PRACTICE EXAM 4: A3 SIMULATION — MANUAL DRIVE TRAIN AND AXLES

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1. A vehicle has been brought in with the following findings: complaint of clutch chatter during engagement, oil contamination visible on the friction disc when removed, oil leak observed at the rear of the engine, and slight burnt odor on the disc. The MOST likely cause is:

A. Adaptive memory not yet cleared after service

B. A failed rear main seal allowing oil to contaminate the friction disc

C. A failed clutch master cylinder

D. A worn input shaft bearing

2. Technician A says clutch hydraulic fluid that appears black or brown indicates contamination from rubber seal degradation that requires complete fluid replacement and inspection. Technician B says clutch fluid color is irrelevant as long as the system functions. 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 a clutch complaint that includes both shift difficulty and pedal abnormality is to:

A. Replace the clutch assembly as the most direct repair

B. Replace the master and slave cylinders simultaneously

C. Verify the customer concern through road test, inspect the hydraulic system for leaks or air, check pedal free play, and inspect the clutch components after isolating the cause

D. Replace the transmission as a precursor to other repairs

4. A vehicle has the following findings: complaint of grinding noise during shifts into multiple gears, manual transmission fluid that appears dark with metallic particles. The MOST likely cause is:

A. Internal mechanical damage with hard parts wear, requiring complete inspection

B. Air in the clutch hydraulic system

C. A failed clutch master cylinder

D. A worn pilot bearing

5. The proper procedure for verifying manual transmission fluid condition is to:

A. Apply compressed air to the fluid

B. Replace the fluid as a precautionary measure

C. Use a scan tool to read fluid condition data

D. Inspect for color, odor, and particulate content, comparing to fresh fluid and noting any abnormalities

6. A manual transmission has been brought in with a complaint of intermittent clutch slip that occurs only when the transmission is fully warm. When cold, the clutch operates normally. The MOST likely cause is:

A. Adaptive memory not yet cleared after service

B. A worn friction disc that becomes apparent when reduced fluid viscosity allows clutch slip under load

C. A failed pilot bearing

D. A failed clutch master cylinder

7. The proper procedure for diagnosing a manual transmission noise complaint where multiple noises are present is to:

A. Replace the transmission as the most direct repair

B. Replace the clutch assembly as a precursor to other repairs

C. Replace the transmission fluid as the only required step

D. Identify each noise individually by its operating conditions, then localize to the specific affected component for each noise source

8. Technician A says a manual transmission produces a noise pattern that varies between operating conditions because different bearings and gears are loaded under different conditions. Technician B says all transmission noises are produced by the same bearing under all conditions. Who is correct?

A. Technician A only

B. Technician B only

C. Both Technician A and Technician B

D. Neither Technician A nor Technician B

9. A vehicle exhibits a complaint of vibration that varies with vehicle speed but disappears when the transmission is shifted into neutral. The MOST likely cause is:

A. A failed pilot bearing

B. Air in the clutch hydraulic system

C. A driveline-related vibration since the driveline is only loaded when the transmission is engaged

D. A worn input shaft bearing

10. The proper procedure for diagnosing a driveline vibration is to:

A. Replace the driveshaft as a precautionary measure

B. Replace the universal joints as the most direct repair

C. Replace the transmission output bearing as a precursor to other repairs

D. Verify the vibration through road test, inspect the driveline for damage, balance issues, working angles, and worn components

11. A vehicle equipped with a two-piece driveshaft has been disassembled for service. The technician finds the center support bearing rubber mount has hardened and cracked. The MOST appropriate action is to:

A. Reuse the bearing assembly with assembly lubricant

B. Replace the center support bearing assembly including the rubber mount

C. Apply silicone sealant to the cracked rubber

D. Reuse the bearing with a different mount

12. The proper purpose of a driveshaft slip yoke 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 driveshaft to change length as the rear axle moves up and down with suspension travel

13. A vehicle equipped with constant velocity (CV) joints exhibits a complaint of vibration during straight-line acceleration. The vibration disappears at cruise. The MOST likely cause is:

A. A worn or damaged inner CV joint allowing vibration during acceleration loads

B. A worn pilot bearing

C. A failed clutch master cylinder

D. Air in the clutch hydraulic system

14. The proper procedure for verifying CV joint operation is to:

A. Apply compressed air to the joint

B. Replace the joint as a precautionary measure

C. Inspect the boot for damage, perform cornering tests for clicking, perform acceleration tests for vibration, and verify joint condition during inspection

D. Visually inspect through the inspection cover

15. A vehicle has been brought in with the following findings: complaint of clunking noise during launch and torque reversals, worn motor mounts visible during inspection, and worn driveshaft slip yoke spline. The MOST likely cause is:

A. A failed pilot bearing

B. Multiple worn driveline components contributing to excessive driveline play

C. Air in the clutch hydraulic system

D. A worn input shaft bearing

16. The proper procedure for inspecting motor mounts during a driveline service is to:

A. Apply compressed air to the mounts

B. Replace the mounts as a precautionary measure

C. Visually inspect for wear only

D. Inspect the mounts for visible damage, separation, fluid leakage, and excessive play during torque application or removal

17. A drive axle has the following findings: pinion seal leak, low fluid level, and worn pinion bearings noted by feel during rotation. The MOST appropriate action is to:

A. Replace the pinion seal, replace the pinion bearings, refill with the correct fluid, verify proper preload, and inspect related components

B. Replace only the pinion seal as the most direct repair

C. Apply additional sealer to the leak

D. Replace the entire drive axle as a precautionary measure

18. The proper procedure for diagnosing a drive axle complaint that includes a fluid leak is to:

A. Apply additional sealer to the leak

B. Replace the drive axle as a precautionary measure

C. Identify the leak source through visual inspection, identify any related component damage, and replace affected components using the manufacturer's procedure

D. Apply compressed air to the differential

19. A vehicle's drive axle pinion has been replaced. The technician notices that the new pinion shim is significantly different from the original pinion shim. The MOST appropriate action is to:

A. Apply maximum torque to the pinion nut

B. Use the new pinion shim as supplied with the new pinion, then verify the pinion depth through contact pattern inspection

C. Reuse the original pinion shim

D. Apply compressed air to the differential

20. The proper procedure for verifying drive axle ring and pinion contact pattern is to:

A. Apply marking compound to the ring gear teeth, rotate the assembly, and inspect the contact pattern position relative to the tooth profile, comparing to manufacturer's specification

B. Apply maximum torque to the ring gear bolts

C. Visually inspect for proper gear mesh

D. Apply compressed air to the differential

21. A drive axle ring gear and pinion contact pattern shows the contact is too high on the ring gear teeth (toward the top of the tooth profile). 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 ring gear is too far from the pinion (excessive backlash)

22. The proper procedure for adjusting drive axle ring gear backlash to specification is to:

A. Apply maximum torque to the ring gear bolts

B. Apply compressed air to the differential

C. Adjust the carrier bearing shims to move the ring gear toward or away from the pinion until backlash is within specification

D. Replace the ring and pinion as a precautionary measure

23. A vehicle equipped with a transfer case has been disassembled for service. The technician finds a stretched chain that exceeds the manufacturer's specification for chain length. The MOST appropriate action is to:

A. Apply hard-facing material to the chain links

B. Replace the chain and matching sprockets as a complete set

C. Reuse the chain after stretching it back to specification

D. Apply compressed air to the chain

24. The proper procedure for verifying transfer case fluid condition during service is to:

A. Apply compressed air to the fluid

B. Replace the fluid as a precautionary measure

C. Inspect the fluid for color, odor, particulate content, and water contamination, then replace the fluid per the manufacturer's specification

D. Use a scan tool to read fluid condition data

25. A vehicle equipped with an electronically controlled AWD coupling has the following findings: complaint of intermittent loss of AWD function, stored DTC for AWD coupling circuit malfunction, and AWD module commanding the coupling normally. The MOST likely cause is:

A. A failed AWD coupling, electrical fault in the coupling circuit, or worn coupling clutch material

B. A failed pilot bearing

C. Air in the clutch hydraulic system

D. A worn input shaft bearing

26. The proper procedure for diagnosing an electronic AWD system fault is to:

A. Replace the AWD coupling as the most direct repair

B. Replace the AWD module as a precursor to other repairs

C. Replace the transmission fluid as the only required step

D. Verify the customer concern through road test, retrieve stored DTCs, monitor scan tool data during operation, and verify proper AWD module commands and component response

27. A vehicle equipped with a transfer case using an electronic shift motor exhibits a complaint that the motor operates briefly when commanded but the shift does not complete. The MOST likely cause is:

A. A failed pilot bearing

B. A binding shift mechanism inside the transfer case, low transfer case fluid level, or stuck shift collar that prevents the motor from completing the shift travel

C. Air in the clutch hydraulic system

D. A worn input shaft bearing

28. The proper procedure for verifying transfer case shift motor operation during diagnosis is to:

A. Verify the motor commands through scan tool data, listen for motor operation, observe the shift travel completion, and verify proper engagement of the shift mechanism

B. Apply compressed air to the motor

C. Replace the shift motor as a precautionary measure

D. Visually inspect for visible damage only

29. A vehicle equipped with a Haldex-type AWD coupling has been brought in for diagnosis. Scan tool data shows the AWD module commanding the coupling at 50% pulse-width modulation, but the coupling produces no measurable engagement. The MOST likely cause is:

A. A failed pilot bearing

B. Air in the clutch hydraulic system

C. A failed AWD coupling that is electrically open, contaminated coupling fluid, or worn clutch material that cannot maintain engagement at the commanded duty cycle

D. A worn input shaft bearing

30. The proper procedure for verifying Haldex-type AWD coupling operation is to:

A. Apply compressed air to the coupling

B. Replace the coupling as a precautionary measure

C. Visually inspect through the coupling cover

D. Verify coupling commands through scan tool data, perform a road test that exercises front-rear speed differential, observe coupling engagement response, and verify proper torque distribution

31. A vehicle equipped with an axle disconnect mechanism has been brought in with a complaint of intermittent failure to disconnect the front axle during 2WD operation. The MOST likely cause is:

A. A failed pilot bearing

B. A worn or sticking disconnect actuator, intermittent electrical fault in the actuator circuit, or damaged disconnect mechanism

C. Air in the clutch hydraulic system

D. A worn input shaft bearing

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

A. Verify the actuator commands through scan tool data, observe the disconnect mechanism action, and verify proper engagement and disengagement under operating conditions

B. Apply compressed air to the disconnect mechanism

C. Replace the disconnect mechanism as a precautionary measure

D. Visually inspect through the inspection cover

33. A vehicle's drive axle ring gear has been removed and inspected. The technician finds the ring gear has excessive runout when measured against the pinion mounting hub. The MOST appropriate action is to:

A. Reuse the ring gear with adjusted backlash

B. Apply hard-facing material to the ring gear

C. Replace the ring and pinion gear set as a complete matched assembly

D. Apply compressed air to the ring gear

34. The proper procedure for measuring drive axle ring gear runout is to:

A. Apply maximum torque to the ring gear bolts

B. Apply compressed air to the differential

C. Visually inspect for wobble during rotation

D. Mount a dial indicator on the ring gear face, rotate the carrier through one revolution, and read the maximum runout against the manufacturer's specification

35. A vehicle has the following findings: complaint of grinding noise during 4WD operation, transfer case fluid that appears black with metallic particles, and stored DTCs for transfer case mode shift sensor. The MOST likely cause is:

A. A failed pilot bearing

B. Internal transfer case mechanical damage with hard parts wear, requiring complete overhaul

C. Air in the clutch hydraulic system

D. A worn input shaft bearing

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

A. 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

B. Replace the transfer case 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

37. A vehicle equipped with a manual transmission and rear-wheel drive has the following findings: complaint of vibration at highway speeds, recently replaced rear universal joints, driveshaft balance verified within specification. The MOST likely cause is:

A. A failed pilot bearing

B. Air in the clutch hydraulic system

C. Improper driveshaft phasing during reassembly, where the slip yoke and pinion yoke are not aligned properly

D. A worn input shaft bearing

38. The proper procedure for verifying driveshaft phasing during reassembly is to:

A. Replace the driveshaft as a precautionary measure

B. Apply compressed air to the driveshaft

C. Verify that the slip yoke ear and the pinion yoke ear are aligned per the manufacturer's specification, typically with the yoke ears in the same plane

D. Visually estimate the alignment

39. A vehicle has been overhauled with a new clutch and pressure plate. The customer reports that the clutch produces a chatter on initial engagement after the overhaul. The MOST likely cause is:

A. Improper installation, a contaminated friction disc, a non-flat or warped flywheel, or a defective new pressure plate

B. A failed pilot bearing

C. Air in the clutch hydraulic system

D. A worn input shaft bearing

40. The proper procedure for verifying flywheel condition during a clutch service is to:

A. Apply compressed air to the flywheel

B. Inspect the flywheel for cracks, hot spots, warpage, and proper ring gear condition, then resurface or replace if not within specification

C. Replace the flywheel as a precautionary measure

D. Visually inspect through the inspection cover

PRACTICE EXAM 4: A3 SIMULATION — ANSWER KEY, EXPLANATIONS, AND TASK REMEDIATION

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1. B — A failed rear main seal allowing oil to contaminate the friction disc. The combination of clutch chatter, oil-contaminated disc, oil leak at the rear of the engine, and burnt odor on the disc all point to rear main seal failure as the underlying cause. The repair must address both the seal and the contaminated clutch components. *ASE Task Reference: A3 Domain A — Clutch Diagnosis and Repair. Review subsection 3.1.*

2. D — Technician A only. Black or brown clutch hydraulic fluid indicates contamination from rubber seal degradation, which compromises seal integrity and hydraulic system function. Fluid color is a meaningful diagnostic indicator and should not be ignored. *ASE Task Reference: A3 Domain A — Clutch Diagnosis and Repair. Review subsection 3.1.*

3. C — Verify the customer concern through road test, inspect the hydraulic system for leaks or air, check pedal free play, and inspect the clutch components after isolating the cause. Clutch complaints with multiple symptoms require systematic diagnosis through verification, hydraulic inspection, free play check, and component inspection. Each step isolates a different potential cause. *ASE Task Reference: A3 Domain A — Clutch Diagnosis and Repair. Review subsection 3.1.*

4. A — Internal mechanical damage with hard parts wear, requiring complete inspection. Grinding during shifts into multiple gears combined with dark fluid containing metallic particles is the diagnostic signature of internal mechanical damage. The combination indicates hard parts wear that requires complete inspection rather than fluid replacement alone. *ASE Task Reference: A3 Domain B — Transmission Diagnosis and Repair. Review subsection 3.2.*

5. D — Inspect for color, odor, and particulate content, comparing to fresh fluid and noting any abnormalities. Fluid condition verification requires inspection of color, odor, and particulate content against fresh fluid for comparison. Each abnormality provides diagnostic information about internal component condition. *ASE Task Reference: A3 Domain B — Transmission Diagnosis and Repair. Review subsection 3.2.*

6. B — A worn friction disc that becomes apparent when reduced fluid viscosity allows clutch slip under load. Clutch slip that occurs only when fully warm is the diagnostic signature of friction disc wear. The hot fluid has reduced viscosity that no longer adequately supports proper friction

operation, exposing the wear that is masked when the fluid is cold and thicker. *ASE Task Reference: A3 Domain A — Clutch Diagnosis and Repair. Review subsection 3.1.*

7. D — Identify each noise individually by its operating conditions, then localize to the specific affected component for each noise source. Multiple noises require individual diagnosis based on operating conditions. Each noise has a specific cause; addressing them individually identifies all the underlying issues. *ASE Task Reference: A3 Domain B — Transmission Diagnosis and Repair. Review subsection 3.2.*

8. A — Technician A only. Manual transmission noises vary between operating conditions because different bearings and gears are loaded under different conditions. The neutral, in-gear, and shift conditions each load different components, producing distinct noise patterns. *ASE Task Reference: A3 Domain B — Transmission Diagnosis and Repair. Review subsection 3.2.*

