

# PRACTICE EXAM 10: ASE A2 SIMULATION

## (50 QUESTIONS)

---

1. A vehicle with a six-speed automatic transmission has no customer complaints and no DTCs stored. During a routine maintenance visit, the technician performs a road test and notices that the 3-4 upshift occurs at 2,200 RPM under light throttle, while the manufacturer's specification for this shift point is 2,100 RPM. All other shifts occur at the correct RPM. Which of the following BEST explains this minor deviation?

A. A failing 4th gear clutch pack that requires the module to delay the shift to build additional engine torque before applying

B. A normal adaptive shift correction that the module has learned to optimize shift quality for this specific vehicle's characteristics

C. A throttle position sensor that has drifted 5% above its calibrated output, causing delayed upshift scheduling system-wide

D. A faulty output speed sensor that reads 100 RPM slower than actual, causing the module to think it has not yet reached shift speed

2. Technician A says that a vehicle with an automatic transmission should never be flat-towed (all four wheels on the ground) with the engine off for more than 15 miles at speeds above 25 mph without taking precautions. Technician B says that the concern with flat-towing is that the oil pump does not operate without the engine running, leaving the transmission without lubrication. Who is correct?

A. Technician A only

B. Neither Technician A nor Technician B

C. Technician B only

D. Both Technician A and Technician B

3. A customer complains that the transmission produces a "clunk" and a vibration that lasts approximately two seconds every time the vehicle transitions from deceleration to acceleration during highway driving. Placing the transmission in Neutral before the deceleration-to-acceleration transition eliminates both the clunk and the vibration entirely. Which of the following is the MOST LIKELY cause?

A. Excessive drivetrain lash that produces a clunk when torque direction reverses, followed by a torsional vibration as the lash takes up

B. A worn torque converter TCC clutch that releases and re-engages harshly during the throttle transition at highway speed

C. A damaged driveshaft U-joint that binds during the torque reversal and vibrates until it frees under the new load direction

D. A failing transmission mount that allows the case to shift position during the transition, causing the converter to oscillate

4. A vehicle with an automatic transmission has the following pressure test results: Park idle = 70 psi (spec 55-75), Neutral idle = 68 psi (spec 55-75), Drive idle = 71 psi (spec 55-75), Reverse idle = 70 psi (spec 55-75). All idle readings are within specification. However, when the technician performs a stall test in Drive, the pressure gauge needle bounces erratically between 120 and 180 psi instead of holding steady at the specified 155-175 psi range. What does the erratic stall pressure indicate?

A. A worn oil pump that cannot maintain consistent flow under the high-demand conditions of the stall test at full throttle

B. A pressure regulator valve that oscillates between its seat positions under the combined load of stall and full throttle

C. Aerated fluid in the system that compresses and expands under the high-pressure, high-heat conditions of the stall test

D. Normal gauge needle oscillation caused by the engine vibration produced during a full-throttle stall test event

5. A vehicle equipped with an eight-speed automatic transmission operates normally in gears 1 through 7 but slips in 8th gear during highway cruising at light throttle. Heavy throttle in 8th gear produces more

pronounced slippage. All other gears hold firmly at all throttle positions. What single diagnostic test would MOST efficiently confirm whether the problem is a pressure deficiency or a worn clutch?

A. A pressure test of the 8th gear clutch apply circuit, comparing the measured pressure to specification while 8th gear is commanded

B. A stall test in Drive to evaluate overall converter and transmission holding capacity under maximum engine torque

C. A scan tool review of the EPC solenoid duty cycle in 8th gear to determine if the module is commanding adequate line pressure

D. A fluid analysis to determine if the ATF friction modifiers have degraded beyond their ability to support clutch engagement

6. A customer reports that the automatic transmission shifts perfectly during the first 30 minutes of driving each day, but then begins producing a harsh 2-3 upshift that worsens progressively over the remaining drive time. By the end of a 60-minute commute, the 2-3 shift feels like a "slam." All other shifts remain smooth throughout the entire drive. There are no DTCs. Which of the following BEST explains this progressive, heat-related harshness in a single gear?

A. The pressure control solenoid increases its output as fluid temperature rises, commanding progressively higher pressure

B. The transmission fluid's friction modifiers break down at operating temperature, altering the clutch engagement characteristics

C. The engine produces more torque as it reaches operating temperature, increasing the load on the 2-3 clutch during the shift

D. The 2-3 accumulator piston seal progressively leaks more as it softens at operating temperature, reducing cushioning over time

7. A technician performs a road test on a vehicle and notices that the transmission downshifts from 6th to 4th gear when the vehicle encounters a moderate uphill grade at steady throttle. The downshift is smooth, and the transmission upshifts back to 6th when the road levels out. Is this behavior normal?

- A. No — the transmission should hold 6th gear on moderate grades and only downshift on steep grades requiring heavy throttle
- B. Yes — the module monitors engine load and commands a downshift to maintain adequate power when the grade increases demand
- C. No — skipping 5th gear during the downshift indicates a solenoid fault that prevents the 6-5 shift from occurring first
- D. Yes — but only if the vehicle is equipped with a grade-sensing feature that uses the accelerometer to detect incline angle

8. A vehicle with a rear-wheel-drive automatic transmission has a vibration that the customer describes as a "hum." The hum increases in pitch and volume with vehicle speed and is present in all gear ranges including Neutral. When the transmission is placed in Park at a stop, the hum disappears. The technician raises the vehicle on a lift and runs it in Drive — the hum is present. The technician then places it in Neutral with the wheels still spinning — the hum persists. What component is the MOST LIKELY source?

- A. The torque converter, because it hums when rotating at engine speed regardless of gear range or vehicle speed
- B. The oil pump, because it is the only component that stops rotating when the vehicle is in Park at a standstill
- C. The output shaft or a component downstream that rotates with the wheels — the hum persists when the wheels spin in Neutral
- D. The driveshaft, which continues spinning in Neutral on the lift but stops in Park when the output shaft is locked

9. Technician A says that a simple planetary gear set with the carrier as input, the sun gear held, and the ring gear as output produces an overdrive ratio. Technician B says that the same gear set with the sun gear as input, the carrier held, and the ring gear as output produces reverse rotation. Who is correct?

- A. Technician A only
- B. Technician B only

C. Neither Technician A nor Technician B

D. Both Technician A and Technician B

10. A vehicle owner states that the transmission "seems weak" during the first two or three miles of driving every morning but feels normal afterward. The scan tool shows no DTCs, and the fluid level is correct. The technician checks the fluid temperature during the "weak" period and finds it is 45°F. What is the MOST LIKELY explanation for the temporary weakness?

