



Let's talk hydraulic torque

Words: Rhodri Williams

The wind industry has a huge number of bolted joint connections and, for the most part, they are critical to both performance of the turbine and safety of those working on or around it. More recent offshore designed turbines have as many as 10,000 bolted connections. With wind turbines being designed larger, bigger bolts and higher torque values are required, so the need for hydraulic torque equipment will thrive.

The primary installation method for assembly of equipment, construction of turbines and for maintenance is the tightening and checking of threaded fasteners, or bolts. This is a standardized way to design joints, which can also be repaired or replaced during the course of the turbine's entire life cycle. These joints provide structural integrity of the tower, nacelle or blades. They ensure correct performance of equipment, safety of both the workers during assembly and construction, and if installed correctly, can maximize the lifetime of the turbine.

There are two trends within the industry that remain the focus for OEMs. The collection of data on critical joints and the safety of their operators. Atlas Copco has completed several Smart Bolting initiatives. These include SRB HA high torque battery tool, Power Focus XC electric nutrunner, RTA intelligent hydraulic wrench system & STS Smart Tensioning System.

These enable the collection of joint data, as well as full traceability of the work completed. Atlas Copco already offers best in class in terms of safety features and data collection, when it comes to continuous rotation tooling. This year will see the launch of the Smart Tensioning System, which will again provide a market leading solution. In parallel to these developments, we are also looking at how we can improve our standard hydraulic torque wrench line, providing greater value to the user, in terms of safety and operational efficiencies.

From the outset of the wind industry, hydraulic torque applications have been paramount in delivering accurate tightening to high levels of torque. There has been a trend from the operators in recent years, to reduce the number of hydraulic wrenches being used on site. Electric and battery-operated torque tooling is now favored because of cost, speed and ease of use for the operator. However, with wind turbines being designed larger, bigger bolts and higher torque values are required, so the need for hydraulic torque equipment will not only remain but continue to thrive.

Through customer driven innovation, at Atlas Copco we have looked at how we can improve our standard and industry known RT, the Square Drive Tool, and RTX, the Direct Fit Tool tooling. This year we will launch an all new range of hydraulic wrenches called TorcFlex, with models TF, the Square Drive Tool, TFX, the Direct Fit Tool and also a unique and innovative new hose set-up, Co-Axial Hose & Coupling.

This addresses some of the issues seen by technicians on-site during installation and maintenance activities. This new innovation changes the system from a traditional double hose connection to a single coupling, making it much easier and quicker to set up and operate, but also reduces hose tangling and so improves maneuverability and importantly improves safety by reducing tripping hazards. The Torcflex product line will be a premium torque wrench offering, delivering high torque, to a calibrated +/- 3% accuracy.

PES spoke to Rhodri Williams, Global Product Manager at Atlas Copco, to learn more about the Torcflex product line and how it will address some of the issues seen with using hydraulic tooling in the field.

PES: Rhodri, can you tell us how the Torcflex development came about?

Rhodri Williams: Atlas Copco is known within the wider industry as being market leader in continuous rotation. Hydraulic bolting, Torque & Tension, is relatively new within the company, after acquiring two businesses during the last decade.

Atlas Copco has always developed products with the user needs as the primary focus, looking at ergonomics, operation efficiencies and safety benefits. So, we were always looking to develop a hydraulic tool range that addressed those needs, whilst delivering a reliable, accurate tightening solution.

Innovation in the hydraulic wrench market is hard to come by. Tools are still being sold today in mass numbers that were developed in the 1990s from the market leaders. There are very little additional features being offered, as the fundamentals of hydraulic torque are not complex.

Most new products we have seen in the market in recent years have seen minor

incremental changes in their designs and very few of those developments actually focus on the users' experience. This product launch looks at where we can offer additional value, whilst promoting a safety first philosophy.

PES: What are these features and how do they benefit the user specifically?

RW: The first standardized feature is the retained reaction arm on our TorcFlex range. Reaction arms on most wrenches in the market need to be disengaged, so that they can be repositioned on the application. This is not only time consuming, but there is also an inherent safety risk of a drop hazard.

Within the wind industry working at heights is an obvious risk, so having a retained reaction arm that can be easily indexed around the application, increases safety for everyone working on the turbine. There will also be an accessory line that compliments the design, with the ability to offer customized solutions where required against application.

