

# PRACTICE EXAM 7

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1. The compressor on a transit bus continues to spin with the engine even after the system reaches full pressure. During this unloaded state, the compressor:

- A. Keeps turning but stops building pressure
- B. Disengages from the engine drive entirely
- C. Reverses to draw air back from the reservoirs
- D. Builds pressure faster than when loaded

2. The governor signals the compressor to load again at which pressure point?

- A. Cut-out, the higher setting
- B. The safety relief pressure
- C. The low-pressure warning point
- D. Cut-in, the lower setting

3. A governor's signal line to the compressor unloader becomes plugged. The most likely result is that the compressor:

- A. Unloads too early and never reaches cut-out
- B. Keeps building past cut-out because it is never told to unload
- C. Purges the air dryer continuously
- D. Disengages from the engine

4. The air dryer's purge cycle is triggered by the same event that:

- A. Applies the service brakes

- B. Cages the spring brakes
- C. Opens the low-pressure warning switch
- D. Causes the compressor to unload at cut-out

5. A worn compressor passing oil downstream most directly threatens which component first?

- A. The wheel speed sensor
- B. The brake drum
- C. The steering gear
- D. The air dryer desiccant

6. Why is the first reservoir downstream of the air dryer called the "wet" tank?

- A. Residual moisture and oil collect there first
- B. It holds brake fluid rather than air
- C. It is sprayed with coolant for cooling
- D. It stores water intentionally for the system

7. A check valve between the supply reservoir and the primary reservoir fails open. The most significant risk is that:

- A. The compressor will overspeed
- B. The air dryer will stop purging
- C. A leak in one circuit can now drain the other
- D. The governor cut-out will rise

8. The pressure protection valve closes the accessory circuit. What does this tell the technician about system pressure?

- A. It has exceeded the safety relief setting
- B. It has dropped below the protection valve's threshold
- C. It is exactly at governor cut-out
- D. It is at maximum operating pressure

9. A relay valve uses a small control signal and a large supply line because:

- A. The small line carries all the braking air
- B. The large line is only for the parking brake
- C. The signal line converts air to hydraulic pressure
- D. The fast signal triggers local delivery of reservoir air

10. A foot valve that fails to fully exhaust on release will most likely cause:

- A. Faster air dryer purging
- B. Dragging brakes that won't fully release
- C. Higher governor cut-out pressure
- D. Reduced wheel bearing end play

11. During an applied-only leak (passes static, fails applied), the suspect components include the:

- A. Supply reservoir and its fittings
- B. Governor signal line at rest
- C. Chamber diaphragms and relay valve delivery seals
- D. Compressor intake filter

12. A bus's compressor cycles rapidly between load and unload while parked. The most likely cause is:

- A. A cut-in set too close to cut-out
- B. A saturated brake lining
- C. An over-tight wheel bearing
- D. A failed wheel speed sensor

13. The quick-release valve improves brake release specifically by:

- A. Converting air to hydraulic pressure
- B. Increasing the governor cut-out
- C. Providing a local exhaust near the chambers
- D. Storing reserve air for the spring brakes

14. A ratio (proportioning) valve is used to:

- A. Cage the spring brakes during service
- B. Convert spring force to fluid pressure
- C. Balance application pressure between axles
- D. Purge the air dryer at cut-out

15. The double check valve's defining behavior is to:

- A. Drain both service reservoirs simultaneously
- B. Increase the compressor's output
- C. Limit pushrod stroke
- D. Pass air from the higher-pressure of two inlets

16. A safety relief valve venting near 150 psi indicates a problem with the:

- A. Brake chamber diaphragm
- B. Wheel speed sensor
- C. Governor or compressor unloader
- D. Foot valve exhaust port

17. A transit bus loses air pressure faster with the brakes applied and held than with them released. This points to a leak on the:

- A. Supply reservoir
- B. Governor signal line
- C. Application side of the system
- D. Compressor discharge line

18. The treadle valve's secondary section can be applied mechanically by the pedal if:

- A. The air dryer fails to purge
- B. The primary section loses pressure
- C. The governor reaches cut-out
- D. The wheel bearings overheat

