STEELWRIST

EARTHMOVING EFFICIENCY

COMMITMENT TO EFFICIENCY

Responsiveness, Simplicity and Speed

Steelwrist is today a global manufacturer of tiltrotators, quick couplers and work tools for excavators with headquarters in Sweden. Since the foundation in 2005, Steelwrist has been one of the fastest growing industrial companies in the industry.

Our core values of Responsiveness, Simplicity and Speed guide the way for how we work with customers, dealers, suppliers and employees. We listen to and learn together with our customers, we are easy to work with and we focus on delivering value with speed – everything being at the core of our company culture.

Steelwrist's goal is to be the "best in the world to develop, manufacture and sell equipment that increases efficiency of excavators" and a determined focus on robust and modern products, combined with fast service are appreciated by an increasing number of customers world wide.

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STEELWRIST

The key to unlock your excavator efficiency

Enablers and Automation
The core of the Steelwrist product offering includes quick couplers, tilt couplers and tiltrotators that together with the control system make up the foundation for higher excavator efficiency.

Regardless if your need is a safe and robust quick coupler, a more advanced tilt coupler, or the most efficient tiltrotator, we have the solution for you.

We introduced the patented Front Pin Lock technology already in 2012 which pushed the industry to focus more on safe quick couplers. Since then we have introduced solutions that increase safety even further.

Our SQ technology will convert the quick couplers and tiltrotators to automatic quick coupler systems connecting both hydraulics and electrical signals in one movement. No need to get out of the cabin for any tool change.

Work Tools
A job needs a work tool and a work tool needs an excavator - not the other way around. That's the starting point when we think about how to increase your excavator efficiency.

Steelwrist work tools include buckets such as grading-, digging-, cable-, v-ditch-, sorting-, skeleton- and utility buckets as well as rippers, pallet forks, asphalt cutters and grading beams.

Our powered work tools include a range of multi-, sorting- and finger grapples as well as sweepers and compactors.

Automation

Control Systems & Synergy Features

ENABLERS

Tiltrotators

Tilt couplers

Quick couplers

WORK TOOLS

Powered work tools

Work tools

STEELWRIST PEOPLE AND SUSTAINABILITY

Sustainability – a continuous mindset

Steelwrist has from its inception focused on excavator efficiency, which is also our biggest contribution to a more sustainable and environmentally friendly world. We know that an excavator equipped with Steelwrist's products is about 20 to 30 percent more efficient than a traditional excavator and we know that the result of this is less fuel consumption, fewer heavy machines needed on job sites, less heavy transportations and increased job safety as many potentially dangerous task now can be carried out by the excavator operator.

The fact that the job can be done faster and that excavators become more versatile eventually result in less environmental impact apart from increasing profitability for the owner, thus allowing for more leeway for our customer to make environmentally friendly investments.

Apart from our product impact, Steelwrist also work hard to reduce the environmental footprint from our operations.

During 2021 we produced our first Sustainability Report and 2022 will be another milestone year as we are joining the Science Based Target Initiative, SBTi, and the zero-carbon transition.

The SBTi is a partnership between CDP, the United Nations Global Compact, World Resources Institute (WRI) and the World Wide Fund for Nature (WWF). Within SBTi we will set an ambitious target for emission reduction in order to fight climate change.

We cannot do everything, but with a continuous mindset we can make sure we pull our own weight in this very important job ahead.


Sanna
Jacob
Hervé
Adrian
Luis
Hugo
Martin
Steve
Stefan
Darryn
Piotr
Sissi
Roy
Victor
Christoffer
Claes
Alain
Mike
Gus
Erik
Jens
Masubuchi
Alexander
Peter
Stefan
Andrew
Vincent
Ricky
Adam
Andreas
Tom
Junglae
Peter
Wonjo
Jonathan
Brett
Pierre
Emil
Kent
Max
Michal
Susann
Toni
James
Stian
Peter
Felicia
Wim
Richard
Jaakko
Nicolas
Anders
Therése
Sebastién
Jean
Daniel
Mattias
Christian
Henrik
Atle
Nicholas
Sofia
Stefan
Jochen
Rainer
Johann
Nick
Niklas
DongHyun
Tom
Robin
Simon
Hiro
Peter
Markus
Erik
Fredrik
Joachim
Luca
Kai
Jonas
Christian
Mats
Joe
Tony

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STEELWRIST SQ AUTO CONNECTION SYSTEM

Changing powered work tools in seconds

The demand for productivity is constantly rising and in some applications the need for quick tool changes is almost continuous. With Steelwrist SQ technology you change between hydraulic powered work tools as well as mechanical work tools in only seconds – all without leaving the cab! In 2017 we introduced our patented Qplus™ technology which radically changes the ”inside” of the hydraulic couplings. In 2022 we are updating the Qplus™ technology to allow for even higher flows.

