

A grayscale photograph of an aircraft's landing gear assembly on a tarmac. The image shows the main landing gear with two large tires, a central strut, and various mechanical components. The background is slightly blurred, showing other aircraft and ground support equipment.

**E X P**  
A E R O S P A C E  
**E R T**  
**I S E**



1986

1992

2005

2014

2016

1970

1988

1997

2007

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## FLYING HIGHER AND HIGHER. WITH TOOL SOLUTIONS FROM STAHLWILLE.

### 1970

Building on the excellent success of such tools as the STAHLWILLE high-performance ratchet 435 and many other tools in aviation, the tool specialist from Wuppertal starts producing tools under the name STAHLWILLE AERO. Even in those days, key issues with tools were compact dimensions and low weight.

### 1986

STAHLWILLE begins developing and manufacturing tools based specifically on the strict standards applicable to the aerospace industry. Amongst other things, STAHLWILLE launches HPQ® tools (High Performance Quality) and the AS Drive (Anti-Slip drive). Both series rapidly become best-sellers – in particular in connection with jet engine disassembly jobs.

### 1988

The growing significance of the aerospace segment is reflected in the company's marketing strategy: STAHLWILLE publishes its first brochure dedicated exclusively to products for the aerospace industry.

### 1992

STAHLWILLE wins its first international order to equip an important European enterprise specialising in the maintenance, repair and overhaul (MRO) of large airliners. In the United Kingdom, BAE Systems (British Aerospace) becomes the first manufacturer to roll out the brand new Tool Control System for maintenance on BAE aeroplanes.

### 1997

An increasing number of leading airlines in Europe place their confidence in STAHLWILLE's tool solutions for MRO work on their aircraft and when equipping their hangars. At the Paris air show in 1997, STAHLWILLE's Tool Control System wins the »Innovation Award«.

### 2005

In 2005, a South American airline switched over to STAHLWILLE tools, while innovative new products like the digital transducer, Tool Box 13216, the TORKMASTER software and 7707W testers soon became standard equipment in the aerospace industry. As early as 2004, STAHLWILLE redefined standards yet again by launching the electronic SENSOTORK® 713R tightening angle torque wrench with a powerful logging function for aviation.

### 2007

The electromechanical torque wrench, MANOSKOP® 730D, launched as a world first in 2007, is used in aviation for the first time. In 2011, STAHLWILLE launches its perfectControl series, motorised, semi-automated calibrating units – and soon afterwards takes home the iF Design Award in the industrial design category.

### 2014

STAHLWILLE's mobile Tool Trolley 13217 is available with specially selected sets of tools to ensure efficient, fast, reliable MRO in the aerospace industry. A year before this, one of the most influential airlines in the Middle East opted to equip its new, state-of-the-art hangar exclusively with tools, tool storage systems and tool transport solutions from STAHLWILLE.

### 2016

In 2016, STAHLWILLE introduces the SENSOTORK® 701: an electronic torque wrench for working in confined spaces. The torque range of 1-20 N·m covers many of the critical bolted joints found in aircraft construction.

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## FLYING HIGHER AND HIGHER. WITH TOOL SOLUTIONS FROM STAHLWILLE.

**For over 30 years, STAHLWILLE has been recognised as being a leading partner of the aerospace industry. All over the world, customers involved in the production and maintenance of aeroplanes and helicopters rely on the solutions and expertise provided by this company – for good reason.**

In recent decades, STAHLWILLE has earned itself a reputation as a capable, innovative and reliable advisor and supplier of premium tool solutions that are »Made in Germany« due to its unrivalled focus on its customers' specific needs. The result is, STAHLWILLE products are to be found all over the world – whether in the production environments of aircraft and turbine manufacturers, in the hangars used by the airlines or with specialised maintenance and repair businesses. There is hardly an aircraft builder or airline in the world that gets by without STAHLWILLE tools.

One key reason for this is that tool solutions from STAHLWILLE provide such close tolerances that they even comply with the extreme quality standards of space travel. These tools are highly resilient and renowned for their extremely long service lifetimes. Last but not least, these solutions support the aerospace industry, which is under constant pressure to reduce costs, in its efforts to blend maximum efficiency with uncompromising safety. This is achieved through solutions that match the needs of the market and meet special requirements in terms of weight, accuracy, logging and safety – foreign object damage is just one aspect.

The best remedy for aircraft on ground (AOG): quality, efficiency and safety. With STAHLWILLE.



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**Quality: more than just a word.**  
Technology in demand worldwide:  
engineered and produced in  
Germany.

## SAFETY DOESN'T JUST HAPPEN. IT IS SUPPLIED BY STAHLWILLE.

The aerospace industry's top priority is the greatest achievable safety. All other issues are subordinate to that. Stringent standards, such as those issued by ICAO (International Civil Aviation Organization) and EASA (European Aviation Safety Agency), ensure that safety is, in effect, »built in« throughout the development and maintenance processes. When it comes to compliance with these standards, it is the quality and process capability of the tools that play a decisive role.

»Made in Germany« is a commitment at STAHLWILLE that is part of our everyday work ethic - in particular with regard to aerospace. Here, more than in many other sectors of industry, peak quality is a decisive criterion for success and safety.

Manually operated STAHLWILLE tightening tools for avionics have been specifically developed and optimised for the highly individual requirements of each application. This applies as much to materials and service lifetimes as to ergonomic design and safety. By making full use of high tensile strength, cadmium-free HPQ® materials (High Performance Quality) and ensuring production in our own precision forging shops, STAHLWILLE can guarantee extremely good durability and effectively prevent corrosion when work involves titanium alloys. The double-T profile used for the open-jaw and ring spanners reduces weight - which is ideal for work »on board«. Torque wrenches ensure that correct torques are applied and processes accelerated, while electronic torque wrenches enable individual fasteners and even complete work sequences to be programmed and the details of every single torquing operation to be logged electronically. STAHLWILLE tool storage systems made of plastic that are approved for use inside aeroplanes are both robust and light.

STAHLWILLE. Tool solutions designed for aerospace.



### Accuracy

Extremely close tolerances coupled with peak load-bearing capacity and extremely thin walls, as guaranteed by the High Performance Quality alloys (HPQ®), outstandingly accurate torque technology in conjunction with compact, smooth-action fine-tooth ratchets for accurate work in confined spaces: these all combine to make STAHLWILLE.



### Safety

STAHLWILLE protects against foreign object damage through its screwless construction, Tool Control System and QuickRelease - the only locking system available that securely locks every part from the drive, extension and universal joint through to the socket without forfeiting valuable space.



### Durability

Tools by STAHLWILLE are simply more durable. Only STAHLWILLE offers robust torque wrenches for day-to-day use that have a virtually wear-free trigger mechanism involving a flexible rod rather than a compression spring, or spanners with the extremely rigid double-T profile.

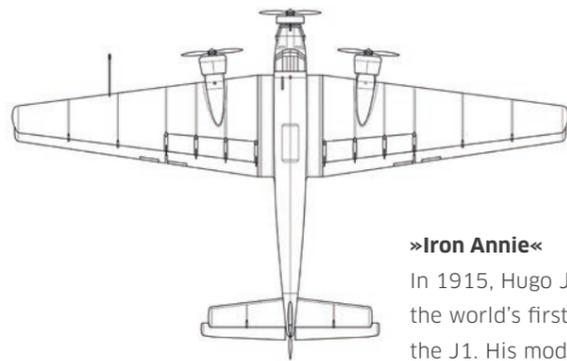


**STAHLWILLE tool solutions:** There is hardly an aircraft manufacturer that gets by without them, and hardly a maintenance and repair company that wants to. Wherever they are in the world.

»WE VERY CAREFULLY NURTURE THE CONFIDENCE OUR CUSTOMERS PLACE IN US.«

Aerospace is a key business segment for STAHLWILLE. In this field, STAHLWILLE, as a specialist for handtools, has repeatedly demonstrated that it is a pace-setter not only in terms of application-relevant technology but also when it comes to redefining advisory services.

Why is aerospace so particularly crucial to STAHLWILLE? Why is STAHLWILLE so important and special to the aerospace industry? Winfried Czilwa, Chief Executive Officer, answers these and many other questions in an interview, against a classic and historic backdrop. We met at the home base of one of the last remaining eight airworthy Junkers 52, at the Hugo Junkers hangar at Mönchengladbach aerodrome. In keeping with the venue, Winfried Czilwa arrived by plane – as an amateur pilot, he flew in in time for the interview in a Robin DR400.



»Iron Annie«

In 1915, Hugo Junkers developed the world's first all-metal aeroplane – the J1. His model Ju 52 was later to become the most successful commercial aeroplane of its time, and was commissioned by twelve airlines worldwide.



**One of the most famous aeroplanes ever built:** the Junkers was Lufthansa's standard aeroplane from 1932 on. The one shown in Hugo Junkers' hangar was built in 1949.



**Mr Czilwa, as we speak we are within view of the famous »Iron Annie«.**

**What does an amateur pilot think when he sees a plane like that?**

Probably the same as any professional pilot does. We have the greatest respect for the skills of the engineers that made flying possible. One also becomes aware of the speed at which things have developed since then. Today, anyone can just hop on board a 'plane and fly to the other side of the world non-stop – and with a safe feeling.

**Why with a safe feeling?**

Because flying is the safest form of travel. A report by the Allianz insurance company in 2014 found that, in the 1960s, for every 100 million passengers on flights, 133 died when their 'planes crashed. Today the ratio is 2:100 million. There are more likely to be fatalities in lightning strikes than in aircraft accidents in Europe and the USA. We at STAHLWILLE make a decisive contribution to that safety.

**In detail, what contribution does STAHLWILLE make?**

Through our tools and tool storage systems we support the aircraft industry in its efforts to work safely and efficiently. Wherever possible, we help to preclude human error. One key issue is foreign object damage, known as FOD. It is absolutely essential to prevent small components being left behind in turbines, for example, during production and maintenance jobs. A second large area of activity is in torque technology, because logging results is becoming increasingly important in aerospace. Thirdly, our tool solutions support work processes and help to make them more efficient. This is a decisive aspect of the success of our aerospace manufacturing and airline customers because of the immense pressure on them to cut costs.

**Let's stay with torque technology.**

**How exactly does that fit in?**

For safety reasons, it is necessary to tighten many bolted joints –

for example, in the cabin or in the immediate vicinity of the turbines – to a predefined torque. This is the case when attaching hydraulic leads

**» AT STAHLWILLE, WE PLACE GREAT STORE BY PROVIDING CUSTOMERS WITH THE IDEAL SOLUTION FOR THEIR APPLICATION. «**

or auxiliary modules such as oil pressure pumps and hot-air leads in accordance with specifications. This involves many different types of joints and fasteners. For manually tightened bolted joints – with frequent tool changes, all in confined spaces and without the loss of a single tool –

we can provide exactly the right solutions for these requirements, like our SENSOTORK® 701, a compact, electronic torque wrench with a fine-tooth ratchet.

