

# PRACTICE EXAM 6: A3 SIMULATION

## — MANUAL DRIVE TRAIN AND AXLES

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1. A vehicle is brought in with a complaint that the clutch pedal stays on the floor when depressed. The pedal does not return when released. The MOST likely cause is:

- A. A worn clutch friction disc
- B. A failed clutch master cylinder, failed slave cylinder, or broken pedal return spring
- C. A worn pilot bearing
- D. Air in the clutch hydraulic system

2. Technician A says a clutch hydraulic system leak that occurs only under pressure may not be visible during static inspection. Technician B says clutch hydraulic leaks are always visible when the system is at rest. Who is correct?

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

3. The proper procedure for diagnosing an intermittent clutch problem is to:

- A. Verify the customer concern under conditions matching the complaint, monitor the clutch hydraulic system for leaks under pressure, inspect for intermittent linkage binding, and verify clutch component condition

- B. Replace the clutch assembly as the most direct repair
- C. Replace the master and slave cylinders simultaneously
- D. Replace the transmission as a precursor to other repairs

4. A manual transmission has been brought in with a complaint of grinding only into reverse gear. Other gears engage smoothly. The MOST likely cause is:

- A. A worn pilot bearing
- B. Air in the clutch hydraulic system
- C. A worn or damaged reverse idler gear, worn reverse synchronizer (if equipped), or worn reverse shift mechanism
- D. A failed clutch master cylinder

5. The proper procedure for diagnosing a manual transmission complaint of fluid leak is to:

- A. Replace the transmission as the most direct repair
- B. Identify the leak source through visual inspection, identify the failed seal or gasket, and replace the affected component using the manufacturer's procedure
- C. Apply additional sealer to the suspected leak area
- D. Apply compressed air to the transmission

6. A vehicle equipped with a manual transmission has the following findings: complaint of intermittent shift difficulty, recent fluid change to a different brand of fluid (rated as compatible), and the symptom developed shortly after the fluid change. The MOST likely cause is:

- A. A failed pilot bearing
- B. Air in the clutch hydraulic system
- C. A worn input shaft bearing

D. The new fluid having different friction characteristics that affect synchronizer operation, requiring either fluid change back to specification or break-in time

7. The proper purpose of the manual transmission's countershaft (cluster gear) is to:

A. Provide the gear set that engages with the input shaft and drives the output shaft gears, enabling the various gear ratios

B. Generate hydraulic pressure for shift control

C. Filter contaminants from the transmission fluid

D. Drive the differential ring gear directly

8. A vehicle has been brought in with a complaint of vibration at highway speeds. The driveshaft has been removed and inspected, with no damage or balance issues found. The technician finds that the rear axle pinion bearings have excessive play when checked manually. The MOST likely cause of the vibration is:

A. A failed pilot bearing

B. Air in the clutch hydraulic system

C. A worn input shaft bearing

D. Worn pinion bearings allowing pinion movement under load, which affects the driveshaft yoke alignment and produces vibration

9. The proper procedure for verifying drive axle pinion bearing condition is to:

A. Apply compressed air to the bearings

B. Replace the bearings as a precautionary measure

C. Manually check for axial and radial play, listen for roughness during rotation, and inspect the bearing surfaces during disassembly for wear, pitting, or damage

D. Visually inspect through the inspection cover

10. A vehicle equipped with constant velocity (CV) joints has been brought in with a complaint of vibration during cornering. The vibration is not present during straight-line driving. The MOST likely cause is:

- A. A failed pilot bearing
- B. A worn or binding outer CV joint that produces vibration during the joint's articulation under cornering loads
- C. Air in the clutch hydraulic system
- D. A worn input shaft bearing

11. The proper procedure for diagnosing a halfshaft complaint is to:

- A. Replace the halfshaft as a precautionary measure
- B. Apply compressed air to the halfshaft
- C. Visually inspect through the halfshaft cover only
- D. Inspect the boots, perform cornering tests for clicking, perform acceleration tests for vibration, and inspect the joint condition during disassembly if needed

