

PRACTICE EXAM 15: ASE T4 BRAKES SIMULATION

1. A heavy-truck air brake system uses a treadle valve. The driver's pedal directly operates this valve to:
 - A. Charge the trailer reservoir
 - B. Modulate the ABS system
 - C. Send a metered air signal that determines service brake application pressure
 - D. Apply the parking brake

2. The quick release valve in a heavy-truck air brake system is typically located:
 - A. Near the front axle chambers, allowing rapid air exhaust during brake release
 - B. At the supply reservoir
 - C. Inside the master cylinder
 - D. At the engine intake manifold

3. The relay valve at the rear axle of a heavy-truck tractor receives its signal from:
 - A. The wheel speed sensors
 - B. The ABS modulator
 - C. The parking brake dash valve
 - D. The treadle valve, with the relay then sourcing high-volume air from the local rear reservoir

4. A heavy-truck air brake system's "wet tank" is another name for the:

- A. Trailer reservoir
- B. Supply reservoir
- C. Primary reservoir
- D. Spring chamber

5. The double check valve in the spring brake circuit serves to:

- A. Boost air pressure to the chambers
- B. Modulate ABS pressure
- C. Select the higher of two pressure inputs to the spring chamber control circuit
- D. Generate the engine RPM signal

6. A heavy-truck driver's foot brake pedal application travels through which sequence?

- A. Driver pedal → treadle valve → relay valves → brake chambers
- B. Driver pedal → master cylinder → ABS → chambers
- C. Driver pedal → engine ECU → compressor → chambers
- D. Driver pedal → spring brake chamber → service chambers

7. The pressure protection valve on a heavy-truck air system isolates:

- A. The compressor from the rest of the system
- B. The trailer from the tractor
- C. The ABS modulator from the master cylinder

D. Non-essential accessories from the brake system if primary pressure drops below the protection threshold

8. A heavy-truck air dryer's purge valve receives its actuating signal from:

- A. The compressor's discharge port directly
- B. The governor's unload signal (control air)
- C. The driver's pedal application
- D. The ABS ECU

9. The yellow dash control valve on a heavy-truck tractor controls:

- A. The ABS warning lamp
- B. The trailer supply air
- C. The tractor's drive-axle parking brake (spring brakes)
- D. The compressor cut-out pressure

10. The red dash control valve on a heavy-truck tractor controls:

- A. The compressor unload signal
- B. The ABS reset
- C. The engine RPM
- D. The trailer supply (emergency) air through the tractor protection valve

11. The tractor protection valve closes automatically when air pressure drops to approximately:

- A. 20 to 45 psi, depending on manufacturer specification

- B. 60 psi
- C. 80 psi
- D. 100 psi

12. A heavy-truck air system's safety relief valve is set to open at approximately:

- A. 80 to 100 psi
- B. 150 to 175 psi
- C. 250 to 300 psi
- D. 60 to 80 psi

13. The air dryer's check valve at the discharge side prevents:

- A. Air from flowing into the engine
- B. ABS modulation
- C. Air from the supply reservoir from flowing back through the dryer during the purge cycle
- D. Compressor seizure

14. A heavy-truck air brake system's primary reservoir typically feeds:

- A. The rear service brake circuit through the rear-axle relay valve
- B. The trailer brakes only
- C. The parking brake spring chambers
- D. The engine fuel system

15. The treadle valve on a heavy-truck has how many circuits?

- A. Single circuit
- B. Three circuits
- C. Four circuits
- D. Two circuits — primary and secondary, ensuring dual-circuit redundancy

16. A heavy-truck air system's secondary reservoir typically feeds:

- A. The trailer brakes
- B. The front (steer-axle) service brake circuit
- C. The compressor
- D. The parking brake control

17. A trailer's relay emergency valve performs how many primary functions simultaneously?

- A. One — service relay only
- B. Two — service and parking
- C. Three — service relay, reservoir charging, and emergency application during supply loss
- D. Four — service, parking, ABS, and supply

18. A heavy-truck air system uses what color gladhand for trailer supply (emergency) air?

- A. Red
- B. Blue
- C. Yellow
- D. Green

19. A heavy-truck air system uses what color gladhand for trailer service signal?

- A. Red
- B. Yellow
- C. Green
- D. Blue

20. The compressor's unloader valve assembly is signaled by:

- A. The treadle valve
- B. The governor when the cut-out pressure is reached
- C. The trailer relay valve
- D. The ABS modulator

