# PRACTICE EXAM 8: ASE A4 SIMULATION (40 QUESTIONS)

**STEERING SYSTEMS DIAGNOSIS AND REPAIR (Questions 1–12)**

1. A 2018 pickup truck arrives with a complaint that the steering wheel has approximately 3 inches of free play before the front wheels respond. The truck uses recirculating ball steering with parallelogram linkage. Technician A says the gearbox sector shaft preload needs adjustment. Technician B says the linkage components should be inspected via dry park test first. Who is correct?

A. Technician A only

B. Both Technicians A and B

C. Technician B only

D. Neither Technician A nor B

2. A customer complains their 2020 sedan steers lighter in one direction than the other during parking maneuvers. The vehicle has rack-mounted EPS. Scan tool data shows no DTCs. Which is the MOST likely cause?

A. The EPS control module has a programming fault affecting one direction

B. A failing torque sensor internal to the rack producing asymmetric signals

C. The steering angle sensor needs calibration for correct direction output

D. The intermediate shaft U-joints are binding in one rotational direction

3. A recirculating ball gearbox is leaking power steering fluid at the pitman shaft seal. The shop has replaced this seal twice in the last 6 months, and it continues to fail. Which is the BEST explanation?

A. The replacement seals are from a defective production batch from the vendor

B. The power steering fluid type being used is incompatible with the seal material

C. The pitman shaft is being over-torqued during reassembly damaging the seal

D. The pitman shaft itself is worn or scored where the seal lip contacts it

4. A technician is preparing to remove a steering wheel from a vehicle with a driver airbag. The correct sequence begins with:

A. Disconnecting the negative battery cable and waiting the specified discharge time

B. Removing the airbag retaining bolts from behind the steering wheel hub

C. Rotating the steering wheel to full lock to access the wheel retaining nut

D. Turning the ignition to the accessory position to unlock the column lock

5. A 2022 SUV with column-mounted EPS has no power assist after a recent battery replacement. The battery is confirmed at 12.8 volts with the engine running. The scan tool shows a DTC for "EPS initialization required." What is the correct repair?

A. Replace the EPS control module because the DTC indicates module failure

B. Perform the manufacturer-specified EPS initialization procedure after battery service

C. Disconnect the battery for another 30 minutes to fully reset the EPS module

D. Check the battery feed to the EPS module for high-resistance connections

6. A customer reports that their vehicle's power steering has become progressively harder over the past month. Fluid is at the correct level and appears clean. Scan tool testing on the EPS shows no DTCs. Which component is MORE likely the cause than the others?

A. The steering angle sensor is losing precision with age affecting EPS assist

B. The power steering hose has a partial internal collapse restricting fluid flow

C. The power steering pump is worn internally and losing output pressure gradually

D. The EPS control module firmware needs updating to the latest software version

7. A vehicle equipped with variable-assist power steering develops a "twitchy" feel at highway speed — the steering is overly light and responsive. Scan tool shows the vehicle speed signal reads zero continuously. What is happening?

A. The variable-assist system defaults to maximum assist when speed input is lost

B. The variable-assist system defaults to minimum assist when speed input is lost

C. The power steering pump is producing excessive pressure at highway speeds

D. The rack pressure spring has backed off allowing excessive hydraulic response

8. A clockspring has been replaced on a vehicle. After installation, the SRS warning light stays on and the scan tool reports "driver airbag resistance out of range." Which is MOST likely the cause?

A. The vehicle's SRS module failed during the clockspring replacement procedure

B. The airbag module itself has developed an internal fault requiring replacement

C. The battery was not disconnected long enough during the SRS service procedure

D. The clockspring was installed improperly or damaged during the centering process

9. A rack and pinion gear is being replaced on a FWD sedan. After installation, the steering wheel is found to be centered at approximately six o'clock when the road wheels point straight ahead. What is the cause?

A. The new rack has a different internal centering than the original part

B. The intermediate shaft was installed 180° out of phase during reassembly

C. The steering angle sensor requires calibration via scan tool procedure

D. The tie rods were installed with unequal lengths on left and right sides

10. A pickup truck's steering damper is being inspected. The damper is mounted horizontally between the axle and the drag link. Which of the following inspection findings requires damper replacement?

