

PRACTICE EXAM 2: A3 SIMULATION

— MANUAL DRIVE TRAIN AND AXLES

1. A vehicle is brought in with a complaint that the clutch pedal does not return to its full upright position after the pedal is released. The MOST likely cause is:

- A. A worn clutch friction disc
- B. A failed clutch pedal return spring or binding pedal mechanism
- C. A worn pilot bearing
- D. Air in the clutch hydraulic system

2. The proper procedure for bleeding a clutch hydraulic system is to:

- A. Replace the master and slave cylinders as a precautionary measure
- B. Apply compressed air to the hydraulic line
- C. Pump the clutch pedal multiple times without opening the bleeder
- D. Open the bleeder, depress the pedal, close the bleeder, release the pedal, and repeat until clean fluid emerges without air bubbles

3. Technician A says a clutch slip complaint with the engine RPM rising while vehicle speed remains constant during acceleration indicates worn friction disc material. Technician B says the same symptom most likely indicates a failed pilot bearing. Who is correct?

- A. Technician A only

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

4. A vehicle exhibits a complaint of clutch noise during clutch engagement only. The noise stops when the clutch is fully engaged or fully disengaged. The MOST likely cause is:

- A. A worn input shaft bearing
- B. A failed clutch master cylinder
- C. A worn or damaged clutch release bearing
- D. A worn pilot bearing

5. The proper purpose of the clutch release bearing is to:

- A. Generate hydraulic pressure for clutch operation
- B. Support the transmission input shaft
- C. Provide the clutch pedal feedback during operation
- D. Apply pressure to the pressure plate fingers to disengage the clutch when the pedal is depressed

6. A manual transmission produces a noise that occurs only in neutral with the clutch engaged. The noise stops when the clutch is depressed. The MOST likely cause is:

- A. A worn output shaft bearing
- B. A worn input shaft bearing or worn countershaft front bearing
- C. A worn pilot bearing
- D. A failed clutch master cylinder

7. A manual transmission exhibits a complaint that gear engagement is normal but the transmission jumps out of fifth gear during deceleration. The MOST likely cause is:

- A. A worn pilot bearing
- B. Air in the clutch hydraulic system
- C. A worn fifth gear synchronizer, worn shift fork, or worn detent mechanism
- D. A failed clutch master cylinder

8. The proper purpose of the manual transmission's countershaft (lay shaft) is to:

- A. Transmit input shaft torque through gear sets to drive the output shaft
- B. Generate hydraulic pressure for shift control
- C. Provide the clutch pedal feedback during operation
- D. Drive the differential ring gear directly

9. A vehicle equipped with a transverse manual transaxle produces a grinding noise during acceleration. The noise varies with engine speed. The MOST likely cause is:

- A. A worn pilot bearing
- B. Air in the clutch hydraulic system
- C. A failed clutch master cylinder
- D. A worn input shaft bearing or worn pinion bearing in the transaxle

10. The proper procedure for verifying manual transmission fluid level on a transmission equipped with a fill plug is to:

- A. Apply compressed air to the fill plug
- B. Remove the fill plug and verify the fluid level reaches the bottom of the fill hole

- C. Use a scan tool to read the fluid level data parameter
- D. Visually inspect through the transmission case

11. A driveshaft that produces a vibration during acceleration but not during deceleration MOST likely indicates:

- A. A failed pilot bearing
- B. A worn clutch master cylinder
- C. A worn or damaged universal joint, worn slip yoke spline, or driveshaft imbalance under load
- D. A worn input shaft bearing

12. The proper procedure for verifying driveshaft balance is to:

- A. Verify driveshaft runout and check for balance weights, then perform balance correction per the manufacturer's specification
- B. Replace the driveshaft as a precautionary measure
- C. Apply compressed air to the driveshaft
- D. Measure driveshaft resistance with an ohmmeter

13. A vehicle equipped with constant velocity (CV) joints exhibits a complaint of clicking noise during acceleration in straight-line driving. The MOST likely cause is:

- A. A worn pilot bearing
- B. Air in the clutch hydraulic system
- C. A failed clutch master cylinder
- D. A worn or damaged inner CV joint allowing axial play during acceleration