21. A heavy-truck air system's compressor cut-out pressure is typically set at:

- A. 80 to 95 psi
- B. 100 to 115 psi
- C. 120 to 135 psi
- D. 150 to 170 psi

22. The air dryer's coalescing filter at the inlet:

- A. Removes oil and particulate contamination from the compressed air before it reaches the desiccant
- B. Generates heat for desiccant regeneration
- C. Boosts pressure to the desiccant
- D. Generates ABS signals

23. A heavy-truck air brake system uses what type of valve for the parking brake control on the dashboard?

- A. Round red knob with smooth grip
- B. Square blue button with raised symbol
- C. Triangle green lever with grip texture
- D. Yellow diamond-shaped knob, federally standardized for parking brake control

24. The trailer's spring brake control valve (spring brake priority valve):

- A. Allows the trailer to be released regardless of supply air condition
- B. Prioritizes available supply air to release the spring brakes when supply pressure rises above the release threshold
- C. Modulates ABS pressure
- D. Boosts service brake pressure

25. A heavy-truck air brake system's anti-compounding valve prevents:

- A. Excessive compressor cycling
- B. ABS faults
- C. The combined service and spring brake forces from exceeding foundation brake design limits
- D. Driver-initiated brake application

26. The compressor on a heavy-truck rotates whenever:

- A. The ABS is active
- B. The driver applies the brake pedal
- C. The trailer is connected

D. The engine is running, regardless of system pressure (the compressor unloads internally when at cut-out)

27. A heavy-truck air system maintains a "differential pressure" between cut-in and cut-out pressures of approximately:

- A. 20 to 25 psi
- B. 50 to 60 psi
- C. 5 to 10 psi
- D. 80 to 100 psi

28. The air brake compressor on a heavy-truck typically receives lubrication from:

- A. A dedicated compressor oil reservoir
- B. The engine's pressurized oil supply through an external line
- C. Splash lubrication only
- D. Fuel oil mixed with the air supply

29. A heavy-truck air system's "dry tank" is another name for:

- A. The supply reservoir
- B. The trailer reservoir
- C. The primary or secondary reservoir downstream of the air dryer
- D. The compressor housing

30. A heavy-truck air system's compressor displacement is typically:

- A. 13 to 18 CFM at 1,250 RPM for Class 8 applications

- B. 5 to 10 CFM at 1,250 RPM
- C. 50 to 60 CFM at 1,250 RPM
- D. 150 to 200 CFM at 1,250 RPM

31. The brake chamber's pushrod, when fully extended at 90 psi applied:

- A. Should be approximately 1 inch long
- B. Should be approximately 4 inches long
- C. Should never exceed 1/4 inch of stroke
- D. Should be within the chamber type's readjustment stroke limit (varies by chamber type)

32. A heavy-truck air system's safety relief valve activates when:

- A. The compressor unloads
- B. System pressure exceeds the relief valve's setting (typically 150 to 175 psi)
- C. The trailer is connected
- D. The driver applies the brake pedal

33. A heavy-truck air dryer's heater element is energized to:

- A. Boost the discharge pressure
- B. Heat the desiccant for faster regeneration
- C. Prevent the purge valve and other components from freezing in cold weather
- D. Increase compressor efficiency

34. A heavy-truck air system uses what type of fittings for most service line connections?

- A. Threaded NPT fittings only
- B. Quick-release SAE fittings only
- C. Brass compression fittings only
- D. SAE J512 inverted flare fittings

35. The trailer's spring brake chambers apply when:

- A. Control air pressure to the chambers drops below the release threshold (typically 60 to 70 psi)
- B. The driver applies the foot pedal
- C. The ABS activates
- D. The compressor cycles on

36. The trailer's relay emergency valve uses what type of logic to activate the emergency function?

- A. Manual driver input only
- B. Automatic — when supply air pressure drops below the threshold, the valve diverts reservoir air to apply the chambers
- C. Engine ECU command
- D. ABS modulator signal

37. A heavy-truck air brake system's relay valve at the rear axle:

- A. Modulates ABS pressure
- B. Limits maximum brake pressure
- C. Sources high-volume air from a local reservoir to reduce application and release time at the rear chambers

