

PRACTICE EXAM 6: ASE T8 PMI

SIMULATION

1. During a brake chamber inspection, the technician notices one chamber on the rear axle shows significantly more extension at rest than the matching chamber on the same axle. Both chambers are spring-brake equipped. The most likely cause is:

- A. The technician is observing normal asymmetry during initial inspection
- B. The spring brake on the extended chamber has failed and is producing partial application
- C. Air leakage in the service brake line to the extended chamber
- D. A failed spring brake holding the chamber in partial application

2. Technician A says that an engine that produces heavy blue smoke at all operating conditions has a compression problem. Technician B says that blue smoke indicates oil burning in the combustion chambers. Who is correct?

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

3. The specified minimum tread depth on a trailer tire measured in any major groove is:

- A. 1/32 inch minimum depth
- B. 3/32 inch minimum depth
- C. 2/32 inch minimum depth

D. 4/32 inch minimum depth

4. A technician tests the air pressure build-up time on a Class 8 tractor's air brake system and finds that build-up from 85 psi to 100 psi requires 90 seconds. The specification is 45 seconds. The most likely cause is:

- A. Air compressor wear or significant air system leakage
- B. Normal build-up time for a Class 8 tractor in cold weather
- C. Compressor belt tension below specification
- D. Governor cut-out pressure set above the standard 120 psi

5. The correct method for testing a wheel speed sensor for ABS function is to:

- A. Rotate the wheel by hand and observe sensor output voltage
- B. Remove the sensor and apply power to verify coil resistance
- C. Inspect the sensor for physical damage only without electrical testing
- D. Measure AC voltage output at the sensor during wheel rotation

6. A vehicle equipped with retarding brakes exhibits reduced retarding effect with significantly higher engine RPMs compared to previous operation. The most likely cause is:

- A. Incorrect retarder control switch calibration at the driver control panel
- B. Worn or stuck engine retarder mechanism components producing incomplete engagement
- C. Excessive engine oil consumption interfering with retarder operation
- D. Normal performance variation between different operating conditions

7. The primary inspection criteria for a fifth wheel mounting plate is:

- A. Color or paint condition of the mounting plate surface
- B. External dimensions compared to specification with a measuring tape
- C. Structural integrity, crack detection, and secure mounting hardware
- D. Weight of the mounting plate compared to new specification

8. Technician A says that an oil analysis report showing elevated copper concentration typically indicates wear at engine bearings, bushings, or the turbocharger. Technician B says that copper in the oil indicates coolant contamination from a failed head gasket. Who is correct?

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

9. During a road test, a commercial vehicle's transmission exhibits slippage in third gear at moderate throttle input. The most likely cause is:

- A. Normal gear-specific slippage during moderate acceleration
- B. Worn clutches or bands associated with the third gear position
- C. Low transmission fluid level producing hydraulic pressure issues
- D. Contaminated transmission fluid requiring complete replacement

10. A Class 8 tractor exhibits a persistent coolant leak at the water pump weep hole, producing visible coolant on the front of the engine. The most likely cause is:

- A. Excessive radiator cap pressure forcing coolant past the pump seal

- B. Overfilled coolant reservoir producing pressure displacement
- C. Internal water pump seal failure requiring pump replacement or seal service
- D. Incorrect coolant concentration reducing pump seal lubrication

11. The correct approach to inspecting a high-pressure diesel fuel system during PMI is to:

- A. Visually inspect for leaks and damage without removing components or opening fittings
- B. Remove all fuel injectors for bench testing of spray patterns
- C. Apply hydraulic pressure to test rails to verify leak-free operation
- D. Disassemble fuel rails for internal component inspection

12. Technician A says that a bent driveshaft will produce vibration that increases with vehicle speed. Technician B says that a driveshaft with a missing balance weight will produce vibration at a specific speed range based on shaft geometry. Who is correct?

