PRACTICE EXAM 3: T5 SIMULATION (50 QUESTIONS)

1. The maximum allowable steering wheel free play on a heavy-duty truck with a 20-inch steering wheel per CVSA out-of-service criteria is:

A. More than 5 inches at the steering wheel rim during inspection

B. More than 1 inch at the steering wheel rim during inspection

C. More than 12 inches at the steering wheel rim during inspection

D. More than 25 inches at the steering wheel rim during inspection

2. The proper measurement procedure for heavy-duty truck steering wheel free play is performed with:

A. The engine off and wheels turned to full lock during measurement

B. The engine off and steering wheel held at maximum rotation during measurement

C. The engine running at idle, wheels straight ahead, and pump at operating temperature

D. The engine at maximum RPM and steering pump at maximum pressure

3. The kingpin in a heavy-duty truck steer axle assembly serves as the:

A. Fastener that holds the wheel to the spindle during normal vehicle operation

B. Pivot point connecting the wheel spindle to the axle beam allowing steering rotation

C. Bearing that supports the wheel during normal operation conditions

D. Connection between the drag link and the wheel spindle during normal operation

4. The proper torque procedure for heavy-duty truck pitman arm to steering gear nut during installation is:

A. Maximum torque applied without measurement during the installation procedures

B. Standard automotive torque specifications for similar nut diameter applications

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

D. Per manufacturer service information specific to the gear and pitman arm model

5. The standard heavy-duty truck power steering pump pressure specification on most fleet applications is typically:

A. 1,500 to 2,000 PSI per manufacturer service specifications during operation

B. 100 to 200 PSI per manufacturer service specifications during operation

C. 5,000 to 7,000 PSI per manufacturer service specifications during operation

D. 35,000 PSI per manufacturer service specifications during operation

6. The proper procedure for verifying heavy-duty truck steering wheel free play is to:

A. Apply battery voltage to the steering system for diagnostic testing during measurement

B. Listen for steering wheel free play with a stethoscope during normal operation

C. Rock the wheel side to side at the rim and measure rim travel before wheel movement

D. Estimate free play visually using shop lighting during the inspection process

7. The CVSA out-of-service criterion for a worn or damaged steering component (tie rod, drag link, etc.) is:

A. Any wear visible during routine inspection regardless of severity during operation

B. Any movement at component connections that exceeds CVSA specification limits

C. Movement only when components are physically pulled apart during inspection

D. Component cracking visible during routine inspection regardless of severity

8. The proper procedure for installing a heavy-duty truck pitman arm onto a steering gear sector shaft is to:

A. Align the pitman arm reference mark with the sector shaft mark and torque per spec

B. Install the pitman arm in any orientation during the installation procedure

C. Apply battery voltage to the components during the installation procedure

D. Heat-treat the pitman arm before installation for proper fit during service

9. Heavy-duty truck steering gear input shaft splines connect to the:

A. Pitman arm directly through the steering linkage during normal operation

B. Front wheel spindle through a flexible coupling during normal operation

C. Drag link end at the wheel spindle during normal operation conditions

D. Steering column shaft from the steering wheel during normal operation

10. The proper procedure for verifying heavy-duty truck tie rod end condition is to:

A. Apply battery voltage to the tie rod end for diagnostic testing during service

B. Check for free movement, no excessive play, and intact dust boot per service info

C. Listen for tie rod end wear with a stethoscope during normal operation

D. Replace tie rod ends as preventive maintenance regardless of condition

11. The proper inspection procedure for heavy-duty truck kingpin condition includes verification of:

A. External paint condition and decal placement during the inspection process

B. Engine compatibility with the steer axle during service procedures

