

## *Building heavy trucks and buses*



Atlas Copco Tools and Solutions  
for quality and productivity

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*Atlas Copco*

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# **21ST CENTURY TOOL TECHNOLOGY FOR HEAVY TRUCK AND BUS MANUFACTURING**

Atlas Copco is more than tools – we are a total solutions provider. Featuring the world's most extensive range of power tools, assembly systems and process software, our product portfolio is a true reflection of cutting-edge 21st century tool technology. Advanced Atlas Copco solutions and technical support are helping to raise productivity and reduce operating costs for heavy truck and bus manufacturers worldwide.

# ATLAS COPCO HAS TOOLING SOLUTIONS THAT WILL...

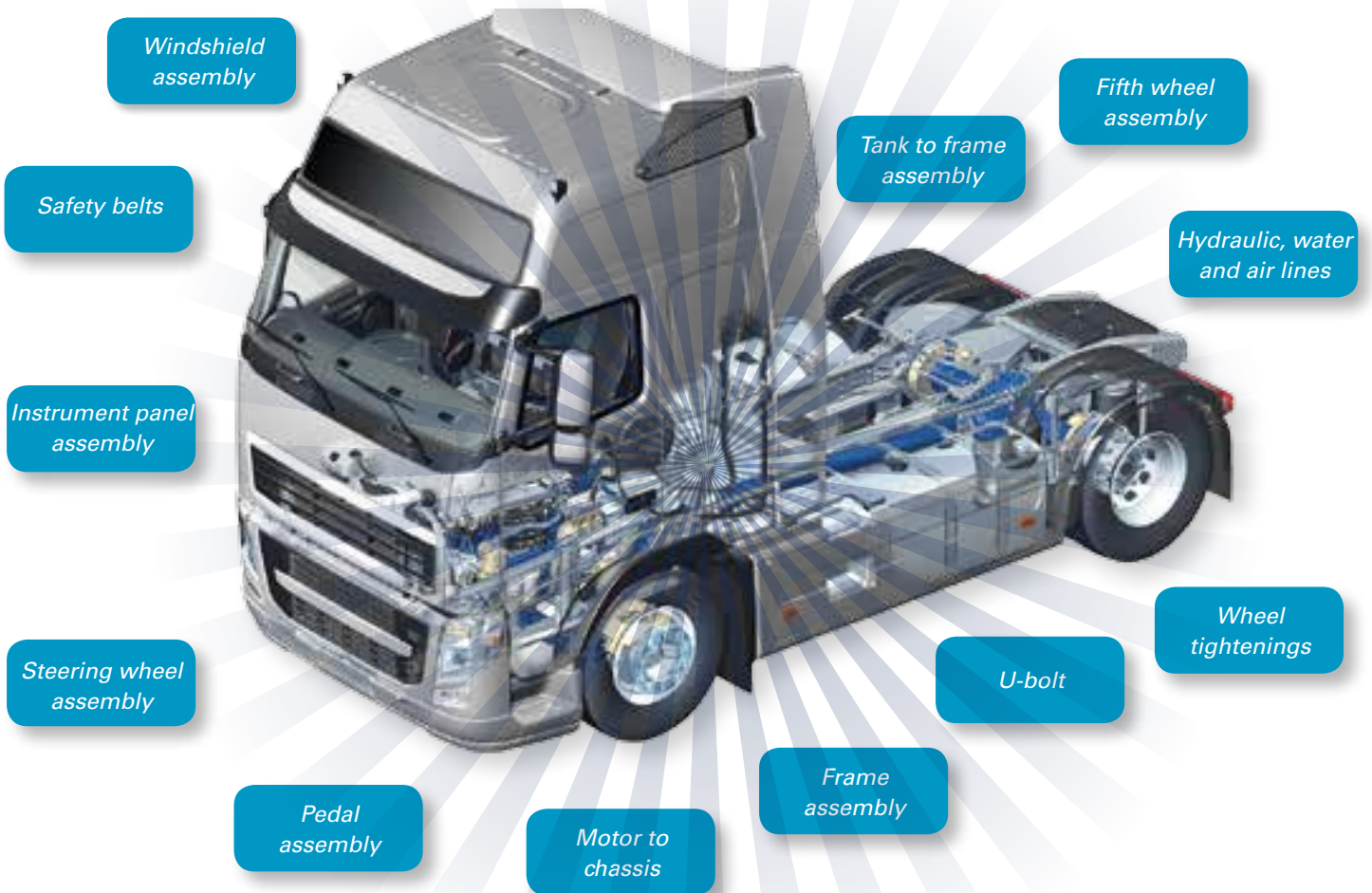
■ Speed up production on your existing production line ■ Help eliminate bottlenecks ■ Raise quality and reduce the number of rejects and reworking further down the line ■ Adapt your tooling to handle product variations being built in the same line ■ Help reduce your operating costs and make your production more cost-effective to sharpen your competitive edge in the marketplace ■ Create a well-planned ergonomic working environment in your plant, helping to increase operator safety and well-being while raising individual productivity.

Look through this brochure, and you will see what we mean!

## CONTENTS

<b>Safety critical or quality critical</b> .....	4 – 5	<b>Electric tools</b>	
<b>Your challenges are our business</b> .....	6 – 7	<b>Fixtured spindles</b> .....	26 – 27
<b>Get it right first time</b> .....	8 – 9	– Fixtured nutrunner QST	
– Choose the right tool for the job		– Fixtured nutrunner ETX	
– Six steps to zero-fault fastening		<b>Material removal tools</b> .....	28 – 29
<b>Ramp up your production – now!</b> .....	10 – 11	– Drills	
<b>Pneumatic assembly tools</b> .....	12 – 19	– Sanders	
– Screwdrivers		– Sanders/Polishers	
– Clutch shut-off battery tools		– Turbine grinders	
– Pistol grip nutrunners		<b>Air line accessories</b> .....	30 – 31
– Nutrunners		<b>Quality assurance in tightening</b> .....	32 – 34
– Angle nutrunners		<b>Saltus sockets and bits</b> .....	35
– Pulse tools		<b>Fixtured multiples</b> .....	36 – 37
<b>Electric nutrunners</b> .....	20 – 23	<b>Atlas Copco application centers</b> .....	38 – 43
– Tensor ES		<b>Atlas Copco Service</b> .....	44 – 45
– Tensor ST/STR			
<b>Electric wireless tools</b> .....	24 – 25		
– Tensor STB			

# LET'S TALK JOINTS – SAFETY CRITICAL OR QUALITY CRITICAL?

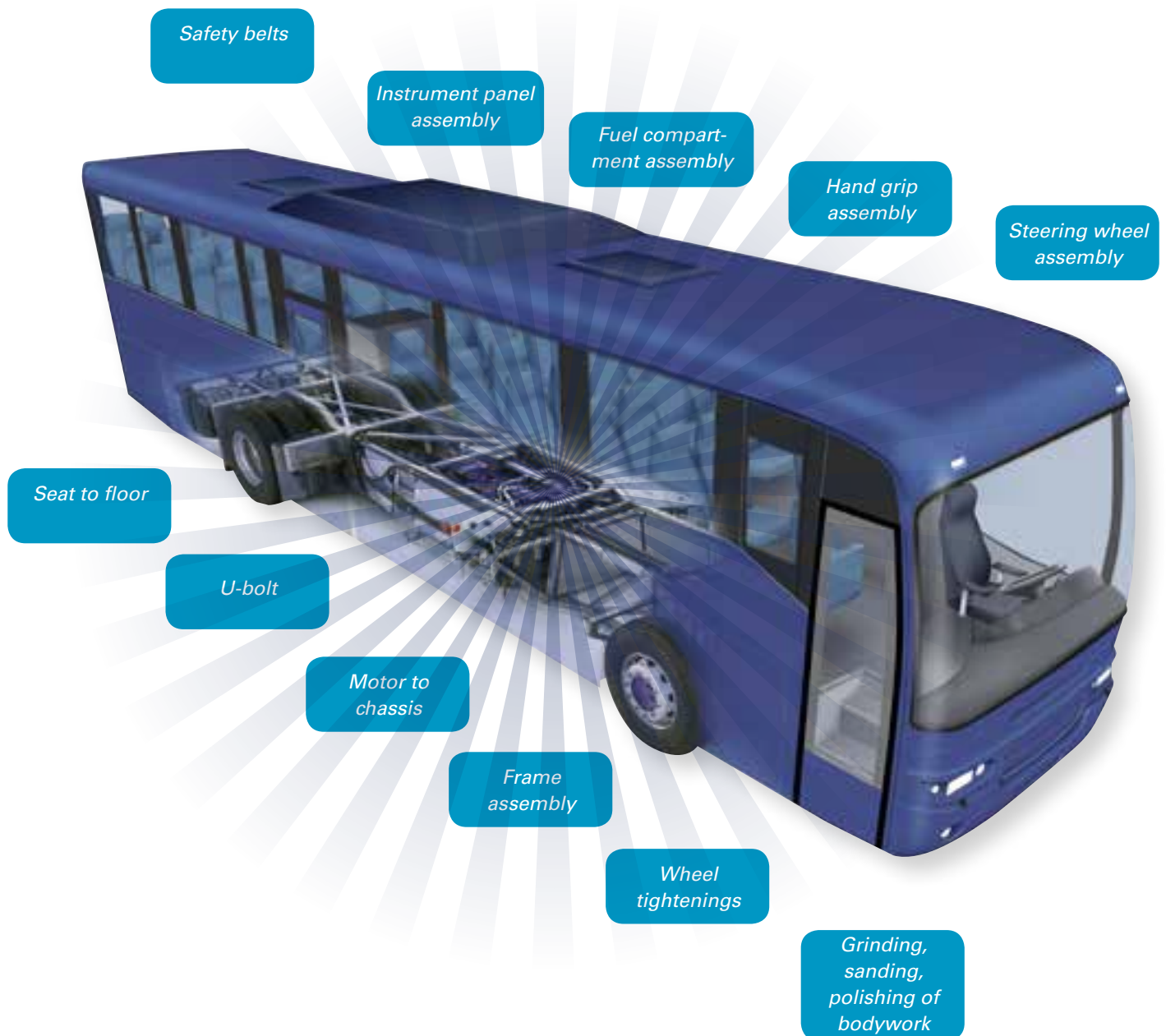


### Choose the right tightening strategy

On truck and bus assembly lines it is important to decide which application will be a safety critical, a quality/function critical or non quality critical application. This is in order to select the correct tool and tightening strategy for the application. The tightening strategy guides the process of applying the right torque to the selected bolt to achieve the correct clamp force.

