

PRACTICE EXAM 5: T4 SIMULATION

(50 QUESTIONS)

1. Technician A says the proper torque for heavy-duty truck wheel lug nuts builds in stages from approximately 100 ft-lbs to final specification. Technician B says heavy-duty truck wheel lug nuts can be torqued to maximum specification in a single pass without component damage. Who is correct?

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

2. The maximum allowable air pressure leak rate per FMVSS 121 with engine off and brakes applied on a heavy-duty single tractor is:

- A. 3 PSI in 1 minute measured during the leak test procedure
- B. 5 PSI in 1 minute measured during the leak test procedure
- C. 10 PSI in 1 minute measured during the leak test procedure
- D. 25 PSI in 1 minute measured during the leak test procedure

3. The proper procedure for measuring heavy-duty truck brake chamber pushrod stroke is to:

- A. Apply 30 to 40 PSI to the chamber and measure stroke from released to applied position
- B. Apply battery voltage to the brake chamber for diagnostic testing during measurement
- C. Apply 90 to 100 PSI to the chamber and measure stroke from released to applied position
- D. Listen for chamber operation with a stethoscope during normal brake application

4. All of the following are direct causes of excessive brake chamber pushrod stroke EXCEPT:

- A. Worn brake lining beyond service specification limits during inspection
- B. Failed automatic slack adjuster unable to compensate for normal lining wear
- C. Brake drum diameter exceeding the maximum allowable specification during inspection
- D. Excessive transmission fluid level above the maximum fill mark indication

5. A heavy-duty truck air pressure governor cut-out specification typically falls in which range?

- A. 100 to 125 PSI on most fleet applications during normal operation
- B. 50 to 75 PSI on most fleet applications during normal operation
- C. 150 to 175 PSI on most fleet applications during normal operation
- D. 200 to 225 PSI on most fleet applications during normal operation

6. Technician A says heavy-duty wheel lug nut torque specifications vary by manufacturer and must be verified before service. Technician B says all heavy-duty wheel lug nuts use a universal torque specification regardless of application. Who is correct?

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

7. The proper measurement procedure for heavy-duty brake drum maximum diameter is to:

- A. Apply battery voltage to the drum for diagnostic testing during measurement
- B. Use a brake drum micrometer at multiple positions across the friction surface
- C. Listen for drum thickness with a stethoscope during normal brake application

D. Estimate diameter visually using shop lighting during the inspection process

8. The Type 30 brake chamber maximum pushrod stroke per CVSA out-of-service criteria is:

A. 0.5 inch measured at 90–100 PSI during inspection procedures

B. 4 inches measured at 90–100 PSI during inspection procedures

C. 6 inches measured at 90–100 PSI during inspection procedures

D. 2 inches measured at 90–100 PSI during inspection procedures

9. Technician A says the air dryer desiccant cartridge replacement interval is typically 1 to 2 years for most fleet applications. Technician B says the air dryer desiccant cartridge can be cleaned and reused indefinitely during service intervals. Who is correct?

A. Technician A only

B. Both Technician A and Technician B

C. Technician C only

D. Technician B only

10. The proper torque application for heavy-duty truck slack adjuster mounting bolts is determined by:

A. Standard automotive torque specifications for similar bolt diameter applications

B. Maximum torque applied during installation procedures during service

C. Manufacturer service information specific to the slack adjuster model and bolt grade

D. Visual estimation based on bolt size during the installation procedures

11. The proper method for verifying air brake system leak rate per FMVSS 121 with brakes released is:

A. Apply 50 PSI to the system and measure pressure decay over 5 minutes total

- B. Apply maximum pressure to the system without measurement requirement
- C. Listen for leak sounds with a stethoscope during normal vehicle operation only
- D. Build pressure to cut-out, shut off engine, and measure pressure decay over 1 minute

12. Heavy-duty truck air dryer purge valve operation is typically activated by:

- A. Battery voltage applied to the purge valve during normal operation conditions
- B. Manual driver intervention during normal operation conditions during service
- C. Governor signal during compressor cut-out events during normal operation
- D. Continuous operation regardless of governor cycle phase during operation