19. Moisture that reaches the reservoirs despite a functioning compressor most likely indicates:

- A. A saturated or failing air dryer
- B. An over-tight wheel bearing
- C. A glazed brake lining
- D. A failed ABS modulator

20. A governor set with cut-out at 130 psi should have a cut-in near:

- A. 60 psi
- B. 150 psi
- C. 108 psi
- D. 90 psi

21. A constant hissing at the air dryer exhaust after the system is fully charged and holding pressure indicates a:

- A. Worn compressor ring
- B. Saturated supply reservoir
- C. Failed wheel speed sensor
- D. Purge valve stuck open

22. The reason a long transit bus uses a relay valve at the rear axle is to:

- A. Increase the compressor output
- B. Convert air to hydraulic pressure at the rear
- C. Speed apply and release at the far chambers
- D. Store reserve air for accessories

23. A bus builds air slowly. The dryer, governor, and lines test good, but the inlet filter is heavily clogged. This causes slow build because it:

- A. Restricts air entering the compressor
- B. Raises the governor cut-out pressure
- C. Cages the spring brakes
- D. Increases reservoir capacity

24. The supply (wet) reservoir feeds the:

- A. Primary and secondary service reservoirs
- B. Wheel speed sensors
- C. Brake fluid master cylinder
- D. Steering gearbox

25. A pressure protection valve exists primarily to protect:

- A. The accessories from over-pressure
- B. Brake air by cutting off accessories when pressure drops
- C. The compressor from overspeed
- D. The wheel bearings from heat

26. A foot valve leaking at its exhaust port only when the brakes are released points to a fault in the:

- A. Inlet/seal on the supply side
- B. Application side of the valve
- C. Relay valve delivery seal
- D. Spring brake circuit

27. The governor's two operating setpoints are best described as:

- A. Boiling point and freezing point
- B. Apply pressure and release pressure
- C. Maximum and minimum stroke
- D. Cut-out and cut-in pressures

28. A compressor that never unloads and over-pressurizes the system is most often caused by a fault in the:

- A. Brake chamber diaphragm
- B. Wheel speed sensor
- C. Governor or unloader mechanism
- D. Quick-release valve

29. The air dryer regenerates its desiccant during the purge by:

- A. Raising the compressor output pressure
- B. Caging the spring brakes
- C. Increasing reservoir capacity
- D. Passing dry air back through it while venting

30. A bus with a stuck-open purge valve may:

- A. Never build to full pressure due to the constant leak
- B. Build pressure faster than normal
- C. Cage the spring brakes automatically
- D. Raise the governor cut-out

31. A reservoir drain releasing significant oil points the technician toward the:

- A. Compressor or its oil-feed pressure
- B. Wheel speed sensor
- C. Brake fluid reservoir
- D. Steering pump

32. The reason both released and applied leak tests are needed is that each:

- A. Measures wheel bearing end play

- B. Isolates a different half of the air system
- C. Checks the hydraulic circuit
- D. Verifies the governor cut-out

33. A relay valve sticking closed on apply would cause:

- A. Faster air dryer purging
- B. Slow or weak brake application at the far chambers
- C. Higher governor cut-out
- D. Reduced wheel bearing end play

34. The treadle valve meters air in proportion to:

- A. The governor cut-out pressure
- B. The wheel speed signal
- C. How far the driver presses the pedal
- D. The air dryer purge timing

35. A bus's accessories (doors, air seat) stop working as system pressure falls during heavy use, while braking remains normal. This is:

- A. The pressure protection valve operating as designed
- B. A failed spring brake chamber
- C. A saturated air dryer
- D. A wheel bearing fault

36. Why must reservoirs be drained of accumulated moisture even with a working air dryer?

- A. To raise the governor cut-out

- B. To cage the spring brakes
- C. To increase compressor output
- D. Some moisture still accumulates over time

