PRACTICE EXAM 4: T6 SIMULATION (50 QUESTIONS)

1. A 2019 Freightliner Cascadia with 540,000 miles develops an intermittent dash blackout that resolves after a few seconds. The truck has had no recent electrical work. Which condition is the most likely cause?

A. Failed instrument cluster with internal damage

B. Failed engine ECU producing communication faults

C. Failed body controller with internal damage

D. Loose or corroded primary chassis ground connection

2. A Class 8 tractor with 720,000 miles has experienced repeated parasitic draw issues over the past 100,000 miles. Three different battery replacements have not resolved the issue. Which condition is the most likely root cause?

A. Multiple module failures producing simultaneous draw

B. A specific circuit not entering sleep mode after key-off

C. Defective replacement batteries from the supplier

D. Excessive accessory loads installed by the driver

3. A 2020 International LT with 280,000 miles has had two relay replacements in the headlight circuit in the past 6 months. The relays are OEM-specification replacements. Which condition is the most likely root cause?

A. Excessive current draw exceeding the relay rating

B. Defective replacement relays from the supplier

C. Vibration damage at the relay socket from chassis flex

D. Incorrect relay part number for the application

4. A 2021 Peterbilt 579 with 180,000 miles develops random electrical issues across multiple unrelated circuits. The driver reports the issues started after a minor accident that bent the front bumper. Which condition is the most likely cause?

A. Multiple coincidental component failures

B. Failed body controller from accident impact

C. Damaged battery ground cable or chassis ground point

D. Failed engine ECU from accident impact

5. A heavy-duty truck has had its primary chassis ground cable replaced 30,000 miles ago. The driver now reports intermittent voltage drops affecting multiple systems. Which condition is the most likely cause?

A. Improper torque or surface preparation at the ground replacement

B. Failed chassis ground cable from manufacturing defect

C. Multiple coincidental electrical issues unrelated to the ground replacement

D. Battery condition unrelated to the ground replacement

6. A 2018 Mack Anthem with 620,000 miles develops a complaint of intermittent fuse blowing in the cab accessory circuit. The fuse blows once or twice per week. Which diagnostic approach is LEAST likely to identify the cause?

A. Inspect the wiring harness for chafing or insulation damage

B. Monitor circuit current draw during normal operation

C. Test for shorts to ground at each accessory in the circuit

D. Replace the fuse panel because of contact wear

7. A Class 8 tractor with 940,000 miles has had three different cab harnesses replaced over its service life. The driver now reports another harness-related electrical fault. Which condition is the most likely root cause of the repeated harness failures?

A. Defective replacement harnesses from the supplier

B. Cab-to-chassis flex at a specific routing point causing harness damage

C. Operator-installed accessories damaging the harness

D. Excessive vehicle vibration unrelated to the harness routing

8. A heavy-duty truck has had its battery cables replaced 50,000 miles ago. The driver now reports a no-start condition. Voltage drop testing shows 0.8 volts across the new positive cable during cranking. The most likely cause is:

A. Defective replacement cable from the supplier

B. Excessive cable length for the application

C. Improper terminal crimping at the new cable connection

D. Battery condition unrelated to the cable replacement

9. A 2019 Volvo VNL with 380,000 miles develops a complaint of dim headlights after a recent battery terminal cleaning service. The headlights worked normally before the service. Which condition is the most likely cause?

A. Improper torque at the battery terminals after cleaning

B. Damaged headlight bulbs during the battery service

C. Failed alternator unrelated to the battery service

D. Failed body controller after the battery service

10. A heavy-duty truck driver reports that random electrical issues started after a recent third-party accessory installation. The shop did not perform the installation. Which condition is LEAST likely the cause?

A. Improper splice or tap into the existing wiring harness

B. Excessive load added to a circuit not rated for the accessory

C. Improper ground connection for the new accessory

D. Coincidental wiring harness failure unrelated to the accessory

11. A 2022 Kenworth T680 with 95,000 miles develops a complaint of intermittent dash warning lamps with no specific pattern. The truck has had no electrical work performed. Which condition is the most likely cause?

