

PRACTICE EXAM 2: T5 SIMULATION

(50 QUESTIONS)

1. A driver reports the steering wheel pulls hard to the right immediately after the truck rolls over a pothole, but tracks straight again within 30 seconds. The most likely cause is:

- A. Worn ring and pinion gears in the rear drive axle assembly during operation
- B. Worn or loose tie rod end allowing momentary toe change after impact loading
- C. A failed coolant temperature sensor reading falsely cold to the engine ECM
- D. Excessive transmission fluid level above the maximum fill mark indication

2. Technician A says heavy-duty truck steering gear sector shaft adjustment compensates for normal wear over service life. Technician B says heavy-duty truck steering gears should be replaced rather than adjusted when free play exceeds specification. Who is correct?

- A. Both Technician A and Technician B
- B. Technician A only
- C. Technician B only
- D. Neither Technician A nor Technician B has the answer right

3. All of the following can cause excessive steering wheel free play in a heavy-duty truck EXCEPT:

- A. A failed coolant temperature sensor reading falsely cold to the engine ECM
- B. Worn drag link ends allowing excessive movement during steering operation
- C. Worn tie rod ends affecting steering linkage during normal operation
- D. Worn steering gear sector shaft bearings allowing excess movement during operation

4. The proper diagnostic sequence when a heavy-duty truck shows a complaint of "vehicle pulls left during normal driving" is to:

- A. Replace the steering gear as the most likely failure component during service
- B. Apply battery voltage to the steering system for diagnostic testing during service
- C. Check tire pressure and condition first, then verify alignment angles and brake balance
- D. Disconnect the steering linkage to eliminate the symptom during operation

5. The CVSA out-of-service criterion for heavy-duty truck steering wheel free play on a 20-inch steering wheel is:

- A. More than 2 inches at the steering wheel rim during inspection
- B. More than 5 inches at the steering wheel rim during inspection
- C. More than 1/4 inch at the steering wheel rim during inspection
- D. More than 12 inches at the steering wheel rim during inspection

6. A LEAST likely cause of a heavy-duty truck that produces a clunking noise from the front end during slow turns at low speed is:

- A. Worn kingpin bushings allowing axial movement during steering operation
- B. Worn drag link ends allowing movement during direction changes during steering
- C. A failed coolant temperature sensor reading falsely cold to the engine ECM
- D. Worn tie rod ends allowing movement during direction changes during steering

7. Technician A says heavy-duty truck steering gear input shaft seal leakage requires shaft inspection before seal replacement. Technician B says heavy-duty truck steering gear input shaft seal leakage can be repaired by adding sealer to the leak area. Who is correct?

- A. Both Technician A and Technician B

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

8. The proper service action when a heavy-duty truck shows excessive steering wheel free play traced to internal steering gear wear is to:

- A. Continue operation since internal wear has minimal effect on steering performance
- B. Add power steering fluid additive to compensate for the internal wear during service
- C. Apply battery voltage to the steering gear for diagnostic testing during service
- D. Replace the steering gear assembly with a remanufactured or new unit per service info

9. The most likely consequence of operating a heavy-duty truck with a worn drag link end is:

- A. Steering wander, hard cornering, and excessive front tire wear during operation
- B. Improved steering response from reduced friction during normal operation
- C. No effect on steering performance during normal operating conditions
- D. Faster steering wheel return to center during normal operation conditions

10. The proper procedure when a heavy-duty truck shows fluid leakage from the power steering pump shaft seal area is to:

- A. Continue operation since minor pump leakage has minimal effect on steering function
- B. Add additional fluid to compensate for the leakage during normal operation
- C. Replace the pump with a new or remanufactured unit and verify proper fluid level
- D. Apply silicone sealer to the leak area to stop the leakage during the same service

11. The LEAST likely cause of a heavy-duty truck that fails to maintain power steering assist during slow-speed maneuvering is:

- A. A failed coolant temperature sensor reading falsely cold to the engine ECM
- B. Worn power steering pump unable to deliver pressure during operation
- C. Restricted power steering supply hose limiting fluid flow to the gear
- D. Low power steering fluid level resulting from a leak during operation

12. The proper procedure for testing power steering pump pressure during diagnostic service is to:

- A. Apply battery voltage to the pump for diagnostic testing during service
- B. Listen for pump operation with a stethoscope at idle conditions during operation
- C. Connect a pressure gauge in the supply line and measure pressure per service info
- D. Replace the pump as preventive maintenance regardless of test results

13. The most accurate description of an unloaded steering gear failure mode is:

- A. Filters compressed air before delivery to the steering gear during operation
- B. Maintains pressure differential between input and output shafts during operation
- C. Releases excess pressure when system pressure exceeds the safety threshold value
- D. Internal seal failure or sector shaft wear producing free play and slow response

14. Technician A says the power steering pump on a heavy-duty truck is typically belt-driven from the engine. Technician B says the power steering pump on a heavy-duty truck is typically gear-driven from the engine on most applications. Who is correct?

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

C. Technician C only

D. Neither Technician A nor Technician B

15. The proper diagnostic priority when a heavy-duty truck shows excessive steering effort despite recent power steering pump replacement is to:

A. Continue operation since recent service should resolve any steering effort issues

B. Add power steering fluid additive to improve steering effort during normal operation

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

D. Verify pump pressure output, inspect for restriction, and inspect gear internal condition

16. The most likely cause of a heavy-duty truck steering system that shows fluid foaming in the reservoir during operation is:

A. Air leakage in the supply line allowing air entry into the fluid during pump operation

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

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

D. Low power steering fluid level allowing the pump to draw air during operation

17. The proper service action when a heavy-duty truck steering system shows fluid contamination during analysis is to:

A. Continue operation since minor contamination has minimal effect during operation

B. Add fresh fluid to dilute the contamination during the same service event

C. Flush the entire system, identify the contamination source, and refill with proper fluid

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

18. The LEAST likely consequence of operating a heavy-duty steering system with hygroscopic moisture absorption beyond service interval is:

- A. Reduced fluid lubricity causing accelerated pump wear during operation
- B. A failed coolant temperature sensor reading falsely cold to the engine ECM
- C. Internal corrosion damage to gear components and pump components
- D. Increased risk of pump cavitation during normal operating conditions

19. The proper procedure when a heavy-duty truck shows a complaint of "leaf spring shifted on axle during recent off-road operation" is to:

- A. Verify U-bolt torque, inspect center bolt condition, and verify proper axle alignment
- B. Continue operation since minor spring shift has minimal effect on suspension function
- C. Apply battery voltage to the suspension for diagnostic testing during service
- D. Replace the leaf spring assembly as preventive maintenance during the same service

20. The most likely cause of a heavy-duty truck that shows broken U-bolts on inspection 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. Improper U-bolt torque, fatigue from repeated cycling, or improper installation

21. The proper diagnostic procedure when a heavy-duty truck shows a complaint of "rear suspension produces a knocking noise during deceleration" is to:

- A. Replace the entire rear suspension as preventive maintenance during the same service
- B. Apply battery voltage to the suspension for diagnostic testing during service

- C. Listen for knocking with a stethoscope without addressing root cause during inspection
- D. Inspect spring eye bushings, shackles, and U-bolt torque systematically

22. The maximum acceptable air ride suspension air bag leak rate during a static pressure test is:

- A. 25 PSI in 1 minute per common service specifications during operation
- B. Less than 1 PSI in 5 minutes per common service specifications during operation
- C. 10 PSI in 1 minute per common service specifications during operation
- D. 5 PSI in 1 minute per common service specifications during operation

23. Technician A says heavy-duty truck shock absorbers should be replaced as a matched pair on each axle. Technician B says heavy-duty truck shock absorbers can be replaced individually without affecting suspension balance. Who is correct?