A normal truck is assembled using some 4,000 screws. If a customer wants to save weight it is possible to specify smaller screws with a higher bolt grade. This will save a lot of weight, but the bolt requires a tool which can deliver a high level of accuracy and which can be adjusted to different tightening strategies.

If you have any doubts or questions about the joints in your production, Atlas Copco's Advanced Fastening Technology Team will support you and suggest the right tightening method.



***YOUR CHALLENGES  
ARE OUR BUSINESS***





### Raising productivity

Atlas Copco pneumatic and electric handheld and fixtured assembly tools are fast and powerful with the capability to help remove bottlenecks and streamline your production. Optimize your production line with advanced tools and technical support from Atlas Copco. We can show you how to achieve a major increase in productivity without investing in expensive new production lines, production facilities and special plant engineering and construction.

### Quality that contributes to safety

The trend in assembly is to use fewer bolts in order to reduce costs and weight. This means that tightening quality is even more important. Choosing the right tools will help ensure optimal product quality. With Atlas Copco advanced tightening tools the correct torque is applied by choosing the right tightening strategy. Correct torque ensures that the joint will not loose when the product is in use. For safety critical applications, Atlas Copco has advanced handheld and fixtured tools offering joint validation and traceability.

### Tools you can work with all day long

Our ergonomically designed handheld assembly and material removal tools offer high power to weight ratios with low noise and vibration levels. Designed with operator health and safety in mind, they help raise individual productivity in your plant.

### An example of what Atlas Copco can do for your production line

The takt time in a truck assembly operation at one of Germany's largest truck manufacturers was around 21 minutes. After consulting Atlas Copco, the line was restructured and new, state-of-the-art Atlas Copco tools were added. It was then possible to cut the takt time to 12 minutes. A second larger investment in tooling from Atlas Copco and a restructuring of the process for time-critical applications improved the takt time further – down to 8 minutes.

Previously, this manufacturer built 10,000 heavy trucks per year in one line. Today he is building more than 20,000 trucks per year in the same line – a production increase of about 100%. The new target is 6 minutes per takt.

***Challenge us to optimize your production and speed up your line.***

# GET IT RIGHT FIRST TIME

## Six steps to zero-fault fastening



### Step 0.

#### There is no torque specified

Operator only need to tighten the parts together. This could also be pre tightening. Totally operator depending tightening.

### Step 1.

#### To assure a correct tightening torque

The first step to zero fault production is obtained by using an assembly tool that delivers a precise and pre-determined torque. However, only the tightening torque is controlled at this first step, operators and workpieces are not yet involved in the monitoring process.

### Step 2.

#### To assure that all screws are tightened

One of the most common causes of a faulty assembly is the fact that the operator simply forgets to tighten a screw or makes a re-hit on an already tightened screw. The remedy against this possible error is to use a controlled tool. It monitors the tightening cycle and identifies a proper shut-off of a tool.

### Step 3.

#### To assure that the joint is correct

With step 1 and 2 the tool and the operator have been taken into consideration. However, the joint itself can also be a cause of the incorrect tightening. There can be several reasons for this. Missing parts like seals or washers will change the characteristics of the joint. Damaged threads or debris in

the joint also leads to an improperly tightened joint. The way to detect these types of faulty joints is to monitor the tightening angle during the tightening process. Operator guidance and feedback is provided by signal lights on the tool and by using socket selectors etc.

### Step 4.

#### To assure that safety critical joints are tightened properly

This is the level required for safety critical joints. All tightening data is documented and can be retrieved for error analyses, thus offering full traceability of the tightening operation. Documented tightening data for safety critical fasteners are essential in order to avoid or limit recalls and warranty claims.

### Step 5.

#### To assure zero fault production

With step five two further elements are introduced for fault-free production. One element is the introduction of part identification, the other is reject management. With step five the tool controllers are not only networked – they are also connected to the factory network. Information about the components is sent over the factory network. By identifying the components that are to be assembled, relevant information is transferred to the tool controller via the network. This safeguards both that the correct component is being assembled and that corresponding tightening parameters are chosen.

# SIX STEPS TOWARDS ZERO-FAULT FASTENING

As joint fastening grows more complex, error proofing becomes a key factor for the profitability of your operation. The later an assembly defect is identified, the more it costs to correct further down the line. At worst, it could reach the end-customer and result in warranty claims and loss of goodwill. Leading the field for tightening process control, Atlas Copco has defined six steps towards zero-fault fastening.



## IS THIS WHAT YOUR OPERATORS ARE THINKING?

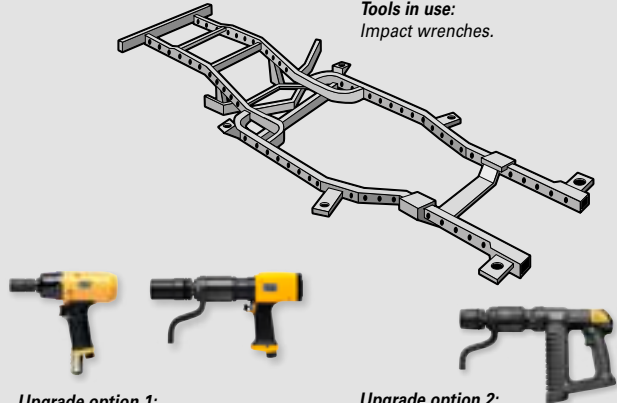


- Can I apply the right torque to a joint with an impact wrench? What happens when the torque is too low and the tightening does not create enough clamp force? Does the joint loosen every time?
- When I use the impact wrench, every time I perform a tightening, I have to go one “click” more. This is very time consuming and my shoulders are aching.
- If I holding down the trigger of the impact wrench for a shorter time because I don't like the vibrations into my hand, will this affect the torque applied to the joint?
- In the morning the pressure to the tool was 6.0 bar. Now the air pressure has dropped to 4.5 bar. Does this affect the torque result? How long should I press the tool trigger?
- Can I apply the right torque with an impact wrench to the safety belt joint? What happens, if I damage the joint? Can I see or feel it?
- The chassis has been sent to the next station and one bolt that I should have tightened is left! Did I forget to tighten this joint? Is there a system which can count tightenings?
- Oh, I used the wrong length of the bolt and the head sticks out a little bit from the hole. Will this affect the function of the part?
- The impact wrenches are very loud. Every evening I have a headache.
- I do my best but the quality is not high enough. How is it possible to trace back my tightenings?
- Every time I perform a tightening I'm supposed to check the torque with a click wrench! My shoulders are aching and I don't always do it.
- I'm using the click wrench. The nut doesn't turn. Is the torque correct, or did I overtighten it? What can happen when the truck is on the road?
- My impact wrench takes a long time to build up torque and then I have to check the torque with a click wrench. Is there a tool that replaces an impact tool in combination with a click wrench?
- I don't like vibrations or reaction force into my hand and wrist. Is it possible to use a supported tool that eliminates the forces acting on my body?

# RAMP UP YOUR

## 1. Chassis assembly

**Tools in use:**  
Impact wrenches.



**Upgrade option 1:**  
ErgoPulse pneumatic pulse tools,  
or LTP pneumatic shut-off tools.

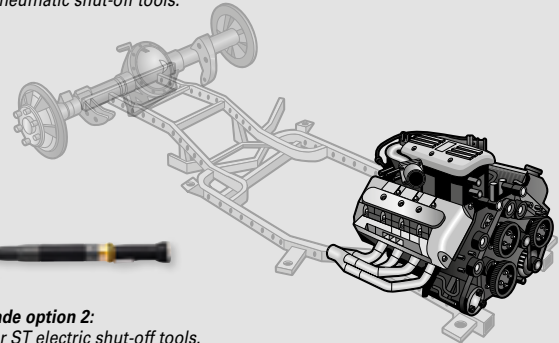
**Upgrade option 2:**  
Tensor Revo pistol grip  
electric shut-off tools.