12. A vehicle equipped with an electronic transfer case shift control has been brought in with the following findings: complaint of intermittent failure to shift between modes, stored DTC for transfer case mode shift sensor, and scan tool data showing the sensor signal varying erratically. The MOST likely cause is:

- A. A failed mode shift sensor or open circuit in the sensor wiring producing erratic signal that the transfer case control module uses for mode verification
- B. A failed pilot bearing
- C. Air in the clutch hydraulic system
- D. A worn input shaft bearing

13. The proper procedure for diagnosing a transfer case electronic shift fault is to:

- A. Replace the transfer case as the most direct repair
- B. Replace the transfer case control module as a precursor to other repairs
- C. Verify the customer concern, retrieve stored DTCs, monitor scan tool data during shift attempts, verify shift switch operation, and verify proper actuator response
- D. Replace the transmission fluid as the only required step

14. A vehicle equipped with an electronic AWD coupling has the following findings: complaint of complete loss of AWD function, stored DTC for AWD coupling circuit, and scan tool shows the AWD module commanding the coupling at maximum duty cycle. The MOST likely cause is:

- A. A failed pilot bearing
- B. A failed AWD coupling that is electrically open, severe internal coupling damage, or open circuit in the coupling control wiring
- C. Air in the clutch hydraulic system
- D. A worn input shaft bearing

15. The proper procedure for verifying AWD coupling resistance is to:

- A. Apply 12 volts directly to the coupling
- B. Visually inspect the coupling for external damage
- C. Replace the coupling as a precautionary measure
- D. Disconnect the coupling connector, measure resistance with an ohmmeter at room temperature, and compare to the manufacturer's specification

16. A vehicle equipped with a transfer case has been brought in with a complaint of intermittent loss of 4WD function. Scan tool data shows the transfer case control module is functioning correctly. The MOST likely cause is:

- A. A failed transfer case mode shift sensor, intermittent electrical fault in the actuator circuit, or worn shift mechanism that does not consistently complete the shift
- B. A failed pilot bearing
- C. Air in the clutch hydraulic system
- D. A worn input shaft bearing

17. The proper procedure for verifying transfer case shift actuator operation is to:

- A. Apply compressed air to the actuator
- B. Replace the actuator as a precautionary measure
- C. Verify actuator commands through scan tool data, listen for actuator operation, observe shift travel completion, and verify proper engagement
- D. Visually inspect for visible damage only

18. A vehicle equipped with an electronically locking differential has been brought in with a complaint that the lock fails to engage when commanded. Scan tool data shows the differential lock module commanding engagement, and the lock motor operates briefly when commanded. The MOST likely cause is:

- A. A failed pilot bearing
- B. A binding or stuck lock mechanism inside the differential, low differential fluid level, or worn lock collar that prevents the motor from completing the lock travel
- C. Air in the clutch hydraulic system
- D. A worn input shaft bearing

19. The proper procedure for diagnosing an electronically locking differential complaint is to:

- A. Verify the customer concern, retrieve stored DTCs, monitor scan tool data during lock attempts, verify lock motor operation, and inspect the lock mechanism if internal failure is suspected
- B. Replace the differential as the most direct repair
- C. Replace the clutch assembly as a precursor to other repairs
- D. Replace the transmission fluid as the only required step

20. A vehicle equipped with a clutch-pack-type limited-slip differential has been brought in with a complaint of chatter during slow tight turns. The MOST likely cause is:

- A. A failed pilot bearing
- B. Air in the clutch hydraulic system
- C. A worn input shaft bearing
- D. Worn limited-slip clutch pack discs, low or contaminated limited-slip differential fluid, or improper limited-slip additive

21. The proper procedure for verifying limited-slip differential clutch pack operation is to:

- A. Apply compressed air to the differential
- B. Replace the differential as a precautionary measure
- C. Perform a road test that exercises the differential through cornering and acceleration, inspect the limited-slip fluid condition, and verify proper torque distribution
- D. Visually inspect through the differential cover

22. A vehicle equipped with a viscous coupling AWD system has been brought in with a complaint of intermittent loss of AWD function. The MOST likely cause is:

- A. A failed pilot bearing

- B. A worn or damaged viscous coupling that has lost its silicone fluid, internal damage to the coupling plates, or progressive coupling failure
- C. Air in the clutch hydraulic system
- D. A worn input shaft bearing