We have also designed an integral square drive retainer. Our previous model, RT, like many such tools on the market has a separate drive retainer, a 2-piece design, which has to be removed and re-engaged, when changing the direction of the square drive. The square drive assembly is now one single piece with a spring-loaded button mechanism, which allows the user to change direction of use



Rhodri Williams

easily and efficiently. There is also a secondary benefit, as these retainers often are dropped or even lost.

Similar in benefits to the integral square drive retainer, we have designed a retained link pin into our TFX tool line. A lot of tools in the market have a pull pin mechanism which has to be removed to change out the ratchet link. Again, this pin often gets lost, dropped or damaged, causing delays on-site. Having a retained pin in the link body, removes this problem for the user.



The new standard support handle and Co-Axial coupling providing greater efficiencies to the user, whilst prioritising safety

PES: Hydraulic bolting, and torque operation in particular, is a safety concern within the wind industry, as you've mentioned. What developments have you made to address that?

RW: It's a huge safety concern. Training is of course paramount, but if we as tool manufacturers can offer features that increase safety for the user, this will of course be of benefit. All of our wrenches now are supplied with a new support handle as standard. This new handle can be indexed, whilst still being attached to the tool, which means it can be used in the most ergonomic and safest manner.

It is common that handles are available for other hydraulic wrenches, but they are typically offered as an accessory, which means they often don't get ordered and then the user always sees the benefits. We have included this new design handle as standard to ensure the user benefits from the most safe too. And by using the new design they will also benefit from the flexibility it offers compared to traditional fixed design handles.

The support handle's primary objective is to remove the operator's hands away from any reaction point on the application. Within onshore wind, hands are the most common part of the body to get injured. Frequently, these injuries result in the workday being lost, suggesting these injuries were severe and noted as high potential. With our new TorcFlex tool, if the new support handle is attached, the risk of injury is reduced significantly and potentially even eliminated. (see photo).

PES: You mention the Co-Axial coupling; how will this benefit the user?

RW: The industry standard coupling offering are twin screw-to-connects or quick-connects from various manufacturers. There are many accepted



The Co-axial hoses and coupling is a breakthrough innovation that improves safety and reduces operation time

issues or risks within the industry, such as pressure intensification, trapped pressure, oil drips during connections, couplings becoming unscrewed and hose entanglement.

The only innovation in recent times has been the adoption of quick connect couplings which only addresses some of the issues. Our new Co-Axial coupling and hose system has a single connection and eliminates all of those known issues and provides physical benefits for the user.

The single hose and free moving coupling, means the user can move round the application more easily, without the risk of hose entanglement. The complete tightening application has been proven to be three times quicker on a standard flange set-up. We have also benchmarked the system vs the industry standard screw to connect set-up and just connecting the hoses is over four times quicker. All of these gains, means less fatigue for the operators and reduction in cost, based on proven time saving for the complete application.

PES: In your opinion, what's the future like for hydraulic torque?

RW: As I've mentioned, the hydraulic torque market has been stagnant for a number of

years. Our priority was addressing the concerns of the user, which we feel we have done, but our secondary concern is addressing the demands of our customers.

Data capture, live feedback to the technician, operator instructions, direct torque measurement and joint integrity solutions are all within our capabilities. We'll be leveraging the platforms and design standards that Atlas Copco is known for within the industry, offering a complete suite of Smart Bolting solutions.

Our vision is to help customers be more productive, reduce costs, increase safety and ultimately to help the industry become more efficient. Our leading market position in other sectors such as automotive has been built on working closely with customers to bring innovation that delivers true value to their operations.

We have proven that with major brands over many years and we believe we can achieve the same in the wind industry, bringing learnings from the factory to the field. We don't see hydraulic torque going anywhere and want to offer new innovations whilst providing a robust, proven, market leading solution to our customers.

PES: It's clear that these developments will offer benefits to the user. When can we see these Torcflex tools in the field?

RW: The tools have all now undergone rigorous in-house and field validation. We'll be launching the TF / TFX product line and Co-Axial hose options early Q4 this year. Should customers want demonstrations, they can contact myself or their local Atlas Copco representative, who will be able to facilitate. We will also be showing the product at the Hamburg Wind show in September, so please feel free to come along and I will demo the features and benefits firsthand.

📄 <https://www.atlascopco.com/>

