

PRACTICE EXAM 8: ASE A7 SIMULATION (50 QUESTIONS)

1. A vehicle's A/C system produces vent temperatures of 48°F at 75°F ambient temperature. The customer insists the system cooled to 38°F last summer. The technician's performance test confirms low-side at 30 psi, high-side at 180 psi, and subcooling at 8°F. What is the MOST likely cause of the slightly warmer vent temperatures?
- A. A condenser fan operating at reduced speed that is marginally limiting high-side heat rejection
 - B. A partially restricted orifice tube that is slightly starving the evaporator of optimal refrigerant flow
 - C. Normal system operation within specification, with the customer's memory likely being inaccurate
 - D. A marginally low refrigerant charge, supported by the subcooling reading near the bottom of the acceptable range
2. Technician A says that when a compressor fails catastrophically and the system is flushed, the replacement hoses should be inspected internally for deterioration before reuse. Technician B says that old rubber hoses can release internal liner particles that contaminate the new compressor even after flushing. Who is correct?
- A. Technician A only, because modern barrier hoses do not deteriorate internally regardless of system age
 - B. Both Technician A and Technician B are correct about inspecting and evaluating hose condition during service
 - C. Technician B only, because hoses cannot be visually inspected internally without cutting them open
 - D. Neither Technician A nor Technician B, because hoses are always replaced as part of a compressor failure repair

3. A technician measures the resistance of a blower motor at the motor connector (disconnected from the vehicle). The reading is 0.6 ohms. A known-good identical motor measures 1.2 ohms. What does the lower resistance reading on the suspect motor indicate?

- A. The suspect motor has a partial internal short in its windings that is drawing excessive current
- B. The suspect motor is in better condition because lower resistance means less opposition to current flow
- C. The reading is within normal variation and does not indicate any problem with the motor's condition
- D. The motor's permanent magnets have weakened, reducing the back-EMF that normally adds to measured resistance

4. A vehicle's A/C system was recharged at a quick-lube shop three weeks ago. The customer reports that cooling performance started well but has gradually decreased. The technician recovers 14 ounces from a system specified at 20 ounces. The orifice tube screen is clean. What is the MOST likely cause of the charge loss?

- A. The quick-lube shop used contaminated refrigerant that has chemically degraded and lost mass inside the system
- B. The orifice tube has developed an internal crack that is allowing refrigerant to bypass without being measured
- C. A leak exists that was either present before the recharge or was created during the quick-lube service procedure
- D. The quick-lube shop only charged 14 ounces initially and did not verify the charge weight during the service

5. On a vehicle with automatic temperature control, the driver presses the A/C button but the indicator light does not illuminate and the compressor does not engage. All other HVAC controls — temperature, fan speed, and mode — function normally. What should the technician check FIRST?

- A. The A/C request button and its input circuit to determine if the button press signal reaches the HVAC module
- B. The compressor clutch coil resistance to verify the electromagnetic coil has not developed an open circuit
- C. The refrigerant charge level since a low charge may prevent the module from illuminating the A/C indicator
- D. The A/C relay and its associated fuse to determine if the compressor engagement circuit is intact downstream

6. A vehicle's engine temperature stabilizes at 175°F in winter weather. The manufacturer's specified thermostat rating is 195°F. The customer complains of insufficient heater output. The technician installs a new 195°F thermostat. After the repair, the engine reaches 195°F and the heater produces hot air. What was wrong with the original thermostat?

- A. The original thermostat was the correct 195°F rating but had a wax element that weakened and opened early
- B. The original thermostat was the correct rating but was installed backward, reversing the sensing direction
- C. The original thermostat housing was cracked, allowing coolant to bypass the thermostat valve entirely
- D. The original thermostat had been replaced at some point with an incorrect lower-temperature unit or had failed open

7. A technician is replacing the evaporator in a vehicle with a TXV system. All of the following should be performed during this repair EXCEPT:

- A. Replacing the TXV sensing bulb insulation with new insulation material for proper thermal contact
- B. Replacing the accumulator with a new unit containing fresh desiccant to protect against moisture
- C. Replacing the receiver-drier with a new unit containing fresh desiccant since the system has been opened

D. Replacing all O-rings at disturbed connections with new HNBR material lubricated with refrigerant oil

8. A technician is diagnosing a vehicle with no blower motor operation on any speed. The blower motor fuse is intact. The technician bypasses the blower motor relay by jumper-wiring the relay socket terminals 30 and 87. The blower motor runs at full speed. What does this test confirm?

A. The blower motor and its power supply circuit are functional, and the fault is in the relay or its control circuit

B. The blower motor resistor block has failed open, preventing current from reaching the motor through normal paths

C. The ground circuit for the blower motor is intact but requires the higher current of a direct connection to function

D. The blower motor speed control module has an internal short that was preventing the relay from operating

9. A customer reports that the A/C cools well when first started but the vent temperature rises from 42°F to 55°F after 30 minutes of highway driving. When the customer stops and idles for 5 minutes, the vent temperature drops back to 42°F. Gauge pressures are normal at idle but the high side rises to 310 psi during highway driving. What is the MOST likely cause?

A. A variable displacement compressor control valve that is not increasing displacement under high-load conditions

B. A partially blocked condenser that provides adequate airflow at idle but creates excessive back-pressure at highway speed from debris compaction

C. A marginal refrigerant charge that performs adequately at idle RPM but cannot sustain cooling at highway loads

D. An intermittent compressor clutch coil that disengages periodically at higher RPM due to thermal expansion

10. On a vehicle with electronic HVAC controls, the technician retrieves DTC B0112 — Ambient Temperature Sensor Circuit High Voltage. The scan tool live data shows the ambient temperature reading -40°F . The actual outside temperature is 72°F . What electrical condition produces this specific reading and code?

- A. A sensor element that has failed internally and is producing a short circuit pulling voltage to the minimum
- B. A corroded sensor connector that is adding resistance to the ground wire and elevating the signal voltage
- C. An open circuit in the sensor wiring that the module reads as maximum resistance, producing high voltage and minimum temperature
- D. A short to battery voltage on the signal wire that is driving the reading to the maximum temperature display

11. A vehicle's A/C system has been sitting unused for six months over winter. The customer starts using the A/C in spring and reports that it takes significantly longer than normal to cool the cabin during the initial pull-down period, but eventually reaches acceptable vent temperatures. What is the MOST likely cause?