## 4. Motor: Attach cooling system to motor

**Tools in use:**  
Impact wrench.



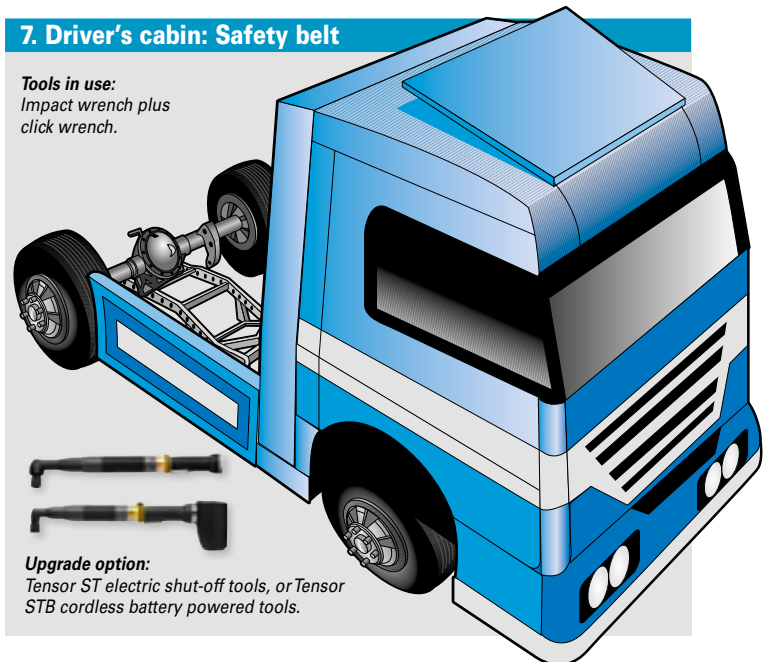
**Upgrade option 1:**  
LTV pneumatic shut-off tools.



**Upgrade option 2:**  
Tensor ST electric shut-off tools.

## 7. Driver's cabin: Safety belt

**Tools in use:**  
Impact wrench plus  
click wrench.

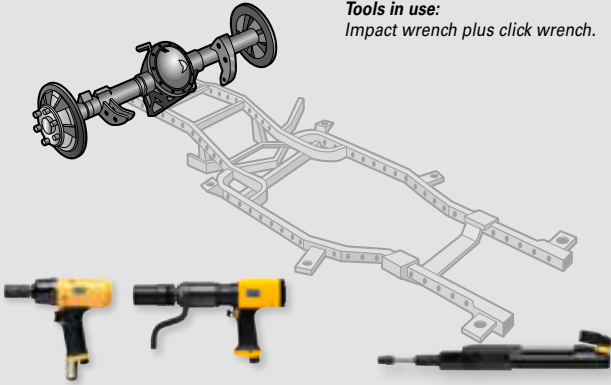


**Upgrade option:**  
Tensor ST electric shut-off tools, or Tensor  
STB cordless battery powered tools.

# PRODUCTION – NOW!

## 2. Truck axle: Assemble holder to axle

**Tools in use:**  
Impact wrench plus click wrench.

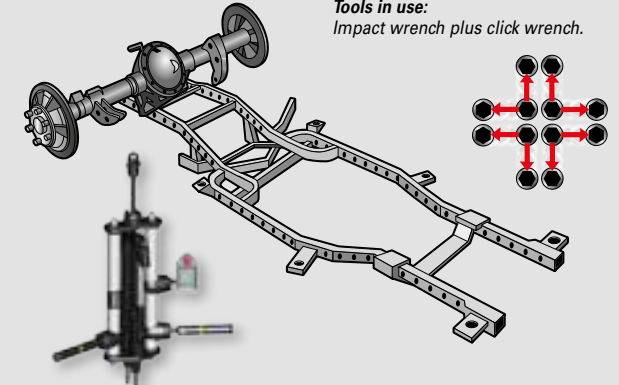


**Upgrade option 1:**  
ErgoPulse pneumatic pulse tools, or LTP pneumatic shut-off tools.

**Upgrade option 2:**  
QST fixtured nutrunners.

## 3. Axle to chassis assembly (U-bolt)

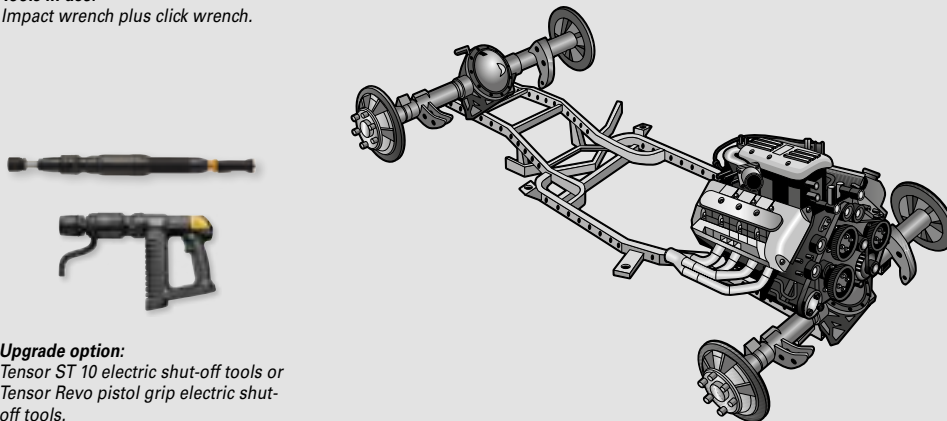
**Tools in use:**  
Impact wrench plus click wrench.



**Upgrade option:**  
Fixtured multiple spindles or QST.

## 5. Motor: Attach gearbox to motor (flange)

**Tools in use:**  
Impact wrench plus click wrench.



**Upgrade option:**  
Tensor ST 10 electric shut-off tools or Tensor Revo pistol grip electric shut-off tools.

## 6. Attach motor with gearbox to chassis

**Tools in use:**  
Impact wrench plus click wrench.



**Upgrade option 1:**  
LTD or LTP pneumatic shut-off tools.

**Upgrade option 2:**  
Tensor ST 10 or Tensor Revo pistol grip electric shut-off tools.

## 8. Driver's cabin: Airbag

**Tools in use:**  
Impact wrench plus click wrench.



**Upgrade option:**  
Tensor ST electric shut-off tools, or Tensor STB cordless battery powered tools.



**Upgrade option 1:**  
LTP, LTV, LTD pneumatic shut-off tools

**Upgrade option 2:**  
Tensor electric shut-off tools (ETP, ETV), Tensor ST 10.

## 9. Driver's cabin: Steering

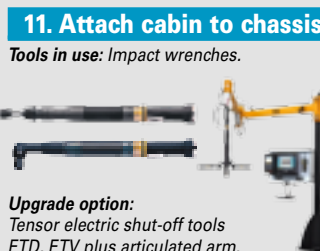
**Tools in use:**  
Impact wrench plus click wrench.



**Upgrade option:**  
Tensor STB cordless transducerized battery powered tools, STwrench.

## 10. Attach cabin to chassis

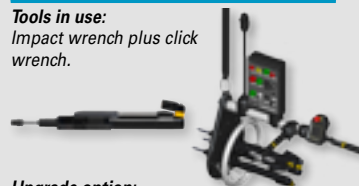
**Tools in use:**  
Impact wrench plus click wrench.



**Upgrade option:**  
Tensor electric shut-off tools ETD, ETV plus articulated arm.

## 12. Wheel attachment

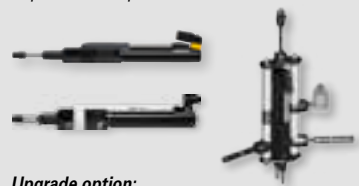
**Tools in use:**  
Impact wrench plus click wrench.



**Upgrade option:**  
Horizontal rotating or Tensor QST.

## 13a. Road semi-trailer attachment (5th wheel)

**Tools in use:**  
Impact wrench plus click wrench.



**Upgrade option:**  
Tensor ETX, QST plus Crowfoot.

## 13b. Or trailer coupling attachment

**Tools in use:**  
Impact wrench plus click wrench

**Upgrade option 1:**  
LTP pneumatic shut-off tools.

**Upgrade option 2:**  
Tensor pistol grip electric shut-off tools .

## 14. Spare wheel attachment

**Tools in use:** Impact wrenches.

**Upgrade option:**  
ErgoPulse pneumatic tools, or LTP pneumatic shut-off tools.

To ensure the highest level of productivity in your plant, Atlas Copco offers two ranges of advanced screwdrivers. Our LUM pneumatic screwdrivers are state-of-the-art tools offering high accuracy, wide torque and speed ranges and operator friendly ergonomic designs. These tools are complemented by our BCP battery clutch pistol-grip screwdrivers, which set you free from cables or hoses! Fast and powerful with superior ergonomics, BCP tools offer maximum accessibility and high productivity for your quality critical assembly operations.

# ***SCREWDRIVERS***



## PNEUMATIC SCREWDRIVERS

- Wide torque and speed ranges
- High torque, maximum accessibility
- Easy on the operator
- Built for productivity



## BATTERY CLUTCH SHUT-OFF SCREWDRIVERS

- Freedom from cables and hoses
- Choose the optimal speed for your assembly
- Feedback to the operator
- Lithium-Ion battery technology



### APPLICATION EXAMPLES



- HOSE CLAMPS
- HOLDERS FOR HOSES AND CABLES
- INTERIOR ASSEMBLY



Note: This is just a selection of tools from our extensive range.  
Please refer to the current edition of our main catalogue, "Industrial Tools and Solutions", to see all the versions available.

If you need a higher level of accuracy in your heavy truck or bus production, take a look at Atlas Copco's LTP shut-off nutrunners. They have become standard tools at truck manufacturers such as Scania and Volvo. A "stall-type" version, the LMP, gives you maximum manual control over the tightening process.