**On the subject of »electronics«: does this mean that high-tech developments are indispensable in aircraft construction and maintenance?**

We have to differentiate here: just because something is technically possible, doesn't mean it's the best choice. At STAHLWILLE, we place great store by providing customers with the ideal solution for their application, not selling them the most expensive.

**Can you explain that to me?**

Electronic torque wrenches are, without doubt, worthwhile high-tech products but the issue of legal certainty is a key factor. Once an aircraft type has been granted type certification, a legally binding maintenance manual defines every

step, every bolted joint and every torque. Compliance with these prescribed procedures has to be logged in an understandable form. With STAHLWILLE electronic torque wrenches this is child's play. High-tech solutions to prevent tool loss are a different matter.

**Solutions that prevent FOD?**

Exactly. We have, of course, reserved radio frequencies for RFID technology. However, our experience shows that this technology for monitoring tools only results in increased safety in very few applications, compared with the relatively simple TCS tool control system. Cost effectiveness, customer benefit and dependability are factors that often mean that a simple solution is more advantageous. Since we explain issues such as this frankly to our customers, rather than just trying to sell them a solution that does not really benefit them, they have confidence in us. We very carefully nurture the confidence our customers place in us.

**You mentioned technical advice. Is this something special?**

Every company claims to provide "consulting" services. At STAHLWILLE, we have decades of hands-on experience in the trades and industry, and that's what counts, when it comes to giving advice. Our application engineers have knowledge of the work processes and are available worldwide. They support customers on-site while a new hangar is being configured – for example, by compiling complete sets of tools for aircraft MRO and then coordinating the deliveries. A further crucial point is that they bring home stimuli from their work in the field that frequently form the basis for innovative tool solutions – and the market shows its appreciation. Our close contact with customers and end users is a feature of STAHLWILLE that mutually benefits us all.



Made in  
Germany

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## ONE HANGAR. 250,000 TOOLS. THE FULL RANGE, SUPPLIED BY STAHLWILLE.

**STAHLWILLE has demonstrated time and again its capability in delivering on even the most complex projects. The company has recently supplied fully configured, customer-specific tool kits and tool storage solutions for the new hangar built by a leading international airline in the Middle East.**

The hangar houses up to 13 Airbus and Boeing aeroplanes and 1000 aircraft maintenance staff who were all to be equipped with tools by STAHLWILLE. Orders like that require special advisory abilities and understanding of market needs. STAHLWILLE application engineers noticed that the airline's requirements lists were less than ideal for the tasks. So they spent 1200 working hours on technical reviews and gap analyses to determine the actual requirements and compile tool kits better suited to the job.

The airline selected various storage solutions equipped with FOD-preventive TCS tool inlays and a label with the name and ID number of each tool kit. Every single one of the 250,000 tools was identified with a laser engraving, so it could be assigned to a particular tool kit and a specific employee. And all of this completed within a challenging time schedule - which is something one can expect from a supplier like STAHLWILLE.



### Mobile and imperial

Ideally prepared for standard maintenance tasks: Tool Trolley 13242a with 109 imperial tools. Compact dimensions, a weight of only 14 kilograms and sturdy castors make this an ideal assistant in field applications.



### The perfect compilation

The red Tool Box made of sheet steel, fitted with two, three or four fully extendible drawers and a compartment under the lid, offers space and protection for around 120 tools. These can be individually configured but there are two standard sets available for aeroplane and helicopter maintenance.

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## FIVE INTO ONE DOES GO. FEWER TOOLS. MORE SECURITY.

**When changing wheels, it is important to work quickly and safely. For a major carrier in the USA, STAHLWILLE developed a special torque wrench for service work on Boeing 737s. That tool does all the work that, previously, it was necessary to have five different torque wrenches for.**

With over 830 aeroplanes, this STAHLWILLE customer conveys around 160 million passengers to their destinations every year. The airline's fleet contains more than 150 Boeing 737s.

To facilitate efficient wheel changes and simplify service work on the undercarriages of these aircraft, STAHLWILLE developed a bespoke torque wrench based on the MANOSKOP® 730N but with a broad torque range. Where the airline used to use five torque wrenches with permanent torques, they now only need this one.

A new setting mechanism prevents errors during operation: the scale only shows the five torques actually required. Instead of stepless adjustment of the torque with intermediate values, one turn of the setting knob through 360° automatically moves up or down to the next target torque - depending on which direction the knob is turned in.

The result speaks for itself: more than 240 of this new torque wrench type are in daily use with that airline. Very soon, other airlines will also be able to take advantage of this innovative design.



### MANOSKOP® 730N

The tool on which the development was based. This versatile mechanical MANOSKOP® 730N torque wrench features accurate yet very fast QuickSelect setting.

In contrast to conventional mechanical torque wrenches, STAHLWILLE torque wrenches are equipped with a trigger system that employs a triggering cam. The advantage of this is the virtually wear-free trigger mechanism that also saves time, because there is no need to reset to »0«.



**Changing wheels and servicing undercarriages are always a challenge:** STAHLWILLE is currently working on providing new special-purpose tools - for many different types of aeroplane.




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## THERE IS NO TURBINE WITHOUT FASTENERS. CONNECTIONS FOR EXTREME REQUIREMENTS.

Even if state-of-the-art gas turbines are featuring increasing amounts of carbon-reinforced materials and lightweight titanium alloys, threaded fasteners are still the most important fastening technology in aircraft turbines, and this is not likely to change. It is only this technique that will withstand the tremendous operating loads while remaining "unboltable" for regular maintenance, repair and overhaul.

Inside gas turbine engines, there are many different types of threaded fasteners. Depending on where the fastener is, it will have to cope with temperatures of up to 1800 °C and withstand extreme vibrations and windspeeds.

STAHLWILLE has all the handtools needed for turbine MRO - extremely resilient to loads, manufactured to the closest tolerances. They still offer much improved service lifetimes even if the fasteners are caked in place due to the extreme heat as if they had been welded in, necessitating considerable release torques.

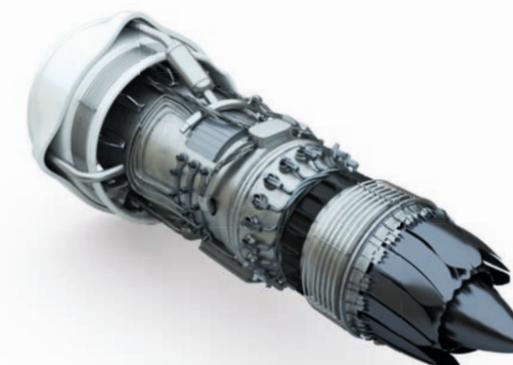
After maintenance has been completed, STAHLWILLE tools are part of the established routine in reassembly. The fine-tooth ratchets enable accurate working in confined spaces and electronic torque wrenches, like the SENSOTORK® 701, also provide a logging function. Maximum protection against lost or forgotten tools is guaranteed by the TCS tool control system.




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### Extremely hard-wearing

STAHLWILLE spline-drive tools transmit the forces applied in the best possible way and reduce the risk of injury and damage to the fastener head.



### 40,000 rpm

State-of-the-art gas turbines run at up to 40,000 revolutions per minute. Any bolted joint here is subjected to the toughest loads.

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## TAKE OFF. LAND. TAKE OFF. SAFELY, EVERY FLIGHT.

Understandably, aeroplanes tend to spend most of the time in the air. But during take-off, landing and manoeuvring between the taxiway and runway, the undercarriage and tyres are affected by powerful forces. STAHLWILLE tool solutions play a key part in the corresponding maintenance work.

Checking tyres and undercarriage after every flight is mandatory in aviation. When wheels have to be changed, numerous bolted joints have to be unscrewed and, later, retightened to specified torques. Frequently, there is little room for movement here, just as in turbine maintenance. Precision fine-tooth ratchets by STAHLWILLE and torque wrenches with a broad torque range assist maintenance staff to deliver first-class work every time.



### Fine mechanisms

With a torque range from 2 - 1000 N·m, accurate one-hand setting and a noticeable dual stop signal when the tool triggers, the MANOSKOP® 730N mechanical torque wrench is the preferred standard for undercarriage work.

### Extreme loadings

With passenger planes, a scheduled wheel change is due after around 250 flights. If damage is detected during inspection, it may well be earlier. The key point is that the aircraft is back in service with the minimum possible downtime.





## AN EXCEPTIONAL INDUSTRY. EXCEPTIONAL TOOLS.

**STAHLWILLE is well established in aerospace and has understanding and knowledge of all the standards applicable and the areas that require bespoke solutions. Even the company's standard tool kits cover a good 80 per cent of all applications in aircraft MRO. For the remaining 20 per cent through to complete, customer-specific sets of tools, STAHLWILLE application engineers will quickly find the ideal solution.**

For every requirement there is an ideal tool. One that will make the user's life that little bit easier – and not more complicated. Finding the optimum tools for a customer in the impressive full range of STAHLWILLE tools and compiling them into individual sets of tools is the task of our application engineers. This includes special-purpose solutions: for example, STAHLWILLE developed spline-drive tools from a special steel alloy used for turbine fasteners – their service lifetimes exceed those of other tools many times over.

The tool inlays and the Tool Control System were designed to meet the stringent safety requirements of the aerospace industry. In comparison with highly complex storage and monitoring systems using RFID or cameras to log every tool removal, our systems stand out because of their simplicity, reliability and low costs. Thanks to the sculpted tool recesses in signal colours, the user can see immediately if a tool is missing. This keeps the attention of the worker and does not delegate responsibility to a highly susceptible, complex, computer-based solution. Last but not least, STAHLWILLE's QuickRelease safety locking system offers the only system on the market that securely protects extensions, universal joints and sockets against loss right through to the bolting point.



### FOD compliant

The drawers in the STAHLWILLE TTS 95 and TTS 95VA Tool Trolleys are available as a roller-mounted option instead of being in ball-bearing mounted pull-out rails. Yet another added-value feature for FOD prevention.



### Safety at a glance

Tool inlays with the TCS tool control system feature sculpted cut-outs in a signal colour: the worker can see immediately if a tool is missing.

## SCREWLESS. ACCURATE. EFFICIENT. FINE-TOOTH RATCHETS.

Fine-tooth ratchets by STAHLWILLE work as reliably as a Swiss watch and are still as sturdy as their daily work schedule requires. Thanks to the very small ratchet angle, they enable bolt tightening even in very confined spaces. The screwless construction and QuickRelease system make them the preferred choice for service work in the aerospace industry.

Thanks to their 80 teeth, compact fine-tooth ratchets by STAHLWILLE have a ratchet angle of only 4.5°. Tightening a fastener only needs a very small amount of lateral movement. This makes STAHLWILLE fine-tooth ratchets ideal for work on turbines and similar assemblies, particularly as both the ratchet and the handle are screwless and compliant with FOD requirements.

