

BONUS SECTION 7: DISC BRAKE CALIPERS, PADS, AND HARDWARE

10 Targeted Practice Questions

1. A technician is replacing front disc brake pads and finds the inboard pad on the left front is worn to 2mm while the outboard pad on the same caliper is worn to 8mm. The MOST likely cause of this uneven pad wear is:

- A. A warped rotor pushing the inboard pad away from the rotor on each revolution
- B. A seized or corroded caliper piston that is not retracting fully after brake release, keeping the inboard pad in continuous contact with the rotor
- C. Incorrect pad installation on the previous service — the thicker outboard pad was installed on the inboard side
- D. The caliper bracket is bent, shifting the caliper inboard and causing preferential inboard pad contact

2. When installing new disc brake pads, a technician applies brake lubricant (caliper grease) to the pad backing plates before installation. The technician should be careful to:

- A. Apply grease liberally to the entire backing plate surface to ensure full coverage and noise suppression
- B. Apply a thin coat only to the metal-to-metal contact points between the pad backing plate and the caliper piston face and caliper fingers — never allowing grease to contact the friction material
- C. Apply grease only to the outboard pad since the inboard pad contacts the piston which is self-lubricating with brake fluid
- D. Avoid all lubrication of the backing plates since any lubricant near the brake caliper creates a fire hazard

3. A technician is replacing brake pads on a vehicle with a fixed opposed-piston caliper. This caliper type has multiple pistons on both sides of the rotor. When compressing the pistons for pad removal, the technician must:

- A. Compress all pistons simultaneously using a single large compression tool that spans the full caliper width

B. Compress each piston individually on both the inboard and outboard sides, using a small piston compression tool or wooden dowel

C. Open the bleeder screw before compressing each piston to allow displaced fluid to exit rather than returning to the reservoir

D. Remove the caliper from the vehicle before attempting piston compression since fixed calipers cannot be compressed in place

4. A disc brake caliper slide pin boot that is torn or missing allows:

A. Brake fluid to leak from the caliper since the boot seals the hydraulic chamber

B. Moisture and road debris to contact the slide pin, causing corrosion that prevents the caliper from sliding freely and results in uneven pad wear

C. The slide pin to fall out of the caliper bracket during hard braking maneuvers

D. Air to enter the hydraulic circuit through the exposed slide pin bore

5. A vehicle has all four brake pads replaced. Six months later, the right rear inboard pad is worn to 1mm while the right rear outboard pad measures 9mm. The right rear caliper slides freely on the pins. The MOST likely cause is:

A. The right rear brake hose is internally collapsed, trapping pressure and keeping the caliper applied

B. The right rear caliper piston is seized and not retracting, maintaining constant inboard pad contact with the rotor

C. The right rear proportioning valve port is stuck open, delivering excessive pressure to the right rear

D. The right rear rotor has excessive lateral runout, forcing the inboard pad outward on each revolution

6. Anti-squeal shims are installed between the brake pad backing plate and the caliper piston. Their primary function is to:

A. Increase the clamping force of the caliper on the rotor by adding spring tension to the piston contact

B. Prevent direct metal-to-metal contact between the pad backing plate and caliper piston, damping the high-frequency vibrations that produce brake squeal

C. Protect the caliper piston seal from the heat generated at the pad-rotor interface during hard braking

D. Center the brake pad laterally in the caliper bracket to prevent edge contact with the rotor

7. A customer reports a rattling noise from the front brakes during driving over rough roads that disappears when the brake pedal is lightly pressed. The MOST likely cause is:

A. Worn caliper slide pin bushings allowing excessive caliper movement over road imperfections

B. Missing, broken, or improperly installed brake pad anti-rattle clips or hardware that normally hold the pads against the caliper bracket under spring tension

C. Loose caliper mounting bolts allowing the caliper body to vibrate against the bracket

D. Brake pads with worn backing plates that have lost their retention tabs

8. A technician is replacing brake pads on a vehicle and finds the caliper bracket pad contact channels have a thin layer of surface rust. The brake pads slide in the channels but with noticeable resistance. The correct preparation before installing new pads is to:

A. Apply a heavy coat of caliper slide grease to the channels to lubricate the pad movement and override the rust resistance

B. Clean the channels with a wire brush to remove all rust and corrosion, restore smooth metal surfaces, then apply a thin coat of approved brake lubricant to the contact areas

C. Lightly sand the pad edges with sandpaper to reduce their width slightly so they slide more easily in the corroded channels

D. Replace the caliper bracket since corroded channels cannot be adequately cleaned and will cause pad hang-up again immediately

9. A vehicle with high-performance fixed calipers has brake pads that must be replaced. The technician finds there is no bleeder screw accessible from the normal position. This is because:

A. Fixed calipers on performance applications are sealed units that do not require bleeding

B. High-performance fixed calipers often have the bleeder screws on the top of the caliper body rather than on the side, requiring the technician to locate them at the highest point of the caliper

C. The bleeder screws are located inside the wheel well on the caliper bridge and are only accessible with the wheel removed and a specialized angled wrench

D. Performance brake systems use a pressure-only design that eliminates bleeder screws entirely

10. A technician completes a front brake pad replacement and during the test drive notices a high-pitched squealing noise under light braking that was not present before the service. The caliper slides are free and the pads are correctly installed. The MOST likely cause is:

A. The new pads have a higher friction rating than the originals and the caliper cannot apply enough force to dampen their vibration

B. The anti-squeal shims from the old pads were reused without cleaning or replacement and are no longer providing adequate vibration damping

C. The new pads were not bedded in properly and the friction material surface is still too smooth to resist vibration

D. The brake rotor surface finish from the machining is too smooth, creating a resonance condition with the new pad material

BONUS SECTION 7 — ANSWERS AND EXPLANATIONS

1. B — Seized caliper piston not retracting — When only the inboard pad wears excessively while the outboard pad remains thick, the caliper piston is the culprit. The piston pushes the inboard pad against the rotor during braking but fails to fully retract when hydraulic pressure releases. The inboard pad remains in light contact continuously, wearing rapidly while the outboard pad, which is moved only by caliper body sliding, sees far less contact time.

2. B — Thin coat on metal contact points only — Brake lubricant prevents metal-to-metal noise and corrosion at the interface between the pad backing plate and caliper piston face and caliper body fingers. It must never contact the friction material surface since even a microscopic amount of grease on the pad face dramatically reduces braking effectiveness and causes grabbing or pulling. Precision application is critical.

3. B — Compress each piston individually on both sides — Fixed calipers have pistons on both sides of the rotor. To install new pads, all pistons on both sides must be pushed back into their respective bores. Each piston is compressed individually. Opening the bleeder screw during this process prevents displaced fluid from returning to the reservoir and potentially overflowing, though it is not required if the reservoir level is watched carefully.

4. B — Moisture and debris cause corrosion and binding — The slide pin boot is a protective rubber sleeve that seals out road contamination from the precision-machined slide pin bore. Without this protection, water and road salt accelerate corrosion on the pin surface, creating friction and binding that prevents the caliper from freely centering on the rotor. The result is one pad wearing faster than the other and potential brake drag.

5. B — Seized caliper piston maintaining constant contact — Free-sliding caliper pins rule out a slide pin problem. With the slides confirmed free, uneven pad wear with the inboard worn significantly more than the outboard points directly to the piston. A seized piston that cannot retract keeps the inboard pad in continuous contact, consuming it rapidly while the outboard pad, which is applied only when the caliper body slides in response to piston movement, sees proportionally less wear.

6. B — Dampen high-frequency vibrations causing squeal — Brake squeal is caused by resonant vibration between the pad and rotor at specific frequencies. Anti-squeal shims are layered metal and rubber or polymer composites that interrupt the vibration transmission path between the piston and the pad backing plate. By absorbing and dissipating these micro-vibrations, the shims prevent them from building into the audible resonance that produces squeal.

7. B — Missing or damaged anti-rattle clips or hardware — Brake pads are held snugly against their caliper bracket contact points by spring clips or integrated spring tangs on the pad backing plate. When this hardware is missing, broken, or not properly installed during the previous service,

the pads are free to move slightly within the bracket clearance during driving. Each bump or road imperfection causes the loose pads to rattle against the bracket, producing the characteristic noise that stops immediately when the brake pedal is pressed and the pads are clamped.

8. B — Wire brush clean channels then apply thin lubricant coat — Rust on caliper bracket pad channels causes pad drag and binding that leads to uneven wear, delayed release, and brake pull. The channels must be cleaned to bare metal using a wire brush, die grinder, or file before new pads are installed. After cleaning, a thin application of approved high-temperature brake lubricant on the metal contact surfaces prevents immediate re-rusting and facilitates smooth pad movement.

9. B — Bleeder screws are on top of the caliper body — High-performance and racing brake calipers typically position the bleeder screws at the absolute highest point of the caliper casting to ensure any air trapped inside can rise to the bleeder location and be purged. On many performance calipers, this means the bleeder screws are on the bridge or upper surface of the caliper body, not on the side facing the vehicle. The technician must identify their location before attempting to bleed the system.

10. B — Old anti-squeal shims reused without replacement — Anti-squeal shims deteriorate with heat cycling and lose their vibration-damping properties over time. Reusing worn shims with new brake pads provides inadequate dampening, allowing the new pads to vibrate at their resonant frequency during light application. New shims should always be installed with new pads — either as part of a complete hardware kit or using the new shims included with quality replacement pad sets.