

PRACTICE EXAM 2: T8 SIMULATION

(50 QUESTIONS)

1. The typical operating temperature range for a heavy-duty diesel engine is:

- A. 140 to 160°F
- B. 180 to 210°F
- C. 220 to 250°F
- D. 250 to 280°F

2. Tech A says heavy-duty diesel engine oil change intervals are typically OEM-specified. Tech B says oil change intervals depend on operating conditions and may be extended with oil analysis. 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

3. The typical pressure rating of a heavy-duty diesel cooling system pressure cap is:

- A. 15 to 20 psi
- B. 7 to 10 psi
- C. 4 to 6 psi
- D. 25 to 30 psi

4. The recommended pH range for heavy-duty diesel coolant is:

- A. 6.0 to 7.0
- B. 4.0 to 5.5
- C. 8.5 to 10.5
- D. 12.0 to 14.0

5. The proper DEF concentration for heavy-duty diesel engine SCR systems is:

- A. Approximately 32.5% urea in deionized water
- B. Approximately 50% urea in tap water
- C. Approximately 75% urea in distilled water
- D. Approximately 100% urea solution

6. Tech A says heavy-duty diesel engine air filter restriction should not exceed OEM specification. Tech B says exceeding restriction limits reduces engine power and increases fuel consumption. 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

7. The typical fuel pressure specification for a heavy-duty diesel engine common rail system at idle is:

- A. 100 to 200 psi
- B. Per OEM specification, often 4,000 to 5,000 psi
- C. 50 to 100 psi

D. Up to 100,000 psi at all conditions

8. The recommended interval for heavy-duty diesel engine extended-life coolant (ELC) replacement is:

A. 30,000 miles or 1 year

B. 100,000 miles or 2 years

C. 200,000 miles or 3 years

D. Per OEM specification, often 600,000 miles or 6 years

9. The typical specific gravity reading for a fully charged heavy-duty truck flooded battery at 80°F is:

A. Approximately 1.265

B. Approximately 1.150

C. Approximately 1.350

D. Approximately 0.950

10. Tech A says heavy-duty diesel engine SCA levels should be tested at scheduled PM intervals. Tech B says SCA test strips provide a quick method to verify inhibitor concentration. 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

11. The typical thermostat opening temperature for a heavy-duty diesel engine is:

A. 145 to 160°F

- B. 165 to 175°F
- C. 220 to 235°F
- D. 180 to 195°F

12. The recommended interval for heavy-duty diesel engine fuel filter replacement is:

- A. 5,000 miles or 30 days
- B. Per OEM specification, often 25,000 to 50,000 miles
- C. 100,000 miles or 1 year
- D. 200,000 miles or 2 years

13. Tech A says heavy-duty diesel engine drive belt tension should be verified at scheduled PM intervals. Tech B says belt tension below specification can cause slippage and accessory failures. 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

14. The proper inspection for heavy-duty diesel engine charge air cooler condition includes pressure testing at:

- A. OEM-specified test pressure with leak verification
- B. 50 psi above operating pressure
- C. Atmospheric pressure only
- D. Maximum compressor output pressure

15. The DOT requirement for heavy-duty truck windshield wiper operation is:

- A. Functional only on driver side
- B. Functional with at least one operating speed
- C. Functional with at least two operating speeds
- D. Functional with adequate sweep area for visibility

16. Tech A says heavy-duty truck cab seat belts must be functional and properly anchored. Tech B says damaged or non-functional seat belts are out-of-service conditions per FMCSA. Who is correct?

