

Bulletin BPI 06-13

Subject: Pedal pulsation after brake service

Vehicle Involved: All vehicles with hub-less rotors.

Condition: Brake pedal pulsation occurs from 1 to 12,000 miles after brake service has been performed.

Repair Procedure: friction materials used in many of today's platforms requires strict adherence to run-out limits. Lateral rotor run-out specifications are referenced in the Disc and Drum Brake Specifications Guide.

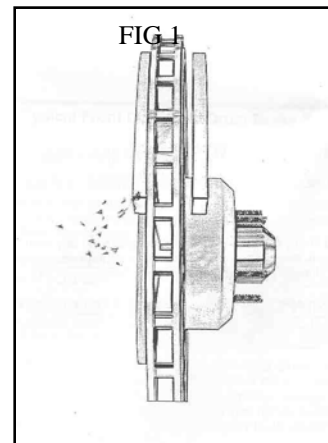
Brake pedal pulsation occurring after brake service may be caused by many variables.

1. What are the causes of lateral rotor run-out?

- Lathe arbor or adapters w/excessive run-out
- Stacked tolerances
- Hub run-out
- Rust or burr on hub
- Hub bent
- Rust or burr on rotor hat
- Unitized wheel bearing, excessive play
- Over tightening of lug nuts with impact gun and socket
- Particles caught between hub and rotor from impact gun
- Rotor cooling fins packed with rust, mud. (no heat dissipation)
- Environmental concerns (salt belt, mining)
- Two footed driving (excessive heat, warping)
- Master cylinder reservoir over full.
- Rear brakes not working, not serviced.

2. With excessive run-out, the rotor wobbles as it turns (Fig.1). Uneven rotor wear occurs when the brake pad contacts the high side of the rotor causing rotor thickness variation. Thickness variation causes:

- Brake pedal pulsation
- Dissatisfied customers
- Comebacks



3. How do I check rotor run-out? (Fig.2 & 3)

- Check bearing for excessive play
- Clean hubs and rotor hat
- Install conical cone washers
- Torque lug nuts in sequence
- Secure dial indicator

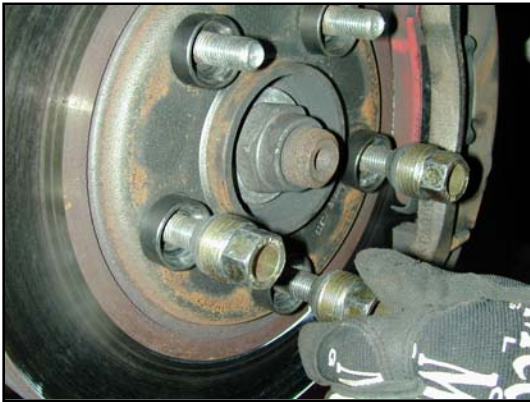


Fig.2

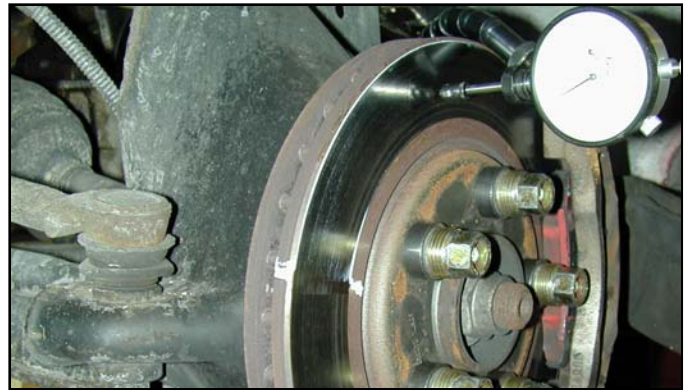


Fig. 3

4. To correct rotor lateral run-out, on the car brake lathes offer many benefits with vehicles utilizing “trapped rotors”, however anyone of the following procedures will reduce lateral rotor run-out.

- Clean hub and rotor of rust and burrs
- Index rotor to hub
- Torque lug nuts in sequence
- Replace hubs with excessive run-out
- On the car lathe
- Brake alignment shims (FIG 4)

A new rotor or a good resurfaced rotor placed on a hub that has run-out may have stacked tolerance. A technician can index the rotor to hub. This process is very easy, and in most cases the run-out specification can be attained.

Index Rotor To Hub: Begin the process by cleaning the hub and rotor of rust and burrs. Identify one of the wheel studs with a yellow marker, torque the rotor to the hub and check run-out.

If the run-out is out of specification, remove the lug nuts and move the rotor one-wheel stud to the right. Torque the lug nuts and re-check rotor run-out. Repeat this sequence until the least amount of run-out is attained. Fig.3

Because of the complexity of friction materials used in many of today's platforms, proper brake service requires strict adherence to run-out limits. For an example the 2002 Oldsmobile Aurora is originally equipped with Non-Ferris Ceramic brake pads front and rear. The run-out limit specification for the front and rear rotors is .002. It is critical that technicians check and correct lateral rotor run-out.

There are many methods for attaining the proper run-out specification. Depending on the severity of the problem, and the availability of resources at your facility, all methods need to be considered.

Fig 4

