PRACTICE EXAM 7: ASE T5 SIMULATION (50 QUESTIONS)

1. A heavy-truck driver complains that the truck pulls right when the engine is cold but tracks straight after the engine warms up. The most likely cause is:

A. A bent pitman arm that aligns under thermal expansion

B. Worn rear torque rod bushings

C. Power steering fluid viscosity producing asymmetric assist when cold

D. Mismatched front tire pressures during ambient temperature changes

2. The proper procedure for verifying free play on a heavy-truck steering wheel is to perform the test with:

A. The engine running and the front wheels pointed straight ahead

B. The engine off and the steering wheel rotated to full left lock

C. The front wheels lifted off the ground

D. The drag link disconnected from the pitman arm

3. A heavy-truck steer axle measures camber of +0.5 degree on both wheels and the included angle is also within specification on both sides. The driver complains of accelerated outside-edge wear on the right front tire. The most likely cause is:

A. Excessive negative camber on the right wheel

B. A worn right kingpin bushing

C. A bent right steering knuckle

D. Excessive toe-in producing outside-edge wear

4. A heavy-truck rear suspension uses an air-spring design with a leveling valve that has failed in the open exhaust position. The expected symptom is:

A. The chassis sits at design ride height with normal air pressure in the bags

B. The chassis drops to the bump stops with audible escaping air at the bag

C. The chassis rises above design ride height continuously

D. The air bags fail to inflate during initial system charge

5. The component that provides damping for the front suspension's vertical motion is the:

A. Stabilizer bar

B. Drag link

C. Shock absorber

D. Pitman arm

6. A heavy-truck driver complains of a rapid onset of hard steering after driving through a deep puddle. The most likely cause is:

A. Power steering belt slip due to belt wetness

B. Cold-temperature thickening of the hydraulic fluid

C. Air ingestion into the power steering pump's suction line

D. Brake drag from moisture in the brake drums

7. Technician A says feathered tire wear with sharp edges pointing toward the inside of the tread indicates excessive toe-in. Technician B says feathered tire wear with sharp edges pointing toward the outside indicates excessive toe-out. Who is correct?

A. A only

B. Both A and B

C. B only

D. Neither A nor B

8. The proper response when a heavy-truck driver complains that the chassis sits noticeably tilted on uneven ground is:

A. Replace both rear shock absorbers immediately

B. Verify whether this condition resolves on level ground before further action

C. Adjust front spring U-bolts to compensate

D. Drain the power steering reservoir

9. A heavy-truck wheel-end has been operated with severely contaminated lubricant. The first inspection finding to expect after disassembly is:

A. Pitting and scoring on the bearing rollers and cup races

B. Cracked steering knuckle at the kingpin pivot

C. Loose wheel studs

D. Erratic ABS sensor air gap readings

10. The OSHA federal regulation that requires lockout/tagout procedures during heavy-truck servicing is:

A. 49 CFR 393, Subpart F

B. 49 CFR 393, Subpart G

C. 29 CFR 1910.147

D. 29 CFR 1910.177

11. A heavy-truck driver complains that the truck pulls steadily during steady-state cornering on the highway. The most likely cause is:

A. Worn upper torque rod bushings on the rear suspension

B. A camber spread between the two front wheels

C. Loose front spring U-bolts

D. A worn fifth wheel kingpin

12. The TMC RP 618 procedure specifies the initial pre-adjust torque for a heavy-truck wheel bearing is approximately:

A. 50 ft-lb while rotating the hub

B. 100 ft-lb while rotating the hub

C. 150 ft-lb while rotating the hub

D. 200 ft-lb while rotating the hub

13. A heavy-truck driver complains that the truck wanders at highway speeds. The technician confirms that all linkage components are within specification, kingpin bushings are intact, and tire pressures are equal. The most likely remaining cause is:

A. Insufficient positive caster on both front wheels

B. Excessive negative camber on the right wheel

C. Loose stabilizer bar end link bushings

D. A bent rear axle producing thrust angle error

14. The tractor-trailer combination known as "dog-tracking" indicates:

A. A worn pitman arm

B. Excessive front-axle toe-in on the tractor

C. Misaligned trailer axles or a non-square trailer frame

D. Loose fifth wheel mounting bolts on the tractor

15. The proper inspection technique for a heavy-truck stabilizer bar is to:

A. Remove the bar from the chassis for bench inspection

B. Visually inspect the bushings and end links for wear, cracks, or tears

C. Apply a multimeter to the bar for resistance measurement

D. Pressure-test the air bag system at the cab leveling valve

16. A heavy-truck integral steering gear has been removed from the chassis for service. Before reinstallation, the technician must verify:

A. The pitman arm has been welded to the sector shaft

B. The torsion bar has been replaced with a stiffer unit

C. The power steering pump has been replaced

D. The over-center adjustment has been verified with the linkage disconnected

17. Technician A says the FMCSA out-of-service criteria specify that broken U-bolts on a heavy-truck suspension must be replaced before the truck returns to service. Technician B says broken springs are not an FMCSA out-of-service condition. Who is correct?

