PRACTICE EXAM 18: ASE T6 SIMULATION

1. A technician measures voltage at a truck's fuel level sending unit connector. With the connector unplugged, the instrument cluster fuel gauge reads full. With the connector plugged in and the tank at half, the gauge reads half. What type of gauge system does this behavior indicate?

A. A digital gauge system controlled by CAN bus data

B. A voltage-regulated gauge that reads full at maximum resistance

C. A current-sensing gauge that reads full at minimum current

D. A gauge system where an open circuit (infinite resistance) drives the gauge to the full position

2. A heavy-duty truck's starter cranks normally on the first attempt of the day. On the second attempt five minutes later, the starter makes a single loud click but does not crank. Waiting 10 minutes, the starter works again. What is the most likely cause?

A. A failing ignition switch that overheats after the first start and loses the start-position contact

B. A starter solenoid with worn contact disc surfaces that weld momentarily during the first start and then stick on the second attempt until they cool and release

C. A battery with a weak cell that needs recovery time between cranking events

D. A heat-sensitive starter relay that opens after absorbing engine heat

3. A commercial vehicle's scan tool retrieves identical DTCs from three modules — ECM, TCM, and BCM — all reporting "CAN Bus Off." What does a "Bus Off" condition across multiple modules indicate?

A. A severe CAN bus fault — such as a shorted backbone, a missing termination resistor, or a failed transceiver — that has caused multiple modules to disconnect from the network as a self-protective measure

B. The ignition switch is in the off position and the modules are in sleep mode

C. A scan tool communication error that reports false codes when the bus is heavily loaded

D. A single module flooding the bus with error frames that forced other modules to shut down

4. A truck driver reports the left headlight appears aimed lower than the right. Both headlights were recently aimed. The truck is loaded with 40,000 pounds of freight. What should the technician consider?

A. The left headlight aiming mechanism has slipped after the adjustment

B. The headlight housing has internal reflector damage shifting the beam

C. Whether the headlights were aimed with the truck empty, as the added load compresses the suspension and changes the vehicle's pitch, shifting both beam patterns

D. The left headlight bulb has shifted in its socket after installation

5. A technician discovers a truck's 10-gauge wire has been repaired with a section of 16-gauge wire approximately 18 inches long. The circuit is protected by a 20-amp fuse. Why is this repair unacceptable?

A. The 16-gauge section increases the circuit's total resistance beyond specification

B. The 16-gauge wire is only rated for approximately 10 to 13 amps and will overheat under the 20-amp fuse protection before the fuse blows

C. The splice between different gauge wires creates a galvanic corrosion point

D. The 16-gauge wire changes the circuit's voltage characteristics

6. A heavy-duty truck's instrument cluster voltmeter reads 15.2 volts with the engine running. A DMM at the battery terminals confirms 15.2 volts. What is the immediate concern?

A. The batteries are accepting too much current due to low state of charge

B. The instrument cluster voltmeter has a calibration offset

C. The engine RPM is too high, causing alternator overspeed

D. The voltage regulator has failed and the alternator is overcharging — 15.2 volts exceeds the 14.5-volt maximum and sustained overcharging will boil battery electrolyte and damage electronic modules

7. A commercial vehicle's power window operates normally when tested with the engine running but moves very slowly with the engine off and only the battery powering the system. What does this indicate?

A. The battery voltage is too low to drive the window motor at full speed — the reduced voltage available from the battery alone without the alternator's charging supplement limits motor current and speed

B. The window switch has temperature-sensitive contacts that work better when warm

C. The window motor has a developing short that only manifests at lower voltage

D. The body controller module reduces window motor speed when the engine is off

8. A truck's scan tool shows the ECM broadcasting a diesel particulate filter soot load of 95%. The driver reports no performance concerns. The ECM has not commanded a regeneration. What should the technician check?

A. The exhaust backpressure sensor for a reading that does not match the high soot load percentage

B. The DPF temperature sensor for a reading that inhibits regeneration

C. The ECM parameters that enable or inhibit DPF regeneration — conditions such as insufficient exhaust temperature, low coolant temperature, active fault codes, or a missing enable signal may be preventing the ECM from commanding the regeneration cycle despite the high soot load

D. The DPF substrate for physical blockage that prevents soot measurement

9. A heavy-duty truck's battery load test is performed. The battery holds 10.0 volts at the end of 15 seconds with a 450-amp load. The battery is rated at 900 CCA. The ambient temperature is 30°F. What is the minimum acceptable voltage at 30°F?

A. 9.6 volts

B. 9.1 volts

C. 8.9 volts

D. 9.4 volts

10. A fleet technician discovers that a truck's marker light circuit has been repaired with a butt connector crimped over the wire insulation instead of stripped conductor. The lights currently work. What is the risk?

A. The crimp on insulation creates a high-resistance connection that will generate heat under load and progressively worsen as the insulation breaks down, eventually causing circuit failure or fire

B. The butt connector will corrode internally within 30 days

C. The insulation prevents DC current flow entirely

D. The crimp will immediately fail under any vibration

11. A truck's right turn signal flashes at double the normal rate on the tractor. The trailer is not connected. The left turn signal flashes at the normal rate. What is the most likely cause?

A. A faulty turn signal flasher module with different calibrations for left and right outputs

B. The multifunction switch has a partial internal short on the right-side output

C. A burned-out bulb on the right side of the tractor has reduced the circuit load, causing the flasher to increase the flash rate as a burned-bulb indicator

D. The body controller module is commanding a faster rate on the right side as a diagnostic alert

12. A commercial vehicle's alternator produces 14.3 volts at the B+ terminal. The battery positive terminal reads 13.5 volts. What is the voltage drop in the charging output circuit?