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

17. The DOT requirement for heavy-duty truck cab mirrors is:

- A. At least two functional mirrors providing required field of view
- B. One functional mirror on the driver side only
- C. Mirrors are not required if backup camera is installed
- D. Mirrors required only on dual-axle trucks

18. The typical inspection criteria for heavy-duty truck windshield damage includes:

- A. Any visible damage requires replacement
- B. Damage outside the driver's field of view does not require replacement
- C. Damage in the driver's primary visual field exceeding specified size limits

D. Damage on the passenger side does not affect compliance

19. Tech A says heavy-duty truck cab structural integrity inspection includes mounting integrity. Tech B says cab mounting failures can affect cab stability and driver safety. 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

20. The proper inspection for heavy-duty truck hood operation includes:

A. Latch security, hinge operation, and structural integrity

B. Latch security only

C. Hinge operation only

D. Structural integrity only

21. The minimum acceptable voltage during a load test on a fully charged flooded battery at 70°F is:

A. 9.6 volts at the end of the test

B. 8.4 volts at the end of the test

C. 10.5 volts at the end of the test

D. 11.5 volts at the end of the test

22. Tech A says heavy-duty truck PM inspection should include alternator output verification. Tech B says alternator output should be measured under load to verify proper operation. 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

23. The typical voltage regulation range for a 12-volt heavy-duty truck alternator is:

- A. 12.6 to 13.4 volts
- B. 13.8 to 14.5 volts
- C. 14.5 to 15.5 volts
- D. 15.5 to 16.5 volts

24. The DOT requirement for heavy-duty truck headlights is:

- A. One functional headlight is acceptable
- B. Functional headlights at all times
- C. High beam operation only when needed
- D. Two functional headlights with proper aim

25. Tech A says heavy-duty truck PM inspection should include scan tool retrieval of fault codes. Tech B says active fault codes may indicate developing issues requiring service. Who is correct?

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

26. The proper inspection for heavy-duty truck frame rail cracks includes:

- A. Visual inspection only without measurement
- B. Pressure testing only without visual inspection
- C. Visual inspection at high-stress areas including rivet holes and welded joints
- D. Replacement at fixed mileage intervals

27. Tech A says heavy-duty truck frame fastener torque should be verified at scheduled PM intervals. Tech B says loose frame fasteners can lead to component movement and additional damage. Who is correct?

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

28. The proper procedure for heavy-duty truck fifth wheel inspection includes:

- A. Lubrication only without inspection
- B. Replacement at fixed mileage intervals
- C. Visual inspection only without movement check
- D. Visual inspection, lubrication, and operational verification

29. The typical inspection criteria for heavy-duty truck frame damage requiring repair is:

- A. Any visible crack, deformation, or structural compromise
- B. Cracks at non-structural areas only
- C. Surface scratches on the frame web

D. Paint flaking on the frame surface

30. Tech A says heavy-duty truck frame inspection should include crossmember integrity. Tech B says crossmember inspection identifies developing structural issues. 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

31. The proper inspection for heavy-duty truck frame components affected by corrosion includes:

A. Visual inspection only without measurement

B. Replacement only when structural failure occurs

C. Visual inspection plus thickness measurement at affected areas

D. Application of paint to seal the corrosion

32. The proper inspection for heavy-duty truck driveshaft includes:

A. U-joint condition, slip yoke condition, and tube straightness

B. U-joint condition only

C. Slip yoke condition only

D. Tube straightness only

33. Tech A says heavy-duty truck transmission fluid level inspection should follow OEM specifications for proper procedure. Tech B says incorrect fluid level inspection produces inaccurate readings. 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

34. The proper inspection for heavy-duty truck drive axle includes:

- A. Lubrication only without inspection
- B. Fluid level, leak inspection, and breather condition
- C. Replacement at fixed mileage intervals
- D. Visual inspection only without fluid check

35. The typical inspection criteria for heavy-duty truck driveline U-joint replacement is:

- A. Any measurable play indicates replacement is required
- B. Play exceeding 1/4 inch indicates replacement
- C. Visual cracks indicate replacement is required only
- D. Replacement only at fixed mileage intervals

36. The FMCSA out-of-service criterion for air brake leakage rate at applied position is:

- A. 1 psi per minute or less
- B. 2 psi per minute or less
- C. Greater than 3 psi per minute on a single vehicle

D. 5 psi per minute or less

37. The FMCSA out-of-service criterion for air brake adjustment on a Type 30 chamber is:

A. Pushrod travel less than 1.5 inches

B. Pushrod travel less than 2 inches

C. Pushrod travel less than 2.25 inches

D. Pushrod travel exceeding the readjustment limit (typically 2 inches)

38. Tech A says heavy-duty truck air brake system must build from 0 to 90 psi within 3 minutes at idle. Tech B says inadequate buildup time is an out-of-service condition. Who is correct?

