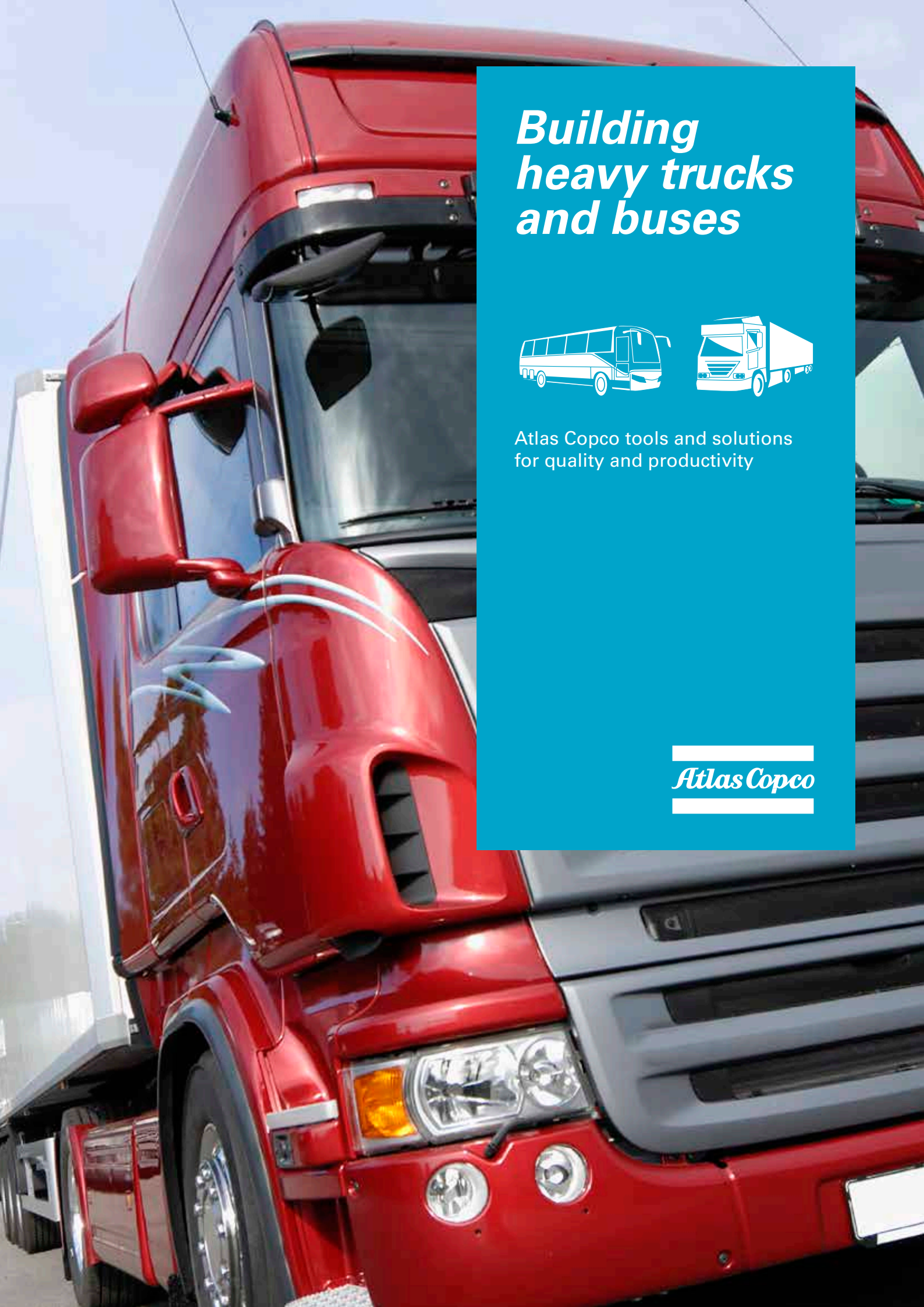


Building heavy trucks and buses

Atlas Copco tools and solutions for quality and productivity

Atlas Copco

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…

- **Productivity –** Speed up production on your existing production line. Help eliminate bottlenecks.
- **Ergonomics –** Create a well-planned ergonomic working environment in your plant, helping to increase operator safety and well-being while raising individual productivity and quality, reducing noise vibration and pollution according to local directives.
- **Quality –** Raise quality and reduce the number of rejects and reworking further down the line.
- **Lost savings –** Help reduce your operating costs and make your production more cost-effective to sharpen your competitive edge in the marketplace.

Contents

Your challenges are our business

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 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. For safety critical applications, Atlas Copco has advanced handheld and fixtured tools offering joint validation and traceability.

Ergonomics: protect operators

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. Transforming air to electric tools reduces noise, vibration and pollution of the air with oil considerably protecting operators during assembly.

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 tact 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.

Data collection and easy re-balancing

SW solutions collecting production data for improved process analysis and optimizations state of the art tools can easily re-balanced reducing cost and improving flexibility in today´s production.

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.

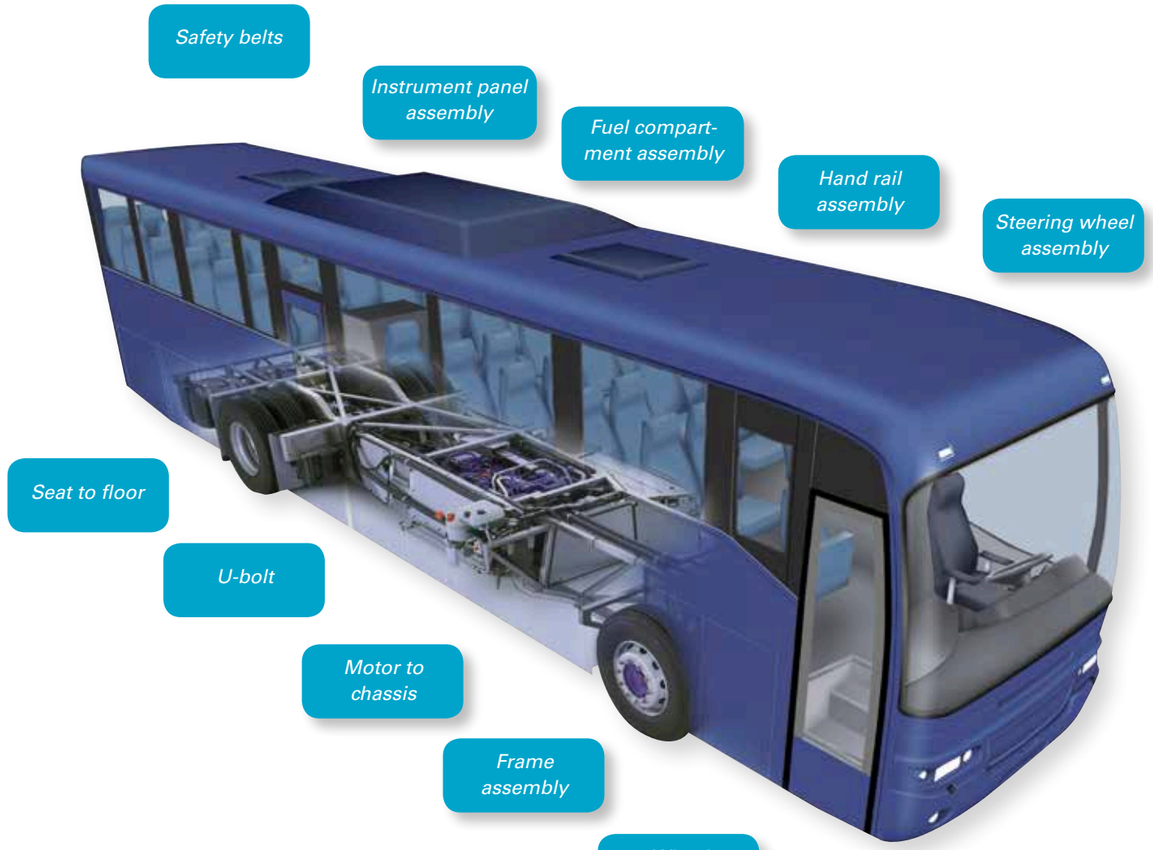
A normal truck is assembled using some 4,000 screws. If a customer wants to save weight it is possible to specify smaller screws with a higher bolt grade. This will save a lot of weight, but the bolt requires a tool which can deliver a high level of accuracy and which can be adjusted to different tightening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

Common applications:

Cabin assembly

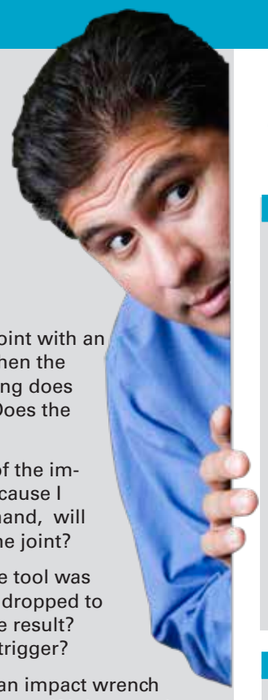
Chassis assembly



... and many more:

... and many more:

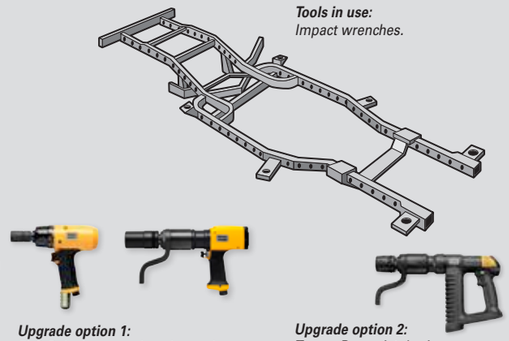
Is this what your operators are thinking?