A. Loose or corroded primary chassis ground connection

B. Failed individual sensors producing intermittent signals

C. Failed body controller with internal damage

D. Failed engine ECU with communication issues

12. A heavy-duty truck has had its engine ECU replaced 10,000 miles ago after a flood damage event. The driver now reports random module communication faults. Which condition is the most likely cause?

A. Defective replacement ECU from the supplier

B. Wiring harness damage from the flood event not addressed

C. Other modules damaged by the flood not addressed

D. Body controller communication issues unrelated to the flood

13. A 2017 Freightliner Cascadia with 1.1 million miles has had its cab harness replaced once during its service life. The driver now reports a complaint of intermittent multiple-circuit electrical faults. Which condition is the LEAST likely cause?

A. Connector corrosion at high-mileage connection points

B. Wiring fatigue from accumulated chassis flex over miles

C. Module failures from accumulated thermal cycling over miles

D. Cab harness replacement performed incorrectly years ago

14. A heavy-duty truck has had its alternator replaced 20,000 miles ago. The driver now reports random electrical issues across multiple circuits. Which condition is the most likely cause?

A. Defective replacement alternator from the supplier

B. Excessive AC ripple from the new alternator damaging electronics

C. Battery condition unrelated to the alternator replacement

D. Body controller failure unrelated to the alternator

15. A 2020 Peterbilt 579 with 220,000 miles has had repeated battery replacements every 12 to 18 months over the past 3 years. The fleet has used the same battery brand throughout. Which condition is the most likely root cause?

A. Defective batteries from the supplier across multiple deliveries

B. Excessive parasitic draw shortening battery life over time

C. Charging system overcharging or undercharging the batteries

D. Operator behavior shortening battery life through usage patterns

16. A Class 8 tractor with 480,000 miles has had its starter motor replaced 40,000 miles ago. The driver now reports slow cranking that has gradually worsened over the past 5,000 miles. Which condition is the most likely cause?

A. Battery condition deteriorating independently of the starter replacement

B. Defective replacement starter motor from the supplier

C. Improper installation of the replacement starter motor

D. Engine cranking load increasing from internal wear

17. A 2018 Mack Anthem with 660,000 miles has had its battery cables replaced 60,000 miles ago. The driver now reports a no-crank condition during cold weather only. Which condition is the most likely cause?

A. Defective replacement cables from the supplier

B. Battery condition unable to maintain voltage in cold weather

C. Starter motor wear accumulating since the cable service

D. Battery cables developing high resistance in cold conditions

18. A 2019 International LT with 340,000 miles has had its starter motor replaced twice in the past 100,000 miles. Both replacements were OEM-specification units. Which diagnostic step is LEAST likely to identify the underlying cause?

A. Verify battery condition and capacity under cranking load

B. Replace the starter motor with a different brand

C. Verify cranking voltage at the starter input terminal

D. Inspect engine cranking load for excessive resistance

19. A 2021 Volvo VNL with 120,000 miles has experienced two no-start events in the past month. Both events occurred after extended parking (3-5 days). The truck starts normally during regular use. Which condition is the most likely cause?

A. Excessive parasitic draw discharging batteries during parking

B. Defective batteries unable to retain charge over time

C. Failed alternator not maintaining battery charge

D. Failed starter motor unable to engage when cold

20. A heavy-duty truck driver reports that the truck has been jump-started multiple times in the past month. The shop has tested batteries and found them within specification each time. Which condition is the most likely cause?

A. Operator behavior leaving accessories on during parking

B. Failed alternator producing intermittent low output

C. Excessive parasitic draw not previously identified

D. Battery condition deteriorating despite passing tests

21. A 2022 Freightliner Cascadia with 80,000 miles has experienced one no-crank event after the driver left the dome light on overnight. The driver wants to know if the batteries should be replaced. Which response is most appropriate?