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

24. All of the following can cause excessive air ride suspension pressure loss EXCEPT:

- A. Damaged air bag with cracks or punctures during normal operation conditions
- B. Failed ride height valve unable to seal during normal operation conditions
- C. A failed coolant temperature sensor reading falsely cold to the engine ECM
- D. Damaged or worn supply line fittings allowing leakage during normal operation

25. The proper procedure for verifying heavy-duty truck shock absorber damping operation during inspection is to:

- A. Apply battery voltage to the shock absorber for diagnostic testing during service
- B. Bounce the truck at the affected corner and observe damping response during inspection
- C. Listen for shock operation with a stethoscope during normal vehicle operation
- D. Replace the shock absorber as preventive maintenance regardless of inspection findings

26. The most likely cause of a heavy-duty truck rear suspension that shows excessive axle wrap-up during heavy throttle application 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 or failed leaf spring components, broken center bolt, or worn shackle bushings

27. The proper service action when a heavy-duty truck shows leaf spring rust scaling visible during inspection is to:

- A. Continue operation if structural integrity is intact, but address corrosion source
- B. Replace all leaf springs as preventive maintenance during the same service event
- C. Apply battery voltage to the springs for diagnostic testing during the service event
- D. Apply heat treatment to the leaves during the same service event

28. The most accurate description of heavy-duty truck air ride leveling valve function is:

- A. Modulates air pressure to the brake chambers during normal application events
- B. Filters compressed air before delivery to the air bags during normal operation

- C. Maintains constant ride height by adding or releasing air as load changes during operation
- D. Supplies air to the spring brake chambers during parking brake engagement only

29. The LEAST likely cause of a heavy-duty truck that shows uneven ride height between the forward-rear and rear-rear axle positions is:

- A. Failed leveling valve at one axle position affecting pressure delivery during operation
- B. A failed coolant temperature sensor reading falsely cold to the engine ECM
- C. Damaged air bag at one axle position allowing pressure loss during operation
- D. Damaged supply line at one axle position preventing proper pressure delivery

30. The proper diagnostic priority when a heavy-duty truck shows a complaint of "air ride suspension pressure loss within 30 minutes of parking" is to:

- A. Continue operation since pressure loss during parking has minimal effect on operation
- B. Replace all air bags as preventive maintenance during the same service event
- C. Apply battery voltage to the air ride system for diagnostic testing during service
- D. Perform a static leak test to identify air bag, supply line, or valve leak sources

31. The proper procedure when a heavy-duty truck shows a complaint of "front tires wearing on the outside edges" is:

- A. Continue operation since edge wear has minimal effect on tire service life during use
- B. Verify camber angle, inspect for excessive positive camber or improper toe setting
- C. Apply battery voltage to the tires for diagnostic testing during service
- D. Replace the tires as preventive maintenance during the same service event

32. The most accurate description of heavy-duty truck included angle is:

- A. Forward or rearward tilt of the kingpin as viewed from the side during inspection
- B. Inward or outward tilt of the wheel as viewed from the front during inspection
- C. Difference between front and rear distance measurements at the wheels in inches
- D. Sum of camber angle and steering axis inclination measured during alignment service

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

- A. Verify thrust angle measurement and inspect for rear axle misalignment
- 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. Continue operation since dog-tracking has minimal effect on operation during use

34. Technician A says heavy-duty truck caster angle affects steering self-centering tendency during operation. Technician B says heavy-duty truck camber angle affects steering self-centering tendency during operation. Who is correct?

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

35. The most likely consequence of operating a heavy-duty truck with insufficient positive caster angle on the steer axle is:

- A. Improved cornering response during normal vehicle operation conditions
- B. Reduced steering self-centering tendency and increased steering effort

- C. No effect on steering performance during normal operating conditions
- D. Improved fuel economy from reduced steering resistance during normal operation

36. The proper procedure when a heavy-duty truck shows a complaint of "vehicle wanders left and right during highway operation" is to:

- A. Verify alignment angles, kingpin condition, tie rod end condition, and tire condition systematically
- B. Apply battery voltage to the steering system for diagnostic testing during service
- C. Replace the steering gear as the most likely failure component during service
- D. Continue operation since wander has minimal effect on safety during operation

