

## DISC BRAKE FUNDAMENTALS - THE EFFECT OF PAD SIZE ON DISC SURFACE TEMPERATURES AND STRESSES

The analysis of disc brake behaviour is usually based on the assumption of continuous heat flux input, i.e. as if the pad contacting the disc were annular. In reality the pad only covers between a tenth and a quarter of the disc area and in any one revolution of the wheel a point on the disc surface receives a proportionately high flux followed by a period of 'cooling'. The cooling is predominantly conductive heat transfer from the surface into the bulk of the disc, and the resulting steep temperature gradients may produce high stresses on the rubbing surface, which can lead to the surface 'crazing' phenomenon noticeable on some discs after a period in service.

This report describes a theoretical investigation into the effect of pulsed heat inputs and the resulting surface temperatures and stresses, using the finite element method.