13. The proper procedure for verifying air brake system low-pressure warning device operation is:

- A. Reduce system pressure with engine off until the warning device activates
- B. Apply battery voltage to the warning device for diagnostic testing during service
- C. Listen for warning device operation with a stethoscope during normal operation
- D. Replace the warning device as preventive maintenance regardless of condition

14. The minimum air pressure at which the low-pressure warning device must activate per FMVSS 121 is:

- A. 30 PSI per FMVSS 121 specifications during operation
- B. 60 PSI per FMVSS 121 specifications during operation
- C. 90 PSI per FMVSS 121 specifications during operation
- D. 100 PSI per FMVSS 121 specifications during operation

15. The proper procedure when reusing brake chamber mounting bolts during heavy-duty service is to:

- A. Reuse all bolts regardless of condition since brake chamber mounting bolts are not torque-to-yield
- B. Apply maximum torque during installation to compensate for any thread wear
- C. Apply anti-seize compound to all threads to ensure proper torque retention
- D. Inspect threads, replace any damaged bolts, and torque to specification per service info

16. The proper inspection procedure for heavy-duty foundation brake hardware during service includes:

- A. Verification of cracks at bolt boss areas, bore wear at bearing locations, and fastener condition
- B. External paint condition and decal placement during the inspection process
- C. Engine compatibility verification with the foundation brake during service procedures
- D. Vehicle type compatibility with the foundation brake during service operations

17. The proper measurement procedure for heavy-duty automatic slack adjuster operation is to:

- A. Apply battery voltage to the slack adjuster for diagnostic testing during service
- B. Listen for slack adjuster operation with a stethoscope during normal brake application
- C. Observe pushrod stroke at various wear levels and confirm self-adjustment function
- D. Replace the slack adjuster as preventive maintenance regardless of condition

18. The standard brake chamber size designation for steer axle applications on most heavy-duty Class 8 tractors is typically:

- A. Type 36 chambers on most heavy-duty Class 8 tractor applications
- B. Type 20 or Type 24 chambers on most heavy-duty Class 8 tractor applications
- C. Type 12 chambers on most heavy-duty Class 8 tractor applications

D. Type 6 chambers on most heavy-duty Class 8 tractor applications

19. The proper torque application for heavy-duty truck brake chamber to bracket mounting bolts is:

- A. Maximum torque applied without measurement during installation procedures
- B. Standard automotive torque specifications for similar bolt diameter applications
- C. Visual estimation based on bolt size during the installation procedures
- D. Per manufacturer service information specific to the chamber and bracket model

20. The minimum air pressure required to release heavy-duty truck spring brake chambers is typically:

- A. 65 PSI applied to the parking brake control circuit during operation
- B. 30 PSI applied to the parking brake control circuit during operation
- C. 90 PSI applied to the parking brake control circuit during operation
- D. 120 PSI applied to the parking brake control circuit during operation

21. Technician A says brake shoe return springs are required on all heavy-duty foundation brakes. Technician B says automatic slack adjusters eliminate the need for brake shoe return springs during operation. Who is correct?

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

22. The proper diagnostic priority when a heavy-duty truck shows a complaint of "compressor cycling more frequently than normal" is to:

- A. Continue operation since increased cycling has minimal effect on system function
- B. Replace the compressor as the most likely failure component during service
- C. Inspect for air leakage and excessive demand sources before component replacement
- D. Apply battery voltage to the compressor for diagnostic testing during service

23. The proper procedure for caging a heavy-duty spring brake chamber before service is to:

- A. Apply maximum air pressure to compress the spring before service procedures
- B. Use the manual caging bolt to mechanically compress the spring before disassembly
- C. Disconnect the chamber while the spring is fully released during normal service
- D. Apply battery voltage to the chamber for diagnostic testing before disassembly

24. The most accurate description of heavy-duty truck spring brake force range is:

- A. 100 to 250 pounds during parking brake engagement events
- B. 5,000 to 7,500 pounds during parking brake engagement events
- C. 50 to 100 pounds during parking brake engagement events
- D. 1,500 to 2,500 pounds during parking brake engagement events

25. Technician A says hydraulic brake fluid is hygroscopic and absorbs moisture from the atmosphere over time. Technician B says brake fluid replacement is unnecessary because modern sealed systems prevent moisture entry. Who is correct?