D. Generates engine RPM signals

38. The brake fluid in a hydraulic brake system on a Class 5 medium-duty truck flows in which order?

A. From caliper through master cylinder

B. From wheel back to reservoir

C. From compressor to wheel

D. From master cylinder reservoir, through the master cylinder, through the lines, to the wheel cylinders or calipers

39. A heavy-truck disc brake caliper's piston is moved by:

A. Hydraulic pressure delivered through the brake line

B. Air pressure

C. Engine vacuum

D. Electric motor

40. The brake pedal's "free play" (the distance the pedal moves before contacting the master cylinder pushrod) is typically set to:

A. 1 inch or more

B. Approximately 1/8 to 1/4 inch

C. No free play allowed

D. 1/2 inch minimum

41. The brake fluid level in the master cylinder reservoir should be:

A. Always at the maximum mark

- B. At the minimum mark
- C. Within the normal operating range, between minimum and maximum marks
- D. Below the minimum mark

42. A heavy-truck air brake system's primary reservoir capacity is approximately:

- A. 50 cubic inches
- B. 500 cubic inches
- C. 5,000 cubic inches
- D. 1,500 to 2,500 cubic inches, varying by application

43. The brake camshaft on an S-cam foundation brake is rotated by:

- A. The slack adjuster, which converts pushrod force into camshaft rotation
- B. The chamber diaphragm directly
- C. The wheel speed sensor
- D. The ABS modulator

44. A heavy-truck wheel speed sensor signals the ABS ECU through:

- A. A hydraulic pressure line
- B. A two-wire electrical connection providing AC pulse signals
- C. An air pressure line
- D. A mechanical linkage

45. The brake fluid type used in a hydraulic brake system should match:

- A. Whatever is on hand at the shop
- B. The supplier's recommendation
- C. The manufacturer's specification, indicated on the reservoir cap and in the service manual
- D. The driver's preference

46. A heavy-truck air system's air dryer is typically located:

- A. After the chambers
- B. Between the trailer and the compressor
- C. Inside the cab
- D. Between the compressor and the supply reservoir, where it removes moisture from the discharge air

47. The brake compressor on a heavy-truck is typically:

- A. Gear-driven from the engine timing train
- B. Belt-driven from the alternator pulley
- C. Hydraulically driven from the power steering pump
- D. Electrically driven from the battery

48. The federal regulation that defines air brake system requirements for heavy trucks is:

- A. FMVSS 105
- B. FMVSS 121
- C. FMVSS 135
- D. FMVSS 106

49. A heavy-truck air brake system uses a "dual circuit" design as required by:

- A. FMVSS 106
- B. FMVSS 105
- C. FMVSS 121
- D. FMVSS 135

50. The brake fluid reservoir cap typically includes:

- A. A heating element to prevent freezing
- B. A vent that allows atmospheric pressure equalization while excluding contamination
- C. A magnetic separator for metal debris
- D. A pressure relief valve

PRACTICE EXAM 15 — ANSWER KEY AND EXPLANATIONS

1. C — Send a metered air signal that determines service brake application pressure. The treadle valve is the driver's primary input to the air brake system. Pedal application opens the valve, sending a metered air signal proportional to pedal position to the relay valves and chambers. The valve's self-lapping design holds commanded pressure constant as long as pedal position is maintained.
2. A — Near the front axle chambers, allowing rapid air exhaust during brake release. Quick release valves are typically mounted near the front axle chambers to provide rapid air exhaust during brake release. They reduce release time by allowing chamber air to exhaust through the local valve rather than traveling all the way back to the treadle valve through long air lines.
3. D — The treadle valve, with the relay then sourcing high-volume air from the local rear reservoir. The rear axle relay valve receives a small-volume signal from the treadle valve and uses it to deliver high-volume air from the local reservoir to the rear chambers. This amplification dramatically reduces application and release time at the rear axle compared to routing all air through the treadle valve.
4. B — Supply reservoir. The supply reservoir is historically called the "wet tank" because it traditionally accumulated most of the moisture that condensed from hot discharge air. Even with modern air dryers, the supply reservoir remains the first downstream collection point and serves as a pressure buffer between the dryer and the primary/secondary reservoirs.
5. C — Select the higher of two pressure inputs to the spring chamber control circuit. The double-check valve in the spring brake circuit has two inlets, and its shuttle automatically seals against the lower-pressure inlet, allowing the higher-pressure source through to the outlet. This selection function enables spring brake modulation during a primary-circuit failure.
6. A — Driver pedal → treadle valve → relay valves → brake chambers. The driver's pedal application travels through the treadle valve, which sends a metered air signal to the relay valves at each axle. The relay valves then deliver high-volume air from local reservoirs to the brake chambers. This sequence ensures fast brake response and proper signal amplification.
7. D — Non-essential accessories from the brake system if primary pressure drops below the protection threshold. The pressure protection valve isolates non-essential accessories (air suspension, horns, cab accessories) when primary system pressure falls below the protection

threshold. This preserves remaining pressure for the critical brake function rather than allowing accessories to continue consuming air during a fault.

