

# Forcecheck+

## CALIBRATES ALUMINIUM RIVETING GUNS

- GREATER PRODUCTIVITY
- IMPROVED RIVET QUALITY
- REDUCED TOOL WEAR



Forcecheck+ Force Monitor & Sensor

Users of our joining analysers include:

BMW, Daewoo, Ford, Saab, Jaguar, Land Rover, Nissan, Volvo and Mercedes.

**Forcecheck+** analyser measures the peak force and force profile at key points during an aluminium riveting cycle. Thus both the timing of the force and its peak value can be assessed. This information can then be used to correctly adjust the riveting guns. The measurement is conducted by a transducer placed in the anvil of the rivet gun.

**Forcecheck+** is a development of the Squeeze Analyser used by all leading auto manufacturers for resistance welding. The move by some manufacturers such as Jaguar, Landrover and Audi toward aluminium monocoque designs has led to a preference for riveting, rather than more expensive aluminium welding. In response to this requirement, Diverse have designed an instrument dedicated to the calibration of the riveting guns.

Correct setting of the riveting pressure is essential in order to get the best compromise between production speed, quality of rivet and tool wear. **Forcecheck+** is recommended for routine quality checks as part of any quality control procedure and following servicing of the riveting equipment.

### FEATURE SUMMARY

- Measures the preload force - the preload force as the gun waits for rivet cycle
- Measures the peak force - the peak force available during the process
- Measures the finish force - the force applied at the end of the cycle
- Display shows both force values and timing as an early indication of piston wear.
- Enables riveting equipment to be correctly adjusted within minutes.
- Ensures high quality riveting performance
- Meets ISO 9000 quality assurance requirements
- Fully calibrated and delivered with certification
- Supplied with a protective carrying case and full user instructions.

# Forcecheck+

## Background

The aluminium riveting process does not involve pre-punched holes, instead the rivet is driven directly into the metal. Rather than going completely through the sheets to be joined, as in a classic rivet process, the rivet deforms the metal and splays open. The hydraulic guns supply a pre-clamp force followed by the full force. An anvil on the other side of the gun provides the load bearing surface for the rivet to be driven against. This part is considered a consumable.

Riveting is normally carried out using robot or hand guided hydraulic guns. These guns are supplied by a number of manufacturers including Henrob. The guns vary in size and force depending on the rivet size and material thickness.

**Forcecheck+** enables the user to measure the key points of the force profile not only when setting up riveting equipment for the first time, but also when doing regular maintenance or corrections after repairs. By setting the optimum force cycle with Forcecheck+, riveting equipment can be adjusted to the highest possible speed, with consistent quality and tool wear.

The instrument transducer is arranged to replace the anvil of the machine under test. It adds approximately 15mm to the height of the anvil. Anvils can be supplied to any machine format, details must be supplied at time of order.

The operation of the **Forcecheck+** is straightforward:

1. Switch on **Forcecheck+**
2. Replace anvil on hydraulic gun to be tested with modified anvil.
3. Press start button on front of **Forcecheck+**
4. Operate hydraulic gun with (or without) a rivet and test piece
5. The numbers displayed are the 3 forces supplied by the gun.
6. These values remain displayed until the unit is powered off or button is pressed for next measurement.

The instrument is subject to large forces and we recommend yearly calibration.

### Specification

Measurement	
Range:	0 kN to 60kN
Accuracy	+/- 1KN
Resolution	10 bits or 60N
Display:	Preload force Peak force Finish force
Stroke Gap:	Gap reduced by 15mm
Sensor Diameter:	25mm to 50mm
Power Supply:	4 rechargeable AA NiMH cells
Monitor Size:	200 x 150 x 60mm
Transducer Size:	15 x 25 - 50 diameter
Battery Charger:-	85 to 265 Volt input
Weight in Case:	1kg.

### Options

Forcecheck+ can be supplied with a serial interface to a PC.

Software is available for displaying the time force profile, and logging the performance of each gun in a database.

One or more of the following riveting conditions may be related to incorrectly set force profiles

- Skew rivets
- Poor top finishing
- Slow cycle time
- Excessive tool wear
- Anvil damage
- Poor peel test performance
- Joint porosity

In order to provide continuing product improvement, the specifications contained in this document and are subject to change without notice.