A. 0.8 volts — this exceeds the 0.5-volt maximum and indicates excessive resistance in the output cable or its connections between the alternator and the battery

B. 0.8 volts — this is within the acceptable range for a heavy-duty charging circuit

C. 13.5 volts — measured at the battery terminal

D. 14.3 volts — measured at the alternator terminal

13. A heavy-duty truck's engine cranks at normal speed but will not start. The scan tool shows the crankshaft position sensor signal is valid but fuel rail pressure reads 0 PSI during cranking. What system should the technician focus on?

A. The crankshaft position sensor circuit for signal quality issues

B. The glow plug system for inadequate preheat

C. The ECM for a no-start fault code that disables fuel delivery

D. The fuel system — the high-pressure pump, the fuel supply to the pump, the pressure relief valve, and the fuel control solenoid — to determine why no rail pressure is building during cranking

14. A truck driver reports that the radio produces a whining noise that increases in pitch with engine RPM. The noise is present at all volume levels and persists even when the radio is tuned to no station. What is the most likely cause?

A. A faulty radio antenna that picks up electromagnetic emissions from the alternator

B. Alternator AC ripple or electromagnetic interference coupling into the radio's power supply through the vehicle's wiring, producing the RPM-dependent whine

C. A defective radio speaker with a damaged voice coil that resonates at engine frequencies

D. The radio's internal amplifier has failed and is amplifying electrical noise from the data bus

15. A commercial vehicle's windshield wiper system works on all speeds but the wipers do not park when turned off. Instead, the blades stop wherever they are in the sweep arc. What is the most likely cause?

A. A worn wiper motor gear that cannot complete the park stroke

B. A faulty wiper switch that does not send the off signal to the motor

C. A failed wiper motor park switch or open park switch circuit that prevents the motor from continuing to run to the park position after the main switch is turned off

D. A binding wiper linkage that prevents the arms from reaching the park position

16. A truck's scan tool shows the ABS module reporting all four wheel speed sensors producing valid signals. The ABS warning light is off. During a road test, the technician performs a hard stop on dry pavement and notices the left front wheel locks up briefly before the ABS intervenes. What is the most likely cause?

A. A slow-responding ABS modulator valve on the left front channel that cannot reduce brake pressure quickly enough to prevent the initial lockup

B. A left front wheel speed sensor with reduced signal amplitude that delays the ABS module's lockup detection

C. Normal ABS operation — a brief initial lockup before intervention is within the system's response time

D. A worn left front brake pad that grabs more aggressively than the other three corners

17. A heavy-duty truck has a 12-volt system with a circuit protected by a 15-amp fuse. The wire is 14-gauge, rated for 20 amps. The load draws 12 amps. Is this circuit properly protected?

A. No — the fuse should match the wire rating at 20 amps, not the load rating

B. No — the 15-amp fuse is too close to the 12-amp load and will blow under normal operation

C. Yes — but only if the wire run is less than 15 feet in total length

D. Yes — the fuse is sized above the normal 12-amp load to prevent nuisance trips, but below the 20-amp wire rating to protect the wire from overheating before the fuse blows

18. A commercial vehicle's scan tool retrieves a DTC from the ECM: "Exhaust Gas Temperature Sensor 1 — Open Circuit." The technician measures the sensor resistance at 145 ohms at room temperature. The specification is 100 to 200 ohms. What should the technician check next?

A. The ECM's internal sensor input circuit for a fault

B. The wiring and connectors between the ECM and the sensor for an open that prevents the ECM from seeing the sensor's resistance despite the sensor itself testing within specification

C. The sensor for an intermittent internal fault that only appears at operating temperature

D. The exhaust system for a leak near the sensor location

19. A truck's electronic cruise control system will not engage. The scan tool shows the cruise enable switch input as "ON" and the vehicle speed is 65 MPH. The brake switch shows "RELEASED" and the clutch switch shows "RELEASED." What should the technician check next?

A. Whether any active DTCs exist that inhibit cruise operation — many ECMs disable cruise engagement when engine, transmission, or ABS fault codes are active

B. The steering wheel set button for a mechanical failure

C. The vehicle speed sensor signal quality

D. The cruise control fuse for a partial failure

20. A heavy-duty truck's left rear marker light works normally but the right rear marker light is completely inoperative. The technician replaces the right rear bulb but the light still does not work. The fuse is good. What should the technician check next?

A. The headlight switch for a failed right-side output

B. The body controller module for a disabled right marker output

C. Voltage at the right rear marker light socket with the markers activated to determine if power is reaching the fixture

D. The alternator output for a voltage drop that affects only the right side

21. A commercial vehicle's scan tool shows the transmission control module has set a code for "Shift Solenoid B — Stuck Off." The transmission will not shift out of second gear. What does "stuck off" indicate?

A. The solenoid is receiving excessive current that holds it in the off position against its spring

B. The solenoid is not energizing when commanded — either the solenoid has failed, the wiring has an open, or the TCM's output driver cannot deliver current to the solenoid

C. The transmission fluid pressure is overriding the solenoid's electrical command

D. The TCM has disabled the solenoid as a protective measure due to a separate transmission fault

22. A truck's headlights produce a noticeable flicker at idle that disappears above 1,500 RPM. The alternator output reads 13.6 volts at idle and 14.2 volts at 2,000 RPM. Both batteries test good. What is the most likely cause?

