

PRACTICE EXAM 23: CANADIAN 310T TRUCK AND COACH TECHNICIAN SIMULATION (135 QUESTIONS)

This practice exam contains 135 multiple-choice questions, each with four options (A, B, C, and D), matching the format of the Interprovincial Red Seal exam for this trade. Allow about four hours and work without manuals or notes. Choose the single best answer for each question. A score of 70 percent, or 95 correct answers, is the pass mark. Check your answers against the key and explanations at the end of the exam.

1. A truck's accessory belt squeals under electrical load, and the automatic tensioner shows its pointer at the end of its travel. What is the correct repair?
 - A. Spray belt dressing on the belt so that the squeal stops while the truck is driven
 - B. Replace the belt and the worn tensioner, then recheck alignment of all driven pulleys
 - C. Remove the tensioner and replace it with a fixed idler to hold the belt tight
 - D. Add a second belt on the same pulleys so the load is shared between both belts

2. After fitting new wet cylinder liners, a technician measures liner standout above the block deck and finds it below the specified range. What is the most likely consequence?
 - A. Higher compression ratio, which would raise cylinder pressure and make the engine easier to start
 - B. Faster liner cooling, which would reduce piston ring wear and extend the life of the whole assembly
 - C. Insufficient clamping on the liner flange, which risks head gasket leakage and coolant or combustion gas loss
 - D. No effect, because the head gasket alone seals each cylinder regardless of how the liners protrude

3. A tractor pulls to one side only when braking, and tire wear is even. Which check is the most appropriate?
 - A. Replace both steer tires, because uneven braking is mainly caused by tire wear patterns
 - B. Check the fifth wheel, since it controls how evenly the front axle brakes act

C. Add air to the trailer tires, because pressure there decides which side of the tractor pulls during braking

D. Compare front brake torque and adjustment side to side, and look for a seized or contaminated brake

4. A truck's wet tank keeps collecting water even after a new desiccant cartridge was installed. No blast of air is heard from the dryer when the compressor unloads. What should be checked first?

A. The brake chamber diaphragms for leaks, because water enters the tanks through the service chambers

B. The governor signal line to the dryer purge valve and the purge valve itself for blockage or failure

C. The slack adjuster stroke, because water collects in the tanks when the brakes are badly out of adjustment

D. The trailer glad hands, because moisture flows backward from the trailer into the tractor tanks

5. A truck with a manual transmission shudders when the clutch engages, and a small amount of oil is visible on the bell housing. What is the most likely cause?

A. The clutch pedal has too much free play, which makes the clutch grab suddenly on every engagement

B. The transmission is overfilled, which pushes oil into the clutch through the shifter

C. Oil from a leaking rear main seal or input shaft seal has contaminated the clutch disc

D. The flywheel has too many teeth, which causes the clutch to engage unevenly

6. A technician must tighten a fastener specified at 40 N·m. The shop has a wrench rated 20 to 200 N·m and another rated 10 to 60 N·m. Which choice best protects torque accuracy?

A. Use the 10 to 60 N·m wrench, because the specification sits inside its working range

B. Use the 20 to 200 N·m wrench, because a larger tool always delivers more reliable readings

C. Use either wrench and add a short extension to correct for any scale error at this value

D. Use the 20 to 200 N·m wrench set near its minimum and tap the handle for the final click

7. A refrigerated trailer unit in defrost mode switches back to cooling normally. What device usually ends the defrost cycle?

- A. A pressure relief valve that opens when the coil reaches full temperature
- B. A fuel pressure sensor that shuts the heater off when fuel pressure drops
- C. The trailer brake switch, which signals the unit when the vehicle slows down
- D. A defrost termination thermostat or sensor that reads coil temperature

8. A hydraulic cylinder rod seal weeps oil, and a fingernail catches on a deep scratch in the chrome rod. What is the proper repair?

- A. Repair or replace the scored rod and install new seals, because new seals will leak again on a damaged rod
- B. Install new seals only and tighten the gland nut firmly to force the seal against the scratch
- C. Apply sealant over the scratch and leave the old seal in place until it stops weeping oil
- D. Increase the system relief pressure so that the seal is pressed against the rod more tightly

9. A technician replaces only one of two parallel-connected batteries because it failed a load test. What is the likely outcome?

- A. Both batteries will perform at the level of the newer one, so charging improves
- B. The alternator will lower its output to match the two batteries automatically
- C. The old and new batteries will charge and discharge unevenly, which shortens the life of the new one
- D. The vehicle will crank faster, because a new battery increases cable resistance

10. A dial indicator shows crankshaft end play of 0.60 mm on an engine whose specification is 0.10 to 0.25 mm. Which component is most likely worn?

- A. The main bearing oil passages, which supply the thrust faces and carry the load around the journals
- B. The crankshaft thrust bearing surfaces, which control axial movement of the crankshaft in the block
- C. The rod bearings, because they locate the crankshaft front to rear while the engine is running
- D. The flywheel dowels, because loose dowels let the crank slide forward in the block under torque

11. A technician replaces an A/C compressor that failed and left metal debris in the system. What else must be done?

- A. Install the new compressor and run the system, since the debris will fall into the dryer
- B. Replace only the compressor clutch and add extra oil to wash the debris through
- C. Add stop-leak to the refrigerant so the debris is sealed against the lines
- D. Flush the system as the manufacturer directs and replace the receiver-drier or accumulator and metering device

12. A steer tire shows a pattern of repeating scallops around its tread. Which cause is most likely?

- A. Overtightened wheel nuts, because they press the tire tread into a scalloped shape
- B. An air-conditioning fault, because refrigerant pressure affects tire contact with the road
- C. Too much steering fluid, because it forces the tire to run at an angle to the road
- D. Worn shock absorbers or a loose or worn suspension and wheel imbalance that let the tire bounce

13. The compressor keeps pumping past the governor cut-out pressure and the safety valve pops open. Which part is most likely at fault?

- A. The brake application valve, because it controls how long the compressor stays loaded
- B. The air dryer heater, because a hot dryer prevents the compressor from unloading
- C. The compressor unloader mechanism or the governor line that signals it to stop loading
- D. The spring brake chambers, because they tell the compressor when the system is full

14. A truck's clutch slips only when the transmission is hot and pulling a heavy load, then grips normally after it cools. Which cause is the most consistent?

- A. A transmission fluid level that is slightly low and cools too slowly during the very long pull
- B. A warped flywheel or weakened pressure plate that loses clamp load as heat expands the parts
- C. A cracked windshield that changes cab pressure and the way the clutch pedal feels
- D. A driveline angle that is too small, which makes the clutch slip when it cools

15. Before tilting a tractor cab that rides on air springs, what step is recommended?

- A. Exhaust the cab air springs so the cab sits low and the tilt mechanism is not under air load
- B. Fill the cab air springs to maximum pressure so the cab lifts with less pump effort
- C. Disconnect the brake lines to the cab so air from the brake system cannot enter the cab springs at all
- D. Remove the cab air springs completely so the cab can slide off its mounts freely

16. A starter makes a loud grinding sound immediately after the engine starts, and then the sound stops once the key is released. What is the likely fault?

- A. The flywheel has too many teeth for the starter pinion and is worn smooth
- B. The starter drive pinion is not retracting or its overrunning clutch is failing
- C. The battery has low voltage and cannot supply current to disengage the starter
- D. The alternator belt is slipping and loads the starter as it spins in neutral

17. An oil analysis report shows high silicon and aluminum on an engine with a recently serviced air cleaner. What does this pattern most strongly suggest?

- A. Coolant leaking into the oil, which usually raises sodium and potassium rather than silicon
- B. Normal break-in wear from new bearings, which always shows silicon until the first oil change
- C. Fuel dilution from a leaking injector, which would mainly show as lower viscosity and flash point
- D. Dirt entering through an intake leak or damaged ducting, wearing pistons and rings with abrasive dust

18. Before touching high-voltage components on an electric truck, a technician removes the service disconnect. What should be done next?

- A. Wait the required discharge time, then verify zero volts with a properly rated meter before starting work
- B. Begin work immediately, because removing the disconnect always leaves no voltage inside
- C. Touch the cable with the back of the hand to feel whether any voltage remains
- D. Test with a standard 12 V test light, since it detects any voltage present in the high-voltage system

19. One wheel stud on a drive axle hub has snapped off. What is the correct repair practice?

- A. Leave the broken stud out and tighten the remaining studs a little more to make up the difference
- B. Replace only the nut on the broken stud and run the truck with the nine remaining studs
- C. Replace the broken stud and inspect the neighbouring studs, nuts, and wheel holes for damage before reassembly
- D. Weld the broken stud back to the hub flange and grind it smooth before fitting the wheel

20. A truck's ABS lamp comes on intermittently at low speed, and a stored code points to one wheel speed sensor. The tone ring shows a missing tooth. What is the correct repair?

- A. Replace only the sensor, because a damaged tone ring never affects the sensor signal
- B. File the neighbouring teeth to match the gap so the signal remains even around the ring
- C. Bypass the sensor with a jumper wire so the ABS module no longer sees the fault
- D. Replace the damaged tone ring and then confirm the sensor signal with the wheels turning

21. Why do many heavy-duty manual transmissions from Eaton Fuller not use synchronizers?

- A. They are designed to be shifted with matching engine speed and a clutch brake, which reduces wear and weight
- B. They have no gears that rotate at different speeds, so synchronizers are not needed
- C. They shift only when the truck is stopped, so synchronizers would serve no purpose
- D. They use electric motors to match speeds, which makes the mechanical synchronizers redundant

22. All the gauges on a truck dash read zero, yet the engine runs normally. Which step comes first?

- A. Replace the dash cluster immediately, because all gauges together mean a failed cluster
- B. Replace the engine control module, since it supplies every gauge on the dash display
- C. Check the cluster power, ground, and data link connections before suspecting the cluster itself
- D. Add a resistor to the dash circuit so that the gauges can sense the engine signal

23. An engine used mostly for long idling has an oil analysis showing 6 percent fuel dilution and low viscosity. Which cause is most consistent with these findings?

- A. A restricted air filter that raises intake vacuum and pulls extra fuel through the crankcase vent
- B. A leaking injector nozzle or prolonged low-load idling that leaves unburned fuel washing past the rings
- C. An overfilled crankcase that raises oil level and draws fuel up through the dipstick tube at idle
- D. A stuck thermostat that keeps coolant hot and thins the oil by raising operating temperature

24. A technician fills a spray bottle from a labelled drum of a hazardous cleaning concentrate. Under WHMIS 2015, what must appear on the new container?

- A. A handwritten note naming the technician and the date the bottle was filled for the shift
- B. Nothing at all, because the bottle is used only by the person who filled it during the same job
- C. A workplace label with the product identifier and safe-handling information, plus a reference to the safety data sheet
- D. A supplier label copied from the drum, including the full list of all ingredients and their percentages

25. A trailer landing gear will not crank down, and the crank handle turns with resistance, then clicks. What is the most likely cause?

- A. A flat spare tire that places weight on the legs and blocks their movement
- B. A low reefer fuel tank that changes the weight on the landing gear legs
- C. A worn brake drum, since the drum and landing gear share the same shaft
- D. Damaged or dry gearbox gears, or a stripped gear in the landing gear housing

26. A technician finds a hydraulic hose with its lay line spiralling around the hose after installation. What does this indicate?