# ***PISTOL GRIP NUTRUNNERS***

## USE ONE LTP 61 FOR A WIDE RANGE OF DIFFERENT JOBS

- Two-speed tightening for speed and accuracy
- Ten times faster rundown
- Ergonomics – our area of expertise
- Multi-Torque Selector



### APPLICATION EXAMPLES



- CHASSIS ASSEMBLY
- SPARE WHEEL
- BACK UP FOR WHEEL
- AXLES
- TRAILER COUPLING

### Reaction bars, examples

#### Multi-Point Reaction Bar

In many workshops, an application that requires a different torque also requires a different reaction point. The Multi-Point Reaction Bar features a sliding bracket that gives you a number of different reaction points.

#### S-Bar – straight out of the box

A blank reaction bar has to be bent, cut or welded. The geometry of the S-Bar has been optimized to provide a maximum number of reaction points. This means you'll be able to use the S-Bar in about 70 – 80% of all applications straight out of the box.



Steel bar



Sliding drive reaction bar



Extended sliding drive reaction bar



Square steel bracket



S-Type reaction bar



Triangular steel bracket



L-Type aluminium bar



Extended sliding tube reaction bar

Note: This is just a selection of tools from our extensive range. Please refer to the current edition of our main catalogue, "Industrial Tools and Solutions", to see all the versions available.

The LTV 8 series is a range of high performance, angle nutrunners offering high speeds, extended torque range, operator comfort and long service life. LTV 69 nutrunners are helping to raising productivity in heavy truck and bus plants around the world. Tools in the new, extremely powerful Atlas Copco LTV 9-2 series combine up to 50% higher speed and consistently high accuracy with operator-friendly features. The new LTV 9-2 series can speed up your production even further.

# ***ANGLE NUTRUNNERS***



- Combining performance with reliability
- Speed and accuracy
- Light on the operator
- Easy to operate
- Built for tough jobs and long service lifetime
- Increase speed by up to 50%
- Fast and powerful
- Low air consumption translates into major energy savings!



APPLICATION EXAMPLES



- CHASSIS ASSEMBLY
- MOTOR ASSEMBLY
- HOLDERS FOR PIPES AND CABLES



Reaction bar kit



Protective cover (a)



Protective cover (b)



Signal connection kit (RE)

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Atlas Copco ErgoPulse tools will help you meet your productivity goals. Their reliability, accuracy and heavy duty construction, combined with their operator-friendly ergonomic designs, make them ideal for continuous production in heavy truck and bus plants. Available in automatic shut-off and non shut-off versions, there is also the amazing Pulsor offering the advantages of a pulse tool, with the intelligence of an electronic nutrunner.

# ***PULSE TOOLS***

- ErgoPulse tools offer high torque with stable torque output
- Comfortable to operate
- Low maintenance, long working lifetime
- Automatic shut-off tools
- Find another tool like this one!

With its amazingly high power-to-weight ratio, our most powerful pulse tool, the ErgoPulse 25PTX, gives you torque of up to 900 Nm in a tool weighing just 10.4 kg.

- Optimum performance on all types of joints
- Non shut-off tools



### Pulsor C – the impulse tool with electric tool intelligence

Atlas Copco's Pulsor C System gives you all the advantages of a controlled impulse tool, plus the intelligence of an electric tightening system. Like all Atlas Copco impulse tools, Pulsor C is fast, powerful, light and compact and generates virtually no reaction force.

The controller remembers up to 4,000 tightenings that can be stored and analyzed. This enables you to fine-tune your process and ensure that every tightening in every shift is perfect. If they are not perfect, you can see why.



ErgoPulse shut-off tools

**ErgoPulse PTS**  
Torque range: 6 – 410 Nm

**ErgoPulse PTX**  
Torque range: 2 – 450 Nm

**ErgoPulse 25PTX**  
Torque range: 450 – 900 Nm

ErgoPulse non shut-off tools

**ErgoPulse XS**  
Torque range: 5 – 400 Nm

### APPLICATION EXAMPLES



- SPARE WHEEL ATTACHMENT
- BACK UP TOOL FOR WHEEL TIGHTENING
- CHASSIS PRE ASSEMBLY TOOL
- DOOR HINGES ASSEMBLY
- BUMPER ASSEMBLY



**Pulsor C**  
Torque range: 16 – 450 Nm

**Pulsor Focus Controller and Tool Control Box**

*Note: This is just a selection of tools from our extensive range. Please refer to the current edition of our main catalogue, "Industrial Tools and Solutions", to see all the versions available.*

The Tensor range of electric assembly tools covers all station and assembly line requirements for safety critical and quality critical fastening applications. At Atlas Copco we have a proud legacy of putting the operator first and we continuously improve the ergonomic features on each new generation of Tensor tools. Tensor is also one of the most advanced tool ranges on the market in terms of high power-to-weight ratios and operator guidance in the form of clear result feedback via LED's or audio signals.

# *TENSOR ES ELECTRIC NUTRUNNERS*



## TENSOR ES – QUALITY CRITICAL

Tensor ES transducerized nutrunners for quality critical applications are available in straight and right angle versions. All models have a sealed design for robustness and offer high productivity with improved ergonomics.

- Torque transducer with an accuracy of  $\pm 7.5\%$  over six sigma.
- Robust, sealed design.
- New durable motor with higher speeds.
- Engineered in modules with component commonality.
- Clear LEDs visible through 360°.
- Hot swap.



## POWER FOCUS 600

The Power Focus 600 is compatible with the Tensor ES tools and is the perfect choice for quality critical assembly. It comes in one single hardware version regardless of which tool model or functionality level is used. Its powerful industrial design gives a reliable process that will speed up your tightening operations.

Thanks to the intuitive interface and the fact that it's so easy to use you can set up and run a new system from the box in minutes. External computer software is no longer required since you can browse in using a web HMI. The intuitive interface and color screen provide clear operator feedback.

Smart software management will guarantee highest possible uptime. Upgrade your controller in a few seconds using only a USB stick.

The Power Focus 600 controller takes quality critical assembly to the next level. Setting up and using an electric system has never been easier. And, by switching from pneumatic tools, you can reduce your energy consumption by up to 85%. Unbelievable but true – we call it easy transformation!

- Easy
- Efficient
- Ergonomic



**Tensor ES angle tool**  
Torque range: 1,6 – 200 Nm

**Tensor ES straight tool**  
Torque range: 0,8 – 50 Nm

**Power Focus 600**

Torque transducer with an accuracy of  $\pm 7.5\%$  over six sigma. Robust, sealed design. New durable motor with higher speeds. Engineered in modules with component commonality. Clear LEDs visible through 360°. Hot swap.

## APPLICATION EXAMPLES



- CABLE/PIPE HOLDERS
- CHASSIS
- PREVAILING TORQUE APPLICATIONS
- HANDGRIP/HOLDER
- INSTRUMENT PANEL



*Note: This is just a selection of tools from our extensive range. Please refer to the current edition of our main catalogue, "Industrial Tools and Solutions", to see all the versions available.*

As a heavy truck or bus manufacturer, with Tensor ST tools you can be sure that your product is built to the correct specification, every time, and that you will not let your customers down or damage their reputation. Available in pistol, angle or straight tools, it would be difficult to find another tool that can match Tensor ST for its combination of productivity, ergonomics, error-proofing and low maintenance.

# ***TENSOR ST/STR ELECTRIC NUTRUNNERS***

- The motor is the key
- Spiral gears – durable and accurate
- Visual and audio feedback
- Comfortable to operate
- Proven transducer
- Easy fixture integration
- Power Focus 4000 controller

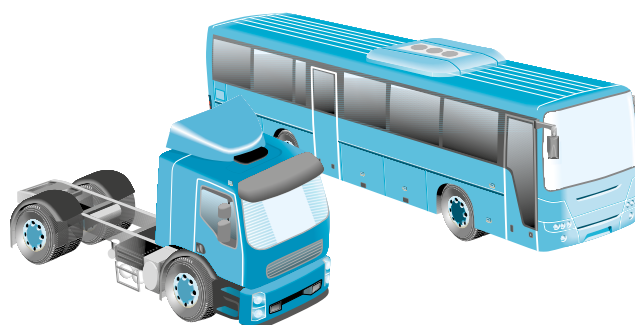


## TENSOR REVO NUTRUNNER

- Easy positioning, 360°
- Swivel on transducerized tool



### APPLICATION EXAMPLES




- SEAT TO FLOOR
- SAFETY BELT
- STEERING WHEEL
- FUEL TANK ASSEMBLY
- CHASSIS ASSEMBLY



Note: This is just a selection of tools from our extensive range. Please refer to the current edition of our main catalogue, "Industrial Tools and Solutions", to see all the versions available.

Available as angle or pistol grip tools, Tensor STB nutrunners give you true cordless freedom! First, they are battery powered. Second, they use Industrial Radio Communication (IRC) to communicate with a controller, giving you full process control. In other words, Tensor STB tools offer the same benefits and zero-fault process control as Tensor ST nutrunners.