A. Tech A only

B. Both Tech A and Tech B

C. Tech B only

D. Neither Tech A nor Tech B

39. The FMCSA out-of-service criterion for brake lining thickness on heavy-duty trucks is:

A. Less than 4mm at the thinnest point or below OEM minimum

B. Less than 8mm at the thinnest point

C. Less than 12mm at the thinnest point

D. Less than 1mm at the thinnest point

40. The typical air brake low-pressure warning activation specification is:

A. At 100 psi or higher

- B. At 80 psi or higher
- C. At less than 60 psi
- D. At less than 30 psi

41. Tech A says heavy-duty truck brake drum diameter should be measured at PM inspection. Tech B says drums beyond OEM service limit require replacement. 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

42. The FMCSA out-of-service criterion for parking brake performance is:

- A. Failure to hold the vehicle on a 20% grade
- B. Failure to hold the vehicle on a posted slope test or per FMCSA test procedure
- C. Failure to hold the vehicle on a level surface
- D. Failure to hold the vehicle on a 5% grade

43. The proper inspection for heavy-duty truck brake hose condition includes:

- A. Visual inspection for cracks, bulges, abrasion, and proper routing
- B. Pressure testing only without visual inspection
- C. Visual inspection only without operational verification
- D. Replacement at fixed mileage intervals

44. The FMCSA out-of-service criterion for steering wheel free play is:

- A. More than 5 degrees
- B. More than 10 degrees
- C. Greater than the OEM specification or 10 degrees on heavy-duty trucks
- D. More than 30 degrees

45. Tech A says heavy-duty truck kingpin wear inspection should include vertical and horizontal play measurement. Tech B says kingpin wear beyond service limits requires replacement. 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

46. The proper inspection for heavy-duty truck leaf spring condition includes:

- A. Visual inspection only without specific criteria
- B. Visual inspection for fractured leaves, displaced center bolt, and worn bushings
- C. Replacement at fixed mileage intervals
- D. Inspection only when complaints reported

47. The proper inspection for heavy-duty truck shock absorber condition includes:

- A. Visual inspection for leaks, damage, and proper mounting
- B. Replacement at fixed mileage intervals
- C. Pressure testing only without visual inspection

D. Inspection only when complaints reported

48. The FMCSA tread depth minimum for heavy-duty truck steer tires is:

A. 2/32 inch

B. 3/32 inch

C. 4/32 inch

D. 6/32 inch

49. Tech A says heavy-duty truck tire pressure should be verified when tires are cold. Tech B says proper inflation pressure depends on load and OEM specification. 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

