length during test brake application
- B. Mark pushrods before application, apply brakes at specified pressure, measure stroke and compare to specification
- C. Measure pushrod movement during free play test with the brake pedal depressed
- D. Compare stroke between left and right chambers without specification reference

44. A driver reports that the vehicle's air conditioning produces adequate cooling only when the fan is set to high speed. At lower fan settings, the outlet air is warm. The most likely cause is:

- A. Normal A/C operation requiring high fan speed for adequate cooling effect
- B. Low refrigerant charge causing cooling issues at reduced compressor speeds
- C. Failed expansion valve allowing inconsistent refrigerant flow
- D. Restricted cabin air filter reducing airflow across the evaporator at low fan speeds

45. The correct procedure for inspecting a commercial vehicle's fire extinguisher during PMI is to:

- A. Check mounting security, pressure gauge reading, pin and seal condition, and current inspection tag

- B. Discharge the extinguisher briefly to verify proper operation
- C. Weigh the extinguisher to verify full charge
- D. Replace the extinguisher at each annual inspection regardless of condition

46. A Class 8 tractor is equipped with aftertreatment system components including DOC, DPF, and SCR. The correct inspection approach during PMI is:

- A. Remove components for internal inspection as preventive service
- B. Clean all components with solvent to remove accumulated contamination
- C. Inspect external condition, clamps, mountings, and retrieve diagnostic codes
- D. Replace DPF and SCR catalysts at each PMI as preventive maintenance

47. The correct response when a commercial vehicle's battery exhibits a swollen or distorted case during PMI inspection is:

- A. Test the battery under load to verify performance before replacement
- B. Replace the battery regardless of load test results due to case damage
- C. Clean the battery exterior and continue service if electrical function is normal
- D. Add water to compensate for electrolyte loss indicated by case deformation

48. A technician inspecting a wheel bearing for condition finds excessive axial end play when rocking the wheel inward and outward while elevated. The correct action is:

- A. Tighten the wheel spindle nut to eliminate the play and continue service
- B. Apply grease through the wheel bearing lubrication fitting to reduce play
- C. Replace the wheel bearing assembly before the vehicle returns to service
- D. Service the wheel bearing by disassembling, cleaning, inspecting, and properly adjusting

49. The correct interpretation of a diesel engine's power output below manufacturer specification during a dyno test is:

- A. Comprehensive diagnostic investigation across fuel, air, and engine mechanical systems
- B. Engine replacement as the most common cause of power deficiency
- C. Routine fuel filter replacement as the likely cause of reduced performance
- D. Normal variation in engine output across different operating conditions

50. The primary purpose of a coolant system deaeration chamber in a commercial vehicle is to:

- A. Increase coolant pressure to improve heat rejection capacity
- B. Filter contaminants from the coolant as it circulates through the system
- C. Remove trapped air from the coolant system during operation
- D. Reduce coolant temperature by providing increased surface area for heat exchange

PRACTICE EXAM 7: ANSWER KEY AND EXPLANATIONS

1. B — A firm brake pedal requiring excessive force, with the engine running and warm, indicates loss of vacuum assistance at the booster. The booster relies on continuous vacuum supply from the engine or a vacuum pump, and a failed check valve or vacuum leak produces the hard-pedal condition. Without vacuum assistance, the driver provides all braking force directly.
2. A — Air brake leak testing requires full system pressure with the engine shut off, so the compressor cannot mask leaks by refilling the system. The brakes-released position tests static leakage through valves, fittings, and reservoirs. The one-minute observation period provides consistent measurement against specification limits (2 psi/min tractor alone, 3 psi/min combination with brakes released).
3. C — The compressor supplies both primary and secondary reservoirs through an initial shared distribution path from the air dryer. Under normal operation both reservoirs maintain approximately equal pressure because the compressor charges them simultaneously. Significant divergence between the two gauges indicates a leak or other problem in one specific circuit.
4. D — Unexpected cruise control disengagement without driver pedal input indicates intermittent fault in a brake or clutch pedal switch producing false disengagement signals. The cruise control's safety logic is designed to disengage on pedal input; a faulty switch sends the disengage signal even when no input occurred. Switch replacement or repair resolves the issue.
5. A — Sliding fifth wheel position is adjusted by releasing the slide lock, driving the tractor forward or backward against the coupled trailer (which is restrained by its brakes), and then locking the slide at the new position. The tractor force against the immobile trailer produces the position change. Manual pushing and service-center-only procedures do not reflect standard fleet practice.
6. C — A turbocharger whining sound that increases in pitch with engine RPM indicates bearing wear or other rotating-component wear in the turbocharger. Normal operation is smoother and less pronounced. Bearing wear produces the characteristic whining sound as clearances increase and rotating components contact surfaces they should not contact.
7. B — The standard air brake governor operating range is cut-in at 100-105 psi and cut-out at 120-125 psi, with a 20-psi differential between cut-in and cut-out. This range provides normal operating pressure while allowing the compressor to cycle between loading and unloading. Lower ranges and equal pressures do not match standard specifications.

