

PRACTICE EXAM 9: 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 battery with a 12.6 V rest voltage fails a load test at half its cold cranking rating, dropping below 9.6 V. What is the correct conclusion?
 - A. The alternator belt is slipping and causing the load drop
 - B. The battery is defective even though it is charged and should be replaced
 - C. The starter motor is drawing too much current for the test
 - D. The battery is healthy and only needs a longer charge before another test

2. A log-truck engine at 900,000 km shows heavy crankcase breather vapour, oil in the intake, and falling power. Compression readings are low on every cylinder. What is the most likely cause?
 - A. A sticking thermostat keeping the engine below its normal operating temperature
 - B. A restricted crankcase ventilation filter holding vapour in the crankcase
 - C. Worn piston rings and cylinder liners letting combustion gas pass into the crankcase
 - D. A failed turbocharger oil drain line returning oil to the intake piping

3. With the engine running, a power steering pump pressure test with the shut-off valve briefly closed reads far below the specification. What is the likely fault?
 - A. A worn tie rod end that is allowing the wheels to wander
 - B. A loose steering wheel nut on the steering column shaft

- C. An out-of-balance front tire that is causing steering shake
- D. A worn pump or a faulty pressure relief valve that cannot build pressure

4. Moisture keeps collecting in the air tanks of a logging truck even though the tanks are drained daily. What is the most likely cause?

- A. A tractor protection valve that is closing too early under pressure
- B. A slack adjuster that is travelling too far on every brake application
- C. A saturated air dryer desiccant cartridge or a failed dryer heater
- D. A governor set too high, which lets the compressor run too many hours

5. A mining tractor's clutch slips under load. The technician finds almost no free play at the pedal. How does this cause slipping?

- A. The input shaft spline becomes too tight for the disc to slide on it
- B. The disc becomes hardened by too much pressure, so it grips the flywheel less
- C. The flywheel expands under load, which increases the gap at the disc
- D. Constant release bearing contact keeps the pressure plate from fully clamping

6. A shop crane and two chain legs lift a 3,600 kg crusher component, each leg making a 60-degree angle with the horizontal. What is the approximate tension in each leg?

- A. About 1,800 kg per leg
- B. About 2,078 kg per leg
- C. About 3,118 kg per leg
- D. About 1,039 kg per leg

7. A trailer's landing gear cranks with unusual effort and the legs raise unevenly. What is the first thing to check?

- A. Gearbox and leg lubrication, and any bent leg

- B. The trailer ABS sensor for an erratic signal at low speed
- C. The brake lining thickness at the front axle on the trailer
- D. The tractor air dryer cartridge for moisture reaching the trailer

8. A hoist cylinder on a mine truck moves in jerks when extending under light load, while fluid temperature and pump pressure stay normal. What is the most likely cause?

- A. Contaminated fluid with water
- B. A relief valve set too low
- C. A plugged return line filter
- D. Air trapped in the cylinder or lines

9. Why must replacement batteries in a series-parallel 24 V bank be matched in age and rating?

- A. Unequal internal resistance shares charge unevenly and kills the weaker unit
- B. Mismatched batteries produce a lower voltage even when they are fully charged
- C. Different brands cannot be connected to the same alternator at all
- D. Older batteries create more cranking amps and overheat the cables

10. After installing wet cylinder liners in a haul-truck engine, the technician finds one liner stands higher above the block deck than the specification allows. What is the likely result if the engine is built this way?

- A. Lower compression ratio because the piston travels a shorter stroke
- B. Head gasket crushing and coolant leakage past the liner seal because clamp load is wrong
- C. No problem, because liner height only affects the cylinder head bolt torque
- D. Excess oil consumption because the liner is too hot to hold the oil film

11. A cab heater blows cool air, and both heater hoses are hot at the engine but one hose is cold at the cab end. What is the most likely cause?

- A. A low refrigerant charge in the air conditioning circuit
- B. A failed air conditioning compressor clutch that has stopped engaging
- C. A plugged heater core or a stuck-closed heater valve
- D. A weak alternator that cannot supply the blower motor

12. A power steering reservoir shows foamy fluid, and the steering is noisy. The level is full. What is the most likely cause?

- A. Air entering the suction side through a loose or damaged hose
- B. Overheated brake fluid that has leaked into the power steering circuit
- C. A worn driveshaft slip yoke that is shaking the reservoir
- D. A restricted fuel filter that is lowering the fuel pressure

13. A compressor on a mine truck is passing oil into the air system, and oily residue collects in the tanks. What is the most likely cause?

- A. A weak parking brake spring causing the lines to fill slowly
- B. A cracked brake drum that is overheating the nearby air lines
- C. A leaking pressure relief valve on the wet tank venting too often
- D. Worn compressor rings or a plugged inlet drawing oil past the rings

14. A hydraulic clutch pedal on a quarry tractor slowly sinks toward the floor when held down. The reservoir is full and no external fluid leak is visible. What is the most likely cause?

- A. A seized pilot bearing in the flywheel
- B. An internal leak past the master cylinder seals
- C. A worn slave cylinder dripping fluid onto the housing
- D. A glazed clutch disc that no longer grips

15. Before tilting the cab of a logging truck for service, what is the correct preparation?

- A. Leave the engine running at high idle so the tilt pump has enough pressure
- B. Tilt the cab and then check for items that may be loose inside
- C. Secure loose items, set the brake, clear the area, and use the prop
- D. Stand under the cab to observe the tilt cylinder during the first lift

16. A technician measures parasitic draw on a truck that discharges overnight and reads 1.8 A right after removing a fuse. Why should the reading be retaken after waiting?

- A. Modules stay awake after key-off, so early readings run high
- B. The meter requires a long warm-up to read amperage correctly
- C. Battery voltage rises after key-off, so the current falls by itself
- D. Fuse removal charges the circuit capacitors for several hours afterward

17. An engine's oil pressure reads normal at high speed but drops low at hot idle. Oil level and viscosity are correct. What is the most likely cause?

- A. An oil cooler thermostat sticking closed, which would raise oil temperature only
- B. A pressure relief valve stuck open, which would lower pressure at every speed
- C. Excess bearing clearance from worn main or rod bearings leaking oil at low pump speed
- D. A plugged oil filter, which would also reduce flow to the bearings at high speed

18. Insulation on an orange high-voltage cable of an electric truck is cut through to the conductor. What is the correct repair?

- A. Solder the conductor and cover the cut with insulating tape
- B. Replace the whole cable assembly after isolating the system
- C. Wrap the cut with several layers of heat-resistant tape
- D. Join the ends with a crimped butt connector and heat shrink

19. A driver reports excessive free play at the steering wheel. What should the technician inspect before adjusting the steering gear?

- A. The transmission mount and the clutch release bearing
- B. The fan belt tension and the alternator pulley alignment
- C. The brake chamber pushrod stroke and the slack adjuster angle
- D. Linkage ends, kingpins, and the gear mounting for looseness

20. To locate an air leak at the brake chambers and fittings on a loaded truck, which procedure is correct?

- A. Run the engine at full speed and look for dripping fluid under the chambers
- B. Release all the brakes and listen for hissing from the tank drain valves only
- C. Disconnect the glad hands and spray solvent on every hose to find leaks
- D. Charge the system, apply the brakes engine-off, and soap-test suspect points

21. A driver cannot select a gear from a stop without grinding, even with the pedal fully depressed. Free play at the pedal is greater than specified. What is the likely cause?

- A. The clutch disc is fully released but the input shaft is spinning from the engine brake
- B. The transmission is low on oil and the gears are spinning dry in the housing
- C. The clutch is not fully releasing because the excessive free play is limiting the release travel
- D. The drive axle ratio is too high for the engine at idle speed

22. At 1,500 rpm with the lights on, a truck's batteries read 12.5 V while the alternator output stud reads 14.1 V. The voltage drop across the output cable is 1.6 V. What is the most likely fault?

- A. High resistance in the charging cable or its connections
- B. A weak starter solenoid that is drawing current when running
- C. A defective headlamp relay that is adding a heavy load
- D. A failed alternator regulator holding the output too low at all times

23. Oil analysis on a quarry truck shows elevated sodium, potassium, and boron with a trace of glycol. What does this most likely indicate?

- A. Excess soot loading from extended idling at the mine office
- B. Coolant leaking into the oil, as from a failed cooler
- C. Fuel dilution from leaking injector seals into the crankcase
- D. Abnormal bearing wear from dirt entering through the air filter

24. A mine-road truck's raised dump body must stay up while a technician replaces a hoist cylinder seal. What is the correct first safety step before opening any hydraulic fitting?

- A. Leave the hoist valve in hold and rely on its check valve to keep the body up
- B. Loosen the cylinder fitting slightly to see whether any pressure remains
- C. Chock the front wheels and trust the weight of the body to hold itself
- D. Install the rated body safety prop, then relieve cylinder pressure by the approved method

25. The trailer ABS warning lamp comes on after hooking up to a tractor, and the trailer power cable is connected. What should be checked first?

- A. The tractor engine oil level and pressure at idle
- B. The fifth wheel jaw and the kingpin wear
- C. Power and ground at the plug and trailer module
- D. The trailer tire tread depth on the rear axle

26. A dump body hoist cylinder extends slowly and will not lift a full load, yet pump flow is normal. How can internal leakage in the cylinder be confirmed?

- A. Block one port, pressurize, and watch for leakage past the piston
- B. Increase the relief valve setting until the load lifts
- C. Replace the pump and see whether the lifting speed improves
- D. Add fluid to the reservoir until it is full to the filler neck

27. A technician checks front toe with a trammel bar. Where should the measurements be taken?

- A. At the top of the tires with the steering wheel turned fully to the left
- B. At the wheel nuts with the truck jacked up under the front axle
- C. At the bottom of the tires with the engine running and the brakes on
- D. At spindle height, front and rear of the tires, truck straight and rolled

28. A technician measures AC voltage at the battery terminals with the engine running and finds 1.1 V. What does this indicate?

- A. A loose serpentine belt that is reducing the field current
- B. A failed rectifier diode in the alternator letting AC ripple pass into the system
- C. A weak battery cell that is raising the system voltage slightly
- D. A normal reading, since AC voltage is expected to be around 1 V

29. A Type 30 clamp-type brake chamber measures 56 mm of pushrod stroke with a full brake application. Which statement is correct?

