

# PRACTICE EXAM 31

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1. A vehicle arrives with an ADAS warning lamp on and a customer concern about adaptive cruise. The first action the technician should take is to:
  - A. Replace the forward radar sensor based on the warning lamp symbol shown
  - B. Road test the vehicle at highway speed before recording any diagnostic data
  - C. Clear the codes so the technician can observe which faults return first
  - D. Perform a pre-repair scan to document all stored DTCs across the modules
  
2. During diagnosis of a no-communication fault, the technician should verify power and ground at the module connector before:
  - A. Condemning the module and ordering an expensive replacement unit
  - B. Clearing the stored codes and releasing the vehicle to the customer
  - C. Road testing the vehicle to see whether the fault clears on its own
  - D. Replacing the entire wiring harness from the battery to the module
  
3. A technician must research a vehicle's service history before beginning an ADAS repair. The primary reason this step comes early is to:
  - A. Determine the labor rate that should be charged for the diagnostic work
  - B. Reveal prior repairs, recalls, or bulletins relevant to the current concern
  - C. Identify the customer's preferred radio stations for the entertainment system
  - D. Establish the exact resale value of the vehicle for the customer's records
  
4. When checking voltage drop across an ADAS power feed under load, the technician should compare the reading against:

- A. The total resistance of the windshield's embedded radio antenna grid
- B. The acceptable maximum drop specified for that circuit and connection
- C. The outside ambient temperature recorded on the day of the inspection
- D. The replacement part number printed on the module's identification label

5. A technician needs to interpret a waveform from an ADAS sensor signal circuit. A clean, repeating pattern that matches the expected shape indicates the:

- A. Signal circuit is producing the correct output for that sensor's operation
- B. Module's internal calibration file has reverted to an older software version
- C. Data bus has shorted between its two conductors somewhere in the harness
- D. Sensor's mounting bracket has exceeded its allowable angular tolerance

6. A technician must determine the proper order of operations for an ADAS repair that requires both a mechanical fix and a calibration. The calibration should be performed:

- A. Before the mechanical repair so the system is calibrated to the old condition
- B. After the mechanical repair is complete and verified, then the system calibrated
- C. At the same time as the mechanical repair to save overall shop labor time
- D. Only if the customer specifically requests it as an additional billable service

7. Technician A says a pre-scan should be performed before any ADAS repair. Technician B says a post-scan should be performed after the repair. Who is correct?

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

8. A technician finds an aftermarket accessory wired into an ADAS circuit. Before continuing the diagnosis, the technician should:

- A. Evaluate whether the accessory is affecting the ADAS circuit's operation
- B. Immediately replace the affected ADAS module to clear the stored faults
- C. Ignore the accessory since aftermarket additions never affect ADAS systems
- D. Disconnect the entire vehicle battery and leave it disconnected overnight

9. A scan tool shows a U-code for lost communication with the radar module. This code category specifically directs the diagnosis toward:

- A. A powertrain fueling concern affecting engine operation at idle speed
- B. A body lighting circuit unrelated to the data communication network
- C. An internal mechanical failure of the radar sensor's printed circuit board
- D. A network communication or data bus fault between control modules

10. A technician must select the correct sequence when a calibration fails. The proper first step after a failed calibration is to:

- A. Verify the setup, vehicle condition, and enable criteria before retrying
- B. Immediately replace the sensor that was being calibrated at the time
- C. Clear all codes and release the vehicle with the calibration incomplete
- D. Replace the gateway module since it is the shared bus communication point

11. A vehicle's ADAS shares wheel-speed data with the brake control module. If one wheel-speed signal is faulty, the technician should expect the fault to affect:

- A. Only the cabin climate control blower motor during normal operation
- B. Both the brake-related functions and ADAS features using that speed data
- C. Only the tire pressure monitoring relearn procedure on that one wheel

D. Only the head-up display brightness during daytime highway driving

12. A technician must verify a calibration bay floor is level within specification. The proper tool and method is to:

- A. Estimate the slope by rolling a ball across the floor and watching it move
- B. Measure the diagonal distance across the bay with a steel tape measure
- C. Suspend a plumb bob from the ceiling and observe where it comes to rest
- D. Use a digital inclinometer to read the floor slope against the specification