A. A only

B. Both A and B

C. B only

D. Neither A nor B

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

A. Approach the trailer at high speed to lock the kingpin firmly

B. Apply parking brakes to the tractor only

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

D. Tilt the cab forward to provide additional clearance during coupling

19. A heavy-truck driver complains that the steering wheel returns slowly to center after a turn. Pump pressure is normal. The most likely cause is:

A. Worn rear torque rod bushings

B. Insufficient positive caster on both front wheels

C. Excessive scrub radius

D. A clogged inline cooler in the return line

20. The two angles that combine to produce front-wheel return-to-center behavior on a heavy truck are:

A. Camber and toe

B. Toe and KPI

C. Caster and thrust angle

D. Caster and steering axis inclination (SAI/KPI)

21. A heavy-truck rear suspension uses an equalizing-beam design. A worn rubber bushing at the central trunnion pivot will produce:

A. Clunking noise during axle reversals and lateral axle movement

B. Loss of cab air suspension function

C. Excessive front tire shoulder wear

D. Reduced power steering pressure during cornering

22. The component within an 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

23. A heavy-truck driver complains of hard steering at parking-lot speeds. Power steering pump pressure is normal, fluid level is correct, and front-end mechanical components have been verified within specification. The next inspection priority is:

A. Front tire pressure compared to specification

B. Internal leakage in the steering gear's hydraulic chambers

C. Excessive sector shaft lash

D. Cab air suspension valve adjustment

24. A heavy-truck hub-piloted disc wheel uses studs and flanged nuts. The wheel is centered on the hub through:

A. A precision-machined center bore that fits closely around a pilot diameter on the hub

B. The studs themselves engaging tapered holes in the wheel disc

C. The lug nuts seating into beveled openings in the wheel

D. A keyway between the wheel and the hub flange

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

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 torqued correctly

D. Inspect studs and bearings for damage before continued service

26. A heavy-truck driver complains that the chassis tilts noticeably to one side when the truck is parked overnight, but levels itself when the engine starts. The most likely cause is:

A. A bent pitman arm

B. Worn fifth wheel locking jaws

C. A leaking air bag or air supply line on the affected side

D. Excessive sector shaft lash

27. The FMCSA out-of-service criterion for free play on a 22-inch power-steered steering wheel is approximately:

A. 1/2 inch of rim travel

B. 2 inches of rim travel

C. 1 inch of rim travel

D. 4 inches of rim travel

28. A heavy-truck rear axle has been rotated slightly during a hard impact. The driver will perceive this as:

A. The steering wheel sitting visibly off-center to compensate

B. Excessive cab vibration at highway speed

C. Reduced air pressure in the rear bags

D. Loss of power steering pump engagement

29. A heavy-truck integral hydraulic steering gear's torsion bar has fatigued and is no longer producing crisp valve action. The most likely symptom is:

A. Sustained hard steering at all speeds

B. Loss of power steering pump output

C. Excessive bearing endplay

D. Erratic, oversensitive, or numb steering depending on the failure mode

30. Technician A says cab air suspension uses its own height control valve separate from the chassis system. Technician B says cab air suspension shock absorbers are common wear items that affect ride quality directly. Who is correct?

A. A only

B. B only

C. Both A and B

D. Neither A nor B

31. A heavy-truck oil-bath wheel-end fluid level has been verified through the sight glass at mid-range. After the truck operates for 100 miles, the technician should:

A. Drain the oil and refill with fresh fluid

B. Continue normal service and re-check at the next PM interval

C. Replace the inboard seal regardless of condition

D. Add additional grease to compensate

32. The proper component to inspect when a heavy-truck driver complains of a clunking noise during cornering and uneven pavement transitions is:

A. Stabilizer bar end link bushings

B. Power steering pump bearing

C. Front spring U-bolt torque

D. Rear axle thrust angle

33. A heavy-truck driver complains that the truck "hunts" left and right at highway speeds. After verifying linkage condition and tire pressures, the next inspection priority is:

A. Front shock absorber damping

B. Power steering pump output pressure

C. Cab leveling valve adjustment

D. Rear axle alignment and thrust angle

34. The component that supports the vertical load between the steering knuckle and the lower face of the axle eye is the:

A. Upper kingpin bushing

B. Lower kingpin bushing

C. Thrust bearing

D. Sealing flange

35. A heavy-truck front spring has accumulated significant fatigue from years of service. The most likely visible sign is:

A. A broken main leaf

B. Reduced free camber compared to specification

C. Cracked U-bolt seat plates

D. Loose spring center bolts

36. The proper response when a heavy-truck wheel speed sensor produces erratic signals while the sensor itself bench-tests within specification is to:

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

B. Replace the entire ABS controller

C. Replace the brake drum

D. Re-torque the wheel nuts to higher specification

37. Technician A says heavy-truck disc wheels and spoke wheels can be interchanged without component replacement. Technician B says the two wheel architectures use different fastener torque specifications. Who is correct?

A. Both A and B

B. A only

C. Neither A nor B

D. B only

38. A heavy-truck driver complains of vibration at highway speeds. After confirming wheel balance is correct, the next inspection priority is:

A. Power steering pump output pressure

B. Cab leveling valve adjustment

C. Wheel-and-tire radial and lateral runout measurement

D. Front spring U-bolt torque

39. The component that allows fore-and-aft repositioning of a sliding fifth wheel on the chassis is the:

A. Cab tilt mechanism

B. Slider lock pin engaging the slider rails

C. Pintle hook on the rear bumper

D. Pivot point at the kingpin contact surface

40. A heavy-truck driver complains of vibration that intensifies during right-hand cornering and decreases during left-hand cornering. The most likely cause is:

A. A worn right front wheel bearing

B. Mismatched front tire pressures

C. A bent pitman arm

D. Excessive caster on the right front wheel

41. The proper procedure for measuring rear axle thrust angle on a heavy-truck tractor is to:

A. Lift the rear axle off the ground for measurement

B. Disconnect the trailer from the fifth wheel before measurement

C. Apply parking brakes during measurement

D. Use alignment equipment with the truck on a level rack at curb weight

42. A heavy-truck driver complains that the truck pulls toward the right shoulder on a normally crowned road. The truck tracks straight on a perfectly flat surface. The most likely cause is:

A. A bent pitman arm

B. Worn drag link ball studs

C. Normal road crown effect that no alignment can fully eliminate

D. Excessive negative caster on both front wheels

43. The proper procedure for inspecting heavy-truck shock absorber condition is:

A. Apply a torque wrench to the shock body

B. Inspect the shock body for fluid leakage indicating internal pressure loss

C. Press on the shock with a dial indicator

D. Measure shock weight on a calibrated scale

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

A. Insufficient pump output at idle due to belt slip or worn pump

B. Excessive bearing preload at the wheel-end

C. A bent pitman arm

D. Mismatched dual rear tires

45. The component that retains a heavy-truck kingpin axially in the axle eye through a tapered key driven through a transverse hole is called a:

A. Lock pin

B. Threaded retaining plug

C. Snap ring

D. Draw key

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

A. 800 to 1,200 psi

B. 1,200 to 1,500 psi

C. 1,500 to 2,200 psi

D. 2,500 to 3,000 psi

47. Technician A says the height control valve linkage rod must be lengthened to lower chassis ride height. Technician B says shortening the rod will raise chassis ride height. Who is correct?

A. A only

B. Both A and B

C. B only

D. Neither A nor B

48. A heavy-truck rear suspension uses adjustable upper torque rods. Lengthening the rod on one side will:

A. Shift the axle laterally and adjust thrust angle on the affected side

B. Reduce air bag pressure on that side

C. Increase steering wheel free play

D. Decrease wheel bearing preload

49. The component that holds air pressure inside a tubeless tire is:

A. A separate inner tube installed inside the tire

B. The tire's outer tread surface

C. The air-impermeable inner liner combined with a sealed bead-to-rim contact

D. A factory-applied sealant inside the tire body

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

A. Re-torque the front spring U-bolts immediately

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 7: ANSWER KEY AND EXPLANATIONS

1. C — Power steering fluid viscosity producing asymmetric assist when cold. Cold hydraulic fluid is significantly thicker than warm fluid, and uneven flow distribution can produce asymmetric assist between left and right turn directions. As the fluid warms and thins, viscosity equalizes and the pull resolves.

2. A — The engine running and the front wheels pointed straight ahead. The free play measurement requires the power-assist system to be active so the test reflects real operating conditions, with the front wheels straight so the gear is at center mesh. The technician rotates the wheel between left-just-moves and right-just-moves to determine total play.