- 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?
- If I am 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 production – now!

1. Chassis assembly

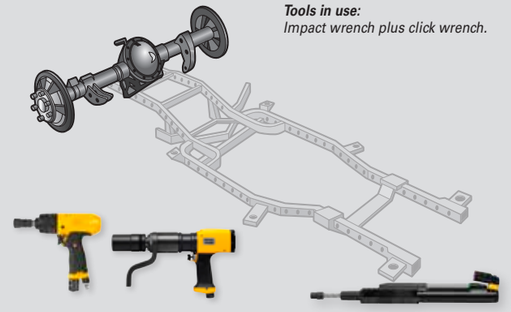


Tools in use:
Impact wrenches.

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

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

2. Truck axle: Assemble holder to axle

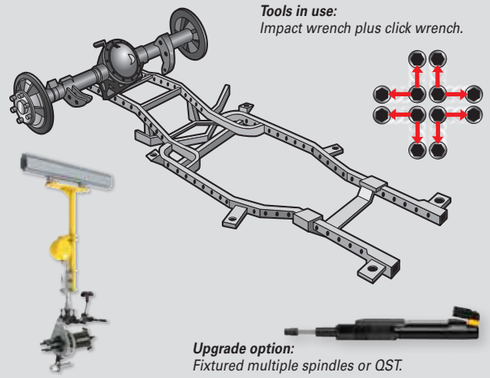


Tools in use:
Impact wrench plus click wrench.

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

Upgrade option 2:
QST fixtured nutrunners.

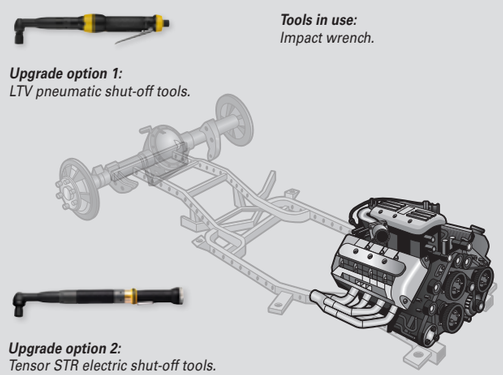
3. Axle to chassis assembly (U-bolt)



Tools in use:
Impact wrench plus click wrench.

Upgrade option:
Fixtured multiple spindles or QST.

4. Motor: Attach cooling system to motor

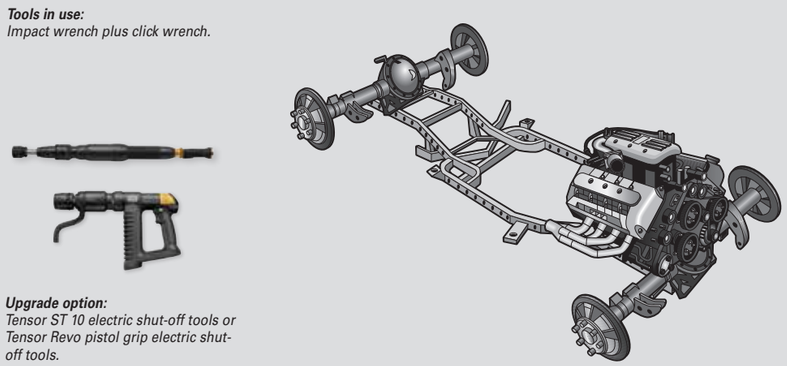


Tools in use:
Impact wrench.

Upgrade option 1:
LTV pneumatic shut-off tools.

Upgrade option 2:
Tensor STR electric shut-off tools.

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.

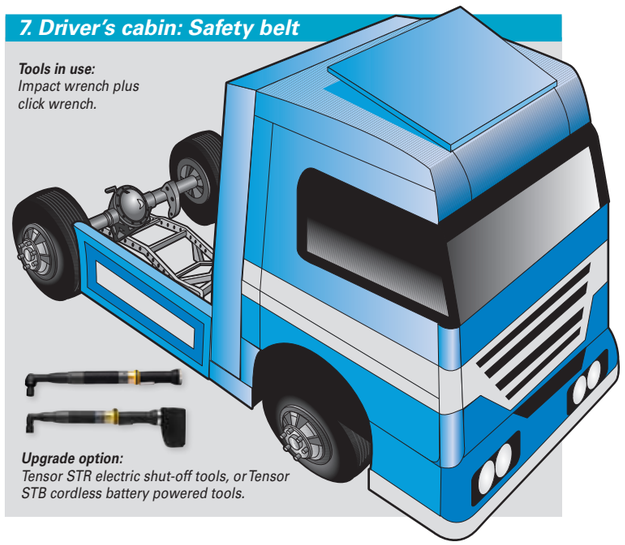
6. Attach motor with gearbox to chassis

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.

7. Driver's cabin: Safety belt



Tools in use:
Impact wrench plus click wrench.

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

8. Driver's cabin: Airbag

Tools in use:
Impact wrench plus click wrench.

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

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 1:
LTP, LTV, LTD pneumatic shut-off tools

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

11. Attach cabin to chassis

Tools in use: *Impact wrenches.*

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 PTI pneumatic tools, or LTP pneumatic shut-off tools.

Six steps to 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.

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 and monitored also on further accessories.

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

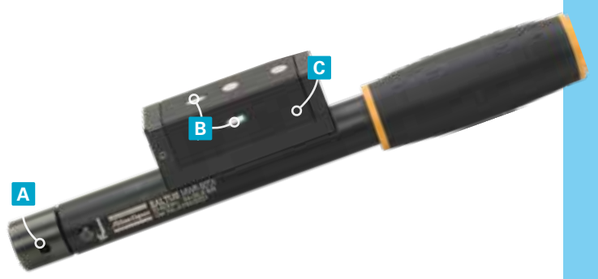
With step five two further elements are introduced for fault-free production. One element is the intoduction of part identification, the other is reject management. With step five the tool controllers are not only networked – they are also connected to the factory network. Information about the components 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.

Increase the quality of your joints considerably with the Error Proofing functionalities of the MWR mechatronic system. Combining the productivity of a click wrench with the traceability of an electronic one, this smart manual fastening system for tightening processes is a good investment. Using the smallest version of this high productive wrench you are able to get access to joints inaccessible for a standard tool. The online results provide a complete traceability of the tightening process.

The Mechatronic system

More than a click!

- Wireless
- Traceability
- Optimal size
- Produtivity
- Error proofing



- **A** Thanks to a standard drive (9x12 and 14x18) , the operator can always find the perfect end fitting for his application.
- **B** Operator can always know if a wrench is ready to work, and if the tightening was correct, by looking at the onboard **LEDs**.
- **C** Thanks to the **wireless connection** the operator is free to move around and to access bolt location.
- **D** The **charging cradle** is a stable holder and a battery charger, making sure that the tools are always ready to perform their tasks. Shift after shift.
- **E** Detailed tightening information is immediately available on the Focus 60 and 61 **display**.
- **F** Tightening data from MWR wrenches are easily transferred to Production data collection systems like ToolsNet. **Communicating** either with the simple protocol or with the Atlas Copco Open Protocol.
- **G** With a **barcode reader** connected to the Focus controller, operator scans an ID number and the right job is selected. All tightening data will automatically include the scanned ID number.
- **H** Intuitive “just a few clicks away” **interface**.
- **I** Production stations can easily implement a real-time feedback in a **Live monitor** using TT BLM software.

Throughout a tightening, the MWR Wrench will monitor three things, depending on the choosen model. It measures that the right angle is achieved, that the right torque is applied and that the operator releases at the correct time

Smart click

Throughout a tightening, the MWR Wrench will monitor three things, depending on the choosen model. It measures that the right angle is achieved, that the right torque is applied and that the operator releases at the correct time.

MWR wrench

Torque angle

The MWR-TA measures torque and angle values, reporting problems immediately. Wrong screws or damaged threads are history! Any re-hit is detected making you 100% sure that all the screws in a sequence are properly tightened.

Torque

The MWR-T is measuring torque during the entire tightening process. Depending on the limits, the peak value gives the OK/NOK status. Giving you the real torque applied on the joint.