13. A technician finds the available service information does not fully cover an unusual ADAS concern. The most appropriate next step is to:

- A. Determine whether additional resources or manufacturer support are needed
- B. Replace the suspected module immediately to resolve the concern quickly
- C. Release the vehicle and tell the customer the concern cannot be diagnosed
- D. Guess at the likely cause based on experience with unrelated vehicle brands

14. A technician must confirm an ADAS module was properly configured after replacement. The verification is best done by:

- A. Measuring the supply voltage at the module connector under an applied load
- B. Checking the module's mounting bracket torque against the specification
- C. Visually inspecting the module's external case for any cracks or damage
- D. Confirming the module reports the correct vehicle options via the scan tool

15. A technician reads a schematic and finds two ADAS modules connected by a twisted pair labeled CAN-H and CAN-L. The twisting of these wires serves to:

- A. Increase the supply voltage delivered to each of the two connected modules

- B. Provide a redundant ground path if one of the conductors breaks open
- C. Reduce electromagnetic interference and preserve the differential signal
- D. Allow the two modules to share a single power feed from one fuse circuit

16. A technician performing an ADAS diagnosis should interpret a freeze-frame primarily to:

- A. Identify the replacement part number for the module that set the code
- B. Understand the operating conditions present when the fault was recorded
- C. Determine the labor time the manufacturer allows for the repair procedure
- D. List every control module currently installed on the vehicle's network

17. A technician must determine root cause rather than simply clearing a recurring ADAS code. This disciplined approach matters because:

- A. Clearing codes permanently repairs the underlying fault in every case
- B. Manufacturers require codes to be cleared before any diagnosis begins
- C. Treating only the symptom leaves the actual fault to recur after release
- D. Root-cause analysis is only necessary for powertrain faults, not ADAS

18. A technician researches ADAS intersystem design and learns the active suspension can raise or lower ride height. The significance for an upcoming calibration is that the:

- A. Vehicle must be set to the manufacturer-specified ride height during calibration
- B. Active suspension must be completely removed before the calibration begins
- C. Ride height has no measurable effect on the sensor aim during calibration
- D. Calibration may proceed at any height provided the battery remains charged

19. A technician begins diagnosing a forward camera concern. The correct first step in the diagnostic sequence is to:

- A. Replace the camera module to eliminate it as a possible cause quickly
- B. Verify the concern and determine whether it is normal or a malfunction
- C. Recalibrate the camera before performing any other diagnostic checks
- D. Clear all stored codes and release the vehicle to observe for symptoms

20. A camera-based lane-keeping concern is being diagnosed. Before checking the camera itself, the technician should first inspect for:

- A. The exact resistance of the windshield's embedded antenna grid elements
- B. Obstruction, damage, or tampering affecting the camera's field of view
- C. The torque value of the rear bumper reinforcement mounting bolts only
- D. The refrigerant charge level in the air conditioning high-side service port

21. A camera reports "calibration required" after a windshield replacement. The proper next step in the workflow is to:

- A. Release the vehicle, since a new windshield never requires recalibration
- B. Replace the camera module before attempting any calibration procedure
- C. Road test the vehicle first to see whether the code clears on its own
- D. Perform the required calibration per the manufacturer's specified procedure

22. A technician must determine whether a camera concern results from a previous service. The best research source for this determination is the:

- A. Owner's manual section describing how the lane systems behave on the road
- B. Vehicle's service history combined with the manufacturer's service information
- C. Anonymous online forum thread written by an owner of a similar vehicle

D. Casting numbers stamped on the discarded camera's metal mounting plate

23. A camera calibration target must be placed at a specified distance and height. The technician should establish these positions using a:

- A. Visual estimate from the driver's seat until the target appears centered
- B. Calibrated tape measure or laser referenced to the specified datum points
- C. Standard carpenter's level read by eye from several feet across the bay
- D. Convenient location based on the existing layout of the calibration bay