A. The torque converter clutch is engaging prematurely in cold fluid, reducing the converter's torque multiplication ability

B. Cold fluid viscosity is causing higher internal friction and slower clutch apply rates, making shifts feel less responsive

C. The oil pump is unable to generate adequate pressure with cold fluid, causing all clutch circuits to slip intermittently

D. The engine control module is limiting throttle opening during cold operation, reducing available power to the transmission

11. A vehicle equipped with an automatic transmission and a stop/start system has the following customer complaint: after the engine automatically restarts at a traffic light, the vehicle lurches forward with a noticeable "bump" before driving normally. The lurch occurs at every restart and was not present when the vehicle was newer. What is the MOST LIKELY cause?

A. A worn auxiliary electric pump that can no longer maintain adequate holding pressure during the engine-off period

B. A failing stop/start battery that cannot power the starter motor for a smooth restart, causing a jerky engine crank

C. A degraded transmission mount that amplifies the normal restart engagement force into a more noticeable vehicle lurch

D. A control module calibration error introduced by a recent software update that increased the restart engagement pressure

12. A scan tool shows DTC P0868 — Transmission Fluid Pressure Low — stored as a current code. The technician performs a line pressure test and confirms pressure is 15 psi below specification in all ranges at idle. The fluid level is correct and the fluid condition appears normal. All of the following could cause this system-wide low pressure EXCEPT:

- A. A worn oil pump with excessive gear clearances that allow internal fluid leakback from outlet to inlet
- B. A pressure regulator valve that is stuck slightly open, venting excess fluid before full pressure builds
- C. A single leaking clutch piston seal in the forward clutch circuit that bleeds pressure only in Drive ranges
- D. A clogged or restricted pump intake filter that limits the volume of fluid available to the pump for pressurization

13. A vehicle has stored DTCs P0731 (Gear 1 Incorrect Ratio) and P0735 (Gear 5 Incorrect Ratio). The transmission operates normally in 2nd, 3rd, 4th, and 6th gears. A technician reviews the component application chart and finds that 1st and 5th gears share a common low/reverse one-way clutch that is not applied in any of the working gears. What is the MOST LIKELY diagnosis?

- A. The pressure control solenoid is commanding incorrect pressure specifically during 1st and 5th gear application events
- B. The low/reverse one-way clutch has failed, preventing it from holding in both 1st and 5th gears while leaving other gears unaffected
- C. Both the 1st gear clutch and the 5th gear clutch have worn out simultaneously from a shared lubrication deficiency
- D. A faulty input speed sensor is producing errors specifically at the RPM ranges that correspond to 1st and 5th gear operation

14. A technician monitors scan tool data during a road test and observes the following: at 55 mph in 5th gear with TCC ON, the engine RPM is 2,000 and the input shaft speed is 1,980. What does the 20 RPM difference between engine RPM and input shaft speed indicate?

- A. The TCC is operating in a controlled slip mode with 20 RPM of designed slip to reduce NVH at this operating point
- B. The TCC is fully locked and the 20 RPM difference is within normal measurement tolerance for the speed sensors
- C. The TCC is slipping excessively and should show 0 RPM difference, indicating a worn converter clutch surface
- D. The input speed sensor is reading 20 RPM low due to a partially damaged reluctor ring that misses occasional pulses

15. A vehicle equipped with a ten-speed automatic transmission has a customer complaint that shifts between 7th and 8th gear feel noticeably harsher than all other shifts. All other shifts — including 6-7 and 8-9 — are perfectly smooth. The scan tool shows the 7-8 shift duration is 0.15 seconds versus the target of 0.28 seconds. What does the short shift duration indicate?

- A. The 8th gear clutch friction material is severely worn and the module is commanding a fast apply to minimize slip time
- B. The engine torque management strategy is not reducing engine torque during the 7-8 shift, causing an aggressive transition
- C. The shift solenoid controlling the 7-8 transition is responding too slowly, causing a delayed but sudden valve movement
- D. The 7-8 accumulator or cushioning circuit is not functioning correctly, allowing the clutch to apply faster than designed

16. A technician is diagnosing a transmission concern and connects a scan tool to review live data. The transmission range sensor shows "INVALID" or "BETWEEN GEARS" while the shift lever is firmly in the Drive position. The transmission does not engage. What should the technician check FIRST?

- A. The transmission control module for a failed internal processor that cannot decode the range sensor signal properly
- B. The range sensor connector and wiring for a loose connection, corroded pins, or an open circuit preventing signal delivery

C. The valve body manual valve for a stuck condition that prevents the valve from reaching the Drive detent position

D. The shift cable for excessive stretch that has moved the manual valve beyond the Drive detent into a dead zone

17. A vehicle has DTC P0741 — Torque Converter Clutch System Stuck Off. The TCC solenoid tests within specification electrically. The technician uses the scan tool to command maximum TCC apply pressure. The TCC slip drops from 150 RPM to 85 RPM but will not reach zero. What should the technician conclude?

A. The TCC solenoid is functioning at reduced capacity and should be replaced with a new unit to restore full output

B. The TCC apply valve in the valve body is stuck and cannot deliver the commanded pressure to the converter clutch piston

C. The TCC friction material inside the converter is worn and cannot achieve full lockup even at maximum available apply pressure

D. The maximum commanded pressure from the scan tool is limited by software and does not represent the system's true maximum

18. A technician reviews scan tool data and finds the following adaptive learning values for a transmission with 130,000 miles: 1-2 clutch = +18%, 2-3 clutch = +22%, 3-4 clutch = +45%, 4-5 clutch = +15%, 5-6 clutch = +12%. What does the significantly higher adaptation value for the 3-4 clutch indicate compared to the other clutches?

A. The 3-4 shift solenoid has higher resistance than the others and requires more duty cycle to achieve the same pressure output

B. The 3-4 clutch has worn significantly more than the other clutch packs and requires substantially more pressure compensation

C. The 3-4 accumulator has partially failed, requiring the adaptive system to increase pressure to overcome the sticking piston

D. The module's adaptive algorithm weights the 3-4 shift more heavily because it occurs at the highest torque demand point

19. A vehicle produces a DTC P0720 — Output Speed Sensor Circuit — intermittently. The code sets during highway driving above 60 mph but never during city driving below 45 mph. The sensor resistance tests within specification and the wiring shows no visible damage. What diagnostic approach would MOST LIKELY reveal the root cause?

A. Monitor the output speed sensor signal waveform with a DSO during highway driving to identify signal dropouts or anomalies at high speed

B. Replace the output speed sensor since intermittent codes that test within specification indicate an internally failing sensor

C. Inspect the reluctor ring for damage that only affects the signal at certain rotational positions reached at higher output shaft speeds

D. Perform a voltage drop test on the sensor circuit with the vehicle stationary to identify high-resistance connections in the wiring

20. A vehicle equipped with a hybrid powertrain uses a power-split planetary gear device. The customer reports that the vehicle accelerates very slowly in EV mode when the battery state of charge is above 80%. The gasoline engine is off during these events. A scan tool shows Motor-Generator 2 (the drive motor) is receiving full commanded power from the hybrid control module. What is the MOST LIKELY cause?