8. B — The governor's unload signal (control air). The air dryer's purge valve is signaled to open by air pressure from the governor's unload signal. When the governor commands the compressor to unload at cut-out, the same control air signal opens the purge valve, allowing the desiccant to regenerate using stored dry air.
9. C — The tractor's drive-axle parking brake (spring brakes). The yellow diamond-shaped dash valve is federally standardized to control the tractor's drive-axle spring (parking) brakes. Pulling the knob exhausts air from the spring chamber control ports, allowing the power springs to apply the brakes mechanically.
10. D — The trailer supply (emergency) air through the tractor protection valve. The red dash valve controls the trailer supply (emergency) air through the tractor protection valve. Pulling the red valve exhausts the control signal to the TPV, which closes and isolates the trailer from tractor air. Pushing the valve in restores the signal, opening the TPV and charging the trailer supply circuit.
11. A — 20 to 45 psi, depending on manufacturer specification. The tractor protection valve automatically closes when tractor air pressure drops to approximately 20 to 45 psi, depending on manufacturer specification. This threshold is well below the 60-psi low-air warning, ensuring the driver has received a warning and had time to stop before the trailer is isolated.
12. B — 150 to 175 psi. Heavy-truck air brake safety relief valves are typically set to open at approximately 150 to 175 psi. This pressure threshold is well above normal operating ranges (120-135 psi cut-out) but below the failure threshold of system components, providing safety protection without normal operational interference.
13. C — Air from the supply reservoir from flowing back through the dryer during the purge cycle. The check valve at the air dryer's discharge side prevents air in the supply reservoir from flowing back through the dryer and out the purge port when the purge valve opens. This preserves reservoir pressure and ensures the purge cycle uses only a small dedicated volume of dry air.
14. A — The rear service brake circuit through the rear-axle relay valve. In most tractor configurations, the primary reservoir feeds the rear drive axle service brake circuit through the primary side of the treadle valve and the rear-axle relay valve. This circuit handles the larger of the two service braking duties on a typical tractor.
15. D — Two circuits — primary and secondary, ensuring dual-circuit redundancy. The treadle valve contains two independent circuits — primary and secondary — to provide the dual-circuit redundancy required by FMVSS 121. A failure in one circuit does not affect the other, preserving braking capability through the surviving circuit.
16. B — The front (steer-axle) service brake circuit. The secondary reservoir typically feeds the front (steer-axle) service brake circuit through the secondary side of the treadle valve. This separation

ensures that a failure in either the primary (rear) or secondary (front) circuit does not disable both axles' braking capability.

17. C — Three — service relay, reservoir charging, and emergency application during supply loss. The trailer relay emergency valve performs three simultaneous functions: amplifying service signal from the tractor, charging the trailer reservoir from supply air, and automatically applying the trailer brakes from reservoir air during supply loss. This multifunction design is the backbone of trailer air brake safety.
18. A — Red. The red gladhand carries supply (emergency) air to the trailer. Federal standardization has specified the red color for this function. The red gladhand charges the trailer reservoir and releases the trailer spring brakes; loss of supply air through the red gladhand causes the trailer's spring brakes to apply.
19. D — Blue. The blue gladhand carries service signal air to the trailer. Federal standardization has specified the blue color for this function. The blue gladhand carries the metered service signal from the treadle valve to the trailer's relay emergency valve, which then applies the trailer service brakes.
20. B — The governor when the cut-out pressure is reached. The compressor's unloader valve assembly is signaled by the governor when system pressure reaches cut-out. The governor sends control air to the unloader, which holds the inlet valves open so the compressor rotates without compressing air until cut-in pressure is reached.
21. C — 120 to 135 psi. Standard governor cut-out pressure on modern heavy-truck air systems falls within the 120 to 135 psi range. This setting provides adequate reserve pressure for multiple full-pressure brake applications while keeping component stress and compressor duty cycle within safe operating parameters.
22. A — Removes oil and particulate contamination from the compressed air before it reaches the desiccant. The air dryer's coalescing filter at the inlet captures oil droplets and particulate debris before the air reaches the desiccant cartridge. This protects the desiccant from contamination and significantly extends its service life.
23. D — Yellow diamond-shaped knob, federally standardized for parking brake control. The parking brake control valve uses a yellow diamond-shaped knob, federally standardized so that the driver can identify the valve by touch alone in low-light conditions. The shape is intentionally distinct from the red octagon-shaped trailer supply valve.
24. B — Prioritizes available supply air to release the spring brakes when supply pressure rises above the release threshold. The trailer's spring brake control valve (priority valve) prioritizes available supply air to release the spring brakes when supply pressure rises above the release threshold. This ensures that available air is used first to release the parking brakes before being routed to other functions.