A. The headlight bulbs are nearing end of life and their aging filaments are more sensitive to voltage variation

B. A loose alternator drive belt that slips at idle speed, reducing output

C. Weak batteries that cannot buffer the voltage fluctuation at idle

D. The alternator's idle-speed output of 13.6 volts is marginally low for steady headlight operation, producing visible flicker that resolves at the higher voltage produced above 1,500 RPM

23. A fleet technician discovers that identical trucks in the fleet have slightly different idle speeds — ranging from 600 to 650 RPM. All trucks are the same model and year with identical engine calibrations. Is this variation a concern?

A. Yes — identical trucks should idle at exactly the same RPM

B. Yes — the variation indicates some trucks have vacuum leaks

C. No — minor variations in idle speed between individual engines are normal and result from slight differences in injector calibration, sensor tolerances, and mechanical wear

D. No — but only if all trucks are using the same fuel grade

24. A heavy-duty truck's starter solenoid has been replaced. The starter now cranks normally but the technician notices the solenoid gets very hot after three consecutive start attempts. Is this normal?

A. Yes — the solenoid's pull-in winding draws heavy current during each engagement, and three consecutive start attempts generate significant heat in the coil that is noticeable to the touch

B. No — a properly functioning solenoid should remain cool regardless of usage frequency

C. No — excessive heat indicates the replacement solenoid has shorted windings

D. Yes — but only if the ambient temperature is above 90°F

25. A truck's electronic instrument cluster displays "CHECK ELECTRICAL SYSTEM" and the charging indicator light illuminates. Battery voltage reads 12.3 volts with the engine running at 2,000 RPM. The alternator belt is intact and the pulley is spinning. What should the technician check first?

A. The battery state of charge to determine if a deeply discharged bank is pulling voltage down

B. The instrument cluster for a faulty warning light driver

C. The engine RPM sensor to confirm adequate alternator speed

D. The alternator field circuit — the field connector, the sense wire, and the voltage regulator — since the alternator is being mechanically driven but producing no output above battery rest voltage

26. A commercial vehicle's right rear combination light housing has two separate ground wires — one for the tail/marker filament and one for the brake/turn filament. The tail/marker works normally but the brake/turn does not illuminate. The brake/turn bulb is good and has 12.1 volts at its power terminal. What is the most likely cause?

A. A faulty brake light switch that does not deliver power to the right side

B. An open or high-resistance brake/turn ground wire that prevents current from completing the circuit despite adequate voltage at the power terminal

C. A body controller module fault limiting current to the brake/turn output

D. A multifunction switch with a failed right-side brake contact

27. Technician A says that a truck's starting circuit should be tested by measuring voltage drop across each component while the engine is cranking. Technician B says that voltage drop testing identifies resistance that an ohmmeter cannot detect because the high cranking current reveals connection faults that are invisible under no-load conditions. Who is correct?

A. Both Technician A and Technician B

B. Technician A only

C. Technician B only

D. Neither Technician A nor Technician B

28. A truck's trailer ABS warning light illuminates on the tractor dash only when driving at speeds above 50 MPH. At lower speeds, the light is off. No DTCs are stored in either the tractor or trailer ABS module. What should the technician investigate?

A. The trailer ABS module for a speed-dependent self-test that triggers the warning at highway speed

B. The tractor ABS module firmware for a compatibility issue with the trailer's ABS system

C. An intermittent electrical fault in the trailer ABS power or communication circuit that manifests only at highway speed due to increased vibration, wind buffeting of the trailer cord, or thermal expansion of connectors at sustained operating temperature

D. The J1939 bus for a communication delay that triggers the warning only when data volume increases at highway speed

29. A heavy-duty truck's scan tool shows the ECM commanding a fuel injection quantity of 0 mm^3 per stroke at idle, but the engine idles at 700 RPM. How is the engine running if the ECM is commanding zero fuel?

A. The engine is running on residual fuel in the cylinders from the previous injection event

B. The scan tool is displaying the pilot injection quantity, not the total injection quantity — the ECM may command multiple injection events per stroke, and the parameter being viewed shows only one portion of the total fuel delivery

C. The ECM has a frozen data display that does not update at idle speed

D. The engine is dieseling on crankcase oil vapors being drawn through the PCV system

30. A truck's left headlight operates normally but the right headlight flickers intermittently. All connections test tight and clean. Voltage drop tests are normal during steady-state operation. The technician cannot reproduce the fault in the shop. What diagnostic approach is most appropriate?

A. Replace the right headlight bulb, socket, and connector as a precautionary measure

B. Install a higher-wattage bulb to overcome the intermittent resistance

C. Check the multifunction switch for an internal contact fault on the right-side output

D. Connect a recording DMM or data logger to the right headlight circuit and have the driver operate the truck under normal conditions to capture the intermittent voltage dropout and identify when, where, and under what conditions it occurs

31. A commercial vehicle's scan tool shows the body controller module commanding the heated windshield relay on. The relay clicks. The technician measures 12.2 volts at the relay output terminal. The heated windshield does not warm up. What is the most likely cause?

A. The heated windshield element has failed open — the relay circuit is proven functional through to its output, but no current flows because the heating element cannot conduct

B. The relay contacts have high resistance limiting current below the heater's minimum operating threshold

C. The BCM is commanding the relay on for insufficient duration to produce detectable heat

D. The windshield glass has delaminated, insulating the heating element from the outer surface

32. A fleet of trucks experiences a pattern where the right front turn signal bulb fails approximately twice as often as the left front. The bulbs are the same part number. What should the technician investigate?