A. The hybrid battery pack has degraded cells that cannot deliver full current despite showing a high state of charge percentage

B. The engine is dragging the planetary gear set through MG1 even though it is supposed to be completely disengaged during EV mode

C. Motor-Generator 1 is consuming excessive power from the battery for generator functions when it should be idle in EV mode

D. A worn single-speed reduction gear in the drive motor circuit that is slipping under load and not transmitting full motor torque to the wheels

21. A technician is diagnosing a vehicle with an automatic transmission that has been converted from a conventional hydraulic-only governor to a fully electronic shift control through an aftermarket conversion kit. The conversion uses the original valve body with electronic solenoids replacing the governor. After installation, the transmission shifts from 1st to 3rd, skipping 2nd. Which of the following is the MOST LIKELY cause?

- A. The aftermarket electronic controller is not compatible with this specific valve body and is commanding incorrect solenoid patterns
- B. The original governor passage in the valve body is still open and is interfering with the electronic solenoid-controlled fluid routing
- C. The solenoid pattern programmed in the aftermarket controller corresponds to 3rd gear instead of 2nd gear for the second shift event
- D. The 2nd gear band was inadvertently damaged during the conversion installation process when the governor was removed

22. A vehicle has no transmission DTCs stored, but the customer reports that the transmission shifts "differently" at high altitude when driving in the mountains compared to sea-level driving. Shifts occur at slightly lower RPMs and feel marginally softer at altitude. What MOST LIKELY accounts for this change in shift behavior?

- A. Reduced atmospheric pressure at altitude decreases engine power output, and the module adapts its shift schedule to match the lower available torque
- B. The transmission fluid expands at higher altitudes due to lower atmospheric pressure, causing the fluid level to read higher than actual
- C. The transmission fluid temperature runs cooler at altitude due to lower ambient temperature, causing the module to soften shifts
- D. The output speed sensor reads differently at altitude because the thinner air reduces aerodynamic drag and changes vehicle deceleration rates

23. A vehicle equipped with a CVT has a customer complaint that the engine RPM "hangs" at 3,500 RPM during moderate acceleration even as vehicle speed increases from 20 to 50 mph. The scan tool

shows the CVT ratio changing smoothly from 2.2:1 to 0.9:1 during this acceleration event. Is this RPM behavior normal for a CVT?

- A. No — the engine RPM should decrease proportionally as the CVT ratio decreases from 2.2:1 to 0.9:1 during acceleration
- B. No — the CVT belt is slipping on the pulleys and the RPM is rising because torque is not being transmitted to the wheels
- C. Yes — but only if the vehicle is equipped with a simulated-step-shift program that holds RPM at predetermined plateaus
- D. Yes — a CVT is designed to hold the engine at an efficient RPM while continuously varying the ratio to increase vehicle speed

24. A technician discovers that a vehicle's transmission control module has a manufacturer recall for a software update that addresses "intermittent harsh shifting." The customer's vehicle matches the affected VIN range and has the symptoms described in the recall. The technician performs the software update. After the update, what additional step should be performed?

- A. Replace the pressure control solenoid since the software update confirms the original solenoid was operating out of specification
- B. Reset the adaptive values and perform a re-learn drive cycle since the new software uses different baseline calibration parameters
- C. Drain and replace the transmission fluid because the old software's shift patterns may have degraded the fluid's friction properties
- D. Adjust the shift cable since the software update may have changed the module's interpretation of the range sensor signal positions

25. A vehicle has DTC P2764 — Torque Converter Clutch Pressure Control Solenoid Control Circuit High. The scan tool shows the TCC pressure solenoid is commanded OFF (0% duty cycle), but the measured current at the solenoid connector is 1.2 amps. The solenoid specification for 0% duty cycle is 0 amps. What does this data indicate?

- A. The solenoid coil has a partial short that draws current even when no duty cycle is commanded by the module
- B. The control module's TCC driver circuit is leaking current internally despite commanding the solenoid to the off state
- C. The solenoid connector has a short to the vehicle's battery positive circuit that feeds current regardless of module command
- D. The solenoid circuit has a short to voltage somewhere in the wiring, feeding current to the solenoid independently of the module's command

26. A technician is performing a transmission fluid service on a vehicle that uses an external spin-on transmission filter, similar in appearance to an engine oil filter. After replacing the filter and refilling with the correct fluid, the technician starts the engine. Fluid immediately begins leaking from the filter housing area. What is the MOST LIKELY cause?

- A. The old filter's gasket remained stuck to the filter housing when the old filter was removed, and the double gasket is preventing a proper seal
- B. The replacement filter is a different thread pitch than the housing and cross-threaded during installation without the technician noticing
- C. The filter housing has a hairline crack from the removal force applied to the old filter during the service procedure
- D. The new filter was installed dry without pre-filling it with ATF, creating an air pocket that prevents the gasket from sealing

27. A customer complains that the vehicle "stalls" when the transmission is shifted from Park to Reverse on cold mornings, but not when shifted from Park to Drive. The engine restarts immediately and Reverse then functions normally. No DTCs are stored. Which of the following is the MOST LIKELY explanation?

- A. The reverse clutch apply circuit fills faster than the forward clutch circuit in cold fluid, creating a sudden load spike on the cold engine

B. The engine idle speed is set too low for cold operation, and the higher torque demand of the reverse engagement stalls the engine

C. The reverse clutch engagement produces a greater load on the engine than the forward clutch, and the cold engine idle speed cannot absorb it

D. The torque converter is slow to fill on cold mornings, and the sudden mechanical shock of Reverse engagement exceeds the converter's empty dampening capacity

28. A vehicle's transmission has been serviced at an independent shop where the technician used a universal ATF instead of the manufacturer-specified fluid. The customer returns to the dealer three weeks later complaining of TCC shudder at highway speed. The TCC solenoid and circuit test within specification. What is the MOST appropriate first step?

A. Replace the torque converter since the universal fluid has permanently damaged the TCC friction surface beyond recovery

B. Perform a complete transmission overhaul since the incorrect fluid has damaged all internal friction surfaces uniformly

C. Replace the TCC solenoid with an updated unit that is designed to work with a wider range of fluid specifications

D. Drain the universal fluid, flush the system, and refill with the manufacturer-specified ATF to restore correct friction modifier chemistry

29. A technician notices that the transmission vent tube is clogged with road debris and dried fluid residue. The fluid level is correct and there are currently no leaks. What is the potential consequence of NOT clearing the clogged vent?

