



Tech Tip

BRAKES 146

SIMPLE SOLUTIONS For Some Perplexing Brake Problems

INSPECTING NISSAN MAXIMA CALIPERS

While installing a new set of tires on a 2005 Nissan Maxima, a safety inspection was performed as a courtesy to the customer. The technician recommended that the disc pads should be replaced and the calipers were seeping fluid around the piston seals. Days later, the customer was at the Nissan dealer for a warranty recall and they confirmed the need for the disc pad replacement, but claimed that a caliper replacement was not necessary. That was a bad reflection on the tire shop. It would appear that the tire technician was trying to sell the customer calipers when they were not needed. Actually, the tire man was honest in his assessment, as it sure looked as if brake fluid was seeping from the caliper seals.

Here's the scoop... Nissan advises that 2005–2007 Maxima and 2007 Altima vehicles may contain an oily residue around the piston seals that appears to be brake fluid seeping from the seals. The oily residue is actually “Castor Oil” that was used as an assembly lubricant during the caliper assembly. Some residue may be present around the piston and seal. This should be considered a normal characteristic and does not require a caliper replacement. To verify:

- 1) Remove the lower pin from the caliper and pivot the caliper upward.
- 2) Remove the disc pads and hardware from the torque member.
- 3) Clean the brake caliper with brake cleaner and thoroughly dry the caliper.
- 4) Reinstall the disc pads and hardware and secure the caliper to the torque member. Reinstall the lower caliper pin.
- 5) Set the parking brake and place the shifter in the park or neutral position.
- 6) Start the engine.
- 7) Slightly depress the brake pedal for 10 seconds and release.
- 8) Depress the brake pedal at a full pedal stroke and hold for 60 seconds.
- 9) Repeat both steps 7 and 8 three times.
- 10) Depress the brake pedal at a full pedal stroke and hold for 60 seconds. Do this three times.
- 11) Turn engine off.
- 12) Visually inspect the calipers for leakage. The calipers should be dry. Any wetness indicates brake fluid leakage, which requires a caliper rebuild or replacement.

ALTIMA BRAKE NOISE

Solving a brake noise complaint can be a frustrating endeavor. Most vehicle owners despise brake squeal or squeak symptoms and will hound you until the noise is eliminated. Most of the time the friction gets the blame and is often replaced numerous times in a futile effort to quiet a brake noise complaint.

Little consideration is given to other components. Sometimes the brake noise condition may be a normal characteristic of a specific vehicle platform. Sometimes major system components may require modifications to eliminate audible frequency vibrations. For example: Eliminating front brake noise during light brake application on 2007–2008 Nissan Altimas may require the replacement of some major components. Vehicles affected include: 2007–2008 Altima Sedan, 2007–2008 Altima Hybrid and the 2008 Altima Coupe. Production dates include all 2007 vehicles and 2008 vehicles built before October 19, 2007. Nissan advises that if the vehicle emits a squeal or squeaking noise from the front end while the vehicle is moving forward during light brake application; after 10-15 minutes of driving, whereby the brakes are heated; or at speeds less than 10 miles per hour...new revised caliper assemblies may be required. The new calipers are loaded assemblies that include disc pads and hardware (Nissan part numbers: RH-41000-JA00A, LH-41010-JA00A).

AUDI'S BRAKE NOISE SOLUTION

Audi acknowledges that customer complaints of front brake moan while accelerating from a stop or turning at slow speeds may be due to the caliper pistons not retracting far enough into the calipers during brake release. If this occurs, a residual drag of the disc pads against the rotors will be present, promoting brake noise conditions.

Vehicles affected include: 2005–2008 A4 all VINs, 2006–2008 A6 all VINs, and 2005 A6 vehicles with VIN range 400000–999999. Audi has made a modification to the caliper piston seals that allows the pistons to retract farther into the calipers during brake release (PN-4EO 698 471 A). When installing the new seals, Audi cautions that only Dot 4 brake fluid should be used to lubricate the new piston seals. Use of an unapproved assembly lubricant will decrease the effectiveness of the new seals.

MASTER CYLINDER SQUEAK

GM recommends a master cylinder brake fluid exchange to eliminate a squeaking noise during brake application or release.

Models affected include: 2004–2007 Buick Rainier, 2008 Buick Enclave, 2004–2008 Chevrolet Colorado, TrailBlazer EXT, TrailBlazer SS, 2008 Chevrolet Malibu, 2004–2008 GMC Canyon, Envoy XL, Envoy XUV, 2007–2008 GMC Acadia, 2008 Pontiac G6, 2007–2008 Saturn OUTLOOK, 2008 Saturn AURA and 2005–2008 Saab 9-7X.