37. A bus reaches cut-out, purges, and holds pressure normally. The technician concludes the:

- A. Wheel bearings are correctly adjusted
- B. Brake linings are glazed
- C. Air supply and dryer are functioning properly
- D. ABS modulator has failed

38. A leak only on the supply side (brakes released) would NOT typically involve the:

- A. Supply reservoir
- B. Reservoir-to-reservoir lines
- C. Brake chamber diaphragm
- D. Valve inlet seals

39. The compressor's unloader, when signaled by the governor, holds:

- A. The discharge valve closed permanently
- B. The intake valves open so no air is compressed
- C. The relief valve open to atmosphere
- D. The spring brakes released

40. A bus drags its brakes at all wheels and chambers exhaust slowly on release. The most likely shared cause is the:

- A. Foot valve not exhausting properly

- B. A single seized slack adjuster
- C. One contaminated lining
- D. A worn wheel bearing

41. A governor whose cut-out is set too low will cause the bus to:

- A. Build past the relief valve setting
- B. Purge the dryer constantly
- C. Overheat the wheel bearings
- D. Run short of air with frequent low-pressure warnings

42. Air leaving the compressor is hot and laden with moisture and oil; the air dryer's job is to:

- A. Cool and pressurize it further
- B. Remove the moisture and oil before storage
- C. Convert it to hydraulic pressure
- D. Cage the spring brakes

43. The relay valve's large supply line connects directly to the:

- A. Foot valve application port
- B. Wheel speed sensor
- C. Reservoir for local air delivery
- D. Master cylinder

44. A bus that builds pressure but loses it overnight with the brakes released has a:

- A. Application-side leak

- B. Static supply-side leak
- C. Wheel bearing fault
- D. Glazed lining

45. The check valves in the air system primarily exist to:

- A. Increase compressor output
- B. Convert air to spring force
- C. Measure the leak rate
- D. Prevent stored air from back-draining through a leak

46. A bus's air system holds pressure when released but drops quickly when the brakes are applied and held. The technician should inspect the:

- A. Chamber diaphragms, foot valve apply side, and relay delivery
- B. Supply reservoir fittings only
- C. Governor signal line at rest
- D. Compressor intake filter

47. The treadle valve does NOT:

- A. Meter stored air to the brake circuits
- B. Create new compressed air
- C. Exhaust application air on release
- D. Control both circuits through its two sections

48. A relay valve that won't exhaust on release will cause the served brakes to:

- A. Apply more slowly

- B. Purge the dryer
- C. Build pressure faster
- D. Drag because air is trapped in the chambers

49. Why does the air dryer purge audibly when the bus reaches full pressure?

- A. The spring brakes are applying
- B. The foot valve is venting
- C. The master cylinder is bypassing
- D. The compressor unloads and the dryer vents and regenerates

50. A governor differential that is far too large will cause:

- A. Rapid compressor cycling
- B. Excessive swings in system pressure
- C. Constant dryer purging
- D. Wheel bearing overheating

51. A bus's compressor builds normally but the system never reaches full pressure, and a steady leak is heard at the dryer. The most likely cause is a:

- A. Purge valve stuck open
- B. Worn brake drum
- C. Glazed lining
- D. Failed wheel speed sensor

52. The pressure protection valve sacrifices accessory air to:

- A. Raise the governor cut-out

- B. Cage the spring brakes
- C. Increase reservoir capacity
- D. Preserve braking capability during low pressure

53. A bus loses the primary circuit due to a ruptured rear line. The driver should still have:

- A. Service braking from the intact secondary circuit
- B. No service braking at all
- C. Only the parking brake by pumping
- D. Braking only through the ABS modulator

54. A governor cut-out verified with an accurate test gauge reads 145 psi against a spec of 125 psi. The technician should:

- A. Replace the safety relief valve
- B. Adjust or replace the governor to correct cut-out
- C. Replace the air dryer cartridge
- D. Adjust the wheel bearings

55. A relay valve's job at the far axle is fundamentally to reduce:

- A. Reservoir capacity
- B. The time for air to reach and leave the chambers
- C. The governor cut-out
- D. The compressor output