24. A camera passes its static calibration, but the workflow requires a further confirmation step. That step is to:

- A. Clear all stored codes and release the vehicle without further testing now
- B. Replace the windshield a second time to rule out any optical distortion
- C. Perform the dynamic verification or road test per the manufacturer procedure
- D. Reduce the camera bracket torque to relieve stress on the windshield glass

25. A technician must research the enable criteria for a camera DTC before diagnosing it. Knowing the enable criteria tells the technician:

- A. The replacement part number for the camera module that set the code
- B. The labor operation code needed to bill the diagnostic time correctly
- C. The conditions that must be met for the module to set or clear that code
- D. The torque specification for the camera bracket retaining fasteners

26. A camera's field of view is partially blocked by a dash-mounted accessory. The correct action before calibration is to:

- A. Calibrate around the accessory since the camera looks through the glass anyway

- B. Remove the obstruction so it does not interfere with detection or calibration
- C. Lower the camera bracket so it can see beneath the mounted accessory item
- D. Increase the calibration target brightness to overcome the partial blockage

27. A camera calibration fails repeatedly after a body repair near the A-pillar, despite correct target setup. The technician should next investigate whether the:

- A. Repair altered the windshield or bracket geometry, shifting the camera aim
- B. Calibration target was printed on the wrong color of background paper
- C. Vehicle battery was too discharged to complete the calibration procedure
- D. Rear ultrasonic sensors were left connected during the calibration attempt

28. A technician completes a camera repair and must document the result. The required final documentation step is to:

- A. Reset the engine oil life monitor to one hundred percent remaining life
- B. Record the customer's preferred climate settings for their next service visit
- C. Perform a post-repair scan confirming no related DTCs remain stored
- D. Top off the windshield washer reservoir with the approved winter solution

29. A camera fails dynamic calibration on a route with worn lane markings but succeeds on a well-marked route. The technician should conclude the:

- A. Camera module has an internal defect requiring immediate replacement now
- B. Rear ultrasonic sensors must be unplugged for the calibration to succeed
- C. Procedure can only ever be completed inside a sealed dark room indoors
- D. Worn-marking route lacks the lane references the camera needs to learn

30. A technician must identify the components of an unfamiliar camera system and their locations. The authoritative first resource is the:

- A. Manufacturer's service information describing the system layout and parts
- B. Anonymous online forum post written by an owner of a similar vehicle model
- C. Casting numbers stamped on the discarded camera's metal mounting plate
- D. Owner's manual section explaining how the lane systems behave while driving

31. (Refer to ADAS Composite Vehicle Type 1.) A scan tool cannot communicate with only the forward radar module, while all other modules respond normally. The technician should focus the diagnosis on the:

- A. Shared battery feed common to every ADAS module on the vehicle at once
- B. Gateway module, which would disable all bus communication simultaneously
- C. Circuit or connector serving the forward radar module specifically here
- D. Driver monitoring camera, which uses a completely separate private data line

32. A radar calibration workflow requires several conditions be met before starting. The technician should first confirm that the:

- A. Customer has approved a four-wheel alignment as an additional service item
- B. Vehicle has no stored ADAS DTCs and the underlying repair is complete
- C. Shop's wireless network can reach the manufacturer's online programming portal
- D. Infotainment system has been updated to the newest available map database

33. A static radar calibration requires a reflection-free space ahead of the vehicle. The technician should understand that stray reflections can:

- A. Lower the 12-volt supply voltage reaching the radar during the procedure
- B. Increase the resistance of the radar sensor's internal heating element circuit
- C. Erase the stored DTCs from the gateway module before calibration begins
- D. Return false signals that corrupt the radar's calibration reference data

34. Technician A says a bent radar bracket can cause aim error after calibration. Technician B says correct ride height is required for radar calibration. Who is correct?