- A. It exceeds the 51 mm limit, so the brake is out of adjustment
- B. The stroke is too short and indicates the drum is oversize
- C. The stroke is acceptable because chambers may travel up to 63 mm
- D. The stroke is fine because only the spring brake portion has a limit

30. A clutch grabs and chatters, and the disc faces are soaked with oil. What is the proper repair?

- A. Clean the disc with solvent and reinstall it with a thin coat of grease
- B. Replace only the pressure plate springs and leave the disc in place
- C. Replace the disc, fix the oil leak, and resurface the flywheel
- D. Increase the free play at the pedal to reduce the grab

31. The oil level on a gravel truck's engine has risen above full, the oil feels thin, and it smells of diesel. What is the most likely source?

- A. Condensation from short trips in cold weather without warming up
- B. Fuel entering the crankcase from a leaking injector O-ring or transfer pump seal
- C. Over-filling during the last oil change by a technician in a hurry
- D. Coolant entering from a cracked cylinder liner or cooler core

32. The temperature setting on a cab climate control does not change the air temperature, and a clicking noise comes from behind the dash. What is the likely fault?

- A. A worn compressor belt that slips on a cold morning
- B. A clogged cabin filter that restricts the air entering the blower
- C. A leaking cylinder head gasket that spills coolant into the heater
- D. A failed blend door actuator or a stripped blend door gear

33. A truck's batteries are boiling over, and system voltage reads 15.8 V at the battery. What is the most likely cause?

- A. A low coolant level that is raising the temperature of the batteries
- B. A worn drive belt that is reducing the output of the alternator
- C. A faulty voltage regulator or sense circuit allowing the alternator to overcharge
- D. A stuck starter solenoid that is feeding extra current to the batteries

34. One steer tire on a mine tractor shows wear on only its outer shoulder. Which alignment condition most likely caused it?

- A. Excessive positive camber, which leans the top of the tire outward
- B. Too much steering axle setback, which loads the inner shoulder
- C. A correct toe setting combined with proper tire inflation
- D. Excessive negative caster, which makes the steering return poorly

35. A truck overheats only when climbing long mine grades at full load. The coolant level is full, the fan clutch engages, the cap holds pressure, and the thermostat opens fully. What is the most likely cause?

- A. A low coolant level caused by a leaking radiator cap seal
- B. A radiator core packed with mud and dust, blocking airflow
- C. A thermostat stuck in the open position, letting coolant bypass the radiator
- D. A failed coolant temperature gauge sender giving a false hot reading

36. An ABS fault lamp comes on at low speed, with a wheel speed sensor signal that is erratic. The sensor wiring tests good. What should be inspected next?

- A. The brake pedal valve for a leak that dumps the pressure at idle
- B. The spring brake chamber for a ruptured diaphragm at the park port
- C. The tone ring teeth for damage or debris and the sensor's clip and air gap
- D. The air compressor governor for a stuck unloader valve

37. A range-shift transmission will not engage high range, and the splitter works normally. Air pressure in the system is adequate. What should be checked first?

- A. The engine oil level and viscosity in the crankcase
- B. The rear axle breather and the differential oil level
- C. The clutch brake wear and the pedal free play at the clutch
- D. The air supply to the range cylinder, including the regulator, filter, and lines

38. A starter on a mine truck only clicks. A voltage drop test across the starter ground path measures 2.9 V while cranking. What does this show?

- A. The flywheel ring gear has too many teeth for the pinion
- B. High resistance in the ground cable or its connections
- C. The starter armature is shorted internally and drawing no current
- D. The batteries are overcharged and are rejecting the load

39. Water collects on the floor of a mine truck cab after pressure washing. The door seals look intact. Where should the technician look next?

- A. The door and cab drain holes and floor plugs, for blockage
- B. At the power steering reservoir for a cracked cap that is leaking inside
- C. At the transmission breather for water that has been drawn into the cab
- D. At the exhaust aftertreatment shield for condensate dripping through the floor

40. A steer tire shows feathered tread blocks that are sharp on one edge across the whole tread. What condition causes this?

- A. Incorrect toe, which drags the tire sideways across the road as it rolls
- B. An out-of-round brake drum, which would cause flat spots only
- C. A worn wheel bearing, which would cause only a cupped wear pattern
- D. Low tire inflation, which would wear both shoulders evenly instead

41. A radiator pressure cap rated lower than the specification is installed on a haul-truck engine. What is the effect?

- A. The water pump flow increases because there is less resistance
- B. Coolant freezes at a higher temperature, which is a risk only in winter
- C. The thermostat opens later because system pressure is reduced
- D. Coolant boils at a lower temperature and is expelled from the system under hot operation

42. A technician must arc-weld a cracked brace on a log truck with electronic engine controls. Which preparation best protects the control modules?

- A. Keep the batteries connected so module memory is held, and clamp the ground on the rear frame
- B. Turn the key to run so the modules can absorb the stray welding current safely
- C. Disconnect both battery cables and the module connectors, then clamp the ground close to the weld
- D. Bridge the battery terminals together so the welding current has a short path

43. The rear tires of a tri-axle log trailer show scrub wear on one side, and the trailer pulls to that side. What is the likely cause?

- A. A failed trailer marker lamp that is changing the load balance
- B. Axle misalignment or tracking error, which should be checked with an alignment measurement
- C. An overfilled landing gear gearbox that is dragging on the legs
- D. Low air pressure in the trailer supply line to the relay valve

44. A hydraulic system's oil temperature climbs steadily while a relief valve discharges almost all the time. What is the explanation?

- A. Fluid passing over the relief valve at high pressure converts pump power into heat
- B. The fluid is cold-thickened and cannot circulate through the system
- C. The relief valve is a heat exchanger that cools the fluid as it passes
- D. High temperature is caused by too much fluid in the reservoir

45. On a mine truck, air escapes continuously from the weep hole of one service brake chamber whenever the brakes are applied. What is the repair?

- A. Tighten the pushrod locknut because it is allowing the air to bleed past
- B. Add lubricant to the clevis pin so the seal reseats itself
- C. Replace the brake drum, since a worn drum causes air leaks
- D. Replace the chamber's leaking service diaphragm, preferably in pairs across the axle

46. How should the lubricant level of a heavy-duty manual transmission be checked?

- A. With the engine running at high idle so the oil is circulating
- B. By measuring the level at the drain plug before removing it
- C. On level ground, with the lubricant even with the bottom of the fill plug opening
- D. With the truck parked on a slope so the oil collects at the plug

47. A starter cranks slowly even though the batteries and cables test good, and the engine turns freely by hand. What is the most likely fault?

- A. A low coolant level causing the pistons to expand
- B. A restricted fuel filter that is slowing the crankshaft speed
- C. An overfilled crankcase that is creating hydraulic lock
- D. An internal starter fault, such as worn bushings dragging the armature

48. A viscous fan clutch on a quarry truck roars at full speed immediately after a cold start and stays that way. What is the correct conclusion?

- A. The fan drive is working normally because it engages fully when the engine is cold
- B. The fan drive is stuck engaged, so it should be replaced
- C. The thermostat is stuck closed, which locks the fan drive until it opens
- D. The water pump impeller is slipping on its shaft and driving the fan faster

49. A truck's A/C gauges show both low-side and high-side pressures higher than normal, and the air is warm. What is the most likely cause?

- A. A frozen evaporator, which would lower the low-side pressure
- B. Condenser airflow restriction or too much refrigerant
- C. A leaking heater core, which is part of the coolant system
- D. A low refrigerant charge, which gives low pressures on both sides

50. A heavy-haul tractor has a crack in a heat-treated frame rail. What is the correct repair approach?

- A. Leave the crack alone because rails are designed to flex with cracks
- B. Weld the crack and grind it smooth, since all steel rails can be welded the same
- C. Follow the manufacturer's frame repair instructions, which may restrict welding and drilling of the flanges
- D. Drill several extra holes in the flange so the crack cannot spread

51. What is the function of the service disconnect on a high-voltage traction battery pack?

- A. It splits the pack's high-voltage circuit for service
- B. It charges the 12 V battery from the traction pack
- C. It limits the charging current from the roadside charger
- D. It stores the fault codes when the system shuts down

52. A brake drum on a heavy-haul tractor shows heat checking, hard spots, and blue discoloration. What is the correct action?

- A. Polish the drum surface with emery cloth and keep using it
- B. Replace the drum, because overheated drums cannot be reliably machined back to serviceable condition
- C. Reverse the drum on the hub to put the damaged face outboard
- D. Machine the drum within its limits to remove all of the hard spots

53. A transmission-mounted hydraulic retarder gives weak retarding, and the transmission fluid level is low. Why does low fluid reduce retarding?

- A. Low fluid causes the retarder valve to open at lower road speed
- B. Low fluid increases the friction on the output shaft and overworks the retarder
- C. Low fluid raises the temperature of the engine coolant circuit
- D. A full fluid fill between rotor and stator creates the drag

54. A relay's coil terminals measure an infinite resistance on an ohmmeter. What is the correct conclusion?

- A. The coil winding is open, so the relay should be replaced
- B. The relay is good because the coil should be infinite when tested
- C. The relay contacts are welded shut and just need cleaning
- D. The relay diode has failed and should be bypassed with a wire

55. The air filter restriction indicator on a haul truck shows red after a dusty shift. What is the proper action?

- A. Remove the element completely so the engine can breathe freely until payday
- B. Reset the indicator and continue because the engine will not be harmed
- C. Service or replace the element per the manufacturer, then reset the indicator
- D. Tap the element on the fender to knock off dust and reinstall it immediately

56. Checking a tractor frame, a technician finds the two diagonal measurements differ noticeably. What does this indicate?

- A. The suspension is aligned properly and needs no further inspection
- B. The frame is straight and the difference is normal manufacturing variation
- C. The frame is out of square, a condition often called diamonded
- D. The frame has excess camber that will correct itself under load

57. A 24 V system powers a 150 W work light bar on a loading truck. What is the approximate current draw?

- A. About 12.5 A
- B. About 3.6 A
- C. About 0.16 A
- D. About 6.25 A

58. A mine-site tractor with a 2019 engine calls for API CK-4 oil. A new supplier offers API FA-4 oil. What is the correct guidance?

- A. Use FA-4 only in the transmission since it is a gear lubricant grade for axles
- B. Use FA-4 only if the engine maker approves it, since its lower high-temperature viscosity suits specific engines
- C. Use FA-4 whenever the oil is changed in winter because it flows better when cold
- D. Use FA-4 freely because every newer category replaces and outperforms the older one

59. A diesel refrigeration unit on a trailer shows high discharge pressure, and the condenser coil is packed with road dirt. What is the correct action?