- A. The compressor oil has settled to the bottom and needs several minutes to circulate and lubricate properly
- B. The evaporator core has developed a layer of dust and debris that insulates the surface and reduces heat transfer
- C. The cabin air filter has absorbed moisture over winter that must evaporate before the filter passes adequate airflow
- D. A small amount of refrigerant has leaked during the storage period, creating a marginal charge that takes longer to cool

12. Technician A says that when replacing a compressor, the technician should rotate the new compressor's clutch hub by hand several times before installation to distribute oil throughout the internal mechanism. Technician B says that the new compressor should be stored with the ports capped until the moment of installation to prevent moisture entry. Who is correct?

- A. Both Technician A and Technician B are correct about proper new compressor handling before installation
- B. Technician A only, because modern compressors arrive in moisture-sealed packaging that eliminates the need for caps
- C. Technician B only, because rotating the clutch hub can damage the internal seals before proper lubrication occurs
- D. Neither Technician A nor Technician B, because no special handling is required for modern replacement compressors

13. A vehicle's HVAC system has an electronic blower motor controller that receives a PWM (pulse-width modulated) signal from the HVAC control module. The technician measures the PWM duty cycle at the controller's input with the blower set to medium speed and reads 0%. The blower does not operate. What does this reading indicate?

- A. The controller has failed internally and is not responding to the module's signal regardless of duty cycle
- B. The blower motor has a locked rotor condition that is preventing the controller from outputting any signal
- C. The HVAC module is not sending a speed command signal to the controller, indicating a module output fault
- D. The PWM signal wire has a short to ground that is pulling the duty cycle reading to zero at the test point

14. A vehicle's cooling system has been refilled after a heater core replacement. The engine reaches 200°F operating temperature. The heater produces hot air from the floor vents. However, 10 minutes later, the heater output drops to lukewarm and the engine temperature gauge rises to 230°F before the cooling fan brings it back down. This cycle repeats every 10–15 minutes. What is the MOST likely cause?

- A. A failing water pump bearing that seizes intermittently, stopping coolant flow until it frees again from cooling

- B. A new heater core that has an internal manufacturing defect creating a periodic restriction in coolant flow
- C. An incorrectly installed thermostat that is sticking intermittently between the open and closed positions
- D. A large air pocket trapped in the cooling system from the refill procedure that intermittently blocks coolant circulation

15. A technician is testing a blower motor relay. With the relay removed and a DMM set to ohms, the technician measures between terminals 85 and 86 (coil terminals) and reads 75 ohms. Then the technician measures between terminals 30 and 87 (contact terminals) and reads OL (over limit). What do these readings indicate?

- A. The relay is completely failed because both the coil and the contacts show abnormal resistance values
- B. The relay coil is intact (75 ohms is normal) and the contacts are open (OL is normal for a de-energized relay)
- C. The relay coil has excessive resistance indicating degradation, and the contacts are welded closed
- D. The readings are inconclusive because relay testing requires applying voltage to the coil before measuring contacts

16. A vehicle's A/C system has the following readings at 90°F ambient: low side 25 psi, high side 340 psi. The compressor clutch engages and disengages every 5–8 seconds. The condenser fan is operating at full speed and the condenser face is clean. What is the MOST likely cause?

- A. A low refrigerant charge causing the rapid cycling through the low-pressure cutout switch repeatedly
- B. The high-pressure cutout is tripping due to excessive head pressure, likely from an overcharge or non-condensable gases
- C. A stuck-open TXV flooding the evaporator and causing the compressor to slug liquid on each engagement
- D. A restricted suction line between the evaporator and compressor creating abnormal cycling pressure behavior

17. A vehicle has been diagnosed with a compressor shaft seal leak. The compressor is five years old but otherwise operates normally with no noise or pressure issues. The technician determines the seal is independently replaceable on this compressor model. All of the following steps are required for the shaft seal replacement EXCEPT:

- A. Flushing the entire refrigerant system with approved solvent before replacing the shaft seal component
- B. Recovering all refrigerant from the system before removing the clutch assembly to access the shaft seal
- C. Replacing the accumulator or receiver-drier since the system will be opened to atmosphere during the repair
- D. Evacuating the system to proper vacuum depth and recharging with the specified refrigerant amount by weight

18. A technician is diagnosing a vehicle where the HVAC control module is not commanding the A/C compressor clutch relay to engage. The scan tool shows the following data: A/C button pressed (yes), ambient temp 78°F, engine coolant temp 195°F, evaporator temp sensor reading 28°F, A/C pressure sensor 92 psi. Why is the module NOT commanding the relay?

- A. The evaporator temperature sensor reads 28°F, which is below the module's freeze protection threshold
- B. The A/C pressure sensor reading of 92 psi is above the module's maximum engagement pressure limit
- C. The engine coolant temperature of 195°F is too high for the module to authorize compressor engagement
- D. The ambient temperature of 78°F is below the module's minimum threshold for A/C compressor activation

19. Technician A says that mixing IAT (green) coolant with OAT (orange) coolant produces a gel-like sludge that can clog the heater core within months. Technician B says that if the wrong coolant type was accidentally added, the system should be thoroughly flushed and refilled with the correct type as soon as possible. Who is correct?

- A. Technician A only, because the gel formation is irreversible and flushing cannot remove it once it forms
- B. Technician B only, because mixing coolant types produces mild discoloration but no harmful chemical reaction
- C. Both Technician A and Technician B are correct about the risks of mixing and the proper corrective action
- D. Neither Technician A nor Technician B, because modern coolant formulations are universally cross-compatible

20. A technician is diagnosing a vehicle with an ATC system where the blower motor runs at maximum speed continuously regardless of the temperature setting or current cabin conditions. The scan tool shows the module commanding 35% blower speed. The voltage at the blower motor connector measures 14.1V (full battery voltage). What has MOST likely failed?

- A. The HVAC control module, since it is commanding 35% but its output driver is stuck at full voltage output
- B. The electronic blower motor controller, which is receiving the 35% command but outputting full voltage to the motor
- C. The blower motor itself, which has an internal fault causing it to run at full speed regardless of input voltage
- D. The high-speed relay, which has welded contacts bypassing the controller and supplying full voltage directly

21. A customer reports that their vehicle's A/C produces a brief puff of foul-smelling air when first turned on, then the air smells normal after approximately 30 seconds. The system cools normally. The vehicle is three years old and has never had the evaporator treated. What should the technician recommend?