A. Replace the batteries because deep discharge causes permanent damage

B. Recharge and load test the batteries before any replacement decision

C. Replace the batteries because lead-acid batteries lose capacity after deep discharge

D. Continue service without replacement because deep discharge is normal

22. A heavy-duty truck has had its battery terminals cleaned 5,000 miles ago. The driver now reports intermittent slow cranking that occurs randomly. Which condition is the most likely cause?

A. Improper terminal torque after the cleaning service

B. Battery condition deteriorating since the cleaning service

C. Starter condition deteriorating since the cleaning service

D. Cable condition unrelated to the cleaning service

23. A 2018 Kenworth T680 with 640,000 miles has had its alternator replaced 80,000 miles ago. The driver reports the battery has been discharged on three occasions in the past month. Which condition is the LEAST likely cause?

A. Excessive parasitic draw discharging batteries when parked

B. Defective replacement alternator from the supplier 80,000 miles ago

C. Charging system load exceeding alternator output capacity

D. Battery condition deteriorating since the alternator replacement

24. A heavy-duty truck has had repeated alternator failures at approximately 100,000-mile intervals over the past 300,000 miles. Three different alternator brands have been installed without resolution. Which condition is the most likely root cause?

A. Defective alternators from each respective supplier across deliveries

B. Drive belt tension specification missed at each installation

C. Charging system load demand exceeding alternator capacity over miles

D. Battery condition affecting alternator life through high charge demand

25. A 2020 Peterbilt 579 with 360,000 miles has developed a complaint of intermittent battery warning lamp activation. Alternator output tests within specification at the time of inspection. Which condition is the most likely cause?

A. Intermittent alternator output drop not present during testing

B. Failed warning lamp circuit unrelated to alternator output

C. Failed body controller activating the lamp without input

D. Battery condition affecting the warning lamp activation

26. A heavy-duty truck has had its drive belt replaced 15,000 miles ago. The driver now reports a complaint of low alternator output. Voltage tests show 13.2 volts at the alternator output. Which condition is the most likely cause?

A. Defective replacement belt from the supplier

B. Battery condition affecting output measurements

C. Belt tension below specification allowing alternator slip

D. Failed alternator unrelated to the belt replacement

27. A 2017 Mack Anthem with 880,000 miles has had three alternator replacements over its service life. The driver reports the most recent alternator has been in service for 10,000 miles and is producing slightly low output. Which condition is the most likely cause?

A. Defective replacement alternator from the supplier

B. Drive belt tension below specification or belt wear

C. Charging system load exceeding alternator capacity

D. Battery condition affecting output measurements

28. A 2019 Freightliner Cascadia with 480,000 miles has had repeated headlight bulb replacements on the passenger side over the past year. The driver side bulb has been in service for 80,000 miles with no issues. Which condition is the most likely root cause?

A. Defective bulbs being installed on the passenger side only

B. Battery condition affecting passenger-side bulb life

C. Vibration damage from a specific routing point on the passenger side

D. High voltage at the passenger-side socket from wiring fault

29. A heavy-duty truck has had its trailer wiring harness replaced 20,000 miles ago. The driver now reports intermittent trailer light failures. Which condition is the most likely cause?

A. Connector contamination or improper installation of the new harness

B. Defective replacement harness from the supplier

C. Trailer connector wear unrelated to the harness replacement

D. Tractor wiring issues unrelated to the harness replacement

30. A 2020 Volvo VNL with 200,000 miles has had its tail light bulbs replaced 6 months ago. The driver now reports flickering tail lights at random intervals. Which condition is the most likely cause?

A. Defective replacement bulbs from the supplier

B. Vehicle vibration affecting bulb filaments after replacement

C. High resistance in the tail light circuit ground or power feed

D. Failed body controller affecting tail light operation

31. A heavy-duty truck driver reports that the driving lights stopped working after a recent off-road operation event. Inspection shows the lights themselves are intact. Which condition is the most likely cause?