56. Air contamination by water is most dangerous in cold climates because water can:

- A. Raise the compressor output

- B. Improve valve lubrication
- C. Freeze and jam valves or block lines
- D. Lower the governor cut-in

57. The treadle valve's balanced (hold) position occurs when the driver:

- A. Holds steady pedal pressure and the valve maintains delivered pressure
- B. Releases the pedal fully
- C. Presses the pedal to the floor
- D. Pumps the pedal rapidly

58. A bus with oil-fouled desiccant should have which corrected before the cartridge is replaced?

- A. The governor cut-in setting
- B. The wheel bearing end play
- C. The compressor or its oil-feed source
- D. The ABS modulator wiring

59. The supply-side diagnostic chain runs in the direction:

- A. Reservoirs to dryer to governor to compressor
- B. Foot valve to compressor to dryer
- C. Dryer to compressor to reservoirs
- D. Compressor to governor control to dryer to reservoirs

60. A bus loses pressure rapidly only when the brakes are applied. Technician A says check the supply reservoir. Technician B says check the chamber diaphragms and relay valve delivery seals. Who is correct?

- A. Technician A only
- B. Technician B only
- C. Both technicians
- D. Neither technician

## Answer Key & Full Answer Explanations

1. A — In the unloaded state the compressor keeps turning with the engine but stops building pressure, because the governor has signaled the unloader to hold the intake valves open. It does not disengage, reverse, or build faster; it simply idles without compressing.
2. D — The governor signals the compressor to load again at cut-in, the lower setpoint, resuming pressure build. Cut-out is the higher unload point, and the relief and warning points are unrelated to normal loading.
3. B — A plugged governor signal line means the unloader never receives the unload command, so the compressor keeps building past cut-out. It does not unload early, purge continuously, or disengage from the engine.
4. D — The air dryer's purge cycle is triggered by the compressor unloading at cut-out, the same event that stops pressure build. It is not tied to brake application, spring-brake apply, or the warning switch.
5. A — Oil passing downstream most directly threatens the air dryer desiccant, fouling it so it can no longer adsorb moisture. The sensor, drum, and steering gear are not in the contaminated air path.
6. A — The first reservoir is called the "wet" tank because residual moisture and oil that gets past the dryer collects there first before air reaches the service tanks. It holds air, not fluid or water by design.
7. C — A check valve failing open removes the isolation between reservoirs, so a leak in one circuit can now drain the other, defeating dual-circuit protection. It does not affect compressor speed, purging, or cut-out.

8. B — When the pressure protection valve closes the accessory circuit, system pressure has dropped below the valve's threshold, so it is preserving air for the brakes. It is not at relief, cut-out, or maximum pressure.

9. D — The relay valve uses a small fast control signal to trigger local delivery of reservoir air from its large supply line. The small line does not carry braking air, the large line is the main supply, and no hydraulic conversion occurs.

10. B — A foot valve that won't fully exhaust on release traps application air, causing dragging brakes that won't fully release. It does not speed purging, raise cut-out, or affect bearing end play.

11. C — An applied-only leak that passes static implicates application-side components: chamber diaphragms and relay valve delivery seals, pressurized only when the brakes are applied. Supply-side parts and the intake filter are not the suspects.

12. A — Rapid load/unload cycling while parked indicates a cut-in set too close to cut-out, giving too small a differential so the compressor reloads almost immediately. A lining, bearing, or sensor fault would not cause this.

13. C — The quick-release valve improves release by providing a local exhaust port near the chambers so they dump air quickly instead of venting back through the foot valve. It does not convert to hydraulic pressure, raise cut-out, or store air.

14. C — A ratio (proportioning) valve balances application pressure between axles to match braking force and prevent premature lockup. It does not cage springs, convert spring force, or purge the dryer.

15. D — A double check valve passes air from the higher-pressure of its two inlets while blocking the lower, ensuring the working circuit supplies a shared function. It does not drain reservoirs, increase output, or limit stroke.