50. The recommended re-torque interval for heavy-duty truck wheel lug nuts after installation is:

A. 5,000 miles or one month

B. 50 to 100 miles after installation

C. 50,000 miles or next PM

D. Re-torque is not required after installation

PRACTICE EXAM 2: ANSWER KEY AND EXPLANATIONS

1. B — 180 to 210°F. The typical operating temperature range for a heavy-duty diesel engine is 180 to 210°F, providing optimal combustion efficiency and emissions while maintaining adequate viscosity in lubricating oil. Operating outside this range indicates cooling system faults requiring inspection.
2. D — Both Tech A and Tech B. Heavy-duty diesel engine oil change intervals are OEM-specified based on engine design, operating conditions, and oil specification. Intervals depend on operating conditions (severe duty, normal duty, highway) and may be extended with oil analysis confirming oil condition supports continued service.
3. A — 15 to 20 psi. Heavy-duty diesel cooling system pressure caps typically rate at 15 to 20 psi, raising the boiling point of the coolant to allow higher operating temperatures without boiling. The pressure cap also protects against over-pressure conditions through a relief valve.
4. C — 8.5 to 10.5. The recommended pH range for heavy-duty diesel coolant is 8.5 to 10.5 (slightly alkaline), preventing acid attack on cooling system components. pH outside this range requires coolant service to restore proper chemistry.
5. A — Approximately 32.5% urea in deionized water. The proper DEF concentration for heavy-duty diesel SCR systems is approximately 32.5% urea in deionized water, which is the standardized concentration for SCR catalyst chemistry. Concentrations outside this range can damage the SCR catalyst and produce emissions issues.
6. C — Both Tech A and Tech B. Heavy-duty diesel air filter restriction should not exceed OEM specification because excessive restriction reduces engine performance. Exceeding restriction limits reduces engine power (less air for combustion) and increases fuel consumption (engine works harder for same output), making restriction monitoring important.
7. B — Per OEM specification, often 4,000 to 5,000 psi. Heavy-duty diesel common rail fuel systems operate at very high pressures, with idle pressure typically 4,000 to 5,000 psi per OEM specification. Operating pressures vary by engine and load conditions but follow OEM specifications.
8. D — Per OEM specification, often 600,000 miles or 6 years. Heavy-duty diesel extended-life coolant (ELC) replacement intervals are OEM-specific, typically extending to 600,000 miles or 6 years. The exact interval depends on the specific coolant formulation and maintenance protocol.

9. A — Approximately 1.265. The typical specific gravity reading for a fully charged heavy-duty truck flooded battery at 80°F is approximately 1.265, which is the industry standard for full charge state. Lower readings indicate decreasing state of charge per the standard SG-to-SOC table.
10. C — Both Tech A and Tech B. Heavy-duty diesel engine SCA levels should be tested at scheduled PM intervals because SCA depletes during operation. SCA test strips provide a quick method to verify inhibitor concentration, allowing technicians to add SCA when concentration drops below specification.
11. D — 180 to 195°F. The typical thermostat opening temperature for a heavy-duty diesel engine is 180 to 195°F, regulating coolant flow to maintain optimal operating temperature. Lower opening temperatures result in poor combustion efficiency; higher temperatures risk overheating.
12. B — Per OEM specification, often 25,000 to 50,000 miles. Heavy-duty diesel fuel filter replacement intervals are OEM-specific, typically falling in the 25,000 to 50,000 mile range. Severe service or fuel quality issues may require shorter intervals; clean fuel and normal service support longer intervals.
13. C — Both Tech A and Tech B. Heavy-duty diesel engine drive belt tension should be verified at scheduled PM intervals because tension affects belt function and life. Belt tension below specification can cause slippage (reducing accessory drive efficiency) and accessory failures (alternator, water pump) from inadequate drive.
14. A — OEM-specified test pressure with leak verification. Heavy-duty diesel charge air cooler pressure testing uses OEM-specified test pressure and verifies system integrity through leak detection. Specific test pressures vary by engine, but OEM specification provides the proper test parameters.
15. D — Functional with adequate sweep area for visibility. DOT requires heavy-duty truck windshield wipers to be functional with adequate sweep area for visibility, ensuring driver can maintain proper visibility in adverse weather. Specific requirements include sweep area, speed control, and proper blade contact.
16. B — Both Tech A and Tech B. Heavy-duty truck cab seat belts must be functional and properly anchored to provide occupant protection during operation. Damaged or non-functional seat belts are out-of-service conditions per FMCSA, requiring repair before continued operation.
17. A — At least two functional mirrors providing required field of view. DOT requires at least two functional mirrors providing the required field of view, with specific positioning requirements. Mirrors must be properly mounted and adjustable to driver position.
18. C — Damage in the driver's primary visual field exceeding specified size limits. Heavy-duty truck windshield damage criteria include damage in the driver's primary visual field exceeding specified size limits (typically 1.25 inches or larger). Damage outside the driver's primary field may not require immediate replacement.