A. Defective driving lights damaged by off-road operation

B. Wiring damage from off-road debris contact at a specific routing point

C. Failed body controller affecting driving light operation

D. Battery condition affecting driving light operation

32. A 2018 International LT with 540,000 miles has had repeated trailer connector corrosion issues over the past 200,000 miles. The fleet has cleaned and treated the connector multiple times without lasting resolution. Which condition is the most likely root cause?

A. Defective trailer connector design unable to seal properly

B. Operator behavior using improper coupling procedures

C. Coincidental corrosion events unrelated to root cause

D. Damaged connector seal allowing moisture ingress

33. A 2021 Mack Anthem with 110,000 miles has experienced two LED headlight failures in the past 6 months. The truck originally came with LED headlights from the factory. Which diagnostic approach is most appropriate?

A. Verify supply voltage and circuit integrity at the headlight connector

B. Replace the LED headlights with incandescent units to avoid failures

C. Replace the body controller because of LED driver issues

D. Replace the wiring harness because of accumulated damage

34. A heavy-duty truck has had its headlight aim adjusted 30,000 miles ago. The driver now reports oncoming drivers flashing headlights at the truck. Which condition is the most likely cause?

A. Headlight aim drifted out of specification since adjustment

B. Defective headlight bulbs producing improper beam pattern

C. Suspension or load condition affecting headlight aim

D. Defective headlight assembly with damaged reflector

35. A 2019 Peterbilt 579 with 380,000 miles has had its instrument cluster replaced 5,000 miles ago. The driver now reports the speedometer reads 5 mph low at all speeds. Which condition is the most likely cause?

A. Defective replacement cluster from the supplier

B. Speed sensor wear unrelated to the cluster replacement

C. Wiring damage during the cluster replacement service

D. Improper cluster programming for the truck configuration

36. A heavy-duty truck has had its J1939 backbone wiring replaced 40,000 miles ago. The driver now reports intermittent communication faults across multiple modules. Which condition is the most likely cause?

A. Defective replacement wiring from the supplier

B. Improper terminating resistor placement during replacement

C. Module failures unrelated to the wiring replacement

D. Connector contamination at the new wiring connections

37. A 2020 Kenworth T680 with 240,000 miles has had repeated false low-coolant warning activations over the past 6 months. The coolant level has been verified normal each time. Which condition is the most likely root cause?

A. Failed low-coolant sensor with intermittent signal

B. Coolant level fluctuating above and below the sensor threshold

C. Body controller activating the warning without sensor input

D. Wiring damage producing false signals to the controller

38. A heavy-duty truck has had its body controller reflashed 10,000 miles ago after a software update. The driver now reports random warning lamp activations. Which condition is the most likely cause?

A. Defective body controller from the reflash service

B. Sensor failures unrelated to the reflash service

C. Software calibration issues from the reflash affecting warning logic

D. Wiring damage during the reflash service

39. A 2018 Volvo VNL with 720,000 miles has had two telematics module replacements over its service life. The driver reports the most recent module is not transmitting data. Which condition is the LEAST likely cause?

A. Cellular signal availability in the truck's operating area

B. Defective replacement telematics module from the supplier

C. Telematics module configuration not properly programmed

D. J1939 bus communication issues affecting data input

40. A heavy-duty truck has had its instrument cluster replaced 3 months ago after a flood damage event. The driver now reports intermittent gauge failures. Which condition is the most likely cause?

A. Defective replacement cluster from the supplier

B. Connector or wiring damage from the flood not addressed at replacement

C. Sensor failures from the flood unrelated to the cluster

D. Body controller failure from the flood unrelated to the cluster

41. A 2021 Freightliner Cascadia with 140,000 miles has experienced multiple unrelated fault codes after a recent jump-start event from another vehicle. Which condition is the most likely cause?

