ALL NISSAN, BRAKE NOISE/JUDDER/PEDAL FEEL DIAGNOSIS AND REPAIR

IMPORTANT: THIS BULLETIN HAS BEEN REVISED

- A note (*) was revised on page 6 related to the Rotor Run-out specification.
- Refer to this bulletin NTB00-033a for complete information.
- Discard all previously distributed copies of NTB00-033.

APPLIED VEHICLE(S): All Nissan

SERVICE INFORMATION

This bulletin addresses potential customer concerns regarding brake operation and provides diagnostic and repair information for each if any should occur. Refer to the general descriptions below to identify the type of concern and then reference the appropriate repair information in the Service Procedure Section of this bulletin. Most brake incidents fall into the following categories:

Brake Noise:
- A squeak, squeal, clunk, or groan that occurs when the brakes are applied or released. Detailed descriptions of brake noise are contained in the Service Procedure section of this bulletin.

Brake Judder:
- A vibration that can be felt in the vehicle, steering wheel or brake pedal when the brakes are applied.

Pedal Feel:
- The effort needed to operate the brakes is too high or too low.
- The driver may indicate the brake pedal feels hard or soft.

Additional Brake Noise Information:
All current Nissan vehicles are equipped at the factory with Nissan Original Equipment (OE) brake pads. The OE pads use a non-asbestos organic (NAO) compound. The NAO material provides state of the art resistance to squeal noise. These pads are available as service parts and must be used if replacing brake pads under the terms of the Nissan new car warranty.

Key Value brake pads are also available as a high quality service replacement part at a very attractive price. These pads use a semi-metallic compound similar to the material used in Nissan OE pads prior to the introduction of the NAO compound. Key Value semi-metallic pads offer excellent braking performance but do not offer the same level of noise resistance as the OE-NAO pads.
Service customers have varying sensitivity to brake noise and the individual customer must decide which product best suits his or her requirements, balancing price and noise resistance. Ensure the Service Advisor adequately explains the differences between Key Value brake pads and Nissan OE-NAO brake pads to the customer when discussing brake service.

SERVICE PROCEDURE
1. Verify the condition by road testing the vehicle with the customer.
2. Determine the specific brake incident based on the description in the service information section of this bulletin.
3. Follow the appropriate repair procedure in this section of the bulletin.

Brake Noise
Brakes can make a range of noises when applied or released. Some noises are normal and no repair action should be taken. Use the following description to identify the specific type of brake noise and the appropriate repair.

Squeak noise when the brakes are cold:
• Usually occurs during the first few stops in the morning.
• This is a normal condition. No service action is necessary

Squeak noise with the brakes at normal operating temperatures:
• Refer to technical bulletins specific to the model of vehicle regarding this incident.
• If specific repair information is not available, install OE type pads using the information listed under Brake Service in this bulletin (see page # 5).

Loud continuous Squeak/Squeal noise:
• Occurs with or without braking.
• This is a normal brake function. It occurs when the brake pad wear indicators contact the rotor.
• It indicates the brake pads are worn out and need to be replaced. Refer to Brake Service for additional information (see page # 5).

Groan noise when slightly releasing the brakes after coming to a stop:
• This is sometimes called “creep groan”
• It is a normal condition. No service action is necessary

Groan noise during stopping:
• Usually caused by glazing of the rotor’s surface as a result of heavy or frequent braking.
• Refer to technical bulletins specific to the model of vehicle regarding this incident.
• Replace the brake pads, then resurface the rotors and finish them with sand paper to repair this incident. Refer to Brake Service (page # 5) for additional detail.

Single clunk noise from front suspension when applying the brakes:
• Can be duplicated by lightly touching the brake pedal.
• If the brake pedal is pushed hard, the noise is less likely to occur.
• The noise is a result of the brake pads shifting in the direction of rotor rotation when the brakes are applied.
• Install the appropriate shims and apply PBC grease to the pad’s steel sliding surfaces to repair this incident. Refer to brake service (page # 5) for additional detail.

Multiple clunk noise and pedal pulsation when first applying the brakes after starting the vehicle:
• ABS Self-Check. The vehicle’s ABS system performs a self check when the brakes are applied after initial start-up. This is a normal condition. No service action is necessary.
Rear Brake Squeal:
- Usually due to an accumulation of brake dust and dirt between the pads/shoes and rotors or drums.
- Clean all dust and dirt from the brakes shoes, backing plates and related components.
- Lubricate all sliding surfaces or brake shoe contact surfaces with the appropriate brake grease. Refer to Brake Service for additional detail.

Brake Judder
Brake Judder is caused by rotor thickness variation. When the inner and outer surface of the rotor are not flat and parallel, the brake pads will have a tendency to travel in and out as they follow the low and high spots on the rotor during braking (see Figure 1). This motion of the brake pads is transferred through the caliper pistons and can be felt in the brake pedal as a pulsation. In severe cases it can also cause a back and forth oscillation in the steering wheel.