- A. Technician A only
- B. Both Technician A and Technician B

C. Technician C only

D. Neither Technician A nor Technician B

26. The proper procedure for bleeding a heavy-duty hydraulic brake system is to:

A. Bleed only the wheel cylinder closest to the master cylinder during service procedures

B. Apply battery voltage to the system for diagnostic testing during bleeding procedures

C. Bleed wheel cylinders in sequence per manufacturer service information specifications

D. Listen for air with a stethoscope during the bleeding procedure without manual bleed

27. The proper service procedure when reusing hydraulic brake fluid during heavy-duty service is:

A. Reuse fluid regardless of condition since brake fluid does not degrade during service

B. Always use new fluid; reused brake fluid contains contamination from prior service

C. Filter the fluid through a paper filter and reuse during the same service event

D. Mix the fluid with new fluid to refresh the chemical composition during service

28. The proper torque application for heavy-duty hydraulic brake line fittings during installation is:

A. Maximum torque applied during installation procedures during service

B. Standard automotive torque specifications for similar fitting size applications

C. Visual estimation based on fitting size during the installation procedures

D. Per manufacturer service information using a calibrated flare-nut wrench when applicable

29. The most accurate description of an air-over-hydraulic brake actuator function is:

A. Air pressure powers a hydraulic actuator that develops fluid pressure for wheel cylinders

- B. Mechanical linkage transfers pedal force directly to the wheel cylinders during application
- C. Vacuum boost provides primary force to the wheel cylinders during normal operation
- D. Pneumatic pressure applies directly to wheel cylinders without hydraulic conversion

30. The proper diagnostic priority when an ABS warning lamp remains illuminated after vehicle key-on is to:

- A. Continue operation since the ABS warning has minimal effect on normal brake function
- B. Replace the ABS controller as the most likely failure component during service
- C. Connect a scan tool to retrieve ABS fault codes and review system data systematically
- D. Apply battery voltage to the ABS controller for diagnostic testing during service

31. The proper measurement procedure for heavy-duty ABS wheel speed sensor air gap is to:

- A. Apply battery voltage to the sensor for diagnostic testing during measurement
- B. Estimate the air gap visually using shop lighting during the inspection process
- C. Use a feeler gauge between the sensor face and the tone ring per service information
- D. Listen for sensor operation with a stethoscope during normal vehicle operation

32. The maximum allowable ABS wheel speed sensor air gap on most heavy-duty applications is typically:

- A. 0.040 to 0.060 inches measured per manufacturer service specifications
- B. 0.250 to 0.500 inches measured per manufacturer service specifications
- C. 0.001 to 0.005 inches measured per manufacturer service specifications
- D. 1.000 to 2.000 inches measured per manufacturer service specifications

33. The proper procedure for verifying heavy-duty ABS modulator valve operation is to:

- A. Apply battery voltage to the modulator for diagnostic testing during service
- B. Listen for modulator operation with a stethoscope during normal brake application
- C. Replace the modulator as preventive maintenance regardless of condition
- D. Use scan tool to command modulator operation during diagnostic testing

34. The proper service action when an ABS controller shows a fault code that returns immediately after clearing is to:

- A. Continue clearing the fault code repeatedly until it remains cleared during service
- B. Investigate the underlying cause rather than continuing to clear without correction
- C. Apply battery voltage to the ABS controller for diagnostic testing during service
- D. Replace the ABS controller as the most likely failure component during service

35. The proper procedure for verifying heavy-duty truck brake chamber diaphragm integrity is to:

- A. Apply battery voltage to the diaphragm for diagnostic testing during service
- B. Estimate diaphragm condition visually using shop lighting during the inspection process
- C. Apply pressure to the chamber and check for external air leakage at multiple positions
- D. Listen for diaphragm operation with a stethoscope during normal brake application

