PRACTICE EXAM 3: A3 SIMULATION — MANUAL DRIVE TRAIN AND AXLES

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1. A clutch friction disc removed during inspection shows oil contamination on both sides. The MOST appropriate action is to:

A. Replace the friction disc and identify and repair the source of the oil contamination

B. Clean the disc with solvent and reinstall

C. Reuse the disc with new pressure plate

D. Apply additional clamping pressure to compensate

2. The proper procedure for measuring clutch pedal free play is to:

A. Apply the parking brake and depress the pedal fully

B. Operate the engine at idle and observe pedal position

C. Push the pedal down by hand until resistance is felt and measure the travel distance

D. Apply 50 pounds of force and measure pedal deflection

3. A vehicle has been brought in with a complaint of clutch chatter that occurs only when starting from a stop on an incline. On level ground the clutch operates smoothly. The MOST likely cause is:

A. Air in the clutch hydraulic system

B. A worn or contaminated friction disc that produces chatter under heavy initial load

C. A worn pilot bearing

D. A failed clutch master cylinder

4. The proper purpose of the clutch pressure plate diaphragm spring is to:

A. Generate hydraulic pressure for clutch operation

B. Support the transmission input shaft

C. Allow the clutch to engage when the pedal is depressed

D. Apply clamping force to hold the friction disc against the flywheel

5. A manual transmission produces a noise that varies with engine speed in neutral but disappears completely when any gear is engaged. The MOST likely cause is:

A. A worn input shaft bearing

B. A worn output shaft bearing

C. A worn pilot bearing

D. A failed clutch master cylinder

6. A manual transmission has been disassembled for overhaul. The technician finds visible bluing on a synchronizer cone surface. The MOST likely cause is:

A. Coolant contamination of the transmission fluid

B. Normal wear consistent with vehicle mileage

C. Air contamination from a recent service

D. Excessive heat from prolonged synchronizer slippage during shifts

7. The proper procedure for inspecting manual transmission gears during overhaul is to:

A. Replace all gears as a precautionary measure

B. Inspect each gear for tooth wear, pitting, chipping, and surface condition, comparing to manufacturer's specifications

C. Apply hard-facing material to any worn areas

D. Reuse all gears after cleaning with solvent

8. A vehicle equipped with a two-piece driveshaft produces a vibration that occurs only at highway speeds. The driveshaft has been recently serviced. The MOST likely cause is:

A. A failed pilot bearing

B. Air in the clutch hydraulic system

C. A worn or improperly preloaded center support bearing, or improper driveshaft phasing during assembly

D. A worn input shaft bearing

9. The proper purpose of a two-piece driveshaft's center support bearing is to:

A. Generate hydraulic pressure for the driveshaft

B. Filter contaminants from the differential fluid

C. Drive the driveshaft during operation

D. Support the driveshaft at its midpoint, allowing two shorter shafts to be used in place of one long shaft on long-wheelbase vehicles

10. A vehicle exhibits a complaint of vibration that increases with vehicle speed and is most pronounced under load. The MOST likely cause is:

A. A failed pilot bearing

B. A driveline angle problem or improperly aligned u-joint working angles

C. Air in the clutch hydraulic system

D. A worn input shaft bearing

11. The proper procedure for measuring driveline angles is to:

A. Apply compressed air to the driveshaft

B. Replace the driveshaft as a precautionary measure

C. Use a digital or magnetic inclinometer at the transmission output, driveshaft, and pinion to measure each angle, then verify the working angles are within specification

D. Visually estimate the angles

12. A vehicle's CV joint boot has been damaged, allowing grease loss and contamination of the joint. The vehicle has only recently been driven with the damaged boot. The MOST appropriate action is to:

A. Replace the boot, inspect and clean the joint, repack with proper grease, and verify joint condition before reuse

B. Apply additional grease through the boot opening

C. Replace the entire halfshaft as a precautionary measure

D. Apply silicone sealant to the boot damage

13. The proper purpose of a constant velocity (CV) joint is to:

A. Generate hydraulic pressure for the driveline

B. Filter contaminants from the differential fluid

C. Drive the differential ring gear directly

D. Allow the front halfshaft to transmit torque while accommodating both angle changes (steering) and length changes (suspension travel)