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

13. The primary function of an HVAC recirculation mode on a commercial vehicle is to:

- A. Allow outside air to enter the cab for improved air quality
- B. Circulate cab air back through the HVAC system for faster temperature change
- C. Isolate the cab from external dust and contamination during operation
- D. Provide defrost function to the front windshield during cold weather

14. A commercial vehicle's anti-lock braking system (ABS) warning lamp illuminates during hard braking events but remains off during normal driving. The most likely cause is:

- A. Normal ABS operation activating during hard braking situations
- B. Failed ABS control module requiring replacement
- C. Wheel speed sensor signal loss triggering ABS fault detection
- D. Brake fluid contamination producing false ABS fault readings

15. The correct lubricant for a transfer case on a 4x4 medium-duty truck is:

- A. Multi-purpose chassis grease applied through grease fittings
- B. SAE 15W-40 diesel engine oil at regular service intervals
- C. Automatic transmission fluid (ATF) in most applications
- D. Gear oil of the specific grade specified by the manufacturer

16. A technician inspecting a diesel engine finds that engine oil is being forced past the front crankshaft seal, with visible oil leakage on the front of the engine. The most likely cause is:

- A. Restricted or failed crankcase ventilation system producing elevated crankcase pressure
- B. Normal seal wear expected at this service mileage
- C. Overfilled oil level producing internal pressure displacement
- D. Incorrect oil viscosity for the operating temperature range

17. The standard capacity rating of a commercial vehicle air system reservoir is typically specified in:

- A. Cubic inches of internal volume
- B. Cubic feet of internal volume
- C. Gallons of compressed air at atmospheric pressure

D. Cubic meters of internal volume

18. Technician A says that a coolant system pressure test performed with the engine warm will reveal all system leaks. Technician B says that cooling system pressure testing should be performed with the engine cold for safety reasons. Who is correct?

A. Technician A only

B. Technician B only

C. Both A and B

D. Neither A nor B

19. The correct interpretation of oil on the outside of a heavy truck rear axle housing near the pinion is:

A. Normal residual oil from the last service that has not completely cleaned up

B. External damage to the axle housing causing oil seepage

C. Failed pinion seal allowing axle lubricant to escape along the pinion shaft

D. Incorrect axle lubricant level above the fill plug specification

20. A driver complains of reduced cab heat output only when the engine is under load, with normal heat output during idle or light-load conditions. The most likely cause is:

A. Restricted heater core producing inadequate coolant flow during high-flow operation

B. Engine thermostat operating outside normal range during load conditions

C. Heater control valve failure limiting heated coolant flow to the heater core

D. Low coolant level reducing thermal mass during high-demand heating periods

21. The correct diagnostic approach to a vehicle with inconsistent air pressure gauge readings is to:

- A. Replace both pressure gauges as a complete pair for consistent readings
- B. Recalibrate the gauges according to manufacturer specification
- C. Verify gauge accuracy with an independent calibrated test gauge in the system
- D. Adjust the compressor governor to compensate for gauge error

22. A Class 8 tractor with drive axle air suspension is observed to have ride height significantly lower than specification. The vehicle has been parked for several days. The most likely cause is:

- A. Normal air system leak-down during extended parking
- B. Failed air springs requiring replacement at multiple locations
- C. Stuck-open height control valve preventing system recharge
- D. Air system leak-down exceeding normal rates, requiring system leak investigation

23. The primary inspection criterion for a steering axle kingpin is:

- A. Vertical and lateral play when the wheel is lifted and rocked
- B. External appearance of the kingpin grease fitting condition
- C. Steering effort when the steering wheel is rotated at idle
- D. Visual alignment of the tire compared to the opposite side

24. Technician A says that a trailer's electric brake controller must be adjusted to match the trailer's weight and brake system characteristics. Technician B says that brake controller adjustment affects trailer braking response and should be verified during PMI. Who is correct?