14. The proper purpose of the universal joint is to:

- A. Generate hydraulic pressure for the driveshaft
- B. Allow the driveshaft to transmit torque while accommodating angular changes between the transmission output and rear axle
- C. Filter contaminants from the differential fluid
- D. Provide cooling for the driveshaft during operation

15. A vehicle has been brought in with a complaint of driveshaft vibration that is most pronounced at highway speeds. The driveshaft has been recently serviced. The MOST likely cause is:

- A. Improper driveshaft phasing during reassembly, missing or improperly installed balance weights, or universal joint binding from improper installation
- B. A failed pilot bearing
- C. A failed clutch master cylinder
- D. A worn input shaft bearing

16. The proper procedure for installing a new universal joint is to:

- A. Apply hard-facing material to the joint
- B. Heat the joint to expand the bearing cups
- C. Press the joint in squarely using a proper installation tool, verify free rotation without binding, and apply specified grease
- D. Drive the joint in with a hammer

17. A vehicle's drive axle pinion preload measurement reads 8 inch-pounds when the manufacturer specifies 12 to 18 inch-pounds. The MOST appropriate action is:

- A. Apply additional torque to the pinion nut and recheck preload

- B. Replace the ring and pinion as a precautionary measure
- C. Apply compressed air to the differential
- D. Increase pinion preload to specification by tightening the pinion nut while maintaining proper alignment

18. The proper procedure for measuring drive axle ring gear backlash is to:

- A. Apply maximum torque to the ring gear bolts
- B. Mount a dial indicator on the ring gear, hold the pinion stationary, rock the ring gear back and forth, and read the total movement
- C. Visually inspect for proper gear mesh
- D. Apply compressed air to the differential housing

19. A drive axle ring gear backlash measurement reads 0.012 inch when the manufacturer specifies 0.005 to 0.008 inch. The MOST appropriate action is to:

- A. Move the ring gear toward the pinion by adjusting the carrier shims to reduce backlash to specification
- B. Apply additional torque to the ring gear bolts
- C. Replace the ring and pinion as a precautionary measure
- D. Apply compressed air to the differential

20. The proper procedure for verifying drive axle pinion depth is to:

- A. Apply compressed air to the differential
- B. Use a torque wrench to measure rotational drag
- C. Apply marking compound to the ring gear teeth, rotate the assembly, and inspect the contact pattern position relative to the tooth profile
- D. Replace the pinion as a precautionary measure

21. A vehicle equipped with a transfer case has the following findings: complaint of grinding when shifting into low range, normal operation in high range, and a stored DTC for transfer case mode shift sensor. 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 shift mechanism, low fluid level, or stuck range shift collar in the transfer case

22. The proper purpose of the transfer case low range gear is to:

- A. Generate hydraulic pressure for the transfer case
- B. Provide additional torque multiplication for off-road and low-speed operation, with reduced output speed
- C. Filter contaminants from the transfer case fluid
- D. Drive the front axle during AWD operation

23. A vehicle equipped with an electronic transfer case shift control exhibits a complaint of complete failure to shift between modes. Scan tool data shows the transfer case control module is not commanding the shift. The MOST likely cause is:

- A. A failed transfer case shift switch, open circuit in the switch wiring, or failed transfer case control module
- B. A failed pilot bearing
- C. Air in the clutch hydraulic system
- D. A worn input shaft bearing

24. The proper procedure for diagnosing an electronic transfer case shift complaint is to:

- A. Replace the transfer case as the most direct repair
- B. Replace the clutch assembly as a precursor to other repairs
- C. Verify the shift switch operation, check transfer case control module commands, inspect the shift motor operation, and verify proper actuator response
- D. Replace the transmission fluid as the only required step

25. A vehicle equipped with an electronically controlled clutch-pack AWD coupling exhibits a complaint of intermittent loss of AWD function. The MOST likely cause is:

- A. A failed pilot bearing
- B. A worn AWD coupling clutch pack, intermittent electrical fault in the coupling control circuit, or contaminated coupling fluid
- C. Air in the clutch hydraulic system
- D. A failed clutch master cylinder

26. The proper purpose of an electronically controlled AWD coupling clutch pack is to:

- A. Generate hydraulic pressure for the AWD system
- B. Provide variable torque distribution between the front and rear axles based on commands from the AWD control module
- C. Filter contaminants from the AWD fluid
- D. Drive the AWD system input shaft