8. D — An ABS warning lamp that illuminates briefly during key-on prove-out and then extinguishes indicates the ABS system is functioning normally. The prove-out cycle verifies that the bulb works and that the ABS system completes its self-test successfully. A lamp remaining illuminated would indicate a fault; the described behavior is the expected healthy response.
9. A — Small amounts of oil in intake ducts downstream of the CCV connection are normal because the CCV system routes crankcase blowby gases (which contain entrained oil mist) back into the intake stream. Excessive accumulation indicates CCV system failure — oil separator problems, restricted CCV path, or other issues requiring service. The distinction between normal minor accumulation and excessive accumulation is important diagnostically.
10. C — Coolant rising substantially above the HOT mark after a single trip indicates internal cooling system problems producing excessive pressure and coolant displacement. Common causes include combustion gas leakage into the coolant (head gasket or EGR cooler), overheat events producing expansion, or pressure buildup from chemistry problems. Normal thermal expansion does not rise substantially above HOT.
11. D — Pushrod stroke measurement on air brake systems is performed at 90-100 psi applied pressure. This range represents typical operating brake application and produces consistent, comparable measurements across different brake chambers. Lower pressures produce partial application and invalid readings; higher pressures approach safety limits and do not represent typical operation.
12. C — Delayed trailer brake application with normal tractor brake response indicates the service brake signal is reaching the trailer but slowly or insufficiently. This points to a restricted service line (kinked, damaged, or undersized) or a failed relay valve at the trailer that normally boosts the signal for rapid application. Low tractor pressure and chamber leakage produce different symptom patterns.
13. A — The trailer service brake signal emergency valve automatically applies trailer brakes when the tractor air supply is lost or a supply line is severed. This is a critical safety feature preventing trailer runaway during breakaway events. The valve monitors supply pressure and initiates emergency brake application when pressure falls below the designed threshold.
14. B — Damaged insulation with charring on the air compressor discharge line indicates the line has been exposed to excessive temperature. Continued service risks further insulation damage, line failure, and potential fire hazard. The correct action is to replace the damaged line and investigate the source of excessive temperature (exhaust routing, insulation gap, etc.) to prevent recurrence.
15. D — A TPMS indicating low pressure on a properly inflated tire points to sensor-side problems: failed sensor, depleted sensor battery, or wiring/connection problems. TPMS sensors are battery-powered and have finite service lives. Regular sensor replacement or service is part of maintaining accurate TPMS operation across the fleet.

16. C — Both technicians are correct. A coolant temperature gauge below normal indicates the engine cannot reach operating temperature, which is commonly caused by a stuck-open thermostat allowing continuous radiator flow. A gauge above normal indicates overheating, which can result from a stuck-closed thermostat, low coolant, failed fan, or other cooling system problems.
17. A — Brake chamber clamp band inspection is a visual procedure checking clamp integrity, examining for cracks or deformation, and verifying secure hardware torque. Spring brake chamber clamps contain substantial spring energy and cannot be safely disassembled without proper tools — visual inspection is the appropriate PMI method. Replacement at every inspection is not standard practice.
18. B — Dark, slimy sludge in a fuel filter water separator bowl is the characteristic appearance of microbial contamination in diesel fuel. Bacteria and fungi grow at the fuel-water interface in contaminated tanks, producing the distinctive slime. Decontamination requires fuel system cleaning, fresh fuel, biocide treatment, and filter replacement.
19. D — SAE J560 pin 3, identified by the yellow wire, carries the left turn signal circuit from the tractor to the trailer rear lamps. When the tractor left turn signal is activated, this pin delivers the signal to the left side trailer rear lamps. Standardized pin assignments ensure correct trailer lighting across all J560-compliant connections.
20. C — Difficulty engaging low gear during cold startup that improves after warm-up indicates gear oil viscosity is too thick for cold conditions, preventing proper flow for synchronizer operation. As the oil warms to operating temperature, viscosity drops and flow improves, restoring normal shifting. Winter-grade gear oils or synthetics help address this condition in cold climates.
21. A — A slight whitish haze at idle that clears at elevated RPM is characteristic of cold-idle combustion where combustion chamber temperatures are not quite sufficient for complete combustion of all injected fuel. As RPM increases and combustion temperatures rise, the haze clears. The pattern is diagnostic — persistent white smoke at elevated RPM indicates more serious problems.
22. B — A broken leaf in an auxiliary (non-main) leaf of a rear leaf spring still requires vehicle rejection for service until the broken leaf is replaced. While auxiliary leaves are not the CVSA out-of-service criterion that main leaves are, their failure affects load distribution and spring performance and is a reportable defect requiring correction before continued service.
23. D — The specification for a tractor-trailer combination leak test with service brakes released is 3 psi per minute maximum pressure drop. Different specifications apply with brakes applied and for tractor-alone configurations. The 3 psi/min standard reflects the additional connections and component count of a combination vehicle.
24. C — Wiper blades leaving streaks typically indicate worn wiper blade rubber or deteriorated blade material that no longer contacts the glass uniformly. Blade replacement resolves the streaking.

