PRACTICE EXAM 8: T5 SIMULATION (50 QUESTIONS)

1. TMC RP 615 specifies that measurable vertical play in a sealed drag link end requires:

A. Adjustment of the castellated nut torque

B. Lubrication through the zerk fitting

C. Replacement of the affected end

D. Continued service until 1/8 inch play

2. On most heavy-duty integral steering gears, worm shaft thrust bearing preload is:

A. Not field-adjustable; gear replacement required

B. Adjusted by the over-center screw

C. Adjusted by tightening the input shaft nut

D. Adjusted by adding shims behind the cover

3. Tech A says the bleed procedure requires lock-to-lock cycling. Tech B says the reservoir cap should be left off during bleeding. Who is correct?

A. Tech A only

B. Both Tech A and Tech B

C. Neither Tech A nor Tech B

D. Tech B only

4. Per TMC RP, the power steering pressure gauge is installed:

A. In the suction line at the pump inlet

B. In the return line at the reservoir

C. At the pump outlet only after disconnecting

D. In a tee in the high-pressure line

5. OEM specifications call for over-center adjustment to be performed:

A. With the gear at on-center position

B. With the gear at full lock right

C. With the gear at full lock left

D. With the gear pressurized at relief

6. A heavy-duty pump tests 2,300 psi against a 2,200 psi maximum specification. The correct action is:

A. Continue service and monitor

B. Adjust the relief valve lower

C. Replace the pump

D. Accept the higher pressure

7. Heavy-duty intermediate shaft U-joint lubrication intervals are:

A. Required only on driver complaint

B. Specified by OEM at PM intervals

C. Not required (sealed for life)

D. Specified at every gear service

8. The proper power steering bleed procedure includes:

A. Lock-to-lock cycling with reservoir level checks

B. Disconnecting the return line at start-up

C. Brief idle without lock-to-lock cycling

D. Road operation for 50 miles before checking

9. Tech A says OEM-specified power steering fluid must be used. Tech B says universal ATF can be substituted in any application. Who is correct?

A. Both Tech A and Tech B

B. Neither Tech A nor Tech B

C. Tech B only

D. Tech A only

10. The OEM step that prevents off-center steering wheel after gear replacement is:

A. Setting toe before installing the gear

B. Centering the gear sector before installing the pitman arm

C. Removing and reinstalling the steering wheel

D. Adjusting over-center higher than specification

11. The TMC dry-park test is performed:

A. Engine running, truck moving slowly

B. Engine running, wheels lifted

C. Engine running, truck stationary

D. Engine off, truck stationary

12. Drag link installation torque specifications cover:

A. Both ball-and-socket end fasteners

B. The drag link clamp bolts only

C. The pitman arm-to-sector nut only

D. The cross tube clamps

13. A removed core steering gear should be:

A. Drained and shipped dry

B. Filled with new fluid before shipping

C. Capped at all hydraulic ports

D. Shipped as removed without capping

14. Tech A says kingpin replacement is performed as a complete kit. Tech B says individual component replacement is acceptable. Who is correct?

A. Tech A only

B. Tech B only

C. Both Tech A and Tech B

D. Neither Tech A nor Tech B

15. Heavy-duty integral steering gear ratio between wheel and pitman arm is:

A. Constant throughout the steering range

B. Higher at lock and lower at center

C. Lower at center and higher at lock

D. Variable for reduced effort at center

16. TMC RP for power steering hose routing specifies:

A. Proper support and free of kinks

B. Hose tension across the routing path

C. Direct lines without flex consideration

D. Replacement only by OEM assemblies

17. The intermediate shaft slip yoke should be:

A. Welded to the upper column

B. Replaced with a solid shaft

C. Lubricated per OEM specification

D. Inspected only on complaint

18. Tech A says integral gears are replaced as assemblies, not field-rebuilt. Tech B says external seals and the over-center adjuster are field-serviceable. Who is correct?

