

## Bedding-in and Pad Conditioning Procedure

### Background

Any deviation from perfect flatness of the brake pads or disc under load will result in less than 100% contact between the two when the brake is first installed. Correct bedding, namely 100% contact, is generally achieved after the first few operations in dynamic braking applications, but is more difficult to achieve when the brake is only used as a holding device (stationary clamp). Some dressing of the pad may be necessary in such cases, and is one reason why an adequate safety factor is necessary.

A further essential preparation for a new brake pad is 'conditioning', which involves the generation of progressively more heat at the pad surface to bring about changes in the surface material which are necessary to develop its full braking potential.

Both bedding and conditioning are necessary to realise the full friction level of the material and its ability to handle high specific power dissipation.

Inadequate bedding may cause 'hot spots' and inadequate conditioning may badly damage the pads.

### 1. General bedding-in procedure for dynamic braking applications

For bedding-in of dynamic braking applications the principle is to work the brake lightly at first to remove pad high spots and so achieve something approaching 100% pad contact with the disc. Progressively heavier braking can then be applied until the full rated duty is reached.

If there are signs of distress, such as the deposition of pad material on the disc, try progressing more slowly towards the rated braking duty. This may involve gradual increases in both rubbing speed and/or pad pressure as appropriate to the type of installation. Remove any deposits on the disc braking surfaces.

### 2. Bucyrus dragline hoist & drag applications

The following procedure is provided as guidance for bedding-in Twiflex GMRSD (spring applied, air release) calipers fitted with sintered bronze MD550 pads, on Bucyrus dragline and hoist and drag applications. Note: sintered pads need to have full friction face contact and be heat prepared before full production use.

## 2.1 Requirements prior to bedding-in

1. Install the caliper brakes into position on the machine.
2. Check the brake disc sweeps over the full face of the sintered pads. Sintered Pads must not overlap any edge of the disc.
3. Before starting, ensure that the correct air pressure is available for the SD thruster being used. See Twiflex IOM manual, M1477 for details.
4. With the thruster(s) connected, check the air pressure required to balance the spring force (release pressure) e.g. pressure just before any movement is seen. Also check the full retraction pressure.
5. Check the action of the caliper. The brakes will apply (brake on) with zero air pressure.
6. With the brakes on check the pads make 100% contact with the disc face. Also check the squareness and ensure pads are not tilted which may indicate the pressure plates are incorrectly assembled to the arms.
7. The brakes will retract (brake off) with air pressure. When the air (retraction) pressure is applied, check both pads move smartly away from the disc face. They should not remain in contact with the disc face.

Note: An inclined mounting kit is available to ensure release of both pads when the caliper is mounted in positions greater than 10° above or below the horizontal. See Twiflex IOM manual, M1477 for details.

8. Ensure both pad and brake disc surfaces are clean and dry. If necessary clean brake disc faces and pad faces with suitable (non oily) cleaner.

## 2.3 Bedding-in and conditioning parameters

The data in Table 1 is provided to give guidance for suitable parameters for bedding-in Twiflex caliper brakes fitted with MD550 sintered bronze pads on dragline applications. Please note however, the amount of bedding and conditioning that will be needed may vary somewhat according to the initial condition of the material and the severity of the duty, and the following suggested procedure may be shortened or lengthened by the Commissioning Engineer according to his observation of the performance of the pads during this period.

**NOTE:** Steps 1 and 2 from Table 1 are intended to remove high spots on surfaces so full face contact can be achieved. At the end of step 4 the pads should be inspected to check full face contact is achieved and to check the condition of the pad. No significant damage to the pad pucks should be evident, although slight deformation of the puck edges is permitted. If full face contact is not achieved repeat steps 3 and 4 and check the pads again for face contact and condition.

## 2.4 Cooling times

The recovery (cooling) times act as a guide only. The disc temperature should be monitored during bedding-in as it may be necessary to increase the cooling time to prevent excessive temperatures occurring. After a very heavy braking duty the disc should be allowed to cool down to near ambient temperature before re-testing.

Note: Do not let the pads get too hot. Brake disc temperature will not give a good indication of pad temperature at the rubbing high spots.

**Table 1 – Bedding-in parameters**

Step	Number stops	% of normal motor speed	Bucket load	Recovery (cooling) time (mins)
1	4	25	Empty	1
2	4	50	Empty	1
3	4	75	Empty	2
4	2	100	Empty	5
5	1	100	Full	5