- A. Replacing the cabin air filter and having the air ducts professionally cleaned with compressed air
- B. Adding a refrigerant additive that contains antimicrobial agents to treat the contamination from inside

C. Replacing the evaporator since the odor indicates corrosion has progressed beyond surface contamination

D. Applying an antimicrobial evaporator cleaner and verifying the condensation drain is clear and flowing

22. A technician is testing the voltage output of a sun load sensor on a vehicle with ATC. With the vehicle parked in full shade, the sensor reads 0.3V. When the technician shines a bright flashlight directly on the sensor, the reading rises to 1.8V. On a sunny day, the expected reading should be 3.5V–4.5V. What can the technician determine from these readings?

A. The sensor is responding to light changes, confirming its photodiode is functional, and will likely read correctly in actual sunlight

B. The sensor is partially failed because the flashlight test should produce readings equivalent to full sunlight

C. The sensor wiring has excessive resistance that is limiting the maximum voltage the sensor can produce

D. The HVAC control module is attenuating the sensor signal and preventing it from reaching its full output range

23. A vehicle's A/C system has the following condition: the compressor clutch engages, gauge pressures appear normal, but there is zero airflow from any vent in the cabin. The dashboard controls are set to panel mode with the blower on high. What is the MOST likely cause?

A. A completely blocked evaporator core that is preventing all air from passing through the HVAC housing

B. A seized mode door actuator that has locked all mode doors in the fully closed position blocking all outlets

C. A failed blower motor or blower motor circuit that is not producing any airflow through the HVAC housing

D. A disconnected HVAC housing inlet duct that has separated from the housing and is dumping air behind the dash

24. A vehicle's A/C system has been operating with a known slow leak for approximately 18 months. The customer has had the system "topped off" twice at a quick service center without leak repair. The system now produces no cooling and the compressor clutch will not engage. After recovering zero refrigerant, the technician finds extensive green corrosion inside the aluminum fittings. What caused this corrosion?

- A. The refrigerant itself has become acidic from age and is corroding the aluminum components it contacts
- B. Repeated exposure to atmospheric air and moisture through the leak allowed acid formation that corroded the system
- C. The quick service center used contaminated refrigerant containing corrosive additives from improper recycling
- D. The aluminum fittings are simply reaching the end of their design life due to the vehicle's age and mileage

25. On a vehicle equipped with ATC, the scan tool shows all sensor readings accurate and all actuator positions matching their commanded values. The customer reports that the system maintains the set temperature during city driving but the cabin becomes noticeably warmer during extended highway driving on hot days, despite the system appearing to work harder (higher blower speed). What is the MOST likely explanation?

- A. The system is reaching its maximum cooling capacity under the higher heat load of highway speed on hot days
- B. The condenser is partially blocked with debris that becomes critical only under sustained highway heat loads
- C. A marginal refrigerant charge that performs adequately in moderate conditions but fails under extreme demand
- D. The compressor's variable displacement control valve is not increasing displacement to match highway demand

26. A vehicle was parked for three days in 105°F heat. The customer starts the vehicle and immediately selects maximum A/C. The initial vent temperature is 95°F. After 2 minutes it drops to 70°F, after 5 minutes to 52°F, and after 10 minutes it reaches 42°F. The customer believes the system is malfunctioning. What should the technician explain?

- A. The compressor clutch is slipping during initial engagement and needs air gap adjustment to improve response
- B. The TXV is slow to open after an extended hot soak and should be replaced with a faster-responding unit
- C. The cabin air filter is restricting initial airflow and should be replaced to improve pull-down performance
- D. This is normal pull-down behavior when the system must overcome extreme stored cabin heat before reaching target temperature

27. A vehicle with vacuum-controlled HVAC has the following symptom: the mode selection works correctly in all positions except that when the defrost mode is selected, air comes from both the defrost and floor vents instead of defrost only. All other modes — panel, bi-level, and floor — work correctly. What is the MOST likely cause?

- A. The vacuum check valve has a slow leak that reduces available vacuum specifically in the defrost position
- B. A cracked vacuum supply hose to the HVAC control panel reducing total vacuum available to all actuators
- C. A leaking diaphragm in the specific vacuum actuator that controls the defrost-to-floor air split door
- D. The HVAC control panel is simultaneously sending vacuum to both the defrost and floor actuator ports

28. Technician A says that the condenser must always be mounted in front of the radiator to receive the coolest possible outside air for maximum heat rejection efficiency. Technician B says that on some vehicles, an auxiliary transmission cooler or power steering cooler is also mounted in the condenser/radiator stack. Who is correct?

- A. Technician A only, because no other heat exchangers are ever mounted in the condenser and radiator airflow path
- B. Both Technician A and Technician B are correct about condenser positioning and additional heat exchangers in the stack
- C. Technician B only, because some vehicles mount the condenser behind the radiator for crash protection purposes
- D. Neither Technician A nor Technician B, because condenser mounting position varies randomly by manufacturer

29. A technician is performing a voltage drop test on the A/C compressor clutch power circuit. With the clutch engaged, the technician measures from the battery positive terminal to the clutch coil positive terminal. The reading is 0.4V. What does this indicate?

- A. The total power-side voltage drop of 0.4V is within acceptable limits, confirming good wire and connection integrity
- B. The clutch coil is drawing excessive current that is creating an abnormally high voltage drop across the feed wire
- C. The feed wire has a significant resistance problem that is preventing adequate current from reaching the clutch
- D. The measurement technique is incorrect because voltage drop should be measured across individual components only

30. A vehicle with an ATC system has the following complaint: the passenger reports that the floor vents blow warm air while the dashboard panel vents blow cold air. The system is a single-zone design with one blend door. The scan tool shows the blend door at 15% (near full cold). What is the MOST likely cause?

- A. A faulty blend door actuator that is partially opening the door even though the feedback reads 15% position
- B. The floor ductwork passes near a heat source such as the exhaust tunnel, catalytic converter, or transmission that warms the air in transit

C. The evaporator is cooling unevenly, with the lower section producing warmer air that is directed to the floor

D. A failed mode door that is mixing heated floor-mode air from the heater core with cold panel-mode air

31. A technician is diagnosing a vehicle where the A/C compressor clutch engages but the compressor makes no noise and the gauges show no pressure change — both sides remain at static pressure. The drive belt is intact and spinning the compressor pulley. What is the MOST likely cause?