37. The most likely cause of a heavy-duty truck that shows "cupping" wear on the front tires is:

- A. Worn ring and pinion gears in the rear drive axle assembly during operation
- B. Excessive transmission fluid level above the maximum fill mark indication
- C. A failed coolant temperature sensor reading falsely cold to the engine ECM
- D. Failed shock absorbers, worn wheel bearings, or imbalanced tires causing tire bouncing

38. The LEAST likely cause of a heavy-duty truck that shows aggressive tire wear pattern across all four front and rear tires simultaneously is:

- A. Operation with overload conditions exceeding tire rated capacity during operation
- B. Improper inflation pressure across all tires during normal operation conditions
- C. A failed coolant temperature sensor reading falsely cold to the engine ECM
- D. Aggressive driver cornering and braking patterns during normal operation

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

- A. Verification of rear axle alignment relative to vehicle centerline using alignment equipment
- B. Apply battery voltage to the wheels for diagnostic testing during measurement
- C. Listen for thrust angle issues with a stethoscope during normal operation
- D. Estimate thrust angle visually using shop lighting during the inspection process

40. The proper service action 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

41. The proper torque specification for heavy-duty truck wheel lug nuts is determined by:

- A. Standard automotive torque specifications for similar fastener diameter applications
- B. Maximum torque applied that the lug nut can sustain without thread failure
- C. Manufacturer service information specific to the wheel and stud configuration per TMC RP 237
- D. Visual estimation based on lug nut size during the installation procedure

42. The most accurate description of TMC RP 618 application is:

- A. Industry-standard wheel bearing service procedure for heavy-duty applications
- B. Engine performance specifications for heavy-duty diesel applications during service
- C. Transmission shift specifications for AMT applications during normal operation

D. Brake adjustment specifications for heavy-duty truck applications during service

43. The proper diagnostic procedure when a heavy-duty truck shows a complaint of "wheel hub running hot during normal operation" is to:

- A. Replace the wheel hub assembly as preventive maintenance during the same service
- B. Verify wheel bearing endplay and inspect bearing condition systematically per RP 618
- C. Apply battery voltage to the hub for diagnostic testing during service
- D. Continue operation since hot hub has minimal effect on operation during use

44. The most likely cause of a heavy-duty truck wheel seal that fails prematurely is:

- A. A failed coolant temperature sensor reading falsely cold to the engine ECM
- B. Worn ring and pinion gears in the rear drive axle assembly during operation
- C. Excessive transmission fluid level above the maximum fill mark indication
- D. Incorrect bearing endplay, contaminated lubricant, or improper installation procedures

45. The proper procedure when a heavy-duty truck shows tire pressure 15 PSI below specification on one tire is:

- A. Inspect for slow leak source, repair if possible, or replace tire if damaged beyond repair
- B. Continue operation since minor pressure loss has minimal effect on tire service life
- C. Apply battery voltage to the tire for diagnostic testing during service
- D. Replace the tire as preventive maintenance during the same service event

46. The LEAST likely cause of a heavy-duty truck wheel bearing wear is:

- A. Improper torque application during recent wheel bearing service procedures

- B. Contamination from failed wheel seal allowing dirt entry during operation
- C. A failed coolant temperature sensor reading falsely cold to the engine ECM
- D. Excessive endplay or insufficient preload at the most recent service event

47. The most accurate description of heavy-duty truck tire ply rating is:

- A. Maximum vehicle speed at which the tire can operate during normal operation
- B. Indicator of tire load capacity reflecting tire construction strength rating
- C. Tire diameter specification in inches during normal operation conditions
- D. Tire pressure rating in PSI during normal operation conditions

48. The proper diagnostic priority when a heavy-duty truck shows a complaint of "wheel vibration that begins above 50 mph and disappears below 45 mph" is to:

- A. Replace the entire wheel assembly as preventive maintenance during the same service
- B. Apply battery voltage to the wheel for diagnostic testing during service
- C. Continue operation since speed-specific vibration has minimal effect on safety
- D. Inspect for tire imbalance, wheel runout, and bearing condition systematically

49. The most likely consequence of operating a heavy-duty truck with mismatched tire sizes on the same axle is:

- A. Differential gear damage, premature tire wear, and possible CVSA out-of-service status
- B. Improved fuel economy from improved load distribution during normal operation
- C. No effect on tire performance during normal operating conditions during use
- D. Faster tire wear with improved overall vehicle performance during normal operation

50. The proper service action when a heavy-duty truck shows tire ply separation visible during inspection is to:

- A. Continue operation if separation is minor and within service specification
- B. Add tire sealant to address the separation during the same service event
- C. Replace the tire immediately as it represents a safety-critical failure condition
- D. Apply battery voltage to the tire for diagnostic testing during service

ANSWER KEY AND EXPLANATIONS

1. B — Worn or loose tie rod end allowing momentary toe change after impact loading. A worn tie rod end allows brief toe change during impact loading, producing the temporary pull until the linkage settles back to its at-rest position. The transient nature of the symptom (resolves within 30 seconds) is the diagnostic signature distinguishing tie rod wear from alignment-related pull, which would be persistent.
2. D — Neither Technician A nor Technician B has the answer right. Heavy-duty truck steering gears include adjustable preload mechanisms that compensate for sector shaft and bearing wear within service limits. Once wear exceeds adjustable range or internal damage exists, the gear must be replaced or rebuilt; both technicians' absolute statements are incorrect because the proper response depends on the specific wear condition.
3. A — A failed coolant temperature sensor reading falsely cold to the engine ECM. ECT sensor errors affect engine fuel mixture but do not affect steering wheel free play. The other choices all directly cause excessive free play through wear in the steering linkage: drag link ends, tie rod ends, and steering gear sector shaft bearings all contribute to free play when worn.
4. C — Check tire pressure and condition first, then verify alignment angles and brake balance. Vehicle pull diagnosis begins with the simplest causes (tire pressure and condition) before progressing to alignment and brake balance verification. This sequence catches the most common pull causes quickly without unnecessary parts replacement; tire issues alone account for many pull complaints.
5. B — 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 is more permissive than the 2-inch service specification because CVSA criteria are designed to identify trucks unsafe for road operation, not to enforce service-quality maintenance.
6. C — A failed coolant temperature sensor reading falsely cold to the engine ECM. ECT sensor errors affect engine fuel mixture but do not produce front-end clunking during slow turns. The other choices all directly cause clunking during direction changes: worn kingpin bushings, drag link ends, and tie rod ends all allow component movement that produces audible noise during steering input.
7. B — Technician A only. Steering gear input shaft seal leakage requires shaft inspection before seal replacement because worn shafts damage new seals during installation, producing repeat failures. Technician B's claim about adding sealer is incorrect; sealers cannot reliably stop steering gear seal leakage and may contaminate hydraulic components.