- A. Neither A nor B
- B. Both A and B

- C. Technician A only
- D. Technician B only

25. The correct procedure for checking a commercial vehicle's horn function during PMI is to:

- A. Measure the voltage at the horn terminal only, without activating the horn
- B. Disconnect the horn assembly and test on a bench power supply
- C. Replace the horn assembly at each annual inspection for reliability
- D. Activate the horn control and confirm audible sound output from each installed horn

26. A medium-duty truck with a gasoline engine exhibits difficulty starting with black smoke at startup. The most likely cause is:

- A. Failed starter motor unable to achieve proper cranking speed
- B. Low battery voltage affecting starter and ignition systems
- C. Flooded condition from excessive fuel entering the combustion chamber
- D. Normal cold-start behavior for a gasoline engine in cold weather

27. The correct response when a tire is found with exposed cord or belt material is to:

- A. Replace the tire before the vehicle returns to service
- B. Continue service if the exposed area is on a non-load-bearing portion of the tire
- C. Apply tire sealant to cover the exposed cord area
- D. Reduce tire inflation pressure to minimize stress on the damaged area

28. A technician performing PMI finds that the fuel filter water separator bowl contains visible water accumulation. The correct action is to:

- A. Replace the complete fuel filter assembly with a new unit
- B. Drain the water from the separator bowl until clean fuel discharges
- C. Leave the water accumulation as an indicator of system performance
- D. Add fuel system cleaner to dissolve the water content

29. The primary purpose of the air dryer heating element in a commercial vehicle air brake system is to:

- A. Accelerate moisture removal during the dryer regeneration cycle
- B. Maintain optimum air temperature in the compressed air stream
- C. Reduce air dryer cartridge replacement frequency through accelerated drying
- D. Prevent ice formation in the purge valve during cold-weather operation

30. A diesel engine exhibits excessive black smoke under heavy acceleration only, with normal exhaust at idle and light load. The most likely cause is:

- A. Normal combustion for a heavy-duty diesel under full load
- B. Excess fuel delivery from a failed fuel pressure regulator
- C. Insufficient air supply from a turbocharger problem, air filter restriction, or intake leak
- D. Exhaust restriction from a clogged diesel particulate filter (DPF)

31. Technician A says that a slack adjuster that is over-adjusted produces shorter pushrod stroke than normal. Technician B says that a slack adjuster that is under-adjusted produces longer pushrod stroke than normal. Who is correct?

- A. Technician A only

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

32. The correct method for identifying a specific diagnostic trouble code (DTC) on a Class 8 tractor is to:

- A. Connect a scan tool compatible with the vehicle's SAE J1939 network
- B. Visually inspect the dash for illuminated warning indicators
- C. Listen for audible buzzer codes during engine operation
- D. Measure voltage at specific diagnostic pins with a multimeter

33. A vehicle's automatic slack adjuster was recently replaced as part of brake service. The correct initial adjustment procedure includes:

- A. Allowing the automatic adjuster to self-adjust during the first 100 miles of operation
- B. Setting the slack adjuster to the maximum extended position before service
- C. Adjusting the clutch pedal free travel to compensate for the new slack adjuster
- D. Manual initial adjustment to specification during installation, then verify through normal operation

34. The correct response when a 7-way trailer plug is found to have corrosion on the contact surfaces is to:

- A. Apply contact cleaner and verify electrical continuity with a multimeter
- B. Spray dielectric grease directly on the corroded surfaces
- C. Clean the contacts, inspect for damage, and apply dielectric grease for protection
- D. Replace the entire 7-way plug assembly regardless of corrosion severity

35. A commercial vehicle's coolant exhibits a pink color that the fleet maintenance records indicate has been in service for 3 years and 200,000 miles. The most likely recommendation is:

- A. Verify that this is extended-life coolant (ELC) at proper concentration and continue service
- B. Replace the coolant immediately due to potential chemistry degradation
- C. Add a supplemental coolant additive (SCA) package to restore protection
- D. Drain and flush the cooling system regardless of coolant condition

