

Bulletin BPI 17-04

TITLE Determining Correct Rotor for Med Duty Trucks
Vehicles Involved: All Medium Duty Trucks

Condition: Wheel studs not used when counting mounting holes

Repair Procedure:

Medium duty truck rotors are cataloged a little different than the typical light truck rotors. Light truck rotors are usually slip on style and go over the wheel studs on the bearing hub. Many medium duty truck rotors do not slip over the studs but are bolted to the back side of the stud flange. When the catalog listing says 6 bolt or 10 bolt, they are not talking about the lug studs, they are talking about the bolts that fasten the rotor to flange. These bolts are not visible but may be determined by counting the casting extensions on flange (see fig 1). The figure below shows a 10 bolt mount with 8 studs.

Another note is catalog listings. Medium duty applications are sometimes better determined by size. Overall diameter, height of rotor lying flat on table, center hole diameter and bolt holes are some of the measurements needed for correct part.



Fig 1

Bulletin BPI 03-02

Subject: Diagnosing and Measuring Rotor Run-out.

Vehicle Involved: All vehicles with hub-less rotors.

Condition: Pedal pulsation after brake service.

Repair Procedure:

Brake pedal pulsation can occur from 1 to 7,000 miles after inadequate brake service has been performed. Variables can extend the distance from 10,000 to 12,000 miles before pulsation is evident.

Lateral rotor run-out specifications are easily referenced in the Disc and Drum Brake Specifications Guide. When was the last time you checked rotor run-out after cleaning the hubs and properly installing a new rotor to the hub? Tired of comebacks? Read on.

Brake pedal pulsation occurring after brake service may be caused by many variables. These include but are not limited to: driver habits (two footed driving), friction materials, rotor metallurgy, technician error, and worn, binding or bent parts.

1. What are the causes of lateral rotor run-out?
 - Lathe arbor bent 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
 - Rust shower, (particles caught between hub and rotor) from impact gun and socket
 - 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. What are the effects of excessive lateral rotor run-out? With excessive run-out, the rotor wobbles as it turns (Fig.1). Uneven rotor wear occurs with the brakes not applied causing rotor thickness variation. Thickness variation causes:

- Brake pedal pulsation
- Dissatisfied customers
- Comebacks

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

- Inspect unitized hub and bearing for excessive play
- Clean hubs and rotor hat
- Install conical cones/washers
- Torque lug nuts in sequence
- Secure dial indicator

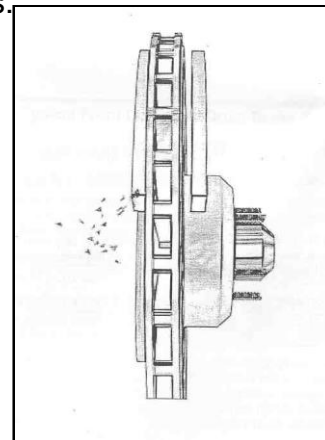


Fig.1

4. How do I correct rotor lateral run-out? If the vehicle you are working on is comeback, ask the customer questions...if for any reason tires have been removed, start by re-tightening the lug nuts in sequence to the proper torque value. Excessive run-out may require additional procedures. On the car brake lathes offer many benefits with vehicles utilizing “trapped rotors”, however any of the following procedures will reduce lateral rotor run-out.

- Cleans 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

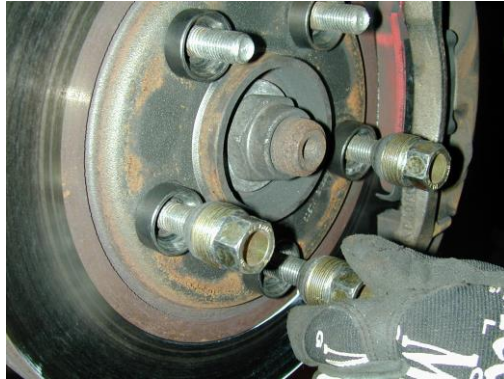


Fig.2

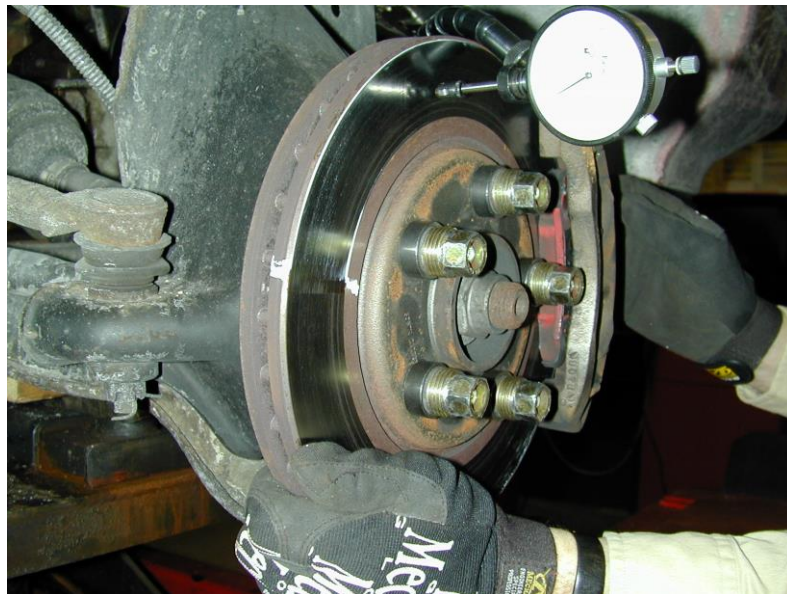


Fig. 3

A new rotor or a good resurfaced rotor placed on a hub that has run-out may cause a comeback. With a little extra care and time, 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, these methods need to be considered.