9. C — A driveline-related vibration since the driveline is only loaded when the transmission is engaged. Vibration that disappears in neutral indicates the source is downstream of the transmission, in the driveline. The transmission is the gateway to the driveline; disengaging the gateway eliminates the vibration source. *ASE Task Reference: A3 Domain C — Driveshaft and Universal Joint/CV Joint Diagnosis and Repair. Review subsection 3.3.*

10. D — Verify the vibration through road test, inspect the driveline for damage, balance issues, working angles, and worn components. Driveline vibration diagnosis requires systematic verification through road test, visual inspection, balance evaluation, working angle measurement, and component inspection. Each step isolates a different potential cause. *ASE Task Reference: A3 Domain C — Driveshaft and Universal Joint/CV Joint Diagnosis and Repair. Review subsection 3.3.*

11. B — Replace the center support bearing assembly including the rubber mount. The center support bearing rubber mount provides isolation and proper bearing support. Hardened or cracked rubber cannot provide proper isolation, and replacement of the complete assembly ensures proper operation. *ASE Task Reference: A3 Domain C — Driveshaft and Universal Joint/CV Joint Diagnosis and Repair. Review subsection 3.3.*

12. D — Allow the driveshaft to change length as the rear axle moves up and down with suspension travel. The slip yoke accommodates length changes that occur as the rear axle moves through its suspension travel. Without the slip yoke, the driveshaft could not maintain proper engagement through the changing geometry. *ASE Task Reference: A3 Domain C — Driveshaft and Universal Joint/CV Joint Diagnosis and Repair. Review subsection 3.3.*

13. A — A worn or damaged inner CV joint allowing vibration during acceleration loads. Inner CV joint wear produces vibration during straight-line acceleration when the joint is loaded. The vibration disappears at cruise because the load on the joint is reduced. *ASE Task Reference: A3 Domain C — Driveshaft and Universal Joint/CV Joint Diagnosis and Repair. Review subsection 3.3.*

14. C — Inspect the boot for damage, perform cornering tests for clicking, perform acceleration tests for vibration, and verify joint condition during inspection. CV joint operation verification requires multiple tests: boot inspection, cornering tests for clicking, acceleration tests for vibration, and direct inspection. Each test reveals a different aspect of joint condition. *ASE Task Reference: A3 Domain C — Driveshaft and Universal Joint/CV Joint Diagnosis and Repair. Review subsection 3.3.*

15. B — Multiple worn driveline components contributing to excessive driveline play. The combination of clunking, worn motor mounts, and worn slip yoke spline indicates multiple driveline components are contributing to excessive play. The cumulative effect produces the clunk during torque reversals. *ASE Task Reference: A3 Domain C — Driveshaft and Universal Joint/CV Joint Diagnosis and Repair. Review subsection 3.3.*

16. D — Inspect the mounts for visible damage, separation, fluid leakage, and excessive play during torque application or removal. Motor mount inspection requires visual inspection plus dynamic evaluation under torque conditions. The mounts must function under load to be considered serviceable. *ASE Task Reference: A3 Domain C — Driveshaft and Universal Joint/CV Joint Diagnosis and Repair. Review subsection 3.3.*

17. A — Replace the pinion seal, replace the pinion bearings, refill with the correct fluid, verify proper preload, and inspect related components. Multiple findings require comprehensive repair including seal replacement, bearing replacement, fluid refill, preload verification, and related component inspection. Single-component replacement leaves other issues unresolved. *ASE Task Reference: A3 Domain D — Drive Axle Diagnosis and Repair. Review subsection 3.4.*

18. C — Identify the leak source through visual inspection, identify any related component damage, and replace affected components using the manufacturer's procedure. Drive axle leak diagnosis requires identification of the leak source and any related damage. Replacement of affected components using the manufacturer's procedure addresses the underlying cause. *ASE Task Reference: A3 Domain D — Drive Axle Diagnosis and Repair. Review subsection 3.4.*