23. The proper purpose of the viscous coupling's silicone fluid is to:

- A. Generate hydraulic pressure for the AWD system
- B. Filter contaminants from the AWD fluid
- C. Drive the AWD system input shaft directly
- D. Provide the viscous resistance that produces torque transfer when there is speed differential between the front and rear drive shafts

24. A vehicle equipped with a Haldex-type AWD system has been brought in with the following findings: complaint of complete loss of AWD function, stored DTC for AWD coupling circuit, and the AWD module is not communicating on the CAN bus. The MOST likely cause is:

- A. A CAN bus communication fault affecting the AWD module, a failed AWD module, or open circuit in the AWD module power or ground
- B. A failed pilot bearing
- C. Air in the clutch hydraulic system
- D. A worn input shaft bearing

25. The proper procedure for diagnosing an AWD CAN bus communication fault is to:

- A. Replace the AWD module as the most direct repair
- B. Replace the transfer case control module as a precursor to other repairs

C. Use a scan tool to verify CAN bus communication between modules, check for stored network DTCs, inspect the CAN bus wiring for proper resistance and signal integrity, and verify proper module power and ground

D. Replace the transmission fluid as the only required step

26. A vehicle equipped with a chain-drive transfer case has been brought in with the following findings: complaint of grinding noise during 4WD operation, transfer case fluid that appears black with metallic particles, and stored DTCs for both shift solenoid A and shift solenoid B. The MOST likely cause is:

A. A failed pilot bearing

B. Internal transfer case mechanical damage with hard parts wear, requiring complete overhaul, with the DTCs likely set due to mechanical interference with the shift mechanism

C. Air in the clutch hydraulic system

D. A worn input shaft bearing

27. The proper procedure for diagnosing a transfer case complaint that includes both fluid contamination and stored DTCs is to:

A. Replace the transfer case as the most direct repair

B. Replace the transfer case control module as a precursor to other repairs

C. Replace the transmission fluid as the only required step

D. Verify the customer concern, retrieve the DTCs, inspect the fluid, perform pressure tests if applicable, and disassemble the transfer case for inspection if internal damage is indicated

28. A vehicle equipped with a transfer case using an electric shift motor has been brought in with a complaint that the shift motor operates correctly but produces excessive noise during operation. The MOST likely cause is:

A. Worn shift motor bearings, worn motor brushes, or contamination in the motor

B. A failed pilot bearing

- C. Air in the clutch hydraulic system
- D. A worn input shaft bearing

29. The proper procedure for verifying transfer case shift motor operation under operating conditions is to:

- A. Apply compressed air to the motor
- B. Replace the motor as a precautionary measure
- C. Listen to the motor during operation, monitor motor current draw with a meter, and verify proper shift travel completion
- D. Visually inspect for visible damage only

30. A vehicle equipped with an electronic AWD system has been brought in with a complaint of intermittent loss of AWD function during specific driving conditions. The technician finds that the AWD module performs correctly during all bench-level testing. The MOST likely cause is:

- A. A failed pilot bearing
- B. Air in the clutch hydraulic system
- C. A worn input shaft bearing
- D. An intermittent electrical fault in the wiring between the AWD module and the AWD coupling, intermittent connector issue, or environmental factor (vibration, temperature) that affects only specific driving conditions

31. The proper procedure for verifying AWD system wiring integrity is to:

- A. Apply 12 volts directly to the wiring
- B. Inspect the wiring for damage, verify continuity through critical circuits, measure voltage drop under operating conditions, and verify proper connector seating and contact
- C. Replace the AWD wiring as a precautionary measure

D. Visually inspect for visible damage only

32. A vehicle's drive axle has been overhauled. After installation, the customer reports a whining noise that varies with vehicle speed. The technician verifies the noise during a road test. The MOST likely cause is:

A. A failed pilot bearing

B. Air in the clutch hydraulic system

C. Improper pinion depth setup, improper backlash, or improper contact pattern that produces gear whine under load

D. A worn input shaft bearing

33. The proper procedure for diagnosing post-overhaul drive axle noise is to:

A. Verify the noise through road test, perform a contact pattern inspection on the recently overhauled gears, verify the backlash and preload settings, and re-shim if needed