25. C — The combined service and spring brake forces from exceeding foundation brake design limits. Anti-compounding circuits use a double-check valve or dedicated valve to ensure that when both service and spring brake applications occur simultaneously, only the larger force is transmitted to the foundation brake. Without this protection, combined forces could cause broken shoes, cracked drums, or bent slack adjusters.
26. D — The engine is running, regardless of system pressure (the compressor unloads internally when at cut-out). The compressor rotates whenever the engine is running because it is gear-driven and cannot be disengaged. When the system reaches cut-out pressure, the compressor unloads internally — the unloader holds the inlet valves open so the compressor rotates without producing air.
27. A — 20 to 25 psi. The standard differential between governor cut-in and cut-out is 20 to 25 psi. This range balances compressor duty cycle (avoiding excessive cycling) with adequate reserve pressure for service demands. Differentials outside this range typically indicate governor adjustment is needed.
28. B — The engine's pressurized oil supply through an external line. Heavy-truck air compressors share the engine's pressurized oil supply through an external oil line. This integration ensures consistent lubrication during operation and eliminates the need for a separate compressor lubrication system — but also means a compressor oil leak indicates a brake-system fault that must be addressed.
29. C — The primary or secondary reservoir downstream of the air dryer. The "dry tank" refers to the primary or secondary reservoir downstream of the air dryer, where the air has been dried and is suitable for use throughout the system. This terminology distinguishes these reservoirs from the "wet tank" (supply reservoir) where moisture historically accumulated.
30. A — 13 to 18 CFM at 1,250 RPM for Class 8 applications. Typical Class 8 tractor air compressors have a displacement of 13 to 18 cubic feet per minute at 1,250 RPM. This range provides adequate reserve capacity to meet FMVSS 121 buildup time requirements while supporting normal in-service demand.
31. D — Should be within the chamber type's readjustment stroke limit (varies by chamber type). The brake chamber pushrod stroke at 90 psi applied must be within the readjustment limit specified for the chamber type. Different chamber types (Type 16, 20, 24, 30, etc.) have different limits, and long-stroke versions of each have different limits than standard versions.
32. B — System pressure exceeds the relief valve's setting (typically 150 to 175 psi). The safety relief valve activates when system pressure exceeds its set point, typically 150 to 175 psi. This is a fail-safe mechanism that protects the system from excessive pressure caused by governor failure. Activation of the relief valve indicates a fault in the pressure regulation system that must be diagnosed and corrected.