36. During a brake inspection, the technician observes that one brake lining on the left side of the vehicle is significantly thinner than the matching lining on the right side. Both linings are at the same axle position. The most likely cause is:

- A. Normal variation in lining wear between left and right sides
- B. Brake imbalance producing uneven application force at the affected wheel
- C. Incorrect lining material installation at the affected wheel
- D. Driver operating pattern favoring application on one side

37. The correct approach to inspecting commercial vehicle exhaust system hangers and clamps is to:

- A. Replace all exhaust hangers at each annual inspection
- B. Visually observe hanger condition from underneath the vehicle without direct inspection
- C. Measure hanger material thickness with a micrometer at each inspection
- D. Inspect hangers, clamps, and mounting points for cracks, corrosion, and secure attachment

38. Technician A says that a power steering fluid hose showing swelling under pressure indicates internal delamination and requires replacement. Technician B says that a swelling power steering hose can be repaired with external clamps to contain the expansion. Who is correct?

- A. Both A and B

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

39. A Class 8 tractor's trailer air supply (emergency) line at the rear of the tractor produces an audible leak with the engine running and the system fully pressurized. The most likely cause is:

- A. Normal air system operation when the trailer is disconnected
- B. Excessive air pressure in the trailer supply system
- C. Failed seal at the tractor protection valve or glad hand connection
- D. Worn air compressor producing excess air to the trailer supply

40. The correct method for measuring the depth of wear on a brake lining is:

- A. A feeler gauge placed between the lining and the drum or rotor surface
- B. A brake lining depth gauge or ruler measuring from the lining edge to the backing plate
- C. Visual estimation of the remaining lining thickness through the brake window
- D. A dial indicator measuring lining movement during brake application

41. During a PMI, a technician finds a drive axle lubricant level that is above the fill plug specification. The most likely consequence is:

- A. Excessive internal pressure producing seal failure and lubricant leakage
- B. Improved gear lubrication at high speed operation
- C. Reduced gear wear due to increased lubricant availability
- D. Normal operating condition that requires no action

42. The correct procedure for checking a commercial vehicle's differential oil level is to:

- A. Remove the inspection plug and observe oil level at the plug opening
- B. Measure differential temperature and compare to specification for oil assessment
- C. Drain the complete differential oil and measure volume for accurate quantity
- D. Open the fill plug and verify the oil level reaches the specified height

43. A Class 8 tractor with air-suspension drive axles shows normal ride height while running, but drops significantly low when parked. The most likely cause is:

- A. Normal operation — air suspension deflates during parking for load management
- B. Failed air springs at multiple positions requiring replacement
- C. Air system leakage exceeding the pressure holding rate during parking
- D. Disconnected air supply line to the drive axle air suspension system

44. Technician A says that a tractor's primary reservoir serves the primary brake circuit and the rear drive axle brakes. Technician B says that the secondary reservoir serves the secondary brake circuit and the steer axle brakes. Who is correct?

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

45. The correct interpretation of a tractor's air dryer that does not produce audible purging at governor cut-out is:

- A. A failed purge valve or stuck-closed discharge line requiring service

- B. Normal operation — some air dryers purge silently without audible sound
- C. Insufficient air pressure in the system preventing purge activation
- D. Restricted air intake reducing compressor output and purge function

46. A diesel engine's DPF differential pressure sensor reads significantly higher than specification during normal operation. The most likely consequence is:

- A. Increased fuel economy due to reduced DPF regeneration cycles
- B. Reduced engine performance from incorrect sensor readings affecting injection
- C. Excessive regeneration cycles from false high-pressure readings
- D. Complete DPF system shutdown to prevent damage from high pressure

47. The correct action when a commercial vehicle's automatic transmission fluid shows a burnt smell and dark brown color is to:

- A. Continue service and monitor for changes at the next PMI interval
- B. Add transmission fluid additive to restore performance characteristics
- C. Drain the contaminated fluid and refill with new fluid of the specified type
- D. Service the transmission including fluid replacement and inspection for internal damage

48. A technician performing PMI discovers that a commercial vehicle's windshield wiper motor operates only at high speed setting. The most likely cause is:

- A. Worn wiper linkage producing binding at low speed settings
- B. Failed wiper motor speed resistor or control module
- C. Incorrect wiper blade replacement causing speed-specific operation
- D. Normal wiper operation at high speed only during wet weather

49. The correct response when a tractor's drive axle lubricant is found to be contaminated with water is to:

- A. Drain and refill the drive axle lubricant with the specified fresh lubricant
- B. Continue service with the water contamination until the next interval
- C. Add a water-dispersing additive to the existing lubricant
- D. Heat the axle to evaporate the water before refilling with fresh lubricant

50. The primary purpose of a brake pedal position sensor on a modern commercial vehicle is to:

- A. Calculate brake pedal force for analytical purposes only
- B. Provide driver training data for fleet management
- C. Supply brake pedal application data to vehicle control systems and stop lamp operation
- D. Measure brake pedal travel for manufacturer warranty compliance

PRACTICE EXAM 6: ANSWER KEY AND EXPLANATIONS

1. D — A spring brake that has failed and is holding the chamber in partial application produces the asymmetric extension observed at rest. The failed spring brake cannot fully retract, so the pushrod remains partially extended even with system air pressure applied. The condition requires chamber replacement to restore proper function.
2. B — Technician B is correct. Blue exhaust smoke indicates oil entering the combustion chamber and burning — commonly from worn valve guide seals, worn piston rings, or failed turbocharger seals. Technician A is incorrect because compression problems typically produce different symptoms (hard starting, uneven running) rather than blue smoke.
3. C — Appendix G specifies a minimum tread depth of $\frac{2}{32}$ inch on trailer tires and all other non-steering-axle tires, measured in any major tread groove. Steering axle tires require the higher $\frac{4}{32}$ inch minimum. The $\frac{2}{32}$ inch minimum applies to drive axle tires and trailer tires across all positions.
4. A — Extended air pressure build-up time (90 seconds versus the 45-second specification) indicates either compressor wear (reducing output capacity) or significant air system leakage (consuming output faster than build-up can compensate). Cold weather and governor settings produce different symptom patterns. The two primary causes are compressor performance and system leakage.
5. D — Wheel speed sensor testing is performed by measuring AC voltage output during wheel rotation. The sensor generates an AC signal proportional to wheel speed, and a healthy sensor produces a clean, measurable signal. DC voltage, coil resistance checks, and visual inspection alone do not verify sensor signal output during actual operation.
6. B — Reduced retarding effect with higher engine RPM indicates worn or stuck retarder mechanism components producing incomplete engagement. The retarder cannot deliver full braking torque because some internal mechanism is not fully engaging. Switch calibration, oil consumption, and normal variation produce different symptom patterns.
7. C — Fifth wheel mounting plate inspection focuses on structural integrity (no cracks), crack detection in welds and mounting bolts, and secure mounting hardware at correct torque. These factors determine whether the fifth wheel can safely support the trailer's weight and handle coupling forces. Paint, dimensions, and weight are not meaningful inspection criteria.
8. A — Technician A is correct. Copper in engine oil typically indicates wear at engine bearings, bushings, or turbocharger components, because these components contain copper alloys that

release measurable copper into the oil as they wear. Technician B is incorrect — head gasket failure produces coolant contamination markers (sodium, potassium) rather than copper.