19. B — Use the new pinion shim as supplied with the new pinion, then verify the pinion depth through contact pattern inspection. New pinions are supplied with their own pinion shim that matches the new pinion's specifications. Using the new shim and verifying with contact pattern is the proper procedure. *ASE Task Reference: A3 Domain D — Drive Axle Diagnosis and Repair. Review subsection 3.4.*

20. A — Apply marking compound to the ring gear teeth, rotate the assembly, and inspect the contact pattern position relative to the tooth profile, comparing to manufacturer's specification. Contact pattern verification uses marking compound applied to the ring gear teeth. Rotating the assembly leaves a visible contact pattern that must match the manufacturer's specification. *ASE Task Reference: A3 Domain D — Drive Axle Diagnosis and Repair. Review subsection 3.4.*

21. D — The ring gear is too far from the pinion (excessive backlash). A contact pattern too high on the ring gear teeth indicates excessive backlash, where the gears have too much clearance and the contact rides up the tooth profile. Adjusting backlash to specification corrects the pattern. *ASE Task Reference: A3 Domain D — Drive Axle Diagnosis and Repair. Review subsection 3.4.*

22. C — Adjust the carrier bearing shims to move the ring gear toward or away from the pinion until backlash is within specification. Backlash adjustment uses carrier bearing shim manipulation to move the ring gear closer to or farther from the pinion. The resulting backlash measurement must match specification. *ASE Task Reference: A3 Domain D — Drive Axle Diagnosis and Repair. Review subsection 3.4.*

23. B — Replace the chain and matching sprockets as a complete set. A stretched chain that exceeds specification cannot be reused or stretched back to specification. Chain replacement requires matching sprocket replacement to ensure 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.*

24. C — Inspect the fluid for color, odor, particulate content, and water contamination, then replace the fluid per the manufacturer's specification. Transfer case fluid condition verification requires multi-aspect inspection. Each finding (color, odor, particulate, water contamination) provides diagnostic information about internal condition. *ASE Task Reference: A3 Domain E — Four-Wheel Drive/All-Wheel Drive Component Diagnosis and Repair. Review subsection 3.5.*

25. A — A failed AWD coupling, electrical fault in the coupling circuit, or worn coupling clutch material. With normal AWD module commands but loss of function, the issue must be in the coupling itself or its circuit. Failed coupling, electrical fault, or worn clutch material 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.*

26. D — Verify the customer concern through road test, retrieve stored DTCs, monitor scan tool data during operation, and verify proper AWD module commands and component response. Electronic AWD diagnosis requires comprehensive diagnostic approach including verification, DTC retrieval, scan tool monitoring, and component verification. Each step provides different diagnostic information. *ASE Task Reference: A3 Domain E — Four-Wheel Drive/All-Wheel Drive Component Diagnosis and Repair. Review subsection 3.5.*

27. B — A binding shift mechanism inside the transfer case, low transfer case fluid level, or stuck shift collar that prevents the motor from completing the shift travel. Brief motor operation without shift completion is the diagnostic signature of mechanical binding inside the transfer case. The motor cannot overcome the resistance to complete the shift travel. *ASE Task Reference: A3 Domain E — Four-Wheel Drive/All-Wheel Drive Component Diagnosis and Repair. Review subsection 3.5.*

28. A — Verify the motor commands through scan tool data, listen for motor operation, observe the shift travel completion, and verify proper engagement of the shift mechanism. Shift motor

verification requires multiple checks: command verification, motor operation, shift completion, and engagement verification. Each step isolates a different aspect of the shift system. *ASE Task Reference: A3 Domain E — Four-Wheel Drive/All-Wheel Drive Component Diagnosis and Repair. Review subsection 3.5.*

29. C — A failed AWD coupling that is electrically open, contaminated coupling fluid, or worn clutch material that cannot maintain engagement at the commanded duty cycle. With the AWD module commanding 50% PWM but no engagement, the coupling cannot execute the commanded engagement. Electrical open, contaminated fluid, or worn material 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.*

30. D — Verify coupling commands through scan tool data, perform a road test that exercises front-rear speed differential, observe coupling engagement response, and verify proper torque distribution. Haldex coupling verification requires real-world testing through road test conditions that exercise the coupling. Scan tool monitoring combined with operational verification provides complete assessment. *ASE Task Reference: A3 Domain E — Four-Wheel Drive/All-Wheel Drive Component Diagnosis and Repair. Review subsection 3.5.*