36. The proper inspection procedure for heavy-duty foundation brake S-cam bushing condition includes:

- A. Verification of bushing wear, lubrication condition, and freedom from binding during operation
- B. External paint condition and decal placement during the inspection process
- C. Engine compatibility verification with the foundation brake during service procedures

D. Vehicle type compatibility with the foundation brake during service operations

37. The proper torque application for heavy-duty truck S-cam mounting hardware is determined by:

- A. Visual estimation based on hardware size during installation procedures
- B. Standard automotive torque specifications for similar hardware diameter applications
- C. Maximum torque applied during installation without measurement requirement
- D. Manufacturer service information specific to the foundation brake assembly model

38. The proper procedure for verifying heavy-duty truck brake hose condition during service includes:

- A. Apply battery voltage to the brake hoses for diagnostic testing during service
- B. Inspect for cracks, swelling, abrasion, and leakage at all connection points
- C. Listen for hose damage with a stethoscope during normal brake application
- D. Replace all brake hoses as preventive maintenance regardless of condition

39. The proper measurement procedure for heavy-duty truck hydraulic brake fluid specific gravity is to:

- A. Use a brake fluid hydrometer or refractometer per service information specifications
- B. Apply battery voltage to the fluid for diagnostic testing during measurement
- C. Listen for fluid condition with a stethoscope during normal vehicle operation
- D. Estimate fluid condition visually using shop lighting during the inspection process

40. The proper service procedure when reusing a heavy-duty truck wheel cylinder during brake service is:

- A. Reuse the wheel cylinder regardless of condition since wheel cylinders do not degrade
- B. Apply maximum torque during installation to compensate for any wear during service

- C. Inspect cylinder bore for scoring, replace seals, or replace cylinder per condition findings
- D. Apply anti-seize compound to all sealing surfaces during the installation procedure

41. The proper procedure for verifying heavy-duty truck master cylinder operation is to:

- A. Test pedal feel, pressure capability, and fluid level retention through diagnostic procedures
- B. Apply battery voltage to the master cylinder for diagnostic testing during service
- C. Listen for master cylinder operation with a stethoscope during normal brake application
- D. Replace the master cylinder as preventive maintenance regardless of condition

42. Heavy-duty truck wheel bearing torque procedure per TMC RP 618 includes:

- A. Maximum torque application without preload verification during the procedure
- B. Standard torque values without rotation requirement during the installation
- C. Apply battery voltage to the bearings for diagnostic testing during installation
- D. Tighten while rotating, back off, then retighten to specification per RP 618

43. The proper procedure for inspecting heavy-duty truck brake drum thickness during service is:

- A. Apply battery voltage to the drum for diagnostic testing during measurement
- B. Measure drum diameter and compare to maximum-allowable specification value
- C. Listen for drum thickness with a stethoscope during normal brake application
- D. Estimate thickness visually using shop lighting during the inspection process

44. The proper torque application for heavy-duty truck brake drum mounting hardware is determined by:

- A. Maximum torque applied during installation without measurement requirement

- B. Standard automotive torque specifications for similar hardware diameter applications
- C. Manufacturer service information specific to the brake drum assembly application
- D. Visual estimation based on hardware size during installation procedures

45. The proper procedure for verifying heavy-duty truck spring brake chamber operation is to:

- A. Apply battery voltage to the chamber for diagnostic testing during service
- B. Verify air pressure release engages parking brakes and pressure restoration releases them
- C. Listen for chamber operation with a stethoscope during normal vehicle operation
- D. Replace the chamber as preventive maintenance regardless of condition

46. The proper procedure for heavy-duty truck brake fluid replacement during service is to:

- A. Add new fluid to existing fluid without removing old fluid during service procedures
- B. Apply battery voltage to the master cylinder for diagnostic testing during service
- C. Listen for brake fluid condition with a stethoscope during normal vehicle operation
- D. Flush the entire system and refill with new fluid per manufacturer specifications

