PRACTICE EXAM 10: ASE T5 SIMULATION (50 QUESTIONS)

1. A heavy-truck rear suspension uses a four-spring tandem-axle leaf-spring design. The most heavily stressed component during severe braking is:

A. The forward chassis hanger bolt

B. The leaf spring transmitting longitudinal braking torque

C. The leveling valve linkage

D. The rear shackle bushing

2. The proper procedure for adjusting wheel bearing endplay using TMC RP 618 begins with:

A. Pre-adjusting the inner spindle nut to approximately 200 ft-lb while rotating the hub

B. Tightening the inner nut to 50 ft-lb until the hub stops rotating

C. Backing off the inner nut a full turn before any torque is applied

D. Installing the lock washer first to keep the assembly seated

3. A heavy-truck driver complains of a shimmy at the steering wheel that occurs above 50 mph and disappears at lower speeds. After verifying balance and tire condition are correct, the next inspection priority is:

A. Power steering pump output pressure

B. Cab leveling valve adjustment

C. Front-end linkage and kingpin bushings for wear

D. Front spring U-bolt torque

4. The proper response when a heavy-truck driver complains of a noisy power steering pump that gets louder during right-hand turns is to:

A. Replace the pump immediately

B. Verify fluid level and check for air ingestion in the suction line

C. Adjust toe at the tie rod adjusting sleeves

D. Re-torque the front spring U-bolts

5. A heavy-truck oil-bath wheel-end has been operated with discolored oil that contains visible metal particles. The technician should:

A. Drain the oil and refill with fresh fluid only

B. Top off the oil level and continue service

C. Replace the inboard seal and continue service

D. Disassemble the hub and inspect bearings for damage before any further service

6. A heavy-truck driver complains that the steering wheel feels loose at the center and tightens up during turns. The most likely cause is:

A. Excessive sector shaft lash producing on-center looseness

B. Worn fifth wheel locking jaws

C. Mismatched front tire pressures

D. A bent pitman arm

7. The proper procedure for measuring caster on a heavy-truck front wheel requires:

A. Lifting the front axle off the ground

B. Holding the steering wheel at full left lock

C. Turning the wheel through a calibrated angle on an alignment turntable

D. Disconnecting the drag link from the pitman arm

8. A heavy-truck rear suspension uses an air-spring design. The technician notes the bags inflate normally but the chassis sits 2 inches above design ride height. The most likely cause is:

A. A leaking pressure-protection valve

B. The height control valve linkage rod has been adjusted too long

C. Worn upper torque rod bushings

D. Excessive front spring U-bolt torque

9. The proper procedure for inflating a heavy-truck multi-piece rim wheel is:

A. Inflate at a remote location away from any structures

B. Stand directly in line with the rim during inflation

C. Use a hand-held inflation chuck for precise control

D. Use a tire cage with a clip-on remote inflation chuck while standing outside the trajectory zone

10. A heavy-truck driver complains of vibration that occurs at all speeds and does not change with cornering load. The most likely cause is:

A. An imbalanced wheel-and-tire assembly or out-of-round drivetrain component

B. A worn front wheel bearing

C. Mismatched front tire pressures

D. Excessive caster on both front wheels

11. Technician A says the integral hydraulic steering gear contains a torsion bar that twists during steering input to direct fluid flow. Technician B says the torsion bar is also responsible for engaging the kingpin retention mechanism. Who is correct?

A. Both A and B

B. A only

C. A only

D. Neither A nor B

12. The proper response when a heavy-truck driver complains that the truck's chassis sits noticeably tilted when parked, but levels itself when the engine starts is:

A. Replace the cab air shock absorbers

B. Inspect for a leaking air bag or air supply line on the lower side

C. Re-torque the front spring U-bolts

D. Adjust the rear axle thrust angle

13. The component on a heavy-truck chassis that resists axle wind-up under acceleration and braking torque on an air-spring rear suspension is the:

A. Drag link

B. Stabilizer bar

C. Cab leveling valve

D. Torque rod

14. A heavy-truck steer axle measures camber within specification on both wheels and includes angle within specification on both wheels. The driver complains of accelerated outside-shoulder wear on the right front tire. The most likely cause is:

A. Excessive toe-in producing outside-edge wear on both tires

B. Worn right front kingpin bushings

C. A bent right steering knuckle

D. Mismatched front tire pressures

15. The proper response when a heavy-truck driver complains of a slight pull during cornering that disappears at steady tracking is:

A. Replace the front shock absorbers immediately

B. Adjust the cab leveling valve

C. Inspect the drag link ball studs for transient looseness during steering

D. Drain and replace power steering fluid

16. A heavy-truck integral hydraulic steering gear's pressure relief valve typically opens at:

A. 600 to 800 psi

B. 1,500 to 2,200 psi

C. 2,500 to 3,500 psi

D. 4,000 to 5,000 psi

17. The proper response when a heavy-truck wheel has been operated for an extended period with extremely loose nuts is:

A. Apply additional torque beyond specification

B. Add lock washers between the nuts and the wheel face

C. Continue service if the nuts are now properly torqued

D. Inspect studs for damage and fatigue cracks, replacing as needed

18. The component that locates the heavy-truck front spring assembly longitudinally on the axle's spring pad is the:

A. Spring center bolt (also called tie bolt)

B. Stabilizer bar end link

C. Drag link

D. Torque rod

19. A heavy-truck driver complains of slow steering response at idle that improves at higher engine RPM. The most likely cause is:

A. A bent pitman arm

B. Mismatched dual rear tires

C. Insufficient pump output at idle from belt slip or worn pump

D. Excessive bearing endplay at the wheel-end

20. The proper procedure for diagnosing a heavy-truck wheel-end heat complaint is to:

A. Replace the wheel seal as the first step

B. Verify bearing endplay falls within TMC RP 618 specification before further inspection

C. Adjust the cab leveling valve

D. Re-torque the front spring U-bolts

21. The OSHA federal regulation that governs servicing of multi-piece and single-piece rim wheels on heavy trucks is:

A. 49 CFR 393, Subpart F

B. 49 CFR 393, Subpart G

C. 29 CFR 1910.147

D. 29 CFR 1910.177

22. A heavy-truck driver complains that the truck pulls toward the right shoulder consistently. After confirming alignment angles are within specification and tire pressures equal, swapping the front tires reverses the pull direction. The most likely cause is:

A. Worn drag link ball studs

B. A bent pitman arm

C. Tire conicity in one of the front tires

D. Excessive caster on the right front wheel

23. The proper response when a heavy-truck driver complains of significant steering wheel free play is to:

A. Inspect external linkage components for wear before performing any internal gear adjustment

B. Replace the steering pump immediately

C. Adjust the over-center screw on the gear cover first

D. Increase wheel nut torque on the front wheels

24. The component on a heavy-truck integral hydraulic steering gear that establishes the gear's center mesh tightness during over-center adjustment is the:

A. Pitman arm

B. Sector shaft

C. Recirculating ball

D. Torsion bar

25. A heavy-truck driver complains of vibration that occurs only when traveling above 60 mph. The most likely cause is:

A. Worn front shock absorbers

B. Mismatched front tire pressures

C. A bent pitman arm

D. Wheel-and-tire imbalance creating speed-dependent resonance

26. The proper response when a heavy-truck driver complains of a clunking noise that occurs only when accelerating from a stop is to:

A. Replace the front shock absorbers

B. Adjust the cab leveling valve

C. Inspect the upper torque rod bushings on the rear suspension

D. Re-torque the front spring U-bolts

27. A heavy-truck driver complains of a steady pull to the left at highway speed. After confirming alignment angles are within specification, the next inspection priority is:

A. Tire pressures and condition on all front wheels

B. Power steering pump output

C. Front spring U-bolt torque

D. Rear axle thrust angle

28. The proper procedure for inspecting kingpin bushing wear on a heavy-truck front axle is:

A. Disconnect the steering linkage and rotate the steering knuckle by hand

B. Raise the front axle off the ground and rock the wheel inward and outward

C. Press on the front bumper while observing knuckle movement

D. Measure steering wheel free play with the engine off

29. The component that supports the vertical load between the lower face of the steering knuckle and the lower face of the axle eye on a heavy-truck steer axle is the:

A. Upper kingpin bushing

B. Lower kingpin bushing

C. Sealing flange

D. Thrust bearing

30. The proper procedure for engaging the trailer kingpin during fifth wheel coupling is to:

A. Drive forward at high speed for firm engagement

B. Apply trailer brakes only and reverse the truck

C. Verify the locking jaws are in the open position before backing under the trailer

D. Tilt the cab forward to provide additional clearance

31. A heavy-truck driver complains that the chassis sits significantly lower than design ride height after several hours of being parked. The most likely cause is:

A. A leaking air bag or air supply line

B. A bent pitman arm

C. Worn front kingpin bushings

D. Excessive sector shaft lash

32. The component on a heavy-truck rear suspension that allows two drive axles to share load equally as one axle articulates over a bump is the:

A. Drag link

B. Equalizing beam

C. Stabilizer bar

D. Pitman arm

33. The proper response when a heavy-truck driver complains of vibration that worsens during cornering on the right side and improves during left-hand cornering is:

A. Replace the front shock absorbers

B. Adjust the cab leveling valve

C. Re-torque the front spring U-bolts

D. Inspect the right front wheel bearing for wear

34. A heavy-truck integral hydraulic steering gear has internal damage allowing fluid to bypass between the two pressure chambers. The driver will experience:

A. Loss of power steering pump engagement

B. Excessive bearing endplay

C. Reduced power assist during turns despite normal pump output

D. Off-center steering wheel position

35. The proper procedure for replacing a heavy-truck wheel seal during hub service requires the technician to:

A. Reuse the original seal if it appears undamaged

B. Apply gasket sealer to the seal lip

C. Heat the seal to soften it

D. Install a new seal regardless of apparent condition

36. The proper response when a heavy-truck driver complains of progressively worsening steering wheel free play with linkage components within specification is:

A. Inspect steering U-joints and intermediate shaft splines

B. Replace the steering gear immediately

C. Adjust the cab leveling valve

D. Re-torque the front spring U-bolts

37. The proper procedure for measuring rear axle thrust angle on a heavy-truck tractor requires:

A. Lifting the rear axle off the ground for measurement

B. Calibrated alignment equipment with the truck on a level rack at curb weight

C. Disconnecting the trailer from the fifth wheel before measurement

D. Applying parking brakes during measurement

38. The component on a heavy-truck steering linkage that synchronizes the angular position of the two front wheels during a turn is the:

A. Drag link

B. Pitman arm

C. Tie rod assembly

D. Sector shaft

39. The proper response when a heavy-truck wheel-end has been operated with insufficient lubricant is:

A. Top off the oil and continue service

B. Replace only the seal and reuse the existing bearings

C. Apply additional grease around the seal area

D. Disassemble the hub and inspect bearings for damage before any further service

40. A heavy-truck rear suspension uses a walking-beam design. The walking-beam design is typically chosen for:

A. Severe off-highway service such as concrete mixers and oilfield equipment

B. Highway tractor applications with maximum fuel economy

C. Light medium-duty delivery trucks

D. Bus chassis with air-spring requirements

41. The proper procedure for diagnosing a heavy-truck pull complaint begins with:

A. Replacing the front shock absorbers

B. Verifying tire pressures and inspecting tires for damage and conicity

C. Adjusting toe at the tie rod adjusting sleeves

D. Disconnecting the steering linkage at the pitman arm

42. The component within a heavy-truck integral hydraulic steering gear that converts rotational input from the steering wheel into linear motion of the ball nut is the:

A. Sector shaft

B. Pitman arm

C. Worm shaft and recirculating ball mechanism

D. Torsion bar

43. The proper response when a heavy-truck driver complains of significant steering effort during low-speed cornering with foamy power steering fluid is to:

A. Replace the steering gear immediately

B. Adjust the over-center screw

C. Re-torque the front spring U-bolts

D. Inspect the suction line for air ingestion that produces pump cavitation

44. A heavy-truck driver complains of slow steering response that improves as the engine warms up. The most likely cause is:

A. Cold-fluid viscosity producing reduced pump output until warmed

B. Worn front shock absorbers

C. A bent pitman arm

D. Mismatched front tire pressures

45. The proper response when a heavy-truck wheel speed sensor has been installed correctly with proper air gap and the ABS controller still reads erratic signals is:

A. Replace the entire ABS controller

B. Verify wheel bearing endplay falls within TMC RP 618 specification

C. Replace the brake drum

D. Re-torque the wheel nuts to higher specification

46. The component on a heavy-truck steer axle that combines with caster to produce wheel-return-to-center behavior is:

A. Toe

B. Camber

C. Steering axis inclination (SAI/KPI)

D. Thrust angle

47. The proper response when a heavy-truck driver complains of brake-related pull during deceleration is:

A. Replace the front shock absorbers

B. Adjust front-end alignment angles

C. Re-torque the front spring U-bolts

D. Verify equal brake function on both sides before checking other systems

48. The maximum acceptable kingpin lock-up clearance per typical fifth wheel manufacturer specifications is:

A. 1/2 inch

B. 1/4 inch

C. 1/8 inch

D. 3/8 inch

49. A heavy-truck rear suspension uses an air-spring design with leveling valves. The technician notes the bags exhaust continuously when the engine is off. The most likely cause is:

A. A leveling valve failed in the open exhaust position

B. Worn front spring U-bolts

C. A bent pitman arm

D. Excessive toe-in on the front axle

50. The proper response when a heavy-truck driver complains of a thumping sound at the fifth wheel during acceleration and braking transitions is to:

A. Re-torque the front spring U-bolts

B. Inspect the kingpin lock-up clearance with a 2-inch kingpin gauge

C. Replace the rear shock absorbers

D. Adjust the cab air suspension valve

PRACTICE EXAM 10: ANSWER KEY AND EXPLANATIONS

1. B — The leaf spring transmitting longitudinal braking torque. On a four-spring tandem-axle leaf-spring suspension, the springs perform every function — supporting load, locating the axles, and transmitting braking torque between the chassis and the axles. The springs cycle through stress reversals during braking that fatigue the steel and make them the most heavily stressed component.

2. A — Pre-adjusting the inner spindle nut to approximately 200 ft-lb while rotating the hub. TMC RP 618 specifies an initial pre-adjust torque of approximately 200 ft-lb during the seating step, while the technician rotates the hub by hand to seat bearing rollers fully against the cones. This step ensures all components are fully seated before final adjustment.

3. C — Front-end linkage and kingpin bushings for wear. Steering wheel shimmy at highway speed with verified balance and tire condition points to looseness in components that connect the steering input to the front wheels. Worn drag link, tie rod ends, or kingpin bushings all produce shimmy that no amount of balancing can eliminate.

4. B — Verify fluid level and check for air ingestion in the suction line. A noisy power steering pump that gets louder during turns is the classic signature of cavitation, where vapor bubbles form in the suction side because fluid is insufficient or air is being drawn in. The noise intensifies during turns because demand on the pump is highest.

5. D — Disassemble the hub and inspect bearings for damage before any further service. Discolored oil with metal particles is the diagnostic signature of bearing damage in progress. Continuing service or topping off without inspection will allow the damage to propagate, leading to bearing failure and potential wheel separation.

6. A — Excessive sector shaft lash producing on-center looseness. Steering wheel that feels loose at center and tightens during turns is the classic signature of excessive sector shaft lash within the steering gear. The mesh tightness varies through the rotation range, with the center position being the most affected by lash.

7. C — Turning the wheel through a calibrated angle on an alignment turntable. Caster measurement requires the wheel to be turned through a calibrated angle while the alignment system tracks the change in camber. The turntable allows the wheel to rotate without binding the suspension, producing accurate readings.

8. B — The height control valve linkage rod has been adjusted too long. Lengthening the link rod causes the height control valve to perceive the chassis as lower than it is, prompting the valve to admit more air into the bags. The bags inflate further and the chassis rises above design ride height.

9. D — Use a tire cage with a clip-on remote inflation chuck while standing outside the trajectory zone. OSHA 29 CFR 1910.177 requires multi-piece rim inflation inside a restraining device with a clip-on remote inflation chuck specifically to position the technician outside the trajectory zone. Multi-piece rim component failures during inflation can be fatal without these protections.

10. A — An imbalanced wheel-and-tire assembly or out-of-round drivetrain component. Vibration that occurs at all speeds and does not change with cornering load is the diagnostic signature of imbalance or runout in a rotating component, rather than a load-sensitive component like a bearing. The vibration is constant because the imbalance produces consistent centrifugal force regardless of cornering.

11. C — A only. The integral hydraulic steering gear contains a torsion bar that twists during steering input to direct fluid flow into the appropriate gear chamber. The torsion bar has no role in kingpin retention — kingpin retention is performed by the draw key, lock pin, or threaded retaining plug.

12. B — Inspect for a leaking air bag or air supply line on the lower side. Tilt that resolves at engine start indicates an air supply that holds during operation but cannot maintain pressure during shutdown. The height control valve restores pressure when the engine starts and the air system recharges, masking the underlying leak.

13. D — Torque rod. Air bags themselves cannot transmit longitudinal forces, so air-spring suspensions rely on torque rods to fix the axle's longitudinal position and resist axle wind-up under braking and acceleration. Without torque rods, the axle would simply rotate about its own axis.

14. A — Excessive toe-in producing outside-edge wear on both tires. With camber and included angle within specification on both wheels, the cause must be a non-camber alignment issue. Excessive toe-in places the outside edge of the tire under additional road contact pressure, producing characteristic outside-edge wear.