A. The transmission will overheat because the vent provides a secondary cooling path for hot internal air circulation

B. Internal case pressure will build as the fluid heats up, eventually forcing fluid past seals and creating leaks

C. The oil pump will cavitate because the sealed case creates a vacuum on the pump intake as fluid circulates

D. The transmission control module will detect the pressure buildup and enter limp mode to protect the internal seals

30. A technician replaces the pan gasket on a transmission and discovers that one of the pan bolt holes in the case has a stripped thread. The technician installs a HeliCoil thread repair insert. After the repair, what must the technician verify about the repaired hole?

A. That the insert protrudes slightly above the case surface to provide additional thread engagement for the pan bolt

B. That the insert is seated below the case surface so the bolt head contacts the case flange, not the insert top

C. That the insert provides adequate thread depth and that the bolt torques to specification without bottoming out or stripping

D. That a longer bolt is used in the repaired hole to compensate for the thread depth consumed by the insert installation

31. A customer reports that the transmission "hunts" between 3rd and 4th gear on a specific stretch of highway that has a slight but constant uphill grade. The hunting does not occur on flat roads at the same speed and throttle position. There are no DTCs stored. Which of the following is the correct explanation?

A. A worn 4th gear clutch that can hold on flat ground but slips on grades, causing the module to downshift and retry

B. A faulty grade sensor that overestimates the incline angle and triggers unnecessary downshifts during mild grades

C. A throttle position sensor that reads intermittently higher on grades due to the engine tilting rearward in its mounts

D. The slight grade increases engine load just enough to push the operating point across the shift schedule threshold between 3rd and 4th

32. A technician is replacing the external wiring harness on a transmission. The new harness has one additional connector that the original harness did not have. The technician verifies the part number matches the vehicle application. What is the MOST LIKELY explanation for the additional connector?

A. The replacement harness is a universal fit that includes connectors for multiple transmission models in the same platform

B. The replacement harness reflects a mid-production-year design change that added a sensor not present on earlier builds

C. The additional connector is a spare that the manufacturer includes for field service technicians to use as a pigtail repair source

D. The harness is the wrong part number despite the catalog match, and a different harness should be ordered from the dealer

33. A technician discovers during a routine inspection that the transmission cooler lines on a vehicle are made of aluminum instead of the steel lines used on most other models. What special precaution applies when servicing aluminum cooler lines?

A. Aluminum lines require lower torque on their fittings than steel lines because the softer material is more susceptible to cracking from over-tightening

B. Aluminum lines must be replaced with steel lines during any service because aluminum degrades from ATF chemical exposure

C. Aluminum lines require special flaring tools that create a different flare angle than standard steel line flaring equipment

D. Aluminum lines must be coated with anti-corrosion sealant after any disconnection to prevent galvanic corrosion at the fitting

34. A vehicle's automatic transmission engages all gears normally, but the customer reports that the gear indicator on the dashboard displays "3" when the transmission is actually in 4th gear, and "4" when it is in 5th gear. All other positions display correctly. What is the MOST LIKELY cause?

- A. The transmission range sensor has a worn contact at the 4th and 5th position points, producing offset voltage readings
- B. The transmission control module has a software glitch that incorrectly maps the commanded gear to the display output
- C. A wiring fault between the TCM and the instrument cluster that corrupts the gear position data for specific gear values
- D. The shift solenoid pattern for 4th and 5th gears produces a parasitic signal that interferes with the display data channel

35. A technician is performing an in-vehicle valve body replacement on a transmission. After removing the old valve body, the technician notices that the separator plate gasket on the case side is adhered to the case mating surface and appears to be in good condition. Should the technician reuse this gasket?

- A. Yes — if the gasket shows no tears, compression damage, or deterioration, reusing it avoids the risk of misalignment
- B. Yes — removing an adhered gasket risks damaging the aluminum case surface, which is worse than reusing a good gasket
- C. No — but only if the new valve body comes with a replacement gasket, otherwise the old gasket should be reused
- D. No — gaskets should always be replaced during valve body service regardless of their apparent condition

36. A technician replaces the transmission range sensor on a vehicle. After adjustment and verification, the engine starts in Park and all gears engage correctly with proper indicator display. However, the technician discovers that the cruise control no longer functions. What is the MOST LIKELY connection between the range sensor replacement and the cruise control failure?

- A. A cruise control enable wire was inadvertently disconnected or damaged during the range sensor replacement procedure
- B. The new range sensor sends a signal that the cruise control module interprets as an incompatible gear position for cruise engagement

C. The range sensor replacement requires a cruise control system re-initialization through the manufacturer's scan tool

D. The cruise control vacuum actuator hose was accidentally disconnected while accessing the range sensor mounting area

37. A vehicle has an intermittent transmission fluid leak that appears only after the vehicle has been parked for several hours following a long highway drive. No leak is visible during or immediately after driving. The fluid puddle appears in the morning under the vehicle's center section. What is the MOST LIKELY explanation?

A. A seal that holds under system pressure during operation but weeps fluid from residual case pressure as the transmission cools and contracts

B. Condensation inside the bell housing that mixes with residual fluid on the case surface and drips while the vehicle sits overnight

C. A cooler line fitting that loosens from thermal cycling and allows fluid to seep only after the metal contracts during cooling

D. An engine oil leak that only appears after the engine is off because crankcase pressure stops pushing oil past the rear main seal

38. A technician is preparing to remove a transaxle from a front-wheel-drive vehicle. The service information states that the subframe must be lowered to gain adequate clearance. Which of the following safety precautions is MOST critical when lowering the subframe?

A. Disconnecting the exhaust system before lowering the subframe to prevent damage to the catalytic converter and oxygen sensors

B. Removing the engine splash shield to ensure the subframe does not catch on it during the lowering procedure

C. Supporting the engine from above with a support bar before lowering the subframe, since the subframe supports the engine weight

D. Marking the subframe bolt positions before removal to ensure correct realignment when the subframe is reinstalled

39. During a transmission overhaul, a technician discovers that the input shaft has a twisted spline section — the splines have visibly rotated approximately 5 degrees relative to the adjacent section. What does this spline twist indicate, and what is the correct action?

- A. Normal wear from high-torque operation that does not affect function and the shaft can be reused as is
- B. A manufacturing defect that should have been caught during quality control and warrants a warranty claim from the supplier
- C. The shaft was subjected to extreme torsional overload that permanently deformed the splines, and the shaft must be replaced
- D. The splines were improperly machined with an intentional twist to improve engagement, and the shaft is designed this way

40. A technician is inspecting the parking pawl mechanism during a transmission overhaul. The pawl itself is in good condition, but the actuating rod that connects the manual shaft to the parking pawl has a visible bend. The bend is approximately 10 degrees. What is the consequence of reinstalling this bent rod?