A. Permanent damage to multiple modules from the jump-start

B. Voltage transients during the jump-start affecting modules

C. Voltage transients during disconnect or reconnect affecting modules

D. Coincidental simultaneous module failures unrelated to the jump-start

42. A heavy-duty truck has had its scan tool diagnostic connector damaged from physical impact. The technician cannot retrieve fault codes through the connector. Which condition is the most likely cause?

A. Damaged diagnostic connector pins or wiring from the impact

B. Failed body controller affecting diagnostic communication

C. J1939 bus failure affecting diagnostic communication

D. Failed engine ECU affecting diagnostic communication

43. A 2017 Mack Anthem with 940,000 miles has had three instrument cluster replacements over its service life. The driver reports the most recent cluster shows incorrect mileage display. Which condition is the most likely cause?

A. Defective replacement cluster from the supplier

B. J1939 bus communication issues affecting mileage display

C. Speed sensor wear affecting accumulated mileage calculation

D. Cluster programming not completed with truck-specific configuration

44. A heavy-duty truck driver reports that the dash display "freezes" intermittently and recovers after a few seconds. The truck has had no recent electrical work. Which condition is the most likely cause?

A. Failed instrument cluster requiring replacement

B. Body controller power supply issues during operation

C. J1939 bus communication issues affecting cluster

D. Failed engine ECU affecting communication with cluster

45. A 2020 Peterbilt 579 with 260,000 miles has had its temperature sender replaced 3 months ago. The driver now reports temperature gauge erratic behavior. Which condition is the most likely cause?

A. Improper sender installation or wiring at the replacement

B. Defective replacement sender from the supplier

C. Cluster issues unrelated to the sender replacement

D. Engine cooling system issues unrelated to the gauge

46. A heavy-duty truck has had its check engine lamp illuminated for 50,000 miles without service action. The driver now wants the lamp diagnosed. Which condition is the most likely consequence of the delayed service?

A. No consequence because the lamp can illuminate indefinitely

B. Battery damage from continuous lamp illumination over time

C. Body controller damage from continuous warning operation

D. Fault progression with potential additional damage from the underlying issue

47. A 2019 International LT with 420,000 miles has had its J1939 wiring repaired multiple times at the same location over the past 100,000 miles. Which condition is the most likely root cause?

A. Defective splice connections at each repair location

B. Wiring damage from operator-installed accessories

C. Cab-to-chassis flex at the repair location causing repeated damage

D. Coincidental damage events at the same location

48. A heavy-duty truck telematics module has been transmitting incorrect fuel level data for 30 days. The truck's fuel gauge reads correctly. Which condition is the most likely cause?

A. Failed telematics module requiring replacement

B. Telematics module configuration error for fuel data

C. J1939 bus issues affecting fuel data transmission

D. Failed fuel sender unrelated to the telematics issue

49. A 2018 Kenworth T680 with 580,000 miles has had its instrument cluster receive software updates twice in the past year. The driver reports gauge accuracy has degraded since the most recent update. Which condition is the most likely cause?

A. Software calibration issues from the most recent update

B. Sensor failures coincidental with the update timing

C. Cluster hardware failure unrelated to the software update

D. Wiring damage during the software update service

50. A heavy-duty truck has had its body controller replaced 25,000 miles ago after a wiring short event. The driver now reports random warning lamp activations and gauge erratic behavior. Which condition is the most likely cause?

A. Defective replacement body controller from the supplier

B. Sensor failures unrelated to the controller replacement

C. Wiring damage from the original short event not addressed

D. J1939 bus issues unrelated to the controller replacement

PRACTICE EXAM 4: ANSWER KEY AND EXPLANATIONS

1. D — Loose or corroded primary chassis ground connection. Intermittent dash blackouts that resolve on their own are the classic signature of a marginal ground connection that loses contact under vibration or thermal expansion and reconnects when conditions change. Module replacements before checking primary grounds are wasteful and rarely resolve the issue.

2. B — A specific circuit not entering sleep mode after key-off. Repeated battery drain across multiple replacements points to a system-side fault rather than the batteries, with a circuit failing to enter sleep mode being the most common cause. Battery replacement does not address the underlying current draw.