- A. Clean the condenser coil, then recheck the pressures
- B. Disconnect the high-pressure cutout so the unit stays running
- C. Add refrigerant until the discharge pressure drops to normal
- D. Replace the compressor because high pressure always means it is worn

60. A dump hoist cylinder slowly drifts down with the control valve in hold. Which are the likely causes?

- A. A restricted reservoir breather that is raising the oil temperature
- B. Internal leakage past the piston seals or a leaking valve
- C. A worn driveshaft slip yoke that is shaking the hoist
- D. A slipping alternator belt that is lowering the system voltage

61. Brake linings on a log trailer are soaked with oil from the wheel end. What is the correct repair?

- A. Replace only the one oily lining and leave the rest of the axle alone
- B. Burn the oil off the lining by braking hard on a downgrade
- C. Replace the linings on both ends of the axle and repair the leaking wheel seal
- D. Wash the linings in solvent and reinstall them after they dry

62. A gear that jumps out of mesh under load in a manual transmission is most likely caused by what?

- A. Excess free play in the clutch pedal linkage
- B. A glazed clutch disc that slips when the pedal is released
- C. A plugged transmission breather that raises case pressure
- D. Worn clutching teeth, a worn shift fork, or a weak detent

63. A highway tractor on a long gravel haul has low boost, black smoke, and no fault codes. The air filter and turbo are good. What is the best next test?

- A. Pressure test the charge air cooler and piping for leaks with the outlets plugged
- B. Replace the turbocharger because boost loss always originates in the turbo
- C. Check the oil pressure sender because it feeds the boost control circuit
- D. Increase the fuel pump pressure to restore the lost power output

64. One side of a truck sits lower than the other. The air bag on the high side is fine. Which component should be checked first?

- A. The power steering pump drive belt and pulley
- B. The fuel tank selector valve and its return line
- C. The height control valve and its linkage
- D. The brake chamber pushrod and its clevis pin

65. An intermittent fault is traced to corroded terminals in a harness connector exposed to mine dust and washdown. Which repair is best?

- A. Twist the wires together and cover them with a wire nut
- B. Replace the damaged terminals, seal the connector, and apply dielectric grease where specified
- C. Spray contact cleaner into the connector and reassemble it as it was
- D. Wrap the connector tightly in electrical tape to keep the water out

66. A turbocharger on a mine truck fails repeatedly, with bearing discoloration and coked oil in the centre housing. Which practice most likely caused this?

- A. Shutting the engine off immediately after a hard pull with no cool-down idle
- B. Idling for two minutes after every hard pull before shutdown
- C. Using the specified oil and changing it at the recommended interval
- D. Keeping the oil supply line free of kinks and the filter fresh

67. On a tractor-trailer, the supply line pressure drops to zero because a glad hand parts. What should happen at the trailer?

- A. The trailer brakes release so that it can roll freely off the road
- B. The trailer ABS turns off all valves and trailer lights stay lit
- C. The trailer brakes stay released until the driver presses the pedal
- D. The trailer's emergency valve applies the trailer brakes automatically as supply pressure falls

68. What is the correct way to check the fluid level on an electronically controlled Allison automatic transmission?

- A. Engine idling, selector in neutral, fluid at the stated temperature
- B. Check it only by counting the litres drained at each fluid change
- C. Check the dipstick cold with the engine off and the truck parked on a slope
- D. Check it with the engine at full throttle and the selector in drive

69. The air-suspension seat in a haul truck cab slowly sinks over a few minutes after the driver sits down. What is the most likely cause?

- A. A failed air dryer cartridge that is releasing moisture into the cab
- B. A worn drive axle ratio that is altering the road vibration
- C. A weak clutch pedal return spring that is dropping the seat base
- D. A leaking seat air spring or height valve fitting letting the air bleed away

70. An A/C system on a truck has low pressure on both gauges and poor cooling. What is the most likely fault?

- A. A blocked condenser that has raised the discharge pressure
- B. A low refrigerant charge from a leak
- C. A failed blower resistor that is slowing the cab fan
- D. An overcharge of refrigerant that has raised the head pressure

71. Trailer marker lights flicker when the coiled seven-way cable moves. Which fault is most likely?

- A. A worn brake lining that is shorting the lighting circuit
- B. A failed trailer tire pressure sensor sending weak signals
- C. A poor ground connection at the seven-way plug or the trailer
- D. A low air pressure in the supply line to the trailer

72. After installing new leaf springs on a mine tipper, how should the U-bolts be tightened?

- A. With the axle hanging free at full droop, in any order, to specification
- B. With the springs unloaded, tightening each bolt fully in turn
- C. With weight on the springs, in cross pattern, retorqued after service
- D. By hand, and trusting the locknuts to hold them without a torque wrench

73. A tractor loses coolant with no visible external leak, and white smoke appears from the exhaust. The engine has an EGR cooler. What is the most likely cause?

- A. A loose DEF line fitting leaking urea solution into the exhaust
- B. A restricted air filter causing rich fuel combustion
- C. A leaking radiator hose clamp dripping onto the engine undertray
- D. An internal leak in the EGR cooler

74. The safety valve on the wet tank of a mine truck keeps venting even though the compressor should have unloaded. What is the most likely cause?

- A. The governor is not unloading the compressor, so pressure keeps rising
- B. The wheel speed sensors are sending too weak a signal to the module
- C. The air dryer cartridge is saturated, which raises pressure above the cut-out
- D. The parking brake valve is set to the wrong position at idle

75. An automatic transmission's temperature rises during a heavy grade even though the fluid level is correct. What should be checked next?

- A. The engine oil filter for an overdue change at the service interval
- B. The cooler and lines, for restricted flow or poor airflow
- C. The fuel return line for a kinked section near the tank
- D. The windshield washer reservoir for a low fluid level

76. A technician plans to reinstall the torque-to-yield cylinder head bolts removed from an engine on a gravel-haul truck. What is the problem with doing so?

- A. They become magnetized during service, which pulls on the gasket surface
- B. They lose their zinc plating, so they will seize in the block threads
- C. They are hardened only on the thread surface, so reuse leaves the threads weaker
- D. They were stretched into their yield range on first tightening, so reuse gives unreliable clamp load

77. Bubbles are visible in the sight glass of a trailer refrigeration system with the unit running, and cooling is poor. What does this suggest?

- A. Moisture in the diesel fuel feeding the refrigeration unit
- B. A low refrigerant charge, usually from a leak
- C. A normal condition, since bubbles show the system is working well
- D. An overcharged system with a plugged evaporator coil

78. A hydraulic return filter's bypass indicator shows red on a cold morning but resets after the oil warms up. What does this mean?

- A. Cold, thick oil caused a temporary restriction, so recheck when warm
- B. The filter has failed and the system must be flushed immediately
- C. The reservoir is overfilled and needs to be drained to the sight glass
- D. The pump is producing excess pressure and needs to be replaced

79. A 15 A fuse blows immediately whenever a circuit is energized. What is the correct approach?

- A. Replace the fuse with a piece of wire to complete the circuit
- B. Disconnect the battery ground permanently so the fuse lasts
- C. Find the short to ground, then fit a same-rated fuse
- D. Install a 30 A fuse so the circuit can carry the surge

80. A torque rod bushing on a drive axle suspension is replaced. At what position should its fasteners be final torqued?

- A. Anywhere, because the rubber bushing adapts after a few days
- B. With the suspension at normal ride height, so rubber is neutral
- C. With the axle raised and the suspension hanging at full droop
- D. With the springs fully compressed against the bump stops

81. A diesel particulate filter on a log truck shows high restriction, and a service report shows ash load above the limit. Parked regeneration does not help. What is the proper repair?

- A. Run a longer parked regeneration until the ash load disappears
- B. Drill out the filter core to restore the exhaust flow
- C. Clear the fault codes and operate the truck at higher engine speed
- D. Remove it for approved ash cleaning, or replace it

82. With power off, an ohmmeter across CAN-high and CAN-low on a J1939 backbone reads 120 ohms. What does this indicate?

- A. One terminating resistor is missing or the bus is open
- B. Both terminating resistors are present and the bus is shorted
- C. The network voltage is too high for the control modules
- D. The backbone is normal because the expected reading is 120 ohms

83. A spring brake chamber on a trailer has a corroded housing and is leaking around the clamp band. What is the proper repair?

- A. Cage the spring and weld the corroded area to seal the housing
- B. Remove the clamp band and replace only the damaged power spring
- C. Replace the complete chamber assembly without opening the spring section
- D. Drill the housing and pump sealant into the spring section

84. After installing a new clutch in an automated manual transmission, what must the technician do before the truck is put back in service?

- A. Adjust the pedal free play to specification with a feeler gauge
- B. Perform the clutch calibration or touch-point learn procedure with the service software
- C. Fill the transmission with gear oil until it overflows the fill plug
- D. Disconnect the batteries for one hour to reset the module

85. An electric truck in extreme cold shows limited charging and reduced power. What does the battery management system do in this condition?

- A. It increases the charging rate to make up for the lost range
- B. It bypasses the cell temperature sensors so the truck can operate
- C. It limits power while cells are cold, protecting the pack
- D. It shuts the high-voltage system down permanently until a technician resets it

86. A steer axle bounces repeatedly after bumps, and the tires show cupped wear. Which component is most likely worn?

- A. The shock absorbers, which no longer damp wheel motion
- B. The driveshaft centre bearing, which no longer supports the shaft
- C. The air compressor, which no longer fills the tanks quickly
- D. The alternator, which no longer holds its output voltage

87. A scan tool shows a DEF quality fault, and the NOx output has risen. A refractometer reads far below the 32.5 percent urea concentration. What should the technician do?

- A. Add more urea crystals to the tank to bring the concentration back up
- B. Replace the NOx sensors because the DEF reading is unrelated to them
- C. Top up the tank with diesel exhaust fluid from any unmarked container
- D. Drain and flush the DEF tank and lines, then refill with fresh certified fluid

88. Why is an air conditioning system evacuated with a vacuum pump for a period of time before it is charged?

- A. The vacuum increases the refrigerant oil's viscosity for better lubrication
- B. Low pressure lowers water's boiling point so moisture leaves as vapour
- C. The vacuum tests the compressor clutch by making it spin faster
- D. The vacuum compresses the moisture into the desiccant so it is stored there

89. On a truck, every module loses communication after one control module's CAN wiring is damaged. What is the best way to isolate the faulty module?

- A. Unplug modules one at a time while watching the bus
- B. Add extra terminating resistors at several points on the bus
- C. Replace every module on the network until the communication returns
- D. Clear all codes and drive the truck until the fault reappears

90. A line breaks in the primary service circuit of a dual air brake system on a mine truck. What happens?

- A. All service braking is lost immediately since both circuits share one tank
- B. The parking brakes apply at once at any speed to stop the truck
- C. The primary circuit pressure rises to compensate for the leak
- D. The secondary circuit stays charged and provides braking while the low-air warning operates

91. An automated manual transmission will not engage a gear, and the air pressure supplied to its actuators is below the minimum. What is the correct action?