27. A vehicle equipped with a transfer case in 4WD high range exhibits a complaint of binding during slow tight turns on dry pavement. The MOST likely cause is:

- A. Normal operation since 4WD high range locks the front and rear axles together, and binding occurs during turns on high-traction surfaces
- B. A failed pilot bearing
- C. Air in the clutch hydraulic system
- D. A worn input shaft bearing

28. The proper procedure for testing a viscous coupling AWD system is to:

- A. Apply compressed air to the coupling
- B. Replace the coupling as a precautionary measure
- C. Perform a road test that exercises front-rear speed differential, observe the response of the coupling, and verify proper torque distribution under varied conditions
- D. Replace the transmission fluid as the only required step

29. A vehicle equipped with an axle disconnect mechanism exhibits a complaint that the axle disconnect cannot be commanded to engage. 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 failed disconnect actuator, electrical fault in the actuator circuit, or stuck disconnect collar

30. The proper procedure for verifying an axle disconnect operation is to:

- A. Apply compressed air to the disconnect mechanism

B. Verify the actuator commands and operation through scan tool data, observe the disconnect mechanism action, and verify proper engagement and disengagement

C. Replace the disconnect mechanism as a precautionary measure

D. Replace the transmission fluid as the only required step

31. A vehicle's drive axle bearing produces a noise that varies with vehicle speed and changes character when cornering. The MOST likely cause is:

A. A worn axle bearing on the side that bears more load during cornering, with the load shift exposing the wear

B. A failed pilot bearing

C. Air in the clutch hydraulic system

D. A worn input shaft bearing

32. The proper procedure for inspecting an axle bearing is to:

A. Apply compressed air to the bearing

B. Replace the bearing as a precautionary measure

C. Remove the axle and inspect the bearing for play, roughness, and wear, then verify proper preload during reassembly

D. Visually inspect through the differential cover

33. A vehicle equipped with a transfer case has been overhauled. The proper post-overhaul verification includes:

A. Operating the transfer case at maximum RPM

B. Driving aggressively to break in the new components

C. Idling for several hours before driving

D. Filling with manufacturer-specified fluid and quantity, performing a careful initial start, and verifying proper operation in all modes

34. The proper purpose of a transfer case's neutral position is to:

- A. Generate hydraulic pressure for the transfer case
- B. Disconnect the transfer case output from both the front and rear drive shafts, allowing the vehicle to be towed without driving the drivetrain
- C. Filter contaminants from the transfer case fluid
- D. Provide cooling for the transfer case during operation

35. A vehicle equipped with a manual transmission and rear-wheel drive has had the rear axle overhauled. After installation, the vehicle exhibits a clunk when shifting from drive to neutral or from neutral to drive. The MOST likely cause is:

- A. Excessive backlash in the rear axle (gear lash) or worn driveline components allowing movement during torque reversal
- B. A failed pilot bearing
- C. Air in the clutch hydraulic system
- D. A worn input shaft bearing

36. The proper procedure for setting differential carrier bearing preload is to:

- A. Apply maximum torque to the carrier bolts
- B. Replace the carrier bearings as a precautionary measure
- C. Use the carrier bearing shim adjustment to provide specified rotational drag through the carrier bearings, comparing to the manufacturer's specification
- D. Apply compressed air to the differential

37. A vehicle's drive axle pinion seal has been replaced. After the repair, the technician finds the pinion nut torque is critical because:

- A. The nut adjusts the carrier bearing preload
- B. The nut sets the ring gear backlash directly
- C. The nut prevents the pinion from rotating during operation
- D. The pinion nut torque sets the pinion bearing preload, and incorrect torque produces either insufficient preload (resulting in pinion movement) or excessive preload (resulting in bearing failure)

38. The proper purpose of an AWD system's center differential is to:

- A. Generate hydraulic pressure for the AWD system
- B. Allow the front and rear axles to rotate at different speeds during cornering while still distributing engine torque to both axles
- C. Filter contaminants from the AWD fluid
- D. Drive the AWD system input shaft directly

39. A vehicle equipped with a manual transfer case lever exhibits a complaint that the lever is hard to move between operating modes. The MOST likely cause is:

- A. A worn shift linkage, binding shift mechanism, or improperly adjusted shift fork in the transfer case
- B. A failed pilot bearing
- C. Air in the clutch hydraulic system
- D. A worn input shaft bearing

40. The proper procedure for verifying transfer case operation in 4WD mode is to:

- A. Apply compressed air to the transfer case

- B. Replace the transfer case as a precautionary measure
- C. Perform a road test that includes acceleration in 4WD high range and 4WD low range, verify proper torque distribution and shift quality, and inspect for any binding or noise
- D. Replace the transmission fluid as the only required step

PRACTICE EXAM 2: A3 SIMULATION

— ANSWER KEY, EXPLANATIONS, AND TASK REMEDIATION

1. B — A failed clutch pedal return spring or binding pedal mechanism. A pedal that does not return to upright after release indicates the pedal cannot overcome the resistance of the system. A failed return spring or binding mechanism prevents proper pedal return, while hydraulic and clutch component issues produce different symptoms. *ASE Task Reference: A3 Domain A — Clutch Diagnosis and Repair. Review subsection 3.1.*
2. D — Open the bleeder, depress the pedal, close the bleeder, release the pedal, and repeat until clean fluid emerges without air bubbles. Clutch hydraulic system bleeding requires the proper sequence: open bleeder, depress pedal, close bleeder, release pedal, then repeat. This sequence prevents air from being drawn back into the system during pedal release. *ASE Task Reference: A3 Domain A — Clutch Diagnosis and Repair. Review subsection 3.1.*
3. A — Technician A only. Engine RPM rising while vehicle speed remains constant during acceleration is the diagnostic signature of clutch slip from worn friction disc material. A failed pilot bearing produces noise rather than slip; the symptom Technician A describes specifically indicates friction disc wear. *ASE Task Reference: A3 Domain A — Clutch Diagnosis and Repair. Review subsection 3.1.*
4. C — A worn or damaged clutch release bearing. Clutch noise that occurs only during engagement and stops at full engagement or disengagement is the diagnostic signature of release bearing wear. The release bearing is loaded only during the engagement transition, producing noise specific to that operating condition. *ASE Task Reference: A3 Domain A — Clutch Diagnosis and Repair. Review subsection 3.1.*
5. D — Apply pressure to the pressure plate fingers to disengage the clutch when the pedal is depressed. The release bearing's primary function is to apply pressure to the pressure plate fingers (or diaphragm) when the clutch pedal is depressed. This force releases the clamping pressure on the friction disc, allowing the clutch to disengage. *ASE Task Reference: A3 Domain A — Clutch Diagnosis and Repair. Review subsection 3.1.*
6. B — A worn input shaft bearing or worn countershaft front bearing. Noise in neutral with the clutch engaged that stops when the clutch is depressed is the diagnostic signature of input shaft or countershaft front bearing wear. When the clutch is depressed, the input shaft and countershaft

stop rotating, eliminating the noise source. *ASE Task Reference: A3 Domain B — Transmission Diagnosis and Repair. Review subsection 3.2.*

