



WHERE QUALITY IS PAR FOR THE COURSE

Club Car Excels Using Ingersoll Rand QX™ Series Tools Club Car has found that smart tools are also smart business. Faced with tough operational goals and logistical challenges, the company found the solution it needed with next-generation Ingersoll Rand QX™ Series Power Tools.

Club Car has found that Ingersoll Rand

- The QX Series of cordless electric “smart” tools gives Club Car assemblers the ability to get at fasteners in the tightest of quarters, without worrying about air hoses or electric cords.
- The patented closed-loop transducer control delivers precise torque every time and provides traceable results.
- The tools are compact, lightweight and ergonomically balanced for maximum comfort and safety.
- And QX Series tools are integrated into a plant-wide network to drive speed, accuracy and traceability.





QX Series tools improve process control, quality, cost-efficiency and operator safety and comfort. Club Car and Ingersoll Rand both are business units of Ingersoll Rand Corporation.

About Club Car

Quality and innovation have been the name of the game at Club Car, a business of Ingersoll Rand, for more than 35 years. Today, the company produces 40 base models of golf, utility and transportation vehicles, which are industry leaders in efficiency and long-lasting value. No wonder customers have made Club Car the world's best-selling brand of small-wheel, zero-emission electric vehicles.

The Club Car commitment to superior performance is legendary and a key enabler of the company's success. It shows in the products Club Car manufactures and in the way the cars are produced, with painstaking

attention to detail, at the company's factory in Augusta, Ga. The manufacturing team is continuously on the lookout for new and better ways to build Club Car products and meet customers' high expectations. Paramount to the company's success is its passion for employee health and safety, superior quality and productivity.

The Challenge

For decades Club Car manufacturing employees have successfully used air-powered and direct-current hand tools to insert and tighten the thousands of fasteners of various sizes and types that are used to assemble a typical car. In the hands of skilled assemblers, air and DC tools have gotten the job done on tens of thousands of cars. But the fact is that air and DC tools are not right for every application.

That is why Club Car manufacturing

leaders began exploring new options for power tools used in the assembly process. After researching several brands of wireless electric power tools, Club Car decided to go with the QX Series of tools from Ingersoll Rand to help address various challenges in the manufacturing process.

For example, the Club Car manufacturing team identified access to fasteners as a particular challenge. Access problems arise when operators have a hard time reaching certain fasteners on the car they are assembling. This often occurs because assemblers are encumbered by air hoses and electrical cords, which can make it tough to work in tight spaces. This is particularly true for two-handed tasks, when the operator needs to hold the power tool in one hand and a wrench in the other to put the fastener in place. Access is also a problem the company

faces in a special staging area for cars that have already been assembled. The area is used to attach canopies to cars, customize cars to meet customer requirements, refurbish fleet vehicles and perform rework to correct minor quality problems. Since the area is located outside the factory, it cannot be accessed with conventional air or electric tools. In this area, the use of air or corded electric tools simply is not an option.

Ergonomics is another priority for Club Car, which has a well-established culture of worker health and safety. The company goes above and beyond to help employees avoid repetitive motion injuries. This objective is made more challenging by the fact that conventional hand tools are often heavy and their connections to electric or air lines sometimes require operators to assume awkward physical positions to tighten hard-to-reach fasteners.

“Club Car is a world leader in the development and manufacture of a product that is known for its quality and lasting value. We’re delighted that they have had a positive experience with our QX Series tools and we’ve been able to contribute to their success.”

Eric Dees
Category Manager
Ingersoll Rand

Over the years the Club Car assembly process has evolved and the company has discovered new ways to make sure that every car rolling off the line is as good as it can be. After careful study, the manufacturing team determined that air and DC electric tools to not provide a “one size fits all” solution in the manufacturing world. Other options needed to be considered to ensure continuous improvement in quality, cost, productivity and safety.

The Solution

In the fall of 2012, the Club Car manufacturing team began investigating cordless electric tools for use on



select areas of the assembly line. After considering several options, Club Car agreed to purchase beta units for a newly developed family of handheld “smart” tools – the QX™ Precision Fastening System – developed by Ingersoll Rand, a global leader in power tools. Designed to help users improve productivity, lower operating costs and increase quality, the QX Series includes unique technological features in an affordable, lightweight package. The family of tools includes the QX Series Precision Screwdriver, Haz Tool and Angle Wrench.

Features include:

- A patented closed-loop transducer control that delivers precise torque and accurate, precise and traceable results
- A multi-function display module that allows for quick setup and feedback on every tool
- Eight user-programmable configurations for torque, angle and speed – enabling one tool to do the work of eight
- A compact, lightweight and ergonomically balanced design that enables operators to work without the constraint of air hoses or power cords
- A wireless communications option using a dedicated Process Communications Module (PCM) to integrate tools into a facility-wide network and enable configuration adjustments remotely and in real time

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The Results

Working closely with the Club Car manufacturing team, Ingersoll Rand representatives conducted a wide-ranging

evaluation of the company's manufacturing operation and helped the team decide where to introduce the new tools for maximum operational impact. First applications were in the staging area for completed cars and on the power train feeder line. Today, close to 50 QX Series tools are being used throughout the Club Car facility. The Club Car manufacturing team has found the tools to be extremely flexible and easy for operators to use. Use of the QX Series tools supports the organization's quality initiatives by providing unprecedented torque control and reducing variance so that fasteners are consistently inserted at the right speed and at the right torque. As a result, the team believes that more fasteners are installed correctly the first time, reducing the need for rework.

In addition, quality is bolstered by the fact that the QX Series software automatically counts fasteners as they are inserted, ensuring traceability and reducing liability. If a fastener is missed the tool notifies the user and the issue can be addressed before it becomes a quality issue.

“We love the QX Series tools are trying every day to find new applications in our factory. The tools are extremely flexible and can be used in non-dedicated operations where one QX tool can replace several air or DC tools. The QX tools have all the features we need and none of the features we don't, making them extremely cost-effective.”

**Gerald Skelton
Manufacturing Engineer
Club Car**



Several features of the QX Series improve throughput and continuous flow on the assembly line. For example, the fact that a single tool can handle various types of fasteners and that sockets can be changed quickly helps keep the line moving smoothly. In addition, traceability features of the tools enable the floor team to collect data throughout the manufacturing process and quickly handle rework at the end of the line.

In locations such as the staging area operators often are required to address multiple types of fasteners with different torque requirements in quick succession. This is where the flexibility of the QX Series tools pays off. Changing the torque setting on a QX tool takes about 30 seconds; changing the setting on an air tool requires additional equipment and takes about 15 minutes. This time savings and its productivity impact is quickly multiplied in an environment where as many as six joints are secured per minute.

The Club Car team has had positive feedback from operators about the ease of use of the QX tools on the factory floor. Operators have been especially vocal about the benefits of wireless electric power, provided by long-life batteries, which enable them to work without the inconvenience of air hoses and power cords.

For more information, visit:

<http://www.ingersollrandproducts.com/am-en/products/tools/fastening/cordless-fastening-systems>

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