14. A vehicle has been brought in with a complaint of a clunking noise that occurs only when shifting from drive to reverse. The MOST likely cause is:

A. A failed pilot bearing

B. Excessive driveline play from worn universal joints, worn driveshaft slip yoke, worn motor mounts, or worn differential components

C. Air in the clutch hydraulic system

D. A worn input shaft bearing

15. The proper procedure for installing a new CV joint boot is to:

A. Heat the boot to expand it before installation

B. Apply RTV silicone to the boot mating surfaces

C. Drive the boot in with a hammer

D. Pack the joint with the specified grease, install the boot squarely on both ends, and secure with the appropriate clamps per manufacturer's specification

16. A drive axle pinion bearing preload reading is checked using a dial-type torque indicator. The reading must be taken:

A. With the pinion seal removed and any oil seals not contributing to the drag, with the pinion rotating slowly through several revolutions

B. With the pinion stationary

C. With the pinion at maximum rotation speed

D. After applying compressed air to the pinion bearings

17. The proper procedure for performing a final drive axle setup is to:

A. Apply maximum torque to all components

B. Replace the ring and pinion as a precautionary measure

C. Set pinion depth, set pinion preload, set carrier bearing preload, set ring gear backlash, then verify the contact pattern with marking compound

D. Apply compressed air to the differential

18. A drive axle ring gear and pinion contact pattern shows the contact is centered on the ring gear teeth but offset toward the toe (inner edge) of each tooth. The MOST likely cause is:

A. A failed pilot bearing

B. The pinion is set too shallow (not far enough into the ring gear)

C. Air in the clutch hydraulic system

D. A worn input shaft bearing

19. The proper procedure for adjusting drive axle pinion depth on a setup that uses a pinion shim is to:

A. Apply maximum torque to the pinion nut

B. Apply compressed air to the pinion bearings

C. Replace the ring and pinion as a precautionary measure

D. Replace the pinion shim with a thicker or thinner shim as needed to move the pinion into the proper depth, then verify with the contact pattern

20. A drive axle ring gear and pinion contact pattern shows the contact is centered on the ring gear teeth but offset toward the heel (outer edge) of each tooth. The MOST likely cause is:

A. A failed pilot bearing

B. Air in the clutch hydraulic system

C. The pinion is set too deep (too far into the ring gear)

D. A worn input shaft bearing

21. Technician A says drive axle pinion preload that is too tight will cause premature pinion bearing failure. Technician B says drive axle pinion preload that is too loose will allow pinion movement under load and produce noise. Who is correct?

A. Both Technician A and Technician B

B. Technician A only

C. Technician B only

D. Neither Technician A nor Technician B

22. The proper purpose of differential side gears is to:

A. Generate hydraulic pressure for the differential

B. Drive the ring gear during operation

C. Filter contaminants from the differential fluid

D. Drive the axle shafts when the differential is operating, while allowing the axle shafts to rotate at different speeds during cornering

23. A vehicle equipped with a transfer case that uses an electric motor for shift control exhibits a complaint of failure to shift between modes. The shift motor can be heard operating but no shift occurs. The MOST likely cause is:

A. A failed pilot bearing

B. A worn shift mechanism inside the transfer case, broken shift fork, or stuck collar

C. Air in the clutch hydraulic system

D. A worn input shaft bearing

24. The proper procedure for diagnosing a transfer case fluid leak is to:

A. Verify the leak source through visual inspection, identify the failed seal or gasket, and replace the affected component using the manufacturer's specified procedure

B. Apply additional sealant to the suspected leak area

C. Replace the transfer case as a precautionary measure

D. Apply compressed air to the transfer case

25. A vehicle equipped with a Haldex-type AWD coupling exhibits a complaint of intermittent loss of AWD function. 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 or contaminated coupling fluid, worn clutch pack, or electrical fault in the coupling control circuit

26. The proper purpose of a Haldex-type AWD coupling is to:

A. Generate hydraulic pressure for the AWD system

B. Drive the AWD system input shaft directly

C. Provide variable torque distribution to the rear axle through an electronically controlled clutch pack, with the coupling typically located at the rear differential