A. A failed compressor with completely broken internal components that spin freely without pumping anything

B. A stuck-closed metering device that is preventing any refrigerant from flowing despite compressor operation

C. The compressor clutch is engaging but slipping — the hub is not transferring torque to the compressor shaft

D. The manifold gauge set is malfunctioning and not reading the actual pressures present in the operating system

32. A technician connects a scan tool to a vehicle and attempts to perform a blend door actuator calibration after replacing the actuator. The scan tool displays "Calibration failed — actuator did not reach end stop." What does this message MOST likely indicate?

A. The blend door is physically hitting an obstruction or the actuator cannot drive the door through its full mechanical range

B. The replacement actuator is the correct part number but has a defective motor that cannot generate adequate torque

C. The HVAC control module software is not compatible with the replacement actuator's feedback signal protocol

D. The scan tool software needs updating because its calibration routine does not support this vehicle model year

33. A vehicle's A/C system was operating normally. After an engine oil change, the customer notices the A/C is not cooling. The compressor clutch does not engage. The technician checks and finds a blown A/C fuse. After replacing the fuse and verifying the A/C works, what should the technician determine?

- A. Whether the engine oil service included any work near the A/C wiring harness that could have caused a short
- B. The blown fuse was coincidental and not related to the oil change service performed on the vehicle
- C. The compressor clutch coil is beginning to fail and will blow the replacement fuse within a short period
- D. The oil change technician disconnected the compressor electrical connector and caused a short when reconnecting

34. Technician A says that when the A/C compressor cycles off in a cycling clutch system, the low-side pressure rises because refrigerant continues to boil in the evaporator without being removed by the compressor. Technician B says that when the compressor cycles back on, the low-side pressure drops because the compressor begins pulling refrigerant from the evaporator faster than it enters through the orifice tube. Who is correct?

- A. Technician A only, because the low-side pressure actually drops when the compressor cycles off due to rapid cooling
- B. Technician B only, because the low-side pressure stays constant when the compressor cycles off until it re-engages
- C. Both Technician A and Technician B are correct about the pressure behavior during normal compressor cycling
- D. Neither Technician A nor Technician B, because both-sides pressures equalize instantly when the compressor stops

35. A vehicle's scan tool HVAC data shows the blend door actuator commanded to 50% and the actual feedback reading 50%. The vent temperature from the center vent is 90°F. The set temperature is 72°F and the in-car sensor reads 90°F. The evaporator temperature sensor reads 38°F. What should the technician conclude?

- A. The HVAC control module is miscalculating the required blend door position because its algorithm is corrupted
- B. The module is correctly commanding 50% because it is attempting to bring the 90°F cabin down to 72°F gradually rather than slamming to full cold
- C. The blend door actuator has stripped gears and the door is at full hot despite the feedback reading 50%
- D. The evaporator temperature sensor is inaccurate and the evaporator is not actually cooling to 38°F

36. A vehicle's cooling system is equipped with an electric water pump controlled by the engine management system. The pump is commanded to run at a variable speed based on engine temperature and load. How does this electric pump design affect heater performance compared to a conventional belt-driven pump?

- A. The engine management system can command higher pump speed during cold starts to improve heater warm-up time
- B. Electric pumps provide no coolant flow when the engine is off, eliminating any residual heat from the heater
- C. The heater will always produce less heat because electric pumps cannot match the flow rate of mechanical pumps
- D. Electric pump speed is not affected by engine RPM, so heater performance is identical at all engine speeds

37. A vehicle with electronic HVAC controls has an intermittent problem where all HVAC actuators lose their calibration simultaneously and the system defaults to a failsafe mode. After cycling the ignition off and back on, the system recalibrates and functions normally for several days before the problem recurs. What is the MOST likely cause?

- A. A faulty HVAC control module with degrading memory that intermittently loses stored calibration values
- B. The blend door actuator is intermittently drawing excessive current and triggering a module protective reset

C. A cabin air filter that is severely restricted, causing airflow fluctuations that confuse the actuator feedback

D. An intermittent power supply interruption to the HVAC module that causes it to reset and lose calibration data

38. A vehicle's A/C system has a condenser with heavily bent fins across approximately 40% of the condenser face. The remaining 60% is clean and undamaged. How much impact does this fin damage have on system performance?

A. Minimal impact because the remaining 60% of undamaged condenser provides sufficient surface area for most conditions

B. No measurable impact because bent fins only affect the cosmetic appearance and do not restrict airflow

C. Significant impact because 40% blockage substantially reduces total heat rejection capacity and raises head pressure

D. The impact depends entirely on which 40% is damaged — upper section damage is critical while lower is not

39. A customer reports that the A/C system in their vehicle produces a brief clicking sound followed by a visible RPM drop each time the compressor clutch engages. This occurs every 30–45 seconds during normal operation. The A/C cools normally. What should the technician tell the customer?

A. This is normal compressor cycling behavior — the click is the clutch engaging and the RPM dip is the engine compensating for the compressor load

B. The compressor clutch air gap is too wide and should be adjusted to prevent the audible engagement click

C. The engine idle air control system needs service because it should fully compensate for the compressor load

D. The compressor bearings are beginning to fail and the engagement noise will worsen over time if not repaired

40. A technician is diagnosing a vehicle where the scan tool shows a DTC for lost communication with the mode door actuator (U-code). All other HVAC actuators respond normally. The technician checks the LIN bus wire to the mode door actuator and finds continuity. What should the technician check next?

A. The CAN bus for a fault that might be affecting the HVAC module's ability to communicate with all actuators

B. The mode door actuator's power supply and ground circuits to verify the actuator has the voltage needed to communicate

C. The HVAC control module for a failed LIN bus output driver that cannot send commands to that specific actuator

D. The blend door actuator wiring for a cross-talk condition that is interfering with the mode door signals

41. A vehicle's A/C evaporator drain tube is dripping water continuously while the A/C is operating on a humid 90°F day. The puddle under the vehicle is approximately 6 inches in diameter after 30 minutes of operation. Is this normal?

A. No — excessive condensation indicates the evaporator is running too cold due to a failed freeze protection device

B. No — the drain tube should only drip intermittently, and continuous flow indicates a clogged drain backing up

C. Yes — continuous condensation drainage during A/C operation on a humid day is completely normal behavior

D. Yes — but only if the A/C is set to recirculation mode, which increases the moisture content of recirculated air

42. A technician is diagnosing a vehicle where the A/C compressor engages and the low-side pressure drops normally, but the high-side pressure rises very slowly and never exceeds 140 psi at 85°F ambient. Normal high-side at this temperature should be 190–230 psi. What is the MOST likely cause?