A. The damper mounting eyes show surface corrosion from road spray exposure

B. The damper body temperature is slightly warm after a highway drive cycle

C. Oil is actively leaking from the shaft seal with a wet stripe down the body

D. The damper produces consistent resistance when stroked slowly by hand

11. A hydraulic power steering system is being bled after rack replacement. The technician runs the engine at 2,000 RPM and cycles the steering lock-to-lock repeatedly. A whining noise develops and the reservoir fluid becomes foamy. What went wrong?

A. Bleeding at high engine RPM pressurizes trapped air causing foaming in the fluid

B. The replacement rack has an internal leak allowing air into the hydraulic system

C. The power steering pump has failed during the bleeding procedure from wear

D. The return line hose clamp has loosened allowing air ingestion during bleeding

12. A 2019 vehicle has an intermittent EPS warning light that appears only during heavy electrical load (headlights on, heated seats, rear defrost). Battery tests good at rest. What should be checked NEXT?

A. The EPS control module for internal failure requiring complete replacement

B. The steering angle sensor calibration status using a manufacturer scan tool

C. Voltage drop on the EPS power and ground circuits under maximum electrical load

D. The serpentine belt tensioner for proper function during high accessory load

**SUSPENSION SYSTEMS DIAGNOSIS AND REPAIR (Questions 13–24)**

13. A customer complains of a persistent clunk from the front end over small bumps during straight-line driving. The clunk disappears during hard cornering. Which is MOST likely the cause?

A. A worn lower control arm pivot bushing on the driver's side of the vehicle

B. A failed stabilizer bar end link producing noise when loaded by bumps only

C. A worn upper strut bearing causing friction during steering wheel rotation

D. A worn tie rod end producing clunking during suspension deflection over bumps

14. A MacPherson strut has been replaced on one side of a vehicle. The customer returns one week later complaining the vehicle "doesn't feel right" and rides unevenly. Which action should have been taken during the original repair?

A. The wheel alignment should have been performed after the strut replacement

B. The upper strut mount should have been replaced along with the new strut

C. The strut-to-knuckle bolts should have been torqued to final specification

D. Both struts on the same axle should have been replaced to match characteristics

15. A wear-indicator ball joint on a pickup truck shows the grease fitting has receded below the housing surface when inspected at curb height. What does this indicate?

A. The ball joint has reached its wear limit and requires immediate replacement

B. The ball joint is within acceptable wear and requires no action at this service

C. The wear indicator is defective and the joint must be inspected by other means

D. The vehicle must be lifted to access the ball joint for proper inspection

16. A vehicle with four-corner air suspension arrives with all four corners sagged overnight. The compressor runs but takes approximately 8 minutes to restore normal ride height. Which is MORE likely than the alternatives?

A. A failed ride height sensor is causing the compressor to run incorrectly

B. The suspension control module has an internal fault needing replacement

C. Multiple slow leaks across all four air springs from aging rubber components

D. The compressor has failed output and is barely producing enough pressure

17. A stabilizer bar end link is being replaced. The link has a ball-and-stud design at each end with rubber boots. Which practice is correct during installation?

A. Torque the fasteners to final specification while the vehicle is on the lift

B. Torque the fasteners at ride height with the suspension loaded normally

C. Leave the fasteners hand-tight to allow the link to self-position during use

D. Apply anti-seize to all threaded surfaces and torque beyond specification

18. A leaf spring rear suspension has the axle visibly offset — the right rear wheel sits approximately 1 inch forward of the left rear wheel. The leaves themselves show no visible cracks. What is MOST likely the cause?

A. The rear shock absorber has failed on the right side of the vehicle

B. The rear stabilizer bar bushings have shifted allowing axle movement

C. The tire pressures are unequal causing apparent axle position differences

D. The center bolt in the right rear leaf spring has sheared allowing shift

19. A technician is installing a new torsion bar front suspension on a pickup truck. The torsion bars are marked left and right but the marks are faded. The technician installs them without verifying orientation. What is the likely long-term consequence?