B. Replace the ring and pinion as a precautionary measure

C. Replace the carrier bearings as a precursor to other repairs

D. Replace the transmission fluid as the only required step

34. A vehicle equipped with a transfer case in 4WD low range has been brought in with a complaint of difficulty shifting back to 4WD high range. The complaint occurs only when shifting from low range; high-to-low shifts are normal. The MOST likely cause is:

A. A failed pilot bearing

B. Air in the clutch hydraulic system

C. A worn input shaft bearing

D. A worn or damaged shift mechanism specific to the low-to-high shift, low transfer case fluid level, or improper shift technique

35. The proper procedure for verifying transfer case shift technique compliance is to:

- A. Apply compressed air to the transfer case
- B. Verify the manufacturer-specified shift procedure is being followed (vehicle stopped, gear in neutral, proper shift sequence) and verify the shift completes through observation
- C. Replace the transfer case as a precautionary measure
- D. Replace the transmission fluid as the only required step

36. A vehicle has been brought in with a complaint of vibration that is most pronounced during acceleration. The vibration disappears during deceleration. Compression and leakdown tests are normal. The MOST likely cause is:

- A. A failed pilot bearing
- B. Air in the clutch hydraulic system
- C. A driveline-related vibration where worn components or improper alignment produces cyclical loading under acceleration that disappears during deceleration when the load reverses
- D. A worn input shaft bearing

37. The proper procedure for diagnosing a driveline vibration that is acceleration-specific is to:

- A. Inspect the driveshaft for damage, verify driveshaft balance, measure driveline angles, and verify u-joint working angles, since acceleration loads expose driveline alignment issues
- B. Replace the driveshaft as a precautionary measure
- C. Replace the universal joints as the most direct repair
- D. Replace the transmission output bearing as a precursor to other repairs

38. A vehicle equipped with an axle disconnect mechanism has been brought in with a complaint of grinding noise during 2WD operation. The MOST likely cause is:

- A. A failed pilot bearing
- B. Air in the clutch hydraulic system
- C. A failed disconnect mechanism that allows partial engagement of the front axle during 2WD, producing drag and noise as the front axle attempts to operate at vehicle speed
- D. A worn input shaft bearing

39. The proper procedure for verifying axle disconnect operation under driving conditions is to:

- A. Apply compressed air to the disconnect mechanism
- B. Verify the actuator commands through scan tool data, observe the disconnect mechanism action during shift events, and verify proper engagement and disengagement during a road test that includes both 2WD and 4WD operation
- C. Replace the disconnect mechanism as a precautionary measure
- D. Visually inspect through the inspection cover

40. A vehicle equipped with an electronically controlled AWD system has been brought in with a complaint of intermittent loss of AWD function. The MOST likely cause is:

- A. An intermittent electrical fault in the AWD wiring or connectors, contaminated AWD coupling fluid, worn coupling clutch material, or a marginal AWD module producing inconsistent commands
- B. A failed pilot bearing
- C. Air in the clutch hydraulic system
- D. A worn input shaft bearing

