

# The Importance of Torque Data Collection

*The reason Torque Data Collection is becoming increasingly significant to manufacturers across various industries.*

## Torque Measurement and Data Collection

One of the most important aspects during the manufacturing 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, aircraft, heavy-duty machinery and white goods etc.

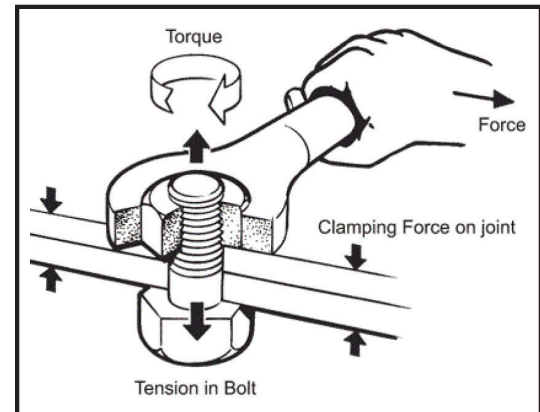
The tension in a fastener, such as a nut and bolt, essentially holds the assembly of a product together. This fastener needs to be installed at a specific, correct level of tension, ensuring a stable and secure joint. Too little tension and the fastener can become loose. Too much and the fastener or joint can become deformed or break due to over-stress. 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 to ensure 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 Industry and Torque Data Collectors

Torque Data Collectors are utilized 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 analyze 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.



**Torque is the turning force which applies clamping tension to a fastener to correctly secure the joint.**



**Torque measurement and in particular, torque data collection, is one of the most important aspects of quality assurance within a number of industries including the assembly lines of automotive and agriculture industries.**

*The collection, recording and storage of torque data is extremely important...  
a vital stage for eliminating potential hazards and health and safety risks.*

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 utilized 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 preprogrammed, making the process efficient and timely. Specialty 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 utilized 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 manufacturer's system database where the data can be stored on a larger scale, making the information accessible to choice employees throughout the business.

## Consistency, Quality, and Accountability.

Torque data collectors are used across a whole host of industries including automotive, aerospace, rail, marine, agriculture, 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.



**A rotary torque transducer and torque data collector being used during a quality audit test of a joint and fastener within the ag industry.**



**A set up including torque transducers and torque joint kits alongside a torque data collector is common for regularly auditing production assembly tools on the factory floor.**



**High precision engineering and data traceability is an absolute standard demand in the aerospace industry.**

For example, in the automotive industry, vehicles are essentially held together by vast numbers of critical joints and fastenings, all the force in torque management 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.

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 traced 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, and if missed, recalled after 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 seat belts. 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.

***Torque Data Collecting provides peace of mind for a company's customers and end users, increasing their reputation for a high quality, precision engineered product.***



**Torque tightening readings being audited with a torque data collector during the assembly stage of a large engine.**



**A digital torque wrench with a built-in data collection system being used to test the torque readings of a typical joint on a car engine.**



**Power tool torque auditing takes place on and around the production line during the assembly process.**