- A. Add transmission fluid to raise the air pressure in the actuators
- B. Bypass the pressure switch so the transmission operates anyway
- C. Build the air pressure, then find the supply leak
- D. Replace the transmission control module because it has failed

92. Which tool and setup correctly measure crankshaft endplay during an overhaul of a heavy-haul engine?

- A. A torque wrench on the vibration damper bolt while counting the degrees of rotation
- B. A micrometer clamped across the front crankshaft journal while the shaft is turned
- C. A feeler gauge slid between the flywheel and the rear of the block with bearing caps loose
- D. A dial indicator on a rigid mount reading shaft movement while the shaft is pried fore and aft

93. Before loading a log trailer, which inspection belongs to proper trailer service?

- A. Checking the bunks, stakes, and securement points for damage and wear
- B. Draining the fuel from the tractor tanks to reduce the weight
- C. Removing the trailer ABS sensors to prevent contamination
- D. Lowering the tire pressure to improve traction on the haul road

94. How should a new high-pressure hydraulic hose be installed to ensure a long life?

- A. Pulled tight between fittings so it cannot chafe on other parts
- B. Without twist, following the lay line, with slack for length change
- C. Looped sharply at the fitting to reduce the overall hose length
- D. Twisted a quarter turn so it is under tension and cannot vibrate

95. A truck idles for hours at a mine gate, and the SCR system stops dosing. No faults are stored. What is the most likely reason?

- A. The NO_x sensor is no longer needed after the first hour of operation
- B. The DEF pump has failed, and a fault code should always be stored for this
- C. Exhaust temperature stays below the threshold needed for urea to decompose, so dosing is held off
- D. The DEF tank has frozen solid, which always stops dosing at any temperature

96. After coupling a log trailer, what is the correct check that the fifth wheel is locked?

- A. Checking that the trailer lights work and the air hoses are connected
- B. Watching that the landing gear is fully raised before moving
- C. A tug test and a visual check of jaws and lever
- D. Confirming that the kingpin is greased and the plate is shiny

97. A windshield on a mine truck has a long crack running across the driver's field of view. What is the correct action?

- A. Fill the crack with clear resin so it cannot be seen
- B. Wait until the crack reaches the edge before replacing it
- C. Drill a small hole at the end of the crack to stop it from spreading
- D. Replace it, since a crack in the swept area impairs vision

98. An engine control module resets intermittently while cranking in cold weather. What test is most useful?

- A. A voltage drop test of its power and grounds
- B. A brake chamber stroke measurement at full application
- C. A compression test on all cylinders at room temperature
- D. A coolant concentration test with a refractometer

99. Trailer brakes on a log truck release slowly after the pedal is let up, and air exhausts sluggishly at the relay valve. What is the most likely fault?

- A. A worn steer axle kingpin bushing that is binding the hub
- B. A contaminated or sticking relay valve with a restricted exhaust port
- C. An overcharged battery bank that is slowing the ECM response
- D. A cracked wiper blade that is altering the air supply

100. When greasing a driveline universal joint, how does the technician know it is fully lubricated?

- A. A thin film of grease shows at only the first cap that was filled
- B. The joint becomes warm to the touch after a few minutes of travel
- C. The grease gun handle becomes difficult to push after three strokes
- D. Fresh grease purges from all four bearing cap seals

101. A tractor loses power at full load going uphill but idles smoothly. Fuel pressure drops under load, and inlet vacuum at the lift pump measures high. What is the most likely cause?

- A. A plugged primary filter or restricted suction line starving the lift pump
- B. A leaking intake manifold gasket that raises the air pressure
- C. A worn turbocharger bearing that reduces the boost on hills
- D. A weak starter solenoid that cannot hold at higher engine speed

102. Why does a modern electronic accelerator pedal assembly use two separate position signals?

- A. The second signal powers the cruise control switch independently
- B. The two signals double the voltage reaching the control module
- C. The module compares them to detect a fault
- D. The extra signal lets the pedal adjust itself as it wears

103. A sliding fifth wheel is moved to a new position for weight distribution on a heavy-haul tractor. What must be confirmed before moving off?

- A. That the air suspension is dumped to its lowest ride height
- B. That both locking pins are fully engaged and the release handle is latched
- C. That the trailer landing gear is partly lowered for safety
- D. That the slider rails have been lubricated with a heavy coat of oil

104. A technician needs to disconnect a high-pressure fuel line on a common rail engine. Which precaution is correct?

- A. Shut off, wait the specified bleed-down time, and wear a face shield
- B. Wrap the fitting in a rag and open it right after switching the engine off
- C. Loosen the line slowly with the engine idling so the pressure drops gradually
- D. Crank the engine with the line loose to purge the remaining fuel quickly

105. An A/C compressor clutch will not engage though it receives battery voltage when jumpered. The refrigerant pressure reads very low. What is the likely reason?

- A. The compressor has a built-in timer that waits for 24 hours
- B. The clutch coil requires 48 V and is not receiving enough power
- C. The low-pressure cutout switch is preventing engagement because refrigerant is low
- D. The engine thermostat is holding the clutch until it opens

106. A cracked nylon air line on a trailer must be repaired. Which method is correct?

- A. Wrap the crack tightly with electrical tape and keep the line in service
- B. Replace the damaged section with matching DOT-approved nylon tubing and proper fittings, cut square
- C. Splice in a piece of hydraulic hose rated for lower pressure
- D. Join the two ends with a hose clamp and a short piece of heater hose

107. A slip yoke has noticeable rotational play when twisted against its shaft, and the truck has a clunk when the driver applies power. What is the repair?

- A. Tighten the yoke retaining nut until the play is eliminated
- B. Add heavier grease to the splines and continue operating the truck
- C. Remove the slip yoke and operate with a fixed yoke instead
- D. Replace the worn slip yoke and shaft, since backlash causes clunk

108. Several unrelated sensors set low-voltage fault codes together. What is the most likely common cause?

- A. A failed fuel pump that is lowering the fuel pressure
- B. A short or fault in the shared five-volt reference circuit
- C. A loose wheel nut that is changing the tire rolling radius
- D. A weak cabin air filter that is restricting the airflow

109. A pintle hook latch on a heavy-haul tractor shows cracking and visible wear. What is the correct action?

- A. Grease the latch more often and continue operating the truck
- B. Add a second safety chain and leave the damaged latch in place
- C. Weld the crack and grind it smooth so that the latch operates
- D. Replace the worn or cracked hook and latch

110. An apprentice on a steep mine ramp starts to work under a truck without placing wheel chocks, saying it saves time. What is the best response from the journey person?

- A. Stop the work, explain the roll-away risk, and have the apprentice demonstrate the chocking procedure
- B. Report the apprentice to the supervisor and let the supervisor decide at some later time
- C. Let the apprentice finish the task and discuss the shortcut at the end of the shift
- D. Place the chocks yourself without comment so the work can continue quickly

111. Air escapes at the glad hand when the trailer supply line is connected. What is the correct repair?

- A. Wrap the connection with tape and trust the air compressor to compensate
- B. Tighten the hose clamp on the glad hand as far as it will go
- C. Replace the worn glad hand seal and clean the faces
- D. Replace the trailer spring brake chambers on the first axle

112. Which standard is commonly used to express the cleanliness level of hydraulic fluid by particle count?

- A. ISO 4406
- B. API CK-4
- C. NLGI Grade 2
- D. SAE J1939

113. A scan tool shows SPN 110 FMI 3 for coolant temperature. With the sensor unplugged and a jumper across the harness terminals, the reading goes to maximum temperature and the code changes to FMI 4. What does this indicate?

- A. The sensor is fine and the thermostat has stuck open
- B. The harness is shorted to power and must be replaced
- C. The control module has failed and needs reprogramming
- D. The harness and module are good; the sensor is faulty

114. A wiper motor on a logging truck runs slowly and draws high current. Power supply and the fuse test normal. What should be checked?

- A. The brake pedal valve for leaks in the air supply to the motor
- B. The motor ground path and the brushes and bearings, for resistance and wear
- C. The driveshaft slip yoke for worn splines and play

D. The DEF tank for contamination or crystals

115. Excess free play is found at an S-cam shaft, and the automatic slack adjuster cannot keep stroke within limits. What is the most likely repair?

- A. Tighten the brake drum bolts to restrain the camshaft movement
- B. Increase the air pressure on the chamber to reduce the stroke
- C. Replace the worn cam bushings and seals, then verify stroke
- D. Install a longer pushrod to take up the extra play in the shaft

116. A driveline vibrates at highway speed, and the rubber in the centre support bearing is cracked and sagging. What is the correct repair?

- A. Increase the tire pressure to damp the vibration
- B. Add balance weights to the rear axle housing to cancel the vibration
- C. Replace the transmission input shaft seal to remove the shaft movement
- D. Replace the centre support bearing and check the shaft alignment and phasing

117. Why must dual tires on a drive axle be matched in diameter?

- A. Matching sizes makes the wheel nut torque easier to measure and record
- B. A smaller tire takes more load and runs cooler than its partner
- C. The larger tire carries more load and drags the smaller one
- D. Mismatching only changes the speedometer reading by a small amount

118. A hybrid truck sets an insulation resistance fault, and the technician suspects moisture on a high-voltage connector. How should it be confirmed?

- A. Isolate the circuit and measure with a rated insulation tester
- B. Spray water on the connector and watch for the fault to return
- C. Replace the traction battery pack immediately without any testing

D. Probe the orange cable with a standard multimeter while the system is energized

119. A compression brake on a heavy-haul truck gives weak retarding. Oil pressure is normal and no codes are stored. What should be checked first?

- A. The transmission oil level, because retarding depends on gear oil volume
- B. The engine brake slave piston lash setting and the solenoid valve operation
- C. The air dryer cartridge, because moisture reduces engine brake power
- D. The alternator output, because the brake needs a high charging voltage

120. A variable reluctance wheel speed sensor is checked with a meter while the wheel is turned by hand. What signal is expected?

- A. A steady five-volt DC signal that does not change with the wheel speed
- B. A fixed resistance of exactly 1 ohm at all times
- C. An AC voltage whose amplitude and frequency rise as the wheel speed increases
- D. A digital square wave whose height is always 12 V

121. A logging truck cab rattles, and a rear cab mount bolt is found loose with a worn bushing. Why is this more than a comfort issue?