A. The torsion bar will eventually fracture from loading in the wrong direction

B. The ride height adjustment range will be reduced but bars will function normally

C. No issue will occur because torsion bars can install on either side safely

D. The preload will be incorrect but can be corrected through adjustment procedures

20. A vehicle with MagneRide adaptive dampers has a scan tool DTC for "left rear damper current out of range." Live data shows commanded current of 2.0 A but actual current reads 0.1 A. Which is MOST likely the cause?

A. The left rear MR damper fluid has leaked out of the internal chambers

B. The suspension control module output driver has failed for that circuit

C. The damper wiring has an open circuit or the damper coil has failed internally

D. The external magnetic field exposure has affected the damper internal operation

21. A customer reports the vehicle "floats" over highway bumps and continues bouncing for multiple cycles after each bump. Tire pressures are correct. Which diagnostic step is MOST appropriate?

A. Measure ride height at each corner to check coil spring condition first

B. Perform a bounce test by pushing down on each corner and observing response

C. Inspect the stabilizer bar bushings and end links for worn rubber condition

D. Road test the vehicle over progressively larger bumps to evaluate control

22. A multi-link IRS on a 2021 vehicle has rear camber that cannot be brought within specification despite adjustment at the camber eccentric cam. Suspension components appear intact on visual inspection. Which is MOST likely the cause?

A. The rear tires are mismatched and affecting the camber measurement readings

B. The alignment equipment requires recalibration for the vehicle model being serviced

C. The ride height at the rear is out of specification affecting all alignment angles

D. The rear subframe has shifted and requires centering using manufacturer pins

23. A coil spring replacement is being performed on a strut assembly. After the spring compressor is engaged and the spring is compressed, the technician removes the strut mount retaining nut. What should happen?

A. The spring remains fully captured by the compressor with no expansion visible

B. The spring expands upward approximately 1 inch before contacting the mount

C. The upper strut mount rises freely without any further spring compression held

D. The strut body drops free from the spring assembly immediately after nut removal

24. A subframe has been replaced on a unibody vehicle. The technician torqued the mounting bolts to specification but did not use centering pins. After alignment, the rear toe cannot be brought to specification. What is the correct repair?

A. Replace the replacement subframe because it may be defective from manufacturing

B. Adjust the alignment eccentric cams to their extreme range to compensate for shift

C. Loosen the subframe bolts and reposition using manufacturer centering pins

D. Install aftermarket offset bushings to compensate for the subframe position error

**WHEEL ALIGNMENT DIAGNOSIS, ADJUSTMENT, AND REPAIR (Questions 25–35)**

25. A vehicle arrives with a pull to the right. Tire pressures are correct at all four wheels. After swapping the front tires side-to-side, the pull now goes to the left. Which is the correct diagnosis?

A. Alignment is out of specification at the front of the vehicle requiring adjustment

B. A front brake caliper is dragging causing the pull in the original direction

C. The steering gear has internal bypass causing direction-dependent pull behavior

D. A tire has conicity causing a lead direction regardless of wheel position on vehicle

26. A technician is performing an alignment on a vehicle with MacPherson struts and factory-slotted camber adjustment at the strut-to-knuckle bolts. After loosening the bolts and adjusting camber, what is the correct next step before final torque?

A. Remove the wheel to verify the adjustment reading before tightening fasteners

B. Jounce the suspension several times to settle components into their natural position

C. Tighten the lower bolt first, then measure camber before tightening the upper bolt

D. Apply anti-seize compound to the bolt threads to prevent future seizure issues

27. A vehicle has front camber readings of left +0.3° and right +0.2°, both within specification. Front caster is left +3.0° and right +4.8°. The vehicle pulls to the LEFT at highway speed. What is the cause?

A. Caster imbalance — more caster on the right creates pull toward the left side

B. Camber imbalance — 0.1° difference is significant enough to cause the pull direction

C. Rear toe asymmetry creating a thrust angle that causes the directional pull

D. Normal road crown compensation pulling the vehicle in that direction is expected

28. A technician measures SAI at 13.2° on the left front and 11.5° on the right front. Camber is within specification on both sides. Which is MOST likely the cause?