Motor failure, incorrect arm tension, and contamination produce different symptom patterns and would not typically produce streak-pattern failures.

25. A — An exhaust brake (flap-type retarder) creates exhaust backpressure by partially closing a flap valve in the exhaust stream. The engine must work against this backpressure on the exhaust stroke, producing braking torque. This is different from compression brakes (which alter valve timing) and engine retarders that use different mechanisms. The key mechanism is backpressure generation.
26. D — Finding a loose lug nut on a wheel requires removing the wheel, inspecting wheel studs and mounting surface for damage, replacing damaged hardware, and retorquing all lug nuts in correct sequence. A single loose nut may have damaged threads or mounting surfaces that affect other nuts' retention. Simple retightening without inspection may leave underlying damage unaddressed.
27. B — Technician B is correct. Fresh fifth wheel grease should be applied at each service interval to supplement or replace existing lubrication. Technician A is incorrect — brake cleaner is not the correct product for fifth wheel service. Brake cleaner removes lubricant, leaving the fifth wheel without protection and causing galling between the fifth wheel and trailer upper coupler.
28. B — Decreased retarding force during extended grade descent typically indicates excessive engine oil consumption during retarder operation — commonly from worn piston rings that allow more oil into the combustion chamber during the retarding operation. The oil consumption affects retarder effectiveness progressively. Normal operation and overheating produce different patterns.
29. A — Persistent white smoke during operation (not just at startup) indicates serious problems requiring diagnostic investigation: cooling system leak into combustion chambers (head gasket, cylinder head crack), injector problems, or fuel system contamination. Clearing through RPM adjustment or fuel treatment is not correct, and the condition requires root-cause investigation beyond PMI scope.
30. D — Brake chamber diaphragm inspection focuses on detecting air leakage from the chamber breather vent during normal operation. The breather provides an external indication of diaphragm integrity; significant airflow from the vent indicates diaphragm failure allowing air to escape through the non-pressurized side. Replacement is required for failed diaphragms.
31. C — Tandem axle tire wear significantly different between left and right sides indicates an alignment problem at the trailer tandem axle producing asymmetric wear patterns. Common causes include axle shift, bent components, or improper adjustment. Normal variation, driver patterns, and manufacturing variance do not typically produce this level of asymmetry.
32. D — A voltmeter reading 12.4 volts with the engine running at idle indicates below-normal charging system output. A properly functioning charging system produces 13.8-14.4 volts with engine running. The 12.4 V reading suggests the alternator is not producing sufficient output or the charging circuit has problems. This represents near battery voltage, not charging voltage.