- A. Worn bushings increase the steering effort and make the truck harder to drive
- B. They retain the cab and carry impact loads, so wear weakens securement
- C. The mount bolts control engine speed and so affect the fuel economy
- D. Loose mounts only change the sound level in the cab and cause no safety risk

122. A fully loaded log truck must descend a long mountain grade. Which practice best prevents brake fade?

- A. Select a lower gear early and use the engine brake
- B. Increase the trailer brake gain so the trailer does most of the braking

- C. Ride the service brakes lightly the entire way down to keep speed constant
- D. Shift to neutral to coast and apply the brakes hard when speed rises

123. A drained differential's magnetic plug carries a fine grey paste, and a separate piece of chipped metal. What do these indicate?

- A. Both the paste and the chip are normal for any high-mileage axle
- B. The paste indicates damage, but the chip is a harmless casting flake
- C. Neither is significant if the lubricant level is full
- D. Fine paste is normal wear, but a chip means damage

124. How should wheel bearing end play be measured on a trailer hub?

- A. A dial indicator on the hub end, pushing and pulling the hub
- B. With a torque wrench on the spindle nut while the wheel turns
- C. With a tire depth gauge set against the hub cap
- D. With a feeler gauge between the brake drum and the backing plate

125. An engine has burned exhaust valves after valve lash was set tighter than specification. How does too-tight lash cause the damage?

- A. The rocker arm oil supply is blocked, which cools the valve more
- B. The valve spring becomes weaker and stops returning the valve
- C. The valve does not seat fully, so it cannot shed heat
- D. The camshaft lobe wears flat and holds the valve open permanently

126. The windshield fogs on a cold, damp morning at a mine site. What is the best way to clear it quickly?

- A. Select recirculation mode and run the heater on its lowest setting
- B. Turn off the fan so the glass can warm slowly from the sun

- C. Spray washer fluid across the glass and run the wipers continuously
- D. Defrost with the A/C running and fresh air to dry the air

127. A three-wire Hall effect sensor is being tested with a scan tool and meter. Which statement is correct?

- A. It outputs a signal with a resistance that changes with its temperature
- B. It needs supply voltage and ground, and outputs a switching digital signal
- C. It produces voltage only when the sensor is hot enough
- D. It needs no supply voltage and produces its own AC signal

128. A technician pours brake cleaner from a labelled drum into an unmarked spray bottle for convenience. What does WHMIS require for the bottle?

- A. A pictogram only, since signal words are needed only on supplier containers
- B. A workplace label with product identifier, precautions, and SDS reference
- C. No label, since the original drum is labelled and kept in the same shop
- D. A handwritten note with only the date that the product was poured

129. What is the purpose of the red and white retroreflective tape on a trailer's sides and rear?

- A. To reduce the wind drag when the truck is travelling at high speed
- B. To show the trailer's maximum load rating in an emergency
- C. To identify the trailer's brake system type to roadside inspectors
- D. To improve the trailer's conspicuity so other drivers see it, especially at night

130. A hydraulic cylinder with a 125 mm bore receives 17 MPa at the piston. Approximately what extend force does it produce?

- A. About 209 kN
- B. About 104 kN

- C. About 835 kN
- D. About 417 kN

131. An air-powered accessory line on a mine truck develops a large leak, yet the brake tanks stay charged. Which component protects the brake circuits?

- A. A quick-release valve that vents the accessory line to the atmosphere
- B. A tractor protection valve that isolates the accessory circuit from the trailer
- C. A pressure protection valve that closes the accessory circuit at its set pressure
- D. An inversion valve that applies the spring brakes when pressure falls

132. A driver on a dry highway leaves the inter-axle differential lock engaged after a muddy haul road. What is the likely consequence?

- A. Driveline windup and tire scrub, which stress components and wear the tires
- B. Improved fuel economy because both axles are locked together
- C. Lower tire wear because the drive axles share the load equally
- D. No effect, because the lock releases automatically above 10 km/h

133. Rust-coloured streaks radiate from the wheel nuts on a log trailer. What does this indicate and what is the response?

- A. Excess grease on the studs, which only requires wiping the wheel clean
- B. Overtightened nuts, which should be loosened half a turn
- C. Normal weathering, so it can be ignored until the next scheduled service
- D. Loose nuts, so inspect, torque, and retorque after 80 to 160 km

134. A truck at a remote camp cranks well but will not start in cold weather. Fuel pressure is normal and the batteries are strong. What should be tested?

- A. The trailer ABS connector for a corroded pin

- B. The intake air heater circuit, relay, and fuse
- C. The tire pressure monitoring sensors for a low signal reading
- D. The cab heater blower motor for slow operation

135. The headlights on a logging truck dim whenever the electric winch is used. The batteries and alternator test good. What should be checked?

- A. The brake chamber pushrod stroke for correct adjustment
- B. The turbocharger boost control for a sticking actuator
- C. Voltage drop across the winch cables under load
- D. The transmission fluid level with the engine running

Practice Exam 9: Answer Key and Explanations

1. B — A battery that holds 12.6 V at rest is charged, but a heavy load drop below 9.6 V shows high internal resistance from sulfation or damage. It cannot deliver cranking current. Charging longer will not fix that, and the alternator and starter are not part of a bench load test.

2. C — Low compression on all cylinders together with heavy blow-by points to worn rings and liners, because gas escapes past the pistons and pressurizes the crankcase. A restricted breather would raise pressure but not lower compression. A turbo drain or thermostat fault would not reduce compression in every cylinder. Confirm the diagnosis with a cylinder leakage test.

3. D — A closed-valve test checks the maximum pressure the pump can produce. A low reading means the pump is worn or the relief valve is leaking or stuck open. Tie rod ends, a loose wheel nut, and tire balance are mechanical issues that do not affect hydraulic pump pressure. Replace or rebuild the pump if it fails the test.

4. C — The air dryer removes moisture and oil mist before air reaches the tanks. A saturated desiccant cartridge or a failed heater lets water pass, so tanks keep collecting it despite daily draining. A high governor setting, a protection valve, or a slack adjuster cannot create more water in the air supply.

5. D — Free play lets the release bearing clear the pressure plate levers when the pedal is up. With none, the bearing rides on the levers and relieves clamping force, so the disc slips and the bearing wears. Adjusting free play to specification restores full clamp load. Hardening and expansion do not explain it.

6. B — Each leg carries half the load, 1,800 kg, divided by the sine of 60 degrees, which is 0.866, giving about 2,078 kg. Reading 1,800 kg ignores the angle entirely. Using the cosine instead of the sine inflates

the answer, and halving it again undercounts. Flatter angles raise tension sharply, so check the leg angle before every lift.

7. A — Heavy cranking and uneven raising point to a dry or damaged landing gear, so the gearbox lubricant, leg slides, and shaft are inspected for damage. The air dryer, ABS sensor, and brake lining have no connection to the mechanical landing gear. Dry bearings, a bent leg, or a worn gear set are typical findings.

8. D — Trapped air compresses and then releases, so the cylinder moves in jerks instead of smoothly even when pressure and temperature look normal. Bleeding the circuit at the high points and checking for suction leaks cures it. A low relief setting would limit force, and a plugged filter or water would show other symptoms, such as noise or overheating.

9. A — Batteries in the same bank share current according to their internal resistance. A new unit with an old one works harder and the old one lags, which shortens the life of both. Voltage per cell is the same, brands can share an alternator, and older batteries do not give more current.

10. B — Liner protrusion sets how hard the head gasket squeezes the liner flange. Too much stand-out concentrates load, crushes the gasket, and lets coolant or combustion gas escape. Technicians measure it with a dial indicator and correct it by shimming or reseating, since piston stroke and bolt torque do not compensate.

11. C — A heater core needs coolant flowing through it, so a hose that is cold at the cab end shows flow is blocked, either by a plugged core or a control valve stuck closed. The A/C clutch, alternator, and refrigerant charge are not part of the heating circuit. Flushing or replacing the core restores heat.

12. A — Foaming fluid and noise mean the pump is drawing in air, usually from a loose or damaged suction hose or fitting. Air compresses and makes the pump noisy and the steering erratic. Brake fluid, driveshaft yokes, and fuel filters cannot add air to a steering circuit. Bleed the system after tightening the hose clamps.

13. D — A worn compressor lets lubricating oil pass the piston rings into the discharge, and an inlet restriction can pull more oil into the cylinder. Oily residue in the tanks is the result. Valves venting, weak parking springs, or hot drums do not introduce engine oil into the supply. Check the compressor discharge line for carbon buildup.

14. B — A pedal that sinks under steady foot pressure means fluid is bypassing the piston inside the master cylinder, even though nothing leaks outside. A leaking slave cylinder would leave visible fluid, and a glazed disc or seized pilot bearing affects engagement or noise, not pedal drift. Rebuild or replace the master cylinder and bleed the system.

15. C — A tilting cab has a large mass, so loose items must be removed, the truck secured, the area cleared, and the prop or mechanical lock used before anyone works beneath it. Hydraulic pressure alone must never hold a tilted cab, and standing underneath during a lift is dangerous. Always verify the lock is seated before working underneath.

- 16. A** — Electronic modules continue communicating and powering down for many minutes after key-off. Measuring too early records that normal activity, not the true parasitic load. The meter should be in series with the circuit, and the technician should wait until the modules sleep before judging the draw. Allow the specified sleep time, often twenty minutes or more.
- 17. C** — At idle the pump delivers little flow, so worn bearings with extra clearance let oil escape faster than the pump supplies it and pressure sags. At higher speed the pump overcomes the leakage. A stuck relief valve or plugged filter would show the problem at all speeds or at high demand.
- 18. B** — High-voltage cables carry hundreds of volts at high current, and field splices cannot guarantee the insulation, strength, or shielding of the original. The system must be isolated and verified dead, and the complete cable assembly replaced with the manufacturer's part. Tape, solder, or butt connectors risk arcing, heat, and shock, so none is acceptable.
- 19. D** — Free play at the wheel can come from any joint in the steering path. Loose linkage ends, worn kingpins, or a loose gear mount often cause it, and adjusting the gear first can hide the real wear or cause binding. Brakes, transmission mounts, and belts are not part of the steering path.
- 20. D** — Leaks show best when the circuit is pressurized in the state being tested, such as with the service brakes applied. Chocking and engine off keep the truck safe, and soapy solution bubbles at the leak point. Solvent, listening only at drains, or looking for fluid will not reliably find air leaks.
- 21. C** — Total pedal travel is split between free play and release stroke. Too much free play, or air in a hydraulic system, uses up travel so the clutch does not fully disengage and the input shaft keeps turning, causing grinding. Adjusting the linkage or bleeding the system restores release. Check free play against the specification first.
- 22. A** — The alternator is producing 14.1 V, but only 12.5 V arrives at the batteries, so 1.6 V is lost in the wiring, far above the roughly 0.5 V guideline. A corroded or loose connection or damaged cable is responsible. The regulator is doing its job, and the starter and relay are not in this path.
- 23. B** — Sodium, potassium, and boron come from coolant corrosion inhibitors, and glycol confirms it. Together they show coolant entering the oil. Fuel dilution appears as lower viscosity and flash point, dirt as silicon, and soot as an increase in carbon, so none of those fit this combination. An oil cooler or head gasket test then locates the leak.
- 24. D** — A raised body is stored gravitational energy, so it must be mechanically supported by the rated prop before any line is opened. Valve check seats can leak or fail, and cracking a fitting to test pressure risks a sudden drop or an injection injury. Wheel chocks control vehicle roll, not the raised box.
- 25. C** — A trailer ABS module needs steady power and ground, and a poor connection at the plug or module is a common cause of a lamp after hookup. Tread depth, engine oil, and fifth wheel wear are not part of the ABS circuit. Check connector pins for corrosion and wire continuity before replacing the trailer ABS module.
- 26. A** — A worn piston seal lets fluid bypass the piston instead of pushing it. Blocking one port and pressurizing the other shows leakage by flow from the blocked port. Replacing pumps, topping up fluid,

and raising relief settings guess instead of testing, and a higher relief setting is unsafe. Always follow the manufacturer's hydraulic test procedure.