A. Tech A only

B. Tech B only

C. Both Tech A and Tech B

D. Neither Tech A nor Tech B

19. TMC RP specifies U-bolt installation torque values that are:

A. Within the elastic-to-yield transition

B. Below the yield point for reuse

C. At the design break torque

D. Not specified by TMC

20. The OEM-recommended re-torque interval for new U-bolts is:

A. 10,000 miles or one month

B. 50,000 miles or next PM

C. 500 miles or one to two days

D. Not required after installation

21. Tech A says air bag replacement can be done without exhausting if supply is shut off. Tech B says the bag must be exhausted through the dump valve first. Who is correct?

A. Tech A only

B. Tech B only

C. Both Tech A and Tech B

D. Neither Tech A nor Tech B

22. Trailing arm bushings must be installed using:

A. Hand pressure only

B. A press without alignment tool

C. A torch to expand before pressing

D. The proper tool with correct orientation

23. TMC RP specifies that ride height be measured:

A. At OEM reference points to a defined dimension

B. By eye estimation comparing both sides

C. With the truck at full GVW load

D. With the truck completely unloaded

24. Heavy-duty rear shock absorber replacement requires:

A. One shock at a time as needed

B. All four shocks at once on tandem

C. Pairs (both shocks on same axle)

D. Only shocks with external leakage

25. Tech A says TMC RP requires leaf spring inspection at PM intervals. Tech B says inspection is required only on driver complaint. Who is correct?

A. Tech A only

B. Tech B only

C. Both Tech A and Tech B

D. Neither Tech A nor Tech B

26. Hendrickson Haulmaax rubber spring elements:

A. Require lubrication at every PM

B. Are replaced at fixed mileage intervals

C. Are sealed and not field-serviceable

D. Require visual inspection for damage

27. Air bag pressure after installation is set by:

A. Maximum supply pressure during start-up

B. Manual adjustment before linkage connection

C. The height control valve once linkage is connected

D. The air supply solenoid timing

28. Equalizer beam center bushing replacement is required when:

A. Any visible wear is present

B. Movement exceeds the OEM service limit

C. Surface scoring is present at any wear level

D. Service mileage exceeds 500,000

29. Tech A says air bag replacement requires ride height verification. Tech B says it also requires height control valve linkage adjustment verification. Who is correct?

A. Tech A only

B. Tech B only

C. Neither Tech A nor Tech B

D. Both Tech A and Tech B

30. OEM service procedure specifies that U-bolts at spring renewal are:

A. Replaced because they cannot be reliably reused

B. Reused if cleaned and re-torqued

C. Reused if threads are visibly undamaged

D. Replaced only if torque cannot be reached

31. Per OEM, torque rod inspection includes:

A. Wear, looseness, bushings, and fastener torque

B. Wear and looseness only

C. Lubrication levels at zerk fittings

D. Visible centerline alignment only

32. TMC trailing arm pivot bolt torque specifications are typically:

A. Below 200 lb-ft with no re-torque

B. At yield strength for maximum clamp

C. 350 to 600 lb-ft with break-in re-torque

D. Not specified (tightened to feel)

33. Per OEM, the proper alignment sequence is:

A. Toe, then caster, then camber

B. Camber, then caster, then toe

C. Pre-alignment inspection, caster, camber, toe

D. Caster, toe, camber, thrust angle

34. TMC RP for heavy-duty steer axle caster specification is:

A. Negative caster of -1 to -2 degrees

B. Positive caster of +3 to +5 degrees

C. Zero caster on most heavy trucks

D. Positive caster of +8 to +12 degrees

35. Tech A says thrust angle measurement is part of every heavy-duty alignment. Tech B says it is required only on dog-tracking complaint. Who is correct?