8. D — Replace the steering gear assembly with a remanufactured or new unit per service info. Internal steering gear wear beyond adjustable range requires gear replacement with a remanufactured or new unit. Continuing operation allows progressive wear and potential steering loss; fluid additives and voltage application have no effect on internal mechanical wear within the gear assembly.
9. A — Steering wander, hard cornering, and excessive front tire wear during operation. A worn drag link end produces multiple symptoms because it disrupts the steering linkage's geometry and stability. The wear allows wandering during straight-line driving, produces hard cornering response from compromised input transmission, and causes accelerated tire wear from inconsistent toe maintenance during operation.
10. C — Replace the pump with a new or remanufactured unit and verify proper fluid level. Power steering pump shaft seal leakage indicates the seal has reached the end of its service life; the typical service is pump replacement with a new or remanufactured unit. Sealer applications cannot reliably stop pump shaft seal leakage; continuing operation with leakage causes pump damage from low fluid level.
11. A — A failed coolant temperature sensor reading falsely cold to the engine ECM. ECT sensor errors affect engine fuel mixture but do not affect power steering assist. The other choices all directly cause loss of power steering assist during slow-speed maneuvering: worn pump cannot deliver adequate pressure, restricted hose limits fluid flow, and low fluid level allows pump cavitation.
12. C — Connect a pressure gauge in the supply line and measure pressure per service info. Power steering pump pressure testing connects a pressure gauge in the supply line and measures pressure per manufacturer service information. The reading is compared to specification (typically 1,500–2,000 PSI on heavy-duty applications); pressure below specification indicates pump wear or other supply system issues.
13. D — Internal seal failure or sector shaft wear producing free play and slow response. An "unloaded" steering gear failure mode refers to internal damage that allows the gear to lose control of motion without external indication. Internal seal failure or sector shaft wear produces free play and slow response that mask the failure; routine inspection identifies the wear before complete steering loss.
14. A — Technician A only. Heavy-duty truck power steering pumps are typically belt-driven from the engine, providing continuous mechanical power as long as the engine is running. Gear-driven pumps are not the standard configuration on most heavy-duty applications; the belt-drive design allows for easier service and replacement.
15. D — Verify pump pressure output, inspect for restriction, and inspect gear internal condition. Excessive steering effort despite recent pump replacement indicates the cause is elsewhere in the system. Verification of pump pressure output (confirming the new pump performs to

specification), inspection for supply restriction, and inspection of gear internal condition identifies the actual fault location.

16. A — Air leakage in the supply line allowing air entry into the fluid during pump operation. Steering fluid foaming in the reservoir indicates air entrainment in the fluid. The most common cause is a damaged or loose suction (supply) line allowing air entry during pump operation; the air-fluid mixture appears as foam in the reservoir. Low fluid level can produce similar symptoms but with audible pump noise.
17. C — Flush the entire system, identify the contamination source, and refill with proper fluid. Steering fluid contamination requires complete system flush, identification of the contamination source (failed seal, internal pump damage, foreign material entry), and refill with proper fluid. Adding fresh fluid does not eliminate contamination; the contamination has reached all system components and must be removed completely.
18. B — A failed coolant temperature sensor reading falsely cold to the engine ECM. ECT sensor errors affect engine fuel mixture but are unrelated to power steering fluid moisture content. The other choices all describe direct consequences of operating with moisture-saturated steering fluid: reduced lubricity causes accelerated wear, internal corrosion damages components, and increased cavitation risk affects pump operation.
19. A — Verify U-bolt torque, inspect center bolt condition, and verify proper axle alignment. A leaf spring shifted on the axle requires verification of U-bolt torque (loose U-bolts allow the shift), inspection of center bolt condition (the bolt locates the spring on the axle), and verification of proper axle alignment after correction. All three steps ensure the axle returns to its correct position and remains there.
20. D — Improper U-bolt torque, fatigue from repeated cycling, or improper installation. Broken U-bolts indicate failure under load conditions, typically from improper torque (insufficient or excessive), fatigue from repeated cycling without proper retorquing, or improper installation. Each cause concentrates stress on the U-bolt until failure occurs; proper installation per service specification prevents the failure.
21. D — Inspect spring eye bushings, shackles, and U-bolt torque systematically. Rear suspension knocking during deceleration indicates component movement under load. Systematic inspection of spring eye bushings (worn bushings allow movement), shackles (worn shackle pins allow movement), and U-bolt torque (loose U-bolts allow axle movement) identifies the specific cause for targeted repair.
22. B — Less than 1 PSI in 5 minutes per common service specifications during operation. Static air ride suspension pressure tests typically allow less than 1 PSI loss in 5 minutes per common service specifications. Loss rates exceeding this specification indicate air bag, supply line, or valve leakage requiring service. The tight specification reflects the small volume and slow leak rates that affect ride height stability over time.