- A. The hose is installed correctly, since the lay line should always spiral along the hose
- B. The hose was twisted during installation, which can shorten its life
- C. The hose pressure rating is too high, which causes the lay line to wind around it

D. The hose is too short, so it has stretched and rotated against the fitting

27. After rotating tires on a vehicle with direct tire pressure monitoring sensors, the dash shows the wrong position for a low tire. What should be done?

- A. Perform the sensor relearn or location procedure so that each sensor ID matches its wheel position
- B. Replace all four sensors, since moving tires always damages the internal sensors
- C. Reset the odometer, because sensor locations are tied to the vehicle distance record
- D. Add pressure to the tires until the display stops showing the incorrect position

28. On a standard automotive relay, which terminal is the normally closed contact that carries power when the coil is not energized?

- A. Terminal 85
- B. Terminal 86
- C. Terminal 87a
- D. Terminal 30

29. A technician installs a new clip-in ABS wheel speed sensor. What is the correct way to set the sensor gap on most heavy-duty axles?

- A. Push the sensor in until it contacts the tone ring and let wheel rotation set the running gap
- B. Set the gap with a thick feeler gauge to a fixed value and then lock the clip firmly
- C. Pull the sensor out about 10 mm and then tighten the clip bolt as firmly as possible
- D. Coat the sensor with grease and press it into the hub until it stops against the axle

30. A range shift on a heavy-duty manual transmission is slow, and the air system pressure is normal. What should be checked?

- A. The steering gearbox, since steering fluid controls the speed of the range shift
- B. The radiator cap, because the range cylinder uses coolant pressure to move its piston

- C. The brake chambers, because the range cylinder and chambers share the same diaphragm
- D. The transmission air filter and regulator, and the range valve and cylinder for contamination

31. A technician finds milky oil on the dipstick. The coolant level is steady and there are no external leaks. What is the best next step?

- A. Change the oil and filter, then run the engine at fast idle to see whether the milky colour returns later today
- B. Pressure-test the cooling system and inspect for oil in the coolant, then isolate the oil cooler as a likely source
- C. Add stop-leak to the cooling system and recheck the dipstick after one full shift of normal driving
- D. Replace the head gasket immediately since milky oil always means a failed head gasket on any engine

32. A set of A/C gauges shows high low-side pressure and low high-side pressure with weak cooling. What is the most likely fault?

- A. An overcharged system, since an overcharge always makes the high side read low
- B. A blocked condenser, since blockages cause the high side to read extremely low
- C. An internal compressor fault, such as leaking valves, that cannot build proper pressure difference
- D. A clogged orifice tube, because it makes the low side pressure rise above normal

33. A relay coil lacks a suppression diode, and the electronic control module is getting voltage spikes when the relay opens. How should a diode be installed?

- A. In series with the relay contacts with the banded end toward ground
- B. Across the battery terminals with the banded end toward the negative post
- C. In series with the ignition feed with the banded end toward the module
- D. Across the coil with the banded end toward the positive supply side

34. A tire's DOT date code ends in the four digits 3421. When was the tire manufactured?

- A. In the 34th week of 2021
- B. On the 34th day of the year 2021
- C. In March 2021, in the fourth production batch
- D. In the 21st week of the year 2034

35. A turbocharger shows wet oil in the turbine housing and oil in the charge air cooler. Which cause is most likely?

- A. A cracked exhaust manifold, because exhaust leaks pull oil through the turbo bearing housing
- B. A restricted turbo oil drain line or high crankcase pressure forcing oil past the turbo shaft seals
- C. Low coolant level, because turbochargers rely on coolant to carry oil to the turbine side of the turbo shaft
- D. Overinflated tires, because wheel loads change the oil return pressure in the turbo drain

36. The ABS lamp on a tractor comes on only when a trailer is connected and stays on. The trailer has its own ABS. Which check is most appropriate?

- A. Replace the tractor ABS electronic control unit, since trailer lamps always indicate a tractor module fault on this model
- B. Remove the trailer ABS fuse so the lamp stays off whenever the trailer is hooked up
- C. Disconnect the tractor wheel speed sensors, because they send signals into the trailer wiring
- D. Inspect the seven-way connector and test the constant ABS power and ground circuits for corrosion and voltage

37. A truck's manual transmission overheats and leaks from its breather after a service visit. What is the most likely cause?

- A. The transmission was overfilled above the fill plug level, causing churning, heat, and pressure
- B. The transmission was filled with too little oil, which makes the oil flow out the breather
- C. The clutch was installed backward, which makes the oil level rise inside the bell housing
- D. The driveshaft was balanced, which pushes the oil toward the transmission breather

38. A coolant temperature sensor with a negative temperature coefficient has an open circuit. What will the engine control module most likely interpret?

- A. An extremely hot engine, because the signal voltage drops toward ground
- B. An extremely cold engine, because the signal voltage rises toward the 5 V reference
- C. A normal operating temperature, because open circuits are ignored by the engine control module completely
- D. An engine at idle only, because open circuits affect only low speed operation

39. A driver reports wind noise at highway speed, and a light test shows a gap in the door seal near the latch. What is the best correction?

- A. Fill the gap with silicone sealant and close the door so the sealant spreads and sets
- B. Tape over the outside of the door seam with foil tape and leave the seal as it is until the next service
- C. Adjust the door striker and latch so the door compresses the seal evenly, and replace the seal if it is damaged
- D. Increase the cab tire pressure so the cab rides lower and closes the gap

40. A tractor's dual tires show a significant pressure difference between inner and outer tires. What is the most likely consequence?

- A. Uneven load sharing and scrubbing that causes irregular wear and heat in the underinflated tire
- B. Improved fuel economy because the lower pressure tire carries less weight than the other
- C. Longer tread life because each tire wears at its own pace without sharing the load equally
- D. No effect, because the two tires share the same axle and always rotate at the same speed

41. A truck with a variable geometry turbocharger spikes above specified boost under load and then derates. The fault says boost pressure too high. Which cause is most likely?

- A. A leaking charge air cooler hose, which lowers boost and would produce an underboost fault instead
- B. A plugged air filter, which restricts the intake and would drop boost below the commanded value

- C. Sticking vanes held closed by soot buildup, which restrict turbine flow and push boost above the target
- D. A failed thermostat stuck open, which would keep coolant cool but has no effect on turbo vanes

42. During a pre-use check of a chain sling, the hook throat opening looks visibly wider than a matching new hook, and the latch hangs loose. What is the correct action?

- A. Keep using it for light loads only and note the hook condition in the shop logbook for later review by the supervisor
- B. Remove the sling from service and tag it so no one reuses it until a competent person inspects or replaces it
- C. Close the throat by clamping it in a vise, then return it to service at its original rated capacity
- D. Weld a small bead across the throat opening so the hook cannot spread any further under future loads

43. Trailer clearance lamps are dim and flicker on one side, and the supply voltage at the lamps is normal. What should be tested next?

- A. The trailer tires for pressure, because tire pressure affects lamp brightness on that side of the trailer frame
- B. The landing gear, since it passes electrical current to the clearance lamps
- C. The slack adjusters, because the lamps are wired through the brake adjusters
- D. The ground return path at the lamp and trailer wiring for resistance, using a good ground reference

44. A directional control valve spool sticks intermittently in a hydraulic system with dirty fluid. What is the best approach?

- A. Tap the valve body with a hammer to free the spool, then run the system as it is
- B. Check the fluid cleanliness, clean or replace the valve, and flush the system with proper filtration
- C. Increase relief valve pressure to push the spool past the contamination
- D. Switch to a thinner oil so the spool slides more easily through the particles

45. A truck's rear brakes apply slowly and release slowly while the front brakes act normally. Which component is the most likely cause?

- A. A cracked brake drum, because it changes how fast air flows in the service lines
- B. Low engine oil pressure, because it controls how fast air moves through the relay valve
- C. A worn steering gear, because it shares air pressure with the rear brake circuit
- D. A relay valve or quick release valve with a restricted exhaust port or sticking piston

46. How should the fluid level be checked on a typical Allison automatic transmission when a hot check is required?

- A. With the engine idling in neutral and the transmission at normal operating temperature
- B. With the engine off and the transmission cold after sitting overnight in the shop
- C. With the engine at high idle and the transmission in drive to circulate the fluid
- D. With the vehicle on a steep slope so the fluid collects at the dipstick tube opening

47. A technician wants to test a variable-reluctance crankshaft position sensor while the engine cranks. What kind of signal should be expected from it?

- A. A steady 5 V DC level that changes only when the engine reaches idle speed
- B. A fixed 12 V square wave whose frequency does not change with engine speed
- C. An AC voltage that rises in amplitude as cranking speed increases
- D. A resistance reading that rises when the crankshaft turns past the reluctor

48. A truck has steady coolant loss with no external leak, white exhaust smoke at start-up, and sweet-smelling exhaust. Which component should be pressure-tested first?

- A. The fuel filter housing, because it can leak coolant into the injectors and produce white smoke
- B. The turbocharger compressor wheel, because it can leak coolant into the intake air from the inlet
- C. The radiator cap seal, because a weak seal can create white smoke by dripping onto the exhaust
- D. The EGR cooler, because an internal leak can send coolant into the exhaust stream

49. On a dual-zone cab climate system, one side blows hot while the other side blows cold with the same settings. Which component is most likely at fault?

- A. The compressor clutch, which controls the temperature on only one side
- B. A blend door actuator or its linkage for the affected side
- C. The condenser fan, because it blows hot air only to the left side of the cab
- D. The receiver-drier, since it feeds heat into one side of the evaporator only

50. A leaf spring tandem shows a sheared center bolt, and the axle appears shifted rearward on one side. What problem will this cause?

- A. A higher cab, because the sheared bolt raises the cab on its mounts at that corner
- B. A faster steering response, since the bolt is part of the steering linkage
- C. Axle misalignment, so the truck tracks crooked and tires wear unevenly
- D. Better fuel economy, because the axle shift reduces the wheelbase and rolling weight

51. On a battery-electric bus, regenerative braking feels weaker on a very cold morning, and the friction brakes do more of the work. What explains this?

- A. A cold battery limits how much charging current it can accept, so regeneration is reduced
- B. The brake pads are glazed, so the system moves all braking to the drive motor
- C. The tires are too hard, so the regeneration system cannot sense the wheel speed
- D. The cab heater is on, so the system turns off regeneration to save energy

52. After a long mountain descent, a driver reports poor braking. The technician sees blued drums with heat checking on every axle. What is the most likely cause?

- A. A weak air compressor that supplied too little pressure during the descent
- B. Incorrect wheel-nut torque that heated the drums by rubbing on the wheel face
- C. Excessive heat from using the service brakes instead of engine braking and a lower gear
- D. Overinflated tires that moved too much heat into the brake system from the road surface

53. A fleet runs manual transmissions through severe northern winters. Which lubricant property is most important for cold-start shifting?

- A. A low pour point and good low-temperature viscosity, as in an approved synthetic gear lubricant
- B. A high flash point, because the lubricant must survive the heat of the first start-up
- C. A high pour point, because a thicker lubricant coats the gears better at low temperature
- D. A low cetane number, because it lets the lubricant flow freely when the engine is cold

54. After a technician replaces a trailer's incandescent turn lamps with LEDs, the turn signals flash too quickly. What is the usual correction?

- A. Use larger gauge wire to the lamps so that the flasher runs at lower speed
- B. Replace the LEDs with a higher wattage set of lamps to increase the resistance
- C. Add a diode in series with each lamp so the current is blocked half of the time
- D. Install load equalizers or an LED-compatible flasher so the flasher sees the expected load

55. A DPF differential pressure sensor reads high at idle, yet soot load calculations are low right after a cleaning. What should be checked first?