A. Tech A only

B. Tech B only

C. Both Tech A and Tech B

D. Neither Tech A nor Tech B

36. OEM-specified cross-caster split is typically:

A. Not specified by OEM

B. Within 1.5 degrees with no side preference

C. Within 2.5 degrees toward the road crown

D. Within 0.5 degrees opposite the road crown

37. Total toe specification for a Class 8 tractor steer axle is typically:

A. Toe-out by approximately 1/16 inch

B. Zero toe with no toe-in or toe-out

C. Toe-in by 1/16 to 1/8 inch per OEM

D. Toe-in by approximately 1/2 inch

38. Heavy-duty steer axle camber specification is typically:

A. Negative camber of -0.5 to -1.0 degrees

B. Positive camber of 0 to +0.5 degrees

C. Zero camber for all heavy-duty trucks

D. Positive camber of +1.5 to +2.5 degrees

39. TMC pre-alignment inspection requirements include:

A. Kingpins, linkage, tires, ride height, frame

B. Tire pressure verification only

C. Kingpin inspection only

D. Frame alignment verification only

40. Toe adjustment on a tie rod cross tube requires:

A. Loosening clamps and rotating the tube

B. Rotating without checking thread engagement

C. Centering the wheel by feel before adjusting

D. Centering the gear with equal thread engagement

41. Tech A says alignment should be checked at scheduled PM regardless of complaints. Tech B says alignment is checked only on complaint or abnormal wear. Who is correct?

A. Tech A only

B. Tech B only

C. Both Tech A and Tech B

D. Neither Tech A nor Tech B

42. Included angle is calculated as:

A. KPI plus camber

B. KPI minus camber

C. Caster plus camber

D. Caster minus camber

43. TMC RP 222 specifies wheel installation torque applied:

A. In numerical order around the wheel

B. One stud at a time top to bottom

C. Clockwise from the top stud

D. In a star pattern with progressive passes

44. TMC RP 618 wheel bearing preload procedure is:

A. Tighten to high torque and lock

B. Tighten, back off, retighten, back off precisely, lock

C. Tighten and back off until end-play shows

D. Tighten to a low fixed torque value

45. Tech A says clean mating surfaces are required for disc wheel installation. Tech B says this is critical for hub-piloted systems. Who is correct?

A. Tech A only

B. Tech B only

C. Both Tech A and Tech B

D. Neither Tech A nor Tech B

46. Recommended lug nut re-torque interval after installation is:

A. 50 to 100 miles

B. 50,000 miles or next PM

C. Not required after installation

D. 5,000 miles or one month

47. TMC RP requires immediate tire removal from service for:

A. Tread depth at 6/32 inch on the steer axle

B. Visible sidewall scuffing from curb contact

C. Inside-edge tread wear greater than outside

D. Sidewall bulge or cord exposure

48. Class 8 steer tire (295/75R22.5) at full GVW typically requires:

A. 80 to 90 psi cold inflation

B. 110 to 120 psi cold inflation

C. 130 to 140 psi cold inflation

D. 95 to 100 psi cold inflation

49. Tech A says spindle journal inspection is required before seal replacement. Tech B says the new seal compensates for any spindle wear. Who is correct?

A. Tech A only

B. Tech B only

C. Both Tech A and Tech B

D. Neither Tech A nor Tech B

50. On hub-piloted disc wheels, the wheel is centered by:

A. Lug nut tapered seats on the wheel disc

B. The hub flange face providing radial centering

C. Hub pilot pads engaging wheel pilot bores

D. Stud-piloted seating cones inside the disc

PRACTICE EXAM 8: ANSWER KEY AND EXPLANATIONS

1. C — Replacement of the affected end. TMC RP 615 establishes that sealed ball-and-socket joints in heavy-duty steering linkage allow no measurable vertical play, and any detected play indicates internal joint wear that cannot be adjusted out. Replacement is the only acceptable corrective action.

2. A — Not field-adjustable; gear replacement required. Worm shaft thrust bearing preload is set during gear manufacture and is not field-adjustable on most heavy-duty integral gears. OEM service procedures specify gear replacement when preload is out of specification.