15. C — Inspect the drag link ball studs for transient looseness during steering. A pull that occurs only during cornering inputs but disappears at steady tracking is the signature of a worn linkage joint that becomes loose only under transient loads. The looseness allows the wheel to deviate briefly during steering inputs.

16. B — 1,500 to 2,200 psi. The pressure relief valve in a heavy-truck integral hydraulic steering gear typically opens between 1,500 and 2,200 psi, depending on the application. The valve protects pump seals, hose assemblies, and gear seals from rupture during full-lock turns.

17. D — Inspect studs for damage and fatigue cracks, replacing as needed. Loose-nut operation flexes the studs under each wheel rotation, initiating fatigue cracks that may not be visible without close

inspection. A wheel run on extremely loose nuts is a candidate for stud replacement, not just retorque.

18. A — Spring center bolt (also called tie bolt). The spring center bolt passes through the spring leaf stack and engages a hole in the spring pad on the axle, locating the spring assembly longitudinally. Without it, the spring could shift on the axle pad and dramatically alter caster geometry.

19. C — Insufficient pump output at idle from belt slip or worn pump. Slow steering response that improves as engine RPM increases indicates the pump is not delivering enough flow at low speeds. Belt slip and internal pump wear both produce this signature, where higher RPM compensates for the underlying flow deficiency.

20. B — Verify bearing endplay falls within TMC RP 618 specification before further inspection. Wheel-end heat is most commonly caused by excessive bearing preload, which can be confirmed or eliminated through endplay verification. The 0.001 to 0.005-inch specification is the diagnostic baseline for proper bearing operation.

21. D — 29 CFR 1910.177. This OSHA standard governs servicing of multi-piece and single-piece rim wheels and includes the trajectory zone, restraining device, and remote-control inflation requirements. It is the primary regulation the T5 exam references for tire-and-wheel safety.

22. C — Tire conicity in one of the front tires. When swapping front tires reverses the pull direction, the cause is tied to the tire itself rather than alignment, brakes, or suspension. Conicity creates a constant lateral force at the contact patch that follows whichever side the affected tire is mounted on.

23. A — Inspect external linkage components for wear before performing any internal gear adjustment. External linkage wear is far more common than internal gear wear and should be eliminated first. Adjusting the gear without addressing external wear produces a setting that drifts as soon as the truck moves.

24. B — Sector shaft. The sector shaft's axial taper, combined with the over-center adjusting screw bearing against the shaft end, sets the gear's center mesh tightness. Tightening the screw advances the sector shaft into deeper mesh with the ball nut teeth, reducing lash at the gear's center position.

25. D — Wheel-and-tire imbalance creating speed-dependent resonance. Vibration that occurs only above a specific speed and disappears below it is the diagnostic signature of dimensional or balance variation that produces resonance at a specific rotational frequency. Wheel-and-tire imbalance is the most common cause.

26. C — Inspect the upper torque rod bushings on the rear suspension. Clunking that occurs only during acceleration from a stop is the diagnostic signature of axle wind-up under torque inputs. Worn upper torque rod bushings allow the axle to rotate slightly under acceleration, producing the characteristic clunk.

27. A — Tire pressures and condition on all front wheels. Tire-related causes are the most common, easiest to verify, and least invasive to address. Beginning with tire inspection prevents unnecessary alignment adjustments when the actual cause is a tire issue.

28. B — Raise the front axle off the ground and rock the wheel inward and outward. With the wheel on the ground, friction prevents the lateral movement that exposes kingpin bushing play. Lifting the axle removes contact load and allows the technician to feel any movement not accounted for by wheel bearing play.

29. D — Thrust bearing. The thrust bearing sits between the lower face of the axle eye and the lower face of the steering knuckle, supporting the vertical load of the front wheel. Without an intact thrust bearing, the knuckle settles directly onto the axle eye, causing severe friction.

30. C — Verify the locking jaws are in the open position before backing under the trailer. The fifth wheel locking jaws must be open before the kingpin enters the throat for proper engagement. Backing into a closed-jaw fifth wheel can damage both the jaws and the kingpin.

31. A — A leaking air bag or air supply line. Ride height that drops during long parked periods indicates an air supply that cannot maintain pressure during shutdown. The height control valve restores pressure when the engine starts and the air system recharges, masking the underlying leak.

32. B — Equalizing beam. The equalizing beam pivots at its center, allowing one drive axle to rise while the other drops by an equal amount. This mechanical equalization keeps both axles loaded and in contact with the road regardless of road surface irregularities.