D. Filter contaminants from the AWD fluid

27. A vehicle equipped with a transfer case in 2WD mode exhibits a complaint of vibration during acceleration. The vibration disappears in 4WD mode. The MOST likely cause is:

A. A failed pilot bearing

B. A worn front axle disconnect mechanism, worn front halfshaft, or improperly disengaged front axle creating drag during 2WD operation

C. Air in the clutch hydraulic system

D. A worn input shaft bearing

28. The proper procedure for verifying transfer case shift fork operation during overhaul is to:

A. Inspect each shift fork for wear, alignment, and proper operation, then verify proper engagement with the corresponding clutch sleeve or collar

B. Replace all shift forks as a precautionary measure

C. Apply compressed air to the shift forks

D. Visually inspect for visible damage only

29. A vehicle equipped with a manual transmission and front-wheel drive produces a clicking noise during sharp left turns. The noise is more pronounced under load. The MOST likely cause is:

A. A failed pilot bearing

B. Air in the clutch hydraulic system

C. A worn outer CV joint on the right side (which is loaded during left turns)

D. A worn input shaft bearing

30. The proper procedure for inspecting a halfshaft during service is to:

A. Replace the halfshaft as a precautionary measure

B. Inspect the boots for damage, the joints for play and noise, the shaft for damage or runout, and verify proper operation through manipulation

C. Apply compressed air to the halfshaft

D. Visually inspect through the halfshaft cover

31. A vehicle is brought in with a complaint of grinding noise from the front axle during 4WD operation. The noise is not present in 2WD. 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 front axle ring and pinion, worn front axle bearings, or worn front halfshaft components

32. The proper purpose of an axle disconnect mechanism on a 4WD vehicle is to:

A. Generate hydraulic pressure for the AWD system

B. Drive the AWD system input shaft directly

C. Disconnect the front axle from the front drive shaft during 2WD operation, eliminating drivetrain drag and improving fuel economy

D. Filter contaminants from the AWD fluid

33. A vehicle equipped with a chain-drive transfer case has been disassembled for service. The technician finds visible wear on the chain sprockets. The MOST appropriate action is to:

A. Replace the chain and both sprockets as a complete matched set

B. Reuse the sprockets with a new chain only

C. Apply hard-facing material to the worn sprocket teeth

D. Apply additional grease to compensate for the wear

34. The proper procedure for verifying transfer case chain tension during overhaul is to:

A. Apply maximum tension to the chain

B. Replace the chain as a precautionary measure

C. Verify the chain tension is within manufacturer's specification using the proper measurement method

D. Apply compressed air to the chain

35. A vehicle is brought in with a complaint of a humming noise that varies with vehicle speed and changes pitch when cornering. The noise is most pronounced during gentle cornering. The MOST likely cause is:

A. A failed pilot bearing

B. A worn wheel bearing or axle bearing where the bearing condition becomes apparent under cornering load

C. Air in the clutch hydraulic system

D. A worn input shaft bearing

36. The proper procedure for verifying wheel bearing condition is to:

A. Raise the wheel, attempt to rock it manually for play, spin it for roughness, and listen for noise during operation

B. Apply compressed air to the bearing

C. Replace the bearing as a precautionary measure

D. Visually inspect through the bearing seal

37. Technician A says a worn pinion bearing produces a noise that varies with vehicle speed and may be present in any drive mode. Technician B says a worn pinion bearing produces noise only during cornering. Who is correct?