- A. The engine oil level and grade, because the sensor reads oil pressure through the exhaust stream
- B. The sensor tubes and fittings for blockage, kinks, or reversed connections before condemning the filter
- C. The DEF tank level, because low fluid always increases pressure drop across the DPF
- D. The turbocharger wastegate, because it controls the pressure on the filter side of the sensor

56. An air-suspended tractor sits low on one side only after overnight parking. Which fault should be checked first?

- A. A leaking air spring or fitting on that side, or a leveling valve problem with its linkage
- B. A fuel leak, because the fuel tank weight changes how the suspension sits on that side of the truck
- C. A loose cab mount, because it sends extra air to the suspension on the same side
- D. A worn driveshaft, because it takes air pressure from the suspension to stay straight

57. A technician repairs a damaged harness wire that runs through a wet area near the frame. Which repair method is best?

- A. Twist the ends together and wrap with several layers of electrical tape
- B. Solder the wire and leave the joint exposed so that moisture can evaporate quickly
- C. Crimp the splice with an adhesive-lined heat-shrink butt connector and then verify the circuit
- D. Use a wire nut and wrap it with duct tape to protect it from the road spray

58. A bench grinder runs at 6,000 rpm. A technician finds a spare wheel marked with a maximum safe speed of 4,500 rpm. What should the technician do?

- A. Install it, because the guard will contain fragments if the wheel happens to fail during use
- B. Install it and run the grinder only in short bursts to keep the wheel from heating up too much
- C. Install it after a ring test, since a wheel that rings clearly is safe above its marked speed
- D. Reject the wheel, because its rated speed must equal or exceed the grinder's speed

59. A technician must adjust the torsion spring on an overhead trailer door. Which practice is the safest?

- A. Release the spring tension all at once with the door open so that it settles quickly
- B. Use properly fitted winding bars, keep the door secured, and never use screwdrivers or makeshift tools
- C. Use a screwdriver in the winding cone holes because it is faster than winding bars
- D. Stand directly under the door and hold the spring with one hand while turning it

60. A hydraulic motor runs slowly, and its case drain flow is much higher than specified. What does this indicate?

- A. Internal wear in the motor allows excess leakage, so it needs repair or replacement
- B. The motor is working correctly, since high case drain flow means high efficiency
- C. The reservoir is too full, which raises the case drain flow of every motor

D. The hose on the supply side is too long, which directly increases the case drain flow

61. A driver on a truck with drum brakes feels a pulsation in the brake pedal during light braking at highway speed. Which condition is the most likely cause?

- A. A cracked air tank that releases pressure in short bursts as the brakes are applied
- B. A weak compressor governor that cycles the compressor on and off during braking
- C. Overinflated trailer tires that shake the trailer brakes with each wheel turn
- D. Out-of-round or distorted drums that contact the linings unevenly as they turn

62. A manual transmission suffers repeated input shaft bearing failures after each clutch job. What should be checked next?

- A. The air pressure in the trailer tires, because trailer tire pressure alters the input shaft loads
- B. Bell housing bore and face alignment to the crankshaft, measured with a dial indicator
- C. The color of the transmission oil, because a darker oil will always cause bearing failure
- D. The paint on the transmission case, because paint thickness changes the bearing alignment

63. White crystalline deposits have built up around a DEF doser nozzle in the exhaust. What is the most appropriate response?

- A. Chip the crystals off with a screwdriver and refit the doser without any further checks on the system afterwards
- B. Switch to a thinner fluid grade that will dissolve the crystals while the truck is running
- C. Remove the deposits, check the doser spray pattern and heating operation, and verify DEF quality and exhaust temperature
- D. Disable dosing through a software change so crystals can no longer form on the nozzle

64. A technician sees a shock absorber with a light film of oil on its body but no drips. What is the proper judgment?

- A. Replace it at once, because any trace of oil on a shock absorber means that it has failed
- B. Wipe off the film and add oil through the top cap until the shock body looks dry again
- C. A thin oily film can be normal, and the shock should be replaced only if oil is running or dripping from it
- D. Replace only the shock on the opposite side, since an oily shock always damages its partner

65. A new fuse blows immediately when installed with the circuit connected, but a test light shows power is present at the fuse holder. What is the correct approach?

- A. Locate the short to ground in the circuit by isolating sections, and keep the correct fuse rating
- B. Install a larger fuse so that it can carry the current needed during the short
- C. Wrap the fuse in foil so the circuit keeps working while the short is repaired later in the week
- D. Replace the battery, since a fuse blowing quickly indicates the battery voltage is too high

66. Bubbles appear in a clear return hose on an engine that cranks long and runs rough. Where is the air most likely entering the fuel system?

- A. Inside the high-pressure rail itself, where air is compressed and then forced into the return
- B. At the fuel tank cap, where air normally flows in and out in large amounts during pumping and cooling
- C. Through the injector nozzles, where air from the combustion chamber travels back to the filter
- D. On the suction side upstream of the lift pump, such as a loose fitting or cracked supply hose

67. A technician finds grease on the brake lining of a drum brake after a service interval. What is the most likely source?

- A. Condensation from the air tanks, which mixes with brake dust into a greasy film
- B. Over-greasing the camshaft bushings or slack adjuster, or a leaking wheel seal
- C. Normal lining wear, which releases oil from the friction material as it gets thinner
- D. Excess air pressure in the chamber, which pushes grease out through the spring brake

68. A tandem axle truck has a vibration and a rumble on deceleration, and the inter-axle driveshaft center support rubber is cracked. What does this indicate?

- A. The center support bearing or its rubber isolator has failed and the shaft needs support service
- B. The wheel studs have loosened because wheel nuts loosen when the truck decelerates on a long grade
- C. The air suspension is overinflated and transmits road shock into the driveshaft center
- D. The driver is using the engine brake incorrectly and damaging the center support

69. A technician finds surface rust bubbling the paint along a cab seam, with no holes in the metal. What is the best repair?

- A. Sand the paint lightly, spray a coat of colour over the bubbles, and leave the rust underneath
- B. Fill the bubbles with body filler directly over the rust and sand the area smooth for paint
- C. Cover the seam with a layer of tape and let the rust dry out before the next service
- D. Remove the rust to bare metal, treat the metal, prime it, seal the seam, and repaint the area

70. Frost forms at the inlet of a thermal expansion valve, and suction pressure is low. Which cause is most likely?

- A. Too much airflow through the evaporator from a fast blower setting
- B. Moisture or a restriction in the valve or the liquid line ahead of it
- C. A weak alternator that reduces the power to the expansion valve heater during every cold start
- D. A loose fan belt that reduces the condenser airflow at highway speed

71. A technician needs to check voltage at a terminal inside a sealed weather-pack connector while the circuit operates. Which method protects the connector the most?

- A. Push a sewing needle through the wire insulation and into the conductor for the test
- B. Pry the terminal out of the connector and then reinstall it after testing the circuit
- C. Back-probe the terminal from the wire side with a thin sealed-connector probe
- D. Cut the wire open near the connector and splice in a test lead for the measurement

72. A technician replaces a frame bracket that was originally installed with lockbolts. Which fastener is the correct choice?

- A. The proper lockbolt or the manufacturer-approved fastener installed with the correct tool
- B. Any bolt of the same diameter, because the clamping force is not important
- C. Welded studs, which join the bracket permanently to the frame rail flange
- D. Self-tapping screws, which cut their own thread and are quick to install

73. In a Yukon winter, diesel becomes cloudy before the truck stops running. Which fuel property identifies the temperature at which wax crystals first appear?

- A. Flash point, which marks the lowest temperature at which the fuel vapour can ignite
- B. Cloud point, which marks the first visible wax crystals forming as the fuel cools
- C. Cetane number, which marks how quickly the fuel ignites after injection into hot air
- D. Viscosity index, which marks how much the fuel thickens when exposed to extra moisture

74. A technician applies the brakes and hears air hissing from the vent opening of a service brake chamber. What does this indicate?

- A. A normal sound as the chamber exhausts air pressure when the pedal is applied
- B. A leaking air tank safety valve that is dumping pressure to the chamber
- C. A leaking service chamber diaphragm that needs the chamber replaced
- D. A worn slack adjuster pawl that lets air flow into the chamber breather

75. A technician finds rust-coloured powder around a universal joint bearing cap. What does this most likely indicate?

- A. Normal paint dust from the driveshaft that does not affect the joint operation
- B. Condensation from the air tanks that has stained the cap with a harmless colour
- C. Residue from the axle breather that has no effect on the bearing cup or cross
- D. Fretting from poor lubrication or joint movement, so the joint needs inspection and service

76. A stripped bolt thread in an aluminum transmission housing must be restored to full strength. Which repair is the most appropriate?

- A. Fill the damaged threads with a bead of epoxy and re-tap by running the original bolt through it
- B. Wrap the bolt with thread-seal tape and tighten it to a slightly higher torque to seat it well
- C. Install a longer bolt of the same diameter and tighten it until the housing shows light distortion
- D. Drill and tap the hole, then install a wire thread insert using the matching tap and installation tool

77. A technician inspects a pintle hook before a converter dolly is towed. Which check is the most important?

- A. Check only the colour of the safety chains, because the hook does not carry any of the towing load
- B. Check the hook horn and latch for wear, cracks, and positive closure, and confirm the safety pin is installed
- C. Check that the hook turns freely in its bracket so that it can rotate with every turn made
- D. Check that the lunette ring is greased heavily, so the latch cannot close completely on it

78. A hydraulic cylinder extends but slowly drifts down under load when the control valve is in neutral. Which component should be checked first?

- A. The reservoir breather, because a blocked breather always makes cylinders drift down
- B. The hydraulic pump coupling, because the pump holds the cylinder in place at rest
- C. The holding or counterbalance valve and the cylinder piston seals for leakage
- D. The control lever linkage, because linkage looseness lets fluid leak out of the cylinder

79. A 24 V auxiliary heater is rated at 1,200 W. How much current does it draw at its rated power?

- A. 50 A
- B. 25 A
- C. 100 A
- D. 5 A

80. Torque rod bushings on a tandem drive axle are badly worn. What is the most likely result?

- A. Axle misalignment under load and driveline vibration or tire wear from shifting axle position
- B. A stronger ride because the worn bushings absorb more road shock than new ones
- C. Faster steering, since torque rods connect directly to the steering linkage
- D. Better brake action, because the worn bushing keeps the axle from shifting during stops

81. One bank of a compression brake gives noticeably weaker retarding than the other. After checking oil supply, what is the next most likely adjustment or fault?

- A. A mismatch between tire sizes, because retarding force depends on wheel diameter alone
- B. Excess coolant in the exhaust, because coolant raises the exhaust back pressure for that bank
- C. Incorrect brake lash or a worn slave piston or rocker in that bank's brake housing
- D. A weak battery, because compression brake solenoids need full voltage for the fuel to burn

82. On an older truck, all analog dash gauges read low at the same time and they all move together. Which component is the most likely cause?

- A. A weak alternator rectifier that supplies low voltage only to the dash gauges
- B. A cracked fuel sender that makes each gauge read low in turn instead of together
- C. A failing starter solenoid that drops dash gauge voltage after the engine starts
- D. A failing instrument voltage regulator or a poor ground at the gauge cluster

83. A truck's brake valve freezes in winter even though the system uses a dryer. What is the best long-term fix?

- A. Pour windshield washer fluid into the air tanks every morning before starting out
- B. Repair the dryer or desiccant system so moisture is removed from the air before it reaches the valves
- C. Drain the tanks only once a month and keep the shop door open during the cold season of winter
- D. Fit larger brake chambers so that ice forms more slowly inside the application valve

84. A driveline vibration appears only during hard acceleration, and the slip yoke feels stiff when moved by hand. What is the likely problem?