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

35. (Refer to ADAS Composite Vehicle Type 1.) With the ADAS central module unplugged, a DMM across the ADAS-CAN pair reads about 120  $\Omega$ . The technician should interpret this expected reading as indicating the:

- A. Bus has a dead short between its two conductors in the harness wiring
- B. Bus has a complete open isolating one module from the rest of the network
- C. Bus termination is intact and the measured circuit is configured normally
- D. Battery is fully discharged and cannot supply the measurement current flow

36. A radar behind a bumper that received excessive filler now detects targets late. The mechanism is that the excessive filler:

- A. Attenuates and delays the radar signal passing through the cover material
- B. Raises the sensor's supply voltage above its rated operating maximum value
- C. Changes the vehicle's CAN bus baud rate during message transmission timing
- D. Forces the ultrasonic sensors to share the radar's data bus bandwidth fully

37. A radar sensor's mounting-angle specification has a very tight tolerance. The technician should understand that a small angular error will:

- A. Change the data bus baud rate the radar uses to transmit its messages
- B. Increase the supply voltage the radar draws from the vehicle battery system

- C. Lower the resistance of the radar sensor's internal heating element circuit
- D. Cause a large lateral position error at the radar's far detection range

38. A radar calibration target must be placed at a precise lateral position. If the target is positioned off that point, the technician should expect:

- A. A short circuit between the radar's supply and ground inside the module case
- B. An automatic increase in the ultrasonic sensors' rated detection range value
- C. An incorrect calibration that biases the radar's perceived target angle
- D. A complete loss of communication across the entire vehicle data bus network

39. A radar function drops out only when the vehicle travels over rough railroad tracks. The technician should suspect:

- A. An outdated calibration file that needs a reflash at the next service visit
- B. A permanently failed radar sensor requiring immediate full replacement now
- C. Normal operation, since radar is designed to mute over railroad crossings
- D. A loose connector or mount that breaks electrical contact under vibration

40. (Refer to ADAS Composite Vehicle Type 1.) A technician needs the forward radar's maximum detection range to evaluate a late-warning concern. The correct source for this value is the:

- A. Estimating software's labor guide entry for the front bumper assembly job
- B. Aftermarket catalog listing for the radar sensor's replacement part number
- C. Shop foreman's experience with similar radar systems on other vehicle brands
- D. Composite vehicle reference, which lists the radar's range specification value

41. A radar sensor connector is found with green corrosion on several terminals. The correct corrective action is to:

- A. Apply additional body filler around the connector to seal out future moisture
- B. Increase the system supply voltage to overcome the added contact resistance
- C. Repair or replace the affected terminals and connector to restore the circuit
- D. Clear the stored codes and release the vehicle, since corrosion is cosmetic only

42. A radar calibration aborts indoors despite a correct target setup. The technician suspects environmental interference. Which finding best supports that conclusion?

- A. A 1.5 volt drop measured across the radar sensor's main ground connection
- B. A target printed in a gray shade slightly off the manufacturer's specification
- C. A metal parts cart and a vehicle lift positioned within the radar's field
- D. A camera software version one revision behind the radar module's software

43. A radar sensor's aim is verified relative to the vehicle's thrust line. The thrust line is established by the vehicle's:

- A. Front bumper distance measured to the calibration target stand base point
- B. Steering wheel held perfectly straight throughout the calibration procedure
- C. Forward camera optical axis projected down onto the calibration bay floor
- D. Rear axle geometry, which defines the direction the vehicle actually tracks

44. A radar is replaced and calibration completes, but a road test shows the ACC reacting to vehicles in adjacent lanes. The technician should suspect a:

- A. Residual aim or mounting error skewing the radar's lateral detection field
- B. New radar shipped from the wrong regional distribution center originally
- C. Battery voltage that was marginal during the static calibration phase earlier
- D. Set of ultrasonic sensors left disconnected during the road test drive run

45. After a radar repair, a manufacturer-specified road test confirms the ACC holds proper following distance. The road test primarily verifies that the:

- A. System performs correctly under actual real-world driving conditions on road
- B. Battery fully recharged after the static calibration procedure was completed
- C. Tire pressure monitor relearned all four sensors during the test drive period
- D. Engine reached full operating temperature before the stored codes were cleared

46. A technician begins diagnosing an ultrasonic park-assist concern. The correct first step in the diagnostic sequence is to:

- A. Replace the controller module to eliminate it as a possible cause quickly
- B. Recalibrate all of the sensors before performing any other diagnostic check
- C. Verify the concern and determine whether it is normal or a malfunction
- D. Clear all stored codes and release the vehicle to observe for symptoms later