47. The proper inspection procedure for heavy-duty foundation brake automatic slack adjuster wear is to:

- A. Apply battery voltage to the slack adjuster for diagnostic testing during service
- B. Verify free rotation of the adjustment mechanism and check for excessive wear or binding
- C. Listen for slack adjuster operation with a stethoscope during normal brake application
- D. Replace the slack adjuster as preventive maintenance regardless of condition

48. The proper procedure for verifying heavy-duty truck air system check valve operation is to:

- A. Apply battery voltage to the check valve for diagnostic testing during service
- B. Listen for check valve operation with a stethoscope during normal vehicle operation
- C. Test for proper one-way flow and pressure retention per service information procedures
- D. Replace the check valve as preventive maintenance regardless of condition

49. The proper measurement procedure for heavy-duty truck brake lining thickness during inspection is to:

- A. Apply battery voltage to the lining for diagnostic testing during measurement
- B. Listen for lining wear with a stethoscope during normal brake application
- C. Estimate lining thickness visually using shop lighting during the inspection process
- D. Measure remaining lining material from the lining surface to the rivet head locations

50. The proper torque application for heavy-duty truck wheel hub bearing nut during installation is:

- A. Maximum torque applied during installation without measurement requirement
- B. Per TMC RP 618 procedure including initial torque, rotation, back-off, and final torque
- C. Standard automotive torque specifications for similar nut diameter applications
- D. Visual estimation based on nut size during the installation procedure

ANSWER KEY AND EXPLANATIONS

1. B — Technician A only. Heavy-duty wheel lug nut torque builds in stages from approximately 100 ft-lbs to final specification (typically 450 to 500 ft-lbs per TMC RP 237) using a star pattern. Single-pass maximum torque produces uneven clamping force across the studs, leading to potential wheel separation or stud failure during operation.
2. A — 3 PSI in 1 minute measured during the leak test procedure. The federal standard establishes 3 PSI per minute as the maximum acceptable leak rate with engine off and brakes applied for single tractors. The applied-brake leak test verifies sealing of the entire service brake circuit including chambers; rates exceeding this specification indicate brake system faults requiring service.
3. C — Apply 90 to 100 PSI to the chamber and measure stroke from released to applied position. Brake chamber pushrod stroke measurement at full service application pressure (90–100 PSI) provides accurate stroke values that reflect actual operating conditions. Lower-pressure measurements understate stroke and can mask out-of-service conditions during inspection.
4. D — Excessive transmission fluid level above the maximum fill mark indication. Transmission fluid level is unrelated to brake chamber pushrod stroke. The other choices all directly cause excessive pushrod stroke through their effect on foundation brake clearance: worn lining, failed slack adjuster, and excessive drum diameter.
5. A — 100 to 125 PSI on most fleet applications during normal operation. Cut-out pressure on heavy-duty trucks is typically set within 100 to 125 PSI, with specific values varying by manufacturer and application. The range provides adequate operating pressure for service brake performance while protecting components from over-pressurization.
6. C — Technician A only. Heavy-duty wheel lug nut torque specifications vary by manufacturer, application, stud size, and grade, requiring verification before service. Universal torque specifications do not apply across all heavy-duty trucks because different applications use different stud configurations that require specific torque values.
7. B — Use a brake drum micrometer at multiple positions across the friction surface. Brake drum diameter measurement requires a brake drum micrometer at multiple positions (typically 4 or more) across the friction surface to detect both maximum diameter and ovality. Single-position measurements miss out-of-round conditions that affect brake performance.
8. D — 2 inches measured at 90–100 PSI during inspection procedures. CVSA out-of-service criteria for Type 30 chambers establish 2 inches as the maximum allowable pushrod stroke at 90–100 PSI applied pressure. Stroke at or beyond this limit places the truck out of service because excessive stroke compromises braking force delivery.