When it comes to load-bearing capacity, STAHLWILLE fine-tooth ratchets exceed even the requirements of ISO standards. The specially constructed mechanism on the inside - with heavy-duty Spirolox® rings to absorb the axial forces from the rotary drive - is enclosed in a dust-excluding housing and allows the user to benefit from smooth action, even when applying high torques.

With sizes of 1/4", 3/8" and 1/2", all the most popular drives are immediately available with reversible clockwise and anticlockwise operation - as well as a comprehensive range of shell tools. In addition, thanks to the tightest manufacturing tolerances, STAHLWILLE achieves extremely good fitting accuracy between the square drive and the insert tool, which reduces deviations to an absolute minimum. In addition, the QuickRelease system ensures rapid tool changes and guarantees at the same time that no shell tool can be inadvertently released and lost during MRO operations.



### QuickRelease

QuickRelease is the only system worldwide that secures every shell tool from the drive through to the bolting point in a way that is absolutely safe. So tools cannot become detached and go missing, even when working with extensions.



### 80 teeth

Thanks to the large number of teeth, STAHLWILLE fine-tooth ratchets have a tight ratchet angle of only 4.5°. As a result, they enable bolt tightening in even the most confined spaces, in comparison with conventional fine-tooth ratchets.



### FOD compliant

STAHLWILLE fine-tooth ratchets for aerospace are constructed without any screws. The handle and lever arm are a single unit. The "vital organs" of the tool are securely encapsulated and no small components can get lost during work.



415SG-QR N 1/4"

435SG-QR N 3/8"

512SG-QR N 1/2"

### Product family

STAHLWILLE, as the first and only manufacturer to do so, offers a family of fine-tooth ratchets with 80 teeth and steel handles. All the drives - 1/4", 3/8" and 1/2" - generate an extremely small ratchet angle of only 4.5°.



## STAHLWILLE TORQUE SOLUTIONS. AS DIVERSE AS YOUR FIELDS OF APPLICATION.

STAHLWILLE is recognised worldwide as the specialist in the field of manually operated torque tools for the aerospace industry. The company has appropriate, efficient solutions available for every conceivable application.

The production and maintenance of aeroplanes and helicopters hardly provides opportunities for automation. There are simply too many different fastener types, too large a range of torques to be applied, and the workflows are too complex. This makes it all the more important to have manually operated torque tools that enable our customers to work quickly, efficiently and, in particular, safely. Manual torque tools bearing the name STAHLWILLE cover the full range of bolted joints in the aerospace industry at unrivalled standards of quality. Ergonomically designed, accurate measurement and reliable clicking.

Whether it is the classic tool, the purely mechanical torque wrench, or torque wrenches with the electromechanical trigger mechanism that is unique in the market, through to special-purpose solutions that guarantee peak accuracy in confined spaces, or programmable models with a logging function that will guide the user through even the most complicated joints and entire work sequences, STAHLWILLE has the answer. We also have the necessary measuring equipment. STAHLWILLE is the only German manufacturer of torque wrenches that also offers torque testers and calibrating units. All available from a single source – even for testing and calibrating in compliance with the new DIN ISO EN 6789:2017.



### Logging function

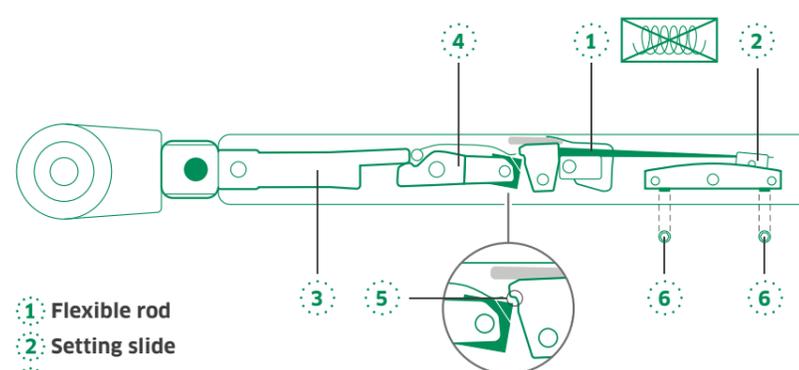
Electronic torque wrenches by STAHLWILLE are able to log every single torquing operation in detail. Managing maintenance lists consisting of many pages is now a thing of the past.

### Electromechanical triggering

As the only manufacturer, STAHLWILLE unites the advantages of two worlds in one tool: MANOSKOP® 730D and 714 measure digitally and click noticeably, just like a mechanical torque wrench.

### Intuitive

Electronic torque wrenches and tightening angle torque wrenches are equipped with an intuitive control system – providing maximum functionality and easy operation.



- 1 Flexible rod
- 2 Setting slide
- 3 Left-hand switching element
- 4 Right-hand switching element
- 5 Triggering cam
- 6 Adjusting screws

### Flexible rod instead of a compression spring

STAHLWILLE's unique trigger mechanism with the flexible rod does not require a compression spring, so resetting the wrench to »0« after each fastener to unload the spring is not necessary. The system is virtually wear-free.

## ABSOLUTELY ACCURATE. EVEN IN CONFINED SPACES. SENSOTORK® 701.

An increasing number of bolted connections in the aerospace industry have to be tightened to a specified torque - and frequently in restricted spaces. The SENSOTORK® 701 electronic torque wrench is extremely compact and tightens fasteners in low torque ranges reliably and safely, even in awkward working spaces.

SENSOTORK® 701 is compact, slim and lightweight. This fine-tooth ratchet for clockwise and anticlockwise tightening with 80 teeth requires only a tiny ratchet angle of 4.5° and thus enables accurate working even when space is at a premium. The torque range begins at 1 N·m and goes up to 20 N·m. This means that this tidy hand tool covers a multitude of critical bolted joints in aircraft construction - and boasts a display deviation value of only ± 4%.

The SENSOTORK® 701 is operated easily through the LC display using the intuitive single-button system. There are three operating modes available. In the track mode, the SENSOTORK® 701 shows the currently measured value. The peak hold mode indicates the highest measured value. In the user mode, additional functions can be configured in conjunction with the STAHLWILLE SENSOMASTER software, such as predefining evaluation functions for an individual joint.

The LEDs integrated in the SENSOTORK® 701 indicate to the user, with the aid of traffic-light colours, whether the tightening operation is within the tolerance, above the advance warning threshold or outside the tolerance altogether. In addition, calibrating intervals can be defined and comprehensive logs created.



### QuickRelease

The tried-and-tested QuickRelease system permits rapid, efficient tool changes while locking extensions and shell tools reliably in place - there is no way they can inadvertently become separated from the tool.



### 80 teeth

The fine-tooth ratchet in the SENSOTORK® 701 operates with absolute precision and provides a ratchet angle of only 4.5°. The internal mechanism offers a smoothness of operation that has created a new standard in the market.



### FOD compliant

The fine-tooth ratchet in the SENSOTORK® 701 is permanently installed and is a screwless construction, which prevents FOD. In addition, the QuickRelease system prevents hazardous loss of tools even when working in hard-to-reach places.



### One software package for all.

With its SENSOMASTER software package, STAHLWILLE has made a centralised PC tool available for reading out and configuring all electronic STAHLWILLE torque wrenches. The software automatically detects the tool and synchronises any fasteners and work sequences that have been generated on the PC.



## MORE SECURITY. MORE CONTROL. CHECK AND CALIBRATE WITH STAHLWILLE.

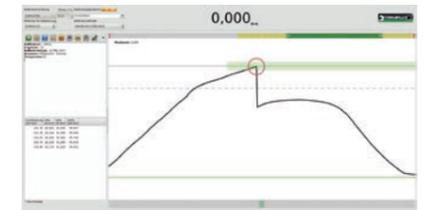
**STAHLWILLE is the only manufacturer in Germany that provides both the torque tools and the corresponding testing and calibrating technology from a single source – including innovative software solutions. For enhanced safety in production and maintenance.**

The SmartCheck torque tester, winner of the iF Design Award, is compact, can run on mains power or with batteries and is ideally suited for attaching to the wall or positioning on a workbench. Inside, it contains particularly accurate, robust measuring technology that informs the end user within a very short time whether or not the torque wrench is still within the specified tolerances, needs adjusting or whether there is a case of human error.

The 7707 W electronic torque wrench tester enables both rapid inspection of the tool and user training sessions on controlled tightening.

SmartCheck and 7707 W have one thing in common: they both guarantee peak process and audit reliability because checks within the compulsory testing intervals are a simple matter.

If calibration is scheduled, the manual and semiautomatic calibrating units in the perfectControl series ensure maximum efficiency. They too have been awarded the iF Design Award. When linked to the PC through a USB port, and in conjunction with STAHLWILLE's proprietary TORKMASTER software, these units allow very fast testing and calibration – now in compliance with the latest DIN EN ISO 6789:2017 standard. They can also be linked up to computer aided quality assurance (CAQ) systems.



### Everything at a glance: TORKMASTER

The parameter databases stored in the TORKMASTER software enable efficient testing and calibration in compliance with applicable standards, now including the DIN EN ISO 6789:2017. The system provides several testing methods, live view of the torque progression, tool history and management of inspection, measuring and test equipment. Calibration certificates are printed off straight from the software – or exported as a corresponding PDF file.



## UNCOMPROMISINGLY DURABLE. SPLINE-DRIVE.

When tightening fasteners with very high tensile strength ratings, as is often the case in the aerospace industry, high torques are frequently needed. Outstanding force transmission and maximum protection against slip-off are essential here. And this is where spline-drive tools by STAHLWILLE are indispensable.

With many fastener profiles, cam-out forces can occur when tightening and these can cause the tool to slip. This is not the case with spline-drive profiles which have twelve spline teeth angled at 60°. In comparison with hexagon or 12-point profiles, these profiles offer much improved contact with the fastener, which results in reduced surface pressure.

Spline-drive tools by STAHLWILLE do not merely conform with aerospace standard MS-33787 in every aspect, a particular quality feature of these tools is the extremely close manufacturing tolerances and long service lifetimes. This is, on the one hand, because STAHLWILLE spline-drive products are manufactured exclusively at our own precision forging shops in Germany and, on the other, because we use only extremely robust alloys and very accurate manufacturing processes.

This is how we make tools whose tight fit is a market-leader feature. For improved force transmission and greater efficiency and safety when working on aircraft components. They deliver excellent protection against conditional wear & tear and damage to costly fasteners. This commitment is incorporated in the name STAHLWILLE HPQ® (High Performance Quality). Worldwide.



### More durable

Special-purpose alloys and exceptional know-how in manufacturing give spline-drive spanners and sockets from STAHLWILLE service lifetimes that are unparalleled in the market.



### Light

STAHLWILLE spline-drive spanners with the double-T profile and STAHLWILLE sockets with their thin wall thicknesses reduce weight. This is an indispensable characteristic in aircraft maintenance - where every gram counts.



### Accuracy made in Germany

As with all STAHLWILLE tools, spline-drive tools are manufactured to the closest of tolerances and exclusively in Germany.