33. A — Technician A is correct. Both dashboard warning lamps AND exterior lights (when their switches are activated) can be verified during a functional test. The prove-out cycle specifically verifies dashboard warning lamps. Exterior lights (headlamps, tail lamps, turn signals, etc.) are verified by activating their switches and confirming operation. Both are part of the complete light verification process.
34. C — Rough idle with smooth operation at elevated RPM is characteristic of a failed injector or injector problem producing uneven combustion at idle. At idle, each cylinder's contribution to engine smoothness is critical; at higher RPM, the effects of any one cylinder's issue are less noticeable. Diagnostic investigation identifies the specific cylinder and injector.
35. B — HVAC system producing cold air at some outlets but warm air at others indicates mode or blend door actuator failure producing inconsistent air routing. The doors cannot properly direct air between heating and cooling paths across the full outlet distribution. Refrigerant issues and filter problems produce different symptom patterns.
36. D — After air dryer cartridge replacement, the correct next step is to verify the air system builds full pressure in the specified time. This confirms both the cartridge is functioning properly and the system is otherwise leak-free. Simple documentation without verification may miss undetected problems; the build-up test validates overall system health.
37. A — A brake chamber with visible dents or impact damage on the housing must be replaced before the vehicle returns to service. Structural damage compromises the chamber's ability to contain air pressure reliably and may indicate internal damage. Repainting, reinforcement, or continued service monitoring do not address the structural issue.
38. B — A transmission output shaft seal leaking at approximately 1 ounce per week is a defect requiring seal replacement as a critical service item. Continued operation with active leakage leads to transmission fluid depletion, which can cause catastrophic transmission damage. Monitoring and compensation do not resolve the seal failure; replacement is required.
39. B — Visible blade damage on a turbocharger compressor wheel indicates the turbocharger is compromised and must be replaced. Damaged blades cannot be reliably cleaned or rebalanced; the turbocharger's precision balance is essential for its operation at rotational speeds exceeding 100,000 RPM. Continued operation risks failure with potentially catastrophic consequences.
40. D — AMT hesitation and jerky engagement during shifts, particularly from a stop, typically indicates worn clutch friction material or incorrect clutch adjustment affecting AMT engagement. The AMT depends on proper clutch response for smooth engagement, and clutch-side problems produce the described symptoms. Driver input, cold weather, and fluid levels produce different patterns.
41. A — The primary purpose of a crankcase ventilation (CCV) filter is to separate oil from blowby gases before they pass to the intake stream. Without the filter, entrained oil would enter the intake

and cause carbon buildup, incorrect air-fuel mixing, and other problems. The filter protects downstream components while allowing the required gas flow.

42. C — Wear grooves on a trailer upper coupler plate matching the fifth wheel top plate shape indicate progressive wear at the contact interface. The correct action is to inspect for wear limits specified by the manufacturer and schedule service as needed if the wear exceeds acceptable limits. Grease application and fifth wheel position changes do not address progressive wear patterns.
43. B — Correct pushrod stroke measurement requires marking the pushrod before application, applying brakes at the specified pressure (90-100 psi), measuring the stroke distance, and comparing the result to chamber-specific specification. This standardized procedure produces consistent, defensible measurements. Visual estimation and simple comparisons without specification reference are not reliable.
44. D — A/C producing adequate cooling only at high fan speed, with warm air at lower fan settings, commonly indicates a restricted cabin air filter reducing airflow across the evaporator at lower fan speeds. At higher fan speeds, more airflow is forced through the restriction, providing adequate cooling. Filter replacement typically resolves the condition.
45. A — Fire extinguisher inspection during PMI verifies mounting security, pressure gauge reading (should be in the green/operational range), pin and seal condition (showing no indication of discharge), and current annual inspection tag. All four factors must be verified for compliance. Discharge testing and weight measurement are not standard PMI procedures.
46. C — Aftertreatment system inspection during PMI covers external condition of components (DOC, DPF, SCR), clamp and mounting integrity, and diagnostic code retrieval through scan tool. Internal component inspection typically requires specialized service beyond PMI scope. Replacement of DPF and SCR at each PMI is not standard practice; service is based on condition and diagnostic indications.
47. B — A battery with a swollen or distorted case must be replaced regardless of electrical test results. Case swelling indicates internal pressure buildup from heat, overcharging, or cell failure, and the battery is unreliable even if current electrical testing shows acceptable readings. Continued use risks case rupture and battery failure.
48. D — Excessive axial end play in a wheel bearing requires service by disassembly, cleaning, inspection of all bearing components, and proper adjustment to specification (typically 0.001-0.005 inch). Simply tightening the spindle nut may not correct worn components, and adding grease does not resolve dimensional wear. Full service allows assessment and proper correction.
49. A — Diesel engine power output below specification requires comprehensive diagnostic investigation across multiple systems. Fuel-side problems (contaminated fuel, restricted filters, low fuel pressure), air-side problems (intake restriction, turbocharger issues, aftertreatment

backpressure), and engine mechanical problems all can produce power deficiency. Systematic diagnosis identifies the specific cause.

50. C — A coolant system deaeration chamber removes trapped air from the coolant system during operation. Air in the coolant prevents proper coolant circulation to hot components, reducing cooling effectiveness and potentially creating hot spots. The deaeration chamber allows air to separate and escape from the coolant, maintaining system integrity.