A. The right-side turn signal flasher circuit for a higher-frequency flash rate

B. The alternator for voltage spikes that concentrate on the right-side lighting circuits

C. The right front turn signal housing for excessive vibration, heat exposure, or moisture intrusion that accelerates bulb failure compared to the left side

D. The body controller module for a PWM frequency difference between left and right outputs

33. A truck's electronic throttle responds normally to pedal input, but the scan tool shows the ECM occasionally setting and clearing a "TPS Correlation Error" code during driving. The code never stays active for more than a few seconds. What does this intermittent pattern suggest?

A. The ECM's internal analog-to-digital converter is failing under processor load

B. A CAN bus intermittent fault corrupting the TPS data between the pedal module and the ECM

C. The TPS is nearing end of life and should be replaced preventively before the intermittent fault becomes permanent

D. The dual TPS signals momentarily diverge beyond the acceptable tolerance during vehicle vibration or pedal movement — a connector issue, a wiring fault, or a sensor internal defect causes brief signal disagreement under dynamic conditions

34. A heavy-duty truck's battery disconnect switch is turned off nightly per fleet policy. The driver reports that the truck requires longer cranking time on the first start each morning compared to other trucks in the fleet that do not use the disconnect switch. What is the most likely cause?

A. The disconnect switch is not fully engaging when turned back on, creating resistance in the cranking circuit

B. Turning off the disconnect switch de-powers the ECM and fuel system modules, requiring additional cranking time for these systems to reinitialize and re-prime the fuel system before the engine fires

C. The disconnect switch contacts have corroded from nightly cycling, increasing resistance

D. The batteries are losing charge overnight despite the disconnect switch being off

35. A truck's right side mirrors — both main and convex — have no power adjustment in any direction. The left side adjusts normally. Both sides share the same fuse. What is the most likely cause?

A. An open in the common power feed or ground wire serving both right-side mirror motors after the circuit splits from the shared left/right power source

B. Both right-side mirror motors have failed simultaneously

C. A body controller module fault disabling right-side mirror outputs

D. The mirror select switch is stuck on the left-side position

36. A commercial vehicle's horn sounds weak. The technician bypasses the relay and applies 12 volts directly from the battery to the horn. The horn sounds at full volume. What does this test confirm?

A. The horn diaphragm is worn and cannot produce full volume through the relay circuit

B. The horn relay or the wiring between the relay output and the horn has excessive resistance, reducing voltage to the horn below its full-output threshold

C. The relay is delivering adequate voltage but the horn needs its circuit resistance to produce the correct tone

D. The horn relay coil is drawing current from the horn circuit, reducing available power

37. Technician A says a truck's CAN bus backbone should be a twisted-pair wire to reduce electromagnetic interference. Technician B says that twisting the CAN_H and CAN_L wires together causes the interference induced in one wire to be equally induced in the other, allowing the differential receiver to cancel out the noise. Who is correct?

A. Technician A only

B. Both Technician A and Technician B

C. Technician B only

D. Neither Technician A nor Technician B

38. A heavy-duty truck's scan tool shows the ECM receiving an engine oil pressure of 12 PSI at idle with operating temperature reached. The low oil pressure warning threshold is 10 PSI. The engine runs normally with no unusual noises. Should the technician be concerned?

A. No — 12 PSI at idle is within the normal operating range for a heavy-duty diesel engine at operating temperature

B. No — the ECM would set a code if the pressure were dangerously low

C. Yes — but only if the oil pressure drops below 12 PSI during acceleration

D. Yes — 12 PSI at idle is only 2 PSI above the warning threshold, which leaves minimal margin and suggests developing oil system wear that should be investigated before it progresses to a critical level

39. A truck's right rear backup light is inoperative. The left backup light works. The fuse is good. The technician measures 0 volts at the right backup light socket with the transmission in reverse. The left socket reads 12.1 volts. What does the 0-volt reading at the right socket indicate?

A. An open in the wire between the backup light circuit branch point and the right rear socket — power reaches the left side but cannot travel to the right side due to a broken wire, disconnected connector, or corroded splice in the dedicated right-side path

B. A faulty reverse gear switch that only sends voltage to the left side

C. A blown fuse specific to the right backup circuit

D. A grounded wire on the right side that collapses all voltage before it reaches the socket

40. A commercial vehicle's scan tool shows the transmission oil temperature at -40°F while the truck has been operating for two hours in 70°F ambient conditions. What does the -40°F reading indicate?

A. A faulty scan tool that cannot read the transmission temperature parameter

B. A CAN bus error corrupting the temperature data

C. An open circuit in the transmission temperature sensor wiring — the TCM reads infinite resistance from the open circuit and interprets it as the coldest possible temperature on its lookup table

D. A frozen transmission oil cooler thermostat holding fluid in the cooler

41. A truck's left headlight is inoperative on low beam but works on high beam. The right headlight works on both beams. The low beam fuse is good. The technician measures 12.2 volts at the left headlight connector on the low beam terminal. What should the technician check next?

A. The headlight housing lens for a blockage that appears to make the low beam inoperative

B. The headlight relay for contact resistance on the low beam output

C. The multifunction switch for an internal fault on the left low beam contact

D. The left headlight bulb's low beam filament and the socket contact for that filament, since power is reaching the connector but the light does not illuminate

42. A fleet technician discovers that a truck's aftermarket dash camera is wired to a switched ignition feed. The driver complains that the camera does not record overnight events while the truck is parked. What wiring change would enable overnight recording?