Switch

The MWR-S supports the worker providing a feedback about the correct wrench handling. Staying too long in the “clicked” position is an indicator for over-torqueing. The MWR-S does count this as a NOK. Operator is also warned about double clicks on the same tightening.

Productivity

Based on the mechanical “click” wrench, the MWR mechatronic wrench is highly productive. The clear physical feedback of the “click” makes it easy to handle even for untrained workers, giving you a very short training period.

Feedback

Feedback of the tightening process is clear with the distinctive “Click” of the MWR mechanism in combination with the colored LED’s. If needed the MWR mechatronic system can be completed with the stack lights connected to the Focus controller.

Size

Size and performance makes the MWR wrenches optimal for limited space applications. With all functionalities in a compact size.

MWR-25

MWR-50

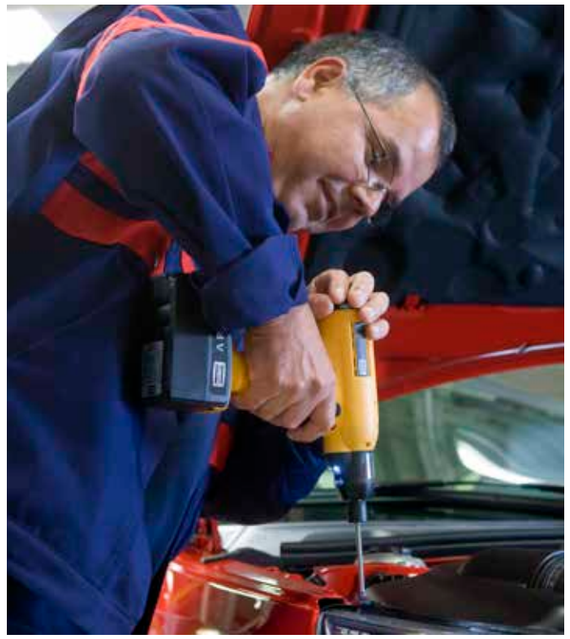
MWR-85

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

LUM 12 HRF
Torque range: 0.6 – 8 Nm

LUM 32
Torque range: 5 – 15.5 Nm

LUM 22
Torque range: 0.6 – 26 Nm

BCP battery tool
Torque range: 0.8 – 12 Nm

BCV battery tool
Toque range: 1,5-45 Nm

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, Volvo and Daimler. A "stall-type" version, the LMP, gives you maximum control over the tightening process.

Pistol grip nutrunners

Use one LTP 61 for a wide range of multi torque selection

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

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.

APPLICATION EXAMPLES

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

LTP 61 shut-off nutrunner with multi torque selector
up to 4 different torque levels
Torque range: 55 – 3,800 Nm
Speed range: 50 – 1,800 rpm

LTP 61 shut-off nutrunner
Torque range: 55 – 3,800 Nm
Speed range: 50 – 1,800 rpm


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

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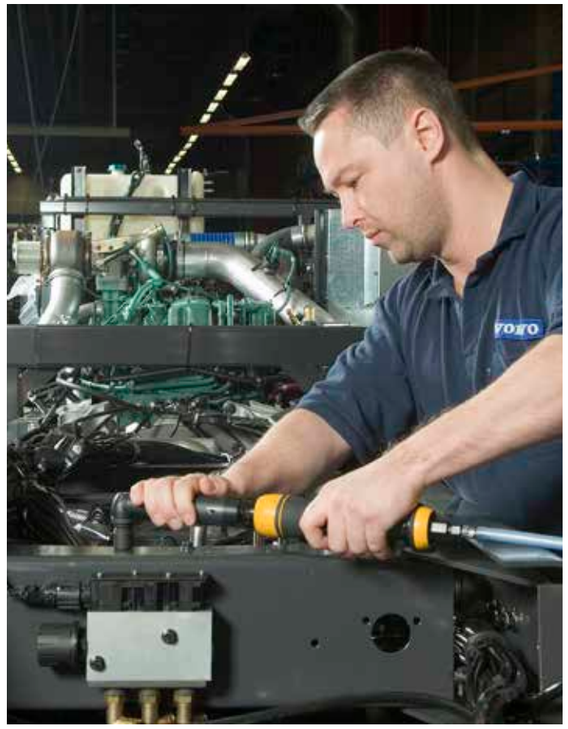
The LTV 9 series is a range of high performance, angle nutrunners offering high speeds, extended torque range, operator comfort and long service life. LTV 69 nutrunners are helping to raising productivity in heavy truck and bus plants around the world. Tools in the new, extremely powerful Atlas Copco 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

Benefits

- Combining performance with reliability
- Speed and accuracy
- Light tool
- Easy to operate
- Built for tough jobs and long service lifetime
- Increase speed by up to 50%
- Fast and powerful



APPLICATION EXAMPLES

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

LTV 29-2
Torque range: 6 – 30 Nm
Speed range: 500 – 850 rpm

LTV 39-2
Torque range: 7 – 85 Nm
Speed range: 305 – 1,200 rpm

LTV 48 HAD
Torque range: 70 - 200 Nm
Speed range: 100 - 215 rpm

LTV 69
Torque range: 70 – 600 Nm
Speed range: 280 – 840 rpm

Reaction bar kit

Protective cover (a)

Protective cover (b)

Signal connection kit (RE)

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.

HAD stands for Hold-and-Drive system and refers to those joints where it is not possible to hold the screw from the opposite side of the threaded end where the tightening takes place.

Hold-and-Drive system

HAD - Hold-and-Drive tools for easy and efficient assembly of screws

- One tool instead of two
- One operator instead of two
- Some of the tools are reaction free despite high torque

Hold-and-Drive nutrunners

An increasingly common use of HAD screws today is for frame assembly on trucks and buses. With those screws the thread end usually has a two flat, hex or double hex shape. Screw sizes M10, M12 and M14 are frequently used to clamp frame profiles together instead of riveting. HAD screws are also the preferred method of fixing components onto the frame sides.

Special range of angle nutrunners for HAD applications

One of the tightening concepts is angle nutrunners for HAD applications. Most commonly, the HAD angle nutrunner has a drive socket incorporated with the bevel gear. The screw holder is usually either a socket for a two-flats, hex or double hex screw end or a bit holder for a hexagon or a Torx insert bit. It is connected to the angle head housing via a splined sleeve, allowing the screw holder to move axially without rotating in relation to the tool.

Range of drive sockets and screw holders

Drive sockets and screw holders come in different sizes and models to meet the nut and screw specifications. They are also available in different lengths to satisfy various access requirements. However, the socket/screw holder system has a defined maximum travel decided by the depth of the splined sleeve. This means that the length of the drive socket and screw holder that decides the extension from the angle head has no relevance to the distance the holder can retract inside the socket.

Hold-and-Drive reaction free

Assembly without reaction bar

Hold-and-drive reaction free

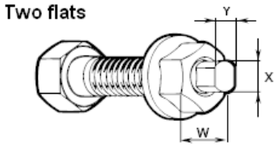
Today you can also choose a more or less completely reaction free solution. You can use either an electric or pneumatic pistolgrip nutrunner together with a HAD front part, or the new angle nutrunner range type LR.

LR stands for low reaction.

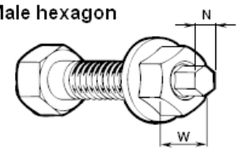
The LR type can be supplied in either an electric or a pneumatic version.

When using the LR versions it is essential that the screw tip is designed to take the full reaction torque since all of the reaction torque will be transferred internally and almost nothing will be transferred via the body of the tool to the operator or any type of external support device.