19. D — Both Tech A and Tech B. Heavy-duty truck cab structural integrity inspection includes mounting integrity (bolts, bushings, frame attachment) because mounting affects cab stability. Cab mounting failures can affect cab stability and driver safety, with developing failures identified through proper inspection.
20. A — Latch security, hinge operation, and structural integrity. Heavy-duty truck hood operation inspection includes latch security (preventing unintended opening), hinge operation (proper raise and lower function), and structural integrity (preventing failure during operation). Comprehensive inspection identifies developing issues.
21. A — 9.6 volts at the end of the test. The minimum acceptable voltage during a load test on a fully charged flooded battery at 70°F is 9.6 volts at the end of the 15-second test. Lower readings indicate the battery has lost capacity and requires replacement.
22. C — Both Tech A and Tech B. Heavy-duty truck PM inspection should include alternator output verification because alternator condition affects all electrical systems. Alternator output should be measured under load to verify proper operation, since unloaded testing may show normal voltage despite reduced current capability.
23. B — 13.8 to 14.5 volts. The typical voltage regulation range for a 12-volt heavy-duty truck alternator is 13.8 to 14.5 volts, providing adequate voltage to charge batteries while preventing overcharge. Values outside this range indicate regulator or alternator faults.
24. D — Two functional headlights with proper aim. DOT requires two functional headlights with proper aim on heavy-duty trucks, ensuring adequate road illumination for safe operation. Single headlight operation is not compliant; aim must meet specifications for road illumination without blinding oncoming drivers.
25. A — Both Tech A and Tech B. Heavy-duty truck PM inspection should include scan tool retrieval of fault codes because codes provide diagnostic information not visible through inspection. Active fault codes may indicate developing issues requiring service before they progress to operational failures.
26. C — Visual inspection at high-stress areas including rivet holes and welded joints. Heavy-duty truck frame rail crack inspection focuses on high-stress areas including rivet holes and welded joints, where cracks typically develop. These areas are more prone to fatigue cracking than other frame areas.
27. B — Both Tech A and Tech B. Heavy-duty truck frame fastener torque should be verified at scheduled PM intervals because loose fasteners can lead to additional damage. Loose frame fasteners can lead to component movement and additional damage from increased stress and impact loads, requiring periodic verification.
28. D — Visual inspection, lubrication, and operational verification. Heavy-duty truck fifth wheel inspection includes visual inspection (component condition), lubrication (proper greasing), and

operational verification (engagement and release function). All elements are required for proper fifth wheel service.

29. A — Any visible crack, deformation, or structural compromise. Heavy-duty truck frame damage requiring repair includes any visible crack, deformation, or structural compromise that affects frame integrity. Surface conditions (paint, scratches) do not require structural repair.
30. C — Both Tech A and Tech B. Heavy-duty truck frame inspection should include crossmember integrity because crossmembers contribute to overall frame structure. Crossmember inspection identifies developing structural issues such as cracks, loose fasteners, or impact damage.
31. C — Visual inspection plus thickness measurement at affected areas. Heavy-duty truck frame components affected by corrosion require visual inspection plus thickness measurement at affected areas to determine remaining structural capacity. Surface treatment without measurement does not address potential structural compromise.
32. A — U-joint condition, slip yoke condition, and tube straightness. Heavy-duty truck driveshaft inspection includes U-joint condition (wear, damage), slip yoke condition (lubrication, wear), and tube straightness (no bends or damage). All elements affect driveshaft operation and life.
33. D — Both Tech A and Tech B. Heavy-duty truck transmission fluid level inspection should follow OEM specifications for proper procedure (engine running or off, fluid temperature, level reference points). Incorrect fluid level inspection procedure produces inaccurate readings that can lead to incorrect service decisions.
34. B — Fluid level, leak inspection, and breather condition. Heavy-duty truck drive axle inspection includes fluid level (verifying proper level), leak inspection (identifying external leaks), and breather condition (verifying proper venting). These elements identify developing axle issues.
35. A — Any measurable play indicates replacement is required. Heavy-duty truck driveline U-joint replacement is indicated when any measurable play is detected, since U-joints are designed to operate without measurable play. Play indicates internal wear that progresses to complete failure.
36. C — Greater than 3 psi per minute on a single vehicle. The FMCSA out-of-service criterion for air brake leakage rate at applied position is greater than 3 psi per minute on a single vehicle. Excessive leakage compromises brake system reliability and can result in brake failure during operation.
37. D — Pushrod travel exceeding the readjustment limit (typically 2 inches). The FMCSA out-of-service criterion for air brake adjustment on a Type 30 chamber is pushrod travel exceeding the readjustment limit, which is typically 2 inches for Type 30 chambers. Specific limits vary by chamber type per FMCSA tables.
38. B — Both Tech A and Tech B. Heavy-duty truck air brake system must build from 0 to 90 psi within 3 minutes at idle per FMCSA requirements. Inadequate buildup time is an out-of-service