C. Vertical and horizontal play, lubrication condition, and freedom of movement

D. Vehicle type compatibility with the steer axle during service operations

12. The proper torque application for heavy-duty truck steering gear mounting hardware during installation is:

A. Per manufacturer service information specific to the steering gear model

B. Standard automotive torque specifications for similar bolt diameter applications

C. Maximum torque applied that the bolt can sustain without thread failure

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

13. The proper procedure when a heavy-duty truck shows steering gear input shaft seal leakage is:

A. Apply silicone sealer to the leak area to stop the leakage during the same service

B. Continue operation since minor seal leakage has minimal effect on steering operation

C. Apply battery voltage to the steering gear for diagnostic testing during service

D. Inspect for shaft wear, replace the seal, and verify proper fluid level after service

14. Heavy-duty truck integral hydraulic power steering uses:

A. Standard automotive engine oil specifications for normal operation conditions

B. Power steering fluid specified by the manufacturer per service information

C. Diesel fuel quality specifications for proper hydraulic system operation

D. Industrial lubricant specifications for heavy-duty applications during operation

15. The proper procedure for filling a heavy-duty truck power steering system after service is:

A. Fill the reservoir, run the engine briefly, cycle the steering, and verify fluid level

B. Fill the reservoir to maximum capacity without engine running during service

C. Apply battery voltage to the system for diagnostic testing during the fill procedure

D. Run the engine at maximum RPM during the fill procedure

16. Heavy-duty truck steering linkage components require:

A. Standard automotive lubricant suitable for similar applications during operation

B. Engine oil with extended-life synthetic formulation during service intervals

C. Specific grease per manufacturer service information at scheduled intervals

D. Hydraulic fluid suitable for industrial applications during normal operation

17. The proper procedure when a heavy-duty truck steering wheel shows excessive free play during inspection is to:

A. Replace the steering gear assembly as the most likely failure component during service

B. Apply battery voltage to the steering system for diagnostic testing during service

C. Continue operation since steering wheel free play has minimal effect on vehicle safety

D. Inspect linkage components systematically and adjust steering gear if internal wear is identified

18. The maximum allowable kingpin radial play on most heavy-duty truck applications is typically:

A. 0.005 to 0.010 inches measured at the wheel during inspection

B. 0.500 to 1.000 inches measured at the wheel during inspection

C. 0.250 to 0.500 inches measured at the wheel during inspection

D. 1.000 to 2.000 inches measured at the wheel during inspection

19. The proper torque specification for heavy-duty truck spring U-bolt nuts is determined by:

A. Standard automotive torque specifications for similar fastener diameter applications

B. Manufacturer service information specific to the suspension model and U-bolt grade

C. Maximum torque applied that the U-bolt can sustain without thread failure

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

20. The proper procedure for installing heavy-duty truck leaf springs during service is:

A. Replace one leaf at a time to maintain consistent spring rate across the assembly

B. Apply battery voltage to the leaf spring for diagnostic testing during service

C. Replace springs as a matched set per axle and torque U-bolts per service info

D. Clean existing springs with solvent and reinstall during the same service event

21. The function of brake-equivalent return springs in a heavy-duty truck suspension is to:

A. Apply force to the suspension during operation events during normal use

B. Return the suspension to ride height after compression during normal operation

C. Modulate suspension force during normal application events during operation

D. Filter compressed air before delivery to the suspension components during operation

22. The proper service action when a heavy-duty truck suspension shows leaf spring lining contaminated with grease from a failed wheel seal is to:

A. Apply additional suspension adjustment to compensate for reduced friction coefficient

B. Continue operation since grease contamination has minimal effect on spring performance

C. Clean the contaminated leaf with solvent and reinstall during the same service event

D. Replace the wheel seal AND inspect the leaf spring for damage from the contamination

23. The S-shaped support member in a heavy-duty truck rear suspension assembly serves as the:

A. Spring shackle that allows leaf spring length change during compression and extension

B. Fastener that holds the leaf spring to the axle during normal operation

C. Bearing that supports the rear axle during normal operation conditions

D. Connection between the leaf spring and the rear axle during normal operation

24. The proper inspection procedure for heavy-duty truck shock absorbers during service includes verification of:

A. External paint condition and decal placement during the inspection process

B. Engine compatibility with the suspension during service procedures

C. Damping function, mounting integrity, and absence of fluid leakage

D. Vehicle type compatibility with the suspension during service operations

25. Heavy-duty truck air ride suspension air bag pressure is typically maintained between:

A. 5 to 10 PSI during normal operation conditions

B. 50 to 100 PSI during normal operation conditions depending on load

C. 250 to 500 PSI during normal operation conditions during service

D. 1,000 to 2,000 PSI during normal operation conditions during service

26. The proper procedure for verifying heavy-duty truck air ride leveling valve operation is to:

A. Verify ride height measurement, observe valve response to load changes during inspection

B. Apply battery voltage to the valve for diagnostic testing during service

C. Listen for valve operation with a stethoscope during normal vehicle operation

D. Replace the valve as preventive maintenance regardless of condition

27. The most likely cause of a heavy-duty truck rear suspension that produces a clunking noise during direction change is:

A. Worn ring and pinion gears in the rear drive axle assembly during operation

B. A failed coolant temperature sensor reading falsely cold to the engine ECM

C. Excessive transmission fluid level above the maximum fill mark indication

D. Worn shackle bushings, U-bolts, or spring eye bushings during operation

28. The proper procedure when reusing leaf spring U-bolts during heavy-duty service is to:

A. Reuse all U-bolts regardless of condition since spring U-bolts are not torque-to-yield

B. Replace U-bolts during service per most manufacturer service information specifications

C. Apply maximum torque during installation to compensate for any thread wear

D. Apply anti-seize compound to all threads to ensure proper torque retention

29. The proper procedure for verifying heavy-duty truck air bag integrity during service is to:

A. Apply battery voltage to the air bag for diagnostic testing during service

B. Listen for air bag damage with a stethoscope during normal operation

C. Inspect for cracks, abrasion, contamination, and pressure retention per service info

D. Replace all air bags as preventive maintenance regardless of condition

30. The proper torque application for heavy-duty truck shock absorber mounting hardware is determined by:

A. Manufacturer service information specific to the shock absorber model and bolt grade

B. Standard automotive torque specifications for similar bolt diameter applications

C. Maximum torque applied that the bolt can sustain without thread failure

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

31. The proper procedure for verifying heavy-duty truck suspension ride height during service is to:

A. Apply battery voltage to the suspension for diagnostic testing during measurement

B. Listen for ride height issues with a stethoscope during normal operation

C. Estimate ride height visually using shop lighting during the inspection process

D. Measure suspension dimension at specified reference points per manufacturer service info

32. The proper inspection procedure for heavy-duty truck leaf spring eye bushings includes verification of:

A. Bushing wear, lubrication condition, and freedom from binding during operation

B. External paint condition and decal placement during the inspection process

C. Engine compatibility with the suspension during service procedures

D. Vehicle type compatibility with the suspension during service operations

33. The most accurate description of heavy-duty truck caster angle is:

A. Inward or outward tilt of the wheel as viewed from the front during inspection

B. Difference between front and rear distance measurements at the wheels in inches

C. Forward or rearward tilt of the kingpin as viewed from the side during inspection

D. Steering wheel position relative to wheel direction during normal operation

34. Heavy-duty truck positive caster angle is typically set in the range of:

A. 3 to 5 degrees forward (positive) on most heavy-duty steer axle applications

B. 1 to 2 degrees rearward (negative) on most heavy-duty steer axle applications

C. 10 to 15 degrees forward (positive) on most heavy-duty steer axle applications

D. 20 to 30 degrees rearward (negative) on most heavy-duty steer axle applications

35. The proper procedure for measuring heavy-duty truck wheel alignment angles is:

A. Apply battery voltage to the wheels for diagnostic testing during measurement

B. Listen for alignment-related noise with a stethoscope during normal operation

C. Estimate angles visually using shop lighting during the inspection process

D. Use specialized alignment equipment per manufacturer service procedures

36. The most accurate description of heavy-duty truck steering axis inclination (SAI) is:

A. Forward or rearward tilt of the kingpin as viewed from the side during inspection

B. Inward tilt of the kingpin/steering axis as viewed from the front during inspection

C. Difference between front and rear distance measurements at the wheels in inches

D. Steering wheel position relative to wheel direction during normal operation

37. Heavy-duty truck toe is typically expressed as a measurement in:

A. Inches or fractions of an inch (or millimeters) of toe-in or toe-out

B. Degrees and minutes of forward or rearward kingpin tilt during inspection

C. Pounds of force applied to the steering wheel during normal operation

D. PSI of hydraulic pressure during normal vehicle operation conditions

38. The proper procedure when a heavy-duty truck shows alignment angles outside service specification is to:

A. Continue operation since alignment angles have minimal effect on tire wear

B. Apply battery voltage to the alignment system for diagnostic testing during service

C. Adjust adjustable angles to specification, identify cause of non-adjustable angle deviation

D. Replace all alignment components as preventive maintenance during the same service

39. The proper service action when a heavy-duty truck shows tire wear that indicates dog-tracking is to:

A. Continue operation since dog-tracking has minimal effect on operation during use

B. Replace the rear axle assembly as preventive maintenance during the same service

C. Apply battery voltage to the alignment system for diagnostic testing during service

D. Verify thrust angle measurement and inspect for rear axle misalignment

40. The proper inspection procedure for heavy-duty truck thrust angle includes:

A. Apply battery voltage to the wheels for diagnostic testing during measurement

B. Verification of rear axle alignment relative to vehicle centerline using alignment equipment

C. Listen for thrust angle issues with a stethoscope during normal operation

D. Estimate thrust angle visually using shop lighting during the inspection process

41. The maximum allowable heavy-duty truck thrust angle on most fleet applications is typically:

A. Less than 0.10 degrees per manufacturer service specifications during operation

B. 1 to 2 degrees per manufacturer service specifications during operation

C. 3 to 5 degrees per manufacturer service specifications during operation

D. 10 to 15 degrees per manufacturer service specifications during operation

42. The proper procedure for measuring heavy-duty truck toe is to:

A. Apply battery voltage to the wheels for diagnostic testing during measurement

B. Listen for toe-related noise with a stethoscope during normal operation

C. Estimate toe visually using shop lighting during the inspection process

D. Use alignment equipment to measure distance between wheels at front and rear positions

43. The proper torque specification for heavy-duty truck wheel lug nuts on most fleet applications is:

A. 100 to 150 ft-lbs applied per TMC RP 237 specifications during installation

B. 450 to 500 ft-lbs applied per TMC RP 237 specifications during installation

C. 750 to 800 ft-lbs applied per TMC RP 237 specifications during installation

D. 1,000 to 1,500 ft-lbs applied per TMC RP 237 specifications during installation

44. Technician A says heavy-duty truck wheel bearing service follows TMC RP 618 procedures. Technician B says heavy-duty truck wheel bearing torque values may vary by manufacturer for specific applications. Who is correct?