- A. The parking pawl will engage more aggressively because the bent rod provides additional leverage on the pawl pivot
- B. The bent rod may not move the pawl far enough to fully engage or disengage from the parking gear, causing intermittent Park hold failure
- C. The transmission will function normally because the actuating rod has built-in compliance to accommodate minor bending
- D. The bent rod will break under the stress of Park engagement on an incline, causing sudden loss of Park hold while parked

41. A technician measures clutch pack clearance on a forward clutch during reassembly and obtains a reading of 0.028 inches. The manufacturer's specification is 0.025 to 0.050 inches. The technician has three selective snap ring options: 0.060 inches (currently installed), 0.070 inches, and 0.080 inches. Which snap ring should be installed?

- A. The 0.060-inch snap ring that is currently installed, because the measured clearance of 0.028 inches is within specification
- B. The 0.070-inch snap ring, because it will reduce clearance to 0.018 inches and provide a tighter, more responsive clutch engagement
- C. The 0.080-inch snap ring, because it will reduce clearance further to 0.008 inches for the firmest possible shift quality
- D. The clearance cannot be adjusted with snap rings alone and requires adding another friction disc to the clutch pack stack

42. A technician is performing an oil pump inspection during a transmission overhaul. The pump is a vane-type variable-displacement design with a movable cam ring (slide). During inspection, the technician finds the slide moves freely with no binding. What additional check should the technician perform on this variable-displacement pump that would NOT apply to a fixed-displacement pump?

- A. Gear tip clearance between the rotor vane tips and the pump body bore wall at the widest point of the rotor path
- B. Rotor-to-pump cover side clearance using a straightedge and feeler gauge across the vane tips and housing surface
- C. The condition and operation of the slide pivot, bias spring, and feedback control orifice that regulate the slide position
- D. The pump drive engagement features on the converter hub that mesh with the pump drive mechanism at installation

43. A technician has completed a transmission rebuild and is preparing to set endplay. The service information specifies that the selective thrust washer is located between the pump housing and the front clutch drum. The technician measures endplay at 0.052 inches with the current thrust washer installed. The specification is 0.020 to 0.040 inches. The current washer is 0.060 inches thick. What thickness washer should the technician install to bring endplay within specification?

- A. A 0.070-inch washer, which would reduce endplay by 0.010 inches to approximately 0.042 inches
- B. A 0.065-inch washer, which would reduce endplay by 0.005 inches to approximately 0.047 inches

- C. A 0.080-inch washer, which would reduce endplay by 0.020 inches to approximately 0.032 inches
- D. A 0.075-inch washer, which would reduce endplay by 0.015 inches to approximately 0.037 inches

44. A technician is reassembling a transmission after an overhaul. The rebuild kit includes new Teflon sealing rings for the input shaft that have a butt-cut joint (the ring ends meet but do not overlap). During installation, two of the four rings crack when the technician attempts to stretch them over the shaft to seat them in their grooves. What is the correct action?

- A. Use the remaining two intact rings and leave the cracked ring grooves empty since Teflon rings are supplementary seals
- B. Obtain new Teflon rings and install them using a ring expander tool or by carefully warming them to increase flexibility before stretching
- C. Replace the Teflon rings with standard rubber O-rings of the same cross-section diameter since they serve the same function
- D. Apply sealant to the cracked rings and install them since the butt-cut joint already has a gap and minor cracks will seal under pressure

45. A technician installs a rebuilt transmission and fills it with the correct fluid. Upon starting the engine, the transmission immediately produces a loud grinding noise from the front of the case. The noise is present in all gear ranges including Park and Neutral and varies in pitch with engine RPM. What is the MOST LIKELY cause?

- A. The torque converter is not fully seated, and the pump drive is not properly engaged, causing the pump gears to clash or spin freely
- B. The input shaft is broken and the turbine is spinning freely inside the converter without engaging the planetary gear train
- C. The front pump seal was installed backward, creating a vacuum in the pump that causes cavitation and grinding noise
- D. A bell housing bolt that is too long is contacting the converter housing as it rotates, producing a grinding noise once per revolution

46. After completing a transmission rebuild and installation, the technician performs a road test. All shifts are smooth and correctly timed. The TCC engages and releases normally. However, the technician notices that the engine RPM drops approximately 200 RPM lower than expected during TCC lockup at highway cruise. What is the MOST LIKELY cause?

- A. The rebuilt transmission has tighter internal clearances that reduce parasitic drag, allowing the engine to idle at a lower RPM under load
- B. The replacement torque converter has a slightly different lock-up clutch friction coefficient that changes the engine loading during lockup
- C. The replacement torque converter has a different stall speed or internal geometry that changes the engine's operating point during TCC lockup
- D. The transmission adaptive values need more drive cycles to fully calibrate the TCC engagement parameters for the rebuilt unit

47. A technician performs a cooler flow test after flushing the system following a transmission overhaul. The flow rate is one quart in 20 seconds. The specification minimum is one quart in 25 seconds. However, when the technician reverses the flow direction and retests, the flow rate drops to one quart in 45 seconds. What does the directional flow difference indicate?

- A. Normal cooler behavior because most coolers have a designed flow preference in one direction over the other
- B. The flushing procedure was only performed in one direction, leaving debris and restriction on the unflushed side
- C. The flow test equipment is malfunctioning and producing inconsistent readings depending on the connection orientation
- D. A partial blockage inside the cooler that allows flow in one direction but restricts it in the other, indicating the cooler must be replaced

48. A technician has completed a transmission overhaul on a vehicle with an integrated TCM (mechatronic unit). After installation and fluid fill, the scan tool communicates with the TCM and shows no DTCs. However, when the technician attempts to command the transmission into gear, no engagement occurs in any range. The engine runs normally. What should the technician check FIRST?

- A. The torque converter for proper seating and pump drive engagement, since a partially seated converter may not drive the pump
- B. The mechatronic unit's internal electrical connections to verify all solenoid connectors were properly mated during assembly
- C. The shift cable connection at the manual shaft to verify the manual valve is being positioned correctly by the driver's selector
- D. The fluid level, because even a slight underfill on a mechatronic-equipped transmission can prevent the pump from priming

49. A technician completes a transmission rebuild and performs the initial road test. All shifts are harsh despite resetting the adaptive values before the drive. After 20 minutes of driving, the shifts gradually smooth out and become normal. Is this post-rebuild shift learning progression normal?