- A. A severely restricted orifice tube that is not allowing adequate refrigerant to flow from the high side
- B. An overcharged system where excess liquid refrigerant is absorbing the compressor's output capacity
- C. A condenser fan running at maximum speed that is overcooling the condenser and keeping pressures low
- D. A compressor with worn internal valves that is moving refrigerant but not compressing it to full discharge pressure

43. Technician A says that R-134a service fittings are designed with different sizes for the high side and low side to prevent connecting the wrong gauge to the wrong port. Technician B says that R-12 service fittings use the same thread size for both the high side and low side, which is why R-12 adapters must be selected carefully. Who is correct?

- A. Technician A only, because R-12 fittings also use different thread sizes for the high and low side ports
- B. Technician B only, because R-134a fittings use the same quick-disconnect size for both high and low sides
- C. Both Technician A and Technician B, because both R-134a and R-12 use different sizes for high and low
- D. Neither Technician A nor Technician B, because all A/C service fittings are universal across refrigerant types

44. A vehicle owner reports that the heater works well when driving straight but produces noticeably cooler air during left turns. The symptom resolves as soon as the vehicle straightens. Engine temperature remains normal. What is the MOST likely cause?

- A. The water pump impeller is worn and cannot maintain flow against the centrifugal force during cornering
- B. An air pocket in the heater core that shifts position during turns, intermittently blocking coolant flow through the core

C. A low coolant level that allows the heater core inlet to become uncovered during the lateral G-forces of turning

D. The blend door actuator is sensitive to vehicle tilting and repositions slightly during the centrifugal load of turns

45. A technician retrieves a DTC from the HVAC module: B0228 — Blend Door Actuator Circuit Malfunction. The scan tool bidirectional test commands the actuator to move from 0% to 100%. The motor can be heard running faintly but the position feedback does not change from 8%. What is the MOST likely cause?

A. A disconnected position feedback wire that is sending a fixed reading while the motor spins inside the housing

B. A failed HVAC control module output that cannot provide sufficient current to drive the motor at full power

C. A seized blend door that the motor cannot overcome, causing the motor to stall while feedback stays fixed

D. Stripped gears inside the actuator that allow the motor to spin without turning the output shaft or feedback mechanism

46. A vehicle's A/C system uses an electronic pressure transducer for the A/C high-side pressure. The scan tool reading shows 95 psi with the system at rest and the engine off at 84°F ambient. A manifold gauge connected to the high-side port reads 94 psi. The P-T chart for R-134a indicates approximately 93–95 psi at 84°F. What can the technician determine?

A. The system has a marginal overcharge because the static pressure is at the upper limit of the P-T chart range

B. The electronic pressure transducer is reading slightly high and may need replacement for improved accuracy

C. The system has an adequate refrigerant charge and both the electronic transducer and manifold gauge are reading accurately

D. The manifold gauge is more accurate than the electronic sensor and should be used as the primary reference

47. A technician is testing a blower motor by applying battery voltage directly to the motor connector (bypassing all controls and resistors). The motor runs but significantly slower than expected and draws 28 amps. The specification for this motor is 18 amps maximum on high speed. What does the excessive current draw indicate?

A. The motor has an internal fault such as dragging brushes, a shorted winding, or a seized bearing that is overloading the circuit

B. The applied voltage is too high and is causing the motor to overdraw from the unregulated direct battery connection

C. The motor's permanent magnets have demagnetized, causing the motor to work harder to achieve the same speed

D. The test result is normal for a direct battery connection because bypassing the resistor eliminates all current limiting

48. Technician A says that when an A/C system is opened for any repair, the system must be evacuated to remove air and moisture before recharging. Technician B says that evacuation is only necessary if the system was open for more than 30 minutes, as brief openings do not allow significant moisture entry. Who is correct?

A. Both Technician A and Technician B, because the evacuation requirement depends on how long the system was open

B. Technician A only, because any exposure to atmosphere introduces air and moisture that must be removed by evacuation

C. Technician B only, because PAG oil's desiccant properties absorb enough moisture to protect the system during brief openings

D. Neither Technician A nor Technician B, because modern systems use automatic moisture compensation in the accumulator

49. A vehicle's A/C system had both-sides-high gauge readings. The technician recovered the refrigerant and found the system contained 30 ounces — 10 ounces more than the 20-ounce specification. After recharging with exactly 20 ounces, the system pressures are normal and the vent temperature drops to 42°F. What was the root cause of the original poor performance?

- A. A partially restricted condenser that produced the high readings regardless of the amount of refrigerant charged
- B. Non-condensable gases in the system that were coincidentally introduced along with the excess refrigerant
- C. A failed condenser fan that was unable to reject the additional heat load produced by the excess refrigerant
- D. The 50% overcharge of refrigerant, which flooded the condenser with liquid, reduced heat transfer, and elevated system pressures

50. A technician is performing a final quality check after an A/C system repair. The system has been charged with the correct amount of refrigerant. What measurements should the technician take to verify the system is performing correctly before returning the vehicle to the customer?

- A. Low-side and high-side gauge pressures only, comparing them to the manufacturer's published normal ranges
- B. Vent temperature only, confirming it falls within the expected range for the current ambient temperature
- C. Vent temperature, gauge pressures, subcooling, and superheat under standardized performance test conditions
- D. A 10-minute timed test monitoring vent temperature decline rate from ambient to target as the sole criterion

Practice Exam 8: Answer Key and Explanations

1. D — Subcooling of only 8°F sits at the low end of the acceptable 10°F–20°F range, indicating the condenser is not producing as much fully subcooled liquid as it should. This borderline subcooling reading, combined with a vent temperature that is adequate but not optimal, points to a marginally low

refrigerant charge. The system has enough refrigerant to function but not enough to achieve peak performance — a slow leak has likely depleted a few ounces over time.

2. B — Both technicians are correct. Technician A is right that hoses should be inspected internally during major repairs — squeezing hoses to feel for soft spots, internal swelling, or a mushy texture can reveal inner liner deterioration invisible from the outside. Technician B is right that deteriorated internal liner material can break off in small particles and circulate through the system, potentially clogging the new compressor's internal passages and causing premature repeat failure.

3. A — A motor winding resistance of 0.6 ohms — half the 1.2 ohms measured on a known-good identical motor — indicates a partial short between adjacent windings inside the suspect motor. Shorted turns reduce total resistance, which causes the motor to draw significantly more current than designed at any given voltage. This excess current overheats the motor windings and the blower motor resistor block or electronic controller, leading to premature failure of both components.