The complaint from the customer will involve a squeaking noise during brake application or release, with or without the engine running. The noise is more pronounced during slow brake application and release. GM has isolated the noise as coming from the master cylinder.

GM's solution for the noise condition is to remove the old fluid from the master cylinder and refill the reservoir with Dot 3 fluid. Start the engine and fully apply and release the brake pedal until the noise diminishes.

BRAKE SERVICE PROMOTES LEAN FUEL CONDITION

Imagine a customer arriving at a brake shop complaining of a dropping pedal sensation on a 2005 Chevrolet Silverado. The symptom is diagnosed as a defective master cylinder. The master cylinder is replaced and the pedal height and firmness is restored. The next morning the customer returns to the repair facility with a complaint of an illuminated malfunction indicator lamp (MIL). The customer would naturally assume that the condition must be related to the brake service, even though the brakes worked perfectly.

The diagnostic memory is scanned for trouble codes and PO171 (Fuel Trim System Lean Bank 1) and PO174 (Fuel Trim System Lean Bank 2) are both stored in memory. At this point, most technicians would assure the customer that the brake repair had nothing to do with the illuminated MIL lamp and the stored codes. Instead, the condition was related to an engine performance condition. Later it would be determined that this was an incorrect assessment and a brake related problem was the culprit.

The normal checks for a lean fuel condition would include:

- 1) Check all vacuum hoses for deterioration, kinks, splits or improper connections.
- 2) Check fuel pressure and volume.
- 3) Sufficient fuel level in the fuel tank
- 4) Contaminated fuel
- 5) Restricted fuel injectors
- 6) Check the intake manifold, throttle-body and fuel injector o-rings for proper sealing with no evidence of vacuum leaks.
- 7) Examine the fresh air intake for evidence of leakage, due to cracked or split hoses.
- 8) Check the evaporative system for proper sealing and to be certain there are no obstructions or hose leakage.

- 9) Make certain the PCV system is functioning properly and is sealed.
- 10) Check the heated oxygen sensors (HO2S) to be certain they are functioning properly with no damage to the wiring, such as contact with the exhaust system.
- 11) The exhaust system should be sealed with no leakage that could affect oxygen sensor operation.
- 12) Examine all engine components to be certain they are functioning properly.

In this case, performing the test and evaluation of the mentioned systems and components would do little to reveal the cause of the illuminated MIL lamp and stored codes.

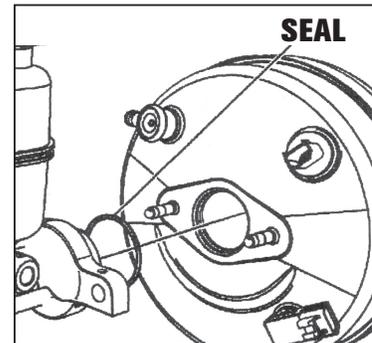
With the assistance of a GM dealership technician, the reason for the lean fuel trim was identified. Once the technician determined the MIL lamp illuminated following the replacement of the master cylinder, he quickly pinpointed the cause of the lean fuel condition. While monitoring the long term fuel trim with a scan tool and encountering a lean condition, he pinched the power brake booster vacuum hose with a set of crimping pliers. When he did this, the fuel trim returned to normal. A vacuum leak had occurred between the master cylinder and the power brake vacuum booster due to a dislodged seal (see illustration).

When replacing the master cylinder, the vacuum reserve in the power brake booster should be depleted by applying the brake pedal several times with the engine off. This will prevent the seal from being sucked into the booster when removing the master cylinder.

GM advises that the following models may encounter a lean fuel trim condition due to a dislodged master cylinder seal: 2007–2008 Cadillac Escalade,

Escalade ESV, Escalade EXT, 2005–2007 Chevrolet Silverado Classic and GMC Sierra Classic, 2007–2008 Chevrolet Avalanche, Silverado, Suburban, Tahoe, 2007–2008 GMC Sierra, Yukon, Yukon XL, Yukon Denali, and Yukon Denali XL equipped with vacuum assisted power brakes.

The complexity of today's systems offers many challenges for the automotive technician. Systems and symptoms often share a common characteristic, making an accurate or conclusive diagnosis extremely challenging. The technician must keep an open mind and an open book for the necessary diagnostic information, and familiarize himself with any factory service information that could provide a solution to the customer's concern.



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