**TENSOR STB  
TRANSDUCERIZED  
BATTERY  
NUTRUNNERS**

Critical joints demand not only validation and documentation, but speed and accuracy. However, tool cables limit smooth movement along the line and cause access problems in cramped spaces. This is particularly attractive for the operator working on moving lines or at rework stations with many different tightening positions

- Unique fastening performance
- Superior ergonomics
- All-round player
- Higher productivity
- Better operator feedback



## CORDLESS FREEDOM WITH FULL PROCESS CONTROL

- IRC – industrial strength
- Less parts in stock
- A complete tightening system

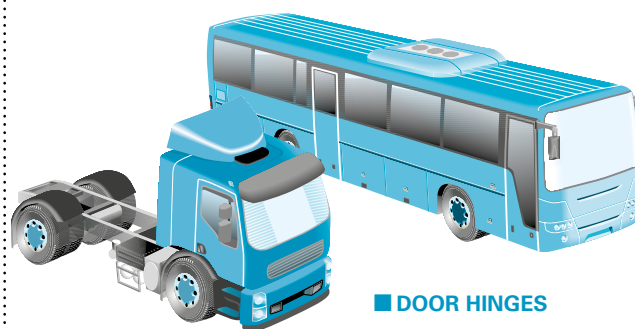


**Tensor STB angle tool up to 150 nm**  
Torque range: 2 – 100 Nm

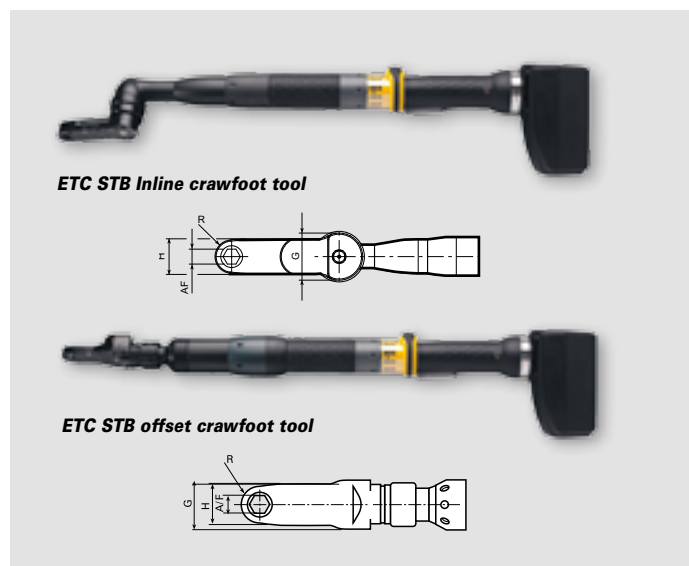
**Tensor STB pistol grip tool**  
Torque range: 2 – 12 Nm

**Power Focus 4000 controller**

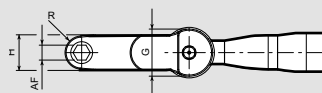
### APPLICATION EXAMPLES



- DOOR HINGES
- STEERING WHEEL
- SEAT BELTS
- SEAT TO FLOOR



**ETC STB Inline crawfoot tool**



**ETC STB offset crawfoot tool**



Note: This is just a selection of tools from our extensive range. Please refer to the current edition of our main catalogue, "Industrial Tools and Solutions", to see all the versions available.

Designed for large-scale, heavy duty tightening, ETX and QST fixtured nutrunners are compact, durable and easy to integrate in your heavy truck or bus production line. These rugged tools are designed to give you a long working lifetime and high accuracy in heavy duty applications.

# *FIXTURED NUTRUNNERS*

## QST TOOLS WITH POWER MACS 4000

The QST nutrunner is a true state-of-the art product. Partnered with the PM4K and offers one of the most advanced and reliable tightening solution on the market.

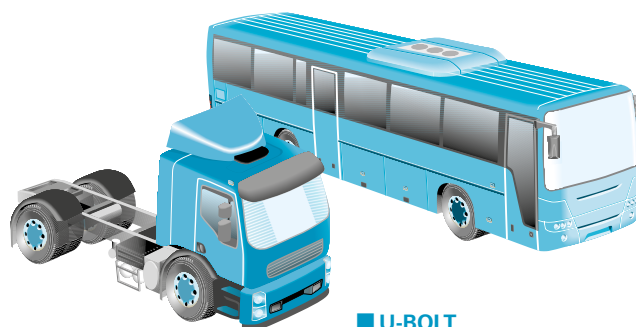
- Speed that raises productivity
- Accurate and easy to maintain
- Built-in memory chip
- Hot Swap function



**QST fixtured nutrunner**  
Torque range: 0 – 1,750 Nm

**Power MACS 4000 controller**

### APPLICATION EXAMPLES



■ WHEEL MULTI

■ 5TH WHEEL

■ U-BOLT

■ CHASSIS ASSEMBLY

■ MOTOR TO CHASSIS

## ETX TOOLS WITH POWER FOCUS 4000

ETXnutrunners are compact, durable and easy to integrate. ETX is controlled by the PF4K, like the Tensor ST tools, it is possible to achieve 100% controller commonality in a line.

- Functionality and flexibility
- Durability and precision
- Optimized for integration



**ETX fixtured nutrunner**  
Torque range 6 – 950 Nm.

**Power Focus 4000 controller**

*Note: This is just a selection of tools from our extensive range. Please refer to the current edition of our main catalogue, "Industrial Tools and Solutions", to see all the versions available.*

The tools in Atlas Copco's advanced range of pneumatic drills, sanders and polishers are ideal for a long list of bodywork finishing tasks in heavy truck and bus manufacturing parts.

Turbine Grinders give you twice the power with half weight, ergonomic design and high power-to-weight ratios.

# ***TURBINE GRINDERS, DRILLS, SANDERS AND POLISHERS***

## GTG 25 TURBINE GRINDER

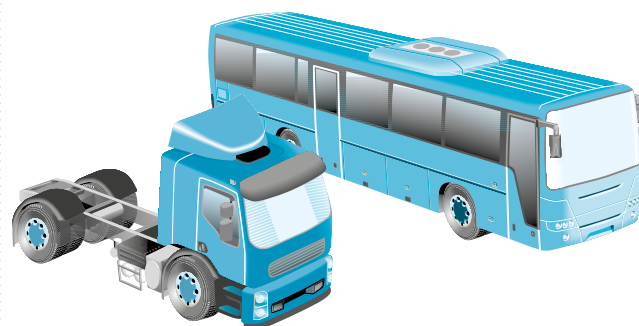
- Turbine technology boosts productivity
- Reduces operator strain
- Highly service friendly

## GTG 40 TURBINE GRINDER

- High rate of material removal
- Turbo-powered productivity



### APPLICATION EXAMPLES



- BODY PANELS
- CHASSIS
- INTERIOR
- ROOF TO BODY
- FIXING FLOOR

## DRILLS

Drills are widely used in bus building and with Atlas Copco drills the result becomes excellent. Various materials such as composites and steel call for drills with high power and the intensity in the process makes our line of drills the clear choice for the operator.

## SANDERS

- Tools that won't tire you out!
- Efficient pneumatic motors
- Long service life

## SANDERS/POLISHERS

- A full range of random orbital sanders
- Comfortable to work with



Note: This is just a selection of tools from our extensive range.  
Please refer to the current edition of our main catalogue, "Industrial Tools and Solutions", to see all the versions available.

To ensure that you benefit from the full potential power of your tools, Atlas Copco has developed a full range of air line accessories for use with Atlas Copco tools and air motors. All accessories can be used for other applications and pneumatic equipment.

# AIRLINE ACCESSORIES

Atlas Copco offers top quality accessories with guaranteed reliability. They are designed to ensure correct air pressure and maximum tool performance. Each component is tested and selected for its low pressure drop characteristics.

- Productivity – Atlas Copco quick couplings provide low pressure drop and higher tool power, plus one-handed operation for fast tool changing.
- Quality – For consistent torque accuracy, your Atlas Copco airline system will have a reliable pressure regulator and minimum pressure drops at critical workstations.
- Energy savings – Reliable pressure regulators, the correct size hose and high quality accessories will minimize leakage, eliminating energy losses.
- Ergonomics – Atlas Copco's range of ergonomic accessories take the strain off the operator without impairing the air flow in the system.

## Time to upgrade your air distribution system?

Atlas Copco pneumatic tools work best at the design pressure of 6.3 bar (90 psi). Any pressure less than 6.3 bar (90 psi) decreases tool power. A pressure loss of 1 bar (15 psi), for example, reduces the power of our LSV 28 grinder by more than 15%. By upgrading their air distribution system with Atlas

Copco air hose assembly and new high quality couplings, a large customer in Australia boosted productivity by 30%.

Avoid sub-standard nipples, poor quality couplings, underdimensioned hose, and badly designed safety devices. They can cause restrictions or leakage in your air distribution system. Subsequent loss of pressure leads to reduced tool performance and lower torque accuracy, affecting productivity and quality. It also wastes energy. Atlas Copco offers the highest quality air line accessories.



## Ever wished there was a better way?



**AIR PREPARATION UNITS**



**QUICK COUPLINGS**



**SWIVEL CONNECTORS**



**HOSE REELS**



**BALANCERS**



**AIR NET - QUALITY PIPING SOLUTION**



**HM OPEN**



**HM FLEX L**



**HM OPEN XL**



**HOSES, PVC**



**CABLAIH HOSES**



**SPIRAL HISES**



In the heavy truck and bus manufacturing industry, demands on safety and quality are increasing all the time. Problems related to tightening account for a growing percentage of total warranty costs. Poor quality in the assembly area can also result in damaged brand image for the manufacturer. Atlas Copco QAT is a program of solutions for assuring tightening quality throughout the product cycle and for maintaining optimum tool accuracy during production.