A. Connect the dash camera to an always-hot fuse position that receives constant battery power

B. Connect the dash camera to a constant battery power source with its own inline fuse, allowing continuous operation regardless of ignition position

C. Connect the dash camera to the dome light circuit that remains active during door events

D. Connect the dash camera to the battery disconnect switch output for continuous power

43. A truck's scan tool retrieves a DTC from the ABS module: "Right Rear Wheel Speed Sensor — Air Gap Out of Range." The sensor is fully seated. What should the technician check?

A. The ABS module's right rear input channel for a calibration fault

B. The sensor wiring for electromagnetic interference

C. The reluctor ring on the right rear hub for damage, contamination, runout, or a ring that has loosened and shifted position on the hub

D. The brake drum for excessive wear that changes the mounting depth of the hub assembly

44. A heavy-duty truck's batteries are tested individually after disconnecting from the bank. Battery 1: 12.62V, 920 CCA (rated 950). Battery 2: 12.58V, 890 CCA (rated 950). Battery 3: 12.60V, 440 CCA (rated 950). Battery 4: 12.61V, 905 CCA (rated 950). What action should be taken?

A. Replace Battery 3 because it has fallen to 46% of rated CCA — well below the 70% replacement threshold — and replace all four as a matched set since mixing one new battery with three aging units creates a bank imbalance

B. Replace only Battery 3 since the other three are above the replacement threshold

C. Slow-charge Battery 3 and retest since its voltage appears adequate

D. Replace Batteries 2 and 3 since both show reduced capacity

45. A commercial vehicle's power locks work normally from the key fob remote. The driver's door interior lock switch locks all doors but does not unlock them. The passenger door switch works normally in both directions. What is the most likely cause?

A. The body controller module has a fault limiting the driver switch to lock-only mode

B. A wiring fault between the driver switch and the BCM on the unlock signal path

C. The driver door lock actuator has a mechanical fault preventing unlocking

D. The driver's door lock switch has a failed unlock contact — the lock direction contact works, but the unlock direction contact does not make connection when pressed

46. A truck's HVAC blower motor runs on high speed only. The technician replaces the blower motor resistor block. After replacement, the blower now works on medium and high but still not on low. What does this tell the technician?

A. The replacement resistor block has a defective low-speed element

B. A second fault exists on the low-speed circuit — either the blower switch low-speed contact has failed or the wire between the switch and resistor block for that speed setting has an open

C. The blower motor cannot operate at the low RPM required for the low-speed setting

D. The body controller module limits the blower to medium and high speed during cold ambient conditions

47. A heavy-duty truck has a parasitic draw of 85 milliamps against a 50-milliamp specification. The technician pulls fuses one at a time. Removing a fuse labeled "ACCY 3" drops the draw to 42 milliamps. What should the technician do next?

A. Identify which circuits and modules are powered through the ACCY 3 fuse, then disconnect each component on that circuit individually to isolate which specific device is drawing the excess 43 milliamps

B. Replace the ACCY 3 fuse with a lower-amperage unit to limit the draw

C. Install a timer on the ACCY 3 circuit to disconnect it after a preset period

D. Upgrade the battery bank capacity to accommodate the higher parasitic draw

48. A commercial vehicle's trailer clearance lights on the right side are dim while the left side operates at full brightness. The connector ground pin has been tested and is good. A DMM reads 10.4 volts at the right-side fixtures and 12.0 volts at the left. What does the 1.6-volt difference indicate?

A. The right-side bulbs are higher wattage than the left, drawing more current and more voltage drop

B. An alternator imbalance delivering less voltage to the right side of the trailer

C. Excessive resistance in the right-side clearance light circuit on the trailer — in the dedicated wiring, a splice, or a connector between the branch point and the right-side fixtures

D. A corroded J560 connector pin affecting only the right-side clearance output

49. A truck's scan tool shows a stored DTC from the body controller module: "Left Front Marker Light — Open Circuit." The technician checks the left front marker and it is illuminated normally. What is the most likely explanation?

A. The BCM is generating false codes due to a firmware error

B. The BCM's current monitoring threshold is set too low for the installed bulb type

C. A CAN bus error caused the BCM to misidentify which light output was affected

D. The code was set during a previous condition — such as a briefly loose bulb or a momentary connector disconnection — and the condition has since resolved, but the stored code remains until manually cleared

50. A fleet of trucks experiences a recurring issue where the right rear tail light housing connector overheats and melts approximately once per year. The same failure does not occur on the left side. The bulbs, fuses, and wiring gauge are all correct. What should the technician investigate?

A. Whether the alternator delivers more current to the right side of the vehicle

B. Whether the right-side connector has a characteristic that promotes resistance buildup — such as greater exposure to road spray, proximity to an exhaust component, or a pin design that creates marginal contact under the steady tail light current

C. Whether the BCM delivers more current to the right-side tail light output

D. Whether the right-side tail light circuit carries additional loads not present on the left side

PRACTICE EXAM 18: ANSWER KEY

1. D — When the sending unit connector is unplugged, the gauge reads full — meaning an open circuit (infinite resistance) drives the gauge to the full position. When the sending unit is connected and provides its variable resistance, the gauge reads correctly. This identifies a gauge system where the sending unit's resistance reduces current flow from full-scale, and removing the sensor entirely produces the maximum (full) reading.

2. B — The starter working on the first attempt and failing on the second with a single click — then recovering after cooling — is characteristic of a solenoid contact disc issue. During the first start, the heavy cranking current causes the contact disc surfaces to weld momentarily. On the second attempt, the welded surfaces stick and prevent proper re-engagement. After cooling, the thermal contraction breaks the weld and the solenoid operates normally.