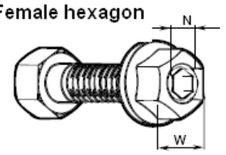
Two flats

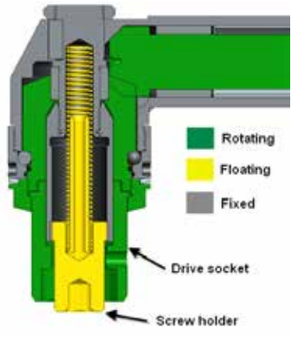


Male hexagon



Female hexagon





APPLICATION EXAMPLES

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

ETV ST81-HAD-LR
Torque range: 40 – 200 Nm
Speed max: 300 rpm

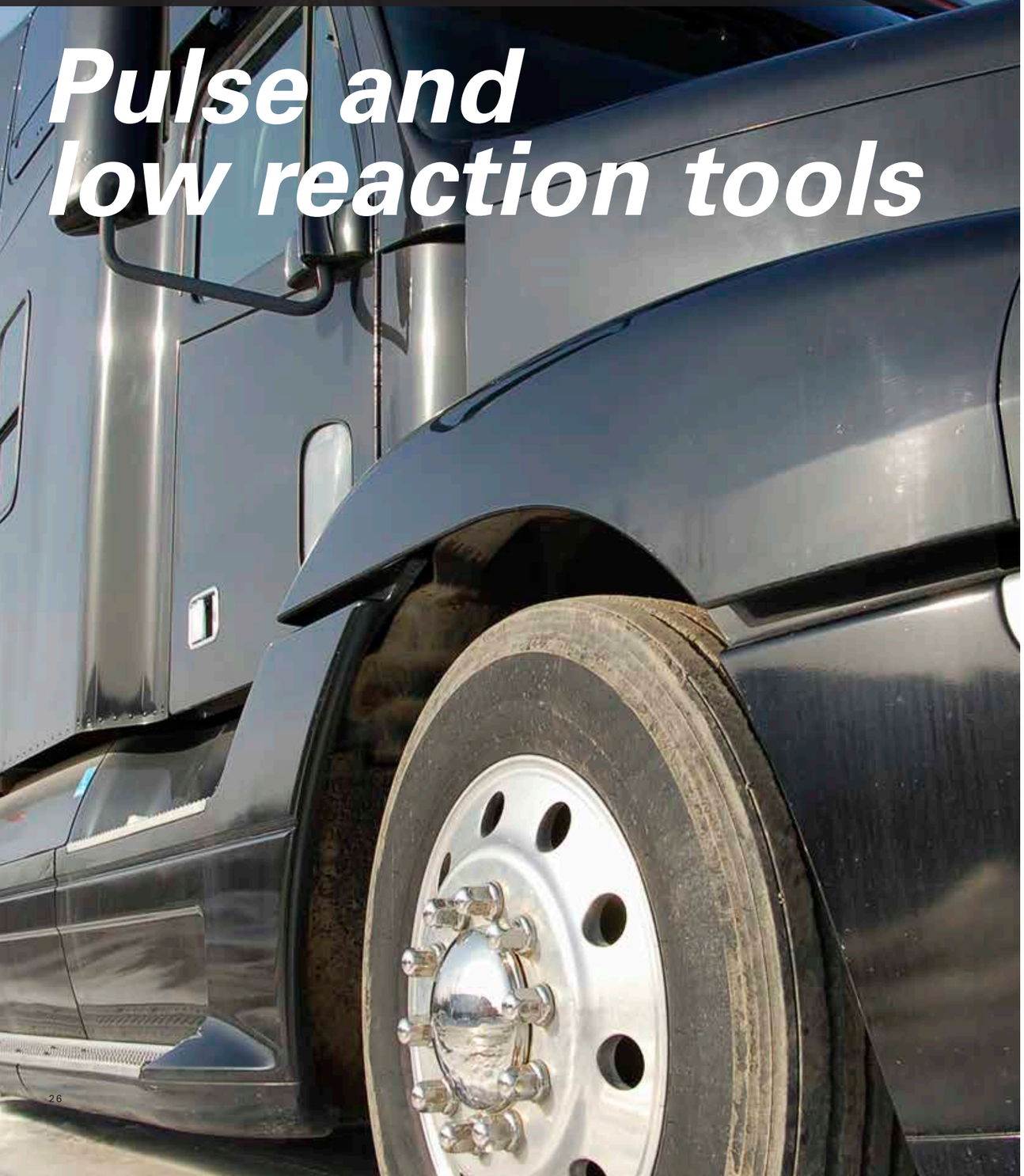
REVO HAD
Torque range: 60 – 500 Nm
Speed max: 400 rpm

LTV69-HAD-LR
Torque range: 100 – 200 Nm
Speed max: 300 rpm

There is a computer program available to make the correct selection of sockets and holders for the different sizes of angle nutrunners.

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 TBP battery pulse tool multi torque selection, offering the advantages of a pulse tool, with the intelligence of an electronic nutrunner.

Pulse and low reaction tools



Benefits

The ErgoPulse shut-off tool is the ideal choice if your operators need to speed up production with fast rundowns and short tightening cycles. It is a reliable and powerful shut-off pulse tool that automatically shuts off the air supply when the pre-set torque has reached. Suitable for continuous heavy production, the PTX series has some air on top HRF models, making it possible to feed the air from above to the tool. All PTX and PTI models can also be used as lubrication free, just like other ErgoPulse tools and is available in StandardTrim and AutoTrim version.

- **ErgoPulse tools offer high torque with stable torque output**
- **Comfortable ergonomi**
- **Low maintenance, long working lifetime**
- **Automatic shut-off tools**
- **Find another tool like this one!**
- **Optimum performance on all types of joints**
- **Non shut-off tools**
- **TBP battery tool**

APPLICATION EXAMPLES

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

ErgoPulse shut-off tools

ErgoPulse PTI
Torque range: 8 – 150 Nm

ErgoPulse PTX
Torque range: 2 – 450 Nm

ErgoPulse non shut-off tools

ErgoPulse 25PTX
Torque range: 450 – 900 Nm

ErgoPulse XS
Torque range: 5 – 400 Nm

Pulsor Focus 6000

TBP
Torque range: 12 – 150 Nm

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 TBP will change everything you thought you knew about pulse tools. TBP is a cordless tool for one-handed operations, enabling error-proof productions. And our DuraPulse® technology will ensure the robustness of the TBP, making it your new favourite workhorse.

TBP – redefining what a pulse tool can do

Cordless tool for one-handed operations

Low vibrations

The lowest vibration levels in the market means saving the operator and reducing work related costs caused by fatigue and injuries such as white fingers.

High service interval

Thanks to new patented technology and design, you will have longer service intervals than with traditional pulse tools. Reduced oil leakage, separation of air and oil, and a cooler tool – meaning higher performance and uptime.

High torque possibilities

With TorqueBoost®, active cooling and advanced motor steering, the torque build up is fast and gives reduced hours per production unit.

Charger and battery

Tensor SRB

Features

- **A** Operator feedback, including battery status, is provided with LED indicators – easily seen from operating position
- **B** Well balanced tool that sits comfortably in your operators hands
- **C** New pulse unit, less affected by oil leakage, with longer service interval
- **D** An efficient ventilation prevents the tool from getting to warm
- **E** A buffer battery makes battery swaps trouble free
- **F** The all new pulse unit delivers 6 000 rpm
- **G** Easy to set up and assign Virtual Station with the Power Focus 6000
- **H** Internal buzzer for audible feedback
- **J** Dual antenna, improves your connectivity
- **K** Rapid Backup Unit (RBU) functionality

What is important in your tightening process

Choosing the right tool is the first – and most important – step towards a perfect operation. Regardless of which of these three tools you use, you will have a well balanced ergonomically designed high quality tool. And choosing the right one will make the whole world of a difference for your specific needs.

TBP

If you are looking for a low reaction tool with maximum flexibility, high torque and the ergonomic benefits of having the lowest vibration on the market – a cordless and powerful Atlas Copco TBP is your tool of choice.

SRB

Low reaction and all strategies, from the standard 2 steps, quick step – to the more advance TurboTight™ and TensorPulse. New electronics and an improved motor, gives you the possibility to reach 1 500 rpm boosting your productivity.

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 ±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.

It's so easy to use and you can setup and run a new system setup 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**

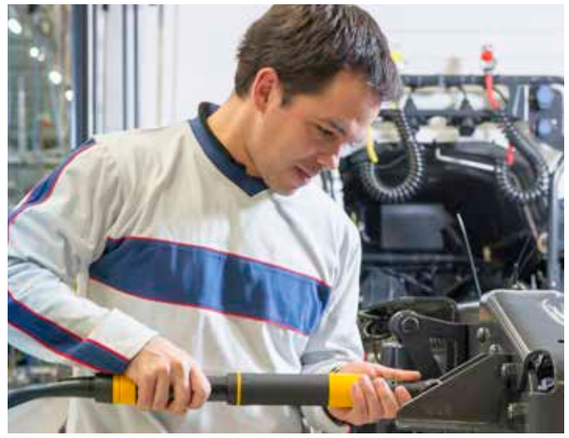
APPLICATION EXAMPLES

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

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

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

Power Focus 600



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 and Tensor STR 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

- Spiral gears – durable and accurate
- Visual and audio feedback
- Comfortable to operate
- Proven transducer
- Easy fixture adaption
- Power Focus 6000 controller
- Flexible together with cordless socket selection

Tensor REVO nutrunner

- Easy positioning, 360°
- Swivel on transducerized tool

Power Focus 6000 controller

TENSOR REVO 2000 Nm

TENSOR REVO with support handle

Telescopic front

Swiveling suspension yoke (gear mounted)

Swiveling suspension yoke

Tensor ST cable with cable protection

Stacklight

Large socket selector

HLTQ-Industrial PC (15",19", 24")