47. Ultrasonic sensors detect objects by emitting sound waves and timing the echo. A sensor face covered with thick paint will:

- A. Increase the measured echo time, making objects appear much farther away
- B. Improve detection by focusing the emitted sound into a tighter narrow beam
- C. Dampen the emitted and returning waves, reducing detection reliability badly
- D. Have no measurable effect because ultrasonic waves pass through paint freely

48. (Refer to ADAS Composite Vehicle Type 1.) A technician needs the detection range and pattern of the rear ultrasonic sensors. The authoritative source is the:

- A. Resistance measured directly across each sensor's two connector terminals
- B. Forward radar's published range specification scaled down for the rear sensors
- C. Vehicle wheelbase printed on the certification label inside the door jamb area

D. Composite vehicle reference document describing the ultrasonic system specs

49. A single ultrasonic sensor reads erratically while the others function normally. The most efficient first inspection step is to check that sensor's:

A. Face and connector for obstruction, physical damage, or a loose connection

B. Software revision against the park-assist controller's current version number

C. Contribution to the data bus termination resistance measured at the gateway

D. Supply voltage compared against the forward radar sensor's supply voltage

50. After replacing a damaged ultrasonic sensor and clearing codes, the technician confirms proper operation by:

A. Reprogramming the forward radar module to recognize the new sensor hardware

B. Performing a functional test and post-repair scan of the park-assist system

C. Raising the park-assist chime volume to its maximum available output setting

D. Replacing the remaining original sensors so the complete set matches exactly

## Answer Key & Full Answer Explanations

1. D — The first action is a pre-repair scan to document all stored DTCs across the modules. This baseline guides the diagnosis and proves which faults pre-existed. Replacing a part off a symbol, road testing first, or clearing codes destroys that diagnostic record.

2. A — Power and ground must be verified at the connector before condemning the module and ordering a replacement. Most apparent module failures are supply faults feeding a good module. Confirming the basics first prevents needless replacement, code clearing, or harness work.

3. B — Researching service history early reveals prior repairs, recalls, or bulletins relevant to the current concern. That context shapes an efficient diagnosis. It is not for setting labor rates, radio presets, or resale value.

4. B — Voltage drop should be compared against the acceptable maximum drop specified for that circuit and connection. The spec defines whether the reading indicates excess resistance. Antenna resistance, ambient temperature, and a part number are not the comparison reference.
5. A — A clean, repeating waveform matching the expected shape indicates the signal circuit is producing the correct output. A good pattern confirms proper operation. It does not signal a reverted calibration file, a bus short, or a bracket angle problem.
6. B — Calibration should be performed after the mechanical repair is complete and verified, then the system calibrated. The sensor must reference the corrected condition. Calibrating before or during the repair, or treating it as optional, produces an invalid result.
7. B — Both technicians are correct: a pre-scan before the repair and a post-scan after it are both proper practice. The pre-scan documents existing faults; the post-scan confirms the repair. Both are required, not just one.
8. A — Finding an aftermarket accessory wired into an ADAS circuit calls for evaluating whether it is affecting the circuit's operation. Improper additions can disrupt ADAS function. Replacing the module, ignoring the accessory, or disconnecting the battery overnight does not address the interference.
9. D — A U-code directs the diagnosis toward a network communication or data bus fault between modules. The "U" designation is the communication category. It is not a fueling concern, a body-lighting fault, or an internal board failure.
10. A — After a failed calibration, the proper first step is to verify the setup, vehicle condition, and enable criteria before retrying. These factors cause most failures. Replacing the sensor, releasing the vehicle, or swapping the gateway skips the real cause.
11. B — A faulty wheel-speed signal shared with the brake module affects both the brake-related functions and ADAS features using that speed data. Both systems rely on the same input. Climate control, TPMS relearn, and HUD brightness do not use wheel-speed for these functions.

12. D — A calibration bay floor is verified level by using a digital inclinometer to read the floor slope against the specification. Precision calibration demands measured accuracy. Rolling a ball, measuring a diagonal, or hanging a plumb bob does not quantify slope to spec.