A. Technician A only

B. Technician B only

C. Both Technician A and Technician B

D. Neither Technician A nor Technician B

45. The proper procedure for heavy-duty truck wheel bearing endplay measurement per TMC RP 618 is:

A. Apply battery voltage to the bearings for diagnostic testing during measurement

B. Use a dial indicator to measure axial movement at the wheel during inspection

C. Listen for endplay-related noise with a stethoscope at idle during operation

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

46. The maximum allowable wheel bearing endplay specification per TMC RP 618 is typically:

A. 0.025 to 0.050 inches measured at the wheel during inspection

B. 0.100 to 0.200 inches measured at the wheel during inspection

C. 0.500 to 1.000 inches measured at the wheel during inspection

D. 0.001 to 0.005 inches measured at the wheel during inspection

47. The proper procedure for tightening heavy-duty truck wheel hub bearing nuts per TMC RP 618 is:

A. Maximum torque applied without rotation requirement during the procedure

B. Tighten while rotating the wheel, back off, then retighten to specification per RP 618

C. Standard torque values without rotation during the installation procedures

D. Apply battery voltage to the bearings for diagnostic testing during installation

48. The proper procedure for heavy-duty truck tire pressure verification during service is:

A. Apply battery voltage to the tire for diagnostic testing during measurement

B. Listen for pressure with a stethoscope during normal operation

C. Use a calibrated tire pressure gauge per manufacturer service specifications

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

49. The proper service procedure when reusing wheel bearings during heavy-duty service is:

A. Reuse bearings without inspection regardless of condition during service

B. Apply maximum torque during installation to compensate for any wear during service

C. Inspect bearings for wear, lubricate properly, and replace if condition is beyond service limits

D. Apply anti-seize compound to all bearing surfaces during the installation procedure

50. The proper procedure for installing a heavy-duty truck wheel and torquing lug nuts is:

A. Apply battery voltage to the wheel for diagnostic testing during installation

B. Listen for wheel installation issues with a stethoscope during operation

C. Apply maximum torque to one nut before moving to the next nut during installation

D. Torque to specification in star pattern using a calibrated wrench in stages per RP 237

ANSWER KEY AND EXPLANATIONS

1. A — More than 5 inches at the steering wheel rim during inspection. CVSA out-of-service criterion for steering wheel free play on a 20-inch wheel is more than 5 inches at the rim. The 5-inch limit identifies trucks with severe linkage or gear wear that compromises steering control during operation; smaller free play within 2 inches is the service-quality specification, which is more permissive.

2. C — The engine running at idle, wheels straight ahead, and pump at operating temperature. Steering wheel free play measurement requires the engine running at idle (so hydraulic assist is active), wheels straight ahead (the centered position where free play is normally evaluated), and the steering pump at operating temperature (so fluid viscosity is normal). Measurement under any other condition produces inaccurate results.

3. B — Pivot point connecting the wheel spindle to the axle beam allowing steering rotation. The kingpin is the pivot point that connects the wheel spindle to the steer axle beam, allowing the spindle (and the wheel mounted to it) to rotate left and right for steering. Worn kingpins produce loose steering, wander, and irregular tire wear; proper kingpin condition is essential for steering geometry.

4. D — Per manufacturer service information specific to the gear and pitman arm model. Pitman arm to steering gear nut torque values come from manufacturer service information specific to the gear and pitman arm model. The torque is critical because the splined connection must hold under heavy steering loads; standard automotive specifications and visual estimation are inadequate for heavy-duty applications.

5. A — 1,500 to 2,000 PSI per manufacturer service specifications during operation. Heavy-duty truck power steering pump pressure specification on most fleet applications is typically 1,500 to 2,000 PSI per manufacturer service information. The high pressure is required to deliver the assist force needed for heavy axle loads; pressure below specification indicates pump wear or other supply system issues.

6. C — Rock the wheel side to side at the rim and measure rim travel before wheel movement. Steering wheel free play is measured by rocking the steering wheel side to side at the rim with the wheels straight ahead and observing how far the rim travels before the road wheels begin to turn. The travel at the rim is then compared to specification (typically 2 inches maximum on heavy-duty applications).

7. B — Any movement at component connections that exceeds CVSA specification limits. CVSA out-of-service criteria for steering components establish specific limits for movement at component connections (tie rod ends, drag link ends, pitman arm to gear). Any movement

exceeding these specification limits indicates wear that compromises steering control and requires service before the truck returns to operation.

8. A — Align the pitman arm reference mark with the sector shaft mark and torque per spec. Pitman arm installation requires alignment of the pitman arm reference mark with the sector shaft mark (typically a punch mark or paint mark), then torque to specification. The reference mark ensures proper steering geometry; misalignment results in incorrect steering wheel position relative to wheel direction.

9. D — Steering column shaft from the steering wheel during normal operation. The steering gear input shaft splines connect to the steering column shaft from the steering wheel, transmitting driver input to the gear. The gear converts the rotational input to the linear output at the pitman arm; the splined connection must transmit torque without slippage or wear.

10. B — Check for free movement, no excessive play, and intact dust boot per service info. Tie rod end inspection requires verification of free movement (no binding), no excessive play (axial or radial), and intact dust boot condition (preventing contamination entry) per service information. All three conditions must be acceptable; any issue requires replacement to maintain proper steering control.

11. C — Vertical and horizontal play, lubrication condition, and freedom of movement. Kingpin inspection requires verification of vertical play (axial movement up and down), horizontal play (radial movement at the spindle), lubrication condition (proper grease distribution at the bearing), and freedom of movement (smooth rotation through the steering arc). All conditions must be within specification.