A. The alignment equipment requires recalibration before the measurements are valid

B. The vehicle's tire pressures are significantly different between left and right sides

C. The right front steering knuckle is bent from an impact and needs replacement

D. The ride height difference between sides is affecting the SAI measurement accuracy

29. Before beginning an alignment on any vehicle, the technician must:

A. Install new outer tie rod ends to eliminate any pre-existing play in linkage

B. Perform a road test to evaluate steering feel before beginning the service

C. Replace all four tires with new matching units to eliminate tire-caused pull

D. Inspect steering linkage, ball joints, and ride height for proper condition

30. A vehicle with torsion beam rear suspension has rear toe reading 0.25° more toe-in on one side than the other. Which is the correct diagnosis?

A. The rear toe can be adjusted at the eccentric cam on the trailing arm pivot

B. The torsion beam or trailing arm is bent and requires replacement to correct

C. The rear tires are mismatched in size causing asymmetric toe measurements

D. The rear tire pressures should be equalized to correct the toe difference

31. A customer complains the steering wheel is off-center by 15° after an alignment performed by a previous shop. All alignment angles are within specification when rechecked. What is the correct repair?

A. Remove the steering wheel and reindex it on the splines to correct the offset

B. Leave the condition because the alignment readings confirm specifications are met

C. Adjust rear toe to shift the thrust angle and correct the steering wheel position

D. Split the front toe adjustment unequally between tie rods to re-center the wheel

32. A vehicle's alignment printout shows a thrust angle of 0.45° and a setback reading of 0.05°. Which reading is more likely to indicate collision damage?

A. Thrust angle of 0.45° because it indicates significant asymmetric rear toe settings

B. Setback of 0.05° because even small setback always indicates structural damage

C. Both readings together indicate collision damage requiring immediate frame inspection

D. Neither reading is significant enough to indicate any collision damage or issues

33. Excessive negative camber on both front wheels will MOST likely cause:

A. Outside-edge tire wear with a feathered sawtooth pattern across the tread

B. Center tread wear with both shoulders showing significantly less wear pattern

C. Inside-edge tire wear with a smooth flat feel across the tread shoulder

D. Cupped or scalloped wear around the tire circumference from shock issues

34. A vehicle has had its alignment completed. The steering angle sensor was not disturbed during the service but the front toe was adjusted significantly. Which is correct regarding SAS calibration?

A. No calibration is needed because the SAS was not physically disconnected

B. SAS calibration is required because toe adjustment re-centered the steering wheel

C. SAS calibration is optional and only needed if the customer reports issues

D. SAS calibration is only performed after physical sensor replacement, not alignment

35. A vehicle has front cross-caster of 1.5° with the left side more positive than the right side. What is the expected vehicle behavior?

A. The vehicle will pull strongly to the left during highway-speed straight driving

B. The cross-caster has no effect on pull direction at any driving speed or condition

C. The vehicle will pull to the right, toward the side with less positive caster

D. The steering wheel will sit 1.5° off-center during straight driving on level roads

**WHEEL AND TIRE DIAGNOSIS AND SERVICE (Questions 36–40)**

36. A vehicle exhibits steering wheel shimmy at 55–65 mph. Below and above this range, the shimmy is minimal. All four tires have been checked for balance and are within specification. Which is the MOST likely cause?

A. Radial or lateral runout in one or both front wheel-and-tire assemblies

B. A worn steering rack internal component causing a vibration frequency issue

C. Front wheel bearing failure producing a speed-specific vibration pattern

D. Rear suspension imbalance transmitting through the drivetrain to the front

37. A 2023 vehicle with direct TPMS has had its tires rotated. After rotation, the dashboard display shows the right front tire pressure value that was previously shown for the right rear position. What has NOT been completed?

A. The right front TPMS sensor has failed and needs to be replaced with a new unit

B. The tire pressure in the right front tire needs to be adjusted to the placard spec

C. The vehicle-specific relearn procedure that teaches the module new sensor positions

D. The TPMS module needs to be reset using a scan tool to clear the old pressure data

38. A wheel hub assembly has been replaced on a driven front wheel. The axle nut is torque-to-yield and the technician installs a new nut. After torquing to specification, the wheel has slight free play when rocked by hand at 12 and 6 o'clock. What is MOST likely the cause?