31. B — A worn or sticking disconnect actuator, intermittent electrical fault in the actuator circuit, or damaged disconnect mechanism. Intermittent failure to disconnect indicates the actuator or mechanism cannot consistently execute the disconnect command. Worn or sticking actuator, electrical fault, or damaged mechanism produce intermittent symptoms. *ASE Task Reference: A3 Domain E — Four-Wheel Drive/All-Wheel Drive Component Diagnosis and Repair. Review subsection 3.5.*

32. A — Verify the actuator commands through scan tool data, observe the disconnect mechanism action, and verify proper engagement and disengagement under operating conditions. Axle disconnect verification requires scan tool monitoring of commands, observation of mechanism action, and operational verification under conditions matching the customer concern. *ASE Task Reference: A3 Domain E — Four-Wheel Drive/All-Wheel Drive Component Diagnosis and Repair. Review subsection 3.5.*

33. C — Replace the ring and pinion gear set as a complete matched assembly. Excessive ring gear runout indicates the gear is bent or warped, which cannot be corrected through adjustment. Replacement of the matched assembly is required for proper operation. *ASE Task Reference: A3 Domain D — Drive Axle Diagnosis and Repair. Review subsection 3.4.*

34. D — Mount a dial indicator on the ring gear face, rotate the carrier through one revolution, and read the maximum runout against the manufacturer's specification. Ring gear runout measurement uses a dial indicator on the gear face during full rotation. The maximum reading must be within specification for the gear to be serviceable. *ASE Task Reference: A3 Domain D — Drive Axle Diagnosis and Repair. Review subsection 3.4.*

35. B — Internal transfer case mechanical damage with hard parts wear, requiring complete overhaul. The combination of grinding noise, contaminated fluid with metallic particles, and stored DTCs is the diagnostic signature of internal mechanical damage. Complete overhaul is required to address the underlying cause. *ASE Task Reference: A3 Domain E — Four-Wheel Drive/All-Wheel Drive Component Diagnosis and Repair. Review subsection 3.5.*

36. A — 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. Comprehensive transfer case diagnosis requires verification, DTC retrieval, fluid inspection, pressure tests where applicable, and disassembly when internal damage is indicated. Systematic approach identifies the full scope of repair required. *ASE Task Reference: A3 Domain E — Four-Wheel Drive/All-Wheel Drive Component Diagnosis and Repair. Review subsection 3.5.*

37. C — Improper driveshaft phasing during reassembly, where the slip yoke and pinion yoke are not aligned properly. Vibration after recent service with new joints and verified balance points to phasing error. Improper phasing produces vibration even when components are individually correct. *ASE Task Reference: A3 Domain C — Driveshaft and Universal Joint/CV Joint Diagnosis and Repair. Review subsection 3.3.*

38. C — Verify that the slip yoke ear and the pinion yoke ear are aligned per the manufacturer's specification, typically with the yoke ears in the same plane. Driveshaft phasing requires the slip yoke and pinion yoke ears to be aligned per the manufacturer's specification. Typical specification is yoke ears in the same plane, but the manufacturer's specification governs. *ASE Task Reference: A3 Domain C — Driveshaft and Universal Joint/CV Joint Diagnosis and Repair. Review subsection 3.3.*

39. A — Improper installation, a contaminated friction disc, a non-flat or warped flywheel, or a defective new pressure plate. Post-overhaul chatter indicates an installation issue or a problem with the new components. Multiple potential causes must be investigated to identify the specific issue. *ASE Task Reference: A3 Domain A — Clutch Diagnosis and Repair. Review subsection 3.1.*

40. B — Inspect the flywheel for cracks, hot spots, warpage, and proper ring gear condition, then resurface or replace if not within specification. Flywheel condition verification requires inspection for cracks, hot spots, warpage, and ring gear condition. Each finding determines whether resurfacing is adequate or replacement is required. *ASE Task Reference: A3 Domain A — Clutch Diagnosis and Repair. Review subsection 3.1.*