3. B — Both Tech A and Tech B. Bleeding requires lock-to-lock cycling to purge air from the gear and lines, and the reservoir cap must be left off so trapped air can escape from the reservoir during the procedure. Both steps are part of the standard procedure.

4. D — In a tee in the high-pressure line. Power steering pump pressure testing requires a gauge in the high-pressure line where pump output can be measured directly, with a tee fitting allowing the system to remain operational. Suction or return line measurements do not provide pump output data.

5. A — With the gear at on-center position. Over-center adjustment removes lash at the on-center position where the sector and rack experience the most wear during normal driving. OEM procedures specify performing the adjustment at this position to set proper feel where it matters most.

6. C — Replace the pump. Relief valves on most heavy-duty pumps are not field-adjustable, and pressure above specification indicates pump or relief valve damage that risks hose, gear, or seal failure. Pump replacement is the standard corrective action.

7. B — Specified by OEM at PM intervals. Heavy-duty intermediate shaft U-joints typically include lubrication fittings and require lubrication at scheduled chassis PM intervals per the OEM service manual. They are not sealed for life on most heavy-duty applications.

8. A — Lock-to-lock cycling with reservoir level checks. The standard bleed procedure cycles the system through its full hydraulic range to displace air, with repeated reservoir checks because air displacement reduces fluid level as bubbles escape. Other approaches risk pump damage or incomplete bleeding.

9. D — Tech A only. OEM and TMC specifications require OEM-specified power steering fluid because heavy-duty integral gear seals, viscosity requirements, and additive packages are matched to specific formulations. Universal ATF substitution can damage seals and void warranty.

10. B — Centering the gear sector before installing the pitman arm. The gear sector has a specific on-center position established at manufacture, and the pitman arm uses a master spline that locates it correctly relative to the steering linkage. Installing with the gear off-center produces an off-center steering wheel.

11. D — Engine off, truck stationary. Dry-park testing isolates mechanical lash by applying steering input without hydraulic assist, allowing the technician to identify worn components by direct observation. Engine-on or wheels-up testing introduces hydraulic forces that mask play.

12. A — Both ball-and-socket end fasteners. Drag link installation includes torque specifications for the threaded ball-and-socket end fasteners at both connections (pitman arm and steering arm), where proper torque establishes joint preload and prevents loosening in service.

13. C — Capped at all hydraulic ports. Rebuilders prefer cores shipped with fluid retained and ports capped because retained fluid prevents internal corrosion and capped ports prevent contamination during transit. Draining or removing fluid creates damage opportunities.

14. A — Tech A only. OEM procedures specify kingpin replacement as a complete service kit (pins, bushings, thrust bearings, seals) because reusing any worn component compromises service life of the new components. Individual replacement is not standard OEM practice.

15. D — Variable for reduced effort at center. Modern heavy-duty integral steering gears use variable-ratio designs that provide easier turning effort near center and increased steering response at lock. This is a design feature for highway driving comfort and parking maneuverability.

16. A — Proper support and free of kinks. TMC RP specifies hoses must be supported, properly routed without kinks or sharp bends, and protected from heat and moving parts to prevent premature failure. Hose tension or unsupported direct routing is specifically not desired.

17. C — Lubricated per OEM specification. Slip yoke splines require lubrication per OEM specification to prevent dry binding and wear, with lubrication scheduled at chassis PM intervals using the specified grease. The slip yoke is a service-rated component, not sealed.

18. B — Tech B only. OEM service procedures typically allow field replacement of external components (sector shaft seal, input shaft seal, over-center adjuster) while requiring complete gear replacement for internal failures. Tech A's complete-replacement-only position is inconsistent with OEM practice.