23. A — Technician A only. Heavy-duty truck shock absorbers should be replaced as a matched pair on each axle to maintain equal damping characteristics across the axle. Mixing new and used shocks produces unbalanced damping that affects ride quality, handling, and component wear. Technician B's claim about individual replacement compromises suspension balance.
24. C — A failed coolant temperature sensor reading falsely cold to the engine ECM. ECT sensor errors affect engine fuel mixture but do not affect air ride pressure loss. The other choices all describe direct sources of air ride pressure loss: damaged air bag with cracks or punctures, failed ride height valve unable to seal, and damaged supply line fittings allow leakage during normal operation.
25. B — Bounce the truck at the affected corner and observe damping response during inspection. Shock absorber damping verification involves bouncing the truck at the affected corner and observing how quickly the bouncing stops. Properly functioning shocks stop the bouncing within one to two oscillations; failed shocks allow continued bouncing, indicating loss of damping function.
26. D — Worn or failed leaf spring components, broken center bolt, or worn shackle bushings. Excessive axle wrap-up during heavy throttle indicates the suspension cannot control axle rotation under load. Worn leaf spring components, broken center bolt, or worn shackle bushings all allow excessive axle rotation during torque application. Each component contributes to axle control during driving force transmission.
27. A — Continue operation if structural integrity is intact, but address corrosion source. Leaf spring rust scaling can continue in service if structural integrity is intact, but the corrosion source must be addressed to prevent progression. Continued operation without correction allows the corrosion to weaken the spring until structural failure occurs; addressing the source extends spring service life.
28. C — Maintains constant ride height by adding or releasing air as load changes during operation. The air ride leveling valve maintains constant ride height by adding air as the load increases (suspension compresses) or releasing air as the load decreases (suspension extends). The valve uses mechanical linkage to sense ride height and pneumatic action to adjust air bag pressure accordingly.
29. B — A failed coolant temperature sensor reading falsely cold to the engine ECM. ECT sensor errors affect engine fuel mixture but do not affect air ride suspension pressure. The other choices all describe direct sources of pressure variation between axle positions: failed leveling valve, damaged air bag, and damaged supply line all directly affect pressure delivery at one axle position.
30. D — Perform a static leak test to identify air bag, supply line, or valve leak sources. Air ride pressure loss within 30 minutes of parking requires a static leak test to identify the specific leak source. The test isolates whether the leak is in air bags (slow leaks), supply lines (cracked or chafed lines), or leveling valves (worn valve seats). Identification guides targeted repair.

31. B — Verify camber angle, inspect for excessive positive camber or improper toe setting. Front tire outside-edge wear typically indicates excessive positive camber (wheels tilted outward at top, contact patch shifted outboard) or toe-in (wheels point inward, scrubbing outward during driving). Verification of camber angle and toe setting identifies the specific cause for alignment correction.
32. D — Sum of camber angle and steering axis inclination measured during alignment service. Included angle is the sum of camber angle and steering axis inclination (SAI), measured during alignment service. The included angle is a non-adjustable angle that helps identify damaged or bent components when it does not match the specification, even if camber appears within range.
33. A — 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.
34. C — Technician A only. Caster angle affects steering self-centering tendency by creating a force that returns the wheels to the straight-ahead position after turning. Camber angle affects tire contact patch and wear pattern but does not directly affect steering self-centering. Technician B's claim is incorrect; the self-centering function comes from caster.
35. B — Reduced steering self-centering tendency and increased steering effort. Insufficient positive caster angle reduces the steering's ability to return to center after turning, requiring continuous driver correction. Reduced caster also reduces directional stability, producing wandering and increased steering effort during operation. Heavy-duty trucks typically use 3 to 5 degrees positive caster to maintain stability.
36. A — Verify alignment angles, kingpin condition, tie rod end condition, and tire condition systematically. Vehicle wander during highway operation requires systematic verification of alignment angles, kingpin condition (wear allows wheel movement), tie rod end condition (wear allows toe variation), and tire condition (uneven pressure or wear causes pull). Each component can independently cause wander; systematic inspection identifies the actual cause.
37. D — Failed shock absorbers, worn wheel bearings, or imbalanced tires causing tire bouncing. Tire cupping wear is the classic signature of tire bouncing during driving, typically caused by failed shock absorbers (no damping), worn wheel bearings (allowing wheel oscillation), or imbalanced tires (producing rotational vibration). The bouncing produces the diagnostic cupping pattern across the tire face.
38. C — A failed coolant temperature sensor reading falsely cold to the engine ECM. ECT sensor errors affect engine fuel mixture but do not affect tire wear patterns. The other choices all describe direct causes of accelerated tire wear across all positions: overload exceeds tire capacity, improper inflation affects all tires equally, and aggressive driver patterns increase friction work.