3. A — A "Bus Off" condition is a CAN protocol self-protective response where a module disconnects itself from the network after detecting excessive bus errors. Multiple modules simultaneously entering Bus Off indicates a severe backbone fault — a shorted wire, a missing termination resistor, or a failed transceiver flooding the bus with errors — that has degraded communication quality beyond the error tolerance threshold for multiple modules.

4. C — Headlight aiming is affected by vehicle attitude, which changes with load. If the headlights were aimed with the truck empty, adding 40,000 pounds of freight compresses the rear suspension and raises the front, tilting both headlight beams upward and forward. The perceived aim difference between left and right may be an optical illusion from the road crown, or one side's suspension may compress more than the other under the asymmetric load.

5. B — The 16-gauge wire is rated for approximately 10 to 13 amps of continuous current. The circuit's 20-amp fuse will not blow until current exceeds 20 amps — well above the 16-gauge wire's capacity. The undersized wire section will overheat and potentially melt its insulation or start a fire long before the fuse reaches its trip point, because the fuse protects based on the original 10-gauge wire's capacity.

6. D — System voltage of 15.2 volts confirmed by both the cluster and DMM exceeds the normal 13.5 to 14.5 volt charging range. Sustained overcharging boils battery electrolyte, accelerates plate corrosion, burns out light bulbs prematurely, and can damage sensitive electronic modules. The voltage regulator has failed in a full-field or high-output condition and the charging system must be disabled immediately.

7. A — With the engine running, the alternator supplements battery voltage to maintain 13.5 to 14.5 volts at the electrical system. With the engine off, only the batteries supply power at their resting voltage of approximately 12.6 volts or less. The reduced voltage delivers less current to the window

motor, resulting in slower operation. This is normal behavior — the motor performs better with the higher voltage provided by the running charging system.

8. C — The ECM has measured 95% soot load but has not commanded regeneration, indicating the conditions required for regeneration are not being met. The ECM uses multiple input parameters to determine when regeneration is safe and effective — exhaust temperature, coolant temperature, vehicle speed, active fault codes, and other conditions must all fall within acceptable ranges before the module will initiate the burn cycle.

9. B — The minimum acceptable voltage during a load test decreases as ambient temperature decreases because cold batteries have higher internal resistance. At 30°F, the minimum threshold drops to approximately 9.1 volts (compared to 9.6 volts at 70°F). The battery reading 10.0 volts at 30°F exceeds the 9.1-volt minimum, so this battery passes the load test under these temperature conditions.

10. A — A crimp made over wire insulation instead of stripped conductor relies on the crimp barrel partially penetrating the insulation to contact the copper strands. This creates a high-resistance connection that generates heat proportional to the current squared. Under sustained load, the heat progressively degrades the insulation, worsens the contact, and increases resistance in a self-accelerating cycle that can ultimately cause circuit failure or fire.

11. C — A turn signal that flashes faster than normal on one side while the other side flashes at the correct rate is the standard burned-bulb indicator. The flasher module monitors current flow — when a bulb burns out on one side, the reduced current draw causes the flasher to increase its rate on that side to alert the driver. Inspecting all right-side turn signal bulbs will reveal the failed unit.

12. A — The voltage difference between the alternator B+ terminal (14.3V) and the battery positive terminal (13.5V) is 0.8 volts. This drop occurs across the output cable and its connections as charging current flows from the alternator to the battery. The 0.8-volt drop exceeds the 0.5-volt maximum specification, confirming excessive resistance in the charging output circuit that must be located and repaired.

13. D — The crankshaft position sensor producing a valid signal confirms the ECM knows the engine is rotating and can time the injection events. Fuel rail pressure reading 0 PSI during cranking means no fuel pressure is being generated. The fuel system — high-pressure pump, fuel supply lines, pressure relief valve, and fuel control solenoid — must be investigated to determine why the pump is not building rail pressure.

14. B — A whining noise in the radio speakers that tracks with engine RPM is the classic symptom of alternator-generated electrical noise coupling into the audio system. The alternator's AC ripple or electromagnetic interference enters through the radio's power supply wiring or ground connection. The noise persists at all volume levels because it enters the audio amplifier through the power supply rather than the antenna input.

15. C — The wiper motor park switch maintains the motor circuit after the main switch is turned off, allowing the motor to continue running until the arms reach the park position. A failed park switch or an open in its circuit breaks this sustaining path immediately when the main switch opens, stopping the motor at whatever position the blades happen to occupy rather than completing travel to the park rest position.

16. A — The ABS module receiving valid wheel speed data from all sensors confirms the detection side is functional. A brief lockup before ABS intervention on one wheel indicates the pressure-release response for that channel is delayed. A slow-responding modulator valve on the left front cannot reduce brake pressure quickly enough to prevent the initial lockup, though it eventually activates and releases the wheel.

17. D — Proper circuit protection requires the fuse to be rated above the normal load current (to prevent nuisance trips) but below the wire's maximum current rating (to protect the wire). The 15-amp fuse is above the 12-amp normal load and below the 20-amp wire rating. If a fault increases current above 15 amps, the fuse blows before the wire reaches its 20-amp thermal limit.

18. B — The sensor resistance testing within specification at room temperature proves the sensor element is electrically healthy. The ECM setting an open-circuit code means the module cannot see the sensor's resistance through the wiring. An open in the wire, a corroded connector pin, or a backed-out terminal between the ECM and the sensor prevents the signal from reaching the module despite the sensor being capable of generating it.