### A multitude of sockets

Besides combination spanners for spline-drive profiles, STAHLWILLE's range includes what is possibly the most comprehensive and diverse in terms of spline-drive sockets. In HPQ® quality and constructed as part of the QuickRelease system, they guarantee excellent work results and the highest standard of FOD safety.



## GIVING SAFETY THAT EXTRA TWIST. STAHLWILLE WIRE TWISTING PLIERS.

**Aeroplanes and helicopters are subject to powerful vibrations and widely varying temperatures and pressures. Even if fasteners are correctly tightened to specifications these influences may still cause fasteners to work loose. For this reason, some joints are required to have a positively locking safety mechanism. This is an ideal application for the STAHLWILLE wire-twisting pliers.**

One of the most commonly used retaining systems in the maintenance of aeroplanes and helicopters is the thread locking device: one such example consists of a safety wire that is threaded through holes drilled in the fastener heads, passed through a fixed anchor point and then twisted using the wire-twisting pliers. This system has proved its worth in work on aircraft engines and cowlings.

The wire-twisting pliers made by STAHLWILLE are a further contribution to eliminating FOD. They are made exclusively of metal components. Their accurately machined, induction-hardened cutters will not fracture even if the tool falls to the floor inadvertently. The handles are arrested by a durable leaf spring rather than a highly susceptible coil spring.

Add excellent ergonomic design: these pliers enable fast, efficient, safe working because they are made with a thicker-gauge shank than competing products and can be gripped more securely. The jaws grip the wire reliably without damaging it. The tool simplifies threading the wire, the rotary action can be reversed and locked and creates a twist in a single action that will not work loose of its own accord.



### Made in Germany

Wire-twisting pliers by STAHLWILLE are the only ones on the market not manufactured in the Far East and stand out because of their uncompromising workmanship, efficient operation and outstanding quality.

### Efficient

The head of the pliers is equipped with a special grip pattern that prevents the wire being bent and thus facilitates fast threading. After the wire ends have been twisted, the wire-twisting pliers automatically crimp them.

### FOD compliant

End pieces and cut-offs from the safety wire can no longer go missing. Additional safety is provided by the hardened cutting edges, impact resistant leaf spring and a complete lack of plastic components.



L 230



L 280

### Simply effective: safety wire

Two fasteners are linked together with a wire, which is then twisted. STAHLWILLE wire-twisting pliers make this an easy, effortless task – and a completely safe one. These pliers are available in two different lengths.



## BECAUSE EVERY MINUTE COUNTS. TOOL TROLLEY 13217.

Every minute an aircraft spends on the ground in unscheduled stops costs money. To ensure work can be carried out as efficiently and quickly as possible and AOG times are kept to a minimum, mobile tool storage solutions that are approved for work on-board, such as STAHLWILLE Tool Trolley 13217, are in high demand.

The STAHLWILLE Tool Trolley 13217 is the ideal companion for aircraft mechanics. With this solution, the tool they need is immediately accessible, whether in the hangar, on the tarmac or in the cabin. Even comprehensive tool-kits that cater for almost all service tasks can be easily moved from A to B - and where necessary, into the cabin - thanks to a pair of load-resilient castors, extendible handle and compact outer dimensions. The optional finish with a high-visibility reflecting surface also guarantees best possible staff safety when working in dark surroundings. The version with four swivelling castors provides even greater mobile convenience. This version ensures upright, topple-free transport and has parking brakes.

The robust plastic housing, outer dimensions 585 x 457 x 381 mm, has room for up to eight drawers, each of which can be removed individually and, thanks to the transparent lid and handle, can be used separately as a closed case. Besides the universal set of tools consisting of 104 items, there are sets of tools compiled specifically for the aerospace industry. All the tool-kits are placed in close-fitting TCS tool inlays - for maximum protection against tool loss.



### Sophisticated

Concealed under the lid are a removable tray with handles and two transparent drawer covers.

### Versatile

Easily removable drawers with endstops and three different drawer heights. Drawers can be inserted in any order.

### Ingress protection to IP67

Also available as a dust and waterproof IP67 version - with additional seals, closures and a pressure equalizing valve.



Every tool has its clearly defined space. At a glance, you can see where each tool belongs, saving you time and, as a result, money.



The push-out recesses facilitate tool removal and promote faster, more efficient working.



Conveniently mobile - each of the drawers can be turned into a mobile carry-box by attaching one of the transparent lids.



## STAHLWILLE TOOL SOLUTIONS. THE ONE-STOP SHOP FOR AVIATION.

**STAHLWILLE undertakes to meet every tool requirement in the shortest possible time, provides proactive support in planning investments and even supplies the corresponding testing and calibrating technology. One name ... one source. Wherever you are in the world.**

STAHLWILLE offers one of the broadest, best equipped ranges of tools for aviation in the entire market. In order to meet these high self-imposed quality demands, this tool and torque technology specialist develops and produces exclusively in Germany and on the basis of the standards applicable to the aerospace industry.

In a continual process of analysis and optimisation, our experienced application engineers, together with our customers, tailor FOD-safe solutions to meet new challenges. They will compile bespoke tool-kits, tool storage systems and tool transport solutions and, if necessary, will coordinate development of special-purpose solutions.

If customers require calibration technology and testing technology for torque tools, STAHLWILLE can meet those requirements with freely mountable torque testers and even semiautomatic calibrating units.

STAHLWILLE customers can rely on peak quality: STAHLWILLE is certified to DIN EN ISO 9001 and accredited by the German authoritative body DAkkS to DIN EN ISO/IEC 17025:2005. Single-sourcing for tools in aerospace can mean only one thing: STAHLWILLE.



### Standards compliant

STAHLWILLE products for aviation are created on the basis of standards such as E DIN EN 3709, E DIN EN 3710, SAE AS 954-E, MS-33787, SBAC, TS 48 AS 40605/40606, MIL-W-8982, ASME B 107.5M and RR JDS 1200.01.



### Broad range of products

With over 4000 products - metric, imperial and for all popular profiles up to and including spline profiles - this expert supplier has one of the most comprehensive and best quality ranges on the market.



### One name ... one source

From tool-kits and storage or transport systems through to torque tools and corresponding testing and calibrating technology: no manufacturer of torque tools offers a comparable range of know-how.




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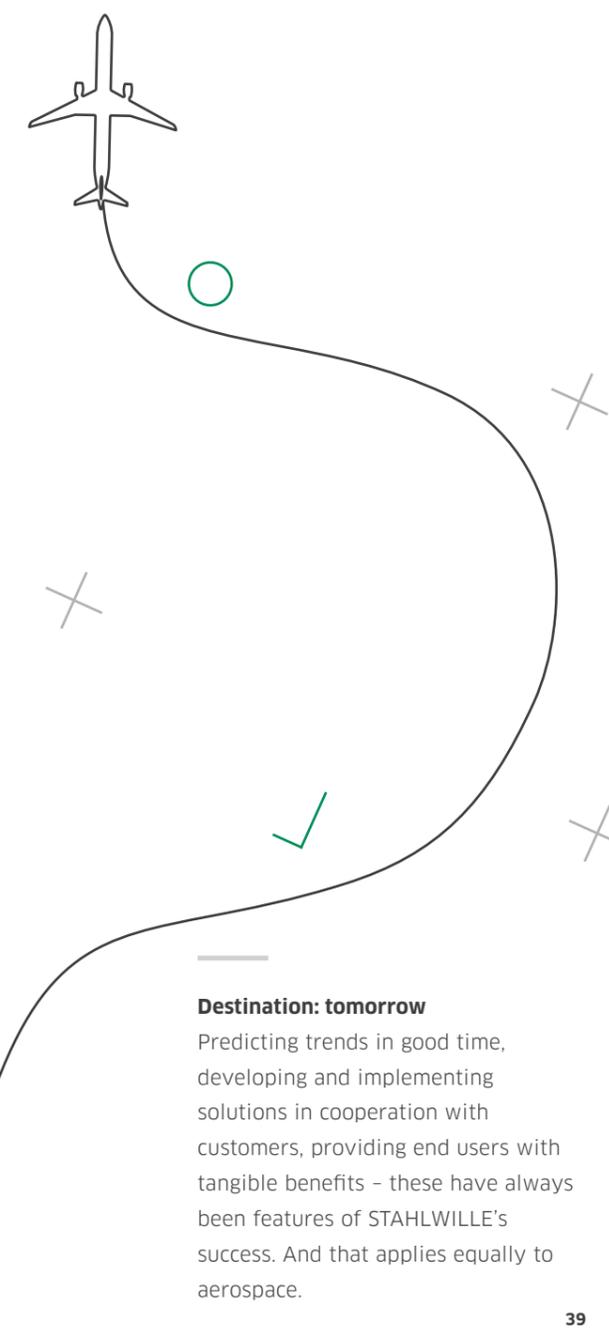
## PREPARING THE JOURNEY'S DESTINATION. STHLWILLE LOOKS INTO THE FUTURE.

**Development cycles for passenger 'planes are long and, once in service, they are often in use for decades, which makes it that much more important to plan ahead. Today, STHLWILLE is already working on staying the best partner of aeroplane manufacturers and maintenance and repair businesses tomorrow.**

The production and maintenance of aeroplanes are subject to almost the same upheavals as other industries. In all likelihood, automation and the application of automated fastener-tightening machines in aircraft construction shops will one day be standard. However, in maintenance, repair and overhaul, craftsmanship will continue to play a crucial role. Solving problems and conducting individual repairs will remain firmly in the human domain.

Nevertheless, computerisation is moving forward in the aerospace industry: the requirement to log results is already considerable. The demands on torque technology with a logging function are already high and are increasing. Interlinking tools and components - as envisaged under »Industry 4.0« - is a further demanding trend that is expected to become established in aerospace in the medium term.

STHLWILLE is fully at home in these fields - and is ready to provide answers to the questions that will arise. These may concern electronic torque wrenches with a logging function that are integrated in networked production and the user's maintenance sequences by radio contact. This is just one example that shows that, at STHLWILLE, the future has already begun.




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### Destination: tomorrow

Predicting trends in good time, developing and implementing solutions in cooperation with customers, providing end users with tangible benefits - these have always been features of STHLWILLE's success. And that applies equally to aerospace.

An aerial, top-down view of the cockpit of a white aircraft, showing the instrument panels, control yokes, and the canopy. The aircraft is on a tarmac or in a hangar, with some ground equipment visible in the background.