9. A — Technician A only. Air dryer desiccant cartridges are typically replaced every 1 to 2 years for most fleet applications because the desiccant material chemically degrades over time. Cleaning and reusing desiccant is not effective because the material structure deteriorates with use, regardless of visual condition.
10. C — Manufacturer service information specific to the slack adjuster model and bolt grade. Slack adjuster mounting bolt torque values come from manufacturer service information specific to the slack adjuster model and bolt grade. Standard automotive specifications and visual estimation are inadequate for heavy-duty equipment because incorrect torque can cause component failure or improper brake function.
11. D — Build pressure to cut-out, shut off engine, and measure pressure decay over 1 minute. The FMVSS 121 leak test with brakes released requires building system pressure to cut-out, shutting off the engine, and measuring pressure decay over 1 minute. The test isolates the supply system from compressor influence to identify air leakage in storage and supply components.
12. C — Governor signal during compressor cut-out events during normal operation. The air dryer purge valve is activated by a signal from the governor at each compressor cut-out event, releasing accumulated moisture and contamination from the dryer through the purge port. This cyclic purging keeps the desiccant material functional throughout normal compressor operating cycles.
13. A — Reduce system pressure with engine off until the warning device activates. The proper test method is to reduce pressure (typically by fanning the brake pedal) with engine off and observe the pressure reading when the warning device activates. The warning must activate at or above 60 PSI per FMVSS 121; activation outside this range indicates a faulty switch or warning system.
14. B — 60 PSI per FMVSS 121 specifications during operation. The low-pressure warning device must activate at or above 60 PSI to alert the driver before pressure drops to a level that compromises stopping capability. The federal standard establishes this threshold to ensure adequate warning time for safe vehicle stopping.
15. D — Inspect threads, replace any damaged bolts, and torque to specification per service info. Reusing brake chamber mounting bolts during service requires thread inspection, replacement of damaged bolts, and torque to specification per service information. Damaged threads cannot maintain proper torque and may strip during installation, compromising chamber retention.
16. A — Verification of cracks at bolt boss areas, bore wear at bearing locations, and fastener condition. Foundation brake hardware inspection during service requires verification of cracks at bolt boss areas (where stress concentrates), bore wear at bearing locations (which affects component seating), and fastener condition (which affects torque retention).
17. C — Observe pushrod stroke at various wear levels and confirm self-adjustment function. Automatic slack adjuster verification requires observing pushrod stroke at various lining wear

levels and confirming that the adjuster self-adjusts to maintain proper stroke. Failed automatic adjusters allow stroke to grow as lining wears, eventually exceeding service limits.

18. B — Type 20 or Type 24 chambers on most heavy-duty Class 8 tractor applications. Steer axle brake chambers on most heavy-duty Class 8 tractors are typically Type 20 or Type 24, smaller than the Type 30 chambers commonly used on drive axles. The smaller chamber size reflects the reduced braking force requirement at the steer axle compared to the heavily loaded drive axles.
19. D — Per manufacturer service information specific to the chamber and bracket model. Brake chamber to bracket mounting bolt torque values come from manufacturer service information specific to the chamber and bracket model. Standard automotive specifications and visual estimation are inadequate for heavy-duty equipment because incorrect torque can cause chamber separation or improper brake function.
20. A — 65 PSI applied to the parking brake control circuit during operation. The minimum air pressure required to release spring brake chambers is typically 65 PSI; below this pressure, the spring force in the chamber overcomes the air pressure and the parking brakes engage automatically. This threshold provides the fail-safe parking brake function mandated by FMVSS 121.
21. A — Technician A only. Brake shoe return springs are required on all heavy-duty foundation brakes regardless of slack adjuster type. Return springs pull the shoes away from the drum when air pressure is released, providing the running clearance between lining and drum during normal driving. Automatic slack adjusters do not eliminate the need for return springs.
22. C — Inspect for air leakage and excessive demand sources before component replacement. Frequent compressor cycling indicates pressure loss between cut-out and cut-in occurring faster than normal, either from system leakage or excessive accessory air consumption. Inspection of these causes before component replacement identifies the actual problem and prevents unnecessary parts replacement.
23. B — Use the manual caging bolt to mechanically compress the spring before disassembly. Caging mechanically compresses the parking brake spring, preventing it from extending dangerously when the chamber is removed. Working on a non-caged spring brake chamber risks serious injury or death from the explosive release of the high-force spring.
24. D — 1,500 to 2,500 pounds during parking brake engagement events. Heavy-duty truck spring brake chambers typically use spring force in the 1,500 to 2,500 pound range to engage parking brakes mechanically when air pressure is released. The high spring force ensures positive parking brake application even on grades with heavy loads.
25. A — Technician A only. Hydraulic brake fluid is hygroscopic, absorbing moisture from the atmosphere through brake hoses, reservoir vents, and seals over time. Even sealed systems experience moisture absorption because brake fluid contacts atmospheric moisture through small

openings and material permeation. Periodic fluid replacement is required to maintain proper system function.