Rotor thickness variation has two common causes:
- Rotor Run Out. If the brake rotor is not true to the hub center, the brake pads contact one point on each side of the rotor with each wheel rotation, even if the brakes are not applied. Over time, this point contact will cause the rotor to wear more in these areas and cause rotor thickness variation (see Figure 2).
• Vehicle Storage. If the vehicle is not operated for periods of time, the area of the brake rotors not covered by the brake pads will rust. The friction characteristics between the rusted and un-rusted areas of the rotor braking surface will be permanently different. This difference may cause brake judder, even after the rust wears off and at low and/or high mileage.

• Lug Nut Overtorque. Another contributor of brake judder is lug nut overtorque. This can occur if the lug nuts are over tightened, especially with an air impact wrench.

Brake Judder Repair
Brake judder incidents can be corrected by turning the rotors with an on-the-car brake lathe (such as the Pro-Cut PFM 9.0 or equivalent) and careful indexing of the brake rotor to the axle hub to ensure minimum runout. If you use an AMMCO On-Car Brake Lathe, refer to NTB00-013 for complete details for using this lathe. For the Rotor Indexing procedure refer to page # 6.

In severe cases, it may also be necessary to adjust the power steering rack sliding force. Refer to related bulletins or the applicable service manual for the power steering rack sliding force measurement and adjustment procedure.

Pedal Feel
Some customers may indicate that the brake pedal feels too hard or too soft when applying the brakes. This can indicate the brake system needs service or can be the result of the customer comparing the feel of the brakes in a new car with the feel of the brakes in his or her previous car.

Road test the vehicle with the driver and determine if brake service is necessary. If so, refer to the appropriate service procedure below.

Brake Pedal Is Soft:
• Inspect the brake calipers and determine if they are correctly installed and sliding freely.
• Inspect the front and rear brakes and determine if the brake pads and/or shoes are properly installed.
• Bleed all air from the brake system.
• Ensure the brake pedal stroke and free play are adjusted correctly. Refer to the BR section of the appropriate service manual.

Brake Pedal Is Hard:
• Burnish the brakes by driving the vehicle on a straight smooth road at about 30 mph (50 kph).
• Use medium brake pedal/foot effort to bring the vehicle to a complete stop from about 30 mph (50 kph). Adjust pedal/foot pressure such that the vehicle stopping time is 3-5 seconds.
• Cool the brake system by driving at about 30 mph (50 kph) for approximately one minute without stopping.
• Repeat steps 1 to 3 between 3 to 5 times to complete the burnishing process.
Brake Service
To ensure a high quality brake service be sure to:

1. Finish rotors properly. This is one of the most important aspects of preventing and eliminating brake noise. Use an on-car brake lathe. It is the best equipment to turn the rotor surface (refer to NTB00-013 for complete details).

2. Properly install pads and shims.
   - Apply PBC grease (P/N 99990-00939) to the facing edge of the piston and to all facing surfaces between piston and pad. This will help dampen noise-causing vibrations (see Figure 3).
   - Lubricate slide pins with silicon grease (P/N 999MP-AB002) and confirm smooth movement of the calipers (see Figure 3).
   - Apply PBC grease (P/N 99990-00939) to the brake pad tabs to repair brake clunk noise (see Figure 3).

   CAUTION: Do not get this grease on the brake pad friction surface.

3. Perform the following post-installation checks.
   - Confirm that brake pads fit snugly in the calipers. Replace worn components as necessary.
   - Test drive after the installation and burnish the new brakes. This will influence brake performance including noise.
     a) Drive the vehicle on a straight smooth road at about 30 mph (50 kph).
     b) Use medium brake pedal/foot effort to bring the vehicle to a complete stop from about 30 mph (50 kph). Adjust pedal/foot pressure such that the vehicle stopping time is 3-5 seconds.
     c) Cool the brake system by driving at about 30 mph (50 kph) for approximately one minute without stopping.
     d) Repeat steps 1 to 3 between 3 to 5 times to complete the burnishing process.

4. Follow-up to ensure customer satisfaction, safety and proper brake performance.
   - Confirm the procedures described in steps 2-4 above have been strictly followed.
Rotor Indexing
When installing a new rotor, a rotor that has been surfaced off the car, or a rotor that has been removed for any reason, use the following indexing procedure to ensure the minimum amount of rotor run-out.

1. Remove the rotor to ensure it is fully contacting the hub. Clean the rotor to hub surface if it is rusty or dirty.

2. Install the rotor and all lug nuts (or suitable fasteners). Tighten the lug nuts to specification.

3. Place a reference mark on the rotor and hub.

4. Measure rotor run-out with a dial indicator (see Figure 4). If the run-out is above 0.0028” (0.07 mm)*, continue with step 5.

5. Remove the lug nuts and shift the position of the rotor one lug then re-install the lug nuts.

6. Measure rotor run-out with a dial indicator. If the run-out is above 0.0028” (0.07 mm)*, repeat steps 4 and 5 until the rotor is positioned with the least run-out.

* NOTE: Some vehicle models may have different run-out specifications (i.e., lower or higher than 0.0028”, 0.07 mm). Please refer to related bulletins or the applicable Electronic Service Manual (ESM) for proper run-out specifications.

CLAIMS INFORMATION
Please reference the current Nissan "Warranty Flat Rate Manual" and submit your claim(s) using the Operation Code (Op Code) or combination of Op Codes that best describes the operations performed.