3. A — Excessive current draw exceeding the relay rating. Repeat relay failures with OEM-specification parts indicate the circuit is overloading the relay, with current draw exceeding the relay's rated capacity being the most common cause. Verifying actual current draw identifies the underlying issue before another relay replacement.

4. C — Damaged battery ground cable or chassis ground point. Multiple unrelated electrical issues following minor front-end impact most commonly trace to damaged primary battery or chassis ground connections at the impact area, since these are the only common-element fault that produces system-wide symptoms. Module impacts typically produce different symptom patterns.

5. A — Improper torque or surface preparation at the ground replacement. Intermittent voltage drops after a recent ground cable replacement point to the replacement service itself, with improper torque or inadequate surface preparation (paint, rust, contamination) being the most common installation faults. Manufacturing defects in cables are statistically rare.

6. D — Replace the fuse panel because of contact wear. Replacing the fuse panel without diagnostic information is unlikely to identify the cause of intermittent fuse blowing, since the cause is typically wiring or load-related rather than panel-related. The other three approaches all directly investigate the actual fault path.

7. B — Cab-to-chassis flex at a specific routing point causing harness damage. Repeated harness failures across multiple replacements at high mileage point to a routing or installation issue at a specific flex point that damages each new harness over time. Identifying and correcting the routing condition is the only path to lasting resolution.

8. C — Improper terminal crimping at the new cable connection. A 0.8-volt drop across a relatively new cable is well above specification (0.5 max) and points to the installation rather than the cable

itself, with improper crimping being the most common installation fault. Manufacturing defects in cables are statistically rare.

9. A — Improper torque at the battery terminals after cleaning. Dim headlights immediately following battery terminal service point to the service work, with improper terminal torque being the most common installation issue. Loose terminals produce voltage drop affecting all electrical systems.

10. D — Coincidental wiring harness failure unrelated to the accessory. The least likely cause of issues immediately following accessory installation is a coincidental harness failure unrelated to the installation, since the timing strongly implicates the installation work itself. The other three options directly involve the installation.

11. A — Loose or corroded primary chassis ground connection. Intermittent multiple-circuit warning lamps without recent service point to a primary ground fault affecting multiple modules and circuits simultaneously. Individual sensor and module failures rarely produce simultaneous multiple-system effects.

12. C — Other modules damaged by the flood not addressed. Random module communication faults after ECU replacement following flood damage point to additional flood-damaged components that were not addressed during the original repair. Modules damaged by flooding may not fail immediately and produce delayed symptoms.

13. D — Cab harness replacement performed incorrectly years ago. The least likely cause of current intermittent faults at 1.1 million miles is an installation issue from many miles ago, since installation faults typically produce immediate or near-term symptoms. The other three options are all consistent with high-mileage wear patterns.

14. B — Excessive AC ripple from the new alternator damaging electronics. Random multi-circuit issues following a recent alternator replacement point to the new alternator producing excessive AC ripple, which damages electronic components across the truck. Verifying ripple voltage at the new alternator is the next diagnostic step.

15. C — Charging system overcharging or undercharging the batteries. Repeated battery failures every 12 to 18 months point to a system-side cause, with charging system over- or under-charging being the most common cause of accelerated battery wear. Verifying charging voltage and current is the next step before another battery replacement.

16. A — Battery condition deteriorating independently of the starter replacement. Gradual cranking degradation 40,000 miles after starter replacement points to an unrelated cause, with battery condition deterioration being the most common gradual-onset cause of slow cranking. Starter installation issues typically produce immediate symptoms.

17. D — Battery cables developing high resistance in cold conditions. Cold-only no-crank with normal warm-condition operation points to high cable resistance that increases at low temperature, where

copper resistance rises and corrosion-affected connections expand more on the cold side than on warm. Cable replacement may be needed.