12. A — Per manufacturer service information specific to the steering gear model. Steering gear mounting hardware torque values come from manufacturer service information specific to the gear model. The torque is critical because the gear must remain rigidly mounted to handle heavy steering loads; standard automotive specifications and visual estimation are inadequate for heavy-duty applications.

13. D — Inspect for shaft wear, replace the seal, and verify proper fluid level after service. Steering gear input shaft seal leakage requires inspection of the shaft sealing surface (worn shafts damage new seals), seal replacement, and fluid level verification after service. Continuing operation with leakage causes pump damage from low fluid; sealer applications cannot reliably stop the leak.

14. B — Power steering fluid specified by the manufacturer per service information. Heavy-duty truck integral hydraulic power steering uses power steering fluid specified by the manufacturer. While some applications use ATF (Type F or Dexron variants), others require specific power steering fluids; using incorrect fluid can damage seals and reduce service life. Service information must be consulted for each application.

15. A — Fill the reservoir, run the engine briefly, cycle the steering, and verify fluid level. Power steering system fill after service requires the reservoir to be filled to the proper level, the engine run briefly, the steering cycled lock to lock to purge air, and final fluid level verified. The cycling expels air from the system; verification ensures proper fluid level after the air is removed.

16. C — Specific grease per manufacturer service information at scheduled intervals. Steering linkage components (tie rod ends, drag link ends, kingpins, etc.) require specific grease per manufacturer service information at scheduled intervals. The grease type matters because steering operating conditions require specific viscosity and additive packages that standard chassis grease may not provide for proper component life.

17. D — Inspect linkage components systematically and adjust steering gear if internal wear is identified. Excessive steering wheel free play requires systematic inspection of linkage components (tie rod ends, drag link ends, kingpin) and steering gear adjustment if internal wear is identified. The systematic approach identifies the actual source; gear replacement or rebuild is reserved for cases where adjustment cannot bring free play within specification.

18. A — 0.005 to 0.010 inches measured at the wheel during inspection. Maximum allowable kingpin radial play on most heavy-duty applications is 0.005 to 0.010 inches measured at the wheel. Play exceeding this specification indicates kingpin or bushing wear that compromises steering geometry and produces wander or irregular tire wear; service is required to restore proper steering control.

19. B — Manufacturer service information specific to the suspension model and U-bolt grade. Spring U-bolt nut torque values come from manufacturer service information specific to the suspension model and U-bolt grade. The torque is critical because U-bolts must clamp the axle to the leaf spring under high load conditions; insufficient torque allows axle movement that fatigues components.

20. C — Replace springs as a matched set per axle and torque U-bolts per service info. Leaf spring installation requires matched-set replacement per axle (to maintain balanced spring rate and load capacity) and U-bolt torque per service information. Single-leaf replacement creates unequal spring rate; voltage application has no relevance to mechanical spring components; cleaning worn springs does not restore service life.

21. B — Return the suspension to ride height after compression during normal operation. Suspension return springs return the suspension to ride height after compression during normal operation. The spring force restores the natural ride height when load is removed or after the suspension cycles over an irregularity; this return action is essential for maintaining proper geometry and ride quality.

22. D — Replace the wheel seal AND inspect the leaf spring for damage from the contamination. Grease-contaminated leaf spring requires wheel seal replacement (addressing the contamination source) and inspection of the leaf for damage. Grease contamination accelerates leaf wear and may damage spring eye bushings; both the source and affected components must be addressed.

23. A — Spring shackle that allows leaf spring length change during compression and extension. The spring shackle is the S-shaped support member that allows the leaf spring to change length as it compresses and extends during normal operation. As the spring flexes, its actual length changes slightly; the shackle accommodates this length change while maintaining the spring's rear connection to the chassis.

24. C — Damping function, mounting integrity, and absence of fluid leakage. Shock absorber inspection requires verification of damping function (smooth resistance through extension and compression), mounting integrity (no broken or worn mounts), and absence of fluid leakage (which indicates internal damage). All three conditions must be acceptable for the shock to function properly.