16. C — A relief valve venting near 150 psi indicates over-pressure from a governor or unloader fault failing to unload the compressor at cut-out. The valve is protecting the system; the diaphragm, sensor, and foot valve are unrelated.

17. C — Losing pressure faster when applied and held than when released points to a leak on the application side, pressurized only during application. A supply reservoir or discharge-line leak would show with the brakes released.

18. B — The treadle valve's secondary section can be applied mechanically by the pedal if the primary section loses pressure, preserving braking on one circuit. It is unrelated to purging, cut-out, or bearings.

19. A — Moisture reaching the reservoirs despite a good compressor points to a saturated or failing air dryer no longer removing water. A bearing, lining, or modulator fault is unrelated to moisture removal.

20. C — Cut-in is normally about 20 to 25 psi below cut-out, so a 130 psi cut-out pairs with a cut-in near 108 psi. The other values fall outside the normal differential.

21. D — A constant hiss at the dryer exhaust after full charge while holding pressure indicates a purge valve stuck open, venting continuously. A worn ring, saturated tank, or failed sensor would not produce this steady exhaust leak.

22. C — A relay valve at the rear axle speeds apply and release at the far chambers by sourcing and venting local reservoir air off a fast signal. It does not increase output, make hydraulic pressure, or store accessory air.

23. A — A clogged inlet filter causes slow build because it restricts air entering the compressor, reducing how much it can pump. It does not raise cut-out, cage springs, or increase capacity.

24. A — The supply (wet) reservoir feeds the primary and secondary service reservoirs, distributing dried air for the dual circuits. It does not feed sensors, the master cylinder, or the steering gearbox.

25. B — The pressure protection valve protects brake air by cutting off accessories when supply pressure drops, reserving remaining air for braking. It does not protect accessories from over-pressure or guard the compressor or bearings.

26. A — A foot valve leaking at the exhaust port only when the brakes are released points to the inlet/seal seal on the supply side, which is pressurized at rest. An applied leak would instead implicate the application side.

27. D — The governor's two setpoints are cut-out (unload) and cut-in (reload) pressures, which define the operating range. They are not boiling/freezing points, apply/release pressures, or stroke limits.

28. C — A compressor that never unloads and over-pressurizes the system is most often a governor or unloader fault failing to command unloading. The diaphragm, sensor, and quick-release valve are unrelated.

29. D — During purge, the air dryer passes a small amount of dry air back through the desiccant while venting, driving off captured moisture and regenerating it. It does not raise output, cage springs, or increase capacity.

30. A — A stuck-open purge valve leaks continuously, so the system may never build to full pressure. It does not build faster, cage springs, or raise cut-out.

31. A — Oil at a reservoir drain points the technician toward the compressor or its excessive oil-feed pressure as the source. The sensor, brake fluid reservoir, and steering pump are not in the air path.

32. B — Both leak tests are needed because each isolates a different half of the air system: released for supply-side, applied for application-side. Neither measures bearing play, checks the hydraulic circuit, or verifies cut-out.

33. B — A relay valve sticking closed on apply cannot deliver local air, causing slow or weak brake application at the far chambers. It does not affect purging, cut-out, or bearing end play.

34. C — The treadle valve meters stored air in proportion to how far the driver presses the pedal, giving graduated application. It is not proportional to cut-out pressure, wheel speed, or purge timing.

35. A — Accessories cutting out as pressure falls while braking stays normal is the pressure protection valve operating as designed, sacrificing accessories for brake air. It is intended behavior, not a chamber, dryer, or bearing fault.

36. D — Reservoirs must still be drained because some moisture accumulates over time even with a working dryer. Draining is unrelated to cut-out, caging springs, or compressor output.

37. C — Reaching cut-out, purging, and holding pressure normally indicates the air supply and dryer are functioning properly. It says nothing about bearings, lining glazing, or the ABS modulator.

38. C — A supply-side (released) leak would not involve the brake chamber diaphragm, which is pressurized only when applied. The supply reservoir, reservoir lines, and valve inlet seals are all pressurized at rest and are valid suspects.