# PRACTICE EXAM 6: A3 SIMULATION

## — ANSWER KEY, EXPLANATIONS, AND TASK REMEDIATION

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1. B — A failed clutch master cylinder, failed slave cylinder, or broken pedal return spring. A pedal that stays on the floor when depressed indicates the system cannot return the pedal. Failed master cylinder, failed slave cylinder, or broken return spring all prevent proper pedal return. *ASE Task Reference: A3 Domain A — Clutch Diagnosis and Repair. Review subsection 3.1.*
2. D — Technician A only. Clutch hydraulic leaks that occur only under pressure may not be visible during static inspection. Pressure testing the system reveals these dynamic leaks that static inspection cannot detect. *ASE Task Reference: A3 Domain A — Clutch Diagnosis and Repair. Review subsection 3.1.*
3. A — Verify the customer concern under conditions matching the complaint, monitor the clutch hydraulic system for leaks under pressure, inspect for intermittent linkage binding, and verify clutch component condition. Intermittent clutch problems require comprehensive diagnosis under symptom-matching conditions. Each step addresses different potential causes of intermittent symptoms. *ASE Task Reference: A3 Domain A — Clutch Diagnosis and Repair. Review subsection 3.1.*
4. C — A worn or damaged reverse idler gear, worn reverse synchronizer (if equipped), or worn reverse shift mechanism. Grinding only into reverse with smooth operation in other gears localizes the issue to reverse-specific components. The reverse idler gear, synchronizer (where equipped), and shift mechanism are the most likely causes. *ASE Task Reference: A3 Domain B — Transmission Diagnosis and Repair. Review subsection 3.2.*
5. B — Identify the leak source through visual inspection, identify the failed seal or gasket, and replace the affected component using the manufacturer's procedure. Manual transmission leak diagnosis requires identification of the source and the failed component. Replacement using the manufacturer's procedure ensures proper sealing. *ASE Task Reference: A3 Domain B — Transmission Diagnosis and Repair. Review subsection 3.2.*
6. D — The new fluid having different friction characteristics that affect synchronizer operation, requiring either fluid change back to specification or break-in time. Even compatible fluids from different brands can have different friction characteristics that affect synchronizer operation. The shift quality issue may resolve with break-in or require fluid change back to the original

specification. *ASE Task Reference: A3 Domain B — Transmission Diagnosis and Repair. Review subsection 3.2.*

7. A — Provide the gear set that engages with the input shaft and drives the output shaft gears, enabling the various gear ratios. The countershaft (cluster gear) provides the gear set that engages with the input shaft and drives the output shaft gears. Different gear combinations produce the different gear ratios. *ASE Task Reference: A3 Domain B — Transmission Diagnosis and Repair. Review subsection 3.2.*
8. D — Worn pinion bearings allowing pinion movement under load, which affects the driveshaft yoke alignment and produces vibration. Excessive pinion bearing play allows the pinion to move under load, affecting the driveshaft yoke alignment. The misalignment produces vibration that becomes apparent at highway speeds when the pinion is fully loaded. *ASE Task Reference: A3 Domain D — Drive Axle Diagnosis and Repair. Review subsection 3.4.*
9. C — Manually check for axial and radial play, listen for roughness during rotation, and inspect the bearing surfaces during disassembly for wear, pitting, or damage. Pinion bearing condition verification requires manual play check, rotation roughness check, and direct inspection during disassembly. Each check identifies different aspects of bearing condition. *ASE Task Reference: A3 Domain D — Drive Axle Diagnosis and Repair. Review subsection 3.4.*
10. B — A worn or binding outer CV joint that produces vibration during the joint's articulation under cornering loads. CV joint vibration during cornering is the diagnostic signature of outer joint wear or binding. The joint articulates under cornering load, producing vibration when the worn or binding components are stressed. *ASE Task Reference: A3 Domain C — Driveshaft and Universal Joint/CV Joint Diagnosis and Repair. Review subsection 3.3.*
11. D — Inspect the boots, perform cornering tests for clicking, perform acceleration tests for vibration, and inspect the joint condition during disassembly if needed. Halfshaft diagnosis requires multiple inspection methods: boot inspection, cornering test for clicking, acceleration test for vibration, and direct inspection during disassembly. Each test reveals different aspects of joint condition. *ASE Task Reference: A3 Domain C — Driveshaft and Universal Joint/CV Joint Diagnosis and Repair. Review subsection 3.3.*
12. A — A failed mode shift sensor or open circuit in the sensor wiring producing erratic signal that the transfer case control module uses for mode verification. Erratic mode shift sensor signal causes the transfer case control module to receive inconsistent mode information. The TCCM cannot verify the actual transfer case mode, producing the intermittent shift failure. *ASE Task Reference: A3 Domain E — Four-Wheel Drive/All-Wheel Drive Component Diagnosis and Repair. Review subsection 3.5.*
13. C — Verify the customer concern, retrieve stored DTCs, monitor scan tool data during shift attempts, verify shift switch operation, and verify proper actuator response. Electronic transfer case shift fault diagnosis requires comprehensive systematic approach including verification, DTC

review, scan tool data monitoring, switch verification, and actuator response verification. *ASE Task Reference: A3 Domain E — Four-Wheel Drive/All-Wheel Drive Component Diagnosis and Repair. Review subsection 3.5.*