25. B — 50 to 100 PSI during normal operation conditions depending on load. Heavy-duty truck air ride suspension air bag pressure is typically maintained between 50 and 100 PSI depending on load. The pressure adjusts automatically as load changes; the leveling valves add air as load increases (suspension compresses) and release air as load decreases (suspension extends).

26. A — Verify ride height measurement, observe valve response to load changes during inspection. Air ride leveling valve verification involves measuring ride height (confirming proper height with no load change), then observing valve response to load changes (adding or releasing air to maintain ride height). The combination verifies both the static set point and the dynamic response of the valve.

27. D — Worn shackle bushings, U-bolts, or spring eye bushings during operation. Rear suspension clunking during direction change indicates worn components allowing movement under load reversal. Shackle bushings, U-bolts, and spring eye bushings all carry load during driving force transmission; wear in any of these allows the characteristic clunking sound during direction changes.

28. B — Replace U-bolts during service per most manufacturer service information specifications. Most manufacturer service information specifies U-bolt replacement during service rather than reuse. U-bolts experience cyclic loading during normal operation and may have hidden damage not visible during inspection; replacement during service ensures proper clamping force and prevents progressive failure.

29. C — Inspect for cracks, abrasion, contamination, and pressure retention per service info. Air bag inspection requires checking for cracks (from age and flex cycles), abrasion (from contact with chassis or other components), contamination (oil or chemical exposure), and pressure retention (per service information procedures). All four conditions must be acceptable for the air bag to function properly.

30. A — Manufacturer service information specific to the shock absorber model and bolt grade. Shock absorber mounting hardware torque values come from manufacturer service information specific to the shock model and bolt grade. The torque is critical because the mounts must hold the shock

under heavy cyclic loads; standard automotive specifications and visual estimation are inadequate for heavy-duty applications.

31. D — Measure suspension dimension at specified reference points per manufacturer service info. Suspension ride height verification requires measuring the suspension dimension at specified reference points per manufacturer service information. The reference points (typically frame to axle distances or specific component-to-component measurements) are compared to specification to confirm proper ride height across the suspension.

32. A — Bushing wear, lubrication condition, and freedom from binding during operation. Leaf spring eye bushing inspection requires verification of bushing wear (within service specification), lubrication condition (proper grease distribution), and freedom from binding (smooth movement through the operating range). All three conditions affect proper suspension operation during driving force transmission.

33. C — Forward or rearward tilt of the kingpin as viewed from the side during inspection. Caster angle is the forward (negative) or rearward (positive) tilt of the kingpin (or steering axis) as viewed from the side of the truck. Positive caster provides directional stability and self-centering; on heavy-duty trucks, caster is typically set positive to maintain straight-line stability under heavy axle loads.

34. A — 3 to 5 degrees forward (positive) on most heavy-duty steer axle applications. Heavy-duty truck positive caster angle is typically set in the range of 3 to 5 degrees forward (positive) on most steer axle applications. This range provides directional stability and steering self-centering force; excessive caster increases steering effort, while insufficient caster reduces stability.

35. D — Use specialized alignment equipment per manufacturer service procedures. Wheel alignment angles are measured using specialized alignment equipment (computerized alignment racks, laser-based systems) per manufacturer service procedures. The equipment accurately measures angles in degrees and minutes; visual estimation cannot achieve the precision required for proper alignment.

36. B — Inward tilt of the kingpin/steering axis as viewed from the front during inspection. Steering axis inclination (SAI) is the inward tilt of the kingpin (or steering axis) as viewed from the front. SAI is a non-adjustable design angle that contributes to steering self-centering and reduces scrub radius; the angle is checked during alignment to identify damaged components.

37. A — Inches or fractions of an inch (or millimeters) of toe-in or toe-out. Heavy-duty truck toe is typically expressed as a measurement in inches or fractions of an inch (or millimeters in metric) of toe-in or toe-out. The measurement reflects the difference between front and rear distance measurements at the wheels; degrees can also be used but inches/millimeters are the common heavy-duty truck convention.