26. C — Bleed wheel cylinders in sequence per manufacturer service information specifications. Hydraulic brake bleeding follows a specific sequence per manufacturer service information, typically starting at the wheel furthest from the master cylinder and progressing closer. The sequence ensures all air is purged from the system without re-introducing air at upstream components.
27. B — Always use new fluid; reused brake fluid contains contamination from prior service. Hydraulic brake fluid should never be reused because exposed fluid absorbs moisture and contamination during service. New fluid maintains the chemical properties (boiling point, viscosity, corrosion protection) required for proper system function. Filtering does not restore the chemical properties of contaminated fluid.
28. D — Per manufacturer service information using a calibrated flare-nut wrench when applicable. Hydraulic brake line fitting torque values come from manufacturer service information, applied using a calibrated flare-nut wrench when fittings are flare-nut style. The flare-nut wrench prevents damage to the fitting during torque application; over-torque damages the seat, while under-torque allows leakage.
29. A — Air pressure powers a hydraulic actuator that develops fluid pressure for wheel cylinders. Air-over-hydraulic systems use compressed air to power a hydraulic actuator (sometimes called a hydraulic boost or air-pack), which develops fluid pressure for the wheel cylinders. This combination provides the high force capability of air systems with the actuation method of hydraulic brakes.
30. C — Connect a scan tool to retrieve ABS fault codes and review system data systematically. ABS warning lamp illumination indicates the controller has detected a fault and disabled some or all ABS function. Scan tool retrieval of fault codes points directly to the specific fault location, allowing targeted diagnosis without unnecessary parts replacement.
31. C — Use a feeler gauge between the sensor face and the tone ring per service information. ABS wheel speed sensor air gap is measured using a feeler gauge between the sensor face and the tone ring per manufacturer service information. The measurement guides whether the sensor requires adjustment, repositioning, or replacement to achieve proper signal generation.
32. A — 0.040 to 0.060 inches measured per manufacturer service specifications. The maximum allowable ABS wheel speed sensor air gap on most heavy-duty applications is typically 0.040 to 0.060 inches per manufacturer service specifications. Air gap exceeding this range produces weak or absent signals that the controller cannot reliably interpret, leading to ABS faults.
33. D — Use scan tool to command modulator operation during diagnostic testing. ABS modulator valve verification uses scan tool commanded operation during diagnostic testing. The scan tool

commands the modulator through its operating cycle while monitoring response, identifying whether the modulator responds correctly to control commands. Voltage application and stethoscope listening cannot verify functional operation accurately.