Socket Selector 8

APPLICATION EXAMPLES

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

Tensor ST/STR angle tool
Torque range: 1 – 600 Nm

Tensor ETP ST/STR pistol grip tool
Torque range: 5 – 125 Nm

ETV SR21 angle tool
Torque range: 2.5 – 25 Nm

Tensor ST/STR straight tool
Torque range: 1 – 4000 Nm

Tensor Revo pistol grip tool
Torque range: 60 – 4000 Nm

Power Focus 6000 controller

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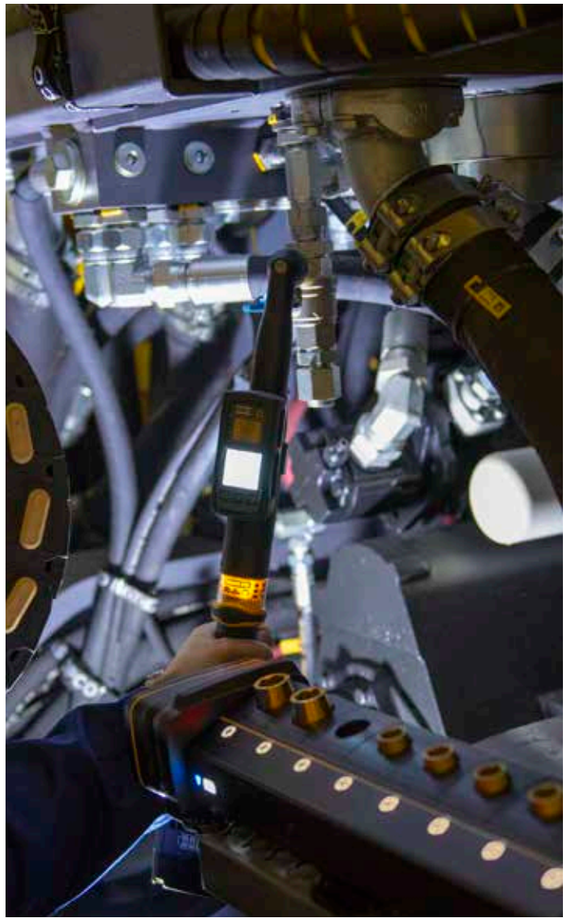
Available as angle or pistol grip ST/STR tools, Tensor STB nutrunners give you true cordless freedom! First, they are battery powered. Second, they use Industrial Radio Communication (IRC) to communicate with a controller, giving you full process control. In other words, Tensor STB tools offer the same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

Tensor STB transducerized cordless nutrunners

Critical joints demand not only validation and documentation, but also location of the tool. A special designed accessory contains a scanner display for operator feedback and a locationtag. This is particulary attractive for the operator working on moving lines or at rework stations with many different tightening positions

- **Unique fastening performance**
- **Superior ergonomics**
- **Location system and tool range limitation (tethering)**
- **Higher productivity**
- **Optimal operator guidance**
- **Flexible solution together with cordless socket selection (tool kit or trolley)**



APPLICATION EXAMPLES

CABIN APPLICATIONS

- n **DOOR HINGES**
- n **STEERING WHEEL**
- n **SEAT BELTS**
- n **SEAT TO FLOOR**
- n **CABIN INTERIOR**

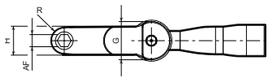
Tensor STB angle tool up to 150 nm
Torque range: 2 – 100 Nm

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

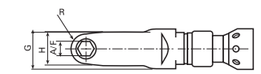
Socket selector

Power Focus 6000 controller

ETC STB Inline crowfoot tool



ETC STB offset crowfoot 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, 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.

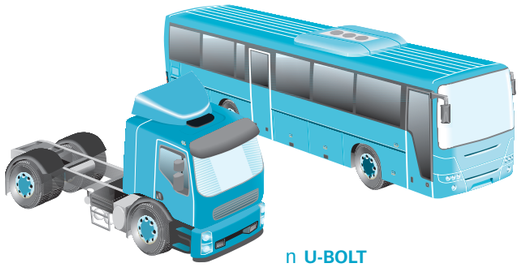
- **Speed that raises productivity**
- **Accurate and easy to maintain**
- **Built-in memory chip**
- **Hot Swap function**
- **Durability**
- **Used in arm or a robot applications**

QST tools with Power Focus 6000

QST nutrunners are compact, durable and easy to integrate. QST is controlled by the PF6000 and FlexDrive, like the Tensor ST/STR tools, it is possible to achieve 100% controller commonality in a line.

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

APPLICATION EXAMPLES



- **WHEEL MULTI**
- **5TH WHEEL**
- **U-BOLT**
- **CHASSIS ASSEMBLY**
- **MOTOR TO CHASSIS**

QST fixtured nutrunner
Torque range: 0 – 1750 Nm

PM 4000

Power Focus 6000 controller

QST fixtured nutrunner
Torque range: 0 – 1750 Nm

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.

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.

Fixtured 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

QST

Power Focus 6000

Tensor STR

Accessories for Quality Integrated Fastening

Operator panel

Stacklight

I/O Expander

HLTQ-Industrial PC (15",19", 24")

Socket selector 8

Indicator box

Fixtures

Spindle types: Straight and Offset
Maximum torque: 1,000 Nm

U-Bolt

Vertical

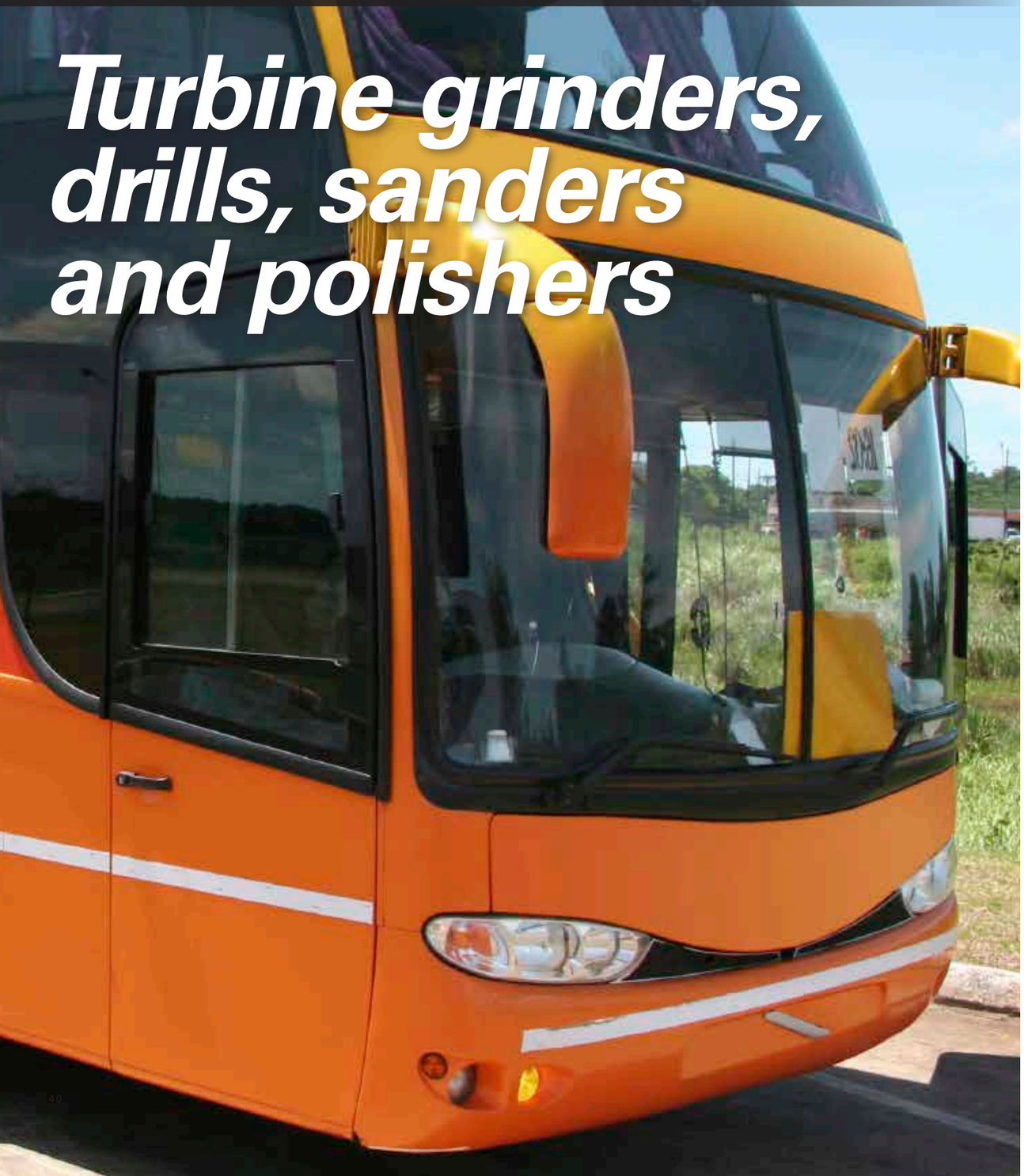
Horizontal

Horizontal rotating

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
– Easy to maintain

GTG 40 Turbine Grinder

– High rate of material removal
– Turbo-powered productivity

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

APPLICATION EXAMPLES

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

Turbine Grinders GTG 25
Power: 2.5 kW
Wheel dia. 125 – 180 mm

Turbine Grinders GTG 40
Power: 3.4 – 4.5 kW
Wheel dia. 150 – 230 mm

Drills
Power: 0.11 – 0.83 kW

LBB 16

LBB 37

LBV 16

LSF 19

LSF 28

LSR 48

Sanders LSV 19, 28, 38 and 48
Power: 0.37 – 1.9 kW
Wheel dia. 50 – 200 mm

LST sanders/polishers
Power: 0.2 – 0.3 kW
Pad size 90 – 150 mm

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.