27. D — Toe is the difference between the front and rear distances between the tire centrelines, measured at spindle height on a level surface with the wheels pointing straight and the truck rolled to settle the linkage. Measuring at other heights or with the axle raised gives false numbers. Recheck the reading after rolling the truck again.

28. B — A good alternator's rectifier converts AC to DC, leaving very little AC ripple, normally well under about 0.5 V. A reading above that points to an open or shorted diode. A slipping belt reduces output, and a weak cell would not create AC voltage. Replace the alternator or its rectifier assembly once the ripple is confirmed.

29. A — A Type 30 chamber has a maximum applied stroke of 51 mm. At 56 mm the brake is out of adjustment, so braking power is reduced. With automatic slack adjusters, the cause, such as a worn camshaft bushing or a failed adjuster, must be found instead of just resetting it. A longer stroke is not too short.

30. C — Oil-contaminated friction material cannot be cleaned and will chatter again. The disc must be replaced, the source of the leak, often the rear main seal or input shaft seal, repaired, and the flywheel resurfaced or replaced. Grease and free play adjustments do not address the contamination. Check the clutch housing for oil traces before reassembly.

31. B — A rising level, thin oil, and a fuel smell point to diesel dilution, often from a leaking injector seal or lift pump diaphragm. Coolant would turn the oil milky, condensation seldom raises the level this much, and over-filling would not thin the oil or add a diesel smell. Find and fix the leak, then change the oil.

32. D — Blend doors mix hot and cold air, and an actuator or gear that has failed leaves the door stuck, often with a clicking noise as the motor tries to move it. A clogged filter reduces airflow, but would not stop temperature changes. The gasket and belt do not match the symptoms.

33. C — Voltage in the 15.8 V range means the alternator is overcharging, which heats the batteries and boils off electrolyte. The regulator, or the sense wire it relies on, is not limiting voltage. A slipping belt would cause undercharging, and coolant level and the starter solenoid do not control charging voltage.

34. A — Positive camber tilts the top of the tire outward and moves load onto its outer shoulder, wearing it faster. This condition is often caused by worn kingpins or a bent axle. Caster and setback do not produce one-sided shoulder wear, and correct toe with proper inflation would not wear it that way.

35. B — The overheating appears only under heavy heat load, and every tested component is healthy, so the radiator's ability to reject heat is suspect. Mud and dust packed in the fins block airflow when demand is high. A stuck-open thermostat would overcool, and a low level or bad cap was already ruled out.

36. C — Erratic signals at low speed, when the signal is weakest, often come from a damaged or dirty tone ring or a sensor loose in its clip so the gap changes. Wiring tested fine, so mechanical inspection is next. A pedal valve, spring brake chamber, or governor would not make the sensor signal erratic.

37. D — Range shifts are air-actuated, so a failure that affects only the range function points to the air supply or valve circuit for the range cylinder. The regulator, filter, and lines are checked first. The clutch brake, engine oil, and axle breather are unrelated to range shifting. A leaking regulator or plugged filter is the usual finding.

38. B — A voltage drop above about 0.5 V on a ground path means resistance is eating the voltage the starter needs. A corroded or loose ground cable or connection should be cleaned or replaced. Armature faults or the ring gear would not create drop across the ground path. Retest the drop after cleaning the connections.

39. A — Cabs have drain holes and floor plugs designed to carry away water that enters the door frames. When these are plugged or missing, water collects and enters the cab. Power steering caps, transmission breathers, and exhaust shields do not route water into the interior. Clear the drain holes with a soft wire and replace any missing floor plugs.

40. A — Feather wear, where tread ribs are smooth on one side and sharp on the other, is the signature of toe error, because the tire is scrubbed sideways as it rolls forward. Under-inflation wears the shoulders, a drum causes braking issues, and a loose bearing causes cupping or play. Correct the toe setting and rotate or replace the tires.

41. D — System pressure raises the coolant boiling point, so a cap with a lower rating vents earlier and lets the coolant boil and escape. The result is coolant loss and overheating. Freeze protection depends on concentration, the thermostat opens on temperature, and pump flow is unrelated to cap pressure. Always fit a cap matching the specified rating.

42. C — Welding current can induce damaging voltage spikes in modules, so isolate the batteries and unplug the controllers per the manufacturer. A ground clamp near the weld keeps current out of bearings, bushings, and wiring. Leaving power on or bridging terminals only creates a path for current to reach sensitive electronics.

43. B — Scrub wear and a trailer that pulls to one side show that the axles are not tracking straight behind the kingpin, a thrust angle or alignment problem. An alignment measurement identifies which axle must be adjusted. Air supply, lamps, and landing gear lubrication do not cause this. Measure the thrust angles before adjusting anything.

44. A — When the relief valve opens, pump flow goes to tank through a restriction, dropping from high pressure to near zero and turning that energy into heat. Frequent operation overheats the fluid. The valve is not a cooler, and reservoir volume or cold thickening do not explain it. Fix the cause of the overload, such as a sticking valve.

45. D — Air leaking from the chamber with the brake applied means the service diaphragm has failed, so it cannot hold pressure. The fix is replacing it, normally in pairs so braking stays balanced. A locknut,

clevis lubricant, or a drum has no connection to air leaking out of the chamber. Seal the new diaphragm properly on installation.

46. C — A transmission is filled to the bottom edge of the fill opening, and the reading is accurate only when the truck is level so that the oil lies flat. Slopes and engine speed alter the apparent level, and the drain plug is not a level reference. Fill until a small amount of oil begins to run out.

47. D — With good power supply and an engine that rotates freely, slow cranking points to the starter, where worn bushings or internal drag reduce speed and raise current draw. Fuel filters do not affect cranking speed, and an overfilled crankcase or low coolant would make the engine harder to turn by hand.

48. B — A viscous fan drive should freewheel at a low speed when cold and lock up only as the temperature-sensing element heats. A fan that roars at full speed from a cold start has a drive stuck in the engaged condition. It wastes power and should be replaced. The thermostat and pump do not control it.

49. B — High pressures on both sides with poor cooling indicate heat is not leaving the system, from a blocked condenser, failed fan, air in the system, or too much refrigerant. A low charge gives low readings, a frozen evaporator lowers the low-side reading, and a heater core leak is not on the A/C side.

50. C — Heat-treated rails can lose strength from welding heat or be weakened by holes in the flanges. Manufacturers publish repair procedures, often with required reinforcement and limits on welding and drilling. Welding without that guidance or adding holes can make the crack worse. Check the manufacturer's service bulletins for approved reinforcement kits and fastener torques.

51. A — A service disconnect, or manual service plug, physically splits the high-voltage circuit so that technicians can work on the system with the pack isolated. It does not charge the low-voltage battery, limit charging current, or store codes. After it is removed and locked out, technicians must still wait and verify zero volts before touching components.

52. B — Blue discolouration and hard spots show metal that has been overheated and hardened, so the structure is compromised and prone to cracking. Machining may not reach below the hardened layer, and polishing or reversing a drum is not a fix. The drum should be replaced. Replace drums in axle pairs to keep braking balanced.

53. D — A hydraulic retarder produces braking by churning fluid between a rotor and stator, so retarding torque depends on how much fluid fills the cavity. Low level means less fluid in the cavity and weaker braking. Level, leaks, and cooler flow should be checked together. Also look for leaks at the retarder housing and cooler lines.

54. A — A relay coil is a winding with a measurable resistance, typically tens to hundreds of ohms. An infinite reading means the winding is open and cannot create the magnetic field that closes the contacts. Replacing the relay is the repair. Contacts and diodes are separate matters. Confirm with a good relay swapped in before ordering parts.

- 55. C** — A red indicator means intake restriction exceeds the limit, which starves the engine of air and can cause smoke and power loss. The element should be serviced or replaced per the maker's procedure. Tapping damages the media, and running with no filter lets abrasive dust wear liners and rings quickly.
- 56. C** — When diagonals measured between matching points are unequal, the frame has shifted out of square, usually from impact or overload. It affects axle alignment and tire wear. Equal diagonals show a square frame. Variation beyond tolerance is not normal and will not correct under load. Straightening requires specialist equipment and measurements against manufacturer data.
- 57. D** — Current equals power divided by voltage, so 150 W divided by 24 V is 6.25 A. Dividing by 12 V gives the 12.5 A error, and dividing voltage by power gives 0.16 A. Knowing the real current lets a technician choose the correct fuse and wire size for the circuit.
- 58. B** — FA-4 oils are formulated with lower high-temperature, high-shear viscosity for fuel economy and are limited to engines whose maker specifies them. Using one in an engine that calls for CK-4 can reduce bearing film protection. CK-4 is backward compatible; FA-4 is not a universal upgrade or a gear oil. Check the engine data plate or owner manual first.
- 59. A** — A dirty condenser cannot reject heat, so discharge pressure climbs. Cleaning the coil restores heat transfer. Adding refrigerant raises pressure further, a compressor is not the cause, and bypassing the cutout defeats a protection device. Check the condenser fan operation and fin condition, then recheck high-side and low-side pressures against the specification.
- 60. B** — With the valve in hold, the cylinder should stay put. Drift means oil is escaping through the piston seals or past a leaking control or counterbalance valve. Breathers, driveshaft yokes, and alternator belts are unrelated to holding a hydraulic load. Isolate the cylinder from the valve and watch for drift to separate the two causes.
- 61. C** — Oil in friction material cannot be cleaned out, and contaminated linings grab unpredictably. Both ends of the axle must be relined to keep braking balanced, and the cause, a leaking wheel seal, must be corrected. Solvent soaks deeper, partial replacement unbalances braking, and burning oil off is unsafe. Inspect the opposite wheel seal while the axle is apart.
- 62. D** — Gear jump-out under load means the gear is being pushed out of engagement, and wear on the clutching teeth, the shift fork, or the detent mechanism lets it slide. Clutch glazing, a plugged breather, or pedal play do not change the engagement of the gears. Inspect the fork pads and the shift rail detent spring closely.
- 63. A** — Leaks in the charge air cooler, hoses, or clamps bleed boost before it reaches the intake, causing low boost, rich combustion, and black smoke without any code. A regulated pressure test with the outlets plugged finds them. Replacing a good turbo or raising fuel pressure treats symptoms and could damage the engine.
- 64. C** — Air suspensions are levelled by height control valves, which add or release air depending on linkage position. A misadjusted linkage or a failed valve leaves one side at the wrong height. Brake,

steering belt, and fuel selector components do not control ride height. Measure the ride height and adjust the linkage to the manufacturer's specification.