- A. Yes — the module starts from conservative default values after an adaptive reset and progressively refines its corrections during the re-learn period
- B. No — a properly rebuilt transmission with correct clearances and a proper adaptive reset should produce smooth shifts immediately
- C. Yes — but only if the transmission was filled with cold fluid that requires 20 minutes to reach operating temperature for normal shift behavior
- D. No — the initial harsh shifts indicate the clutch clearances were set too tight and the friction material needs to wear in before shifts normalize

50. A technician has completed a major transmission overhaul. The customer asks what single maintenance practice would MOST extend the life of the rebuilt transmission. Which of the following is the BEST recommendation?

- A. Adding an aftermarket shift kit to firm up the shifts and reduce clutch slippage during every engagement event
- B. Performing annual stall tests to monitor the converter and clutch holding capacity as the transmission accumulates mileage

C. Performing regular fluid and filter services at the manufacturer's recommended interval using only the specified fluid type

D. Installing a deep-sump aftermarket pan that increases fluid capacity by 50% to provide additional cooling and lubrication volume

## Practice Exam 10: Answer Key and Explanations

1. B — A 100 RPM deviation from specification on a single shift point with no DTCs and no customer complaint is well within the range of normal adaptive correction. The transmission control module continuously adjusts shift points based on learned data about clutch engagement characteristics, fluid condition, and driving patterns. A 100 RPM shift from the factory baseline is a routine adaptation — not a symptom of a failing component.

2. D — Both technicians are correct. Flat-towing an automatic transmission vehicle with the engine off means the oil pump is not operating, so the transmission receives no lubrication or cooling while the output shaft spins at road speed. The rotating internal components — bushings, bearings, thrust washers, and planetary gears — run without oil film protection, generating heat from metal-to-metal contact. Manufacturer towing guidelines specify maximum distances and speeds to prevent damage.

3. A — The clunk and vibration occur only during the coast-to-acceleration torque reversal and are eliminated by shifting to Neutral (which disconnects the drivetrain). Excessive drivetrain lash — play in the driveshaft U-joints, differential backlash, or transmission internal endplay — produces a mechanical clunk when the slack takes up during torque direction change. The two-second vibration is the torsional oscillation that follows the impact as the drivetrain components settle under the new load direction.

4. C — All idle pressure readings are stable and within specification, confirming the pump and regulator function correctly under low-demand conditions. The erratic bouncing during the stall test — where high pressure and high heat are generated — is characteristic of aerated fluid. Air bubbles in the fluid compress and expand under the elevated pressure and temperature of stall conditions, causing the gauge needle to bounce. Normal stall pressure holds steady without oscillation.

5. A — The most direct test for a gear-specific slip concern is measuring the actual apply pressure in the specific clutch circuit while that gear is engaged. If the 8th gear clutch circuit pressure is below specification, the problem is hydraulic — a leaking seal, stuck valve, or pressure routing issue. If the pressure is within specification but the clutch still slips, the friction material has worn beyond its holding capacity. This single test differentiates between the two possible causes.

6. D — The harshness is limited to the 2-3 shift, worsens progressively with driving time (temperature), and all other shifts remain smooth. This points to a temperature-sensitive failure in the 2-3 circuit-specific cushioning system. The 2-3 accumulator piston seal softens and loses its sealing ability as it heats up, allowing progressively more pressure to bypass the piston. With less cushioning, the clutch receives increasingly rapid pressure application, producing progressively harsher shifts.

7. B — This is normal transmission behavior. The module continuously monitors engine load (through throttle position, MAP sensor, and calculated torque), and when road grade increases the load beyond what the current gear can handle efficiently, it commands a downshift to a gear that provides adequate torque. When the grade levels out and load decreases, the module upshifts back to the higher gear for fuel economy. This is the shift schedule responding correctly to changing driving conditions.

8. C — The critical test sequence narrows the source: the hum is present in all driving modes (eliminating engine-speed-only components) and persists in Neutral on the lift with wheels spinning (confirming it is tied to wheel/output speed). It disappears in Park when the output shaft is locked by the parking pawl and the wheels stop spinning. This confirms the source is the output shaft or a component downstream — bearing, driveshaft, or differential — that rotates with the wheels regardless of gear selection.

9. D — Both technicians are correct. With the carrier as input, the sun held, and the ring as output, the ring gear is driven faster than the carrier — this is overdrive because the output speed exceeds the input speed. With the sun as input, the carrier held, and the ring as output, the planet gears act as idler gears between the sun and ring, reversing the direction of rotation at the output. Both are fundamental planetary gear set principles.

10. B — Cold ATF at 45°F has significantly higher viscosity than fluid at normal operating temperature (175-200°F). The thicker fluid flows more slowly through orifices, accumulators, and clutch apply passages, causing each shift to take longer to complete and feel less crisp. The higher viscosity also creates more resistance in the pump and throughout the hydraulic system, reducing the overall responsiveness of the transmission. Once the fluid warms, normal viscosity restores normal shift feel.

11. A — The lurch at every restart that was not present when the vehicle was newer indicates a progressive deterioration of a component involved in the restart engagement process. The auxiliary electric pump maintains clutch apply pressure during the engine-off period. As the pump wears internally over time, its pressure output decreases, and the clutch circuit partially drains during each engine-off event. When the engine restarts, the partially drained circuit must refill rapidly, producing the engagement lurch.

12. C — The question asks which option could NOT cause system-wide low pressure in all ranges. A leaking forward clutch piston seal bleeds pressure only from the forward clutch circuit — it would cause low pressure specifically in Drive ranges but not in Park, Neutral, or Reverse. All other options — worn pump, stuck-open regulator, and clogged filter — affect the main pressure supply upstream of all individual circuits, causing universal low pressure.

13. B — The component application chart reveals that 1st and 5th gears share a common low/reverse one-way clutch that is not applied in 2nd, 3rd, 4th, or 6th — all of which work correctly. A single one-way clutch failure explains both incorrect ratio codes simultaneously. If the clutch cannot hold in either 1st or 5th gear, both ratios will be incorrect because the holding device that supports both gear ranges has failed.

14. A — A 20 RPM difference between engine RPM and input shaft speed with the TCC commanded ON indicates the TCC is not in full lockup but is operating in a controlled slip mode. Many modern transmissions intentionally maintain a small, controlled amount of TCC slip (typically 10-50 RPM) in certain gears or operating conditions to reduce NVH transmission from the engine to the drivetrain. This is a normal, designed operating strategy.

15. D — The 7-8 shift completes in 0.15 seconds — nearly twice as fast as the target of 0.28 seconds — producing harshness. All other shifts, including adjacent shifts (6-7 and 8-9), are smooth. Since the shift timing is too fast for only this one specific transition, the cushioning mechanism for the 7-8 circuit — the accumulator, orifice, or cushioning valve — is not providing adequate pressure absorption, allowing the clutch to engage faster than the target.