Air line accessories

Atlas Copco accessories 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, under-dimensioned 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.

Ever wished there was a better way?

AIR PREPARATION UNITS

QUICK COUPLINGS

SWIVEL CONNECTORS

HOSE REELS

BALANCERS

AIR NET - QUALITY PIPING SOLUTION

TEST EQUIPMENT

HM OPEN

HM FLEX L

HM OPEN XL

HOSES, PVC

CABLAIR HOSES

SPIRAL HOSES

For more information about Air line Accessories, see our main catalogue, "Industrial Tools and Solutions."

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 and manual 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 tigthened 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 continuos operation. (1 test every 30 sec.)
Transducers	SRTT, 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?

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

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.

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 LABwrench.

ST Bench the innovative advanced solution for tool check

The Atlas Copco STbench lets you test the tool capability in the crib or along the line. Meaning you no longer need to take the tool out off the floor and away to test center – and instead taking the test center to your tool. Together with an STpad it enables faster testing with up to 30 tests in just three minutes.

This means you can calibrate your tools quick and convenient, controlling its performances along the line, preventing possible tool errors. Real time checking of tightenings with an advanced algorithm helps you to avoid operator errors and influence.

Full accessibility
With an advanced joint simulation from trace and multistep management you achieve a reliable high quality fastening the operator is fully guided in the complete test process.

Equip your STbench with an STpad for full accessibility. Thanks to the removable STpad and IRC-Connect, you can reach automated stations, robots or difficult to reach areas. wear, lubrication, etc.

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.

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 ±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 ± 4 %**
- **Easy and safe adjusting and handling**
- **Standard drive (9x12 or 14x18) for a wide range of suitable end fittings**

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 ± 4 %**
- **Robust construction**
- **Easy and safe adjusting**

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 ± 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

- **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 ± 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 rotaction

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, lenghts 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.

Rotaction – The professional Atlas Copco solution for safer tightening

Atlas Copco offers a new generation of covered sockets: **ROTACTION**.
The trendsetting, advanced **ROTACTION** concept promotes the increasing demands regarding operators safety and non-marking tools.

The combination of free rotating sleeves and newly developed covers for the connections «tool-to-socket» and «extension-to-socket» improve operators safety significantly.

ROTACTION is available for a large number of Atlas Copco's electrical assembly tools.

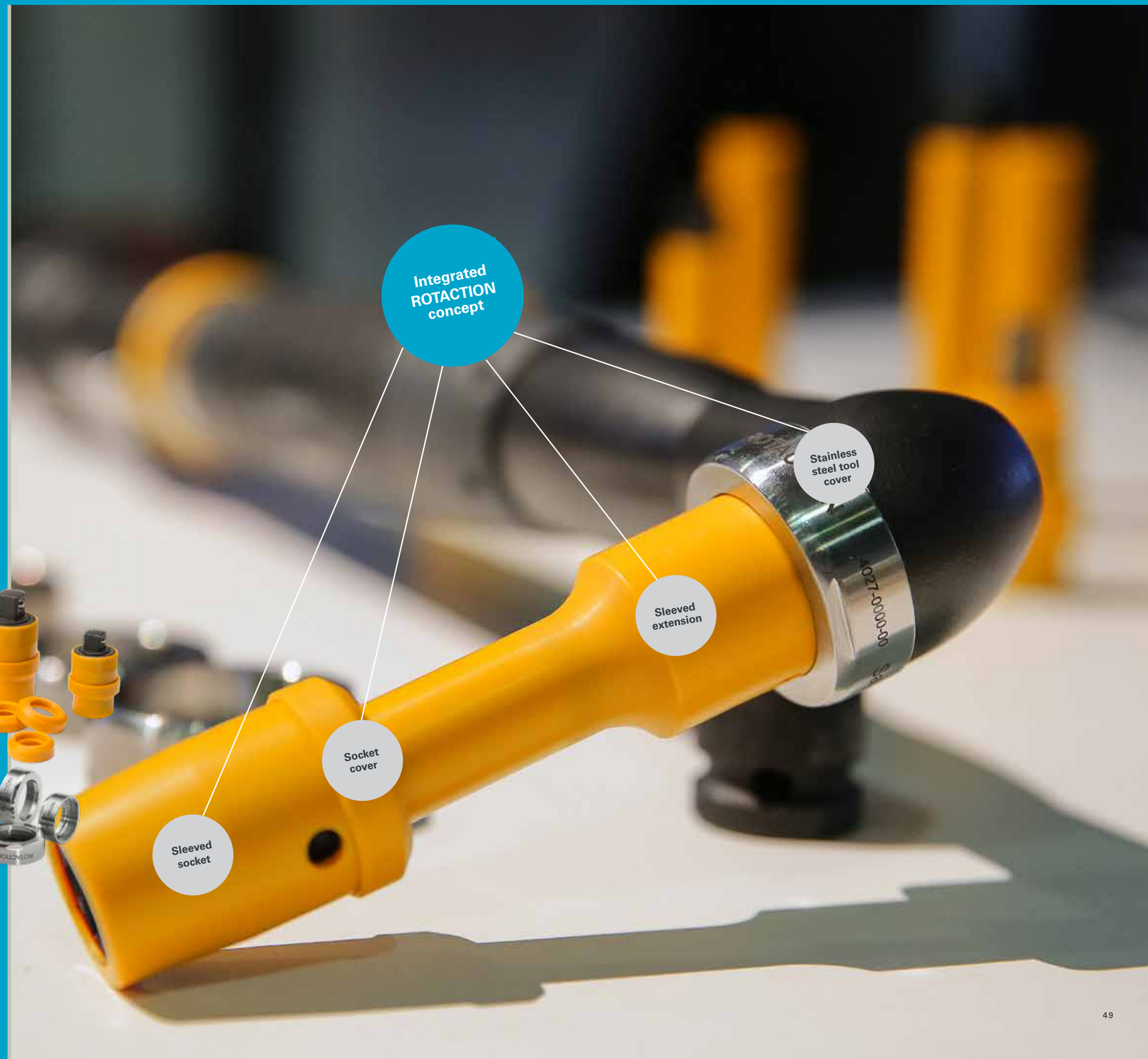
ROTACTION covered sockets ensure:

- Safer operation for operators
- Minimized risk of scratches and marks on painted surfaces
- Low friction
- High resistance to abrasion
- Small outer dimension for betterjoint accessibility

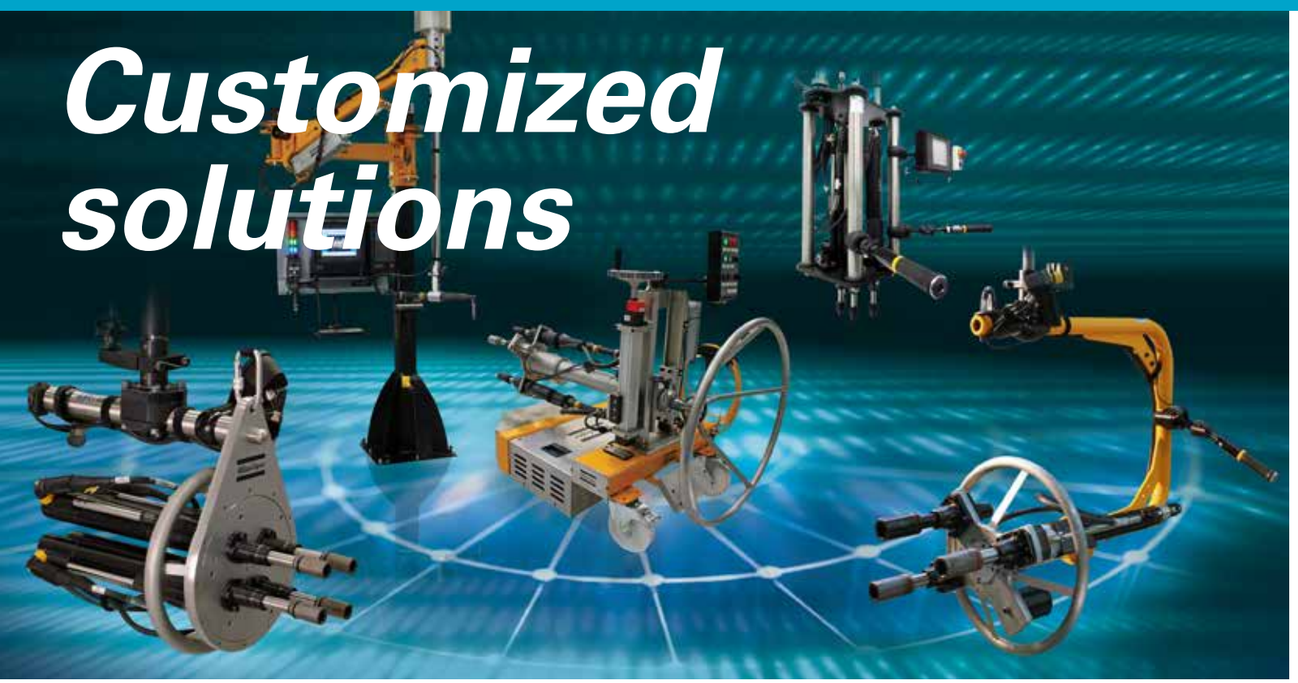
The **ROTACTION** range covers:

- Numerous sockets, bit sockets,bits and nut setters with new, freely rotating protection sleeves
- Various extensions with rotating protection sleeves
- Socket covers to bridge the gap between extension and socket (Refer to page 14)
- Stainless steel tool covers to close the gap between anglehead tools and socket or extension (Refer to page 14)

Beside a wide range of standard products customized solutions can be realized.



Customized solutions



Mobile assembly station

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

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
- Sequence tightening and counting function
- Integrated Cable Management

Control system

- Power Focus 6000 Tightening Controller
- Synatec (SQS) Software and PC for tightening control
- Uninterruptable Power Supply (UPS) Compartment

Customer value

- 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 rame

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

Weel 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 as operation interface
- Fixture rotation for spindle compliance to fasteners
- Light up/down movement with near zerogravity 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
- Display
- 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

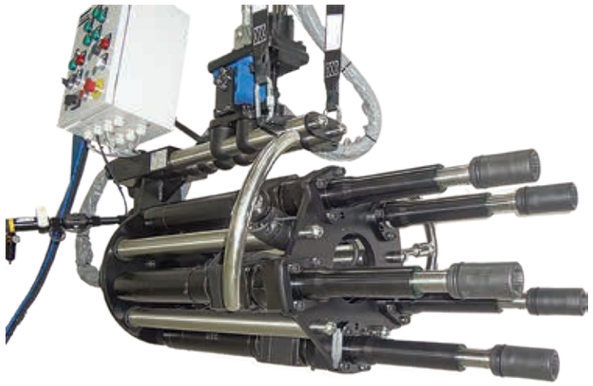
Designed for heavy truck wheel nuts tightening, this solution provides 5bolts synchronized tightening, with air cylinder assistant for up/down movement and forward/backward movement to ensure good ergonomic during operations, rigid up/down guiding suspension and light horizontal rotation makes easy bolts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

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

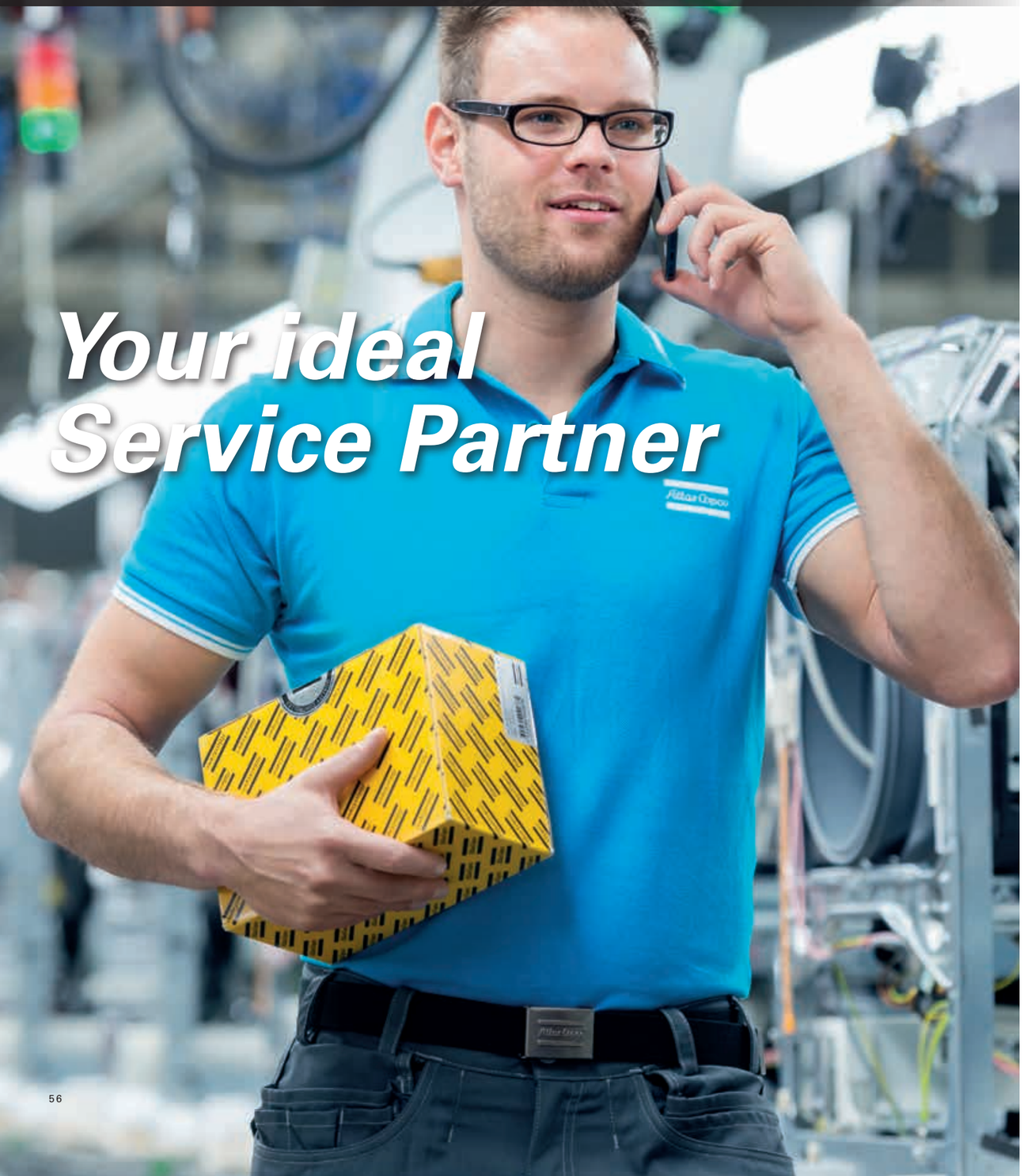
- Double bridge rails
- Four trolleys carriage
- Air cylinder suspension for up/down movement, with lock function and guiding tube

- 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.

At Atlas Copco, we continuously seek ways to improve our customers' operations, as well as our own. With this in mind, we are determined to be the world's most professional supplier of industrial service solutions for fixtured and hand-held power tools. To achive that we have developed a range of standard service packages that will help our customers to improve their quality and productivity in production.



Your ideal Service Partner

Service solutions at Atlas Copco

Every production line and industrial site is unique and has its own challenges.

With that in mind, our service solutions are designed to help you get the most out of your industrial equipment. We combine analyses of production data with know-how and expertise in order to enhance your productivity and quality; while keeping you cost efficiency maintenance under control.

Our service offering consists of various services and options to further customise your maintenance agreement and fit your needs:

Start-up

Starting a new operation requires meticulous planning, investment and training. Getting started quickly and smoothly ensures you're delivering value from the first day. Our start-up service solutions ensure that customers equipment is 'right first time', whilst also ensuring it delivers the optimum quality level and cost efficiency.

Maintenance

Atlas Copco can manage your entire maintenance cycle, whilst supporting our customers with preventive maintenance programs. Our maintenance solutions help customers optimize performance, decrease production downtime, whilst ensuring the right quality of your products. All within a controlled maintenance cost.

Optimization

In your production, there are many factors which might affect the right performance of your equipment. Not only is the tooling important, but also the operator, materials, joint conditions and software. Through our optimization services, we offer the possibility to improve assembly processes whilst optimizing performance.