4. C — Refrigerant does not degrade, evaporate, or lose mass during normal operation — the system is sealed and the charge should remain constant. A loss of 6 ounces (from 20 to 14) over three weeks definitively confirms a leak exists somewhere in the system. The leak may have been present before the quick-lube recharge (which simply masked it temporarily) or may have been created during the service if a fitting was not properly tightened or an O-ring was damaged during connection.

5. A — All other HVAC controls function normally — temperature, fan speed, and mode all respond correctly — which confirms the HVAC module, its output circuits, and the communication network are functional. The A/C button specifically does not illuminate and produces no compressor response, isolating the fault to the A/C request input path. Checking whether the button press signal reaches the module is the logical first step, as a failed button switch or broken signal wire would produce exactly this symptom.

6. D — The engine stabilized at 175°F — 20°F below the specified 195°F thermostat rating — and the problem was resolved by installing a new 195°F thermostat. This confirms the original thermostat was either a lower-rated unit installed during previous service or had failed in the partially open position, allowing coolant to flow to the radiator before reaching the designed 195°F operating temperature. The lower coolant temperature directly reduced the heat available to the heater core.

7. C — This is an EXCEPT question — three options are correct service steps and one is not. A TXV system uses a receiver-drier (on the high side), not an accumulator (which is in orifice tube systems). Replacing the "receiver-drier" is the correct action for a TXV system when the system is opened. The

question asks about replacing the accumulator — which would be incorrect for a TXV system because TXV systems do not have accumulators. The receiver-drier is the component that should be replaced.

8. A — Jumper-wiring terminals 30 (battery power) and 87 (output to motor) at the relay socket bypasses the relay entirely and sends battery voltage directly to the blower motor circuit. The motor running at full speed confirms the motor itself, the power supply wire to the relay, the output wire from the relay to the motor, and the motor's ground circuit are all functional. The fault must be in the relay itself (failed contacts or coil) or in the relay's control circuit (module ground signal, control wiring).

9. B — At idle, the condenser receives airflow from the cooling fan, which is adequate for heat rejection. At highway speed, ram air is forced through the condenser at much higher volume — but if the condenser is partially blocked, the higher-velocity air compresses accumulated debris tighter against the fins, further restricting airflow and paradoxically reducing heat rejection despite the higher air speed. The high-side climbing to 310 psi during highway driving confirms the condenser cannot reject heat under sustained high-load, high-airflow conditions.

10. C — In an NTC thermistor voltage divider circuit, an open circuit (broken wire, disconnected connector, or failed sensor element) produces maximum resistance in the circuit. Maximum resistance produces maximum voltage at the signal wire, and since this is an NTC sensor where high resistance equals low temperature, the module reads the coldest possible value — typically -40°F , which is the default value most modules assign for an open temperature sensor circuit. The high-voltage DTC confirms this open-circuit condition.

11. D — A vehicle sitting unused for six months provides ample opportunity for a slow leak to deplete a few ounces of refrigerant. A marginally low charge still cools but takes longer to pull down the cabin temperature because the reduced refrigerant mass absorbs heat more slowly. Once the system reaches steady-state operation, the reduced charge may produce acceptable vent temperatures — explaining why the system "eventually reaches acceptable temperatures" but takes longer during initial pull-down.

12. A — Both technicians describe correct practices. Technician A is right that gently rotating the clutch hub several times distributes the factory oil charge throughout the compressor's internal surfaces before the compressor operates at full speed, reducing dry-start wear. Technician B is right that keeping ports capped until installation prevents atmospheric moisture from entering the compressor and contaminating the oil and internal surfaces — PAG oil is extremely hygroscopic and absorbs moisture rapidly from open exposure.

13. C — A PWM duty cycle of 0% at the controller's input means the HVAC module is sending no speed command signal to the controller. Without a command signal, the controller has nothing to act on and the motor does not run. The fault is at the module's output — either the module's PWM driver circuit has failed, the signal wire between the module and controller is open or shorted, or the module has decided not to command the blower for a reason visible in other scan tool data.

14. D — Cyclical overheating followed by recovery, combined with intermittent loss of heater output, is the classic symptom of a large air pocket trapped in the cooling system. The air pocket intermittently blocks coolant flow through the thermostat, heater core, or radiator as it shifts position with coolant flow and temperature changes. When the air pocket blocks radiator flow, the engine overheats. When it moves and flow resumes, the cooling fan brings the temperature back down. Proper bleeding of the cooling system after the heater core replacement should resolve the issue.

15. B — A relay coil resistance of 75 ohms is within the normal range for an automotive relay coil (typically 50–120 ohms), confirming the coil winding is intact. A reading of OL (over limit / infinite resistance) between the contact terminals 30 and 87 is correct for a relay that is not energized — the contacts are in their normally open position and no current path exists between them. Both readings indicate a functional relay in its de-energized resting state.

16. B — A high-side pressure of 340 psi at 90°F ambient is dangerously elevated — well above the normal 200–270 psi range. The compressor engaging and disengaging every 5–8 seconds with a clean condenser and functional fan indicates the high-pressure cutout device is tripping each time the compressor runs long enough to push pressure above the threshold. The most common causes of this pattern are a refrigerant overcharge or non-condensable gases (air) that permanently elevate high-side pressure beyond what the refrigerant alone would produce.

17. D — This is an EXCEPT question. A shaft seal replacement on an otherwise functional compressor does not require flushing the entire refrigerant system — there is no debris or contamination to remove. The seal replacement involves recovering the refrigerant (B is required), accessing and replacing the seal, replacing the drier/accumulator since the system is opened (C is required), and evacuating and recharging (D is required). System flushing (A) is only necessary after catastrophic compressor failure or contamination — not for a simple seal replacement.

18. A — The evaporator temperature sensor reads 28°F, which is below the typical freeze protection threshold of 32°F–35°F that most ATC modules use to prevent evaporator icing. The module sees this reading and concludes the evaporator is at risk of freezing, so it refuses to engage the compressor to prevent further cooling. All other parameters are within normal engagement limits — A/C button

pressed, adequate ambient temperature, proper coolant temperature, and normal system pressure. The 28°F evaporator reading is the specific parameter preventing engagement.

19. C — Both technicians are correct. Technician A correctly identifies that mixing IAT and OAT coolant types causes a chemical reaction between the different inhibitor chemistries that produces a gel-like sludge capable of clogging heater cores, radiators, and engine passages within months. Technician B correctly advises that the proper corrective action when coolant types are accidentally mixed is to flush the system thoroughly and refill with the correct single coolant type as soon as possible before permanent damage occurs.