16. B — An "INVALID" or "BETWEEN GEARS" reading while the shift lever is firmly in Drive indicates the module is not receiving a recognizable signal from the range sensor. Before investigating the module, manual valve, or cable, the technician should check the simplest external cause first — the sensor connector and wiring. A loose connector, corroded pin, or broken wire prevents the sensor signal from reaching the module, producing an undefined position reading.

17. C — The solenoid tests electrically normal, and the scan tool command reduces slip from 150 RPM to 85 RPM — confirming the solenoid and hydraulic circuit can deliver increased pressure to the TCC piston. However, even at maximum commanded pressure, the slip cannot reach zero. This proves the TCC friction material inside the sealed converter has worn past the point where any available pressure can produce full mechanical lockup. The converter must be replaced.

18. B — The 3-4 clutch adaptive value (+45%) is more than double the average of the other clutch circuits (+12% to +22%). This disproportionately high adaptation means the module has had to increase the 3-4 clutch apply pressure far more than any other clutch to maintain acceptable engagement quality. The 3-4 clutch has worn significantly more than the others — likely from operating at a higher torque demand point or from a circuit-specific issue that accelerated its wear rate.

19. A — Static resistance tests and visual wiring inspection pass, but the code sets only above 60 mph — a speed-dependent intermittent fault. Monitoring the sensor's actual output waveform with a digital storage oscilloscope during highway driving reveals signal anomalies (dropouts, glitches, amplitude changes, or noise) that only manifest at the higher output shaft speed. Static tests cannot detect dynamic faults that appear only at specific rotational speeds or vibration frequencies.

20. D — The scan tool confirms the motor is receiving full commanded power, and the battery SOC is above 80%, so the electrical system is delivering adequate energy. If the motor is producing its full output but the vehicle accelerates poorly, the power is being lost between the motor and the wheels. A worn or slipping single-speed reduction gear in the drive motor circuit fails to transmit the motor's full torque to the differential, reducing vehicle acceleration despite adequate motor output.

21. C — An aftermarket electronic conversion uses programmed solenoid patterns to replace the governor's hydraulic shift logic. If the solenoid pattern assigned to the second shift event in the controller's program actually corresponds to the 3rd gear valve body state instead of the 2nd gear state, the transmission will skip directly from 1st to 3rd. The controller's shift pattern table needs to be corrected to match the specific valve body's solenoid-to-gear mapping.

22. A — At higher altitude, atmospheric pressure is lower, which directly reduces engine volumetric efficiency and power output. The transmission control module detects the reduced engine torque through the throttle position versus actual acceleration relationship and adapts its shift schedule accordingly — shifting at slightly lower RPMs because less torque is available, and softening shifts because the reduced torque load requires less clutch clamping force. This is normal adaptive behavior.

23. D — This is normal CVT operation. A CVT is designed to hold the engine at an efficient operating RPM while continuously varying the pulley ratio to increase vehicle speed. The ratio changing from 2.2:1 to 0.9:1 while engine RPM holds at 3,500 is exactly how a CVT achieves smooth acceleration without discrete shift steps. The "hanging" RPM is not a fault — it is the fundamental operating characteristic that distinguishes a CVT from a conventional stepped automatic.

24. B — A software update changes the module's baseline calibration parameters — shift pressures, timing targets, and adaptive correction ranges. The old adaptive values stored in the module's memory were learned against the previous software version's calibration. Applying old learned corrections to new baseline parameters produces incorrect shift behavior. Resetting the adaptive values clears the old corrections and allows the module to re-learn from the new calibration's baseline during the drive cycle.

25. D — The module commands 0% duty cycle (solenoid OFF), meaning it is not sending any current. However, 1.2 amps is flowing through the solenoid. Since the module is not commanding this current, the current must be coming from an external source — a short to battery voltage somewhere in the solenoid circuit wiring. This parasitic current feed energizes the solenoid regardless of the module's command, preventing the module from controlling TCC engagement.

26. A — The most common cause of an immediate fluid leak from a spin-on filter housing after a filter replacement is a double gasket. When the old filter was unscrewed, its rubber sealing gasket stuck to the housing's sealing surface. The new filter has its own gasket, creating a double gasket stack that cannot seal properly — the two gaskets do not compress evenly and leave a gap that allows pressurized fluid to leak immediately upon engine start.

27. C — Reverse gear engagement typically applies a different set of clutches and produces a different torsional load on the engine than the forward engagement. In many transmissions, the reverse clutch engages more abruptly because its accumulator characteristics differ from the forward clutch. On a cold morning with a cold engine at minimum idle speed, the engine may not have enough idle authority to absorb the sudden reverse engagement load without stalling. The forward engagement, being cushioned differently, does not produce the same load spike.

28. D — Universal ATF does not contain the exact friction modifier chemistry specified by the manufacturer for the TCC friction surface. The incorrect friction modifiers change the engagement behavior of the TCC — the clutch alternately grabs and slips instead of engaging smoothly. The most appropriate first step is to remove the incompatible fluid, flush the system to purge all traces, and refill with the manufacturer's specified fluid. In many cases, restoring the correct fluid chemistry resolves the TCC shudder without component replacement.

29. B — The transmission vent allows internal air pressure to equalize with atmospheric pressure as the fluid heats up and air inside the case expands. A clogged vent traps this expanding air, causing internal case pressure to build progressively with temperature. The rising pressure eventually exceeds the sealing capacity of the weakest seal — typically the front pump seal — forcing fluid past it. This creates a leak that appears to be a seal failure but is actually caused by abnormal internal pressure.

30. C — After installing a HeliCoil insert, the technician must verify that the repaired hole provides adequate thread depth for the pan bolt and that the bolt torques to specification without bottoming out on the insert or stripping the new threads. The insert should be flush with or slightly below the case surface so the bolt head clamps against the pan flange, not against the insert top. A bolt that bottoms out before reaching torque will not provide proper clamping force.

31. D — The slight uphill grade increases engine load just enough to push the operating point across the boundary between the 3-4 upshift and 3-4 downshift thresholds on the shift schedule map. The module upshifts to 4th because the speed criterion is met, but the grade-induced load immediately triggers a downshift back to 3rd. The cycle repeats because the operating point sits exactly at the crossover — flat road does not produce enough load to cross the threshold.

32. B — A replacement harness with the correct part number but an additional connector most likely reflects a mid-production-year design change. Manufacturers frequently update harness designs during a model year to accommodate added sensors, revised connector locations, or updated module configurations. The additional connector is for a component present on later-build vehicles. If the technician's vehicle is an earlier build, the extra connector simply remains unused.