9. B — Slippage isolated to a specific gear position (third gear), with all other gears functioning normally, indicates worn clutches or bands associated with that specific gear. Planetary gear clutches wear in isolation based on the gear's usage patterns. Whole-transmission issues produce slippage across multiple gear positions, not isolated to one gear.
10. C — A weep hole producing visible coolant leakage indicates internal water pump seal failure. The weep hole is designed to externally signal this failure — coolant appears at the weep hole when the dynamic seal has lost its ability to contain coolant. Pump replacement or seal service is the correct remedy.
11. A — PMI inspection of high-pressure diesel fuel systems is visual — looking for external leaks, damage, and condition — without removing components or opening pressurized fittings. High-pressure common rail systems operate at pressures exceeding 30,000 psi, and field disassembly creates safety hazards and introduces contamination risk to precision components.
12. D — Both technicians are correct. A bent driveshaft produces vibration that increases with speed because imbalance forces rise with rotational speed squared. A missing balance weight creates rotational imbalance that produces vibration in a specific speed range determined by the shaft's characteristics. Both are diagnostic patterns for driveshaft problems.
13. C — HVAC recirculation mode isolates the cab from external dust, contamination, and some contaminants during operation. Recirculation circulates cab air through the HVAC system rather than drawing fresh outside air, which is useful in dusty or contaminated environments. It does not allow outside air entry, doesn't primarily accelerate temperature change, and doesn't control defrost.
14. C — An ABS warning lamp that illuminates only during hard braking and then clears indicates wheel speed sensor signal loss during the high-dynamic conditions of emergency braking. Sensor damage, contamination, or incorrect air gap can produce signal loss only under heavy wheel motion. Scan tool diagnosis is required to identify the specific fault.
15. D — Transfer cases on 4x4 trucks use gear oil of the specific grade specified by the manufacturer — typically GL-5 80W-90 or a synthetic equivalent. The gear oil must match the manufacturer's requirements for viscosity and additive package. Chassis grease, engine oil, and ATF are not suitable for transfer case service.
16. A — Oil forced past the front crankshaft seal from the inside indicates elevated crankcase pressure overwhelming the seal. The most common root cause is a restricted or failed crankcase ventilation (CCV) system. Simply replacing the seal without addressing the CCV root cause produces repeat failures as the pressure continues to force oil past the new seal.

17. B — Commercial vehicle air reservoirs are typically specified by internal volume in cubic feet. This is the standard measure used by air system engineers to match reservoir capacity to compressor output and air demand. Cubic inches are too small for practical reservoirs, gallons apply to liquid containers, and metric measurements are not standard in U.S. heavy truck specifications.
18. D — Neither technician is correct. Cooling system pressure testing is typically performed with the engine cold for safety reasons, but modern pressure testing can reveal leaks under either cold or warm conditions. A cold-engine test prevents scalding and allows accurate seal evaluation. Warm-engine testing can introduce safety risks and does not necessarily reveal all leaks that cold testing would find.
19. C — Oil on the outside of a rear axle housing near the pinion indicates a failed pinion seal allowing axle lubricant to escape along the pinion shaft. The leak follows the shaft path externally and appears at the location described. The condition requires seal replacement, with verification that the axle breather is functional to prevent repeat failure.
20. A — A heater core that produces adequate heat at idle but reduced heat under engine load typically has restricted internal flow. At idle, coolant flow rate is low and allows residence time for full heat transfer. Under load, flow rate increases and coolant passes through the restricted heater core too quickly for adequate heat transfer. This diagnostic pattern identifies heater core restriction.
21. C — Inconsistent air pressure gauge readings require verification with an independent calibrated test gauge installed in the air system. Without independent verification, the technician cannot determine whether the gauge is reading correctly or whether an actual pressure problem exists. This verification-before-replacement principle applies broadly to gauge-related diagnostics.
22. D — Air system leakage exceeding normal overnight rates indicates a leak exceeding compressor capacity to maintain pressure during extended parking. Normal leakage produces small overnight pressure loss; excessive leakage drops ride height significantly. The leak investigation must identify the specific loss source — air lines, fittings, valves, or components.
23. A — Kingpin inspection is performed by lifting the wheel clear of the ground and attempting to lift/lower the tire (vertical play check) and rock the tire inward/outward (horizontal play check). Any detectable play in these motions indicates kingpin wear requiring replacement. Steering effort, grease fitting condition, and external alignment do not reveal kingpin wear.
24. B — Both technicians are correct. Electric brake controllers must be adjusted to match specific trailer characteristics including weight and brake system response. PMI verification of brake controller adjustment ensures the trailer brakes respond correctly to tractor brake input. Both points are valid PMI inspection items.
25. D — Horn function is verified by activating the horn control from the steering wheel and confirming audible sound output from each installed horn (electric and air horns where equipped).