18. B — Replace the starter motor with a different brand. Replacing the starter with a different brand without diagnostic information is unlikely to identify the underlying cause of repeat failures, since the cause is typically system-side rather than starter-quality-related. The other three approaches directly investigate the supply or load side of the system.

19. A — Excessive parasitic draw discharging batteries during parking. No-start events specifically after extended parking with normal use operation point to parasitic draw that discharges batteries during periods of no charging input. Verifying parasitic draw with an ammeter identifies the offending circuit.

20. C — Excessive parasitic draw not previously identified. Multiple jump-starts with batteries passing tests indicates the batteries discharge between uses despite being functional, with parasitic draw being the most common cause not detected by battery testing alone. Specific draw measurement is required to identify this condition.

21. B — Recharge and load test the batteries before any replacement decision. Single deep-discharge events from accessory-on parking do not necessarily require battery replacement, and recharge plus load testing determines actual battery condition. Modern batteries tolerate occasional deep discharge with proper recovery procedure.

22. A — Improper terminal torque after the cleaning service. Intermittent slow cranking immediately following terminal cleaning service points to the service work itself, with improper terminal torque being the most common installation issue. Terminal connections require torque-wrench application to OEM specification.

23. B — Defective replacement alternator from the supplier 80,000 miles ago. An alternator that has functioned for 80,000 miles is unlikely to be a manufacturing defect causing current discharge issues, since defects typically produce immediate failures. The other three options are all consistent with the intermittent discharge pattern reported.

24. C — Charging system load demand exceeding alternator capacity over miles. Repeat alternator failures across multiple brands at consistent intervals point to a system-side cause, with load demand exceeding alternator capacity being the most common cause that destroys each new unit. Verifying actual electrical load is the next step.

25. A — Intermittent alternator output drop not present during testing. Intermittent warning activation with normal testing readings is the classic signature of an intermittent alternator fault that is not active during the test, where loose connections or marginal regulator issues produce momentary output drops. Long-term monitoring or load testing during operation identifies the cause.

26. C — Belt tension below specification allowing alternator slip. Low alternator output 15,000 miles after belt replacement points to belt tension issues, with belt seating and stretch reducing tension

below specification over the first thousands of miles after installation. Re-tensioning may be required.

27. B — Drive belt tension below specification or belt wear. Slightly low alternator output at 10,000 miles on a recent alternator points to a non-alternator cause, with belt tension or belt wear being the most common cause of marginal output that produces these symptoms. Verifying belt condition and tension is the next step.

28. D — High voltage at the passenger-side socket from wiring fault. Repeated bulb failures on one side specifically point to a side-specific cause, with wiring faults producing elevated voltage at the socket being the most common cause of repeated bulb failures. Voltage measurement at the socket identifies the issue.

29. A — Connector contamination or improper installation of the new harness. Intermittent failures 20,000 miles after harness replacement point to the installation work, with connector contamination or improper installation being the most common installation issues. Manufacturing defects in harnesses are statistically rare.

30. C — High resistance in the tail light circuit ground or power feed. Flickering tail lights at random intervals are the classic signature of high-resistance connections in the lighting circuit, where resistance varies with vibration and temperature. Bulb replacement timing is coincidental rather than causal.

31. B — Wiring damage from off-road debris contact at a specific routing point. Lighting failure immediately following off-road operation points to physical wiring damage from debris contact, with specific routing points exposed to debris being the most common damage location. Tracing the wiring identifies the damage.

32. D — Damaged connector seal allowing moisture ingress. Repeat trailer connector corrosion despite cleaning and treatment points to a damaged seal allowing continuous moisture ingress, with the seal damage being the underlying cause that cleaning does not address. Connector replacement is required for lasting resolution.

33. A — Verify supply voltage and circuit integrity at the headlight connector. Repeat LED headlight failures point to a supply or circuit issue at the headlight connector, with voltage and circuit verification being the most appropriate diagnostic approach. LED-to-incandescent conversion does not address the underlying fault.