33. C — Prevent the purge valve and other components from freezing in cold weather. The air dryer's heater element is thermostatically controlled and activates only in cold conditions to prevent the purge valve and other dryer components from freezing. A failed heater produces distinctive cold-weather symptoms: normal operation in mild temperatures but water passage and frozen valve operation in sub-freezing conditions.
34. D — SAE J512 inverted flare fittings. SAE J512 inverted flare fittings are the dominant standard for heavy-truck air brake line connections. The inverted flare design provides reliable sealing under pressure, vibration, and thermal cycling without thread sealants — making it ideal for safety-critical brake applications.
35. A — Control air pressure to the chambers drops below the release threshold (typically 60 to 70 psi). The trailer's spring brake chambers apply when control air pressure to the chambers drops below the release threshold. The power spring inside each chamber requires approximately 60 to 70 psi of control air to overcome its preload and keep the brake released. Below this threshold, the spring extends and applies the foundation brake.
36. B — Automatic — when supply air pressure drops below the threshold, the valve diverts reservoir air to apply the chambers. The trailer's relay emergency valve automatically activates the emergency function when supply air pressure drops below the threshold. The valve diverts reservoir air to apply the chambers, ensuring the trailer brakes apply if the supply line is severed or the tractor is disconnected — a critical fail-safe design.
37. C — Sources high-volume air from a local reservoir to reduce application and release time at the rear chambers. The relay valve mounted near the rear axle sources delivery air from a nearby reservoir, responding to a small-volume pilot signal from the treadle valve. This eliminates the long fill path from the cab and dramatically reduces both application and release times at the rear chambers.
38. D — From master cylinder reservoir, through the master cylinder, through the lines, to the wheel cylinders or calipers. Brake fluid flows from the reservoir into the master cylinder, where it is pressurized when the driver applies the pedal. The pressurized fluid flows through the brake lines to the wheel cylinders (drum brakes) or calipers (disc brakes), where it generates the braking force at each wheel.
39. A — Hydraulic pressure delivered through the brake line. The disc brake caliper's piston is moved by hydraulic pressure delivered through the brake line from the master cylinder. The hydraulic pressure pushes the piston outward, which in turn presses the brake pad against the rotor — generating the braking force through friction.
40. B — Approximately 1/8 to 1/4 inch. Brake pedal free play of approximately 1/8 to 1/4 inch is required to ensure the master cylinder pushrod can fully retract and clear the compensation port between applications. Without this clearance, the system can develop residual pressure that causes brake drag.

41. C — Within the normal operating range, between minimum and maximum marks. Brake fluid level should be maintained within the normal operating range marked on the reservoir. The maximum mark accommodates fluid expansion at high temperatures, while the minimum mark ensures adequate fluid for the master cylinder to function. Levels outside this range indicate either leakage or excessive consumption.
42. D — 1,500 to 2,500 cubic inches, varying by application. Heavy-truck primary reservoir volumes typically range from 1,500 to 2,500 cubic inches, varying based on vehicle application and chamber size. Larger applications require larger reservoirs to meet FMVSS 121's 12× chamber displacement requirement.
43. A — The slack adjuster, which converts pushrod force into camshaft rotation. The brake camshaft is rotated by the slack adjuster, which translates the linear pushrod force from the chamber into rotational force at the camshaft. The slack adjuster's lever arm length determines the mechanical advantage of this conversion.
44. B — A two-wire electrical connection providing AC pulse signals. Wheel speed sensors signal the ABS ECU through a two-wire electrical connection providing AC pulse signals. The two wires include the signal wire carrying the AC pulse and a return wire to ground or a reference point. The ECU processes the differential signal to calculate wheel speed.
45. C — The manufacturer's specification, indicated on the reservoir cap and in the service manual. Brake fluid type is determined by the vehicle manufacturer's specifications — the reservoir cap is marked with the required type, and the service manual confirms it. Mixing fluid types or using the wrong specification can damage seals and components throughout the system.
46. D — Between the compressor and the supply reservoir, where it removes moisture from the discharge air. The air dryer is positioned between the compressor and the supply reservoir, where it processes the hot, moisture-laden discharge air from the compressor. The dryer removes moisture, oil, and particulate contamination before the air reaches the supply reservoir, protecting downstream components.
47. A — Gear-driven from the engine timing train. Heavy-truck air compressors are gear-driven from the engine timing train. This drive method eliminates belt slippage, handles high torque loads reliably, and aligns the compressor with the engine's shared lubrication and coolant systems.
48. B — FMVSS 121. FMVSS 121 specifies the air brake system requirements for heavy trucks, including dual-circuit design, pressure thresholds, ABS requirements, and other safety-critical specifications. This is the foundational federal standard that all heavy-truck air brake systems must comply with.
49. C — FMVSS 121. The dual-circuit air brake design requirement is established by FMVSS 121. This requirement ensures that a failure in one service circuit does not eliminate braking on the other, providing the redundancy essential for safe operation of heavy commercial vehicles.

50. B — A vent that allows atmospheric pressure equalization while excluding contamination. The brake fluid reservoir cap includes a one-way vent that allows atmospheric pressure equalization as fluid level changes (during braking and from temperature changes) while excluding moisture and dirt contamination. Tight sealing prevents the hygroscopic fluid from absorbing excess moisture.