3. D — Excessive toe-in producing outside-edge wear. 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.

4. B — The chassis drops to the bump stops with audible escaping air at the bag. A valve failed in the open exhaust position continuously vents the bags to atmosphere. The chassis settles to the bump stops because the bags cannot retain any air pressure to support the load.

5. C — Shock absorber. The shock absorber is a sealed hydraulic damper that controls suspension motion through velocity-sensitive resistance. It absorbs the energy stored in the spring and prevents excessive oscillation after road inputs.

6. A — Power steering belt slip due to belt wetness. Water on the belt reduces friction at the pulley, causing the belt to slip under load. The slip reduces pump output during turning maneuvers when assist demand is highest, producing rapid onset of hard steering until the belt dries.

7. D — Neither A nor B. Feathered wear with sharp edges pointing inward is the diagnostic signature of toe-out, not toe-in. Outward-pointing feathered edges indicate toe-in. Both technicians have the diagnoses reversed.

8. B — Verify whether this condition resolves on level ground before further action. Chassis tilt observed on uneven ground may simply reflect the ground's slope, not a chassis fault. Confirming the condition on a level surface is the standard first step before assuming the truck has a suspension issue.

9. A — Pitting and scoring on the bearing rollers and cup races. Contaminated lubricant carries abrasive particles into bearing-to-cup contact areas, producing characteristic surface damage. The pitting and scoring are the visible signature of contamination-induced wear and require bearing replacement.

10. C — 29 CFR 1910.147. This OSHA regulation governs the control of hazardous energy through lockout/tagout procedures. It applies to heavy-truck servicing whenever the engine could be started or systems could be inadvertently energized during the work.

11. B — A camber spread between the two front wheels. Pull during steady-state cornering points to a camber difference between the front wheels that affects cornering grip and tracking. The pull rule (toward the wheel with more positive camber) determines the direction.

12. D — 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 the bearing rollers fully against the cones. This step ensures all components are fully seated before final adjustment.

13. A — Insufficient positive caster on both front wheels. With linkage and tires verified, the remaining cause of wander is inadequate self-centering force. Low caster produces light, unstable steering that requires constant driver input to maintain a straight line.

14. C — Misaligned trailer axles or a non-square trailer frame. Dog-tracking on a tractor-trailer combination typically originates in the trailer rather than the tractor. Either rotated trailer axles or a frame that is out of square can cause the trailer to track at an angle to the tractor's direction of travel.

15. B — Visually inspect the bushings and end links for wear, cracks, or tears. The stabilizer bar's wear points are the rubber bushings at the frame mount and end links. Visual inspection of these components for cracks, tears, and elongation is the most efficient and reliable inspection technique.

16. D — The over-center adjustment has been verified with the linkage disconnected. Any time the gear is removed and reinstalled, the over-center adjustment must be verified before the linkage is reconnected. Performing the adjustment with the drag link still connected produces inaccurate readings because external resistance contaminates the measurement.

17. A — Technician A only. Broken U-bolts are an FMCSA out-of-service condition under 49 CFR 393, requiring replacement before the truck returns to service. Broken springs are also an out-of-service condition, so Technician B is incorrect.

18. 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.

19. B — Insufficient positive caster on both front wheels. Slow return-to-center after a turn indicates inadequate self-centering force, which positive caster provides. With normal hydraulic pressure ruled out, low caster is the most likely cause, particularly if it has dropped below specification.

20. D — Caster and 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. The truck's static weight then forces both wheels back to the lower (straight-ahead) position when steering input is released.

21. A — Clunking noise during axle reversals and lateral axle movement. The trunnion bushing is a heavily loaded pivot that must rotate freely through axle motion. When worn, it allows lateral axle movement that produces audible clunking during axle reversals and changes rear axle alignment.

22. C — Worm shaft and recirculating ball mechanism. The worm shaft on the input side 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.

23. B — Internal leakage in the steering gear's hydraulic chambers. With pump output, fluid level, and mechanical components verified, the remaining suspect is the gear's ability to retain pressure during a turn. Internal seal leakage between the two pressure chambers reduces assist felt by the driver.

24. A — A precision-machined center bore that fits closely around a pilot diameter on the hub. Hub-piloted wheels center themselves on the hub through the wheel's center bore engaging a corresponding pilot diameter. The studs and nuts are then used purely for clamping force, not for centering.

25. D — Inspect studs and bearings for damage before continued service. Loose-nut operation flexes the studs under each wheel rotation, initiating fatigue cracks that may not be visible without close inspection. Damaged studs and potentially damaged bearings must be replaced before the truck returns to service.