A. The hub assembly is defective and the internal bearing has failed during shipping

B. The torque-to-yield nut requires additional torque beyond the first-stage specification

C. The brake rotor was not cleaned on its mating surface before the installation

D. The wheel bearing grease has leaked out during the installation procedure

39. A tire shows rapid wear at the center of the tread with both shoulders showing significantly less wear. Tire pressure measured at a cool static condition is 42 psi. The placard specifies 32 psi. What is the cause?

A. Over-inflation causes the center of the tread to contact the road harder than edges

B. Excessive positive camber causes center tread wear with minimal shoulder wear

C. Worn shock absorbers cause center wear from insufficient suspension damping

D. Front toe-in causes center tread wear with feathered pattern at center blocks

40. A wheel balancer reports 0.5 oz at the inner position and 0.5 oz at the outer position, with the two weights located 180° apart on the rim circumference. This reading indicates:

A. The wheel-and-tire assembly has radial runout requiring match-mount correction

B. The wheel-and-tire assembly is within acceptable residual balance for service

C. The wheel-and-tire assembly has dynamic imbalance requiring weights at both rim edges

D. The wheel-and-tire assembly has only static imbalance requiring correction in one plane.

## Practice Exam 8: Answer Key and Explanations

1. C — Linkage inspection via dry park test must come before any gearbox adjustment. Three inches of free play is far more consistent with worn linkage (idler arm, tie rods, pitman arm connections) than with gearbox preload. Tightening preload on a worn-linkage vehicle only causes binding without addressing the actual source of play.

2. B — The torque sensor in a modern EPS rack is a redundant dual-channel device. When one channel drifts or fails intermittently, the module may still produce some assist but with directional asymmetry — heavier in one direction than the other. DTCs only set when the mismatch exceeds threshold; light intermittent faults can occur without codes.

3. D — When a seal fails repeatedly despite proper replacement, the sealing surface itself is damaged. A worn or scored pitman shaft prevents any new seal from maintaining the seal lip contact. The repair is pitman shaft replacement (or complete gearbox replacement) — this is a classic "repeat failure" diagnostic pattern on A4.

4. A — SRS service always begins with disconnecting the negative battery cable and waiting the specified capacitor discharge time. Removing the airbag before this is extremely dangerous because the SRS module's backup capacitor can fire the airbag for several minutes after battery disconnect. No exceptions to this sequence exist.

5. B — Many EPS-equipped vehicles require an initialization or relearn procedure after battery disconnect. The module loses certain learned values during power loss and operates in reduced-assist mode until the procedure is performed. The DTC explicitly confirms this — the fix is performing the initialization, not replacing hardware.

6. C — Progressive hardening of power steering over a month without DTCs and with correct fluid points to gradual mechanical wear in the pump — internal vanes and cam ring losing efficiency over time. Hose collapse is rare and sudden; SAS issues produce different symptoms; firmware updates don't typically address gradual mechanical wear.

7. A — When the vehicle speed signal is lost, variable-assist systems default to maximum assist (as if at parking-lot speed). The result is overboosted, "twitchy" steering at actual highway speed. Always verify VSS input before condemning the variable-assist actuator — bad speed data produces the same symptom as a failed actuator.

8. D — Resistance-out-of-range codes on the driver airbag after clockspring replacement almost always point back to the clockspring itself — either improperly centered during installation, or the ribbon cable was damaged during centering/installation. Battery, SRS module, and airbag-module causes are far less common in this specific scenario.

9. B — Most intermediate shafts will physically install in two orientations 180° apart. When the shaft is installed out of phase, the steering wheel ends up rotated half a turn from straight-ahead — pointing at six o'clock with the road wheels straight. The fix is always repeat disassembly and proper indexing.

10. C — Active external oil leakage with a visible wet stripe down the damper body confirms seal failure and internal fluid loss. The damper can no longer generate consistent damping force and must be

replaced. Surface corrosion, slight warmth, and consistent stroking resistance are all within normal findings.