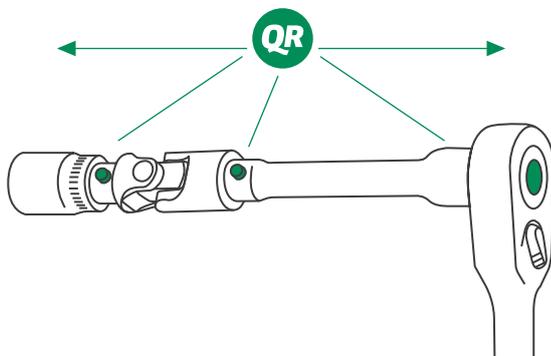
# HIGH AEROSPACE LIGHTS

# QUICKRELEASE

## SECURELY ATTACHED. QUICKLY RELEASED.

In many fields of work, foreign object damage (FOD) can be a real safety hazard - like in aviation. One highly effective method for combating FOD goes by the name of QuickRelease. This locking system, developed and patented by STAHLWILLE, prevents the loss of sockets even in awkward bolting points or in long tapped holes. While other locking systems available on the market only lock the first insert tool to the ratchet, QuickRelease secures every single component in the tool chain - from the ratchet and

extension through to the socket - without forfeiting valuable space. QuickRelease will not relinquish its grip on the tools connected until the user presses the corresponding button on the ratchet, extension or universal joint. The easily accessible, ergonomically optimised mechanism contributes, at the same time, to increased efficiency - thanks to this system, tool changes are not only safer but also faster. In conjunction with torque wrenches, QuickRelease also secures the insert tools while enabling rapid tool changes.



### SAFE

The system will not relinquish its grip on the tools connected until the user presses the QuickRelease button on the individual tool.

### THE KEY ADVANTAGES

- Greater safety in bolted joints where FOD is a serious risk, such as in aerospace.
- The only system that features a uniform locking mechanism for all the tool components through to the bolting point.
- Simple, intuitive handling and reliable operation.
- Insert tools engage firmly and cannot be removed until the release button is pressed.
- Fast, efficient tool changes become a simple matter - without compromising safety in FOD-sensitive areas.

### QuickRelease tools

Code	No	Size	Description		
11 11 10 20	415QR N	1/4"	<b>QuickRelease fine-tooth ratchet</b> , 80 teeth	F&D	
11 11 00 20	415QR	1/4"	<b>QuickRelease ratchet</b> , 22 teeth		
11 11 10 30	415SG-QR N	1/4"	<b>QuickRelease fine-tooth ratchet</b> , steel handle, 80 teeth	F&D	
11 11 00 30	415SG-QR	1/4"	<b>QuickRelease ratchet</b> , steel handle, 22 teeth		
11 11 10 40	415QRL N	1/4"	<b>QuickRelease fine-tooth ratchet</b> , long, 80 teeth	F&D	
11 11 01 53	415QRL	1/4"	<b>QuickRelease ratchet</b> , long, 22 teeth		
11 05 10 10	400QR	1/4"	<b>QuickRelease Drive Handle</b>		
11 07 10 00	404QR	1/4"	<b>QuickRelease Sliding T-Handle</b>		
11 01 10 01	405QR	1/4"	<b>QuickRelease extension</b> , 54 mm		
11 01 10 06			<b>QuickRelease extension</b> , 102 mm		
11 01 10 02			<b>QuickRelease extension</b> , 150 mm		
11 01 10 13			<b>QuickRelease extension</b> , 330 mm		
11 01 10 05			<b>QuickRelease extension</b> , 356 mm		
11 02 10 00	407QR	1/4"	<b>QuickRelease universal joint</b>		
12 11 10 20	435QR N	3/8"	<b>QuickRelease fine-tooth ratchet</b> , 80 teeth	F&D	
12 11 00 20	435QR	3/8"	<b>QuickRelease ratchet</b> , 30 teeth		
12 11 10 30	435SG-QR N	3/8"	<b>QuickRelease fine-tooth ratchet</b> , steel handle, 80 teeth	F&D	
12 11 00 30	435SG-QR	3/8"	<b>QuickRelease ratchet</b> , steel handle, 30 teeth		
12 07 10 00	425QR	3/8"	<b>QuickRelease Sliding T-Handle</b>		
12 01 10 01	427QR	3/8"	<b>QuickRelease extension</b> , 76 mm		
12 01 10 02			<b>QuickRelease extension</b> , 160 mm		
12 01 10 03			<b>QuickRelease extension</b> , 240 mm		
12 02 10 00	428QR	3/8"	<b>QuickRelease universal joint</b>		
13 11 11 20	512QR N	1/2"	<b>QuickRelease fine-tooth ratchet</b> , 80 teeth	F&D	
13 11 00 30	512SG-QR	1/2"	<b>QuickRelease ratchet</b> , steel handle, 36 teeth		
13 11 10 30	512SG-QR N	1/2"	<b>QuickRelease fine-tooth ratchet</b> , steel handle, 80 teeth	F&D	
13 07 10 00	506QR	1/2"	<b>QuickRelease Sliding T-Handle</b>		
13 01 10 01	509QR	1/2"	<b>QuickRelease extension</b> , 52 mm		
13 01 10 04			<b>QuickRelease extension</b> , 75 mm		
13 01 10 02			<b>QuickRelease extension</b> , 130 mm		
13 01 10 03			<b>QuickRelease extension</b> , 255 mm		
13 02 10 00	510QR	1/2"	<b>QuickRelease universal joint</b>		

# SPLINE DRIVE TOOLS

## RESILIENT, EVEN WITH HIGH TORQUES.

In aviation environments, fasteners with spline profiles and high tensile strengths are often used, and these need tightening to high torques. If they then have to be loosened, during maintenance, repair and overhaul, for example, the torques required may be even higher – due to seizing or corrosion in operation.

Spline-drive tools by STAHLWILLE are specifically designed to withstand such high torques, transmit the force applied to where it is required and minimise the risk of injury to the user and damage to the screwhead and tool. Thanks to their twelve spline teeth and the 60° angle, they offer a greater area of contact with the tool. The pressure is spread evenly across the surface and cam-out forces that cause the tool to slip off the fastener head are made controllable.

Spline-drive tools by STAHLWILLE conform to aviation standards MS-33787 and MIL-W-8982. A particular quality feature of these tools is the extremely tight manufacturing tolerances in STAHLWILLE's precision forging processes. This is backed up by long service lives because STAHLWILLE uses special HPQ® (High Performance Quality) alloys in production. The result is tools with outstanding fit, improved force transmission and greater efficiency and safety when working on aircraft components. This is the ideal protection against wear & tear, damage to costly fasteners and expensive rework.



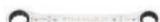
Spline-drive spanners and sockets



### THE KEY ADVANTAGES

- STAHLWILLE HPQ® spline-drive tools guarantee long service lives, even when used in conjunction with the highest forces for tightening and loosening fasteners.
- Extremely good force transmission due to closest machining tolerances and low surface pressure – thanks to the spline-drive profile, in conformity with aviation standards MS-33787 and MIL-W-8982.
- Reduced risk of the hand slipping off the handle so reduced risk of injury and damage to expensive fasteners.

## Spline drive tools

Code	No	Size	Spline size	Size	Description	
40 58 16 16	130aSP		8	1/4"	<b>Spline drive combination spanners</b>	
40 58 20 20			10	5/16"		
40 58 24 24			12	3/8"		
40 58 28 28			14	7/16"		
40 58 32 32			16	1/2"		
40 58 34 34			18	9/16"		
41 16 07 09	220aSP		7 x 9	7/32 x 9/32"	<b>Spline drive double-ended ring spanners</b>	
41 16 08 10			8 x 10	1/4 x 5/16"		
41 16 12 14			12 x 14	3/8 x 7/16"		
41 16 16 18			16 x 18	1/2 x 9/16"		
41 16 18 20			18 x 20	9/16 x 5/8"		
41 16 22 24			22 x 24	11/16 x 3/4"		
41 16 26 30			26 x 30	13/16 x 15/16"		
41 16 28 32			28 x 32	7/8 x 1"		
41 57 08 10	25aSP		8 x 10	1/4 x 5/16"	<b>Spline drive ratchet ring spanners</b>	
41 57 12 14			12 x 14	3/8 x 7/16"		
41 57 16 18			16 x 18	1/2 x 9/16"		
41 57 20 22			20 x 22	5/8 x 11/16"		
41 57 24 28			24 x 28	3/4 x 7/8"		
01 01 10 07	40aSP	1/4"	7	7/32"	<b>Spline drive sockets</b>	
01 01 10 08			8	1/4"		
01 01 10 09			9	9/32"		
01 01 10 10			10	5/16"		
01 01 10 12			12	3/8"		
01 01 10 14			14	7/16"		
01 02 10 07	40aLSP	1/4"	7	7/32"	<b>Spline drive sockets</b>	
01 02 10 08			8	1/4"		
01 02 10 10			10	5/16"		
01 54 20 16	402aSP	1/4"	8	1/4"	<b>UNIFLEX spline drive sockets</b>	
01 54 20 20			10	5/16"		
02 01 10 12	45aSP	3/8"	12	3/8"	<b>Spline drive sockets</b>	
02 01 10 14			14	7/16"		
02 01 10 16			16	1/2"		
22 41 00 28	45aPSP	3/8"	14	7/16"	<b>Spline drive socket, gunmetal finish</b>	
02 02 10 12	46aSP	3/8"	12	3/8"	<b>Spline drive sockets</b>	
02 02 10 14			14	7/16"		
02 48 00 14	447aSP	3/8"	7	7/32"	<b>Spline drive adapter, gunmetal finish</b>	
02 48 00 16			8	1/4"		
02 48 00 18			9	9/32"		
02 48 00 20			10	5/16"		
02 48 00 24			12	3/8"		
02 48 00 28			14	7/16"		
02 48 00 32			16	1/2"		
02 48 00 34			18	9/16"		
02 48 00 36			20	5/8"		
03 01 20 24			50aPSP	1/2"		
03 01 20 28	14	7/16"				
03 01 20 34	18	9/16"				
03 01 30 28	50aPLSP	1/2"	14	7/16"	<b>Spline drive socket, gunmetal finish</b>	

# SMARTCHECK

## THE TORQUE TESTER FOR ALL SITUATIONS.

Whether checking a torque wrench immediately before an assembly operation to ensure it is within the tolerances or subjecting the tool to a detailed inspection as part of an audit, STAHLWILLE's new SmartCheck torque tester provides a compact assistant that will fit on any workbench or wall. It can be fitted both horizontally and vertically, and can even be run on batteries if there is no power outlet available.

The display with its resilient, splash-proof foil keypad is rotatable and can be set to the user's angle of sight in seconds. In addition, since no additional transducers are required, it is possible to use the precision tester as soon as it has been set up. Operating the tester using the integrated display is an intuitive process.



### PRIZE-WINNING TECHNOLOGY

The SmartCheck was awarded the coveted iF Design Award in 2017 in the industrial products category for outstanding ergonomic design and its functional product design.



### THE KEY ADVANTAGES

- Flexible positioning, fast commissioning and intuitive operation.
- Housing made of impact-resistant plastic to protect the accurate, durable measuring mechanism. Display deviation of only  $\pm 1\%$ .
- Three operating modes: track, first peak and peak hold. Target torque and tolerances can be individually set.
- Available for four torque ranges: 1-10 N·m (also for torque screwdrivers), 10-100 N·m, 40-400 N·m, 80-800 N·m.