- A. The tires are balanced too perfectly, which creates a vibration only when the torque rises sharply under load
- B. The slip spline is dry or seized and cannot change length smoothly as the suspension moves
- C. The fuel pressure is too high, which makes the engine produce vibration under load
- D. The brake drums are too thick, which add weight to the driveline and shake it

85. An isolation fault is set on a hybrid truck's high-voltage system. How can the faulty component be located safely?

- A. With the system energized, touch each cable with a screwdriver to find the leak in the insulation
- B. Pour water on each component and watch the dash display for changes
- C. With the system de-energized, disconnect high-voltage loads one at a time and recheck isolation resistance
- D. Replace the battery pack first, since isolation faults are always inside the pack

86. To measure king pin and bushing wear with a dial indicator, how should the front axle be supported?

- A. Leave the weight on the tires and measure the movement while a helper drives forward slowly in the shop yard with the brakes released
- B. Lift only the frame and let the tires hang while checking play at the tire sidewall
- C. Use the parking brake to hold the vehicle and measure movement at the steering wheel
- D. Lift the axle so the weight is off the wheels, and then check the vertical play at the knuckle

87. A cylinder cutout test shows no rpm drop when one cylinder is disabled, while the others show clear drops. What does this indicate?

- A. That cylinder is not contributing power and needs injection and compression testing
- B. That cylinder is working harder than the rest and has been overfuelled by the ECM
- C. The test is invalid, because every healthy cylinder should show exactly the same rpm drop

D. The crankshaft position sensor is faulty, because it caused the cutout to fail on that cylinder

88. An evaporator freezes into a block of ice at moderate ambient temperatures, and airflow from the vents is weak. Which fault should be checked first?

- A. A plugged cabin air filter or blocked evaporator airflow that lets the coil get too cold
- B. A heater core leak, because coolant mixes with the refrigerant and freezes
- C. A broken condenser fan, because it causes ice to form inside the evaporator case during highway driving
- D. A worn engine mount, because vibration causes frost to form on the evaporator

89. A battery tester reports 'Good - Recharge' for a truck battery. What is the correct next step?

- A. Replace the battery immediately, because any recharge message means it has failed
- B. Install the battery as it is and rely on the alternator to charge it on the road
- C. Add distilled water and then retest the battery without charging it first
- D. Fully charge the battery and retest before deciding whether to replace it

90. A dash air pressure gauge reads 827 kPa, but a calibrated test gauge on the same tank reads 724 kPa. What should the technician do?

- A. Adjust the governor up by 103 kPa so the dash gauge and test gauge agree with each other
- B. Replace or recalibrate the faulty dash gauge, since the calibrated gauge shows the true tank pressure
- C. Ignore the difference, because dash gauges are not meant to be accurate to within 15 percent
- D. Replace the compressor, because inaccurate readings mean it is not building true pressure

91. A technician measures ring gear backlash on a drive axle and finds the reading changes noticeably at several points as the gear is turned. What does this suggest?

- A. Normal tooth wear that is expected, so the highest reading is taken as the final value
- B. An overfilled axle housing, since extra lubricant makes the readings vary around the gear

- C. Ring gear or carrier runout, such as a warped ring gear or a poorly seated gear on the carrier
- D. A loose axle shaft spline, since the axle shafts change the backlash measured at the gear

92. A technical service bulletin lists a torque value that differs from the service manual for a transmission built after a stated production date. How should the technician proceed?

- A. Confirm the vehicle's build date or VIN range matches the bulletin, then follow the bulletin if it applies
- B. Follow the manual because printed manuals always override any later revision from the manufacturer
- C. Average the two values to avoid fastener damage and record the result on the repair order
- D. Use the higher value since a tighter joint is always safer and less likely to leak over time

93. A reefer unit has high head pressure and poor cooling, and the condenser coil is visibly packed with dirt. What is the best first step?

- A. Add refrigerant until the head pressure falls to a lower reading on the gauge
- B. Replace the compressor immediately because high head pressure always means failure
- C. Clean the condenser coil, then recheck the pressures and cooling
- D. Remove the condenser fan so air can flow freely through the unit's housing

94. A return filter bypass indicator pops out on a cold start and then retracts when the oil warms. What does this usually mean?

- A. The filter element is blocked and must be replaced immediately before use
- B. Normal cold oil thickness is causing a temporary pressure drop across the filter, and it is not a plugged element
- C. The reservoir is empty and the pump is drawing air into the filter housing
- D. The relief valve is stuck open, and fluid is leaking through the filter bypass

95. A technician sets valve lash with the crankshaft at the top dead centre mark for cylinder one. How can the technician confirm that cylinder is on its compression stroke?

- A. The exhaust rocker is pushed tight against its valve while the intake rocker is loose
- B. Both rocker arms are held firmly against their valves with no movement felt at all
- C. The oil pressure gauge briefly rises when the piston reaches the top of its travel
- D. Both intake and exhaust rocker arms on that cylinder show free play, so both valves are closed

96. Before measuring toe during a front-end alignment, what should the technician do with the vehicle?

- A. Jack the front axle off the floor and then measure the toe with the wheels hanging
- B. Run the engine at high idle for several minutes so the steering reaches its normal temperature
- C. Apply the parking brake firmly and turn the steering wheel to full lock several times
- D. Roll the vehicle forward and back on a level surface so the suspension and tires settle

97. An air-ride driver's seat slowly sinks overnight after being inflated. Which fault is most likely?

- A. A leak in the seat air bellows, fittings, or height control valve
- B. A weak battery, because the air seat uses electricity to hold its height
- C. A bad alternator, because the seat compressor runs from the charging system alone
- D. Worn tires, because the seat is connected to the tire pressure through the floor

98. A truck's battery voltage climbs to 16 V at highway speed and stays high. Which fault is the most likely?

- A. A weak battery that cannot hold charge and sends extra current back to the alternator
- B. A slipping belt, which would reduce alternator output and make the voltage fall
- C. A failed voltage regulator or an open sensing circuit that allows the alternator to overcharge
- D. A loose starter wire, which would stop the alternator from reaching any charging voltage

99. A technician adjusts a manual slack adjuster on a brake chamber. What arm angle is the correct goal when the brake is applied?

- A. About 45 degrees between the arm and the pushrod when the chamber is released

- B. About 90 degrees between the slack adjuster arm and the chamber pushrod at applied stroke
- C. A straight line between the arm and the pushrod when the brakes are applied
- D. About 120 degrees between the arm and the pushrod at full pushrod extension

100. A technician drains drive axle gear oil and finds a fine grey fuzz on the magnetic drain plug and no metal chunks. What does this indicate?

- A. A failed differential, so the axle must be rebuilt completely before it is used again
- B. Water contamination, which always leaves a grey fuzz on the magnet as the lubricant ages
- C. Normal fine wear particles that the magnet collects, so the axle can be refilled with the correct lubricant
- D. A plugged breather, because the breather pushes metal fuzz onto the magnetic drain plug

101. An engine shows normal oil pressure at highway speed but very low pressure at hot idle. Which cause is most consistent with this symptom?

- A. A stuck-closed thermostat, which raises oil viscosity and starves the pump at low engine speeds
- B. Excessive bearing clearance, which lets hot, thin oil escape too freely when pump speed is low
- C. An overfilled crankcase, which raises pressure only when the engine is at idle and hot
- D. A weak battery, which reduces voltage to the oil pressure sender and lowers the shown pressure

102. A technician finds an intermittent turn signal fault. The terminal looks fine, but the connector pin drags loosely on the mating terminal. What should be done?

- A. Replace the terminal or its mate with a proper tension terminal, then retest for the intermittent
- B. Spread the female terminal with a screwdriver tip to make it tighter on the pin
- C. Add dielectric grease only and leave the loose terminals as they are in the connector
- D. Wrap the connector in electrical tape so that it cannot move around in service

103. A steering gear has too much lash at the center position. What adjustment is normally used?

- A. Add more fluid to the reservoir so the gear has less lash when it is centred
- B. Tighten the pitman arm nut as tight as possible to remove free play at the gear
- C. Replace the tires with a smaller size so the steering needs less movement at center
- D. Adjust the over-center preload with the gear on center, following the manufacturer's procedure

104. After engine shutdown, a technician can turn a viscous fan clutch by hand with almost no drag on an engine that has been overheating. What does this suggest?

- A. The fan clutch is not locking up when hot and should be replaced to restore airflow
- B. The fan clutch is working properly because a free-spinning fan reduces power losses
- C. The fan belt is too tight and is transferring excess load to the fan clutch bearings
- D. The radiator is fouled, which increases airflow resistance and allows the fan to move freely

105. A technician wants to find a small A/C leak in a cab system. Which method is commonly used with refrigerant dye?

- A. Use a magnet to find the dye, since the dye contains iron particles
- B. Use a stethoscope to listen to the dye moving through the lines
- C. Use a UV lamp and glasses to look for the fluorescent dye at leak points
- D. Use a thermometer to find the dye by its temperature difference

106. A medium-duty truck with hydraulic brakes has a spongy pedal after a wheel cylinder replacement, and no other sequence is specified. In which order should the wheels traditionally be bled?

- A. Start at the wheel nearest the master cylinder and finish at the farthest
- B. Start at the wheel farthest from the master cylinder and finish at the nearest
- C. Bleed all wheels at the same time using two helpers and equal pump pressure
- D. Bleed only the wheel that was repaired and leave the other wheels as they were

107. A hub with an oil-bath wheel bearing should be checked for oil level with the truck on level ground. What is the correct check?

- A. Open the hub and insert a dipstick through the bearing while the wheel is turning
- B. Fill the hub until oil flows from the vent hole on top of the hub cap
- C. Check the level only after a long road trip when the oil is thin and fully hot
- D. Read the level on the hub cap window or fill plug mark with the cap in its marked position

108. A 30 A load must be wired with a 4 m run on a 12 V circuit. Which approach best limits voltage drop?

- A. Use a heavier wire gauge sized for the current and run length, with protection at the source
- B. Use the thinnest wire available to keep the weight low and the harness flexible
- C. Use two thin wires twisted together and fuse each wire separately at 30 A
- D. Use any wire gauge as long as the insulation colour matches the factory harness

109. A steer axle wheel assembly has dynamic imbalance, and a driver reports a steering wheel shimmy at highway speed. What corrective action is the best?

- A. Add more air to the tire until the shimmy disappears at the speed it occurs
- B. Remove the steering damper so the shimmy cannot be passed to the steering wheel
- C. Swap the steer tires with the drive tires without balancing them to even out the wear
- D. Balance the wheel and tire assembly on a dynamic balancer and check for bent wheels or runout

110. An apprentice skips lockout on a short job, saying it saves time and the truck is not running. Which mentoring response is most appropriate?

- A. Let the job finish this time and mention the issue at the end of the week with other items
- B. Stop the job, explain the hazard of stored energy, have the apprentice apply the lock, and then continue
- C. Tell the apprentice to be careful and then apply the lock yourself without further discussion
- D. Report the apprentice to the whole crew at the next meeting to show that shortcuts are not allowed

111. A trailer tire inflation system shows steady pressure loss on one axle, and the other axles hold pressure. Where should the leak be traced first?