38. C — Adjust adjustable angles to specification, identify cause of non-adjustable angle deviation. Alignment angles outside service specification require adjustment of adjustable angles (toe, sometimes camber) to specification. Non-adjustable angles outside specification (caster, included angle, SAI) indicate damaged components requiring identification and replacement before alignment can be properly completed.

39. D — Verify thrust angle measurement and inspect for rear axle misalignment. Tire wear indicating dog-tracking requires thrust angle verification and inspection for rear axle misalignment. Thrust angle measures rear axle direction relative to vehicle centerline; misalignment causes the truck to track sideways during driving, producing the characteristic tire wear pattern.

40. B — Verification of rear axle alignment relative to vehicle centerline using alignment equipment. Thrust angle inspection requires verification of rear axle alignment relative to vehicle centerline using alignment equipment. The measurement determines whether the rear axle directs the vehicle straight ahead or at an angle; improper thrust angle causes dog-tracking and aggressive tire wear.

41. A — Less than 0.10 degrees per manufacturer service specifications during operation. Maximum allowable heavy-duty truck thrust angle on most fleet applications is less than 0.10 degrees per manufacturer service specifications. Even small thrust angle deviations produce noticeable dog-tracking and accelerated tire wear over highway distances; the tight specification reflects the importance of proper rear axle alignment.

42. D — Use alignment equipment to measure distance between wheels at front and rear positions. Toe measurement uses alignment equipment to measure the distance between wheels at front and rear positions. The difference between these measurements indicates toe-in (front closer than rear) or toe-out (front wider than rear). Modern computerized alignment racks display this measurement directly; manual toe gauges measure the same dimension.

43. B — 450 to 500 ft-lbs applied per TMC RP 237 specifications during installation. TMC RP 237 establishes 450 to 500 ft-lbs as the standard heavy-duty wheel lug nut torque for most fleet applications. The specification ensures proper stud loading without exceeding the design strength of the studs or hub.

44. C — Both Technician A and Technician B. Heavy-duty truck wheel bearing service follows TMC RP 618 procedures, which establish industry-standard practices. However, manufacturer service information may specify variations for specific applications (different bearing types, axle configurations, or load ratings). Both sources contribute to the proper service procedure for any specific truck.

45. B — Use a dial indicator to measure axial movement at the wheel during inspection. Wheel bearing endplay is measured using a dial indicator at the wheel during inspection per TMC RP 618. The indicator displays total axial movement when the wheel is pushed and pulled; the reading is compared to specification to verify proper bearing adjustment.

46. D — 0.001 to 0.005 inches measured at the wheel during inspection. Maximum allowable wheel bearing endplay specification per TMC RP 618 is typically 0.001 to 0.005 inches measured at the wheel. Endplay within this range allows proper bearing operation without preload that would cause heat buildup; endplay exceeding specification allows wheel oscillation and bearing damage.

47. B — Tighten while rotating the wheel, back off, then retighten to specification per RP 618. TMC RP 618 procedure includes 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.

48. C — Use a calibrated tire pressure gauge per manufacturer service specifications. Tire pressure verification uses a calibrated tire pressure gauge per manufacturer service specifications. The gauge accuracy directly affects whether the tire is properly inflated; uncalibrated gauges produce errors that lead to underinflation or overinflation, both of which cause irregular wear and reduced service life.

49. C — Inspect bearings for wear, lubricate properly, and replace if condition is beyond service limits. Wheel bearing reuse during service requires inspection for wear, proper lubrication during reassembly, and replacement if bearing condition is beyond service limits. Bearings showing pitting, scoring, or excessive wear must be replaced; serviceable bearings can be reused with proper lubrication and adjustment.

50. D — Torque to specification in star pattern using a calibrated wrench in stages per RP 237. Heavy-duty wheel installation uses a star pattern in stages with a calibrated torque wrench, building from initial torque to final specification across multiple passes per TMC RP 237. The pattern ensures even clamping force across all studs without distortion; random sequences and corner-first patterns produce uneven clamping that compromises wheel retention.