This functional test confirms the complete circuit and delivers real-world verification. Bench testing and voltage-only testing are unnecessary for PMI-level horn verification.

26. C — A flooded condition from excessive fuel in the combustion chambers produces black smoke at startup and difficult starting. This commonly results from repeated failed start attempts or a fuel system problem that delivers excessive fuel. Gasoline engines are sensitive to flooding, unlike diesel engines where the condition is different.
27. A — A tire with exposed cord or belt material must be replaced before the vehicle returns to service. Exposed internal components indicate the tire has lost its structural integrity and is at immediate risk of failure under load. This condition is a CVSA out-of-service criterion in most cases, regardless of the specific location of the damage.
28. B — Water accumulation in a fuel filter water separator is expected and normal — the separator's function is to capture water before it reaches the injectors. The correct action is to drain the water through the separator bowl drain valve until clean fuel discharges. The filter is not replaced unless the filter element itself shows service need.
29. D — The air dryer heating element prevents ice formation in the purge valve during cold-weather operation. Without the heater, cold temperatures freeze moisture in the purge valve, preventing proper purging during regeneration cycles. The heater ensures consistent dryer function across all operating temperatures.
30. C — Black smoke under heavy acceleration with normal light-load exhaust indicates fuel-rich combustion under load from insufficient air supply. This pattern points to turbocharger problems, air filter restriction, or intake leaks — all of which reduce the air available for complete combustion under load demand. Normal combustion and exhaust restriction produce different symptom patterns.
31. B — Both technicians are correct. An over-adjusted slack adjuster produces shorter pushrod stroke because the adjustment reduces the angular travel required to engage the brake. An under-adjusted slack adjuster produces longer pushrod stroke because more angular travel is required to engage the brake. Both describe valid slack adjuster wear patterns.
32. A — Modern Class 8 tractors use SAE J1939 as the standard in-vehicle network for diagnostic data. A scan tool compatible with J1939 retrieves the specific diagnostic trouble codes stored in the engine control module. Visual inspection, buzzer codes, and voltage measurement at diagnostic pins are not the modern diagnostic method.
33. D — Newly installed automatic slack adjusters require manual initial adjustment to specification at installation, followed by verification through normal operation. The initial adjustment establishes the starting position; the automatic function then maintains correct adjustment as brakes wear. Simple installation without initial adjustment can produce incorrect stroke from the start.

