

## Racecar Braking Torque Measurement

**Customer:**

Formula 1 motorsport company

**Loadcell:**

F268-Z0913 10kN

**Generic Type:**

Shear beam

**Special Features:**

Span drift compensation - Novatech's patented passive technique

High temperature build specification



Novatech Measurements proactively proposed a loadcell system to measure braking torque when applying the brakes of a Formula 1 racing car. Typically, a 3kNm braking torque produces a 20kN reaction at the brake calliper; this was shared between two 10kN loadcells. High temperatures in this application required a loadcell with a safe working temperature of between -10 and 250°C. The loadcell system would also be subjected to high energy vibrational and shock loads at high temperatures.

A miniature shear beam loadcell with customised fixings was integrated into the calliper mounting structure. Using a high temperature build specification and Novatech's patented passive span drift compensation techniques, it was possible to produce a loadcell with minimal measurement errors due to rapid and severe changes in temperature. Loadcells were supplied as matching pairs to counteract differential expansion of the calliper and structural upright. FEA modelling was used to validate the design principles and optimise the structure before producing test prototypes. In house testing and calibration was undertaken using a specially designed rig to replicate in service conditions providing applied forces and temperatures to customer specifications. Prototypes were provided for customer testing prior to full production. The loadcells were given a standard R and D tool classification.