14. B — A failed AWD coupling that is electrically open, severe internal coupling damage, or open circuit in the coupling control wiring. AWD module commanding maximum duty cycle with no engagement indicates the coupling cannot respond to maximum command. Failed coupling, internal damage, or open circuit are the most likely causes. *ASE Task Reference: A3 Domain E — Four-Wheel Drive/All-Wheel Drive Component Diagnosis and Repair. Review subsection 3.5.*
15. D — Disconnect the coupling connector, measure resistance with an ohmmeter at room temperature, and compare to the manufacturer's specification. AWD coupling resistance verification requires connector disconnection (to isolate the coupling), ohmmeter measurement at consistent temperature, and comparison to specification. *ASE Task Reference: A3 Domain E — Four-Wheel Drive/All-Wheel Drive Component Diagnosis and Repair. Review subsection 3.5.*
16. A — A failed transfer case mode shift sensor, intermittent electrical fault in the actuator circuit, or worn shift mechanism that does not consistently complete the shift. With the TCCM functioning correctly, the issue must be in the actuator chain. Failed sensor, electrical fault, or worn shift mechanism are the most likely causes. *ASE Task Reference: A3 Domain E — Four-Wheel Drive/All-Wheel Drive Component Diagnosis and Repair. Review subsection 3.5.*
17. C — Verify actuator commands through scan tool data, listen for actuator operation, observe shift travel completion, and verify proper engagement. Shift actuator verification requires scan tool monitoring, audio confirmation, travel observation, and engagement verification. Each step isolates a different aspect of actuator operation. *ASE Task Reference: A3 Domain E — Four-Wheel Drive/All-Wheel Drive Component Diagnosis and Repair. Review subsection 3.5.*
18. B — A binding or stuck lock mechanism inside the differential, low differential fluid level, or worn lock collar that prevents the motor from completing the lock travel. With the lock motor operating but the lock not engaging, the issue is in the mechanical lock mechanism. Binding mechanism, low fluid, or worn collar prevent the motor from completing the lock travel. *ASE Task Reference: A3 Domain E — Four-Wheel Drive/All-Wheel Drive Component Diagnosis and Repair. Review subsection 3.5.*
19. A — Verify the customer concern, retrieve stored DTCs, monitor scan tool data during lock attempts, verify lock motor operation, and inspect the lock mechanism if internal failure is suspected. Locking differential diagnosis requires comprehensive approach including verification, DTC review, scan tool monitoring, motor verification, and mechanism inspection where internal failure is suspected. *ASE Task Reference: A3 Domain E — Four-Wheel Drive/All-Wheel Drive Component Diagnosis and Repair. Review subsection 3.5.*
20. D — Worn limited-slip clutch pack discs, low or contaminated limited-slip differential fluid, or improper limited-slip additive. Limited-slip chatter during slow tight turns is the diagnostic

signature of clutch pack wear, fluid issues, or additive issues. All three affect the differential's ability to maintain smooth operation during cornering. *ASE Task Reference: A3 Domain E — Four-Wheel Drive/All-Wheel Drive Component Diagnosis and Repair. Review subsection 3.5.*