A. Both Technician A and Technician B

B. Technician B only

C. Neither Technician A nor Technician B

D. Technician A only

38. The proper procedure for verifying the working angles of a driveshaft's universal joints is to:

A. Apply compressed air to the joints

B. Measure the angle of the transmission output, the driveshaft, and the pinion using an inclinometer, then calculate the working angles at each joint to verify they are within manufacturer's specification

C. Replace the universal joints as a precautionary measure

D. Visually estimate the angles

39. A vehicle's drive axle pinion seal has been replaced. After installation, the technician notices the pinion shaft has approximately 1/8 inch of axial play. The MOST likely cause is:

A. A failed pilot bearing

B. Air in the clutch hydraulic system

C. The pinion nut has not been tightened to specification, resulting in inadequate pinion bearing preload

D. A worn input shaft bearing

40. The proper purpose of a halfshaft inboard CV joint is to:

A. Allow the halfshaft to transmit torque while accommodating length changes during suspension travel

B. Generate hydraulic pressure for the AWD system

C. Drive the differential ring gear directly

D. Filter contaminants from the differential fluid

PRACTICE EXAM 3: A3 SIMULATION — ANSWER KEY, EXPLANATIONS, AND TASK REMEDIATION

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1. A — Replace the friction disc and identify and repair the source of the oil contamination. Oil contamination ruins the friction disc beyond reuse, and reinstalling without addressing the source guarantees repeat failure. The repair must include both component replacement and source elimination. *ASE Task Reference: A3 Domain A — Clutch Diagnosis and Repair. Review subsection 3.1.*

2. C — Push the pedal down by hand until resistance is felt and measure the travel distance. Clutch pedal free play is the distance the pedal moves before resistance from the release system begins. Manual measurement of this travel distance against specification verifies proper free play adjustment. *ASE Task Reference: A3 Domain A — Clutch Diagnosis and Repair. Review subsection 3.1.*

3. B — A worn or contaminated friction disc that produces chatter under heavy initial load. Chatter that occurs only on inclines indicates the friction disc cannot maintain smooth engagement under the higher initial load. Wear or contamination becomes apparent under heavy load conditions but is masked under light load. *ASE Task Reference: A3 Domain A — Clutch Diagnosis and Repair. Review subsection 3.1.*

4. D — Apply clamping force to hold the friction disc against the flywheel. The diaphragm spring's primary function is to apply continuous clamping force to hold the friction disc against the flywheel during normal operation. When the pedal is depressed, the release bearing opposes this force to release the disc. *ASE Task Reference: A3 Domain A — Clutch Diagnosis and Repair. Review subsection 3.1.*

5. A — A worn input shaft bearing. Noise in neutral that disappears in any gear is the diagnostic signature of input shaft bearing wear. In neutral the input shaft is rotating but not loaded; engaging any gear changes the load path and silences the bearing noise. *ASE Task Reference: A3 Domain B — Transmission Diagnosis and Repair. Review subsection 3.2.*

6. D — Excessive heat from prolonged synchronizer slippage during shifts. Bluing on synchronizer surfaces is the diagnostic signature of thermal damage from prolonged slippage during shifts. The heat exceeds the material's design temperature, producing the visible bluing. *ASE Task Reference: A3 Domain B — Transmission Diagnosis and Repair. Review subsection 3.2.*

7. B — Inspect each gear for tooth wear, pitting, chipping, and surface condition, comparing to manufacturer's specifications. Gear inspection requires systematic evaluation against specification for wear, pitting, chipping, and surface condition. Each finding determines whether the gear can be reused or must be replaced. *ASE Task Reference: A3 Domain B — Transmission Diagnosis and Repair. Review subsection 3.2.*

8. C — A worn or improperly preloaded center support bearing, or improper driveshaft phasing during assembly. Two-piece driveshaft vibration at highway speeds, especially after recent service, points to center support bearing issues or phasing errors. Both are common service-related causes. *ASE Task Reference: A3 Domain C — Driveshaft and Universal Joint/CV Joint Diagnosis and Repair. Review subsection 3.3.*

9. D — Support the driveshaft at its midpoint, allowing two shorter shafts to be used in place of one long shaft on long-wheelbase vehicles. The center support bearing supports the driveshaft midpoint on two-piece designs, allowing shorter shafts to be used. Without the center support, longer shafts would experience excessive deflection and resonance. *ASE Task Reference: A3 Domain C — Driveshaft and Universal Joint/CV Joint Diagnosis and Repair. Review subsection 3.3.*

10. B — A driveline angle problem or improperly aligned u-joint working angles. Vibration that increases with speed and is most pronounced under load is the diagnostic signature of driveline angle issues. Improper working angles produce the cyclical loading that manifests as vibration under load. *ASE Task Reference: A3 Domain C — Driveshaft and Universal Joint/CV Joint Diagnosis and Repair. Review subsection 3.3.*