# QUALITY ASSURANCE IN TIGHTENING

## STA 6000 DATA ANALYZER QUALITY FOR YOUR TOOLS AND PROCESSES

Improve everyday tasks for Quality supervisors and operators. Reduced weight and compact design makes the STA 6000 easy to carry along the line. Checking tools in the Tool Crib and on the line and checking tightened joints means quality guaranteed.



### Features

**Intuitive color screen.** STA 6000 color screen features intuitive icon menus.

**Clear feedback.** Feedback is clearly displayed, with the possibility to add a gauge indicator and fully customize information.

**No PC required.** Everything is set and analyzed right on the device – no need for a PC!

**Easy checking.** With the STA 6000 mounted on the wall and connected to an SRTT-L, operators can quickly test their tools prior to production. If the line is being rebalanced, only the SRTT-L transducer has to be changed, and not the entire system.

**Notes – preconfigured or new.** STA 6000 makes adding test notes easy. Notes can be prepared in advance for quick selection on the STA 6000. New notes can always be added on the go.

**Rubber protection and stand.** STA 6000 can be complemented with a rubber protection that also improves operator grip. The STA 6000 stand can be used with or without the rubber protection. Secured but still portable.



Weight	0.5 Kg
Screen size	3.2" 320x240
Battery duration	8 hours in normal usage. 6 hours in continuous operation. (1 test every 30 sec.)
Transducers	SRT, SRTT-L, IRTT, MRTT, QRTT
Transducers	mV/V and V transducers
Memory	16 GB - 1000 Pset & Tools - 50000 results & traces
Modules	IRC-B, IRC-W, Barcode

## WHICH STWRENCH ARE YOU?

### STwrench

Can be used in production or in your torque lab for joint analyses. You can also use it for quality control and for critical tightening where it allows you to use many different tightening strategies.

### Start at one end

Build intelligence into your tool with the smartHEAD. The smartHEAD has a builtin memory chip to store calibration values that are automatically recognized by the STwrench controller. Choose from six different sizes ranging from 15 to 1000 Nm.

### BLM joint simulator bench 3860

The BLM Joint Simulator Bench 3860 provides maximum tool evaluation flexibility. DC electric, clutch, impulse and battery tools as well as torque wrenches can be evaluated. The hydraulic brakes simulate the behaviour of a real joint reproducing the stiffness from hard to soft. This allows the tool to be tested in accordance with VDI/VDE 2647.

Torque tools are tested very quickly on a Joint Simulator Bench without having to remove their sockets. So there is no interference with production. It takes just a few seconds for a periodic statistical control and three minutes to make a machine capability test of 30 samples.

Pneumatic tools are tested directly on the production line under real conditions taking into account air pressure, hose wear, lubrication, etc.



Choose your smartHEAD according to your application. Select the torque capacity with or without angle reading.



### For all types of applications

- Torque/angle wrench for production or quality checks
- For traceability or quality management in a network
- For production line assembly with integration via digital I/O or fieldbus.



### End fitting tools for wrenches

The end fitting tools are the tool that can be attached in front of the wrench. There are two types of models, without and with TAG. TAG is a patented solution used by the STwrench to check the process. In the TAG the STwrench can write a number that can be used for socket recognition and the Torque/Angle calibration factor of the extension for automatic calibration. Both types are also compatible with LAB-wrench.

## CWR, BWR AND SWR WRENCH SERIES

The mechanical wrenches in the new Atlas Copco Saltus product line form the basis for manual tightening. They enable you to find the optimal solution for your individual tightening situation regardless whether you are working in assembly lines, rework or repair and maintenance, and even when limited operating space is available.



### CWR 'Click' wrench series

The torque wrenches in our CWR series provide the distinctive "Click" which is a very clear feedback when reaching the preset torque value. The repeatability of  $\pm 4\%$  makes them perfect for use in assembly lines.

For an adjustment of the pre-set value an optional setting key is available.

- Wide range from 2 Nm up to 300 Nm
- Reversible version "R" for tightening in both directions
- Very small sizes ideal for tightening in limited space
- Repeatability of  $\pm 4\%$
- Easy and safe adjusting and handling
- Standard drive (9x12 or 14x18) for a wide range of suitable end fittings



### SWR 'Slipping' wrench series

The torque wrenches in the SWR series are "automatically triggered" once the pre-set torque value is reached. The Camover-technology completely avoids over-tightening. After triggering, the SWR wrench is again ready to use. The integrated ratchet function ensures you controlled clockwise tightening.

The high repeating accuracy with a tolerance of  $\pm 4\%$  makes the SWR wrenches ideal for assembly lines for extreme continuous operation. For an adjustment of the pre-set value an optional setting key is available

### BWR 'Breaking' wrench series

The torque wrenches in our BWR series are primarily used in professional industrial environments. The possibility of overtightening is significantly reduced due to a 22° breaking-angle of the unique BWR mechanism. Therefore, the BWR wrenches are very well-suited for use in assembly lines as well as for repair and maintenance.

You can profit from a wide range of end fittings which are quickly changed. Coupled with our Atlas Copco end fittings for the BWR series, you will obtain a high degree of accuracy in your tightening process.

For an adjustment of the pre-set value an optional setting key is available.

- High process reliability as over-tightening is significantly reduced due to the 22° breaking angle
- Wide range of wrenches from 2 Nm up to 2000 Nm
- Extremely high durability and high repeatability of  $\pm 4\%$
- Robust construction
- Easy and safe adjusting
- Torque range from 5 Nm up to 110 Nm
- High process reliability as camover mechanism avoids over-tightening
- Overloading of the wrench itself is impossible
- Repeatability of  $\pm 4\%$
- Robust construction
- Easy and safe adjusting
- 3/8" (SWR-30 / SWR-60) respectively 1/2" (SWR-110) ratchet drive allows use of standard sockets

## SALTUS SOCKETS, BITS AND SPECIALS



Experienced engineers from the Atlas Cpco “Competence Center Sockets” develop and produce standard and customized sockets covering nearly tightening situations.

More than 1,400 different high-quality Saltus sockets in various versions, lengths and with useful features optimize your assembly operations and increase your productivity.

Thanks to our continuous stream of innovations we steadily improve materials, form and function.

An outstanding example for sustainable productivity. Our

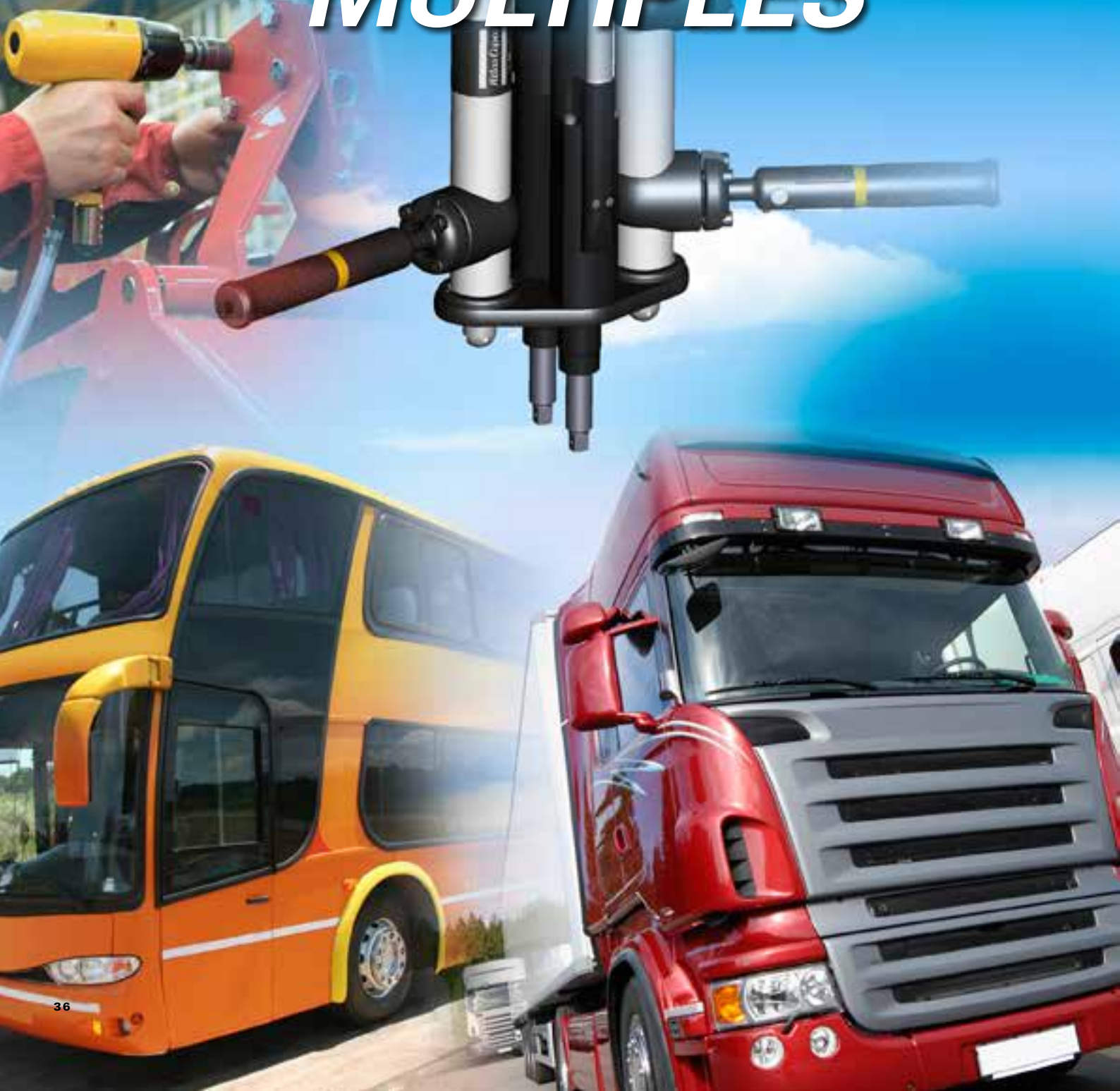
new Long Life sockets which have three to ten times longer lifetime than normal sockets – depending on your applications.