65. B — Corrosion has damaged the terminals, so cleaning gives only a temporary fix. Replacing them, using sealed connector bodies, and applying the right grease restores a durable, weatherproof connection. Tape traps moisture, and wire nuts are not suitable for vehicle harnesses subject to vibration. Crimp new terminals with the correct tool and use adhesive-lined heat shrink.

66. A — A hot turbo shut down suddenly loses oil flow while the housing still holds heat, so oil trapped around the bearings bakes into coke. Repeated hot shutdowns destroy bearings. A cool-down idle, correct oil, and clean supply lines are the standard protections against this failure. Inspect the oil supply line for blockage before fitting the new turbo.

67. D — The red supply line holds the trailer spring brakes off and charges its tanks. When supply pressure is lost, the relay emergency valve exhausts to apply the trailer brakes, a safety feature intended to stop a breakaway. The brakes do not wait for the pedal or release. This is the principle behind the tractor protection valve.

68. A — Fluid level in an automatic changes with temperature and pump operation, so the manufacturer specifies a standard condition, such as engine idling in neutral at a stated temperature, using the dipstick or electronic check. Other conditions give a misleading reading. Use the selector in neutral with engine idling and check again if the fluid is outside the hot band.

69. D — A seat that sags after loading has a slow air leak, most often from the air spring, a fitting, or the height control valve. Soap solution on the connections locates it. Air dryers, axle ratios, and the clutch pedal spring are not part of the seat's air circuit. Replace the leaking seat air spring if needed.

70. B — Low readings on both sides, with weak cooling, show too little refrigerant in the circuit. The leak must be found and repaired before recharging. Overcharge and a blocked condenser produce high pressure, and a blower resistor affects airflow without changing the refrigerant pressures. After the repair, evacuate the system and charge it by weight to specification.

71. C — Intermittent light behaviour with cable movement points to a loose or corroded connection, and a high-resistance ground path is the most common. A voltage drop test on the ground confirms it. Tire sensors, air pressure, and lining wear are not part of the lighting circuit. Clean the plug pins and replace damaged ground wiring.

72. C — Tightening U-bolts with weight on the springs seats the spring pack and axle seat as they will operate. A cross pattern clamps evenly. Parts settle, so retorquing after initial service is standard. Tightening at full droop or by feel gives uneven clamp and loose bolts. Skipping the retorque is a common cause of broken U-bolts.

73. D — An EGR cooler passes hot exhaust past coolant, and a cracked core leaks coolant into the exhaust. This produces coolant loss without drips and white smoke from vaporized coolant. A hose leak would be visible, a DEF line leak would not consume coolant, and a restricted filter produces black smoke.

74. A — A safety valve opens only above normal operating pressure, around 1,035 kPa. If it vents repeatedly, the compressor is not unloading at governor cut-out. A stuck governor or unloader is the likely fault. A saturated dryer, parking valve position, or wheel speed signal does not raise the system pressure. Replace the governor and test the unloader operation.

75. B — Heavy work generates heat that the transmission cooler must remove. With correct fluid level, restricted flow, a blocked cooler, or poor airflow is the likely cause. Engine oil filters, fuel return lines, and washer fluid have nothing to do with transmission fluid temperature. Inspect the cooler fins, hoses, and fittings for debris and kinks.

76. D — A torque-to-yield bolt is tightened beyond its elastic limit by design, permanently lengthening it. A second tightening cannot reliably reproduce the clamp load and the bolt can fracture, risking a blown head gasket. The manufacturer's procedure calls for new bolts and the stated torque and angle sequence. Always replace them as a complete set.

77. B — A steady flow of liquid refrigerant should fill the sight glass. Persistent bubbles indicate vapour in the liquid line, so the charge is low, typically because of a leak. The leak must be located and repaired before the system is recharged. A leak test with electronic detection or dye is the usual next step.

78. A — Cold oil is more viscous and can trip a bypass indicator because it flows less easily through the element. If the indicator clears at operating temperature, the filter is fine. A red indicator at temperature means it is restricted and should be changed. Always recheck the indicator once the oil is at operating temperature.

79. C — A fuse that blows at once indicates a direct short to ground or a failed component. A higher rating or bypass wire defeats the protection and risks wiring damage or fire. The fault must be located by isolating sections or using a resistance check, then repaired before fitting the correct fuse.

80. B — Rubber bushings should be torqued with the suspension at its normal ride height so the rubber is neutral, not twisted. Torquing at droop or compression preloads the rubber and shortens its life, causing axle wander and tire wear. Retorque the fasteners to specification and inspect the mounting brackets for cracks or elongated holes too.

81. D — Regeneration burns off soot but cannot remove ash, which is non-combustible residue from oil additives. Once ash load is high, the filter must be cleaned by an approved process or replaced. Drilling a filter destroys its function and violates emissions law, and clearing codes does nothing to the blockage. Ask the maker for the cleaning procedure.

82. A — A healthy J1939 bus has a 120 ohm resistor at each end, which in parallel read about 60 ohms. A reading near 120 ohms means only one resistor is being seen, so one is missing or a break isolates part of the bus. A short would give a much lower reading.

83. C — The power spring in a spring brake holds enormous stored energy, and opening a chamber can cause severe injury or death. Manufacturers state it must never be disassembled, so a damaged unit is replaced as a complete assembly. Sealing, welding, or removing the band does not make a safe repair.

84. B — An automated manual transmission has no pedal. Its control module learns the clutch engagement, or touch point, and a new clutch changes it. Without calibration, engagement will be rough or fail. The procedure is run with the manufacturer's service tool, not by a pedal adjustment or battery reset. Calibrate it before any road test.

85. C — Cold lithium cells cannot accept high current without damage, so the battery management system restricts power and may use heaters to bring the pack to a safe temperature. It does not shut down permanently, speed up charging, or ignore its sensors. Preconditioning or plugging in before departure helps the pack reach the right temperature sooner.

86. A — Shock absorbers control the oscillation of the axle after a bump. When they wear or leak, the wheel keeps bouncing and the tire hits the road unevenly, producing cupping. The compressor, alternator, and centre bearing have no bearing on wheel bounce. Replace shock absorbers in axle pairs and rotate or replace cupped tires afterward.

87. D — A low refractive reading means the fluid is diluted or contaminated and cannot reduce NOx properly. The system must be drained, flushed, and refilled with certified DEF. Mixing in crystals or unknown fluid gives uncertain concentration and may foul the injector, and the sensors are reporting a real condition. Verify the concentration again after refilling.

88. B — Moisture in a system freezes at the expansion device or forms acids. Pulling a deep vacuum lowers the boiling point of water enough that it vaporizes and is drawn out. It does not compress moisture into the desiccant, change oil viscosity, or spin the clutch. Evacuate for the time the manufacturer specifies, usually at least thirty minutes.

89. A — A shorted node can pull the entire bus down, so unplugging modules one at a time while monitoring resistance or voltage reveals which one clears the problem. Replacing everything is wasteful, clearing codes hides evidence, and extra resistors break the bus termination. Replace the module that restores normal bus resistance and voltage when disconnected.

90. D — Dual systems separate the primary and secondary circuits with protection and check valves, so one failing leaves the other pressurized. The driver loses part of the braking, gets a low-air warning, and can still stop. Both circuits do not share a tank, and pressure does not rise in a leaking circuit.

91. C — Automated transmissions need air pressure above a set value to operate their shift and clutch actuators, and the module will not command a gear without it. Building pressure and finding the supply leak is the repair. Replacing modules, adding fluid, or bypassing switches does not fix low air. Recheck the air pressure after repairs.

92. D — Endplay is axial movement, so a dial indicator with its plunger on the shaft end or a counterweight, mounted on something rigid, reads it directly while the shaft is moved fore and aft. A micrometer measures diameter and a torque wrench measures turning resistance. Neither reveals axial clearance, and a feeler gauge with loose caps is unreliable.

93. A — Log trailers rely on bunks, stakes, and tie-down points to hold the load, so damage or wear there is a serious safety defect. Inspecting them before loading is part of trailer service. Draining fuel,

removing sensors, and reducing tire pressure add risk rather than reduce it. Repair or replace damaged bunks before any load goes on.

94. B — A twisted hose weakens under pressure and fails early, and a hose that is tight cannot accommodate the small length change that pressure causes. The lay line on the hose shows twist, and routing should avoid sharp bends. A straight, slack-correct installation lasts longer. Check the finished installation by pressurizing the system and looking for movement.

95. C — SCR dosing is inhibited until the catalyst and exhaust are warm enough for urea to convert to ammonia without forming deposits. Prolonged idle keeps temperatures low, so the control module holds back dosing without setting a fault. A failed pump would set a code, and the sensor remains in use.

96. C — A fifth wheel can appear coupled without being properly locked. A gentle tug test with the trailer brakes applied, together with a visual check of the jaws around the kingpin shank and a latched lever, confirms the lock. Lights, landing gear, and grease do not prove it is secure. Repeat the tug test every time the trailer is coupled.

97. D — Cracks in the swept area reduce visibility and weaken the glass, and inspection standards treat them as defects. The accepted repair is replacement. Drilling a hole, resin fill, or waiting does not restore the structure or the driver's view. Fit a replacement that meets the vehicle manufacturer's specification and use a certified, qualified installer.