11. C — Use a digital or magnetic inclinometer at the transmission output, driveshaft, and pinion to measure each angle, then verify the working angles are within specification. Driveline angle measurement requires inclinometer readings at each shaft, then calculation of working angles at each joint. The working angles must be within specification for vibration-free operation. *ASE Task Reference: A3 Domain C — Driveshaft and Universal Joint/CV Joint Diagnosis and Repair. Review subsection 3.3.*

12. A — Replace the boot, inspect and clean the joint, repack with proper grease, and verify joint condition before reuse. CV joint service after boot damage requires complete cleanup, inspection of the joint condition, repacking with proper grease, and verification before reuse. If the joint shows damage, replacement is required. *ASE Task Reference: A3 Domain C — Driveshaft and Universal Joint/CV Joint Diagnosis and Repair. Review subsection 3.3.*

13. D — Allow the front halfshaft to transmit torque while accommodating both angle changes (steering) and length changes (suspension travel). The CV joint accommodates both angular changes (from steering) and length changes (from suspension travel) while maintaining constant velocity output. This dual function is essential for FWD applications. *ASE Task Reference: A3 Domain C — Driveshaft and Universal Joint/CV Joint Diagnosis and Repair. Review subsection 3.3.*

14. B — Excessive driveline play from worn universal joints, worn driveshaft slip yoke, worn motor mounts, or worn differential components. Clunk during torque reversal between drive and reverse is the diagnostic signature of slack in the driveline. Worn joints, slip yokes, mounts, or differential components all allow movement during the torque reversal. *ASE Task Reference: A3 Domain C — Driveshaft and Universal Joint/CV Joint Diagnosis and Repair. Review subsection 3.3.*

15. D — Pack the joint with the specified grease, install the boot squarely on both ends, and secure with the appropriate clamps per manufacturer's specification. CV joint boot installation requires proper grease packing, square boot installation on both ends, and proper clamp installation. Incorrect installation produces immediate boot failure or grease loss. *ASE Task Reference: A3 Domain C — Driveshaft and Universal Joint/CV Joint Diagnosis and Repair. Review subsection 3.3.*

16. A — With the pinion seal removed and any oil seals not contributing to the drag, with the pinion rotating slowly through several revolutions. Pinion preload measurement must isolate the bearing drag from any seal drag. Proper procedure removes seal contributions and rotates the pinion through several revolutions for an accurate reading. *ASE Task Reference: A3 Domain D — Drive Axle Diagnosis and Repair. Review subsection 3.4.*

17. C — Set pinion depth, set pinion preload, set carrier bearing preload, set ring gear backlash, then verify the contact pattern with marking compound. Drive axle setup follows a specific sequence: depth, preload, carrier preload, backlash, then contact pattern verification. Each step must be completed correctly before the next. *ASE Task Reference: A3 Domain D — Drive Axle Diagnosis and Repair. Review subsection 3.4.*

18. B — The pinion is set too shallow (not far enough into the ring gear). A contact pattern offset toward the toe (inner edge) of the tooth indicates the pinion is too shallow. Moving the pinion deeper through shim adjustment shifts the pattern toward the center of the tooth. *ASE Task Reference: A3 Domain D — Drive Axle Diagnosis and Repair. Review subsection 3.4.*

19. D — Replace the pinion shim with a thicker or thinner shim as needed to move the pinion into the proper depth, then verify with the contact pattern. Pinion depth adjustment uses pinion shim selection. Thicker shims push the pinion outward (less deep); thinner shims allow the pinion to move inward (deeper). Verification with marking compound confirms proper depth. *ASE Task Reference: A3 Domain D — Drive Axle Diagnosis and Repair. Review subsection 3.4.*

20. C — The pinion is set too deep (too far into the ring gear). A contact pattern offset toward the heel (outer edge) of the tooth indicates the pinion is too deep. Moving the pinion outward through shim adjustment shifts the pattern toward the center. *ASE Task Reference: A3 Domain D — Drive Axle Diagnosis and Repair. Review subsection 3.4.*