- A. The air compressor on the tractor, because the compressor feeds only one trailer axle
- B. The trailer kingpin, since the pin passes air to a single axle in the system
- C. The rotary union, hose, and fittings on the affected axle, using soapy water or a leak detector
- D. The brake drums on the other axles, because they absorb the air for the affected axle

112. A new hydraulic pump has been fitted to a work truck. What should be done before the first start-up?

- A. Run the pump dry for a few seconds to let it clear any air from the inlet line before filling it
- B. Fill the reservoir to the top and start the engine at high idle so that the pump primes quickly
- C. Close the inlet line shutoff and tighten the case drain plug so pressure builds inside the pump
- D. Fill the pump case with clean hydraulic fluid and make sure the inlet line is full so the pump is not run dry

113. Pitting is found on the outside surfaces of wet cylinder liners. Which maintenance failure most likely caused it?

- A. Low coolant additive concentration, which allows cavitation bubbles to erode the liner surface
- B. Overfilling the crankcase, which raises oil temperature and wears the liner surfaces from outside
- C. Using the wrong fuel grade, which burns hotter and melts the outside of the liner
- D. Running with a loose fan belt, which sends vibration through the coolant to the liner

114. A technician is about to reflash an engine control module with a laptop. What should be done to protect the process?

- A. Leave the key off and let the module run from the laptop battery during the process
- B. Run the engine at high idle so that the alternator keeps the voltage up during flashing
- C. Connect a stable power supply to keep system voltage steady during the entire programming session
- D. Disconnect the battery and use a small capacitor to supply the module during programming

115. What is the purpose of an anti-compounding valve in a spring brake circuit?

- A. To raise the air pressure in the spring brake circuit so the parking brake releases faster
- B. To stop the service brake and the spring brake from applying together and overstressing the foundation brake
- C. To drain water from the spring brake chamber each time the parking brake is applied
- D. To signal the ABS module when the parking brake has been applied for more than a minute

116. An output shaft retarder gives weak retarding when hot, and its fluid temperature is very high. What should be inspected first?

- A. The tire sizes, because retarding force depends on wheel diameter and tread depth
- B. The steering gear, since it shares the same fluid circuit with the output retarder
- C. The battery terminals, because the retarder needs full voltage to cool its fluid
- D. The retarder cooler and its coolant or air flow for restrictions that limit heat rejection

117. A technician finds that a stud-piloted wheel was installed with nuts designed for a hub-piloted system. What is the risk?

- A. No risk, because all wheel nuts are made the same and can be freely interchanged
- B. The wheel may not be centred or clamped properly, which can lead to loose nuts and a wheel-off
- C. The wheel will look different but will carry the same loads with no change in safety
- D. The brakes will drag, since the wheel nuts determine the brake drum clearance

118. On a battery-electric truck using DC fast charging, the charging rate drops sharply as the battery nears full. What explains this?

- A. The charge cable has become too hot, so the truck stops accepting any current at all
- B. The tires are wearing, so the system lowers the charging rate to match the wheel speed
- C. The charger and battery management system taper the current at a high state of charge to protect the battery
- D. The cab heater has overloaded the system, so the charger must lower its voltage to match

119. A closed crankcase ventilation filter on a heavy-duty engine is badly plugged. Which symptom is most likely?

- A. Rising crankcase pressure that pushes oil past seals and gaskets and causes external leaks
- B. A sudden loss of coolant through the radiator cap and pressure relief valve under load
- C. A higher idle speed because the ECM adds fuel when the filter restricts air flow
- D. A lower oil level through gradual evaporation of the oil in the crankcase at idle

120. On a heavy-duty engine, a red stop engine lamp and an amber check engine lamp are both on. What does the red lamp indicate?

- A. A routine service reminder that is shown after a set number of kilometres
- B. A severe fault, where the engine should be shut down safely as soon as practical to avoid damage
- C. A minor emissions concern that can be ignored until the next planned oil change
- D. A low washer fluid warning that is sent over the network to the dash display

121. A technician needs to work near the airbag modules in a coach cab. Which precaution is correct?

- A. Leave the battery connected so the airbag system can stay active while you work
- B. Hit the steering wheel hub lightly to test that it holds before starting any work
- C. Use a test light on the airbag connectors to make sure there is no current flowing
- D. Disconnect the battery and wait the time specified by the manufacturer before working near the modules

122. A technician measures a pushrod stroke that has grown steadily on one axle while the other axles remain in range. What should be investigated first?

- A. Whether the compressor is producing too much pressure for the system to handle
- B. Whether the engine retarder is applying the brakes on one axle at a time
- C. Whether the automatic slack adjuster on that axle is working correctly or needs replacement
- D. Whether the steering gear is leaking fluid onto the slack adjuster arm each trip

123. A drive axle differential lock fails to engage even though its dash switch works. The shift cylinder is air operated. What should be checked first?

- A. Air supply and leaks at the shift cylinder and its solenoid, plus the electrical signal to it
- B. The brake chambers, since they use the same piston as the differential lock cylinder
- C. The engine oil level, because low oil prevents the differential lock from engaging
- D. The tire pressure on both axles, since unequal tire pressure locks out the differential

124. A hub-piloted wheel shows signs of loose-nut damage with elongated stud holes. What should be done?

- A. Replace the damaged wheel and inspect the studs, nuts, and mating surfaces
- B. File the stud holes round again and reinstall the wheel with the same nuts
- C. Weld the stud holes closed and drill new ones at the same location in the wheel
- D. Fit thicker washers under the nuts to fill the extra space around each stud

125. A faint ticking noise comes from the exhaust manifold area on a cold start and fades as the engine reaches operating temperature. What is the most likely cause?

- A. A cracked flywheel that tightens as the engine warms and stops making noise
- B. An exhaust manifold gasket leak or crack that closes as the metal expands with heat
- C. A worn water pump bearing that quiets down once the coolant reaches temperature
- D. A loose alternator pulley that becomes quiet when belt tension rises with heat

126. A diesel-fired sleeper heater shows a fault and produces white smoke. What should the technician inspect first?

- A. The engine radiator for dirt, since the heater uses radiator air for combustion
- B. The tire pressure monitoring sensors, because they trigger the heater fault code
- C. The air brake dryer, because heater faults depend on air dryer cycles
- D. The combustion air intake and exhaust tubes for blockage or damage, and then fuel supply

127. A technician replaces a section of J1939 data cable with two straight wires. Several modules begin to log lost communication faults. What is the likely reason?

- A. The wires were too short, which always prevents the network from communicating
- B. The wires were the wrong colour, which causes modules to ignore the data signals
- C. The twisted pair was lost, so electrical noise is no longer rejected on the data lines
- D. The wires were too thick, which raises the voltage on the network above its limits

128. A technician presses a bearing cup off a hub using a hydraulic shop press. Which setup practice is the safest?

- A. Rest the hub on a single bar to one side so the cup can fall freely through the opening
- B. Raise the ram quickly and then use short pumps so the load seats itself when it moves
- C. Support the hub on parallel bars beneath the work, centre the load on the ram, and use the press shield
- D. Remove the press shield for visibility and stand directly in line with the ram to watch the load

129. A technician dumps air from a trailer air suspension to lower the trailer for a loading dock. What must be done before the trailer is moved?

- A. Re-inflate the suspension to normal ride height and confirm the ride height is correct
- B. Leave the suspension deflated, since a low trailer is more stable on the road
- C. Disconnect the leveling valves so that the suspension keeps its lowered position
- D. Lower the tire pressures to match the suspension so the trailer does not tilt

130. How should a technician set a system relief valve on a hydraulic circuit?

- A. Adjust it by sound alone, tightening until the pump just begins to whine
- B. Set it as high as possible so that it never opens during normal work
- C. Remove the relief valve spring so the valve cannot restrict flow in the system
- D. Install a test gauge at the pump port, stall the circuit briefly with the oil warm, and adjust to specification

131. A pre-trip air brake test shows the tractor brake lights working but a trailer rolling when the trailer parking brakes are applied. The tractor protection valve is correct. What is the likeliest cause?

- A. The tractor drive axle is out of balance and the trailer axle follows it
- B. The trailer parking brake chambers or their supply valve are not holding spring force
- C. The trailer tires are overinflated, which reduces rolling resistance too much
- D. The trailer kingpin is too short and is releasing the spring brakes under load

132. A technician hears a noise that occurs only with the clutch pedal pushed down and stops when the pedal is released. Which part is the likely source?

- A. The rear axle pinion bearing, which turns only when the clutch is released
- B. The clutch release bearing, which turns only when the pedal is depressed
- C. The transmission countershaft gear, which turns only when the pedal is depressed
- D. The flywheel ring gear, which turns only when the engine is not running

133. A truck pulls steadily to the right on a straight, flat road with matched tire pressures. An alignment check shows more positive caster on the left front wheel than on the right front wheel. What does this reading explain?

- A. The truck pulls toward the side with more positive caster, which here is the left side
- B. The caster difference has no effect on pull, because only toe settings steer a vehicle
- C. The caster difference makes the truck pull only when braking, never while driving straight
- D. The truck pulls toward the side with less positive caster, which here is the right side

134. A diesel engine accelerates uncontrollably with the pedal released after a turbocharger seal failure. What is the best emergency action?

- A. Turn off the ignition key only, since this stops every kind of diesel engine immediately
- B. Press the clutch and rev the engine to burn off the oil before it can damage anything
- C. Shut off the air supply to the intake, because the engine is burning its own oil as fuel
- D. Open the hood and spray water on the turbocharger to cool it down quickly

135. What precaution should a technician take before handling an electronic control module that is removed from a vehicle?

- A. Ground yourself to discharge static electricity and avoid touching the connector pins
- B. Wrap the module in plastic film so that static cannot reach the pins in transit
- C. Wipe the connector pins with a cloth to remove oil from the technician's fingers
- D. Heat the module with a heat gun to remove moisture before it is stored away

Practice Exam 23: Answer Key and Explanations

1. B — A tensioner at the end of its travel means the belt has stretched or the tensioner has worn, so tension cannot be maintained. Replacing both and checking pulley alignment corrects slip. Dressing hides the symptom, a fixed idler removes tension control, and doubling belts on pulleys made for one belt causes misalignment.

2. C — Liner standout lets the head gasket compress the liner flange firmly. Too little standout leaves low clamping force and lets combustion pressure or coolant move past the seal, so gasket failure follows. Standout does not raise compression in a useful way, and the liner flange is part of the sealing arrangement.

3. D — A pull only under braking points to unequal brake force at the steer axle, such as an out-of-adjustment, seized, or contaminated brake on one side. Even tire wear argues against a tire cause, and the fifth wheel and trailer tire pressures do not change how the steer brakes act on the tractor.

4. B — The dryer purges moisture each time the governor unloads the compressor, so a missing exhaust blast points to a faulty purge valve or its governor signal line. Chambers, slack adjusters, and glad hands do not control dryer purging, and water in the tank after a new cartridge means the dryer is not regenerating properly.

5. C — Oil on the clutch facings reduces friction unevenly and causes chatter, and the leak is usually from the rear main seal or the transmission input seal. The source must be repaired along with the clutch. Pedal free play affects release, an overfilled transmission leaks elsewhere, and tooth count has no effect on how the clutch engages.

6. A — Torque wrenches are most accurate in the middle of their range, and a 40 N·m target near the bottom of a 200 N·m tool risks large percentage error. The smaller wrench keeps the target well inside its calibrated span. Extensions change effective lever length, and tapping the handle after the click overtightens the fastener.