condition because it indicates compressor or system issues that compromise brake system reliability.

39. A — Less than 4mm at the thinnest point or below OEM minimum. The FMCSA out-of-service criterion for brake lining thickness on heavy-duty trucks is less than 4mm at the thinnest point, or below the OEM minimum, whichever is greater. Below this threshold, brake performance is compromised.
40. C — At less than 60 psi. The typical air brake low-pressure warning activation specification is at less than 60 psi, providing the driver early warning of system pressure loss. Below this pressure, brake performance becomes compromised and additional pressure loss results in brake application or release issues.
41. D — Both Tech A and Tech B. Heavy-duty truck brake drum diameter should be measured at PM inspection because diameter indicates wear status. Drums beyond the OEM service limit require replacement because excessive drum diameter compromises brake performance and can cause heat-related drum failure.
42. B — Failure to hold the vehicle on a posted slope test or per FMCSA test procedure. The FMCSA out-of-service criterion for parking brake performance is failure to hold the vehicle per FMCSA test procedure (typically a posted grade test). The parking brake must hold the vehicle to meet FMCSA requirements.
43. A — Visual inspection for cracks, bulges, abrasion, and proper routing. Heavy-duty truck brake hose condition inspection includes visual inspection for cracks (developing failures), bulges (internal damage), abrasion (chafing), and proper routing (avoiding damage points). Visual inspection identifies developing hose issues before failure.
44. C — Greater than the OEM specification or 10 degrees on heavy-duty trucks. The FMCSA out-of-service criterion for steering wheel free play is greater than the OEM specification, with 10 degrees commonly cited for heavy-duty trucks. Excessive free play compromises steering response and vehicle control.
45. D — Both Tech A and Tech B. Heavy-duty truck kingpin wear inspection should include vertical and horizontal play measurement to identify wear in both directions. Kingpin wear beyond service limits requires replacement because wear cannot be corrected through lubrication or adjustment.
46. B — Visual inspection for fractured leaves, displaced center bolt, and worn bushings. Heavy-duty truck leaf spring condition inspection includes visual inspection for fractured leaves (load capacity issues), displaced center bolt (axle position issues), and worn bushings (mounting integrity). All elements affect suspension operation.
47. A — Visual inspection for leaks, damage, and proper mounting. Heavy-duty truck shock absorber inspection includes visual inspection for leaks (oil weeping indicating internal failure), damage

(impact damage), and proper mounting (secure attachment). Leaking or damaged shocks require replacement.

48. C — 4/32 inch. The FMCSA tread depth minimum for heavy-duty truck steer tires is 4/32 inch. Below this depth, the tire is out-of-service for steer axle position and must be replaced or moved to a non-steer position.
49. D — Both Tech A and Tech B. Heavy-duty truck tire pressure should be verified when tires are cold because hot tire pressure varies with operating temperature. Proper inflation pressure depends on load and OEM specification, with the inflation table specifying pressure for the specific tire size and load condition.
50. B — 50 to 100 miles after installation. The recommended re-torque interval for heavy-duty truck wheel lug nuts after installation is 50 to 100 miles, since initial seating reduces clamp load and re-torque restores specification. Skipping re-torque is a known cause of wheel-off events.