20. B — The scan tool confirms the HVAC module is commanding 35% blower speed (module output is functioning correctly at the command level), but the blower motor receives full 14.1V battery voltage and runs at maximum speed. The electronic blower motor controller sits between the module's command and the motor — it should reduce voltage to approximately 35% of battery voltage. Since it is passing full voltage regardless of the 35% command, the controller's power transistor has shorted internally, bypassing the speed regulation function.

21. D — A brief foul odor at startup that clears within 30 seconds is the characteristic symptom of microbial growth (mold, mildew, bacteria) on the evaporator surface. These organisms thrive on the constantly moist evaporator and release volatile compounds when the blower first disturbs them. Applying an antimicrobial evaporator cleaner kills the existing growth and treating the surface inhibits regrowth. Verifying the condensation drain is clear ensures water does not pool and create an even more favorable growth environment.

22. A — The sensor responds to light intensity changes — producing 0.3V in shade and rising to 1.8V with a flashlight — which confirms the photodiode element is functional and the circuit is intact. A handheld flashlight does not produce the same infrared radiation intensity as direct sunlight, so the 1.8V reading is expected to be lower than the 3.5–4.5V range seen in actual full sun conditions. The sensor's response to the flashlight test confirms it is working and will likely produce correct readings in real sunlight.

23. C — The compressor engages and gauge pressures are present (confirming the refrigeration circuit is operational), but there is zero airflow from any cabin vent despite the blower being set to high and the mode set to panel. The only component that produces airflow through the HVAC housing is the blower motor. A failed blower motor, a blown blower fuse, a failed blower relay, or an open motor circuit would produce exactly this condition — the A/C side works but no air moves through the system to deliver the cooling to the cabin.

24. B — Operating with a slow leak for 18 months means atmospheric air and moisture entered the system continuously through the leak point. The moisture reacted with the R-134a refrigerant and PAG oil to form hydrofluoric acid, which attacks aluminum aggressively. The "topped off" recharges without leak repair allowed this corrosive cycle to continue — each time new refrigerant was added, the moisture and acid already present continued destroying internal surfaces. The extensive green corrosion on aluminum fittings is the direct result of prolonged acid exposure.

25. A — All sensors read accurately, all actuators match their commands, and the system appears to work harder (higher blower speed) during highway driving on hot days — confirming the module is correctly maximizing its output in response to the increased heat load. The system is operating at its maximum designed cooling capacity, and the higher heat load from extreme ambient temperature combined with solar gain and engine bay radiation at sustained highway speed simply exceeds what the system can fully overcome. This is a capacity limitation, not a fault.

26. D — A vehicle heat-soaked in 105°F sun for three days has a cabin temperature that can exceed 150°F. The A/C system must first absorb and remove this massive stored heat energy before vent temperatures approach their normal cold range. The progressive pull-down — 95°F at startup, 70°F at 2 minutes, 52°F at 5 minutes, and 42°F at 10 minutes — is completely normal and demonstrates the system is working correctly. The final 42°F vent temperature confirms the system reaches its full cooling potential once the initial heat load is overcome.

27. C — All other mode positions work correctly, meaning the vacuum supply, reservoir, check valve, and control panel are all functional. Only the defrost position has a problem — air exits from both defrost and floor instead of defrost only. This isolated single-mode fault points to the specific actuator responsible for closing the defrost-to-floor split door. A leaking diaphragm in that actuator allows the door to drift partially open, permitting air to escape through both the defrost and floor paths simultaneously.

28. B — Technician A is correct that the condenser is mounted in front of the radiator to receive the coolest ambient air first for maximum heat rejection efficiency — the condenser needs the largest possible temperature differential between the hot refrigerant and the cooling air. Technician B is correct that many vehicles include additional heat exchangers — transmission coolers, power steering coolers, and sometimes oil coolers — stacked with the condenser and radiator in the front airflow path.

29. A — A voltage drop of 0.4V across the entire power-side circuit from the battery positive terminal to the clutch coil positive terminal is within the acceptable range (under 0.5V for power-side circuits). This confirms the wiring, fuse, relay contacts, pressure switches, and all connectors in the power supply path

have low resistance and are delivering adequate voltage to the clutch coil. No significant unwanted resistance exists in the power-side circuit.

30. B — In a single-zone system with one blend door confirmed at 15% (near full cold), all air leaving the HVAC housing should be approximately the same temperature. If the floor vents deliver noticeably warmer air than the dashboard panel vents, the air is being heated after leaving the housing — during its transit through the floor ductwork. Floor ducts typically route through or near the transmission tunnel, exhaust tunnel, or catalytic converter area, where radiant heat from these components warms the air as it travels to the floor outlets.

31. C — The compressor clutch appears to engage (the hub pulls against the pulley), the belt is intact and spinning the pulley, but the gauges show no pressure change — the compressor is not actually pumping. This means the clutch hub is not transferring torque to the compressor shaft despite appearing to contact the pulley. A slipping clutch — from an excessively worn friction surface, oil contamination on the clutch faces, or insufficient magnetic force — allows the hub to ride against the spinning pulley without gripping firmly enough to rotate the shaft.

32. A — "Calibration failed — actuator did not reach end stop" means the actuator attempted to drive the blend door to its mechanical limit but could not reach it. The most common cause is a physical obstruction inside the HVAC housing — a dislodged piece of foam, a foreign object, or a misaligned housing component — preventing the door from reaching its full travel. The door or housing must be inspected and the obstruction removed before recalibrating.

33. D — A blown A/C fuse has a specific cause — an overcurrent event in the clutch circuit. Since the problem appeared immediately after an engine oil change (when the technician was working in the engine compartment near A/C wiring), the most probable cause is that the oil change technician either pinched, chafed, or disconnected the compressor wiring during the service. The momentary short caused by a damaged wire or an improperly reconnected connector would blow the fuse. Inspect the wiring near the service area.

34. C — Both technicians correctly describe the pressure behavior during normal compressor cycling. Technician A is right that when the compressor cycles off, low-side pressure rises because the metering device continues feeding refrigerant into the evaporator while the compressor is no longer removing it — the accumulating refrigerant raises the pressure. Technician B is right that when the compressor cycles back on, it begins pulling refrigerant from the evaporator faster than the metering device supplies it, causing the low-side pressure to drop.