Experience the outstanding features of the SmartCheck torque tester in a video here:  
[www.stahlwille.de/videos/smartcheck](http://www.stahlwille.de/videos/smartcheck)

### SmartCheck

Code	No	N·m	ft·lb	in·lb	Ø "	Description
96 52 12 01*	SmartCheck 10S	1-10	0.74-7.4	8.9-88.5	1/4	<b>Torque Tester</b>
96 52 12 02	SmartCheck 10	1-10	0.74-7.4	8.9-88.5	1/4	<b>Torque Tester</b>
96 52 12 03	SmartCheck 100	10-100	7-74	89-885	3/8	<b>Torque Tester</b>
96 52 12 04	SmartCheck 400	40-400	30-295	354-3540	3/4	<b>Torque Tester</b>
96 52 12 05	SmartCheck 800	80-800	59-590	708-7081	3/4	<b>Torque Tester</b>



\* For testing torque screwdrivers

# 7707 W TORQUE TESTER

## FLEXIBILITY AND ACCURACY ROLLED INTO ONE.

The SENSOTORK® 7707 W electronic tester enables absolutely accurate, extremely efficient testing of torque wrenches. At the same time, it is so well-thought through and compact that it can be used virtually anywhere and really comes into its own where space is at a premium.

It can be mounted horizontally or vertically, comes with a display module that can be mounted on a tripod, which allows the user far greater freedom of movement – like when testing long torque wrenches.



### PC CAPABLE

In conjunction with the STAHLWILLE TORKMASTER software, readings can be transmitted to the PC for logging.



### VARIABLE

Interchangeable transducers with the QuickRelease mechanism allow adaptation to the torque range needed – in less time than it takes to say "STAHLWILLE".



### THE KEY ADVANTAGES

- **Space-saving.** Compact dimensions, a display unit with a spiral cable, tripod and 1.5 metre connector cable ensure maximum flexibility when selecting the best fixing point.
- **Versatile.** Thanks to clockwise and anticlockwise measurements across a very broad measuring range from 2 to 100 per cent of the rated value, interchangeable square drive adapters conveniently stored in the mounting block and a display showing N·m, ft·lb, in·lb units of measure.
- **Accurate.** Patent, low-profile transducers guarantee minimum lateral forces and this translates into optimum readings – including display of the torque actually applied when using click type torque wrenches.

### 7707 W Torque Tester

Code	No	N·m	ft·lb	in·lb	Ø "	Description
96 52 10 86	7707-1-3W <sup>1)</sup>	0.2-10	0.15-7.4	1.8-88.5	1/4	<b>The SENSOTORK® electronic tester</b> , a compact tester that can quickly be adapted with easily interchangeable transducers
96 52 10 85	7707-1-2W	0.2-10	0.15-7.4	1.8-88.5	1/4	
96 52 10 80	7707-1W	0.4-20	0.3-15	3.5-177	1/4	
96 52 10 72	7707-2W <sup>2)</sup>	2-100	1.5-74	18-885	3/8	
96 52 10 83	7707-2-1W <sup>3)</sup>	4-200	3-148	35-1770	1/2	
96 52 10 84	7707-2-2W <sup>4)</sup>	8-400	6-295	71-3540	3/4	
96 52 10 82	7707-3W <sup>4)</sup>	25-1100	18-812	221-9736	3/4	



<sup>1)</sup> For testing torque screwdrivers

<sup>2)</sup> With square drive adapter No 409M (1/4" Ø x 3/8" ■)

<sup>3)</sup> With square drive adapters No 7789-4 (1/4" Ø x 1/2" ■), No 7789-5 (3/8" Ø x 1/2" ■)

<sup>4)</sup> With square drive adapters No 7787 (1/4" Ø x 3/4" ■), No 7788 (3/8" Ø x 3/4" ■), No 7789 (1/2" Ø x 3/4" ■)

# WIRE-TWISTING PLIERS

## DESIGNED TO TWIST. AGAIN & AGAIN.

In the aerospace industry in particular, safety relevant bolted joints are frequently secured using additional twisted safety wires to preclude unintended loosening resulting from powerful vibrations. STAHLWILLE has reinvented wire-twisting pliers specially for reliable, safe wire twisting. Where conventional products cause problems in use, STAHLWILLE wire-twisting pliers – the only ones on the market not manufactured in the Far East – stand out because of their accuracy, efficiency in operation and excellent ergonomic design. Above all, they offer longer lifetimes and effectively prevent foreign object damage. STAHLWILLE wire-twisting pliers are equipped with a thicker, more rigid shank than competing products. The handles are arrested by a durable leaf spring rather than a highly susceptible coil spring. The precision-made cutting edges reliably cut through the

wire and the wire ends are automatically crimped. To make wire-twisting pliers even safer, STAHLWILLE makes them exclusively out of metal. There is no silicone or extruded plastic liable to breakage on the jaws. In addition, to maximise durability and service lifetimes, STAHLWILLE wire-twisting pliers are fitted with individually induction-hardened cutters. As a result, if the pliers fall to the floor inadvertently, the cutting edges cannot break.

STAHLWILLE wire-twisting pliers grip the wire reliably without damaging it and with no loss of crimp strength. The twist function can be switched over and even locked. The head has a special wire gripping pattern that prevents the wire being bent and thus simplifies threading.



### THE KEY ADVANTAGES

- Made exclusively of metal – no plastics, silicone or similar materials.
- More efficient working thanks to automatic crimping of the wire ends.
- Durable leaf spring instead of a conventional coil spring – for long service lives.
- With induction-hardened cutters, ensures resistance to fracture even under the toughest loads.



### Wire-twisting pliers

Code	No	Length	Description
65 75 12 20	66751220	230 mm	<b>Wire-twisting pliers</b>
65 75 12 80	66751280	280 mm	<b>Wire-twisting pliers</b>



# FINE-TOOTH RATCHETS

## MEETING DEMANDING STANDARDS IN TIGHT SPACES.

When working in confined spaces is essential, as with maintenance on turbines, high-quality fine-tooth ratchets really come into their own. Fine-tooth ratchets made by STAHLWILLE have proved themselves to be the ace up the user's sleeve. Thanks to their 80 teeth, they make a ratchet angle of only 4.5° possible. Not only that, the finely constructed mechanism works as reliably as a Swiss watch and ensures unrivalled smooth action, even when transmitting high torques. A cover plate of high-performance plastic protects the mechanism even in heavy use and keeps

dust and dirt away from the interior. Heavy-duty Spirolox® rings absorb the axial forces from the rotary drive. With sizes of 1/4", 3/8" and 1/2", the three most popular drives are immediately available - and, as one would expect, with STAHLWILLE's patented QuickRelease system. This is the only end-to-end locking system available on the market that reliably protects the entire chain of tools, from the ratchet and extensions through to the socket, against inadvertent release and loss, without adding to the dimensions of the tools.



FOD



### FOD SAFE

In addition to the version with the plastic handle, this is also available with a steel handle. This is FOD safe and provides even more freedom of movement in extremely confined working spaces.

### EFFICIENT

Eighty teeth provide a tight ratchet angle of only 4.5° - facilitating precision working in confined spaces. Eight teeth engage at once, which ensures good load-bearing capacity and smoothness of operation.



### THE KEY ADVANTAGES

- **FOD compliant.** The screwless design prevents the loss of small items.
- **Low maintenance.** Durable, resilient mechanism - repairable if needs be.
- **Close-fitting.** Closest possible tolerances on both the square drive of the ratchet and the sockets and adaptors - ensuring reliable combinations.



Details of the mechanical systems, manner of operation and maintenance tips are available as a video here:

[www.stahlwille.de/en/videos/fine-tooth-ratchets](http://www.stahlwille.de/en/videos/fine-tooth-ratchets)

### Fine-tooth ratchets

Code	No	Size	Length	Description	
11 11 10 20	415QR N	1/4"	117 mm	<b>Fine-tooth ratchet</b>	
11 11 10 30	415SG-QR N	1/4"	117 mm	<b>Fine-tooth ratchet</b> , steel handle	
11 11 10 40	415QRL N	1/4"	153 mm	<b>Fine-tooth ratchet</b> , long	
11 13 20 20	415SGB N	1/4"	117 mm	<b>Fine-tooth ratchet</b> , steel handle, internal hex drive, for bits	
11 11 00 10	415SGH N	1/4"	117 mm	<b>Fine-tooth ratchet</b> , steel handle, HI-LOK	
12 11 10 20	435QR N	3/8"	193 mm	<b>Fine-tooth ratchet</b>	
12 11 10 30	435SG-QR N	3/8"	193 mm	<b>Fine-tooth ratchet</b> , steel handle	
13 11 11 20	512QR N	1/2"	265.5 mm	<b>Fine-tooth ratchet</b>	
13 11 10 30	512SG-QR N	1/2"	265.5 mm	<b>Fine-tooth ratchet</b> , steel handle	

# POWERGRIP PLIERS WRENCH

## A MULTIFACETED TOOL.

The patented PowerGRIP pliers wrench should be a firm feature in every set of tools. Thanks to its parallel jaws, it can be used as an adjustable hexagonal spanner – for holding the counter nut when fitting pipes, for example.

The box-type slip-joint and infinitely variable quick adjuster button with the workpiece in place are evidence of the advanced ergonomic design and contribute to fast working without damaging the workpiece.

This makes it a versatile aid that is ideally suited to applications such as aeroplane manufacture and MRO, where the weight and the need for a careful selection of tools in the kit play a key role.

Last but not least, the slim construction allows access even to awkward working spaces.



### PRACTICAL

The patented pushbutton and slip-joint enable the tool to be adapted to the workpiece easily.



### THE KEY ADVANTAGES

- Compact dimensions for use in awkward working spaces.
- Induction-hardened jaw profile, extremely hard and durable.
- Anti-pinch mechanism prevents injuries.
- Available in 3 sizes: 180 mm (10-way adjuster), 240 mm (12-way adjuster) and 300 mm (15-way adjuster).

### PowerGRIP pliers wrenches

Code	No	Length	Description
65 73 51 80	65735180	192 mm	<b>PowerGRIP pliers wrench</b>
65 73 52 50	65735250	253 mm	<b>PowerGRIP pliers wrench</b>
65 73 53 00	65735300	300 mm	<b>PowerGRIP pliers wrench</b>



# ELECTROMECHANICAL TORQUE WRENCHES

## THE BEST OF BOTH WORLDS.

Greater process dependability and accuracy, comprehensive logging and programming options: electronic torque wrenches provide considerable advantages, especially in connection with applications in aerospace, where every operation has to be minutely logged. So that end users do not have to dispense with their accustomed tactile signals as the mechanism triggers, noticeable even through gloves, STAHLWILLE developed the electromechanical torque wrench.

This patented system is a unique solution in the market and makes use of an almost wear-free trigger mechanism involving a triggering cam. As soon as the preset tightening torque is reached, the wrench triggers with tactile and audible signals. At the same time, comprehensive programming options are possible - from a single fastener through to complex work sequences. The tool also enables all fastener-related details to be logged.