7. C — A worn fifth gear synchronizer, worn shift fork, or worn detent mechanism. Jumping out of a specific gear during deceleration is the diagnostic signature of components in that specific gear's circuit. The wear allows the gear to disengage under deceleration loads, but the issue is specific to fifth gear operation. *ASE Task Reference: A3 Domain B — Transmission Diagnosis and Repair. Review subsection 3.2.*
8. A — Transmit input shaft torque through gear sets to drive the output shaft. The countershaft (lay shaft) carries torque from the input shaft through gear sets to the output shaft. The countershaft is the connection between input and output that allows the various gear ratios to be selected. *ASE Task Reference: A3 Domain B — Transmission Diagnosis and Repair. Review subsection 3.2.*
9. D — A worn input shaft bearing or worn pinion bearing in the transaxle. Grinding during acceleration that varies with engine speed is the diagnostic signature of bearing wear in the engine-driven side of the transaxle. The input shaft bearing or transaxle pinion bearing produces this exact pattern. *ASE Task Reference: A3 Domain B — Transmission Diagnosis and Repair. Review subsection 3.2.*
10. B — Remove the fill plug and verify the fluid level reaches the bottom of the fill hole. Manual transmission fluid level on transmissions equipped with a fill plug is verified by removing the plug and checking that fluid is at the level of the plug hole. Visual inspection through the case and scan tool readings are not standard. *ASE Task Reference: A3 Domain B — Transmission Diagnosis and Repair. Review subsection 3.2.*
11. C — A worn or damaged universal joint, worn slip yoke spline, or driveshaft imbalance under load. Driveshaft vibration during acceleration but not deceleration is load-dependent, indicating components that are loaded during acceleration. Universal joints, slip yoke splines, and driveshaft imbalance all become more pronounced under acceleration loads. *ASE Task Reference: A3 Domain C — Driveshaft and Universal Joint/CV Joint Diagnosis and Repair. Review subsection 3.3.*
12. A — Verify driveshaft runout and check for balance weights, then perform balance correction per the manufacturer's specification. Driveshaft balance verification requires runout measurement and inspection of balance weights. Balance correction must follow the manufacturer's specification for accurate results. *ASE Task Reference: A3 Domain C — Driveshaft and Universal Joint/CV Joint Diagnosis and Repair. Review subsection 3.3.*
13. D — A worn or damaged inner CV joint allowing axial play during acceleration. Inner CV joint clicking during straight-line acceleration is the diagnostic signature of inner CV joint wear, where the joint allows axial play under acceleration loads. The clicking pattern matches the joint articulation cycle. *ASE Task Reference: A3 Domain C — Driveshaft and Universal Joint/CV Joint Diagnosis and Repair. Review subsection 3.3.*

14. B — Allow the driveshaft to transmit torque while accommodating angular changes between the transmission output and rear axle. The universal joint's primary function is to transmit torque while accommodating the angular changes that occur as the rear axle moves up and down with suspension travel. Without the joint, the driveshaft could not transmit torque through the changing geometry. *ASE Task Reference: A3 Domain C — Driveshaft and Universal Joint/CV Joint Diagnosis and Repair. Review subsection 3.3.*
15. A — Improper driveshaft phasing during reassembly, missing or improperly installed balance weights, or universal joint binding from improper installation. Driveshaft vibration after recent service is the diagnostic signature of installation errors. Improper phasing, missing or improperly installed weights, or joint binding from incorrect installation all produce post-service vibration. *ASE Task Reference: A3 Domain C — Driveshaft and Universal Joint/CV Joint Diagnosis and Repair. Review subsection 3.3.*
16. C — Press the joint in squarely using a proper installation tool, verify free rotation without binding, and apply specified grease. Universal joint installation requires proper installation tool, verification of free rotation, and proper greasing. Hammer installation and improper tools damage the joint and produce immediate failure. *ASE Task Reference: A3 Domain C — Driveshaft and Universal Joint/CV Joint Diagnosis and Repair. Review subsection 3.3.*
17. D — Increase pinion preload to specification by tightening the pinion nut while maintaining proper alignment. Pinion preload below specification means the bearings are too loose, which produces noise, premature wear, and improper gear mesh. Tightening the pinion nut while maintaining alignment brings preload to specification. *ASE Task Reference: A3 Domain D — Drive Axle Diagnosis and Repair. Review subsection 3.4.*
18. B — Mount a dial indicator on the ring gear, hold the pinion stationary, rock the ring gear back and forth, and read the total movement. Ring gear backlash measurement requires holding the pinion stationary and rocking the ring gear, with the dial indicator reading the total movement. This isolates the ring gear movement from any pinion contribution. *ASE Task Reference: A3 Domain D — Drive Axle Diagnosis and Repair. Review subsection 3.4.*
19. A — Move the ring gear toward the pinion by adjusting the carrier shims to reduce backlash to specification. Backlash above specification means the gears have too much clearance. Moving the ring gear toward the pinion through carrier shim adjustment reduces backlash to the specified range. *ASE Task Reference: A3 Domain D — Drive Axle Diagnosis and Repair. Review subsection 3.4.*
20. C — Apply marking compound to the ring gear teeth, rotate the assembly, and inspect the contact pattern position relative to the tooth profile. Pinion depth verification uses marking compound on the ring gear teeth. Rotating the assembly leaves a contact pattern that reveals whether the pinion is at the correct depth — too shallow shifts the pattern toward the toe, too deep shifts it toward the

heel. *ASE Task Reference: A3 Domain D — Drive Axle Diagnosis and Repair. Review subsection 3.4.*