21. A — Both Technician A and Technician B. Excessive pinion preload causes premature bearing failure from the constant high load (correct), and insufficient preload allows pinion movement under load that produces noise (correct). Both observations describe accurate consequences of

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

22. D — Drive the axle shafts when the differential is operating, while allowing the axle shafts to rotate at different speeds during cornering. The differential side gears connect to the axle shafts and drive them during operation. The differential design allows the side gears to rotate at different speeds during cornering, which is essential for proper axle operation. *ASE Task Reference: A3 Domain D — Drive Axle Diagnosis and Repair. Review subsection 3.4.*

23. B — A worn shift mechanism inside the transfer case, broken shift fork, or stuck collar. With the shift motor operating but no shift occurring, the issue is in the mechanical shift mechanism inside the transfer case. Worn mechanism, broken shift fork, or stuck collar prevent the shift motor's action from completing the mode change. *ASE Task Reference: A3 Domain E — Four-Wheel Drive/All-Wheel Drive Component Diagnosis and Repair. Review subsection 3.5.*

24. A — Verify the leak source through visual inspection, identify the failed seal or gasket, and replace the affected component using the manufacturer's specified procedure. Transfer case leak diagnosis requires identification of the source through visual inspection. The failed seal or gasket must be replaced using the manufacturer's procedure to ensure proper repair. *ASE Task Reference: A3 Domain E — Four-Wheel Drive/All-Wheel Drive Component Diagnosis and Repair. Review subsection 3.5.*

25. D — Worn or contaminated coupling fluid, worn clutch pack, or electrical fault in the coupling control circuit. Haldex coupling intermittent failure has multiple potential causes. Worn fluid, worn clutch material, or electrical fault each can produce intermittent symptoms that defy single-component diagnosis. *ASE Task Reference: A3 Domain E — Four-Wheel Drive/All-Wheel Drive Component Diagnosis and Repair. Review subsection 3.5.*

26. C — Provide variable torque distribution to the rear axle through an electronically controlled clutch pack, with the coupling typically located at the rear differential. Haldex couplings provide variable torque distribution to the rear axle through an electronically controlled clutch pack. The coupling is typically located at the rear differential, distinguishing it from other AWD designs. *ASE Task Reference: A3 Domain E — Four-Wheel Drive/All-Wheel Drive Component Diagnosis and Repair. Review subsection 3.5.*

27. B — A worn front axle disconnect mechanism, worn front halfshaft, or improperly disengaged front axle creating drag during 2WD operation. Vibration in 2WD that disappears in 4WD indicates issues in the front axle that are exposed when the front axle is partially engaged. Worn disconnect, halfshaft, or improper disengagement produces this exact pattern. *ASE Task Reference: A3 Domain E — Four-Wheel Drive/All-Wheel Drive Component Diagnosis and Repair. Review subsection 3.5.*

28. A — Inspect each shift fork for wear, alignment, and proper operation, then verify proper engagement with the corresponding clutch sleeve or collar. Shift fork verification requires inspection for wear, alignment check, and verification of proper engagement with the

corresponding sleeve or collar. Each fork must function correctly for proper shift operation. *ASE Task Reference: A3 Domain E — Four-Wheel Drive/All-Wheel Drive Component Diagnosis and Repair. Review subsection 3.5.*

29. C — A worn outer CV joint on the right side (which is loaded during left turns). Clicking during sharp left turns is the diagnostic signature of right outer CV joint wear, since the right joint is loaded during left turns. The pattern matches the joint articulation under cornering load. *ASE Task Reference: A3 Domain C — Driveshaft and Universal Joint/CV Joint Diagnosis and Repair. Review subsection 3.3.*

30. B — Inspect the boots for damage, the joints for play and noise, the shaft for damage or runout, and verify proper operation through manipulation. Halfshaft inspection requires multiple checks: boots for damage and contamination, joints for play and noise, shaft for damage or runout, and operational verification through manipulation. *ASE Task Reference: A3 Domain C — Driveshaft and Universal Joint/CV Joint Diagnosis and Repair. Review subsection 3.3.*