Where standard sockets cannot support your assembly process efficiency enough, we develop the optimal, individual and customized solutions in close cooperation with you.

These customized sockets are even available in small batches, and if needed within 5–10 working days as express production.

Fixtured multiples from Atlas Copco is a highly flexible, modular system of fixtured multiples that saves time and money when planning or rebalancing a production line. The components are designed to be ergonomic and light without compromising durability. Delivered in as little as four weeks, Fixtured multiples offers full support for lean production.

# ***FIXTURED MULTIPLES***



# THE SMART APPROACH TO FIXTURED MULTIPLES

## Full flexibility – simple to upgrade

With Multiples as many as 10 spindles can be used to tighten up to 1,000 Nm in any predefined modularized multiple. Tailoring a tightening system to new applications is simple. An existing fixture can be rebuilt to a new proven design using the same parts. You can go from vertical to horizontal to rotating with very little effort. Add a spindle or remove a spindle – it's easy.

When an increase in capacity is required, extra nutrunners can be added to the multiple simply by changing the base plate.

## Plug-and-play error-proofing modules

Error-proofing is available in the form of optional plug-and-play accessories from Atlas Copco's Quality Integrated Fastening (QIF) range. These provide operator feedback or guidance, and the capability to handle product variance, or to monitor the processes.

## Go into production in just 4 weeks!

Submit a detailed request to us and we are able to quote you within 24 – 48 hours. Once the order is placed we are able to build, test and deliver your multiple in 4 weeks, depending on where in the world you are located.

## Fixture multiples can be tailored to your needs

Our modular system is the backbone of our multiples concept. Whether you choose rapidly delivered Multiples, Extended or fully Engineered solutions, all are based on modules. Depending on the complexity of your needs we have different offers. They are all based on the modular system and cover a wide range of applications.



## Systems



**PowerMACS 4000**    **OST**    **Power Focus 4000**    **ETX**    **Tensor ST**    **Tensor ES**



## Accessories for Quality Integrated Fastening

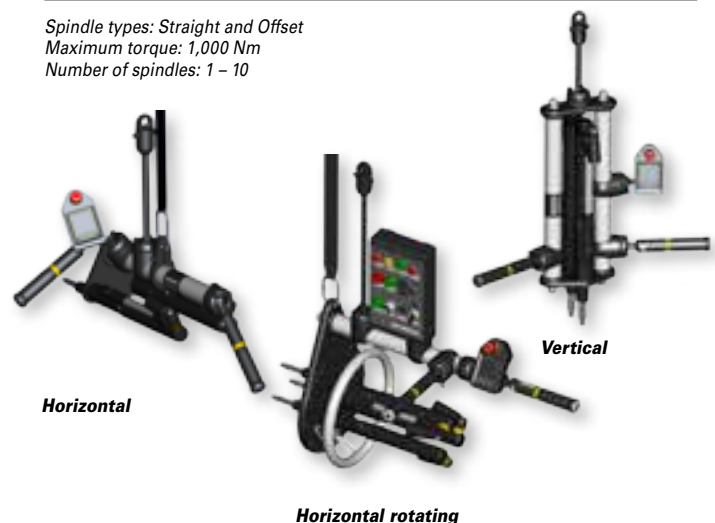


**Operator panel**    **Stacklight**    **I/O Expander**  
**Mini-display**    **Socket selector**    **Indicator box**



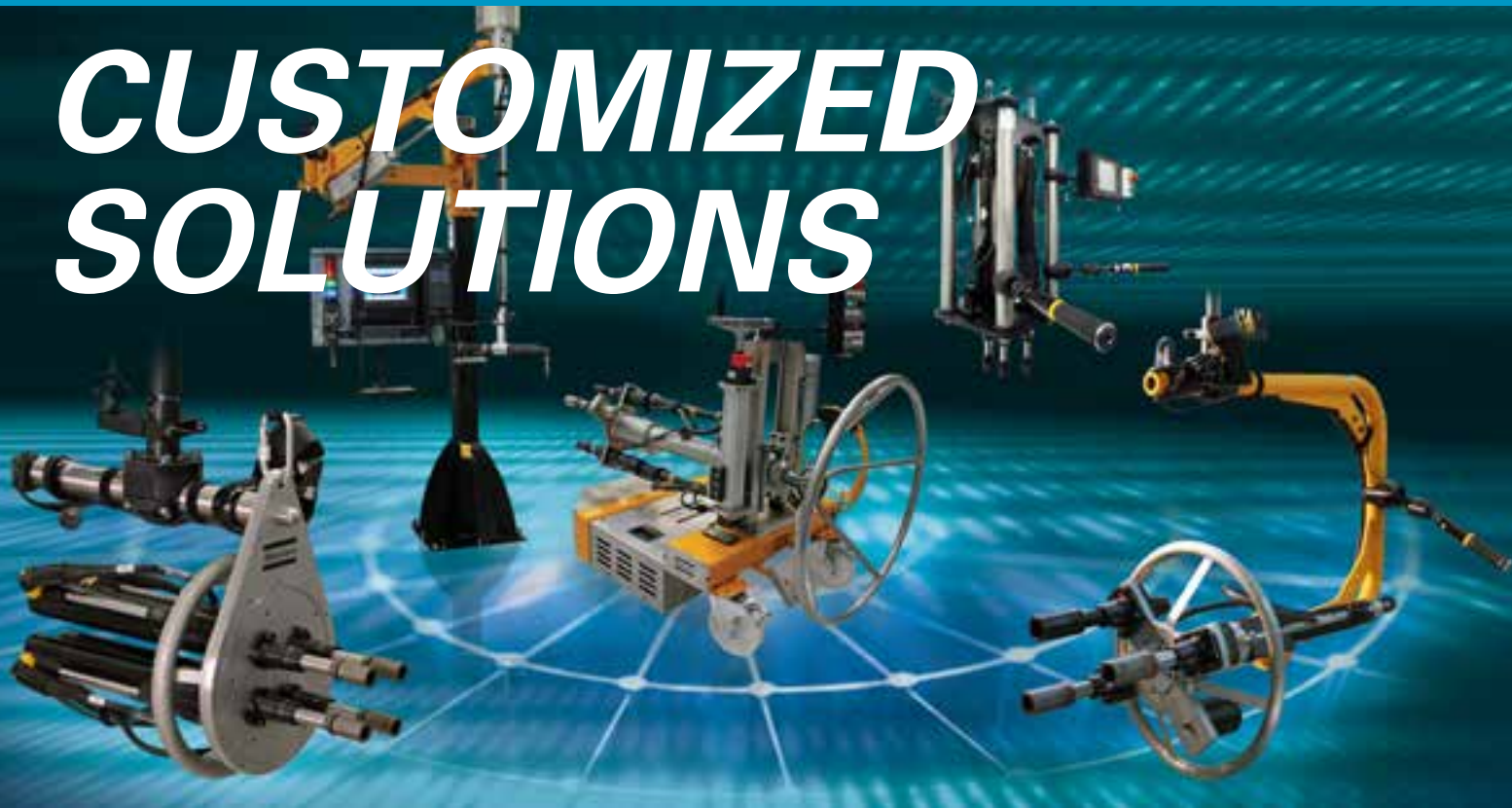
## Fixtures

Spindle types: Straight and Offset  
 Maximum torque: 1,000 Nm  
 Number of spindles: 1 – 10



**Horizontal**    **Horizontal rotating**    **Vertical**

# CUSTOMIZED SOLUTIONS



## MOBILE ASSEMBLY STATION

Maximize your flexibility and take your fastening processes where and when you need them.



- Sequence tightening and counting function
- Integrated Cable Management

### CONTROL SYSTEM

- Power Focus 4000 Graph Tightening Controller
- IRC Focus Controller
- Synatec Software and PC for tightening control
- Uninterruptable Power Supply (UPS) Compartment

### MECHANICS

- Woodwork Surface
- 1 - Keyboard Drawer
- 3 - Storage Drawers
- Worksurface Connection Port 2 - Power Socket, 1 - Ethernet (LAN) and 1 - USB
- Controller Mounting Cabinet
- Push / Pull Handle
- Cable Reel and Power Cable
- Removable Back Walls with Ventilation Slots

- 2 - Fixed Castors and 2 - Swivel Castors with Brake
- 2 - Tool Holders - Side-mounted
- STWrench
- ETV STB33-30
- ETV ST61-50

### FEATURES

- Synatec HLT 15 Display
- Error Proofing and Data Collection

### BENEFITS

- Save time with easy setup and operation
- Maximize your flexibility and take your fastening processes where and when you need them
- Preprogrammed sequence tightening increases productivity and assembly quality
- Keep your assembly line up and running during tool changes, repairs or maintenance
- Customize for a single purpose or multiple applications

## SUSPENDED FRAME

A compact, evolving solution for all work environments.