21. D — A worn shift mechanism, low fluid level, or stuck range shift collar in the transfer case. Grinding when shifting into low range with normal high range operation isolates the issue to the low range shift mechanism. Worn shift components, low fluid, or stuck collar all produce this specific symptom. *ASE Task Reference: A3 Domain E — Four-Wheel Drive/All-Wheel Drive Component Diagnosis and Repair. Review subsection 3.5.*
22. B — Provide additional torque multiplication for off-road and low-speed operation, with reduced output speed. The transfer case low range gear provides additional torque multiplication for low-speed and off-road conditions. The reduced output speed allows the engine to operate at higher RPM while the vehicle moves slowly, providing maximum torque at the wheels. *ASE Task Reference: A3 Domain E — Four-Wheel Drive/All-Wheel Drive Component Diagnosis and Repair. Review subsection 3.5.*
23. A — A failed transfer case shift switch, open circuit in the switch wiring, or failed transfer case control module. With the control module not commanding the shift, the issue must be in the input chain. The shift switch, switch wiring, or the module itself are the most likely failure points. *ASE Task Reference: A3 Domain E — Four-Wheel Drive/All-Wheel Drive Component Diagnosis and Repair. Review subsection 3.5.*
24. C — Verify the shift switch operation, check transfer case control module commands, inspect the shift motor operation, and verify proper actuator response. Electronic transfer case shift diagnosis requires systematic verification of the entire chain: switch, control module commands, shift motor operation, and actuator response. Each step isolates a different potential cause. *ASE Task Reference: A3 Domain E — Four-Wheel Drive/All-Wheel Drive Component Diagnosis and Repair. Review subsection 3.5.*
25. B — A worn AWD coupling clutch pack, intermittent electrical fault in the coupling control circuit, or contaminated coupling fluid. Intermittent loss of AWD function on an electronically controlled clutch-pack coupling has multiple potential causes. Worn clutch material, electrical faults, or contamination all produce intermittent symptoms. *ASE Task Reference: A3 Domain E — Four-Wheel Drive/All-Wheel Drive Component Diagnosis and Repair. Review subsection 3.5.*
26. B — Provide variable torque distribution between the front and rear axles based on commands from the AWD control module. Electronically controlled AWD coupling clutch packs provide variable torque distribution based on AWD module commands. Unlike viscous couplings (which respond passively to speed differential), these couplings respond actively to commanded distribution. *ASE Task Reference: A3 Domain E — Four-Wheel Drive/All-Wheel Drive Component Diagnosis and Repair. Review subsection 3.5.*
27. A — Normal operation since 4WD high range locks the front and rear axles together, and binding occurs during turns on high-traction surfaces. 4WD high range mechanically locks the front and

rear axles, preventing speed differential between them. On dry pavement during slow tight turns, the lack of speed differential produces driveline binding — this is normal for the system, not a fault. *ASE Task Reference: A3 Domain E — Four-Wheel Drive/All-Wheel Drive Component Diagnosis and Repair. Review subsection 3.5.*