13. A — When service information is incomplete, the next step is to determine whether additional resources or manufacturer support are needed. Proper diagnosis depends on adequate information. Replacing a module, releasing the vehicle, or guessing from other brands is not sound practice.

14. D — Proper configuration is verified by confirming the module reports the correct vehicle options via the scan tool. The scan data shows whether configuration succeeded. Supply voltage, bracket torque, and case inspection do not confirm configuration.

15. C — Twisting CAN-H and CAN-L reduces electromagnetic interference and preserves the differential signal. The twist cancels induced noise across the pair. It does not raise voltage, provide a ground path, or share a power feed.

16. B — A freeze-frame is interpreted primarily to understand the operating conditions present when the fault was recorded. Those parameters let the technician reproduce the fault. It is not a part number, labor time, or module list.

17. C — Determining root cause matters because treating only the symptom leaves the actual fault to recur after release. Clearing a code does not repair the underlying problem. Codes are not required to be cleared before diagnosis, and root-cause analysis applies to ADAS too.

18. A — Because active suspension can change ride height, the vehicle must be set to the manufacturer-specified ride height during calibration. Sensor aim references the vehicle's attitude. The suspension is not removed, and height absolutely affects aim.

19. B — The correct first step in a camera diagnosis is to verify the concern and determine whether it is normal or a malfunction. This distinguishes a real fault from expected behavior. Replacing the camera, recalibrating, or clearing codes first skips verification.

20. B — Before checking the camera itself, the technician should inspect for obstruction, damage, or tampering affecting the field of view. A blocked view disables vision functions even with a healthy module. Antenna resistance, bumper torque, and refrigerant charge are unrelated.

21. D — A "calibration required" code after a windshield replacement calls for performing the required calibration per the manufacturer's specified procedure. Glass replacement disturbs the camera's reference. Releasing the vehicle, replacing the camera, or road testing first does not address the requirement.

22. B — Whether a concern stems from previous service is best determined from the vehicle's service history combined with the manufacturer's service information. Together they reveal prior work and normal behavior. The owner's manual, forums, and casting numbers are not reliable for this.

23. B — Target distance and height are established using a calibrated tape measure or laser referenced to the specified datum points. Calibration geometry must be exact. Visual estimates, an eyeballed level, and convenient placement introduce error.

24. C — After a static calibration passes, the workflow requires performing the dynamic verification or road test per the manufacturer procedure. Real-world confirmation completes the process. Clearing codes, replacing glass, or reducing bracket torque does not verify performance.

25. C — Enable criteria tell the technician the conditions that must be met for the module to set or clear that code. Knowing them reveals what the module was monitoring. They are not a part number, labor code, or torque spec.

26. B — A dash accessory blocking the camera's field of view must be removed so it does not interfere with detection or calibration. Any obstruction degrades function. Calibrating around it, lowering the bracket, or raising target brightness does not resolve the blockage.

27. A — A repeated calibration failure after A-pillar body repair calls for investigating whether the repair altered the windshield or bracket geometry, shifting the camera aim. Structural changes move the reference. Wrong paper color, low battery, and connected ultrasonic sensors would not cause this.

28. C — The required final documentation step after a camera repair is a post-repair scan confirming no related DTCs remain. It proves the system is functioning. Resetting oil life, recording climate settings, and topping off washer fluid do not verify the repair.

29. D — A camera that fails on worn markings but succeeds on a well-marked route shows the worn-marking route lacks the lane references the camera needs to learn. The route, not the camera, is deficient. There is no internal defect, no need to unplug sensors, and no dark-room requirement.

30. A — The manufacturer's service information describing system layout and parts is the authoritative first resource for an unfamiliar camera system. It is reliable and model-specific. Forums, casting numbers, and the owner's manual do not map system architecture.

31. C — When only the forward radar is unreachable while all others respond, the diagnosis should focus on the circuit or connector serving that module specifically. A shared battery or gateway fault would disable many modules. Isolating the loss to one node points to its individual wiring.