11. A — Bleeding at high engine RPM pressurizes any trapped air in the system, causing it to dissolve and re-emerge as foam. The correct procedure is engine OFF with slow lock-to-lock cycles first (to draw air out without pressurizing), then engine at idle only — never 2,000 RPM during bleeding.

12. C — EPS is extremely sensitive to supply voltage. High-accessory-load conditions reveal high-resistance connections through voltage drop under load, which wouldn't show at rest or at minimum load. Voltage drop testing on the EPS power and ground circuits under maximum load is the correct diagnostic step before condemning hardware.

13. B — Bilateral clunking over small bumps during straight-line driving that disappears during hard cornering is the classic signature of failed stabilizer end links. The links are silent when loaded by cornering forces and noisy when bumps excite them in straight driving. This specific symptom profile distinguishes end links from other wear.

14. D — Struts must be replaced in pairs on the same axle. Asymmetric damping characteristics (one new, one worn) produce uneven ride and handling feel — exactly the complaint in this scenario. Alignment, mount replacement, and torque are all important but would not produce the "feels uneven" complaint that pair mismatch causes.

15. A — On wear-indicator ball joints, when the grease fitting recedes BELOW the housing surface (with the vehicle at curb height), the joint has reached its wear limit and requires replacement. Only a projecting indicator above the housing indicates acceptable wear. Wear-indicator inspection is always performed at curb height, not on a lift.

16. C — All four corners sagging overnight with an 8-minute recovery time indicates multiple small leaks across aging air springs. Single-sensor and single-compressor failures would not produce bilateral sag; single module failures would produce different symptoms. Aging rubber leaking at all four corners is the most common pattern on older luxury vehicles.

17. B — Stabilizer end link fasteners with rubber bushings must be torqued at ride height with the suspension loaded. Torquing on a lift with wheels hanging preloads the bushings in a twisted position, accelerating wear and producing alignment drift. This is one of the most tested torque-at-ride-height rules on the A4 exam.

18. D — The leaf spring center bolt locates the axle on the spring and prevents fore-aft shift. A sheared center bolt allows the axle to walk forward or rearward on the spring pack, producing the visible wheelbase asymmetry described. Shock failure, bar shifts, and tire pressure don't cause axle longitudinal offset.

19. A — Torsion bars are heat-treated for one-direction loading and must install on the correct side in the correct orientation. A bar installed backwards or on the wrong side eventually fractures from reversed loading. This is a non-negotiable service point: always reference-mark torsion bars before removal.

20. C — Commanded current of 2.0 A with actual current reading 0.1 A indicates either an open circuit in the wiring or an open damper coil. The module is commanding correctly but no current is flowing. Fluid leakage, module output failure, and magnetic field exposure are less common than harness or coil faults — always verify wiring first.

21. B — The bounce test is the definitive diagnostic for shock/strut condition. Push down hard on each corner and release; a healthy damper rebounds once and settles. Multiple cycles indicate failed dampers that have lost damping capability — the direct cause of the "floating" complaint. This is faster and more conclusive than other tests.

22. D — When rear camber cannot be brought to spec through normal adjustment range, the subframe has likely shifted from its design position. Modern rear subframes require centering procedures using manufacturer-specified pins; if the cradle is shifted even a few millimeters, adjustment eccentrics cannot reach spec. Subframe centering is the repair.

23. A — When a spring compressor is properly engaged, the compressed spring remains fully captured when the strut mount nut is removed — no expansion, no launch. This is the entire purpose of the compressor: to fully capture spring energy so components can be safely removed. Any visible spring expansion after nut removal indicates inadequate compression.

24. C — Subframe mounting requires centering pins to lock the subframe to its design position. Skipping this step can shift the subframe enough to make alignment uncorrectable through normal cam range. The fix is loosening the mounting bolts and repositioning with proper centering pins — not adjusting alignment around the error.

25. D — When a tire swap changes the pull direction, the cause is tire conicity — an inherent lead direction from manufacturing. Alignment, brake, and steering gear issues produce pulls that stay in the same direction regardless of tire position. The swap test is the definitive tire-vs-alignment diagnostic and is repeatedly tested on A4.