7. D — Defrost heats the evaporator coil to melt frost, and a thermostat or temperature sensor on the coil ends the cycle when it reaches the set temperature. A relief valve protects against pressure, and fuel pressure and the trailer brake switch do not indicate coil temperature or the end of the cycle.

8. A — A scored rod surface cuts the lip of any new seal and creates a leak path, so the rod must be repaired or replaced as well as resealed, and the cause of the scoring, such as dirt or side loading, should be found. Tightening the gland, sealing the scratch, or raising pressure does not fix surface damage.

9. C — Parallel batteries share load and charge, and a weak older battery pulls current from the new one and ages it quickly. For this reason batteries in a bank are replaced as matched sets. The alternator does not adapt to differences between batteries, and the old unit does not take on the new battery's capacity.

10. B — Thrust faces on one main bearing control crankshaft axial movement, so excess end play points to thrust bearing wear or damage. Rod bearings and oil passages do not locate the crank front to rear, and flywheel dowels affect alignment, not axial float. The thrust surfaces wear when clutch loads or other forces push the crank forward.

11. D — Debris from a failed compressor circulates and can destroy the new compressor, so the system must be flushed and the drier or accumulator and metering device replaced as required. Running the system with debris, adding extra oil, or using stop-leak leaves contamination in the system and risks another failure. Skipping the flush often destroys the replacement compressor.

12. D — Cupping or scalloping develops when a tire repeatedly bounces off the road because of imbalance or worn dampers, loose components, or bent parts, and the tire wears in patches. Wheel nut torque, refrigerant pressure, and steering fluid quantity do not make a tire bounce in a pattern around the tread.

13. C — When the governor reaches cut-out pressure, it sends air to the unloader, which holds the intake valves open so the compressor stops building pressure. If pressure keeps rising and the safety valve opens, the unloader or governor line is failing. The brake valve, dryer heater, and chambers do not command compressor loading.

14. B — Heat can distort a warped flywheel or soften a pressure plate spring, which reduces clamp force and causes slipping under heavy load. When the parts cool, they recover enough to grip. A slightly low gear oil level, cab glass condition, or a small driveline angle does not produce clutch slip that depends on temperature.

15. A — Air-sprung cabs usually require the cab suspension to be dumped before tilting, so the cab rests on its stops and the latch and pivot work correctly. Filling springs raises the cab and strains the tilt gear, and disconnecting brake lines or removing springs is unnecessary and unsafe. Always use the cab prop once it is tilted.

16. B — After the engine fires, the overrunning clutch and solenoid linkage should disengage the pinion from the flywheel. Grinding at that moment means the pinion is still meshing or the clutch is slipping. A tooth count mismatch would show at cranking, and low battery voltage or a slipping belt does not cause grinding right after engine start.

17. D — Silicon is mostly dust, while aluminum comes from pistons and similar parts, so the pair signals abrasive dirt getting into the engine, often past a loose clamp or cracked boot. Coolant contamination shows other elements, and fuel dilution shows up through viscosity and flash point rather than silicon readings. Fix the leak and clean the intake path.

18. A — Capacitors in the high-voltage system can hold charge after the disconnect is removed, so the technician must wait the specified time and confirm zero volts with a meter rated for the system voltage. Starting right away, touching cables, or using a low-voltage test light cannot safely prove the system is de-energized.

19. C — A broken stud shows that the joint was overloaded or loose, and nearby studs and wheel holes may be fatigued or damaged. Replacing the stud and inspecting the neighbours, the nuts, and the wheel finds related damage. Running with a missing stud overloads the others, and welding a hardened stud weakens it.

20. D — The module measures wheel speed from the pulses made by tone ring teeth, so a missing tooth causes a dropout that appears as a speed error. Replacing the ring fixes the cause. A sensor alone does not cure a damaged ring, filing teeth makes it worse, and jumpering a sensor circuit defeats a safety system.

21. A — Non-synchronized heavy-duty transmissions rely on driver skill, using double-clutching or rpm matching for shifts, and a clutch brake for upshifts from standstill. This saves cost and weight and handles high torque. Their gears do rotate at different speeds, they shift on the move, and they do not use electric motors for speed matching.

22. C — When every gauge drops out together and the engine runs, a common power, ground, or data link problem is likely. Testing the cluster connections is quick and avoids replacing an expensive part that may be fine. Replacing the engine module or adding a resistor are not logical first steps and ignore the common failure.

23. B — Fuel in oil comes from fuel passing the rings or leaking injectors, and long idling with poor combustion makes this worse. The diluted oil loses viscosity and protection. A restricted filter, overfilled crankcase, or hot thermostat does not move liquid fuel into the sump and would not explain a measured fuel percentage.

24. C — Decanted hazardous products need a workplace label so every worker can identify the contents and find hazard information. The label carries the product identifier and safe-handling details and points to the SDS. A name and date, or an exact ingredient copy, does not meet the requirement, and skipping labels leaves coworkers unprotected.

25. D — Landing gear uses gears in a housing to raise and lower the legs, and a click under load usually means stripped or damaged gears or a lack of lubrication. Tire condition, reefer fuel, and brake drums have no link to the landing gear gearbox, so the housing must be opened and inspected or the unit replaced.

26. B — Hose lay lines normally run straight, so a spiral shows the hose has been twisted. Twisting concentrates stress in the reinforcement and can loosen fittings and burst the hose. The hose should be rerouted with the fitting loosened and aligned. A spiral does not show a rating error or length problem.

27. A — Direct TPMS sensors transmit an ID tied to a wheel position in the module, so moving the wheels requires a relearn so the module assigns the right location. The sensors are usually fine, the odometer is not involved, and adding air does not change which position the system believes each sensor is in.

28. C — On a five-terminal relay, terminals 85 and 86 are the coil, 30 is the common contact, 87 is the normally open contact, and 87a is the normally closed contact. With no coil current, 30 connects to 87a, and energizing the coil moves the contact over to 87. The coil terminals do not carry the switched load.

29. A — Many clip-in sensors are retained by a spring sleeve and are pushed in until they touch the tone ring. Rotation of the ring then pushes the sensor out to the correct running gap. Setting a fixed gap with a gauge, pulling it out by guess, or relying on grease can leave the signal weak or damage the sensor.

30. D — The range shift is air operated, so a clogged filter, a failed regulator, or a contaminated range valve or cylinder can slow it even when system pressure at the tank is normal. Steering fluid and coolant pressure do not operate the range cylinder, and brake chambers are a separate part of the air system.

31. B — Milky oil means coolant has mixed with oil, and diagnosis should locate where the coolant crosses over. A pressure test and a look for oil in the coolant separate oil cooler leaks from gasket or liner problems. Changing oil hides the symptom, stop-leak is not a repair, and assuming the gasket is risky and expensive.

32. C — When the compressor cannot pump effectively, the low side rises and the high side stays low, which signals internal wear or leaking valves. An overcharge or blocked condenser raises high-side pressure, and a clogged orifice tube usually lowers low-side pressure, so the gauge pattern points to the compressor. Gauge readings tell which side is failing.

33. D — When a coil is turned off, its collapsing field creates a voltage spike. A diode across the coil, reverse-biased in normal operation, gives that current a path and clamps the spike. The banded cathode goes to the positive side. A series diode would block current and other placements do not protect the module.

34. A — The last four digits of a DOT serial code give the manufacturing date, with the first two digits showing the week and the last two showing the year. A code of 3421 means week 34 of 2021. The other readings misplace the week and year or invent a production batch, which this code does not record.

35. B — Oil returns to the sump by gravity through the drain tube, so a restricted drain or excess crankcase pressure backs oil past the seals into the turbine and compressor housings. A manifold leak affects boost and noise, and coolant level and tire inflation have no influence on turbo oil return flow.

36. D — A lamp that lights only with the trailer connected points to the trailer ABS power circuit, so the connector pins, wiring, and voltage at the ABS power and ground terminals should be tested. Replacing

the tractor module or removing fuses ignores the evidence and defeats safety systems, and tractor sensors do not feed the trailer.

37. A — Fluid should be filled to the bottom of the fill opening. Overfilling lets gears churn the oil, which heats it, foams it, and builds pressure that forces oil out of the breather. Underfilling would not make oil flow out of the breather, and a balanced driveshaft or a backward clutch would not raise the transmission oil level.

38. B — In an NTC sensor, resistance falls as temperature rises. An open circuit means near-infinite resistance, so the divider circuit sends a voltage near reference, which the ECM reads as very cold. A short to ground would read hot. Modules usually set a fault code rather than ignoring an open sensor circuit.

39. C — Door seals work by being compressed evenly by the door, so poor striker alignment or a worn seal leaves gaps and noise. Adjusting the striker and replacing a damaged seal restores the seal. Silicone can bond the door shut, tape is temporary, and tire pressure has no effect on how the door closes against the seal.

40. A — Dual tires must carry equal loads, so pressure should be matched within a small difference. If one is low, the other takes more load, and the low tire runs hot and wears unevenly, and the difference in diameter causes scrubbing. Matching pressure avoids these problems, and mismatch does not improve economy or tread life.

41. C — Vanes that stick closed make the turbine speed rise, so boost overshoots the commanded value and the ECM derates to protect the engine. Air leaks and restricted intakes produce low boost, and a thermostat has no direct link to vane position. Cleaning or replacing the vane mechanism corrects the overboost.

42. B — A spread hook throat means the hook has been overloaded or bent, and its rated capacity can no longer be trusted. Damaged lifting gear must be removed and tagged. Reducing loads is guesswork, and heating, bending, or welding hardened hooks changes the metal and creates a hidden failure risk during the next lift.

43. D — A lamp can have normal supply voltage and still be dim if its ground return has resistance, so the ground path should be checked with a reference measurement. Tires, landing gear, and slack adjusters are not in the lamp circuit and cannot dim a clearance lamp, which depends on a complete low-resistance loop.

44. B — Spools stick when particles or varnish bind the close clearance, so the fix is cleaning or replacing the valve and flushing and filtering the fluid. Hammering damages the valve, raising pressure risks components, and changing the fluid grade does not remove contamination or solve a stuck spool. Clean fluid prevents the problem returning.

45. D — Relay and quick release valves speed air delivery and exhaust at the rear. A restricted exhaust port or sticking piston slows both application and release at that axle. A cracked drum causes noise and

vibration, not slow air movement, and engine oil pressure and the steering gear are not part of the rear brake air circuit.

46. A — Allison procedures call for a check with the engine idling in neutral on level ground at operating temperature, so fluid is circulating and the level reading is accurate. A cold check uses a separate dipstick mark. High idle in drive and a slope both give false readings and are not the approved method.

47. C — A variable-reluctance sensor has a coil and magnet and generates its own AC voltage as reluctor teeth pass, with amplitude and frequency rising with speed. It can be checked with an AC voltmeter or a scope while cranking. Hall-effect sensors give digital signals, and resistance is measured with the sensor disconnected and the engine off.

48. D — An EGR cooler uses engine coolant to cool exhaust gas, so an internal crack lets coolant burn in the cylinders, giving white smoke and a sweet smell with unexplained coolant loss. A fuel filter housing and compressor wheel carry no coolant passages, and a weak cap loses coolant overboard rather than into the exhaust.

49. B — In a dual-zone system, separate blend doors mix hot and cold air for each side, and a failed actuator or stuck door leaves one side stuck at hot or cold. The compressor clutch, condenser fan, and receiver-drier affect the whole system, so they would not make the two sides behave differently.