21. C — Perform a road test that exercises the differential through cornering and acceleration, inspect the limited-slip fluid condition, and verify proper torque distribution. Limited-slip operation verification requires road testing under conditions that exercise the differential. Cornering and acceleration tests, combined with fluid inspection, provide complete assessment. *ASE Task Reference: A3 Domain E — Four-Wheel Drive/All-Wheel Drive Component Diagnosis and Repair. Review subsection 3.5.*
22. B — A worn or damaged viscous coupling that has lost its silicone fluid, internal damage to the coupling plates, or progressive coupling failure. Viscous coupling failure produces intermittent loss of AWD function as the coupling cannot maintain proper torque transfer. Loss of silicone fluid, internal damage, or progressive failure all produce intermittent symptoms. *ASE Task Reference: A3 Domain E — Four-Wheel Drive/All-Wheel Drive Component Diagnosis and Repair. Review subsection 3.5.*
23. D — Provide the viscous resistance that produces torque transfer when there is speed differential between the front and rear drive shafts. The silicone fluid in a viscous coupling provides the viscous resistance that produces torque transfer when speed differential exists between the front and rear drive shafts. The fluid is the active component of viscous coupling operation. *ASE Task Reference: A3 Domain E — Four-Wheel Drive/All-Wheel Drive Component Diagnosis and Repair. Review subsection 3.5.*
24. A — A CAN bus communication fault affecting the AWD module, a failed AWD module, or open circuit in the AWD module power or ground. With the AWD module not communicating on the CAN bus, the issue is in the module's communication or power circuit. CAN bus fault, failed module, or power/ground issues are the most likely causes. *ASE Task Reference: A3 Domain E — Four-Wheel Drive/All-Wheel Drive Component Diagnosis and Repair. Review subsection 3.5.*
25. C — Use a scan tool to verify CAN bus communication between modules, check for stored network DTCs, inspect the CAN bus wiring for proper resistance and signal integrity, and verify proper module power and ground. AWD CAN bus fault diagnosis requires comprehensive systematic approach including communication verification, network DTC review, wiring inspection, and power/ground verification. *ASE Task Reference: A3 Domain E — Four-Wheel Drive/All-Wheel Drive Component Diagnosis and Repair. Review subsection 3.5.*
26. B — Internal transfer case mechanical damage with hard parts wear, requiring complete overhaul, with the DTCs likely set due to mechanical interference with the shift mechanism. The combination of grinding, contaminated fluid, and shift solenoid DTCs is the diagnostic signature of internal mechanical damage. The mechanical damage interferes with the shift mechanism,

producing the DTCs as a downstream effect. *ASE Task Reference: A3 Domain E — Four-Wheel Drive/All-Wheel Drive Component Diagnosis and Repair. Review subsection 3.5.*

27. D — Verify the customer concern, retrieve the DTCs, inspect the fluid, perform pressure tests if applicable, and disassemble the transfer case for inspection if internal damage is indicated. Transfer case complaints with multiple findings require systematic comprehensive approach. Each step provides different diagnostic information; disassembly is required when internal damage is indicated. *ASE Task Reference: A3 Domain E — Four-Wheel Drive/All-Wheel Drive Component Diagnosis and Repair. Review subsection 3.5.*
28. A — Worn shift motor bearings, worn motor brushes, or contamination in the motor. Excessive shift motor noise during operation indicates motor wear or contamination. Worn bearings, worn brushes, or contamination produce noise during operation but allow the motor to continue functioning. *ASE Task Reference: A3 Domain E — Four-Wheel Drive/All-Wheel Drive Component Diagnosis and Repair. Review subsection 3.5.*
29. C — Listen to the motor during operation, monitor motor current draw with a meter, and verify proper shift travel completion. Motor operation verification under operating conditions requires listening, current monitoring, and travel verification. Each method reveals different aspects of motor performance. *ASE Task Reference: A3 Domain E — Four-Wheel Drive/All-Wheel Drive Component Diagnosis and Repair. Review subsection 3.5.*
30. D — An intermittent electrical fault in the wiring between the AWD module and the AWD coupling, intermittent connector issue, or environmental factor (vibration, temperature) that affects only specific driving conditions. Intermittent AWD failure during specific conditions with normal bench-level testing indicates an environmental or condition-specific fault. Wiring issues, connector problems, or environmental factors produce condition-specific symptoms. *ASE Task Reference: A3 Domain E — Four-Wheel Drive/All-Wheel Drive Component Diagnosis and Repair. Review subsection 3.5.*
31. B — Inspect the wiring for damage, verify continuity through critical circuits, measure voltage drop under operating conditions, and verify proper connector seating and contact. AWD wiring integrity verification requires comprehensive inspection. Voltage drop testing under operating conditions identifies marginal wiring issues that static testing may miss. *ASE Task Reference: A3 Domain E — Four-Wheel Drive/All-Wheel Drive Component Diagnosis and Repair. Review subsection 3.5.*
32. C — Improper pinion depth setup, improper backlash, or improper contact pattern that produces gear whine under load. Post-overhaul drive axle whine is the diagnostic signature of improper setup. Pinion depth, backlash, or contact pattern issues produce gear whine that matches the load condition. *ASE Task Reference: A3 Domain D — Drive Axle Diagnosis and Repair. Review subsection 3.4.*