19. A — The cruise enable switch is on, vehicle speed is adequate, and both the brake and clutch switches show released — all normal engagement prerequisites are met. Many ECMs inhibit cruise engagement when active DTCs exist for the engine, transmission, or ABS systems. An active fault code that the cruise control logic checks before allowing engagement would prevent the system from responding to the set button.

20. C — The bulb has been replaced and the fuse is good, but the light still does not work. The next logical step is determining whether power is reaching the socket. Measuring voltage at the socket with the markers activated answers a fundamental diagnostic question — if voltage is present, the fault is in the socket or ground; if voltage is absent, the fault is in the wiring between the fuse panel and the socket.

21. B — "Stuck off" means the solenoid is not energizing when the TCM commands it to activate. The solenoid may have failed with an open winding, the wiring between the TCM and the solenoid may have an open, or the TCM's internal output driver may not be delivering current. Without the solenoid activating, the transmission cannot complete the shift that requires that solenoid's engagement.

22. D — The alternator producing 13.6 volts at idle is marginally below the ideal 14.0-volt midpoint. This voltage is just barely sustaining the headlight load without sufficient margin for stable operation. The slight voltage fluctuation inherent in the alternator's idle-speed output modulates the headlight

filament brightness visibly at this marginal level. At 14.2 volts above 1,500 RPM, the output comfortably supports steady headlight operation.

23. C — Minor idle speed variations of 50 RPM between individual engines of the same model are normal manufacturing and operational tolerance. Each engine has slightly different injector flow characteristics, sensor calibration tolerances, compression values, and mechanical friction levels. These small individual differences produce slightly different idle speeds that the ECM's idle control strategy maintains within the acceptable range.

24. A — The starter solenoid's pull-in winding draws 30 to 50 amps of current during each engagement to generate the strong electromagnetic force needed to move the plunger. Three consecutive start attempts in rapid succession generate significant heat in the coil from the I^2R power dissipation. The solenoid feeling hot after three consecutive starts is a normal result of the heavy current flowing through the coil windings.

25. D — Battery voltage of 12.3 volts with the engine running at 2,000 RPM is essentially resting battery voltage — the alternator is contributing nothing. The belt is intact and the pulley spins, confirming mechanical drive exists. The alternator's field circuit — field connector, sense wire, brushes, and voltage regulator — is not providing the field current needed for the rotor to generate output. Checking the field circuit is the logical first step.

26. B — Voltage of 12.1 volts is present at the brake/turn power terminal, confirming the power feed, fuse, brake switch, and multifunction switch are all delivering power. The bulb is confirmed good. With power present and a good bulb, the circuit still does not work — the missing element is the ground return. The dedicated brake/turn ground wire is open or has such high resistance that no current can flow through the filament.

27. A — Both technicians are correct and describe complementary aspects of voltage drop testing. Technician A correctly states the procedure — test while the circuit carries current during cranking. Technician B correctly explains why — the hundreds of amps flowing during cranking reveal resistance in connections that appear fine under no-load conditions, because $V = I \times R$ and the high current amplifies small resistance values into measurable voltage drops.

28. C — The warning light appearing only at highway speed — not at lower speeds — and no DTCs being stored suggests a physical connection that is stable at lower speeds but fails under the increased vibration, wind buffeting, or thermal conditions of sustained highway driving. The trailer cord, its J560 connections, or the trailer-side ABS wiring experiencing speed-dependent vibration produces the intermittent power or communication loss.

29. B — Modern diesel ECMs use multiple injection events per combustion cycle — pilot injections, main injections, and post injections. The scan tool parameter being viewed may display only one of these injection quantities. The 0 mm^3 reading likely represents the pilot injection quantity at idle, while the main injection event delivering fuel to sustain idle occurs on a separate parameter that is not currently displayed.

30. D — An intermittent fault that cannot be reproduced in the shop and passes all static tests requires real-world data capture. A recording DMM or data logger connected to the circuit during actual driving conditions captures the voltage dropout event with a timestamp, duration, and correlation to road conditions, vehicle speed, and ambient temperature — providing the diagnostic data needed to identify the failure mechanism.

31. A — The BCM commands the relay on (confirmed by scan tool), the relay clicks (confirms coil energizes), and 12.2 volts is present at the relay output (confirms contacts close and deliver power). Every component from the BCM to the relay output is proven functional. Voltage is delivered to the heated windshield element but no warming occurs — the heating element itself has failed open and cannot conduct current to generate heat.

32. C — A fleet-wide pattern where the right front bulb fails twice as often as the left on identical trucks indicates an environmental or installation factor specific to that location. The right front housing may be more exposed to road vibration from the engine mounting, closer to an exhaust heat source, or more susceptible to moisture intrusion — any of which accelerates bulb failure compared to the left side.

33. D — The "TPS Correlation Error" setting and clearing intermittently during driving — but never during static testing — indicates the dual TPS signals momentarily diverge beyond tolerance under dynamic conditions. Vehicle vibration, pedal movement, or thermal expansion briefly causes one signal to deviate from the other. A connector pin with marginal contact, a wire with intermittent continuity, or a sensor element with a developing internal defect produces these brief disagreements.

34. B — Turning the battery disconnect switch off completely de-powers the ECM, fuel system modules, and all electronic controls. When reconnected, these systems must reinitialize — the ECM boots up, the fuel control module re-primes the high-pressure fuel system, and various sensors must be read and validated. This initialization process adds cranking time before the engine receives the properly timed fuel delivery needed to fire.