50. C — The center bolt locates the axle on the spring, so a sheared bolt lets the axle move out of position and the truck dog-tracks, wearing tires and straining parts. The bolt is not part of the steering linkage or cab mount, and axle shift does not help fuel economy, so repair the spring and bolt and recheck alignment.

51. A — Cold batteries accept less charging current, so the control system limits regeneration and uses more friction braking, which is normal. Glazed pads would reduce friction braking, hard tires do not stop wheel speed sensing, and the cab heater does not disable regeneration, so the behaviour is expected unless faults are stored.

52. C — Prolonged service braking on a grade overheats drums and linings, causing brake fade, bluing, and heat checks. Using a lower gear and engine braking limits that heat. A weak compressor would show up as low air pressure, and wheel-nut torque and tire inflation do not generate the heat pattern across every axle.

53. A — In extreme cold, ordinary gear oil thickens and makes shifting stiff and slow while the gears starve for lubrication. A lubricant with a low pour point and good cold viscosity, such as an approved synthetic, flows when needed. A high pour point is the opposite, and cetane number describes diesel fuel, not gear oil.

54. D — Thermal and electronic flashers expect a minimum load, and low-current LEDs can look like a burned-out bulb, which causes hyperflash. A load equalizer or compatible flasher restores the expected load or timing. Heavier wire and series diodes do not change that, and higher wattage lamps defeat the energy savings. Check the flasher type first.

55. B — A differential pressure sensor compares pressure on each side of the filter through small tubes, and plugged, kinked, or swapped tubes give false readings. Checking them is quick and inexpensive before replacing a freshly cleaned filter. Oil level, DEF level, and wastegate position do not directly control what the sensor tubes measure.

56. A — An air suspension holds height with air springs and leveling valves. A one-sided sag overnight points to a slow air leak at the spring or its fittings, or to a valve that is not holding. Fuel level, cab mounts, and a driveshaft are not connected to the air supply of the suspension on one side.

57. C — In wet or vibrating locations a sealed crimp with adhesive-lined heat shrink resists moisture and movement. Twisted and taped splices loosen and let water in, an exposed solder joint corrodes and stiffens the wire, and wire nuts with duct tape are not rated for vehicle vibration or water exposure. Heat shrink with adhesive seals the joint.

58. D — Grinding wheels are rated for a maximum rotational speed, and exceeding it can make the wheel burst. A wheel marked 4,500 rpm on a 6,000 rpm machine is overspeeded. Guards help contain debris but do not make an unsuitable wheel acceptable, and a ring test only checks for cracks, never overspeed.

59. B — Torsion springs store great energy, so the technician should secure the door and use correctly sized winding bars in the cone holes, turning in small increments. Screwdrivers can slip or break, and releasing tension suddenly or standing in the line of the bar can lead to serious injury. Slow, controlled turns keep the spring from slipping.

60. A — Case drain flow measures internal leakage past the motor's moving parts, and a high flow means wear and lost efficiency, so the motor runs slowly under load. It does not indicate efficiency, reservoir level, or supply hose length, and measuring drain flow is a standard motor condition test. Compare the drain flow with the specification.

61. D — Drums that are out of round or heat-distorted touch the linings unevenly each wheel turn, which the driver feels as pedal pulsation, often at light application. Checking drum runout and replacing or machining within limits fixes it. A cracked tank or governor cycling would show pressure symptoms, and trailer tire pressure does not cause pedal pulsation.

62. B — A misaligned flywheel housing bore or face forces the transmission input shaft off the crankshaft centre line, which overloads the pilot and input bearings and destroys them early. Measuring runout with a dial indicator confirms alignment. Trailer tire pressure, oil colour, and case paint do not affect how the transmission mounts to the engine.

63. C — Crystals form when DEF dries on hot surfaces, often from poor spray, low exhaust temperature, or bad fluid. Cleaning and then checking spray, heater operation, and fluid quality fixes the cause. Chipping with tools can damage the nozzle, and no thinner grade exists, and defeating dosing breaks emissions compliance and leaves the cause untouched.

64. C — Shock absorbers have a small amount of seal weep that leaves a thin film, which is normal. A shock should be replaced when oil runs down the body, when it has lost damping, or when it is

damaged. Adding oil is not possible on a sealed shock, and replacing the opposite shock does not address the real condition.

65. A — A fuse that blows at once means the circuit has a short or overload, and the fuse is doing its job. The right action is to find the short by disconnecting loads or sections. Larger fuses or foil bypass protection and risk wiring fires, and a battery at normal voltage does not cause an immediate fuse failure.

66. D — Air bubbles in the return line show aeration, which usually enters on the suction side upstream of the lift pump, where pressure is below atmospheric and a loose fitting or cracked hose draws air in. The rail is under high pressure and cannot draw air, and nozzle backflow does not normally reach the filter.

67. B — Grease reaches linings when camshaft bushings or slack adjusters are over-greased, or when a wheel seal leaks. Contaminated lining must be replaced, and the source corrected. Tank condensation is water, normal wear does not release oil, and chamber pressure does not push grease from the spring brake into the drum.

68. A — A center support holds the driveshaft in line and isolates vibration with a rubber mount and bearing. A cracked rubber lets the shaft move and produces noise and vibration, especially when torque changes on deceleration. Loose wheel studs and suspension inflation do not damage the center support, and driver technique does not crack the isolator.

69. D — Rust spreads under paint, so the corrosion must be removed to bare metal and the surface treated, primed, sealed at the seam, and repainted to stop it returning. Painting or filling over rust traps moisture, and tape only hides the problem. Early repair avoids holes and the cost of replacing cab panels.

70. B — A restriction or moisture freezing at the valve causes a pressure drop that makes frost form at the inlet and lowers the suction pressure. Too much airflow would raise the evaporator temperature, and a weak alternator and loose fan belt do not cause a localized drop and freezing at the expansion valve inlet.

71. C — Back-probing with a thin, purpose-made probe lets the meter touch the terminal without damaging seals or insulation. Piercing wires creates corrosion points, prying out terminals bends locks, and cutting wires adds splices that can fail. Care matters on sealed connectors because moisture ingress causes intermittent faults later. Test with the circuit operating and meter leads secure.

72. A — Frame fasteners are chosen for shear strength and clamp load, and lockbolts rely on a swaged collar installed with a specific tool. Replacing them with weaker bolts, welding on the frame, or using self-tapping screws can reduce strength or create fatigue cracks, so the approved fastener and installation method are required.

73. B — Cloud point is the temperature at which wax crystals start forming and the fuel turns hazy, and it comes before the pour point, where the fuel will no longer flow. Flash point concerns ignition hazards,

cetane concerns ignition quality, and viscosity index describes oil behaviour over temperature rather than wax formation.

74. C — When the brakes are applied, air fills the service side of the chamber, and the vent on the other side should stay quiet. Air escaping from that vent means the diaphragm is leaking, and the chamber should be replaced. Normal exhaust happens at the valve, and a safety valve or slack adjuster does not cause vent leakage.

75. D — Rust-coloured powder at a U-joint cap is a sign of fretting corrosion, where tiny movements wear the surfaces and lubricant is missing or has failed. The joint should be inspected and likely replaced. Paint dust, air tank water, and axle breather residue do not collect in this way or point to harmless causes.

76. D — A thread insert restores strong, wear-resistant threads in soft aluminum when the hole is cut to the insert's tap size. Epoxy and tape are not structural, and a longer or over-torqued bolt stresses the casting and risks cracking it or pulling out the remaining threads under vibration. Insert kits make a lasting repair.

77. B — A pintle hook carries the full towing load and a worn or cracked horn or latch can release the lunette ring on the road. Positive latch closure and the safety pin must be confirmed before moving. Safety chains are a backup, free spinning does not secure it, and heavy grease does not secure the connection.

78. C — A cylinder that drifts under load is leaking internally past the piston seals or externally through a valve that should hold, such as a counterbalance valve. A breather, pump coupling, or lever linkage does not hold the load, so they would not cause a drift in neutral, and a pump at rest does not hold the cylinder in position.

79. A — Current equals power divided by voltage, so 1,200 W divided by 24 V gives 50 A. That level of current needs correctly sized wire and a properly rated fuse. Dividing by the wrong value gives 25 A, and the other values do not follow from the power formula. Always size the fuse above the running current.

80. A — Torque rods locate the axle and control wind-up under power and braking. Worn bushings let the axle move, so alignment changes, driveline angles shift, and tires wear. They are not part of the steering linkage, and worn bushings do not improve ride or brake action in any helpful way. Replace the bushings in matched sets.

81. C — Compression brakes rely on correctly set lash and working slave pistons to open the exhaust valve near top dead centre. A bank with poor lash or worn parts retards less. Tire size does not change engine braking in this way, and coolant and battery condition do not affect mechanical valve actuation in that bank.

82. D — Many older analog clusters run through an instrument voltage regulator, and a bad regulator or poor ground makes every regulated gauge read in error together. A single sender would affect only one

gauge, and an alternator or starter fault would show other symptoms such as battery discharge or starting trouble.

83. B — Ice in brake valves comes from moisture in the compressed air, so a working dryer and desiccant are the proper cure. Adding fluids to the tanks can damage seals and valves, infrequent draining makes moisture worse, and larger chambers have no influence on moisture in the valves or lines upstream of the chambers.

84. B — The slip yoke must slide freely to adjust driveline length as the axle moves. When the splines are dry or seized, the shaft binds and creates vibration under torque. Perfect tire balance cannot cause a vibration, and fuel pressure and brake drum thickness do not act on the slip spline.

85. C — An isolation fault means a high-voltage conductor has a leakage path to the chassis, and technicians find it by following the manufacturer's steps, de-energizing the system, isolating sections or loads, and measuring isolation resistance with a suitable tester. Touching live cables, adding water, or replacing a costly pack at once is unsafe or wasteful.

86. D — King pin wear is measured with the axle load removed by lifting at the axle, so the knuckle can move freely and a dial indicator shows vertical play against the axle beam. Measuring with weight on the tires, while driving, or at the steering wheel masks or confuses the movement and does not give a reliable measurement.

87. A — Disabling a working cylinder should cause a drop in engine speed or power. No change means that cylinder was already contributing little, so injector, compression, or valve faults need testing. Healthy cylinders show similar, not identical, drops, and an overfuelled cylinder would give a larger change, not none. Retest after each repair.

88. A — Low airflow across the evaporator keeps the coil too cold, so moisture freezes and further blocks flow. A plugged cabin filter or blocked case is a common cause and an easy first check. A heater core leak, condenser fan failure, or engine mount wear does not reduce airflow across the evaporator.

89. D — A 'Good - Recharge' result means the battery's condition is acceptable but its state of charge is too low for an accurate test. The battery should be fully charged and tested again. Replacing it now wastes a good battery, and trusting the alternator to charge a deeply discharged battery can overload the charging system.

90. B — A calibrated test gauge is the reference. Since the dash gauge reads high, it misleads the driver about available air, so it should be repaired or replaced. Adjusting the governor to match a bad gauge would change real pressures, and replacing the compressor does not address a gauge error that the test gauge shows plainly.

91. C — Backlash should be checked at several points around the ring gear, and a changing reading shows runout, caused by a bent or warped gear or one not seated correctly on the carrier flange. Wear does not vary this way, and lubricant level or axle shaft splines do not change the clearance between meshing ring and pinion teeth.

92. A — Bulletins often supersede manuals for specific builds, but they apply only to defined date or VIN ranges. Verifying applicability and then using the correct figure keeps the joint to specification. Averaging or choosing the highest value ignores engineering data and can strip threads, distort parts, or leave the joint loose.

