Crane Electronics Ltd
The force in torque management

Why is Torque Data Collection important?
A look at Torque Data Collection and why it is becoming increasingly significant to manufacturers across various industries.

What is Torque Measurement and Data Collection?

One of the most important aspects during the manufacture of high-quality products is the measurement of Torque and the Data Collection of these results. This is particularly true when looking at the correct levels of tension within critical Joints and fastenings on cars, aeroplanes, heavy-duty machinery and white goods etc.

The tension in a fastener, such as a nut and bolt, essentially holds the assembly of a product together. This fastener needs to be at a specific, correct level for a good stable Joint ensuring that it is secure. Too little tension and the fastener can become loose. Too much and the fastener or Joint can become deformed or break due to overstress. The way to properly ensure the level of tension on a fastener is to measure the level of Torque applied to that Joint during the tightening process.

The collection, recording and storage of this Torque tightening Data is extremely vital for ensuring that manufacturers have eliminated potential health and safety risks during both the Assembly and Quality Auditing stages. Manufacturers not only have to adhere to and record these specific Torque tightening levels due to legislation but it also helps to provide peace of mind for their customers and end-users, increasing a company’s reputation for a high-quality, precision engineered product.

“The collection, recording and storage of Torque Data is extremely important... a vital stage for eliminating potential hazards and health and safety risks.”

How are Torque Data Collectors used in Industry?

Torque Data Collectors are utilised differently depending on the application, but they all ultimately perform the same function.

For the testing of assembly Power Tools, a Data Collector will be used alongside Torque Transducers or Joint Kits to monitor and analyse the Torque readings that each individual Tool is applying. Manufacturers have routine processes whereby assembly tools can be given ID’s which are then routinely checked using Torque Testers and Data Collectors to log their Torque results. This ensures that all Tools are performing as they should, safeguarding the integrity of the whole production process. Tools that are found to have dropped out of the required Torque range can be calibrated quickly and any...
potentially affected components can be highlighted, checked and if required, corrected. This Data can then be uploaded directly on to the Data Collector, so Tools can be tested quickly and easily with minimal disruption to production, allowing manufacturers to test their Tools more regularly.

Data Collectors are also used to test the Torque levels of individual Joints and fasteners on the actual product, during both the Assembly and Quality Auditing stages of production. Here the Data Collector can be utilised with Torque Transducers as well as Digital Torque Wrenches. In order to ensure that Torque issues are discovered as quickly as possible, many manufacturers will deploy Quality Audit personnel at different stages of the production process. This method of randomly and regularly spot checking Torque results on their products and tools will help to capture any potential issues that may arise.

Initially, all the individual Torque specifications for the many different Joints and components of the product can be set on the manufacturers computer system as Jobs or Rounds. These Jobs or Rounds can then be uploaded on to the Data Collector so that all the individual Torque targets and yields are already pre-programmed, making the process efficient and timely. Speciality Torque software is also available that focuses on the storing and traceability of the Data, allowing reports to be collated and filtered on demand, showing the date, time, operator info, the individual Joints tested and recorded and the actual Torque results applied.

Throughout the measurement processes, relevant values are displayed on the screen of the Data Collector, sometimes alongside a real-time graph of the tightening trace when used with a cabled Wrench or Transducer. Measurement readings are then collected and the associated information is stored on the Data Collector. All of this information can then be utilised in different ways including being saved to a USB drive or emailed directly from the device. Most commonly though, the Data Collector is connected to the manufacturers system database where the Data can be stored on a larger scale which is also accessible to all those who should wish to access it throughout the business.

**Where are Torque Data Collectors utilised and why is this process so important?**

Torque Data Collectors are used across a whole host of industries including Automotive, Aerospace, Rail, Marine, Pharmaceutical, Food & Beverage and General Manufacturing such as that of White goods and electronics.

All industries have their own requirements for monitoring, recording and storing Torque Data, all of which are becoming increasingly important across the board and none more so than in industries that demand a precise, high quality product finish with accurate and reliable Data records, such as Automotive and Aerospace.

For example, in the Automotive Industry, vehicles are essentially...
held together by vast numbers of critical Joints and fastenings, all of which must be tightened to the varying Torque levels to ensure their stability, safety and strength. If a car’s interior trim panel screw was to fail, the result would be a quality issue leading to disappointment from their customers and potential complaints. If a seat belt bolt or wheel nut was to fail, the result would be a critical safety issue which could mean end-user injury or even a fatality. An incident such as this would be catastrophic for a vehicle manufacturer with both significant damage to the company reputation as well as a major financial costs due to fines, compensation, vehicle recalls and loss of future sales.

“A critical safety issue could be catastrophic...with significant damage to the company reputation as well as a major financial costs.”

Here, Data Collection is vital as it offers proof for manufacturers and end-users that items have been completed to the correct standards and that all assembly Tools used in the manufacturing process were applying the correct levels of tightening Torque. This is a now a necessity for all parties.

For example, in the event of a car accident or a common ‘fault’ across a particular vehicle model; manufacturers and legal representatives would require access to the historical records of the production process, including Torque tightening Data, to prove that vehicle safety requirements were met during the manufacturing and Auditing processes and before the vehicle left the factory floor.

Even before this stage is reached, if a Torque tightening issue is highlighted in a batch of vehicles at post-manufacture stage but before the cars are released, the data can be trawled to find the source of when an issue began. This allows the manufacturer to identify all the model numbers which could also be affected, allowing them to isolate the affected vehicles for any potential issues to be resolved before release.

Across all manufacturing industries, ensuring correct Torque levels on critical fasteners is important on every aspect of the car from the chassis, engine and wheels to the seatbelts. This means that an efficient and reliable process of collecting and recording Torque Data must be implemented, allowing the company to capture numerous Data records, simultaneously and with ease, without disrupting the flow of production and auditing.

Who are Crane Electronics and what do they know about Torque Data Collection?

Established in 1971, Crane Electronics has been delivering solutions for Torque management and control problems for over 45 years. Crane offer a variety of Torque Data Collectors which have helped revolutionise and lay the platform for effective Torque measurement and auditing.

In 1986, Crane developed the first practical Torque processors incorporating SPC (Statistical Process Control) which transformed...
organised Torque Data Collection in the industry. This was the first of many innovations from Crane in this area.

In 2003, Crane Electronics launched the popular TorqueStar Opta Torque Data Collector which revolutionised the Torque measurement industry and is still the equipment of choice for the measurement and collection of Torque, Angle, Pulse and Force Data across the manufacturing and quality environment.

2014 saw the launch of the innovative IQVu Torque Data Collector which combined all the features of the established TorqueStar with a market leading, robust tablet to give an improved, modern and easy to use product. The IQVu provides the ideal solution for the measurement and collection of Torque, Angle, and Pulse Data in the manufacturing and quality environment.

The IQVu also allows manufacturers to view their Torque Data in ways like never before. With the inclusion of Trend Analysis, manufacturers can monitor their Torque results for both critical fasteners or their assembly Tools, to review and estimate future increases or drops in Torque tightening performance before they occur in real time. The IQVu gives manufacturers the ability to become strategic in their Quality Auditing process and ensure the most accurate and precise results in the market.

Crane’s innovative Data Collectors work in sync with their own series of Torque Wrenches and Torque Transducers which help record the Torque Audit results. Crane also supply OMS (Opta Management System) Torque Software which is a purpose-built software system that allows companies to record and manage their Torque Data on a large scale and produce customised reports.

For more information about Torque Data Collectors or for any assistance with Torque management and measurement products and services, please contact Crane Electronics on 01455 25 14 88 or email us at sales@crane-electronics.com.