26. C — A leaking air bag or air supply line on the affected 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.

27. B — 2 inches of rim travel. The FMCSA out-of-service criterion for free play on a power-steered wheel is approximately 2 inches of rim travel, with the specific limit varying slightly by wheel diameter. This measurement is taken with the engine running and front wheels straight.

28. A — The steering wheel sitting visibly off-center to compensate. A rotated rear axle creates a thrust angle that the driver compensates for by holding the steering wheel off-center to maintain straight-line travel. The off-center wheel position is the visible signature of rear-axle alignment error.

29. D — Erratic, oversensitive, or numb steering depending on the failure mode. A fatigued torsion bar produces inconsistent valve action during steering input. The driver perceives this as inconsistent steering response — sometimes oversensitive and sometimes numb — depending on which direction the bar's stiffness has degraded.

30. C — Both A and B. Cab air suspension uses its own height control valve separate from the chassis system, with its own air supply and shock absorbers. Cab suspension shocks are common wear items because they damp cab motion directly affecting the driver's perception of ride quality.

31. B — Continue normal service and re-check at the next PM interval. A wheel-end with proper fluid level shown at the sight glass and no other faults is functioning as designed. There is no need for additional intervention until the next scheduled inspection.

32. A — Stabilizer bar end link bushings. A clunking noise during cornering and uneven pavement transitions is the diagnostic signature of worn stabilizer bar end link bushings. The bushings allow the bar to disengage partially, producing the cornering-specific noise.

33. D — Rear axle alignment and thrust angle. Hunting (constant left-right correction) at highway speed with intact front-end and tires points to a rear-axle issue that the driver compensates for with continuous steering input. Verifying rear axle perpendicularity and thrust angle is the next diagnostic step.

34. C — 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.

35. B — Reduced free camber compared to specification. Spring fatigue from cumulative load cycles causes the spring to lose its built-in arch (free camber). A spring whose free camber has dropped below specification has fatigued and must be replaced, even if no leaves are broken.

36. A — Verify wheel bearing endplay falls within TMC RP 618 specification. Excessive bearing endplay allows the hub to wobble axially, dynamically changing the sensor-to-tone-ring air gap. The ABS controller sees this as an erratic signal even when the sensor itself is functioning correctly.

37. D — Technician B only. Disc wheels and spoke wheels cannot be interchanged without complete component replacement because they use different mounting architectures. The two systems use different fastener torque specifications because the centering mechanisms and stud configurations differ fundamentally.

38. C — Wheel-and-tire radial and lateral runout measurement. Vibration that persists after balance has been verified typically indicates dimensional variation in the wheel-and-tire assembly. Runout that exceeds specification produces vibration even at zero balance error.

39. B — Slider lock pin engaging the slider rails. The slider lock pin is the mechanical retention component that holds the fifth wheel at a chosen position on the slider rails. When the pin is disengaged, the fifth wheel can be repositioned along the rails to optimize weight distribution.

40. A — A worn right front wheel bearing. 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.

41. D — Use 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.

42. C — Normal road crown effect that no alignment can fully eliminate. Most public roads are crowned slightly higher in the center for water drainage, causing trucks to drift toward the right shoulder. This effect cannot be fully eliminated by alignment because it depends on the road's geometry, not the truck's.

43. B — Inspect the shock body for fluid leakage indicating internal pressure loss. The most reliable visual inspection of a heavy-truck shock absorber is examining the body for hydraulic fluid leakage. A weeping shock has lost internal pressure and damping capability.

44. A — Insufficient pump output at idle due to 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.

45. D — Draw key. A draw key is a tapered key driven through a transverse hole in the axle eye and secured with a nut, engaging a flat or notch on the kingpin to prevent axial movement. The lock pin and threaded plug are alternative retention methods, while a snap ring is not a heavy-truck kingpin retention method.

46. C — 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.

47. D — Neither A nor B. Lengthening the link rod raises chassis ride height by causing the valve to perceive the chassis as lower than it is, prompting more air into the bags. Shortening the rod lowers ride height by causing the valve to perceive the chassis as higher and venting air. Both technicians have the relationships reversed.

48. A — Shift the axle laterally and adjust thrust angle on the affected side. Lengthening one upper torque rod tilts the axle backward at the top while shifting it laterally, which is how thrust angle and lateral position are corrected on air-spring rear suspensions. Both effects occur simultaneously.

49. C — The air-impermeable inner liner combined with a sealed bead-to-rim contact. Tubeless tires hold air through the tire's own air-impermeable inner liner combined with the airtight seal between the tire bead and the wheel rim. No separate inner tube is required.

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 kingpin gauge and adjusted or jaws replaced if it exceeds 1/8 inch.