35. B — The in-car sensor reads 90°F and the set temperature is 72°F — an 18°F error that requires cooling. The module commands 50% blend door position rather than 0% (full cold) because ATC systems use proportional control — they command a position calculated to deliver the air temperature needed to gradually bring the cabin to the set point without overshooting. Commanding full cold would overcool the air and create uncomfortable temperature swings. The 50% position produces moderately cold air that progressively cools the 90°F cabin toward 72°F in a controlled manner.

36. A — An electric water pump controlled by the engine management system can be commanded to run at higher speeds during cold starts to circulate coolant through the heater core more quickly, improving cabin heat delivery during warm-up. A conventional belt-driven pump's speed is tied directly to engine RPM — at idle, flow is at its lowest. An electric pump can override this limitation and push more coolant through the heater core at idle, improving heater performance independently of engine speed.

37. D — All HVAC actuators losing calibration simultaneously and the system defaulting to failsafe mode points to the HVAC module losing power momentarily — a reset event. When the module loses and regains power, it clears its RAM-stored calibration data and must recalibrate all actuators on the next startup. An intermittent power supply fault — a loose connector at the module, a corroded fuse terminal, or an unreliable ignition-run feed wire — would cause these periodic resets.

38. C — Forty percent fin blockage represents a substantial reduction in the condenser's effective heat transfer surface area. Bent fins block airflow through those sections completely, forcing all heat rejection to occur through the remaining 60% of undamaged surface area. This reduction raises high-side pressure, reduces subcooling, and degrades cooling performance — particularly on hot days when the condenser is already working near its maximum capacity. The fins should be straightened with a fin comb or the condenser replaced if the damage is too severe.

39. A — In a cycling clutch orifice tube system, the audible click of the electromagnetic clutch engaging every 30–45 seconds and the brief RPM dip as the engine absorbs the compressor's mechanical load are completely normal operating characteristics. The engine's idle control system compensates for the load within 1–2 seconds by increasing airflow. Normal cooling performance confirms the system is functioning as designed. No repair or adjustment is needed.

40. B — The LIN bus wire has continuity (ruling out a broken wire), and all other actuators communicate normally (ruling out a module-wide LIN bus failure). The mode door actuator itself needs power and ground to communicate on the LIN bus — even though the communication wire is intact, the actuator cannot respond if it has no operating voltage. Checking the actuator's power supply and ground

circuits verifies the actuator has the basic electrical requirements needed to power up and communicate on the network.

41. C — Continuous water dripping from the evaporator condensation drain during A/C operation on a humid 90°F day is completely normal and expected behavior. The cold evaporator surface continuously condenses moisture from the warm, humid cabin air passing over it. On humid days, the condensation rate is high and the drain tube produces a steady flow. A 6-inch puddle after 30 minutes is well within normal range for high-humidity conditions. This water removal is actually beneficial — it dehumidifies the cabin air.

42. D — The low-side drops normally (confirming the compressor creates suction) but the high-side rises slowly and never reaches normal operating pressure (confirming the compressor cannot build adequate discharge pressure). This pattern indicates the compressor is moving refrigerant but not compressing it fully — worn reed valves, piston rings, or scroll surfaces allow some compressed gas to leak back internally with each stroke, preventing full discharge pressure from developing. The compressor is partially functional but cannot perform at specification.

43. A — Technician A is correct that R-134a quick-disconnect service fittings are intentionally designed with different diameters — the high-side fitting is larger than the low-side fitting — to prevent connecting the high-pressure gauge to the low-side port and vice versa. Technician B is incorrect because R-12 fittings also use different thread sizes for the high and low side ports, specifically to prevent cross-connection. Both refrigerant types use size differentiation as a safety feature.

44. B — An air pocket trapped in the heater core shifts position in response to lateral G-forces during turns. During a left turn, centrifugal force pushes the air bubble to the left side of the heater core, potentially blocking one of the internal flow passages and reducing coolant flow. When the vehicle straightens, the bubble redistributes and flow resumes. This symptom — heat loss during specific turns that resolves when driving straight — is a classic indicator of a trapped air pocket that needs to be bled from the heater circuit.

45. D — The motor can be heard running (confirming the motor and its power circuit function) but the position feedback does not change (confirming the output shaft is not turning). When the motor spins but the output shaft and feedback mechanism remain stationary, the gear train between them has failed — stripped teeth allow the motor pinion to spin freely without transmitting torque through the reduction gears to the output shaft. The actuator assembly must be replaced.

46. C — The electronic pressure transducer reads 95 psi, the manifold gauge reads 94 psi, and the P-T chart indicates 93–95 psi at 84°F ambient. All three values agree within 2 psi — confirming the system contains adequate refrigerant to produce the expected static pressure, and both measuring instruments are reading accurately. The system charge is present and correct, and both diagnostic tools can be trusted for further testing.

47. A — A blower motor drawing 28 amps when the specification is 18 amps maximum is consuming 55% more current than designed. This excessive draw indicates significant internal resistance to rotation — worn or dragging brushes creating friction, a partially shorted winding reducing the motor's efficiency, or a failing bearing creating mechanical drag. The motor runs slower than expected despite the excess current because the extra energy is being converted to heat from friction rather than useful rotation. This motor will destroy resistor blocks and controllers.

48. B — Technician A is correct that any time the A/C system is opened to atmosphere — regardless of duration — evacuation is required before recharging. Even a brief opening allows atmospheric air and moisture to enter the system. Technician B is incorrect because there is no "safe" duration for system exposure to atmosphere — PAG oil is extremely hygroscopic and begins absorbing moisture immediately, and even small quantities of moisture cause metering device freeze-up and corrosive acid formation.

49. D — The system contained 30 ounces when the specification is 20 ounces — a 50% overcharge. After recovering and recharging with the correct 20 ounces, the system performs normally with proper pressures and a 42°F vent temperature. This confirms the overcharge was the sole cause of the original both-sides-high readings and poor performance. Excess refrigerant floods the condenser with liquid, reduces effective condensing surface area, elevates high-side pressure, and forces the low-side pressure up as well.

50. C — A comprehensive performance verification includes all key measurements under standardized test conditions: vent temperature confirms the customer will experience adequate cooling, gauge pressures confirm the refrigeration cycle is operating within its designed parameters, subcooling confirms adequate liquid production at the condenser outlet, and superheat confirms proper refrigerant flow through the evaporator. Together, these four measurements provide a complete picture of system health that any single measurement alone cannot.