33. A — Verify the noise through road test, perform a contact pattern inspection on the recently overhauled gears, verify the backlash and preload settings, and re-shim if needed. Post-overhaul drive axle noise diagnosis requires verification, contact pattern inspection, settings verification, and re-shim if needed. Each step addresses different aspects of the setup. *ASE Task Reference: A3 Domain D — Drive Axle Diagnosis and Repair. Review subsection 3.4.*
34. D — A worn or damaged shift mechanism specific to the low-to-high shift, low transfer case fluid level, or improper shift technique. Difficulty shifting from low to high range with normal high-to-low operation indicates issues specific to the low-to-high shift. The shift mechanism, fluid level, or shift technique are the most likely causes. *ASE Task Reference: A3 Domain E — Four-Wheel Drive/All-Wheel Drive Component Diagnosis and Repair. Review subsection 3.5.*
35. B — Verify the manufacturer-specified shift procedure is being followed (vehicle stopped, gear in neutral, proper shift sequence) and verify the shift completes through observation. Transfer case shift technique verification requires confirmation of the manufacturer-specified procedure and visual confirmation of shift completion. Many shift complaints result from improper technique rather than mechanical issues. *ASE Task Reference: A3 Domain E — Four-Wheel Drive/All-Wheel Drive Component Diagnosis and Repair. Review subsection 3.5.*
36. C — A driveline-related vibration where worn components or improper alignment produces cyclical loading under acceleration that disappears during deceleration when the load reverses. Acceleration-specific vibration with normal compression and leakdown is the diagnostic signature of driveline issues. Worn components or improper alignment produce cyclical loading under acceleration loads. *ASE Task Reference: A3 Domain C — Driveshaft and Universal Joint/CV Joint Diagnosis and Repair. Review subsection 3.3.*
37. A — Inspect the driveshaft for damage, verify driveshaft balance, measure driveline angles, and verify u-joint working angles, since acceleration loads expose driveline alignment issues. Acceleration-specific driveline vibration diagnosis requires inspection of driveshaft, balance, angles, and working angles. Each potential cause must be evaluated under conditions that reveal the specific issue. *ASE Task Reference: A3 Domain C — Driveshaft and Universal Joint/CV Joint Diagnosis and Repair. Review subsection 3.3.*
38. C — A failed disconnect mechanism that allows partial engagement of the front axle during 2WD, producing drag and noise as the front axle attempts to operate at vehicle speed. Grinding noise during 2WD operation is the diagnostic signature of axle disconnect failure. The front axle is partially engaged when it should be fully disconnected, producing drag and noise. *ASE Task Reference: A3 Domain E — Four-Wheel Drive/All-Wheel Drive Component Diagnosis and Repair. Review subsection 3.5.*
39. B — Verify the actuator commands through scan tool data, observe the disconnect mechanism action during shift events, and verify proper engagement and disengagement during a road test that includes both 2WD and 4WD operation. Axle disconnect verification under driving conditions

requires scan tool monitoring, mechanism observation, and road test verification through both 2WD and 4WD operation. *ASE Task Reference: A3 Domain E — Four-Wheel Drive/All-Wheel Drive Component Diagnosis and Repair. Review subsection 3.5.*

40. A — An intermittent electrical fault in the AWD wiring or connectors, contaminated AWD coupling fluid, worn coupling clutch material, or a marginal AWD module producing inconsistent commands. Intermittent AWD function loss has multiple potential causes. Electrical faults, fluid contamination, worn material, or marginal module performance can each produce intermittent symptoms. *ASE Task Reference: A3 Domain E — Four-Wheel Drive/All-Wheel Drive Component Diagnosis and Repair. Review subsection 3.5.*