35. A — Both right-side mirror motors being inoperative while the left side works eliminates the shared fuse and the mirror select switch as causes. The two right-side motors share a dedicated power feed or ground branch that splits from the common circuit. An open in this shared right-side branch prevents power or ground from reaching either right-side motor while the left-side circuit operates independently.

36. B — The horn sounding at full volume when powered directly from the battery proves the horn itself is healthy. The horn sounding weak through the normal relay circuit means voltage is being lost between the relay output and the horn. The relay contacts may have excessive resistance, or the wiring between the relay and the horn has a high-resistance connection — either condition reduces the voltage delivered to the horn below its full-output threshold.

37. B — Both technicians are correct. Technician A correctly identifies that the CAN bus backbone uses twisted-pair wiring to reduce electromagnetic interference. Technician B correctly explains the

physics — twisting the wires together ensures any external electromagnetic interference induces equal voltage in both conductors, and the differential receiver at each module subtracts the common-mode noise, effectively canceling the interference.

38. D — While 12 PSI at idle is above the 10 PSI warning threshold, the 2 PSI margin is minimal. Normal oil pressure at idle for a healthy heavy-duty diesel typically provides a more comfortable margin above the warning threshold. The narrow gap between operating pressure and the warning point suggests developing wear in the oil pump, bearings, or pressure relief valve that warrants investigation before it progresses to a critical level.

39. A — The left backup socket receiving 12.1 volts with the transmission in reverse proves the reverse switch, fuse, and common wiring up to the branch point are functional. Zero volts at the right socket means power cannot reach the right side. An open in the dedicated wire between the branch point and the right rear socket — a broken wire, disconnected connector, or corroded splice — prevents voltage from traveling to the right fixture.

40. C — A reading of -40°F is the classic indicator of an open temperature sensor circuit. NTC thermistors have high resistance when cold — an open circuit presents infinite resistance, which the TCM interprets as the coldest possible temperature on its lookup table. The -40°F reading after two hours of operation in 70°F conditions is physically impossible, confirming an open in the sensor wiring rather than an actual temperature reading.

41. D — The right headlight working on both beams and the left working on high beam eliminate the fuse, relay, and common circuits. Voltage of 12.2 volts present at the left low-beam terminal confirms power delivery is intact. Despite adequate voltage at the connector, the low beam does not illuminate — either the low-beam filament has burned out in the dual-filament bulb, or the socket contact for that specific filament is not engaging the bulb properly.

42. B — The dash camera needs continuous power regardless of ignition position to record overnight. Connecting it to a constant battery power source with a dedicated inline fuse provides uninterrupted power while protecting the circuit. The dedicated fuse prevents the camera circuit from affecting other vehicle systems and provides overcurrent protection for the camera's power feed wire.

43. C — The sensor being fully seated eliminates mounting depth as the cause. An "air gap out of range" code means the effective distance between the sensor face and the reluctor ring teeth is outside the acceptable range. A damaged reluctor ring with missing material, contamination buildup, excessive runout from a worn bearing, or a ring that has loosened and shifted on the hub all increase the effective air gap.

44. A — Battery 3 at 440 CCA (46% of its 950 CCA rating) is far below the 70% replacement threshold of 665 CCA. Despite showing adequate resting voltage at 12.60 volts, its internal plate capacity has severely deteriorated. The other three batteries pass, but replacing only Battery 3 creates a bank mismatch. Replacing all four as a matched set ensures balanced internal resistance and maximum bank performance.

45. D — The key fob remote working in both lock and unlock directions proves all door actuators and the BCM lock/unlock output circuits are functional. The passenger switch working in both directions eliminates a BCM fault. The driver switch locking but not unlocking isolates the fault to the unlock contact inside the driver's door lock switch — the lock direction contact functions, but the unlock contact does not make connection.

46. B — The original resistor failure caused medium and low speed loss. The replacement restored medium speed, proving the new resistor's medium element works. Low speed remaining inoperative after the resistor replacement indicates a second, independent fault on the low-speed circuit. The blower switch's low-speed contact has failed, or the wire between the switch and the resistor block for that specific speed has an open.

47. A — Removing the ACCY 3 fuse dropped the draw from 85 to 42 milliamps, identifying that fuse circuit as the source of 43 milliamps of excess draw. The next step is identifying which specific component on the ACCY 3 circuit is responsible. Disconnecting each device powered through that fuse one at a time while monitoring the DMM isolates the exact component drawing the excess current.

48. C — The J560 ground pin has been tested and is good, eliminating the shared trailer ground as the cause. The left side receiving 12.0 volts while the right receives only 10.4 volts — a 1.6-volt difference — means the right-side dedicated circuit has excessive resistance after the point where the left and right circuits separate on the trailer. A corroded splice, damaged wire, or high-resistance connector in the right-side branch is the source.

49. D — The left front marker light is currently illuminated and functioning normally. A stored code represents a condition the BCM detected at some point in the past — such as a momentarily loose bulb, a briefly disconnected connector during maintenance, or a vibration-induced contact loss that resolved on its own. The code remains in memory until manually cleared even though the condition that triggered it no longer exists.

50. B — The same connector failing consistently on the right side while the left side remains healthy across multiple trucks indicates a location-specific or design-specific factor. A connector more exposed to road spray, positioned closer to an exhaust component, or with a pin design that creates marginal contact under sustained tail light current would progressively build resistance. The heat generated at the high-resistance contact point eventually melts the housing.