34. B — Investigate the underlying cause rather than continuing to clear without correction. ABS fault codes that return immediately after clearing indicate the underlying fault is still active. Continuing to clear without correction wastes service time and may mask conditions that need attention. The proper approach is to investigate why the fault is setting and correct the actual cause.
35. C — Apply pressure to the chamber and check for external air leakage at multiple positions. Brake chamber diaphragm integrity is verified by applying pressure to the chamber and checking for external air leakage at multiple positions around the chamber. Diaphragm damage produces audible leakage; soap solution applied to the chamber surface confirms the leak source location.
36. A — Verification of bushing wear, lubrication condition, and freedom from binding during operation. S-cam bushing inspection during service requires verification of bushing wear (within service specification), lubrication condition (proper grease distribution), and freedom from binding (smooth operation through the operating range). All three conditions affect proper foundation brake operation.
37. D — Manufacturer service information specific to the foundation brake assembly model. S-cam mounting hardware torque values come from manufacturer service information specific to the foundation brake assembly model. Standard automotive specifications and visual estimation are inadequate for heavy-duty equipment because incorrect torque can cause component failure or improper brake function.
38. B — Inspect for cracks, swelling, abrasion, and leakage at all connection points. Brake hose inspection requires checking for cracks (from age and flex cycles), swelling (from internal damage), abrasion (from contact with other components), and leakage at connection points. All four conditions can compromise hose integrity and brake system safety.
39. A — Use a brake fluid hydrometer or refractometer per service information specifications. Hydraulic brake fluid specific gravity is measured using a brake fluid hydrometer or refractometer per manufacturer service information. The measurement guides whether the fluid meets specification or has been contaminated by water or other fluids that change the specific gravity.
40. C — Inspect cylinder bore for scoring, replace seals, or replace cylinder per condition findings. Wheel cylinder service requires bore inspection for scoring or pitting, seal replacement during reassembly, and cylinder replacement if bore damage is beyond specification. The condition findings guide whether seal replacement alone is sufficient or whether the cylinder requires replacement.
41. A — Test pedal feel, pressure capability, and fluid level retention through diagnostic procedures. Master cylinder verification includes testing pedal feel (firm versus spongy), pressure capability

(holds pressure during application), and fluid level retention (no internal seal bypass causing reservoir drop). All three conditions confirm proper master cylinder operation.

42. D — Tighten while rotating, back off, then retighten to specification per RP 618. TMC RP 618 wheel bearing torque procedure requires tightening while rotating the wheel (to seat the bearings), backing off the adjusting nut, then retightening to specification. The rotation during initial torque ensures even bearing seating; the back-off prevents over-tightening; the final torque establishes proper preload or endplay per the recommended practice.
43. B — Measure drum diameter and compare to maximum-allowable specification value. Brake drum thickness verification is performed by measuring drum diameter and comparing to the maximum-allowable specification cast onto the drum or listed in service information. Drums exceeding maximum-allowable diameter must be replaced because they cannot safely transmit braking force.
44. C — Manufacturer service information specific to the brake drum assembly application. Brake drum mounting hardware torque values come from manufacturer service information specific to the brake drum assembly application. Standard automotive specifications and visual estimation are inadequate for heavy-duty equipment because incorrect torque can cause drum separation or improper foundation brake function.
45. B — Verify air pressure release engages parking brakes and pressure restoration releases them. Spring brake chamber operation verification includes verifying that air pressure release engages parking brakes (spring force applied) and that pressure restoration releases them (air pressure overcomes spring force). The dual verification confirms both engagement and release functions of the chamber.
46. D — Flush the entire system and refill with new fluid per manufacturer specifications. Hydraulic brake fluid replacement requires complete system flush followed by refilling with new fluid per manufacturer specifications. Adding new fluid to existing fluid does not address moisture contamination or chemical degradation throughout the system; complete fluid replacement is required.
47. B — Verify free rotation of the adjustment mechanism and check for excessive wear or binding. Automatic slack adjuster wear inspection includes verification of free rotation of the adjustment mechanism (no binding) and check for excessive wear or binding in the wear-compensating components. Both conditions affect the adjuster's ability to compensate for normal lining wear during operation.
48. C — Test for proper one-way flow and pressure retention per service information procedures. Air system check valve verification tests for proper one-way flow (allowing air in the intended direction) and pressure retention (preventing reverse flow). Failed check valves either block proper flow or allow reverse flow, both of which compromise system function.

49. D — Measure remaining lining material from the lining surface to the rivet head locations. Brake lining thickness measurement is taken from the lining surface to the rivet head locations, comparing to manufacturer minimum specifications. The measurement determines whether the lining can continue in service or requires replacement; lining at or below minimum thickness must be replaced.
50. B — Per TMC RP 618 procedure including initial torque, rotation, back-off, and final torque. Heavy-duty wheel hub bearing nut torque follows TMC RP 618 procedure including initial torque (to seat the bearings), rotation (to ensure even seating), back-off (to prevent over-tightening), and final torque (to establish proper preload or endplay). The procedure ensures consistent bearing service life and proper wheel hub function.