33. A — Aluminum is significantly softer than steel, and its fitting threads and flare surfaces are more susceptible to damage from over-tightening. The torque specification for aluminum cooler line fittings is lower than for steel fittings — typically 50-70% of the steel specification. Over-tightening can crack the aluminum flare, strip the threads, or distort the fitting seat, creating a leak that is difficult to repair without replacing the line.

34. C — The gear indicator displays correctly for all positions except 4th and 5th, which are offset by one position each. This selective, consistent offset affecting only two adjacent positions points to a wiring fault between the TCM and the instrument cluster that corrupts the data specifically for those gear values. A range sensor fault would affect all positions, and a module software glitch would likely affect the shift behavior as well, not just the display.

35. D — Gaskets are designed for one-time use. Even if the old gasket appears intact, it has already been compressed to its maximum and has taken a permanent set — its resilience is exhausted. Reinstalling a used gasket provides reduced sealing force and increases the risk of internal pressure leaks between the valve body and case. New gaskets should always be installed during valve body service regardless of the old gasket's appearance.

36. A — The cruise control system requires specific electrical inputs that may run through connectors or wiring near the range sensor mounting area. During the sensor replacement, a cruise control enable wire, vacuum hose, or related connector may have been inadvertently disconnected, pinched, or damaged. The physical proximity of the range sensor to cruise control components makes this the most likely cause of the coincidental cruise control failure.

37. A — During operation, system pressure keeps fluid from weeping past marginal seals. After the engine is shut off and the vehicle parks, the fluid remains hot and at residual pressure for a period. As the transmission cools over several hours, metal components contract and seal contact surfaces change slightly. A seal that holds under operating pressure but has marginal lip contact allows fluid to slowly weep past as temperature decreases and the seal material contracts, producing the delayed drip.

38. D — The subframe supports the engine and transaxle in many front-wheel-drive vehicles. Before lowering the subframe, the engine must be supported from above — typically with an engine support bar or fixture spanning the fender wells — to prevent the engine from dropping when the subframe is lowered. Without upper engine support, lowering the subframe allows the engine to fall, potentially causing severe damage to engine mounts, wiring, hoses, and the vehicle's body structure.

39. C — Visibly twisted splines indicate the shaft was subjected to a torsional load that exceeded the material's yield strength, permanently deforming the spline geometry. A twisted input shaft cannot engage its mating components correctly — the deformed splines create interference, misalignment, and uneven load distribution. The shaft has been structurally compromised and must be replaced. Twisted splines are evidence of a severe overload event.

40. B — The parking pawl actuating rod translates the manual shaft's rotational movement into linear motion that pushes the pawl into the parking gear teeth. A 10-degree bend shortens the effective stroke of the rod, potentially preventing the pawl from traveling far enough to fully engage the parking gear or fully disengage when shifting out of Park. The result is intermittent Park hold failure on grades and possible binding when shifting from Park.

41. A — The measured clutch clearance of 0.028 inches falls within the manufacturer's specification of 0.025 to 0.050 inches. The currently installed 0.060-inch snap ring produces a clearance that is already within the acceptable range. Installing a thicker snap ring would reduce the clearance below the minimum specification (0.070-inch ring would yield approximately 0.018 inches — below the 0.025 minimum). No change is needed; the current snap ring is correct.

42. C — A variable-displacement vane pump has components that a fixed-displacement pump does not — specifically the movable slide (cam ring), its pivot point, the bias spring that returns it to maximum displacement, and the feedback control orifice that regulates slide position based on system pressure. These components must be inspected for wear, binding, and correct operation to ensure the pump can properly vary its output. Fixed-displacement pumps lack these variable-displacement-specific components.

43. D — The current endplay is 0.052 inches with a 0.060-inch washer. The specification is 0.020 to 0.040 inches — the endplay must be reduced by 0.012 to 0.032 inches. Installing a thicker washer takes up axial space and reduces endplay by approximately the same amount as the thickness increase. A 0.075-inch washer is 0.015 inches thicker than the current 0.060-inch washer, reducing endplay by approximately 0.015 inches:  $0.052 - 0.015 = 0.037$  inches, which falls within the 0.020-0.040 specification.

44. B — Teflon sealing rings with butt-cut joints are rigid and brittle at room temperature. They require careful handling — either using a ring expander tool that spreads them gradually without exceeding their elastic limit, or gently warming them (with a heat gun on low or by immersion in hot ATF) to increase their flexibility before stretching over the shaft. New rings must be obtained to replace the cracked ones, as cracked rings cannot seal the high-pressure fluid passages between the shaft and its mating bores.

45. A — A loud grinding noise from the front of the case in all gear ranges including Park and Neutral that varies with engine RPM points to the oil pump — the only component at the front of the transmission that rotates at engine speed in every operating condition. If the torque converter is not fully seated, the pump drive may not be properly engaged, causing the pump gears to spin without proper meshing or to clash against the pump housing. The converter must be removed and reseated.

46. C — A 200 RPM drop in engine RPM during TCC lockup compared to expected values suggests the engine is being loaded more heavily than designed during lockup. A replacement converter with a different internal geometry, different TCC friction characteristics, or a different stall speed changes the engine's operating point when the TCC locks. The engine settles at a lower RPM because the converter's load characteristics differ from the original specification.

47. D — A cooler that flows adequately in one direction but is severely restricted in the opposite direction has a partial internal blockage that acts as a one-way valve — debris or a collapsed internal baffle allows flow in one direction but blocks it in reverse. Since transmission fluid flows through the cooler in one fixed direction during normal operation, this directional restriction will limit cooling capacity during every moment of vehicle operation. The cooler must be replaced.

48. B — The scan tool communicates with the mechatronic TCM and shows no DTCs, confirming the module's processor and communication circuits are functional. The engine runs normally, confirming the converter is likely driving the pump. With no gear engagement in any range despite a functioning module, the most likely cause is that the mechatronic unit's internal solenoid connectors were not properly mated during assembly. Without electrical connection to the solenoids, the module cannot command any hydraulic action.

49. A — After an adaptive reset, the module starts from factory default baseline values — conservative calibration parameters designed for a new, unworn transmission. The initial harsh shifts occur because the default pressures may be slightly higher than optimal for this specific unit's component characteristics. Over the 20-minute re-learn period, the module monitors each shift event and progressively refines its pressure and timing commands until the shifts reach their target quality. This progressive improvement is normal and expected.

50. C — Regular fluid and filter service using the manufacturer's specified fluid is the single most impactful maintenance practice for transmission longevity. Fresh fluid restores friction modifier effectiveness, replenishes anti-wear and anti-oxidation additives, removes accumulated contaminants, and maintains proper viscosity characteristics. The filter traps debris before it can damage valve body components and solenoids. Following the manufacturer's interval with the correct fluid protects every internal component simultaneously.