Brake Drum Inspection - Checking Runout, Wear, And Other Characteristics

The following inspection procedures are recommended to be used when measuring drums for run out both before and after they have been removed from the vehicle. Volvo recommends using a micrometer such as a Starrett inside micrometer set, 124CZ Solid -Rod Inside Micrometer or equivalent for accurate measurement results.

Assembled Brake Drum Runout Check

**NOTE:** You should always check runout on an assembled brake drum. Do not disassemble the wheel and tire assembly, or any other components. Do not remove the wheel and tire assembly from the vehicle, which will change the original position of the assembled components and affect the accuracy of the runout reading.

Perform the following procedure with the wheel and tire assembly installed to obtain an accurate in-service runout reading.

If it is determined after the initial runout measurements are taken that further measurements are needed on the drum, then it is advised that the wheel and tire assembly is removed.

1. Wear safe eye protection. Park the vehicle on a level surface. Block the wheels to prevent the vehicle from moving.

2. Raise the axle you will inspect and support it with safety stands.

3. Remove the dust shields, if equipped, to obtain access to the drum friction surface.

4. Mount the base of the dial indicator onto the axle, steering knuckle or other flat surface near the wheel end.

**NOTE:** If a flat surface is not available: Use a pair of clamps and flat piece of stock to create a flat surface for mounting the dial indicator. Ensure the dial indicator base is correctly secured.

**NOTE:** If there is movement in the base: Relocate it to a more secure position. In some vehicle configurations, a lateral runout gauge or small dial indicator may be required in order to obtain correct clearance. Reference images below, Image 1 and Image 2.
6. Align the dial indicator to contact the drum friction surface. Ensure the dial indicator tip is perpendicular to the drum friction surface to obtain an accurate reading.

Reference images below, Image 3 and Image 4
7. Set the dial indicator to ZERO.

8. Rotate the wheel and tire assembly 360 degrees, one complete revolution. As you rotate the wheel, watch the gauge as it moves left to right. Note the area with the highest runout reading.

9. Rotate the drum to the highest runout reading and zero the dial indicator.

10. Rotate the drum 360 degrees again. As you rotate the wheel, watch the gauge and note the maximum reading. This is the total indicator runout (TIR), which should not exceed 0.015-inch (0.381 mm).

**NOTE:** If runout is less than 0.015-inch (0.381 mm): Return the vehicle.

**NOTE:** If runout exceeds 0.015-inch (0.381 mm): Remove the drum.
NOTE: If runout exceeds 0.015-inch (0.381 mm): Remove the drum and inspect the hub-to-drum mating surfaces for damage. A mismount of the drum pilot to the hub pilot can damage the chamfer surfaces and possibly not allow the drum to position correctly onto the hub pilot. Verify both the mating surface of the hub and the pilot of the drum are free of paint, rust and debris.

No Damage is Found

1. Reinstall the brake drum onto the hub by rotating the drum 180 degrees from its original position.

2. Install two nuts 180 degrees apart to keep the drum seated against the hub. Re-measure runout.

NOTE: If runout is less than 0.015-inch (0.381 mm): Keep the drum in its new position. Remove the nuts, reassemble the wheel, and return the vehicle to service.

NOTE: If runout exceeds 0.015-inch (0.381 mm): Replace the drum.

If Damage is Found—Replace the necessary components.

Brake Drum Wear Inspection

Inspect the brake drums when you perform maintenance and service procedures. Refer to Brake Drum Wear Conditions provided by the product manufacturer to identify the types, possible causes and corrective actions for brake drum wear.

1. Closely check wear patterns on the friction surface inside the drum.

2. The maximum allowable brake drum diameter is stamped or cast into the outer edge of the drum. Place a brake drum diameter gauge inside the drum. Take several measurements within 90 degrees of each other at the top and bottom of the inside of the drum’s friction surface.

NOTE: If any of these measurements are 0.120-inch (3.048 mm) over nominal diameter: Replace the brake drum.

NOTE: If a brake drum is out-of-round: Replace the drum.
3. Inspect all components for corrosion before assembly, especially the brake drum pilot and mating hub and bolt flanges. Corroded parts can cause excessive end play, which can result in deep drum wear on one side only.

4. When installing a drum, ensure proper mounting/orientation of the drum and tightening sequences for the lugnuts are utilized.
PILOT BORE DIMENSIONS

Proper Measurement:

Using a calibrated I.D. micrometer, at least two measurements should be taken at the pilot bore, 90° apart.

If measuring a drum with a “dual pilot” design, be sure to measure the correct pilot surface for accurate measurement results.

The dimensions should fall within print specifications.
BRAKE SURFACE TAPER

Proper Measurement

using a calibrated I.D. micrometer measurements should be taken at the
top of the brake surface twice 90 degrees apart from each other.

A second pair of measurements in the same orientation should be taken at the bottom of the brake surface.

**Brake Surface Taper:**

The difference between the top and bottom measurements in the same plane should not exceed 0.006”.

The difference across the diameter should be greater than 0.010” when measuring 90 degrees apart to be considered “out of round”. 