93. C — A dirty condenser cannot reject heat, which raises head pressure and reduces cooling, and cleaning the coil is the simple first step. Adding refrigerant raises pressure further, replacing the compressor is premature, and removing the condenser fan stops airflow through the coil and makes the situation worse. Clean coils restore normal pressures.

94. B — Cold hydraulic oil is thick and creates a higher differential pressure across the filter, so the indicator can pop and then return as the oil warms. A truly plugged element stays indicated when warm. An empty reservoir or stuck relief valve would show other symptoms, such as noise or no pressure.

95. D — At the top of the compression stroke both valves are closed, so both rocker arms on that cylinder have free play. At the top of the exhaust stroke the valves overlap and one rocker is loaded. Tight rockers indicate open valves, and an oil pressure gauge does not indicate piston position or stroke.

96. D — Alignment readings should be taken with the suspension settled and the tires at normal running position, so the vehicle is rolled forward and back on a level surface to release tension in the tires and bushings. Measuring with wheels hanging gives false angles, and engine speed or steering lock does not settle the suspension in the same way.

97. A — An air seat holds its height with air in a bellows controlled by a valve, so a slow sag points to a leaking bellows, fitting, or valve. Battery and alternator condition do not change whether trapped air stays in the bellows, and tire wear has no link to the seat air supply.

98. C — Voltage well above 14.8 V means the regulator is not limiting output, either because it failed or because its battery-sense circuit is open. Overvoltage can damage electronics and boil batteries. A weak battery, belt slip, or loose starter wire would show low charging voltage rather than a high one. Measure at the battery to confirm.

99. B — The slack adjuster arm and pushrod should form roughly a right angle when the brake is applied at working stroke, which gives the most uniform brake torque. Setting a right angle at the released position leaves an acute angle during application and reduces torque. Other angles change the effective lever length and make brake force inconsistent.

100. C — Gear sets shed tiny particles during normal operation, and a magnetic plug collects a light fuzz, which is expected. Chips, chunks, or flakes would indicate damage and call for further inspection. Fine fuzz alone does not show a failed differential, water contamination, or a plugged breather, so refilling with the specified oil is appropriate.

101. B — Oil pressure results from pump output meeting flow resistance at the bearings. Worn, loose bearings let hot oil leak out more easily, and at idle the pump speed is too low to keep up, so pressure drops while it recovers at higher speed. A thermostat, overfill, or battery would not produce this pattern.

102. A — A terminal with weak pin tension causes high resistance and intermittent contact, so the proper repair is to replace the faulty terminal. Dielectric grease protects against moisture but does not restore tension, spreading a terminal gives poor results, and tape does not fix contact pressure inside the connector. Replace terminals in matched pairs when possible.

103. D — Steering gear lash at center is adjusted with an over-center screw that preloads the sector shaft, set while the gear is centred and following the maker's procedure. Fluid quantity does not change gear lash, overtightening the pitman arm damages splines, and tire size does not alter the mechanical clearance inside the gear.

104. A — A healthy viscous clutch drags noticeably when hot because the fluid shears and locks the fan to the drive. A fan that spins freely on a hot, overheating engine is not engaging, so airflow is poor. Belt tension and radiator fouling do not make the clutch freewheel, and free spinning when hot is a failure sign.

105. C — Leak-detection dye is a fluorescent additive that glows under UV light, so a UV lamp and glasses reveal where it escapes. Dye is not magnetic, cannot be heard flowing, and does not create a temperature difference that a thermometer would show, though an electronic leak detector is another common method.

106. B — Air tends to remain in the longest line, so bleeding begins at the wheel with the longest fluid path and works toward the nearest, pushing air steadily out through each bleeder. Starting at the nearest can leave trapped air downstream, and bleeding only the repaired wheel can leave air elsewhere. Follow the manufacturer's sequence where given.

107. D — Oil-bath hubs have a fill level marked on the cap or visible in a window, and the vehicle should be level with the cap positioned as marked. Opening the hub, overfilling to the vent, or waiting for a hot run all risk contamination, overfilling, or false readings, and overfilled hubs can leak onto the brakes.

108. A — Wire resistance rises as the gauge gets thinner, and voltage drop grows with current and length. A heavier gauge keeps the drop within limits and avoids heating, and the fuse should protect the wire at the source. Thin wire overheats, and matching colour says nothing about current capacity or voltage drop.

109. D — A dynamic imbalance makes the wheel wobble side to side and sets up a shimmy that the driver feels, so balancing the assembly and checking runout is the fix. Raising pressure only masks the problem and risks overinflation, removing a damper removes a protection, and swapping unbalanced tires moves the problem to other positions.

110. B — Safety shortcuts must be corrected immediately, calmly, and with a reason, so the apprentice learns the hazard and builds the habit. Stopping the work, explaining stored energy, and having the apprentice apply the lock models correct practice. Delaying feedback, silently covering the step, or humiliating the apprentice teaches nothing. Then follow up later.

111. C — A single axle losing pressure while others hold means the leak is local, so the rotary union, hose, valve, or fittings on that axle should be traced with soap solution or a detector. The tractor compressor feeds the whole system, the kingpin carries no air to one axle, and drums on other axles are not connected to it.

112. D — Hydraulic pumps depend on fluid to lubricate and cool their internal parts, so a dry start can score them in seconds. Filling the case and inlet with clean fluid before starting prevents this. Running dry to clear air, starting at high idle, or closing the inlet all deprive the pump of fluid or cause damage.

113. A — Liner vibration creates tiny vapour bubbles in the coolant that collapse against the metal and erode it, and proper coolant additives form a protective film that limits this. Low additive levels allow pitting. Oil level, fuel grade, and belt tension do not cause erosion on the coolant-side liner surface. Test coolant additive level regularly.

114. C — Reprogramming needs steady voltage because a voltage dip can corrupt memory and leave the module unusable. A regulated power supply or battery maintainer connected during the session keeps voltage stable. The key must be on, the engine should be off, and a capacitor cannot maintain power for the full process.

115. B — If service air and spring force both apply at the same time, the combined force can bend or break brake parts. An anti-compounding arrangement lets the spring brakes apply only the force that the service brakes are not already supplying. It does not accelerate release, drain water, or communicate with the ABS module.

116. D — A retarder turns braking energy into heat in its fluid, and the cooler must remove that heat. If the oil overheats and retarding fades, restricted cooling flow is a likely cause. Tire sizes, steering gear, and battery terminals do not control heat rejection from the retarder's fluid circuit. Clean or replace the cooler.

117. B — Stud-piloted and hub-piloted wheels centre and clamp differently, and each system needs matching nuts and wheels. The wrong nut can fail to seat or centre the wheel, which allows loosening and can cause a wheel to come off. Nuts are not interchangeable, and they have little to do with brake drum clearance.

118. C — Charging slows at high state of charge because cells are protected from overvoltage and heat, and the battery management system requests less current as the battery fills. This taper is normal. Cable heat could limit current, but it would not stop it completely, and tires and the cab heater do not control the charging profile.

119. A — Blowby gases must leave the crankcase through the breather, so a plugged filter lets pressure build and forces oil past seals, gaskets, and sometimes the turbo drain. The cooling system, idle speed, and evaporation are not affected by this restriction in the same way, and the oil leaks are the typical visible clue.

120. B — On J1939 vehicles the red stop lamp signals a serious condition such as very low oil pressure or high coolant temperature, and the driver should stop safely. The amber lamp indicates a less urgent fault. A red lamp is not a service reminder or a minor warning, and it does not report washer fluid levels.

121. D — Airbag systems store energy and can deploy unexpectedly if the circuit is energized, so manufacturers require battery disconnection and a wait period before work near the modules. Leaving power on, tapping the hub, or probing airbag connectors with a test light can trigger deployment and cause serious injury. Always follow the procedure.

122. C — One axle drifting out of adjustment while others hold points to a failing automatic slack adjuster or a binding foundation brake component on that axle. The cause must be found and corrected rather than just readjusted. Compressor pressure, the engine retarder, and a steering gear leak do not affect only one axle's stroke.

123. A — A differential lock is usually engaged by an air cylinder controlled by a solenoid and a switch, so supply pressure, leaks, and the electrical signal at the solenoid are the first checks. Brake chambers, engine oil level, and tire pressure are not part of the lock's shift circuit and cannot prevent it from engaging.

124. A — Elongated holes show the wheel has moved under load and weakened, so it should be replaced, and the studs, nuts, and mating surfaces inspected for damage. Filing, welding, or adding washers cannot restore the wheel's strength or its clamping surfaces and can cause cracks, so a wheel that has run loose should not be reused.

125. B — Exhaust leaks tick as pulses escape through a small gap, and heat expansion often closes the gap, so the noise fades. A flywheel, water pump bearing, or alternator pulley would not follow the manifold's temperature behaviour. Fixing the gasket or cracked manifold stops exhaust leaking, which can also damage sensors or enter the cab.

126. D — Fuel-fired heaters need clean combustion air and a free exhaust path, so blocked or damaged tubes are an early check, followed by fuel supply and quality. The radiator, tire sensors, and air dryer are separate systems, and a blocked exhaust can also allow dangerous gas to enter the cab, so repairs must be correct.

127. C — A twisted pair cancels interference on the CAN high and low lines, so replacing it with straight wires makes the network more vulnerable to noise and causes lost communication faults. The repair should keep the twist and use proper cable. Wire colour does not matter to modules, and short length or thickness are not the usual causes.

128. C — A press stores great force, so the workpiece needs even support, a centred load, and a shield between the operator and any flying fragments. Uneven support can tip or shoot parts out, and standing in line with the ram without a shield exposes the technician if the part or tooling breaks.

129. A — Dumping air lowers the trailer, but the trailer must be re-inflated to the proper ride height before travel, or the suspension, tires, and clearances will be damaged. Leaving it deflated,

disconnecting valves, or lowering tire pressure creates unsafe handling and does not correct ride height. Check ride height before moving the trailer.

130. D — A relief valve protects the system by opening at a set pressure, so it is adjusted with a test gauge at the pump port while the circuit is briefly stalled with the oil at working temperature. Setting by sound, setting it too high, or removing the spring leaves the pump and components unprotected against damaging pressure.

131. B — Trailer parking brakes are spring brakes held off by air. If the trailer rolls with the parking brakes applied, the spring brake chambers, their relay valve, or the supply valve are failing to hold. Tractor balance, tire inflation, and kingpin length have no direct influence on whether trailer spring brakes apply.

132. B — When the pedal is pressed, the release bearing contacts the pressure plate fingers and turns with them, so a noise present only then points to that bearing. When the pedal is released it stops contacting. Axle bearings, gears, and the ring gear turn or sound under other conditions, so they do not follow the pedal movement.

133. D — A vehicle leans toward the side with less positive caster, because the wheel with more caster has stronger straightening effort. Here the right wheel has less, so the truck drifts right. Correcting caster side to side removes the pull. Caster affects straight-line tracking at all times, not only under braking, and it works together with toe.

134. C — A runaway diesel burns lubricating oil drawn in through the intake, so cutting fuel does not stop it. Blocking the air supply starves combustion. The key may not stop it, revving feeds more oil, and spraying water on a hot turbo is dangerous. Block the intake or stall it in gear with the brakes.

135. A — Static discharge can damage sensitive electronic parts, so technicians discharge static to ground and avoid touching terminals. Ordinary plastic can build up static rather than prevent it, wiping pins is unnecessary, and heating a module can damage components and solder joints. Handling modules by the case helps protect them. Store modules in antistatic bags.