26. B — After loosening and repositioning strut-to-knuckle bolts for camber adjustment, the suspension must be jounced (pushed down and released several times) to settle the components into their natural loaded position before final torque. Torquing without jouncing can leave bushings preloaded in twisted position, producing alignment drift after service.

27. A — Caster imbalance with more caster on the right produces a pull toward the LEFT (the less-caster side). Caster pull direction is opposite to camber pull direction — the side with less caster has less self-centering force. The 1.8° caster difference here is large enough to produce a clear pull despite equal camber readings.

28. C — Side-to-side SAI mismatch of 1.7° exceeds the 0.5° tolerance and is the classic diagnostic signature of a bent steering knuckle. SAI is built into the knuckle casting and cannot be adjusted — if SAI is off but camber is in spec, the knuckle itself is damaged from impact and must be replaced.

29. D — A thorough pre-alignment inspection — steering linkage, ball joints, ride height — is mandatory before any alignment service. An alignment performed on a mechanically compromised vehicle is invalid. Road testing and tire replacement are situational; they are not universal pre-alignment requirements.

30. B — Torsion beam rear suspensions typically have no rear toe adjustment. An out-of-spec reading on one side means the beam is bent or the trailing arm is damaged — requiring component replacement. "Adjusting" at a non-existent eccentric or accepting tire pressure explanations are incorrect for this architecture.

31. D — Splitting the front toe adjustment unequally between left and right tie rods recenters the steering wheel while maintaining correct total toe. This is standard alignment procedure. Reindexing the wheel on its splines is a last resort for misinstalled wheels; adjusting rear toe creates a new thrust-angle problem; the off-center condition is not acceptable.

32. A — A thrust angle of 0.45° is significant and indicates meaningfully asymmetric rear toe — often from collision damage, worn subframe bushings, or a bent component. A setback of 0.05° is within

normal tolerance. Thrust angle of this magnitude warrants investigation for collision damage far more than the tiny setback reading.

33. C — Excessive negative camber causes the inside edge of the tire to carry more load than the outside, producing smooth (flat) inside-edge wear. Feathered wear is a toe issue. Center/shoulder wear comes from pressure issues. Cupping is a shock/strut symptom. Smooth inside-edge wear specifically identifies negative camber.

34. B — Adjusting front toe re-centers the steering wheel relative to the SAS's learned zero-point, invalidating the calibration even though the SAS itself was never disturbed. SAS calibration is mandatory whenever the steering wheel position has been shifted during alignment. This is a mandatory step on most modern vehicles.

35. C — Cross-caster with left more positive produces a pull to the RIGHT (the less-caster side). Caster pull direction is opposite to camber pull direction — the side with less caster has weaker self-centering force, causing the pull to that side. Memorize: caster pulls toward the less-caster side.

36. A — Shimmy at a specific speed range with balanced wheels points to radial or lateral runout — dimensional deviation that balancing cannot correct. Runout must be measured with a dial indicator or road-force balancer; correction requires tire replacement, wheel replacement, or match-mounting. This is the next step after ruling out balance.

37. D — After tire rotation on a direct TPMS vehicle, the module still associates each sensor's ID with its previous position. Until the vehicle-specific relearn procedure is performed, the display continues showing pressures at the wrong positions. The relearn teaches the module which sensor is now at which wheel location.

38. B — Torque-to-yield axle nuts require torque to their final specification, which is often 200+ ft-lb and may include a two-stage procedure (initial torque plus additional rotation). Slight play after first-stage torque typically means the final torque procedure has not been completed. Always verify the full specification, not just the first torque value.

39. A — Over-inflation causes the center of the tread to bulge outward and carry the road load, while both shoulders are underloaded. Measuring pressure at 42 psi with a 32 psi placard confirms significant over-inflation. The wear pattern — center worn, shoulders less worn — is the specific diagnostic signature of over-inflation.

40. C — Weights at both inner and outer rim edges 180° apart is the signature of dynamic (two-plane) imbalance. The offset mass distribution along the wheel's axis creates a wobbling force couple that modern balancers correct with weights at each rim edge simultaneously. Static imbalance would require only single-plane correction.