Open standard
We believe in open standard interfaces, so the SQ system is designed to be able to connect to other brands using the same type of oil connection system.

Steelwrist Qplus™
is the label we have put on all the improvements we have developed compared to competitor solutions. Higher flow, more uptime and improved serviceability are the main benefits for the operator.

Qplus™ - Higher flow!
With Steelwrist Qplus™ the flow area measure up to 37 percent more compared to competitor products (depending on coupling size).

Qplus™ - More uptime!
Steelwrist Qplus™ sealing technology is completely new and significantly more durable compared to competitor products. This will give you more hours in operation before sealings have to be changed.

Qplus™ - Improved serviceability!
Changing seals in Steelwrist Qplus™ couplings is done fast and easy without need for proprietary and complicated tools.

STEELWRIST QUICK COUPLERS

With or without integrated oil couplings

Customers are increasingly demanding safer coupler solutions - all over the world. At the same time legislators are raising the bar for what is considered ”safe”.

Luckily accidents are relatively rare but it is still a problem. When we launched the Front Pin Lock technology in 2012 we wanted operator and ground personnel to feel safe during work tool changes, as the operator could see when the work tool is in a safe position.

Thanks to that we are not sensor dependant our solutions works equally well with all types of excavators regardless if they are small, large, new or used.

Today, with thousands of couplers in the field, the result has been a higher safety level and a robust solution cast in steel.

With Steelwrist entrance into the demolition segment the Front Pin Lock was upgraded to a second generation in order to support the heavy demolition work tools, and we are continuously introducing solutions that increase safety even further.

S and SQ Couplers

- Steel casted
- Upgradeable from S to SQ
- Locked front pin - maintains the work tool in a safe position
- Best in class hydraulic flow characteristics
- EN474, ISO13031 and SUVA compliant
- Expander machine pins
- Positive lock indicator – green indication when the work tool is in a safe position
- Negative lock indicator – the red indicates when the coupler is open

Machine Weight	Machine Quick Coupler	Building Height (inch)	Weight from	Max Oil Couplings
SYMMETRICAL				
< 5500	**S30***	3.2	33 lbs	–
4400-13200	**S40***	3.9-4.7	66/77 lbs	–
11000-26500	**S45**	4.7	154 lbs	–
11000-26500	**S50**	4.7	154 lbs	–
26500-44100	**S60**	5.3-6.7	265 lbs	–
39700-72700	**S70**	6.9-7.9	551 lbs	–
55100-94800	**S80**	9.1	860 lbs	–
88200-165300	**S90**	10.4	1543 lbs	–
SYMMETRICAL FULLY AUTOMATIC				
11000-28500	**SQ50**	5.1-5.3	220 lbs	5
26500-44100	**SQ60-4**	5.3-6.7	265 lbs	4
26500-44100	**SQ60-5**	5.3-6.7	265 lbs	5
30900-48500	**SQ65**	6.3	551 lbs	5
39700-72700	**SQ70**	6.9-7.9	551 lbs	5
39700-72700	**SQ70/55**	6.9-7.9	551 lbs	6
55100-94800	**SQ80**	9.0	926 lbs	6
88200-165300	**SQ90**	10.4	1653 lbs	9

* S30 and S40 in mechanical and hydraulic locking

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STEELWRIST TILTROTATORS

The most compact and optimized tiltrotator on the market

Our core values are responsiveness, speed and simplicity. This coupled with a rigorous attention to detail has allowed us to take the leading technology role within the business.

SQ Technology
All tiltrotators from X12 and upwards can be equipped with our SQ fully automatic technology. SQ on the top side (upper coupler) of the tiltrotator for rapid change between tiltrotator and other work tools.

SQ on the bottom side (attachment coupler) of the tiltrotator will allow for rapid change between hydraulic powered work tools, or why not sandwich with SQ on both top and bottom.

Machine Weight	Tiltrotators	Building Height (inch)	Weight from
0-4400 lbs	**X02**	10.2	132 lbs
4400-8800 lbs	**X04**	13.5	254 lbs
8800-13200 lbs	**X06**	13.5	298 lbs
11000-15400 lbs	**X07**	15.6	430 lbs
15400-26500 lbs	**X12**	16.7	628 lbs
22000-30900 lbs	**X14**	17.9	838 lbs
26500-39700 lbs	**X18**	18.0	882 lbs
35300-44100 lbs	**X20**	20.0	981 lbs
39700-57300 lbs	**X26**	21.1	1257 lbs
55100-72700 lbs	**X32**	24.6	1852 lbs

High Flow Hydraulics and rotation sensors
Steelwrist high flow swivel is raising the bar for compact high flow hydraulics. This will allow you to use powered work tools like never before or just your tiltrotator in a more fuel efficient way. The high flow swivel can also include an electrical connection that can control valves on a work tool below the tiltrotator. During 2022 a new Absolute Rotation sensor is introduced in order to give more exact data to Machine Control Systems. Central lubrication can also be automatically connected to a work tool below the tiltrotator.