34. C — Suspension or load condition affecting headlight aim. Aim drift over 30,000 miles with no specific recent event most likely traces to suspension or load changes affecting the truck's attitude, since aim adjustment itself does not drift in normal service. Verifying suspension and load condition is the next step.

35. D — Improper cluster programming for the truck configuration. A consistent speedometer offset on a recently replaced cluster points to improper programming with truck-specific configuration

data (tire size, axle ratio, transmission output ratio). Manufacturing defects producing consistent calibration errors are statistically rare.

36. B — Improper terminating resistor placement during replacement. Intermittent communication faults after J1939 backbone replacement point to the replacement work, with improper terminating resistor placement being a specific fault that produces intermittent communication issues. Verification of resistor placement is the next step.

37. A — Failed low-coolant sensor with intermittent signal. Repeat false warnings with verified normal coolant level point to the sensor itself producing false signals, with intermittent sensor failures being the most common root cause. Sensor replacement resolves this fault pattern.

38. C — Software calibration issues from the reflash affecting warning logic. Random warning lamp activations immediately following body controller reflash point to the software update, with calibration issues affecting warning logic being a specific fault produced by software changes. Verifying calibration data resolves this issue.

39. D — J1939 bus communication issues affecting data input. The least likely cause of telematics non-transmission is J1939 bus communication issues, since telematics modules typically buffer data locally and transmit when cellular signal allows, regardless of momentary bus issues. The other three options directly affect transmission capability.

40. B — Connector or wiring damage from the flood not addressed at replacement. Intermittent failures following flood damage repair point to additional flood-damaged components that were not addressed during the original repair. Flood damage often affects connector contacts and wiring beyond the initially-failed component.

41. C — Voltage transients during disconnect or reconnect affecting modules. Multi-module fault codes following a jump-start event most commonly trace to voltage transients during disconnect or reconnect, which produce momentary out-of-range readings that modules log as faults. These codes typically clear normally and do not indicate permanent damage.

42. A — Damaged diagnostic connector pins or wiring from the impact. A diagnostic connector damaged by physical impact directly affects code retrieval through that connector, with pin or wiring damage being the typical impact-related fault. Connector inspection identifies the specific damage.

43. D — Cluster programming not completed with truck-specific configuration. Incorrect mileage display on a recently replaced cluster points to incomplete programming with truck-specific configuration data including accumulated mileage. Plug-and-play installation does not complete the service on multiplexed trucks.

44. B — Body controller power supply issues during operation. Intermittent dash freezing that recovers on its own is the classic signature of body controller power supply issues, where voltage

variations cause the controller to reset momentarily. Verifying power and ground at the controller identifies the cause.

45. A — Improper sender installation or wiring at the replacement. Erratic gauge behavior 3 months after sender replacement points to the installation work, with improper installation or wiring being the most common installation issues. Verification of installation and wiring is the next step.

46. D — Fault progression with potential additional damage from the underlying issue. Continuous illumination of a check engine lamp without service indicates an unaddressed fault that may progress and cause additional damage to related systems over time. Delayed service is the only option likely to produce consequences.

47. C — Cab-to-chassis flex at the repair location causing repeated damage. Repeat wiring damage at the same location points to a routing or flex issue at that location, with cab-to-chassis flex being the most common cause of repeated wire damage at fixed locations. Re-routing or protection is required for lasting resolution.

48. B — Telematics module configuration error for fuel data. A telematics module transmitting incorrect data while the cluster reads correctly points to a configuration error in the telematics module, with the cluster confirming the actual signal is correct. Verifying telematics configuration identifies the fault.

49. A — Software calibration issues from the most recent update. Gauge accuracy degradation immediately following a software update points to the update itself, with calibration issues being a specific fault produced by software changes. Reverting or correcting the calibration resolves this issue.

50. C — Wiring damage from the original short event not addressed. Random warning lamps and gauge issues 25,000 miles after body controller replacement following a wiring short point to additional wiring damage from the original short event that was not addressed during the controller replacement. Verifying complete wiring repair is required.