32. B — Before starting a radar calibration, the technician must first confirm the vehicle has no stored ADAS DTCs and the underlying repair is complete. Calibrating over a fault guarantees failure. Alignment approval, network reach, and map updates are not prerequisites to begin.

33. D — Stray reflections during static radar calibration return false signals that corrupt the calibration reference data. The radar cannot separate clutter from its target. Reflections do not lower supply voltage, change heater resistance, or erase codes.

34. C — Both technicians are correct: a bent radar bracket can cause aim error after calibration, and correct ride height is required for radar calibration. Both statements reflect valid principles. Neither is wrong.

35. C — A 120  $\Omega$  reading across the ADAS-CAN pair indicates the bus termination is intact and the circuit is configured normally. That nominal value reflects healthy termination. A short reads near zero, an open reads infinite, and a dead battery would not produce this reading.

36. A — Late radar detection behind heavy filler is caused by filler that attenuates and delays the radar signal passing through the cover. Radar must penetrate within strict limits. It does not raise supply voltage, change baud rate, or force bus sharing.

37. D — A tight mounting-angle tolerance exists because a small angular error causes a large lateral position error at the radar's far detection range. The error compounds over distance. The angle does not change baud rate, supply voltage, or heater resistance.

38. C — A target placed off the precise lateral position produces an incorrect calibration that biases the radar's perceived target angle. The radar references the target's exact location. Misplacement does not create a short, change ultrasonic range, or kill the bus.

39. D — A radar dropout only over rough railroad tracks points to a loose connector or mount that breaks electrical contact under vibration. Mechanical disturbance reveals the marginal connection. A calibration file, a fully failed sensor, or "designed muting" would not track vibration.

40. D — The composite vehicle reference, which lists the radar's range specification value, is the correct source for the forward radar's maximum detection range. It is authoritative for composite-vehicle data. Labor guides, catalogs, and other-brand experience do not supply this spec.

41. C — Corroded terminals must be repaired or replaced to restore the circuit. Corrosion adds resistance and causes intermittent or lost signals. Sealing with filler, raising voltage, or releasing the vehicle fails to fix the connection.

42. C — A metal parts cart and a vehicle lift within the radar's field are genuine environmental interference aborting an indoor calibration. Reflective surfaces return false signals. A ground drop, target shade, or software revision are not environmental interference.

43. D — The thrust line is established by the vehicle's rear axle geometry, which defines the direction the vehicle actually tracks. Radar aim references this true tracking direction. Bumper distance, steering position, and camera axis do not define the thrust line.

44. A — A new radar reacting to adjacent-lane vehicles after calibration suggests a residual aim or mounting error skewing the radar's lateral detection. The beam points slightly off, widening coverage.

Shipping origin, marginal battery, and disconnected ultrasonic sensors do not explain lateral misdetection.

45. A — The manufacturer-specified road test verifies the system performs correctly under actual real-world driving conditions. On-road behavior is the final proof of repair. It does not confirm battery recharge, TPMS relearn, or engine temperature.

46. C — The correct first step in an ultrasonic park-assist diagnosis is to verify the concern and determine whether it is normal or a malfunction. This distinguishes a real fault from expected behavior. Replacing the controller, recalibrating, or clearing codes first skips verification.

47. C — A sensor face covered with thick paint will dampen the emitted and returning waves, reducing detection reliability. Ultrasonic operation depends on a clean emitting surface. Paint does not usefully lengthen echo time, focus the beam, or pass waves freely.

48. D — The composite vehicle reference document describing the ultrasonic system specs is the authoritative source for the rear sensors' range and pattern. It is the defined reference for composite-vehicle data. Terminal resistance, scaled radar specs, and wheelbase do not provide this.

49. A — One erratic sensor among healthy ones is most efficiently diagnosed by checking that sensor's face and connector for obstruction, physical damage, or a loose connection. The fault is localized to that unit. Software revision, bus termination, and radar supply voltage are system-wide factors.

50. B — The repair is confirmed by performing a functional test and post-repair scan of the park-assist system. This verifies both real detection and clean communication. Reprogramming the radar, raising chime volume, or replacing good sensors is unnecessary.