### MECHANICS

- 2 –Trolley Carriage Mounts
- Controller suspended frame with adjustable height
- Controller mounting plate and cable cover plate
- Accessories mounting brackets
- Accessory Shelf
- ETP STB33-12 with tool holder
- ETV STB63-50 with tool holder
- Stacklight
- Selector 4 Socket Tray
- Operator Panel

### FEATURES

- Adjustable height of controller mounting and accessories
- Integrated Cable Management
- Mobile for flexible manufacturing

### CONTROL SYSTEM

- Power Focus 4000 Compact Tightening Controller

### BENEFITS

- Saves valuable floor space
- Durable construction and light weight for ease of handling
- Easy install and maintenance
- Workstation optimization

## WHEEL NUT SECURE – SMALL BOLT PATTERN

Compact Horizontal Rotate Fixture HR1 with Air Cylinder.



### MECHANICS

- QST50-150CT
- Air cylinder auto balancer with guiding and safety belt
- 4 - trolley carriage between single rail and run way rails, 1 - trolley carriage with air motor
- Cable chain for cable management
- 2-Trolley Carriage with Single Bridge Rail

### FEATURES

- Touch Screen MiniDisplay as operation interface
- Fixture rotation for spindle compliance to fasteners
- Light up/down movement with near zero-gravity air balance assistance
- Short operation time
- Automatic “return to home” positioning
- Low impact forward/backward movement
- E-Stop for whole system

### CONTROL SYSTEM

- Power MACS 4000 Tightening System
- Power MACS 4000 Floor Stand
- Indicator Box with E-Stop
- MiniDisplay
- Pneumatic Control System
- Start Handle with forward/reverse

### BENEFITS

- Light-weight, modular fixture for easy operator handling and ergonomics
- Reduces work-related injury
- Efficiency in production
- Synchronized multi-spindles to reduce cycle time and to evenly distribute fastener clamp load
- Tightening results including OK, NOK, Data and traces show on MiniDisplay and indicator box
- Easy Maintenance

## MAIN BEARING CAP SECURE

1-Spindle vertical fixture with high torque reaction suspension.



### MECHANICS

- Atlas Copco WP Spring balancer with up/ down guiding to take torque reaction force
- 4 - trolleys with top plate interface to rails
- Double aluminum rails with three cable trolleys
- QST62-230CT

### FEATURES

- Simple 1-Spindle Vertical Fixture for easy operation
- Up/down movement guiding to take torque reaction force
- Spring balancer for up/down movement, no air supply needed
- Safety belt for machine fall down protection
- Express indicator box with Estop to show tightening results OK,NOK.

### CONTROL SYSTEM

- Power MACS 4000 Tightening System
- Power MACS 4000 Floor Stand
- Indicator box with E - Stop
- Standard Operator Handle Kit with forward/reverse

### BENEFITS

- Light-weight, modular fixture for easy operator handling and ergonomics
- Adjustable handle mounting for custom positioning
- Easy up/down movement by spring balancer
- Hard connection to rails and up/down movement guiding suspension makes angle control possible
- Easy Maintenance

## HAND TOOL SUSPENSION – HTS1

1-Spindle vertical fixture HTS1.



### MECHANICS

- 2 - Trolley Carriage and Single Top Rail
- HTS1 (150 Nm) with WP Spring Balancer
- Fixed Clamp Angle Tool Holder
- ETV STB63-100

### FEATURES

- Torque reaction up to 150 Nm
- Smooth up/down movement
- Adjustable total length with upper extension tube
- Cable management
- Safety wire for fall prevention

### CONTROL SYSTEM

- Power Focus 4000 Compact Tightening Controller
- Controller mounting plate

### BENEFITS

- Absorbs torque reaction generated by the tool, eliminating the operator impact
- Lightweight and smooth movement for ease of handling
- Low handling forces for improved ergonomics
- Easy to install and maintain

## WHEEL NUT SECURE – LARGE BOLT PATTERN

2-Spindle horizontal rotate fixture HR3 with air cylinder suspension.



### MECHANICS

- Up/down Air Cylinder Suspension with stay put function
- 2-Trolley Carriage with Single Bridge Rail and Three Trolley for cables
- Dual Torque Reaction Device
- QST80-600CT

### FEATURES

- Fixture rotation for spindle compliance to fasteners
- 200 mm vertical suspension travel with Air Cylinder
- Safety belt for fall protection
- Up to 15 programs can be selected on Operator Panel

### CONTROL SYSTEM

- Power MACS 4000 Tightening System
- Power MACS 4000 Floor Stand
- Advanced Operator Panel with E-Stop
- Start Handle with forward/reverse

### BENEFITS

- Light-weight, modular fixture for easy operator handling and ergonomics
- Adjustable handle mounting for custom positioning
- Synchronized multi-spindles to reduce cycle time
- Torque Reaction device to protect operator and improve safety
- Air cylinder suspension for easy up/down movement control
- Tightening results with counting are shown in front operator
- Different programs are available to select for different products
- Easy Maintenance

## CYLINDER HEAD SECURE

1-Spindle vertical fixture articulated arm with PRS.



### MECHANICS

- 1000 Nm Articulated Arm with Balance Control
- Rotational spindle mounting plate with Standard Operator Handle Kit
- Vertical extension tube
- Parking Brake
- ETD ST101-1000

### FEATURES

- ComNode III with Position Recognition Software (PRS)
- Barcode Scanner for part identification
- Articulated Arm Home Position Lock and Parallel Arm Cradle
- 3-Axis Encoder Package

### CONTROL SYSTEM

- Power Focus 4000 Graph Tightening Controller
- ComNode III
- Position Recognition System (PRS)

### BENEFITS

- Error-proofing system for improved quality and increased productivity
- Maintain a high quality standard regardless of operator
- Reduce the need for additional quality checks
- Ensures all process documentation is available per application and fastener
- Data collection
- Easy Maintenance



**5 Spindles Wheel Machine Assembly.**

## CUSTOMIZED SOLUTIONS

Designed for heavy truck wheel nuts tightening, this solution provides 5bolts synchronized tightening, with air cylinder assistant for up/down movement and forward/backward movement to ensure good ergonomic during operations, rigid up/down guiding suspension and light horizontal rotation makes easy bolts engagement for operator.

### Mechanics

- Double bridge rails
- Four trolleys carriage with push in/out rod less air cylinder
- Air cylinder suspension for up/down movement, with lock function and guiding tube
- Horizontal rotational multiple with express handles
- Customized operator panel with lamps, program switches and E stop push button

### Control System

- PowerMacs 4000 control system with floor stand for controller mounting



**2 Spindles Wheel Machine Assembly.**

Designed for heavy truck wheel nuts tightening where the production cycle is slow, this solution provides 2bolts synchronized tightening, with air cylinder or spring balancer for up/down movement, there is brake on rear of multiple to stop multiple rotation during tightening work, which minimize the injury risk to operator due to rotation of multiple in case of one spindle breaks during tightening. Spindles distance can be adjusted to adapt different bolts patterns on the line.

### Mechanics

- Double or single bridge rails
- Four or two trolleys carriage
- Air cylinder suspension for up/down movement, with lock function
- Horizontal rotational multiple with express handles, brakes mechanism on back side of multiple, pitch change mechanism on front mounting plate of multiple
- Customized operator panel with lamps, program switches and E stop push button



**U Bolts tightening machine.**

Designed for U bolts tightening, this solution provides four bolts synchronized tightening, ensuring the clamp force on the joint of this critical part in the truck or bus, air cylinder will be provided for up/down movement with guiding tubes sitting beside it.

### Mechanics

- Double bridge rails
- Four trolleys carriage
- Air cylinder suspension for up/down movement, with lock function and guiding tube
- Vertical multiple with four QST spindles inside, which can be adjusted to be tilt according to work situation
- Operator panel with lamps, program switches and E stop push button, express handlesS

### Control System

- PowerMacs 4000 control system with floor stand for controller mounting



**Hub nut-runner.**



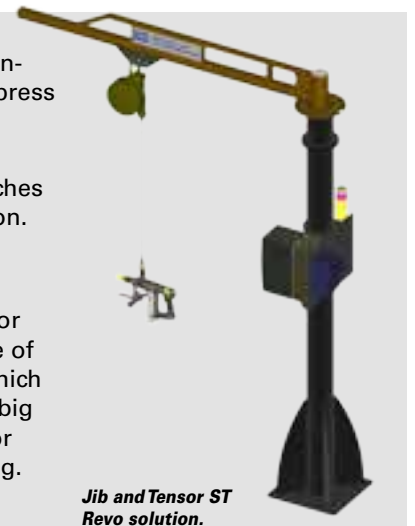
Designed for truck hub nuts tightening and rolling drag check simultaneously, we use coaxial spindles solution to eliminate manual process steps, without validation on the preload checking on the bearing, at same time, it provides additional flexibility in tooling by allowing various part models and parameter selection that can be made by socket change, barcode reader, or other means. As result, It prove the quality, productivity and flexibility to the truck manufacturing.

### Mechanics

- Double bridge rails
- Four trolleys carriage
- Air cylinder suspension for up/down movement, with lock function and guiding tube

- Horizontal coaxial spindles multiple with express handles, fixtures
- Operator panel with lamps, program switches and E stop push button.

By using simple jib and spring balancer, operator will save handling force of Tensor ST Revo tool, which can also cover enough big working area with jib for different bolts tightening.



**Jib and Tensor ST Revo solution.**