33. D — Inspect the right front wheel bearing for wear. Vibration that intensifies during right-side cornering and decreases during left-side cornering indicates a bearing that loads more heavily during right-side cornering. The cornering load transfers additional weight to the right wheel, intensifying noise from the worn bearing.

34. C — Reduced power assist during turns despite normal pump output. Internal seal failure between the two pressure chambers allows fluid to bypass from the pressurized side to the unpressurized side. The pump produces normal output, but the gear cannot retain pressure to push the ball nut, reducing assist felt by the driver.

35. D — Install a new seal regardless of apparent condition. Wheel seals must always be replaced when a hub is opened because the lip is easily disturbed during disassembly and rarely reseats properly. Even an apparently undamaged seal will frequently begin weeping within hundreds of miles after disturbance.

36. A — Inspect steering U-joints and intermediate shaft splines. With external linkage cleared, the next suspect is the rotational path between the column and the steering gear. Worn U-joints accumulate rotational lag that the driver perceives as steering wheel free play, and this wear progresses gradually over time.

37. B — Calibrated alignment equipment with the truck on a level rack at curb weight. Thrust angle measurement requires a calibrated alignment system with the truck at curb weight on a level rack. Other approaches do not provide the geometric reference needed for accurate measurement.

38. C — Tie rod assembly. The tie rod connects the left front steering knuckle to the right front steering knuckle through steering arms at each knuckle. When one knuckle pivots, the tie rod transmits the same motion to the other, ensuring both wheels turn together.

39. D — Disassemble the hub and inspect bearings for damage before any further service. A wheel-end run with low oil may have sustained bearing damage that propagates after lubrication is restored. Direct inspection is the only way to verify internal condition; topping off without inspection defers but does not prevent failure.

40. A — Severe off-highway service such as concrete mixers and oilfield equipment. Walking-beam suspensions use heavy rigid construction with rubber compliance pads designed to handle the impact loads of severe off-highway operation. They sacrifice ride quality for maximum equalization and durability.

41. B — Verifying tire pressures and inspecting tires for damage and conicity. Tire-related causes are the most common, easiest to verify, and least invasive to address. Beginning with tire inspection prevents unnecessary alignment adjustments when the actual cause is a tire issue.

42. C — Worm shaft and recirculating ball mechanism. The worm shaft rotates as the steering wheel turns, and steel ball bearings circulating between the worm threads and ball nut threads translate the ball nut linearly. This linear motion drives the sector gear that produces pitman arm rotation.

43. D — Inspect the suction line for air ingestion that produces pump cavitation. Foamy power steering fluid is the diagnostic signature of air being drawn into the pump suction. Cavitation reduces the pump's ability to deliver flow, producing the increased steering effort the driver describes.

44. A — Cold-fluid viscosity producing reduced pump output until warmed. Cold hydraulic fluid is significantly thicker than warm fluid, which reduces flow through the pump and gear. As the fluid warms during operation, viscosity drops and steering response returns to specification.

45. B — Verify wheel bearing endplay falls within TMC RP 618 specification. With sensor air gap verified correct, excessive bearing endplay is the next suspect. Endplay outside specification allows the hub to wobble axially, dynamically changing the sensor-to-tone-ring relationship and producing erratic signals.

46. C — Steering axis inclination (SAI/KPI). Caster causes the wheels to climb against the self-centering force during a turn, and SAI/KPI causes the wheels to follow a slight upward arc. Together they produce the wheel-return-to-center behavior on heavy trucks.

47. D — Verify equal brake function on both sides before checking other systems. Brake-related pull is a brake system fault, not an alignment or suspension fault. The diagnostic priority is to confirm equal brake performance side-to-side before considering other potential causes.

48. C — 1/8 inch. Manufacturer specifications typically limit kingpin lock-up clearance to a maximum of 1/8 inch when checked with a 2-inch kingpin gauge. Greater clearance produces a thump during acceleration and braking transitions and requires either adjustment or jaw replacement.

49. A — A leveling valve failed in the open exhaust position. A valve failed in the open exhaust position continuously vents the bags to atmosphere. With the engine off, the air system cannot replenish the supply, so the bags exhaust completely until empty.

50. B — Inspect the kingpin lock-up clearance with a 2-inch kingpin gauge. A thumping sound during acceleration and braking transitions is the classic signature of excessive lock-up clearance, where the trailer kingpin has play within the locked jaws. The clearance must be checked with a 2-inch kingpin gauge and adjusted or jaws replaced if it exceeds 1/8 inch.