19. A — Within the elastic-to-yield transition. U-bolt torque specifications are intentionally near the yield point to maximize clamp load, with the trade-off that yielded U-bolts cannot reliably reach

the same clamp load on reinstallation. This is why U-bolts must be replaced when leaf springs are renewed.

20. C — 500 miles or one to two days. New U-bolts must be re-torqued shortly after installation because initial seating of the leaf stack and residual hardware relaxation reduce original clamp load. The 500-mile or 1-2 day re-torque interval is the standard OEM specification.

21. B — Tech B only. Air bag stored pressure can release with significant force when a connection is broken, creating a serious injury hazard, so the bag must be exhausted through the dump valve before any disassembly. Shutting off air supply does not exhaust pressure already in the bag.

22. D — The proper tool with correct orientation. Trailing arm bushings require an installation tool that controls press-in depth and orientation, since incorrect installation damages the bushing or produces incorrect operating characteristics. Hand installation is inadequate, and heating bonded rubber bushings damages them.

23. A — At OEM reference points to a defined dimension. Ride height is measured at OEM-specified reference points to a specific dimension, and proper measurement is essential for correct height control valve adjustment. Eye estimation is not adequate, and the measurement is performed at empty chassis weight.

24. C — Pairs (both shocks on same axle). Mismatched shock damping between left and right sides of an axle produces uneven ride and handling, so shocks are replaced in pairs even when only one shows external damage. Single-shock replacement is not standard practice.

25. A — Tech A only. TMC RP specifies leaf spring inspection at PM intervals for fractured leaves, displaced center bolts, and worn bushings as preventive maintenance, regardless of complaints. Complaint-driven inspection alone misses developing failures.

26. D — Require visual inspection for damage. Hendrickson Haulmaax rubber spring elements require visual inspection at scheduled PM for cracking, set, contamination, or damage indicating end-of-service-life. They are not lubricated, not sealed, and not on a fixed mileage schedule.

27. C — The height control valve once linkage is connected. After bag installation and linkage connection, the height control valve regulates bag pressure based on chassis-to-axle position to maintain ride height. Manual pressure adjustment before linkage connection is not standard practice.

28. B — Movement exceeds the OEM service limit. Equalizer beam center bushing replacement is specified at the OEM service limit measured by pry-bar test, since center bushing wear directly affects load sharing and axle alignment. Wear thresholds are OEM-specific values.

29. D — Both Tech A and Tech B. TMC RP for air bag replacement requires both ride height verification and height control valve linkage adjustment verification after installation. Both verifications are part of the complete procedure.

30. A — Replaced because they cannot be reliably reused. U-bolts are torqued into the yield range during installation and stretched, so they cannot reach the same clamp load on reinstallation. OEM procedures specify U-bolt replacement at every spring renewal.

31. A — Wear, looseness, bushings, and fastener torque. Complete OEM torque rod inspection covers all four items: wear, looseness, cracked rubber bushings, and rod-to-frame fastener torque. Skipping the fastener torque inspection misses a critical safety item.

32. C — 350 to 600 lb-ft with break-in re-torque. Heavy-duty trailing arm pivot bolts are specified at high torque values (350-600 lb-ft typical) with re-torque verification after a break-in interval to compensate for initial seating. These specifications ensure adequate clamp load for axle locating function.

33. C — Pre-alignment inspection, caster, camber, toe. Alignment procedure starts with mechanical inspection because worn or loose components produce false readings, and adjustments proceed from angles that affect others (caster, camber) to those that depend on them (toe). Pre-alignment inspection is non-negotiable.

34. B — Positive caster of +3 to +5 degrees. Heavy-duty truck steer axles use moderate positive caster to provide directional stability and steering wheel return torque, with the typical specification range of +3 to +5 degrees. Negative or zero caster does not produce adequate return; +8 to +12 is excessive.

35. A — Tech A only. Per current TMC RP and OEM practice, thrust angle measurement is part of complete heavy-duty truck alignment service regardless of complaints. Complaint-driven thrust angle measurement misses gradual rear-axle drift that produces tire wear before driver complaints develop.

