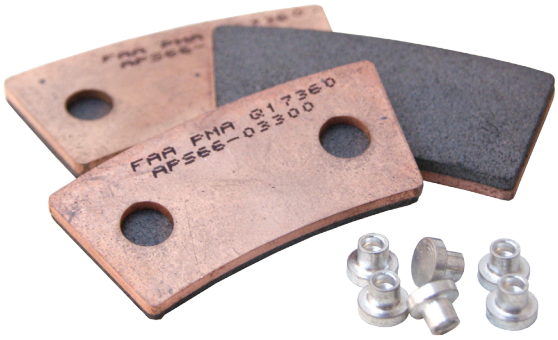
# Lining, Rotor, and Pad Break-In Information




One of the most important factors in disc and lining performance and safety margins is proper bedding before use, yet it is the most ignored. Ninety-nine percent of warranty claims are from an improper break-in. In order for any brake system to work optimally, the disc (rotors) and pads (linings) must be properly bedded in. Other familiar names for this process are Break-in, Conditioning, or Burnishing. Whatever terminology you choose, getting the brakes properly bedded-in is crucial to peak performance. A Cessna 172 on final approach has approximately 159,000 pds of kinetic energy to stop, translating into a lot of energy to turn into heat. Proper break-in is key to producing less heat while stopping the aircraft.

There are two different types of braking systems - Abrasive Friction and Adherent Friction. The Abrasive Friction type generates friction by the rubbing of the brake lining against the brake disc. The more pressure exerted on the brake linings, pushing them against the disc, the more friction that is generated, which in turn generates excessive heat, creating a high degree of wear. With this type of braking system, both the brake discs and linings wear on an accelerated, almost equal, basis. With the Adherent Friction type of brakes, the type most used on airplanes, a thin layer of friction material is transferred from the brake lining to the surface of the brake disc. As pressure is applied to the brake linings, the brake pad actually rubs on the abrasive material that was transferred to the brake disc. With this type of braking system, the brake linings will wear out long before the brake disc.

**CAUTION: Improper breaking-in of the linings can cause "Glazing" of the brakes. Glazing is caused by excessive heat which causes a crystallization of friction material on both the brake pad and the brake disc surface. Once this crystallization occurs, breaking-in of the brakes is virtually impossible.**

## Metallic Lining Break-In Procedure

1. Taxi aircraft at a high rate of speed (30-35 kts.).
2. Apply brakes with a slightly heavier than normal pressure.
3. Repeat the above operation for a second consecutive time. Do not let the brakes cool between stops.
4. Allow brakes to cool for 10-15 minutes.
5. Apply brakes to confirm that normal pressure will hold the aircraft at high level static run-up power settings. If brakes hold, conditioning procedure is complete.
6. If brakes do not hold, allow brakes to cool completely and repeat steps 1-3.

## Semi-Metallic Lining Break-In Procedure

1. Taxi aircraft for 1,500 feet at 1,700 rpm applying brake pedal force as necessary to maintain a 5-10 mph taxi speed.
2. Allow brakes to cool for 10 to 15 minutes.
3. Apply brakes and check for restraint at high static power setting. If brakes hold, break-in is complete.
4. If brakes cannot hold at static power setting, allow brakes to completely cool and repeat steps 1-3.


The purpose of the break-in process is to transfer an even amount of brake pad material to the braking surface of the brake disc. For this transfer of abrasive material to be successful, the correct amount of heat must be generated to transfer brake pad material to the brake disc. Depending on what type of brake lining is being used, semi-metallic or metallic, the break-in procedure will be different. The metallic linings require more heat for the transfer of brake pad material to be successful than for the semi-metallic.

The biggest concerns heard from aircraft owners relating to braking issues is excessive brake pad and disc wear, worn out brakes with very low time, or poor braking performance. All of these issues can originate from incorrect break-in of the linings and discs. Because the proper amount of brake pad material was not transferred to the brake disc, an abrasive friction type brake system was unintentionally developed, which results in very high wear on both the brake discs and brake linings. Hopefully this will stress to you the importance of breaking in new brakes.