31. D — A worn or damaged front axle ring and pinion, worn front axle bearings, or worn front halfshaft components. Grinding noise from the front axle in 4WD that is absent in 2WD localizes the issue to front axle components that engage only in 4WD operation. Ring and pinion, axle bearings, or halfshaft components are the most likely sources. *ASE Task Reference: A3 Domain E — Four-Wheel Drive/All-Wheel Drive Component Diagnosis and Repair. Review subsection 3.5.*

32. C — Disconnect the front axle from the front drive shaft during 2WD operation, eliminating drivetrain drag and improving fuel economy. The axle disconnect's primary function is to disconnect the front axle from the front drive shaft during 2WD, eliminating the drag that the front drivetrain would otherwise create. This significantly improves 2WD fuel economy. *ASE Task Reference: A3 Domain E — Four-Wheel Drive/All-Wheel Drive Component Diagnosis and Repair. Review subsection 3.5.*

33. A — Replace the chain and both sprockets as a complete matched set. Chain wear typically corresponds to sprocket wear, and replacing only the chain produces premature chain wear from contact with the worn sprockets. Replacement as a matched set ensures proper mesh and chain life. *ASE Task Reference: A3 Domain E — Four-Wheel Drive/All-Wheel Drive Component Diagnosis and Repair. Review subsection 3.5.*

34. C — Verify the chain tension is within manufacturer's specification using the proper measurement method. Chain tension verification requires measurement using the proper method per the manufacturer's specification. The specific measurement procedure varies by application but is critical for proper chain operation. *ASE Task Reference: A3 Domain E — Four-Wheel Drive/All-Wheel Drive Component Diagnosis and Repair. Review subsection 3.5.*

35. B — A worn wheel bearing or axle bearing where the bearing condition becomes apparent under cornering load. A humming noise that varies with vehicle speed and changes during cornering is the diagnostic signature of wheel or axle bearing wear. The bearing condition becomes more

apparent under cornering load as the bearing geometry changes. *ASE Task Reference: A3 Domain D — Drive Axle Diagnosis and Repair. Review subsection 3.4.*

36. A — Raise the wheel, attempt to rock it manually for play, spin it for roughness, and listen for noise during operation. Wheel bearing verification requires raising the wheel, manual rocking for play, spinning for roughness, and listening for noise. This systematic approach identifies multiple aspects of bearing condition. *ASE Task Reference: A3 Domain D — Drive Axle Diagnosis and Repair. Review subsection 3.4.*

37. D — Technician A only. A worn pinion bearing produces noise that varies with vehicle speed and may be present in any drive mode. Pinion bearing wear does not specifically produce cornering-only noise; that pattern is characteristic of axle bearing wear, not pinion bearing wear. *ASE Task Reference: A3 Domain D — Drive Axle Diagnosis and Repair. Review subsection 3.4.*

38. B — Measure the angle of the transmission output, the driveshaft, and the pinion using an inclinometer, then calculate the working angles at each joint to verify they are within manufacturer's specification. U-joint working angle verification requires inclinometer measurements at each shaft, then calculation of the working angle at each joint. The working angles must be within specification for vibration-free operation. *ASE Task Reference: A3 Domain C — Driveshaft and Universal Joint/CV Joint Diagnosis and Repair. Review subsection 3.3.*

39. C — The pinion nut has not been tightened to specification, resulting in inadequate pinion bearing preload. Axial play in the pinion shaft after seal replacement indicates the pinion nut has not been tightened to set proper preload. Without adequate preload, the pinion can move axially, producing noise and accelerated wear. *ASE Task Reference: A3 Domain D — Drive Axle Diagnosis and Repair. Review subsection 3.4.*

40. A — Allow the halfshaft to transmit torque while accommodating length changes during suspension travel. The inboard CV joint accommodates length changes that occur as the suspension travels through its range. The outboard joint primarily accommodates angle changes from steering. Each joint has a specific role in halfshaft operation. *ASE Task Reference: A3 Domain C — Driveshaft and Universal Joint/CV Joint Diagnosis and Repair. Review subsection 3.3.*