39. B — When signaled by the governor, the unloader holds the intake valves open so no air is compressed while the compressor continues spinning. It does not hold the discharge or relief valve, or release the spring brakes.

40. A — Dragging at all wheels with slow chamber exhaust on release points to a shared component, the foot valve not exhausting properly. A single seized slack adjuster, one contaminated lining, or one worn bearing would affect only one wheel.

41. D — A cut-out set too low means the compressor unloads early, so the system never reaches full pressure and the bus runs short of air with frequent low-pressure warnings. It would not build past relief, purge constantly, or overheat bearings.

42. B — The air dryer removes the moisture and oil from the hot, contaminated discharge air before it is stored in the reservoirs. It does not pressurize further, convert to hydraulic pressure, or cage springs.

43. C — The relay valve's large supply line connects directly to the reservoir for local air delivery to the nearby chambers. It does not connect to the foot valve apply port, a sensor, or the master cylinder.

44. B — Losing pressure overnight with the brakes released is a static supply-side leak, since only the supply side is pressurized at rest. It is not an application-side leak, bearing fault, or lining issue.

45. D — Check valves prevent stored air from back-draining through a downstream leak, preserving braking air. They do not increase output, convert to spring force, or measure leak rate.

46. A — A system that holds released but drops quickly when applied and held has an application-side leak, so the technician inspects the chamber diaphragms, foot valve apply side, and relay delivery. Supply fittings, the governor signal line, and the intake filter are not the suspects.

47. B — The treadle valve meters stored air, exhausts it on release, and controls both circuits, but it does not create new compressed air; the compressor does that. Creating air is the function it does not perform.

48. D — A relay valve that won't exhaust on release traps air in the chambers, causing the served brakes to drag. It does not slow apply, purge the dryer, or build pressure faster.

49. D — The audible purge at full pressure occurs because the compressor unloads at cut-out and the dryer vents and regenerates its desiccant. It is not the spring brakes, foot valve, or master cylinder.

50. B — A far-too-large governor differential lets pressure swing excessively between a high cut-out and a low cut-in before the compressor reloads. Too small a differential causes rapid cycling; the dryer and bearings are unrelated.

51. A — Normal compressor build but a system that never reaches full pressure with a steady dryer leak indicates a purge valve stuck open, bleeding off air. A worn drum, glazed lining, or failed sensor would not cause this.

52. D — The pressure protection valve sacrifices accessory air to preserve braking capability during low pressure. It does not raise cut-out, cage springs, or increase reservoir capacity.

53. A — Losing the primary circuit still leaves service braking from the intact secondary circuit, the purpose of the dual-circuit design. The driver is not left with no braking or only a pumped parking brake.

54. B — A cut-out reading 145 psi against a 125 psi spec means the governor is out of adjustment, so it must be adjusted or replaced to correct cut-out. Replacing the relief valve, dryer cartridge, or adjusting bearings does not fix the governor.

55. B — A relay valve at the far axle fundamentally reduces the time for air to reach and leave the chambers by sourcing and venting locally. It does not reduce reservoir capacity, cut-out, or compressor output.

56. C — Water contamination is most dangerous in cold climates because it can freeze and jam valves or block lines, disabling braking. It does not raise output, improve lubrication, or lower cut-in.

57. A — The treadle valve's balanced (hold) position occurs when the driver holds steady pedal pressure and the valve maintains the delivered application pressure. Releasing, flooring, or pumping the pedal are different conditions.

58. C — Oil-fouled desiccant means the compressor or its oil-feed source must be corrected before replacing the cartridge, or the new desiccant will foul again. The governor, bearings, and ABS wiring are unrelated to oil contamination.

59. D — The supply-side diagnostic chain runs compressor to governor control to dryer to reservoirs, so symptoms at the tanks are traced upstream. The other sequences reverse or scramble this path.

60. B — Technician B is correct: rapid loss only when applied is an application-side leak, so the chamber diaphragms and relay valve delivery seals are the suspects. Technician A is wrong because the supply reservoir leaks with the brakes released, not specifically on application.