28. C — Perform a road test that exercises front-rear speed differential, observe the response of the coupling, and verify proper torque distribution under varied conditions. Viscous coupling testing requires real-world conditions that exercise the coupling's response to speed differential. Road testing verifies proper coupling operation under realistic driving conditions. *ASE Task Reference: A3 Domain E — Four-Wheel Drive/All-Wheel Drive Component Diagnosis and Repair. Review subsection 3.5.*
29. D — A failed disconnect actuator, electrical fault in the actuator circuit, or stuck disconnect collar. An axle disconnect that cannot engage indicates the engagement mechanism is not responding to commands. Actuator failure, electrical fault, or stuck collar prevent the engagement from occurring. *ASE Task Reference: A3 Domain E — Four-Wheel Drive/All-Wheel Drive Component Diagnosis and Repair. Review subsection 3.5.*
30. B — Verify the actuator commands and operation through scan tool data, observe the disconnect mechanism action, and verify proper engagement and disengagement. Axle disconnect verification requires scan tool monitoring of commands, observation of mechanism action, and verification of proper engagement/disengagement. This systematic approach identifies the specific issue. *ASE Task Reference: A3 Domain E — Four-Wheel Drive/All-Wheel Drive Component Diagnosis and Repair. Review subsection 3.5.*
31. A — A worn axle bearing on the side that bears more load during cornering, with the load shift exposing the wear. Axle bearing noise that varies with cornering is the diagnostic signature of bearing wear that becomes apparent under the cornering load shift. The bearing produces more noise when loaded during cornering. *ASE Task Reference: A3 Domain D — Drive Axle Diagnosis and Repair. Review subsection 3.4.*
32. C — Remove the axle and inspect the bearing for play, roughness, and wear, then verify proper preload during reassembly. Axle bearing inspection requires axle removal and direct inspection for play, roughness, and wear. Reassembly with proper preload restores correct bearing operation. *ASE Task Reference: A3 Domain D — Drive Axle Diagnosis and Repair. Review subsection 3.4.*
33. D — Filling with manufacturer-specified fluid and quantity, performing a careful initial start, and verifying proper operation in all modes. Post-overhaul transfer case verification requires correct fluid, careful initial start, and verification in all operating modes. Each mode must function correctly before returning the vehicle to service. *ASE Task Reference: A3 Domain E — Four-Wheel Drive/All-Wheel Drive Component Diagnosis and Repair. Review subsection 3.5.*
34. B — Disconnect the transfer case output from both the front and rear drive shafts, allowing the vehicle to be towed without driving the drivetrain. The transfer case neutral position disconnects

the output from both drive shafts, allowing flat-towing of the vehicle without driving the drivetrain components. This is essential for proper recreational towing. *ASE Task Reference: A3 Domain E — Four-Wheel Drive/All-Wheel Drive Component Diagnosis and Repair. Review subsection 3.5.*

35. A — Excessive backlash in the rear axle (gear lash) or worn driveline components allowing movement during torque reversal. Clunk during torque reversal between drive and neutral is the diagnostic signature of slack in the driveline, where worn components or excessive gear lash allow movement during the torque change. Each torque reversal produces an audible clunk. *ASE Task Reference: A3 Domain D — Drive Axle Diagnosis and Repair. Review subsection 3.4.*
36. C — Use the carrier bearing shim adjustment to provide specified rotational drag through the carrier bearings, comparing to the manufacturer's specification. Differential carrier bearing preload is set through shim adjustment, with the rotational drag measured against specification. Proper preload is critical for bearing life and gear mesh. *ASE Task Reference: A3 Domain D — Drive Axle Diagnosis and Repair. Review subsection 3.4.*
37. D — The pinion nut torque sets the pinion bearing preload, and incorrect torque produces either insufficient preload (resulting in pinion movement) or excessive preload (resulting in bearing failure). The pinion nut sets the pinion bearing preload, which determines bearing life and gear mesh accuracy. Incorrect torque produces either too-loose preload (allowing pinion movement) or too-tight preload (causing bearing failure). *ASE Task Reference: A3 Domain D — Drive Axle Diagnosis and Repair. Review subsection 3.4.*
38. B — Allow the front and rear axles to rotate at different speeds during cornering while still distributing engine torque to both axles. The center differential's primary function is to allow speed differential between the front and rear axles during cornering while still distributing engine torque. This balance is essential for proper AWD operation on hard surfaces. *ASE Task Reference: A3 Domain E — Four-Wheel Drive/All-Wheel Drive Component Diagnosis and Repair. Review subsection 3.5.*
39. A — A worn shift linkage, binding shift mechanism, or improperly adjusted shift fork in the transfer case. A hard-to-move transfer case lever indicates the shift mechanism is binding or worn. Shift linkage wear, mechanism binding, or improperly adjusted shift fork all produce this symptom. *ASE Task Reference: A3 Domain E — Four-Wheel Drive/All-Wheel Drive Component Diagnosis and Repair. Review subsection 3.5.*
40. C — Perform a road test that includes acceleration in 4WD high range and 4WD low range, verify proper torque distribution and shift quality, and inspect for any binding or noise. Transfer case 4WD verification requires road testing in both high and low range, with attention to torque distribution, shift quality, and any binding or noise. Each operating mode must be exercised for complete verification. *ASE Task Reference: A3 Domain E — Four-Wheel Drive/All-Wheel Drive Component Diagnosis and Repair. Review subsection 3.5.*