39. A — 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.
40. 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) indicate damaged components requiring identification and replacement before alignment can be properly completed.
41. C — Manufacturer service information specific to the wheel and stud configuration per TMC RP 237. Wheel lug nut torque values come from manufacturer service information specific to the wheel and stud configuration per TMC RP 237. Standard automotive specifications and visual estimation are inadequate for heavy-duty applications because incorrect torque can cause wheel separation or stud failure during operation.
42. A — Industry-standard wheel bearing service procedure for heavy-duty applications. TMC RP 618 establishes industry-standard wheel bearing service procedures for heavy-duty applications including specific tightening sequences, rotation requirements during torque, and final verification methods. Most manufacturers reference or follow RP 618 specifications for wheel bearing service.
43. B — Verify wheel bearing endplay and inspect bearing condition systematically per RP 618. A wheel hub running hot during normal operation indicates bearing problems requiring verification of endplay and bearing condition systematically per RP 618. Improper preload or insufficient endplay produces excessive friction and heat; bearing damage produces the same symptoms. Systematic inspection identifies the specific cause.
44. D — Incorrect bearing endplay, contaminated lubricant, or improper installation procedures. Premature wheel seal failure typically traces to incorrect bearing endplay (allowing seal flexing under load), contaminated lubricant (abrasive particles damage seal lip), or improper installation (damaged seal during installation). All three causes shorten seal service life dramatically.
45. A — Inspect for slow leak source, repair if possible, or replace tire if damaged beyond repair. Tire pressure 15 PSI below specification indicates a slow leak requiring source identification, repair if possible (puncture in repairable area), or tire replacement if damaged beyond repair (sidewall damage, large punctures, or repeated punctures). Continuing operation without correction risks blowout from heat buildup.
46. C — A failed coolant temperature sensor reading falsely cold to the engine ECM. ECT sensor errors affect engine fuel mixture but do not affect wheel bearing wear. The other choices all directly cause accelerated bearing wear: improper torque produces incorrect preload, contamination causes abrasive wear, and incorrect endplay or preload damages bearing surfaces during operation.

47. B — Indicator of tire load capacity reflecting tire construction strength rating. Tire ply rating indicates load capacity through tire construction strength rating. Higher ply ratings indicate stronger tire construction capable of carrying heavier loads at appropriate inflation pressures. Modern tires use load range letters (G, H, J) that correspond to traditional ply ratings.
48. D — Inspect for tire imbalance, wheel runout, and bearing condition systematically. Wheel vibration that begins above 50 mph and disappears below 45 mph indicates a rotating mass issue at a specific speed range. Tire imbalance, wheel runout, and bearing condition all produce speed-dependent vibration; systematic inspection identifies the specific cause for targeted repair.
49. A — Differential gear damage, premature tire wear, and possible CVSA out-of-service status. Mismatched tire sizes on the same axle force the differential to operate continuously at uneven speeds, causing differential gear damage, premature tire wear from scrubbing, and possible CVSA out-of-service status during inspection. The mismatched sizes prevent both wheels from rotating at proper speeds during straight-line driving.
50. C — Replace the tire immediately as it represents a safety-critical failure condition. Tire ply separation visible during inspection represents a safety-critical failure condition requiring immediate tire replacement. The separation indicates internal tire structure failure; continuing operation risks blowout and possible loss of vehicle control. No service action other than replacement is acceptable for visible ply separation.