36. D — Within 0.5 degrees opposite the road crown. OEM specifications typically allow up to 0.5 degrees cross-caster split, and when the truck is operated on crowned roads, the higher caster is set on the side opposite the crown to compensate for road effect on tracking.

37. C — Toe-in by 1/16 to 1/8 inch per OEM. Heavy-duty Class 8 tractors typically specify toe-in in the 1/16 to 1/8 inch range, with the exact value being OEM-specific. Toe-out and zero-toe are not typical specifications for heavy-duty steer axles.

38. B — Positive camber of 0 to +0.5 degrees. Heavy-duty steer axle camber is typically specified at zero to slightly positive (0 to +0.5 degrees), reflecting the load-bearing geometry that brings the wheel to vertical or slightly positive under loaded conditions.

39. A — Kingpins, linkage, tires, ride height, frame. Pre-alignment inspection covers all components that affect alignment readings or alignment maintenance over service life. Limited inspection misses conditions that produce false readings or short-life alignments.

40. D — Centering the gear with equal thread engagement. Proper toe procedure requires centered steering gear (not feel-centered wheel), balanced thread engagement at both ends of the tube to maintain strength, and reclamping after adjustment. Skipping any step risks loss of adjustment or linkage failure.

41. A — Tech A only. TMC RP specifies wheel alignment checks at scheduled PM intervals regardless of complaints or tire wear, because alignment can drift gradually without driver awareness. Complaint-driven alignment alone misses gradual drift.

42. A — KPI plus camber. Included angle is defined as kingpin inclination plus camber and is used to detect bent steering knuckles or axle beams when individual angles appear normal. The sum reveals geometry issues that individual angles can mask.

43. D — In a star pattern with progressive passes. TMC RP 222 specifies cross-pattern torquing with progressive passes (typically 50%, 75%, 100% of final torque) to seat the wheel squarely against the hub face and distribute clamp load evenly. Sequential or single-pass tightening produces uneven clamping.

44. B — Tighten, back off, retighten, back off precisely, lock. TMC RP 618 specifies a multi-step procedure that seats the bearings, then sets a precise running clearance through controlled back-off, achieving consistent preload across vehicles and technicians. High torque or end-play methods do not produce the controlled preload required.

45. C — Both Tech A and Tech B. Clean, debris-free mating surfaces are required for all disc wheel installations per TMC RP, and this requirement is especially critical for hub-piloted systems because debris between mating surfaces compresses over miles, reducing clamp load.

46. A — 50 to 100 miles. Initial seating of the wheel against the hub and gasket relaxation reduce clamp load shortly after installation, requiring verification re-torque within the first 50 to 100 miles to restore specification clamp load. Skipping this step is a known cause of wheel-off events.

47. D — Sidewall bulge or cord exposure. TMC RP and DOT regulations require immediate removal from service for sidewall bulge, cord exposure, or structural damage, since these conditions indicate imminent catastrophic failure under load. Tread depth and curb scuffing alone do not require immediate removal.

48. B — 110 to 120 psi cold inflation. Class 8 steer tires of 295/75R22.5 size at full GVW typically require 110 to 120 psi cold per the tire manufacturer's load and inflation chart, with exact pressure determined by actual axle load. Lower pressures cause overheating; higher reduces contact patch.

49. A — Tech A only. TMC RP specifies inspection of the spindle journal sealing surface before installing a new seal because damaged surfaces destroy new seals immediately. Tech B's position that the new seal compensates for surface wear is incorrect — surface damage must be addressed before seal installation.

50. C — Hub pilot pads engaging wheel pilot bores. Hub-piloted systems center the wheel through a precise machined fit between hub pilot pads and the wheel's pilot bore, which is the defining feature distinguishing them from stud-piloted designs. The lug nuts only provide clamping force, not centering.