98. A — Cranking draws heavy current and can sag system voltage, so a weak connection in the module's feed or ground makes it reset. Voltage drop tests under load reveal poor connections. Compression, coolant strength, and brake stroke have no bearing on a module restarting. Repair the high-resistance connection and then confirm the module no longer resets.

99. B — Slow release means air is not leaving the chambers promptly. A relay valve with contamination, a sticking piston, or a restricted exhaust port holds pressure. Cleaning or replacing the valve restores release. Steer axle bushings, battery condition, and wiper blades do not govern brake exhaust. Check the relay valve exhaust port for ice and dirt.

100. D — Greaseable universal joints are filled until clean grease comes out of every cap seal, showing the grease has reached all four bearings and pushed out the old grease. Stopping at hand resistance or after a fixed number of strokes can leave bearings dry. Greasing every cap properly prevents premature needle bearing failure and driveline vibration.

101. A — High vacuum at the lift pump inlet means the suction side is restricted, so the pump cannot supply enough fuel at high demand. A plugged filter or pick-up screen is the usual cause, which fits power loss under load with normal idle. Turbo, starter, and manifold faults would not raise fuel-side vacuum.

102. C — Redundant tracks that move in opposite or different ratios let the module check that they agree, which is called a plausibility check. If they do not, a fault is set and power is limited. The signals do not add voltage, power the cruise control, or compensate for wear. This improves safety for the driver.

103. B — A sliding fifth wheel is held in position by locking pins, and a partly engaged pin can let the unit slide under braking, with disastrous results. Both pins must be seated and the release handle latched before the truck moves. Oil, suspension height, and landing gear do not secure the slider.

104. A — Common rail systems hold extreme pressure that can remain after shutdown and can penetrate skin. The manufacturer specifies a wait time and procedure, and eye and face protection is required. Opening a line with the engine running or cranking is dangerous, and a rag does not contain a high-pressure jet.

105. C — A low-pressure switch prevents the compressor from running without enough refrigerant, which would starve it of oil. The clutch works when jumpered, so the coil is good. The cause is the low charge, which must be found and fixed. There is no built-in 24-hour timer, and the thermostat does not control the clutch.

106. B — Air brake tubing is a safety component, so repairs must use DOT-approved tubing and compatible fittings, cut square and fully seated. Clamps and tape cannot hold system pressure reliably, and a hose that is not rated for air brake service may fail. Replace the section, not patch it. Install new clips if the fittings were disturbed.

107. D — Worn splines have excess backlash, allowing the shaft to shift when torque reverses, which causes clunks and vibration that damage other components. The worn parts must be replaced. Heavier grease or an extra tightened nut cannot restore spline fit, and a fixed yoke would remove needed length change. Check the mating shaft end for wear too.

108. B — Many sensors share one regulated five-volt reference from the module. A short to ground or a failed supply pulls all of them down together, setting multiple codes at once. Unplugging sensors one at a time can find the culprit. Pump, wheel, and filter faults would not affect sensor reference voltage.

109. D — Pintle hooks carry the full towing load and a cracked or worn latch can release under shock. Welding changes the metal's strength and chains do not replace a proper coupling. The safe repair is to replace the worn or cracked components. Inspect the mounting bolts and the drawbar eye for cracks at the same time.

110. A — Safety-critical shortcuts must be stopped immediately, because a roll-away on a grade can kill. Good mentoring then explains the hazard and has the apprentice perform the correct steps to build the habit. Waiting, silently fixing it, or escalating without coaching all leave the apprentice unprepared the next time. Document the incident in the apprentice's record.

111. C — Glad hands seal with rubber gaskets, and a worn or dirty seal leaks. Replacing the seal and cleaning the faces restores the connection. Tape is not a seal for brake lines, over-tightening can damage the hose, and the chambers are not the cause. Confirm the repair with a soap test once the system is charged.

112. A — ISO 4406 gives cleanliness codes that rate the number of particles in set sizes per millilitre of fluid. SAE J1939 is a vehicle data network standard, API CK-4 classifies engine oil, and NLGI Grade 2

describes grease consistency. Only the first relates to hydraulic fluid contamination. Hydraulic systems need regular fluid sampling to maintain this cleanliness.

113. D — FMI 3 means voltage above normal or an open circuit. Jumpering the harness should drive the signal low if the wiring and module work. Seeing the expected change to FMI 4 proves they work, so the open circuit lies in the sensor. A shorted harness or bad module would not respond that way.

114. B — Slow running with high current suggests mechanical drag or electrical resistance in the motor, such as worn brushes, binding bearings, or a poor ground. These are what a technician checks next. Air valves, driveline splines, and the DEF system are unrelated to a wiper motor. Replace the worn brushes or the motor assembly when needed.

115. C — Worn cam bushings let the shaft shift off its axis, so the adjuster's work is lost in slop and stroke grows. New bushings and seals restore alignment. A longer pushrod, tighter drum bolts, or more pressure treat nothing and can create additional problems. Always lubricate the new bushings and check the camshaft for wear.

116. D — A failing centre support bearing lets the shaft sag and whip, causing speed-related vibration. It should be replaced, with the alignment and phasing verified afterward. Axle weights, an input seal, and tire pressure do not correct a shaft supported by a failed bearing. Check the driveshaft angles for wear on the other joints as well.

117. C — Duals share load and rotate together, so a size difference makes the larger tire carry more weight and the smaller one is dragged along the road. This causes heat, uneven wear, and early failure. It is not a speedometer issue, and the smaller tire does not run cooler. Measure each tire's rolling circumference when matching them.

118. A — Insulation faults are measured with an insulation tester, or megohmmeter, on a de-energized, isolated circuit following the manufacturer's procedure. Probing energized cables is hazardous, spraying water is unsafe, and replacing a costly battery pack without testing is not good practice. Confirm the isolation before starting, and wear insulated gloves while connecting the tester to the circuit.

119. B — A compression brake opens the exhaust valves near top dead centre, and its strength depends on correct lash and working solenoids. If lash is wrong or a solenoid sticks, the valve does not open fully. Air dryers, alternator output, and transmission oil have no direct role in how the brake releases compression.

120. C — A variable reluctance sensor generates its own AC signal as the tone ring teeth pass, and both amplitude and frequency rise with speed. It needs no supply voltage. A steady DC level, fixed resistance, or 12 V square wave describes other circuit types, not this sensor. This distinguishes it from sensors that need external power.

121. B — Cab mounts and bolts hold the cab to the frame and carry crash and rollover loads. A loose bolt and worn bushing weaken that attachment, so they must be replaced and torqued to specification. They do not affect steering effort or engine speed. Inspect the frame brackets and mounting holes for cracks or elongation.

122. A — Service brakes convert speed to heat, and long, continuous use overheats drums so friction falls. Choosing a lower gear before the grade and relying on the engine brake keeps the service brakes cool for emergencies. Dragging the brakes, coasting in neutral, and overloading the trailer brakes all invite fade. Plan the gear before reaching the crest.

123. D — A fine paste on a magnet is normal wear from gears and bearings. Larger chips or chunks mean something has broken or spalled, so the carrier must be opened and inspected to find the source. Treating a chip as normal risks a failure on the haul road. Send a sample for analysis if the chips look unusual.

124. A — End play is axial movement of the hub, so a dial indicator reading at the hub or spindle end while the hub is pushed and pulled measures it directly. A feeler gauge, torque wrench, or depth gauge does not read this movement and could mislead the adjustment. Compare the reading with the manufacturer's specification.

125. C — Valves shed most of their heat through the seat while closed. Lash set too tight, plus expansion with temperature, keeps the valve slightly open, so hot gas flows past and heat cannot escape. The valve face erodes and burns. Setting lash with a feeler gauge at the correct engine position prevents this.

126. D — Fog forms when moist air meets cold glass. Running the compressor dries the incoming air and fresh air avoids recirculating the moisture from the cab. Recirculation traps the humidity, turning the fan off stops airflow, and washer fluid does not remove interior moisture. Heat the cab slightly to help evaporate moisture from the glass.

127. B — A Hall effect sensor contains active electronics, so it needs a reference voltage and ground, and it switches an output on and off as a magnet or tooth passes. Self-generating AC belongs to magnetic pickup sensors, and temperature-dependent resistance describes thermistors. The scan tool voltage and the waveform on a scope confirm proper operation.

128. B — Under WHMIS 2015, a hazardous product moved into a workplace container needs a workplace label identifying the product, giving precautions, and pointing to the SDS. A date alone or an unlabelled bottle leaves the next worker without hazard information, and a pictogram alone is not enough. The label should be updated if the contents change.

129. D — Retroreflective tape in a red and white pattern outlines the trailer's shape, making it visible in headlights from the side and rear. This is a safety requirement under the vehicle lighting standard. It does not affect drag, show load ratings, or identify brake type. Keep the tape clean and replace sections that are peeling or faded.

130. A — Force is pressure times area. The area of a 125 mm bore is about 0.01227 square metres, and 17 MPa times that area is roughly 209 kN. Using the radius as though it were the diameter gives 104 kN, doubling the area gives 417 kN, and squaring the diameter without the factor gives 835 kN.

131. C — A pressure protection valve opens only when system pressure is above its set value and closes when pressure falls, so a leaking accessory circuit cannot drain the brake tanks. Tractor protection

valves guard the trailer, inversion valves manage the spring brake circuit, and quick-release valves only speed exhaust. Test by observing the tank pressure while draining the accessory circuit.

132. A — A locked inter-axle differential forces the drive axles to turn at the same speed, which suits low traction but causes windup and scrub on a dry surface where the axles need slightly different speeds. The lock should be disengaged when traction improves. Unlock it as soon as the truck is back on firm, dry pavement.

133. D — Streaks around the nuts show fretting from movement, which means the nuts have loosened. The wheel, studs, and nut seats should be checked for damage, then the nuts torqued to specification in sequence and retorqued after 80 to 160 km. Ignoring it risks losing the wheel. Wipe off the streaks only after inspection and torquing.

134. B — Diesels rely on cold-start aids such as intake heaters to raise the air temperature enough for ignition. If the heater element, relay, or fuse fails, the engine cranks but will not fire in cold weather. Tire sensors, cab blower, and trailer ABS circuits have nothing to do with starting. Test with a meter before replacing parts.

135. C — A winch draws heavy current, so a poor cable or ground connection causes voltage to sag and dim the lights on the shared circuit. A voltage drop test under load locates the resistance. Brake stroke, boost control, and transmission fluid level do not influence electrical sag. Clean and tighten the high-current connections and retest afterward.