Electric measurement

Mechanical triggering

730D



714



### THE KEY ADVANTAGES

- The only click type torque wrenches that measure the torque actually applied and log it - for torque ranges up to 1000 N·m.
- Extremely low display deviation (730D: ± 2%, 714: ± 2% for torque, ± 1% for tightening angle), several measuring methods, data storage, logging function, audible and visual evaluation of the joint.
- Not necessary to reset to »0« to release tension in the spring.
- Intuitive operation, the housing is made of impact-resistant plastic and the display and keypad are splash-proof.



Find out more about the electromechanical function in the video here:

[www.stahlwille.de/en/videos/em-click-trigger](http://www.stahlwille.de/en/videos/em-click-trigger)

### Electromechanical torque wrenches

Code	No	Size	N·m	ft·lb	in·lb	mm	"	Description
96 50 17 10	730D	10	10-100	7.4-75	90-900	9x12		<b>Service/Series MANOSKOP® torque wrenches</b> with mount for insert tools
96 50 17 20		20	20-200	15-150	180-1800	14x18		
96 50 17 40		40	40-400	30-300	360-3600	14x18		
96 50 17 65		65*	65-650	48-480	580-5800	14x18		
96 50 19 65		II/65	65-650	48-480	580-5800	22x28		
96 50 20 80		80	80-800	60-600	720-7200	22x28		
96 50 21 00		100	100-1000	74-750	900-9000	22x28		
96 50 18 10	730DR	10	10-100	7.4-75	90-900	9x12	1/2	<b>Service/Series MANOSKOP® torque wrenches</b> with reversible ratchet insert tool
96 50 18 20		20	20-200	15-150	180-1800	14x18	1/2	
96 50 18 40		40	40-400	30-300	360-3600	14x18	3/4	
96 50 18 65		65	65-650	48-480	580-5800	14x18	3/4	
96 50 20 65		II/65	65-650	48-480	580-5800	22x28	3/4	
96 50 18 80		80	80-800	60-600	720-7200	22x28	3/4	
96 50 18 00		100	100-1000	74-750	900-9000	22x28	3/4	
96 50 09 01	714	1	1-10	0.7-7.5	9-90	9x12		<b>MANOSKOP® tightening angle torque wrenches</b> with mount for insert tools
96 50 09 02		2	2-20	1.5-15	18-180	9x12		
96 50 09 04		4	4-40	3-30	36-360	9x12		
96 50 09 06		6	6-60	4.5-45	54-540	9x12		
96 50 09 10		10	10-100	7.4-75	90-900	9x12		
96 50 09 20		20	20-200	15-150	180-1800	14x18		
96 50 09 40		40	40-400	30-300	360-3600	14x18		
96 50 09 65		65	65-650	48-480	580-5800	22x28		
96 50 09 80		80	80-800	60-600	720-7200	22x28		
96 50 01 00		100	100-1000	74-750	900-9000	22x28		
96 50 10 01	714R	1	1-10	0.7-7.5	9-90	9x12	1/4	<b>MANOSKOP® tightening angle torque wrenches</b> with reversible ratchet insert tool
96 50 10 02		2	2-20	1.5-15	18-180	9x12	1/4	
96 50 10 04		4	4-40	3-30	36-360	9x12	1/4	
96 50 10 06		6	6-60	4.5-45	54-540	9x12	3/8	
96 50 10 10		10	10-100	7.4-75	90-900	9x12	1/2	
96 50 10 20		20	20-200	15-150	180-1800	14x18	1/2	
96 50 10 40		40	40-400	30-300	360-3600	14x18	3/4	
96 50 10 65		65	65-650	48-480	580-5800	22x28	3/4	
96 50 10 80		80	80-800	60-600	720-7200	22x28	3/4	
96 50 11 00		100	100-1000	73-735	885-8850	22x28	3/4	



\* Recommended ratchet insert tool No 735/40HD

# HPQ® TOOLS

## HIGH PERFORMANCE QUALITY FOR THE HIGHEST TORQUES IN CONFINED SPACES.

In jobs involving maintenance work on turbines, high torques are often essential to release existing, possibly caked, bolted connections. In addition, there is often only limited space around the fastener head. Spanners and sockets for such applications have to fulfil two key characteristics: their wall thickness has to be extremely thin, and yet they have to withstand extreme torques without giving or breaking. STAHLWILLE HPQ® tools have been developed specifically

for these requirements. They not only withstand the highest forces applied, they are also constructed to extremely high standards of accuracy. This effectively prevents the cam-out effect and much reduces the risk of damage to the fastener and injury to service personnel. In addition to these advantages, HPQ® tools considerably reduce the weight of a tool kit, which is a boon where every gram makes a difference.

### CRAFTSMANSHIP

STAHLWILLE's particularly close machining tolerances in production guarantee optimum force transmission and safety.

### STRENGTH

HPQ® spanners and sockets are manufactured from selected tough steel alloys in precision forging shops.



### THE KEY ADVANTAGES

- High Performance Quality (HPQ®) high-grade steel – for the highest torques in confined spaces. Ideal for working on turbines, amongst other assemblies.
- With AS Drive profile: for optimum force transmission and to guard against slipping off and damaging the screwhead.
- Cadmium-free: no risk of rust developing when working on titanium alloy parts and titanium fasteners.
- Comply with aerospace standards E DIN EN 3709, E DIN EN 3710, SAE AS 954-E, S.B.A.C. AS, 40605/40606, MS-33787 and MIL-W-8982.
- Broad range of spanners and sockets.



### HPQ® spanners

Code	No	Size	Spline size	Description	
40 57 16 16	130a	1/4"		<b>Combination spanners</b>	
40 57 18 18		9/32"			
40 57 20 20		5/16"			
40 57 22 22		11/32"			
40 57 24 24		3/8"			
40 57 28 28		7/16"			
40 57 32 32		1/2"			
40 57 34 34		9/16"			
40 58 16 16	130aSP	1/4"	8	<b>Spline drive combination spanners</b>	
40 58 20 20		5/16"	10		
40 58 24 24		3/8"	12		
40 58 28 28		7/16"	14		
40 58 32 32		1/2"	16		
40 58 34 34		9/16"	18		
41 60 16 20	180a	1/4 x 5/16"		<b>Double-ended ring spanners, short, small offset</b>	
41 60 24 28		3/8 x 7/16"			
41 60 32 34		1/2 x 9/16"			
41 60 34 36		9/16 x 5/8"			
41 61 16 20	230a	1/4 x 5/16"		<b>Double-ended ring spanners, small offset</b>	
41 61 20 22		5/16 x 11/32"			
41 61 20 24		5/16 x 3/8"			
41 61 24 28		3/8 x 7/16"			
41 61 28 32		7/16 x 1/2"			
41 61 32 34		1/2 x 9/16"			
41 61 34 36		9/16 x 5/8"			
41 61 36 40		5/8 x 3/4"			
41 61 38 40		11/16 x 3/4"			
41 61 42 44		13/16 x 7/8"			
41 61 46 48		15/16 x 1"			
41 61 48 50		1 x 1 1/16"			
41 61 52 56		1 1/8 x 1 1/4"			
41 03 55 07		220			
41 03 06 08	6 x 8 mm				
41 03 09 11	9 x 11 mm				
41 03 10 11	10 x 11 mm				
41 03 12 14	12 x 14 mm				
41 03 13 14	13 x 14 mm				
41 03 17 19	17 x 19 mm				
41 03 18 19	18 x 19 mm				
41 03 19 22	19 x 22 mm				
41 03 20 22	20 x 22 mm				
41 43 14 16	220a	7/32 x 1/4"		<b>Double-ended ring spanners, extra-long, 15° offset</b>	
41 43 16 20		1/4 x 5/16"			
41 43 24 28		3/8 x 7/16"			
41 43 32 34		1/2 x 9/16"			
41 43 36 40		5/8 x 3/4"			
41 43 38 40		11/16 x 3/4"			
41 16 07 09	220aSP	7/32 x 9/32"	7 x 9	<b>Spline drive double-ended ring spanners, extra-long</b>	
41 16 08 10		1/4 x 5/16"	8 x 10		
41 16 12 14		3/8 x 7/16"	12 x 14		
41 16 16 18		1/2 x 9/16"	16 x 18		
41 16 18 20		9/16 x 5/8"	18 x 20		
41 16 22 24		11/16 x 3/4"	22 x 24		
41 16 26 30		13/16 x 15/16"	26 x 30		
41 16 28 32		7/8 x 1"	28 x 32		

Premium as standard: the complete range of **1/4", 3/8" and 1/2"** sockets is made of **HPQ® high-performance steel**.

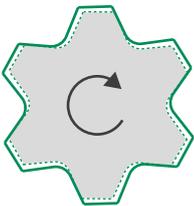


# TORSION BITS

## FORCE TO BE RECKONED WITH.

Where fasteners are tightened with power tools and power screwdrivers or battery-powered impact screwdrivers are used, special bits will be needed. The power drives exert extreme peak loads and normal bits cannot withstand such work loads for long. Frequent tool changes become standard procedure due to excessive wear & tear – accompanied by corresponding negative effects on process efficiency and tooling costs.

The increased risk of damage to the fastener profile is equally problematic. Once a screwhead has been damaged – whether this is caused by worn or broken bits or due to excessive force applied to the profile – the rework will usually be considerable. However, that situation can be avoided. STAHLWILLE torsion bits are the answer: they reduce wear and protect the fastener.

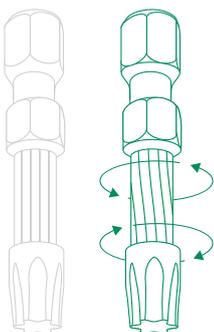


### ELASTICITY

A special hardening process makes the bits more elastic. The spring steel created in this way guarantees optimum retention in the screw-head.



Thanks to the optimised geometry, the bit engages deep inside the head of the fastener. Cam-out forces are minimised and forces are transmitted more effectively. This enables even seized-up screws to be loosened with much reduced wear & tear on the bits.



### TORSION ZONE

Thanks to the special torsion zone, torsion bits absorb a large amount of the energy applied by battery-powered impact screwdrivers that can reach 70 N·m. As a result, the service lifetime of these profiles is far longer than that of conventional bits.



### THE KEY ADVANTAGES

- Precision-manufactured profiles for internal TORX® fasteners with extremely close tolerances.
- Developed specifically for use with professional battery-powered impact screwdrivers.
- Compact construction facilitates optimum handling of battery-powered impact screwdrivers.
- Long service lives due to the torsion shape, elastic steel and special hardening process.