Our service offering

Optimization Services

- Optimization Modules

Tool maintenance

- Monthly KPI´s – Set-up and reports
  On-site technician
  Tool Management Centre
- Field Service and Quarterly KPI´s
  Service Repairs incl. Spares
- Preventive Maintenance
  Tool calibration
- Individual repairs

ToolCover Protect

ToolCover Stability

ToolCover Uptime

RapidRepair

Start-Up Services

- ResultScan
- EasyStart

Start-up

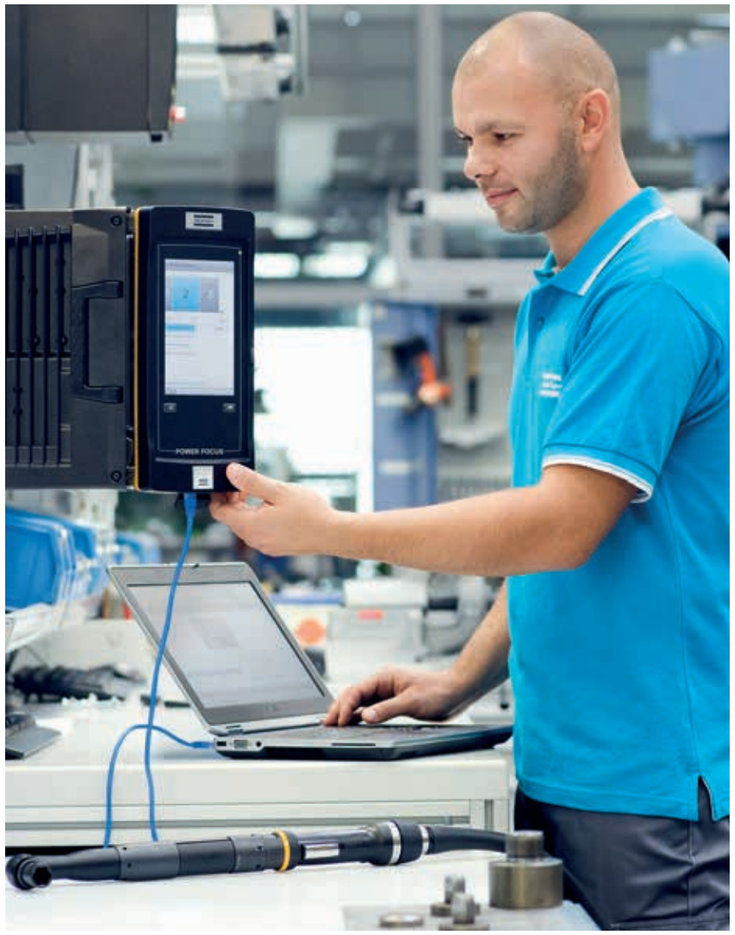
EasyStart

EasyStart offers a trouble-free and efficient start of operations for your tightening system. Through a globally standardized and certified process for every step, from programming to training, you will get it right the first time, saving time and money.

ResultScan

ResultScan reduces your risk of sending defective products to your customers. Thereby decreasing costs of warranty, rework and recall.

It identifies your application´s optimal monitoring limits. Installing these limits enables you to identify cross threading, material problems and operational errors, before the customer does. It reduces your risk of sending defective products to customers. Thereby decreasing costs of warranty, rework and recall.



Maintenance

RapidRepair

RapidRepair, ensures damaged tools are quickly repaired and back in production with minimal administration, cost and inconvenience.

With a predefined, easy and practical process, we take full care of the whole repair cycle – with a leading turnaround time from door to door, because easy is both faster and less expensive.

ToolCover

ToolCover maintenance solutions help optimize performance and gain efficiencies in production, whilst minimizing tool costs and production risks.

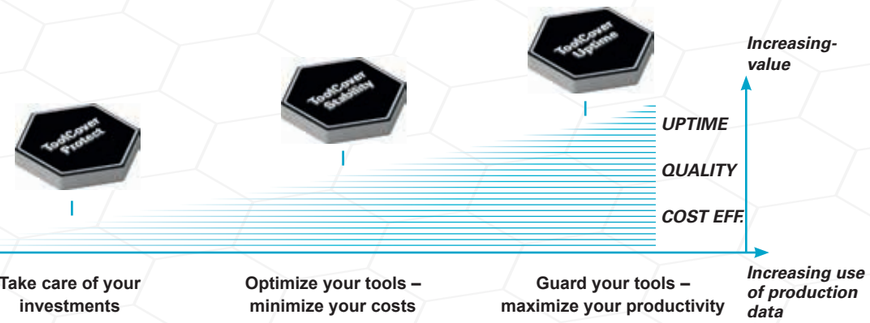
With a modular set of products, ToolCover is designed to meet specific needs and tool usage.

ToolCover solutions are always:

- Reducing Maintenance & Repair time
- Built on global best practice processes and service certificates
- Offered with a fixed Preventive Maintenance cost
- Coupled with discounts on spare parts

BASED ON YOUR NEEDS, YOU CAN CHOOSE BETWEEN PROTECT, STABILITY, UPTIME.

Please see below our value proposition



	Take care of your investments	Optimize your tools – minimize your costs	Guard your tools – maximize your productivity
Preventive Maintenance:	Once per tool and year	Optimization based on historic production data	Optimization based on real-time production data
KPI monitoring and analysis:	Yearly direct cost tracking	Bi-annually direct and indirect cost tracking per tool	Customized real-time monitoring and monthly optimization analysis per tool
Warranty:	Extended 3 month warranty after maintenance	Full contract lifetime warranty	Full contract lifetime warranty
Atlas Copco professional support:	Annual feedback meetings	Biannual feedback and optimization consultancy	Dedicated on-site Atlas Copco personel
Repairs:	Not included – but possible to couple with RapidRepair contract	Yes – priority on workshop repairs and spare parts included	Yes – including instant on-site support

Optimization

Production optimization

Zero fault production at the lowest total cost. Atlas Copco Service can help improve productivity within an existing assembly, or in a new production project.

We ensure that the focus remains on quality and efficiency from concept and R&D, through to full production:

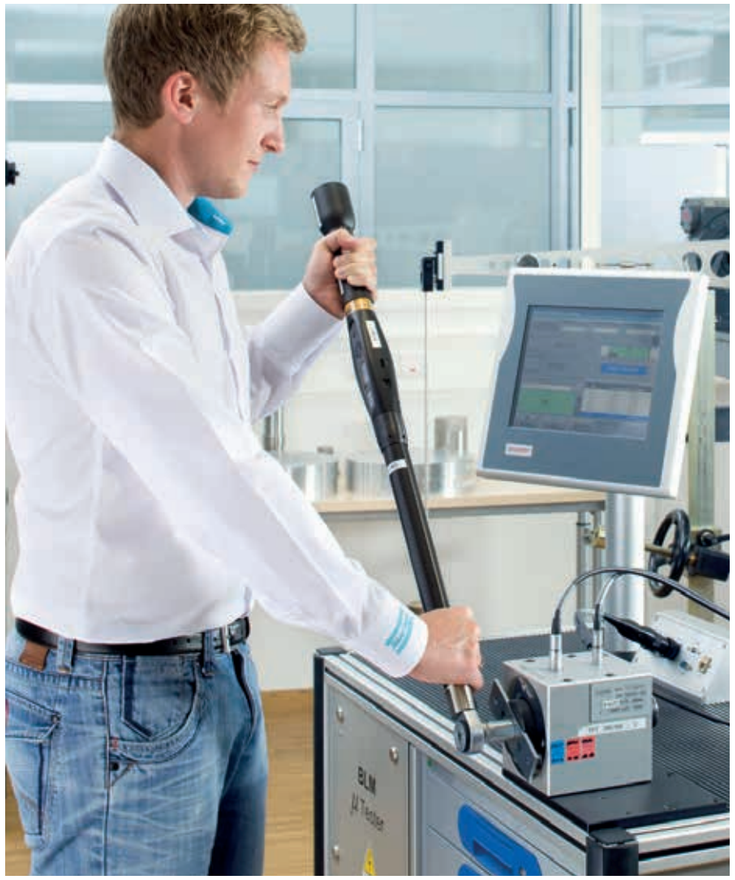
- Joint analysis and optimization
- Process optimization
- Program optimization

Calibration

With our network of calibration laboratories we offer a complete package of calibration services to help control quality for all assembly tools and measurement equipment in production.

The most efficient way to control quality:

- Traceability and document management.
- Calibration/verification of transducerized tools and controllers.
- Torque adjustment and capability test.
- Verification test for a specific application.
- Accredited and factory calibration of measurement equipment.
- Testing and calibration of click and torque wrenches.



Training

Training provide your personnel with the capability to determine whether production issues and interruptions are the result of problems with the tooling or with the parts used in assembly.

Help raise productivity. Having well-trained operators, line engineers and quality people in your operations, means higher productivity and quality.

We have developed an extensive range of training courses that are provided locally through the Atlas Copco global network.

ResultScan

ResultScan reduces your risk of sending defective products to your customers. Thereby decreasing costs of warranty, rework and recall.

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Committed to sustainable productivity

We stand by our responsibilities towards our customers,
towards the environment and the people around us.
We make performance stand a test of time.
This is what we call – Sustainable Productivity.

www.atlascopco.com

Atlas Copco