34. C — Corroded 7-way plug contacts require cleaning, damage inspection, and application of dielectric grease for protection against future corrosion. Contact cleaner alone without grease leaves the contacts exposed to moisture. Spraying grease on corroded surfaces traps contamination. Full replacement is typically reserved for severely damaged connectors beyond cleaning.
35. A — Pink extended-life coolant (ELC) at 3 years and 200,000 miles is still within typical ELC service life (often 600,000 miles or 6-8 years). Verifying the coolant is at proper concentration and continuing service is correct. Immediate replacement, SCA addition, and unnecessary flush are not indicated by the described conditions.
36. B — Uneven brake lining wear between matching wheels indicates brake imbalance at the affected wheel — typically a dragging brake, slack adjuster problem, or hardware issue that produces more brake application on the worn side. The condition requires investigation to identify and correct the specific brake imbalance. Normal variation does not produce significant asymmetry.
37. D — Exhaust system hangers and clamps are inspected for cracks, corrosion, and secure attachment at mounting points. Hangers support the exhaust system against vehicle vibration and thermal expansion; failed hangers produce exhaust system damage, leaks, and potential detachment. Individual measurement is not typical PMI practice; visual observation from underneath is standard but must be thorough.
38. B — Technician A is correct. A power steering hose swelling under pressure indicates internal delamination — the reinforcement layers that contain pressure have separated, allowing the hose to expand under normal operation. The hose requires replacement; external clamps cannot contain a delaminating hose and create additional risk. Technician B is incorrect.
39. C — Audible air leak at the trailer supply (emergency) line with a connected system indicates a failed seal at the tractor protection valve or glad hand connection. The leak is at the tractor-trailer interface and can indicate seal failure, glad hand damage, or valve problems. Normal operation does not produce audible leaks at this location.
40. B — Brake lining depth measurement uses a brake lining depth gauge or calibrated ruler measuring from the lining edge to the backing plate. This provides a quantitative measurement comparable to specification. Feeler gauges are used for different applications, visual estimation is not accurate enough for specification compliance, and dial indicators measure different parameters.
41. A — Drive axle lubricant level above the fill plug specification produces excessive internal pressure during operation. The pressure forces lubricant past seals and gaskets, producing leakage at points that normally hold under specified pressure. Lubricant level above the fill plug is a fault requiring correction.
42. D — Differential oil level checking is performed at a fill plug on the axle housing. The technician opens the fill plug with the vehicle on level ground and verifies that the oil level reaches the bottom

of the plug opening. Temperature measurement, complete drainage, and volume measurement are not standard PMI procedures for level verification.

43. C — Normal ride height while running with significant drop when parked indicates air system leakage exceeding the rate the compressor can replace air. During operation, the compressor keeps pace with small leakage; during parking, the compressor is off and leakage allows pressure to decay. Normal parking, failed air springs, and disconnected supply produce different symptom patterns.
44. B — Both technicians are correct. The primary reservoir feeds the primary brake circuit, which typically controls the rear drive axle brakes on Class 8 tractors. The secondary reservoir feeds the secondary brake circuit, which typically controls the steer axle brakes. This dual-circuit architecture preserves braking capability if either circuit fails.
45. A — An air dryer that does not produce audible purging at governor cut-out indicates a failed purge valve or stuck-closed discharge line. Normal operation produces a distinctive audible purge sound as accumulated moisture is released through the purge valve. Silent operation is not normal for modern air dryer designs; service or replacement is required.
46. C — High DPF differential pressure sensor readings produce false indications that the filter is more restricted than it actually is. The engine management system responds by commanding more frequent regeneration cycles, wasting fuel and potentially damaging the DPF through over-regeneration. The sensor requires service or replacement.
47. D — Automatic transmission fluid with a burnt smell and dark brown color indicates significant overheating or extensive wear within the transmission. Simple fluid replacement without addressing the underlying cause typically produces recurring contamination. The transmission requires service including fluid replacement and internal inspection to identify the source of the problem.
48. B — A wiper motor operating only at high speed indicates a failed wiper motor speed resistor or speed control module. The high-speed circuit bypasses the resistor for direct power, which is why it continues to function. Lower speeds depend on the resistor network and fail together when it does. Linkage wear and blade issues produce different symptom patterns.
49. A — Water contamination in drive axle lubricant is a significant finding that requires immediate drain and refill with fresh specified lubricant. Water contamination accelerates bearing wear and gear damage. Continuing service, additives, and heating methods do not remove the water contamination effectively; complete fluid replacement is the correct remedy.
50. C — A brake pedal position sensor supplies brake pedal application data to multiple vehicle control systems (cruise control disengagement, automatic transmission shift patterns, stability control) and to stop lamp operation. The sensor is an integral part of modern vehicle control networks. Simple purposes like analytical data, training, or warranty compliance are not the primary function.