### Torsion bits

Code	No	Size	Outer 	"
08 16 11 15	1441 TN 15	T 15	E 6.3	1/4
08 16 11 20	1442 TN 20	T 20	E 6.3	1/4
08 16 11 25	1443 TN 25	T 25	E 6.3	1/4
08 16 11 30	1445 TN 30	T 30	E 6.3	1/4
08 16 11 40	1446 TN 40	T 40	E 6.3	1/4



# HI-LOK TOOLS

## A PATENTED BOOST TO SAFETY.

HI-LOK pins have become extremely popular in aerospace construction - they make it possible to achieve reliable structural joints even in safety-critical, restricted work environments. This is precisely where STAHLWILLE's compact, patented HI-LOK ratchet comes in. A key advantage for our customers is that, in contrast to HI-LOK ratchets from other manufacturers, this one offers the best possible prevention of foreign object damage.

Conventional HI-LOK ratchets are merely conventional ratchets with a drilled tool mount for insertion of a hexagon key. The problem is that there is no locking mechanism for the tool using a ball or pin. This means the ratchet is no longer FOD safe. With the patented STAHLWILLE HI-LOK ratchet, this is different: the hexagon key simply pushes the ball retention system to one side. As soon as the hexagon key is removed, the ball moves back into its usual place.



### FOD SAFE

The STAHLWILLE HI-LOK ratchet takes a hexagon key and the conventional 1/4" insert with a ball groove or hole but still guarantees loss-free working with sockets.

### TINY TOOLS

HI-LOK joints are very small and require correspondingly small tools. This also raises the bar in terms of the demands on FOD safety.



### THE KEY ADVANTAGES

- Eighty teeth provide a tight ratchet angle of only 4.5° - facilitating precision working in confined spaces.
- Special offset keys (imperial and metric) and extensions, three different lengths, available.
- Prevents FOD and is a low-maintenance construction due to the screwless design.
- Ideal for safety relevant industries such as aviation.

### HI-LOK tools

Code	No	Size		Description	
11 11 00 10	415SGH N	1/4"		<b>HI-LOK fine-tooth ratchet</b> , steel handle	
11 11 00 02	415SGH	1/4"		<b>HI-LOK ratchet</b> , steel handle	
11 24 00 11	414H	2		<b>HI-LOK extensions</b>	
11 24 00 12		4			
11 24 00 13		6			
43 06 20 02	10759	1	2 mm	<b>Offset screwdrivers</b>	
43 06 40 02		2	2 mm		
43 56 00 04	10759a	1	1/16"	<b>Offset screwdrivers</b>	
43 56 40 04		2	1/16"		
43 56 00 05		1	5/64"		
43 56 40 05		2	5/64"		
43 56 00 06		1	3/32"		
43 56 40 06		2	3/32"		
96 01 63 03	40aD/8/1H			<b>HI-LOK set of socket spanners</b> 5 sockets with double hex No 40aD: sizes 7/32"; 1/4"; 5/16"; 11/32"; 3/8" 3 offset screwdrivers: No 10759a: 1/16"; 5/64"; 3/32" 1 ratchet No 415SGH	

# TOOL TROLLEYS

## AS INDIVIDUAL AS YOUR WORKPLACE.

STAHLWILLE Tool Trolleys 95VA and 98VA make the workplace in the hangar or workshop a mobile one. Thanks to the generous storage volume, they are used to manoeuvre even very comprehensive tool kits quickly to the place they are needed. The three-stage safety logic with central locking by means of a side-mounted cylinder lock, individual locking to prevent inadvertent opening during travel and a topple-proof mechanism that prevents more than one drawer being opened at any one time all add up to a very high standard

of user safety. Both models are available with six, seven or eight drawers mounted in full extension rails with bearing cage guidance, are equipped with wrap-around bumpers, a wear-resistant, scratch-repellent worktop and a ribbed protective base strip made of stainless steel. The castors are acid and oil resistant and two of them have parking brakes. In addition, the 95VA model is also available as an FOD-compliant variant.



### HARD-WEARING

The scratch-repellent stainless steel worktop provides a tidy working space – with a long service lifetime.



### 100% EXTENDIBLE

Fully extendible drawers guarantee clear overview of the tools and easy removal of each tool.



### THE KEY ADVANTAGES

- **Safety concept.** Central locking, individual locking and topple-proof mechanism ensure that relocating the tools is not only a quick but also a safe manoeuvre.
- **FOD compliant.** Available on request as a roller-mounted option instead of being in ball-bearing mounted pull-out rails (95VA).
- **Drawer labelling.** Various drawer stickers are provided to aid fast localisation of the right tool.
- **Spacious.** Generous storage space thanks to large drawers. The drawers in the TTS 95VA provide an area of 530 x 350 mm, the TTS 98VA doubles that with its 700 x 530 mm.



Details of the Tool Trolleys can be found here:  
[www.stahlwille.de/en/videos/tool-trolleys](http://www.stahlwille.de/en/videos/tool-trolleys)

## Tool Trolleys 95VA and 98VA

Code	No	Colour	Description	
81 20 00 55	95VA/6G	green	<b>Tool Trolleys</b> , 6 easily removable fully extendible drawers with bearing cage guidance, three-stage safety concept, drawers can be identified with several stickers per drawer	
81 20 00 56	95VA/6R	red, RAL 3020		
81 20 00 57	95VA/6B	blue, RAL 2703035		
81 20 00 58	95VA/6A	anthracite grey, RAL 7016		
81 20 00 59	95VA/6W	white, RAL 9010		
81 20 00 60	95VA/7G	green	<b>Tool Trolleys</b> , 7 easily removable fully extendible drawers with bearing cage guidance, three-stage safety concept, drawers can be identified with several stickers per drawer	
81 20 00 61	95VA/7R	red, RAL 3020		
81 20 00 62	95VA/7B	blue, RAL 2703035		
81 20 00 63	95VA/7A	anthracite grey, RAL 7016		
81 20 00 64	95VA/7W	white, RAL 9010		
81 20 00 65	95VA/8G	green	<b>Tool Trolleys</b> , 8 easily removable fully extendible drawers with bearing cage guidance, three-stage safety concept, drawers can be identified with several stickers per drawer	
81 20 00 66	95VA/8R	red, RAL 3020		
81 20 00 67	95VA/8B	blue, RAL 2703035		
81 20 00 68	95VA/8A	anthracite grey, RAL 7016		
81 20 00 69	95VA/8W	white, RAL 9010		
81 20 00 99	98VA/6G	green	<b>Tool Trolleys</b> , 100% more drawer volume in comparison with 95VA, 6 easily removable fully extendible drawers with bearing cage guidance, three-stage safety concept, drawers can be identified with several stickers per drawer	
81 20 01 00	98VA/6R	red, RAL 3020		
81 20 01 01	98VA/6B	blue, RAL 2703035		
81 20 01 02	98VA/6A	anthracite grey, RAL 7016		
81 20 01 03	98VA/6W	white, RAL 9010		
81 20 01 04	98VA/7G	green	<b>Tool Trolleys</b> , 100% more drawer volume in comparison with 95VA, 7 easily removable fully extendible drawers with bearing cage guidance, three-stage safety concept, drawers can be identified with several stickers per drawer	
81 20 01 05	98VA/7R	red, RAL 3020		
81 20 01 06	98VA/7B	blue, RAL 2703035		
81 20 01 07	98VA/7A	anthracite grey, RAL 7016		
81 20 01 08	98VA/7W	white, RAL 9010		
81 20 01 09	98VA/8G	green	<b>Tool Trolleys</b> , 100% more drawer volume in comparison with 95VA, 8 easily removable fully extendible drawers with bearing cage guidance, three-stage safety concept, drawers can be identified with several stickers per drawer	
81 20 01 10	98VA/8R	red, RAL 3020		
81 20 01 11	98VA/8B	blue, RAL 2703035		
81 20 01 12	98VA/8A	anthracite grey, RAL 7016		
81 20 01 13	98VA/8W	white, RAL 9010		

# TOOL TROLLEY 13217

## QUICK TO DEPLOY.

When maintenance work is to be carried out on an aeroplane or a malfunction has to be remedied, it is essential to get to the workplace quickly with the right tools, even if it is a long way and the toolbox well stocked. No problem: STAHLWILLE's Tool Trolley 13217 is one of the most manoeuvrable, well-thought-out and safest solutions on the market – and approved for use on-board.

Even very well equipped toolkits can be transported quickly from A to B using the Tool Trolley 13217, thanks to a pair of load-resilient castors, extendible handle and compact

outer dimensions. The trolley is available in a choice of three colours and, as an option, can be fitted with four slewing castors, two with parking brakes, as an IP67 version and with a high-visibility, all-round reflective film wrap – for maximum visibility even in poor lighting conditions or nocturnal jobs on the taxiway. The sturdy plastic housing has room for up to eight individually removable tool drawers. Besides the universal set of tools consisting of 104 items, there are three sets of tools compiled specifically for the aerospace industry.



### EXTREMELY ROBUST

The plastic housing without sharp edges, approved for on-board use, keeps weight down – and is nevertheless not afraid of knocks and jolts.



### PROTECTED

Also available as ingress protection IP67 variant. Additional closures and seals protect against water and dust. Pressure relief is provided by a special valve.



**TCS**

### THE KEY ADVANTAGES

- **Sophisticated.** Every removable drawer has its own handle. By applying the transparent lid, each drawer becomes a carrying case.
- **Flexible.** The endstops for the extendible rails hold each drawer in its defined position. Drawers can be inserted in any order.
- **Mobile.** The rugged castors guarantee maximum conceivable mobility. The version fitted with four castors also allows the trolley to be braked.
- **Variable.** Available in a choice of three colours and with a high-visibility reflecting surface.

### Tool Trolleys 13217

Code	No	Colour	Description	
81 09 13 01	13217 LGE	luminous yellow	<b>Tool Trolley</b> , extremely rugged, resilient Tool Trolley made of polypropylene for professional use, five easily removed drawers that are lockable with transparent covers, with endstops for the extendible rails, 3 different drawer heights	
81 09 13 04	13217 LR	luminous red	<b>Tool Trolley</b> , extremely rugged, resilient Tool Trolley made of polypropylene for professional use, five easily removed drawers that are lockable with transparent covers, with endstops for the extendible rails, 3 different drawer heights	
81 09 13 06	13217 TS	jet black	<b>Tool Trolley</b> , extremely rugged, resilient Tool Trolley made of polypropylene for professional use, five easily removed drawers that are lockable with transparent covers, with endstops for the extendible rails, 3 different drawer heights	
81 09 13 22	13217 TS IP67	jet black	<b>Tool Trolley</b> , protection against water and dust in accordance with IP67 requirements, extremely rugged, resilient Tool Trolley made of polypropylene for professional use, six easily removed drawers that are lockable with transparent covers, with endstops for the extendible rails, 2 different drawer heights	
96 89 48 09	13217 TS RF	jet black with reflecting film wrap	<b>Tool Trolley</b> , with high-visibility, all-round reflective film wrap, extremely rugged, resilient Tool Trolley made of polypropylene for professional use, five easily removed drawers that are lockable with transparent covers, with endstops for the extendible rails, 3 different drawer heights	