The Gripper
An integrated gripper is an amazing tool that increases your productivity even further. The gripper opens widely, closes almost entirely, has robust cylinder covers and does not interfere with excavation. Of course, it can be retrofitted.

Tiltrotators

- High 45° tilt angle
- Direct fit or Sandwich
- Steel casted
- Vertical tilt cylinders that allow digging in narrow trenches
- Lowest building height in the market
- Robust gripper cylinder covers
- Gripper as option
- Grease lubrication for longer life time and connection to central lubrication
- Coupler with Front Pin Lock or Front Pin Hook for safe tool changes
- High flow hydraulics
- Load holding valves
- Absolute Rotation Sensor

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STEELWRIST TILT COUPLERS

When a robust tilt function is enough

Tilt Coupler
The Steelwrist tilt coupler is a combination between a robust tilt motor and the patented Front Pin Lock technology or Front Pin Hook from Steelwrist.

With the Steelwrist tilt coupler you will get a safe quick coupler solution when you just need the tilt function and not the full blown tiltrotator functionality.

The Steelwrist tilt coupler is based on the steel casted coupler as well as the robust direct fit top with expander pins.

TCX
The TCX - a tilt function for the smallest excavators. Available as Direct mounted with S30 coupler, both manual snap-on or hydraulic.

Tilt Couplers

- Front Pin Lock or Front Pin Hook coupler for safe work tool changes
- Hose free internal channels to locking cylinder
- Large contact surfaces to work tool thanks to steel casting
- Expander pins
- Up to 2x90° tilt angle
- Overload protection with cross-over valves

Machine Weight	Tilt Coupler/ TCX	Tilt Angle	Building Height (inch)	Weight from
0-6600 lbs	**TCXS30**	±30°	6.3	62 lbs
4400-13200 lbs	**TC050/S40**	±90°	13.7	210 lbs
11000-15400 lbs	**TC070/S40**	±90°	14.9	320 lbs
11000-26500 lbs	**TC100/S45**	±90°	17.6	463 lbs
11000-26500 lbs	**TC100/S50**	±90°	17.6	463 lbs
26500-44100 lbs	**TC180/S50**	±60°	19.5	794 lbs
26500-44100 lbs	**TC180/S60**	±60°	19.5	838 lbs
39700-52900 lbs	**TC240/S70**	±60°	23.6	1367 lbs
39700-52900 lbs	**TC240/SQ70**	±60°	23.6	1433 lbs

STEELWRIST SQ ADAPTORS

Connecting work tools efficiently

Connecting the tiltrotator or work tools in an efficient way is always a good idea. Regardless if you are looking to safeguard proper maintenance by connecting to a central lubrication system, or if you are chasing seconds when changing work tools we have the solution that you need.

SQ adaptors

The main reason to go for SQ couplers or a tiltrotator with SQ bottom is when the work requires many work tool changes. Regardless if you need an adaptor plate or a weld on bracket we have the cost effective brackets that you need.

All male couplings in the SQ adaptors includes the Qplus™ technology giving your work tool higher flow capabilities and more uptime. Our SQ adaptors build on the Symmetrical (S-type) standard with the addition of oil couplings. Steelwrist SQ adaptors therefore work perfectly with other manufacturers having the same dimensions and positions.

Weld on S-type adaptors

Weld on SQ adaptors - high

Weld on SQ adaptors - low

SQ adaptor plate with manifold

SQ adaptor plate for internal hoses

Pendulum Adaptors

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STEELWRIST CONTROL SYSTEMS

Connected system for highest uptime

Steelwrist supply two types of control systems, both do the job, both comply with all regulations and both will increase your efficiency. The four hose proportional machine control is the more basic system (see Hard facts page 26).

The Quantum platform

Multifunctional ergonomic joystick, simultaneous usage of all functions, remote support and individual profiles for all operators or work tools - all key features to unlock the true efficiency of your excavator. All these are obviously standard in our Quantum platform. With the Quantum app on your smartphone or display in the cabin you will manage settings in a user friendly way.

Add on functionality like joystick steering, track steering, boom swing control or blade control when needed.

Positioning System

- Direct link to your Machine Control System
- Clinometer for tilt and rotation angle indication
- Autotilt

Remote Support

- One click away from online support
- Upgrades online

Tiltrotator Control

- Simultaneous use of all functions
- Based on technology and knowledge from more than 55 000 tiltrotator installations

Joystick steering

Track control

STEELWRIST TOOL RECOGNITION

Automatic optimization and tracking

Data to your Machine Control System

The basic idea behind the Quantum based Tool Recognition (ToolRec) is a system that automatically detects the work tool which is connected to the excavator. This information can be used by any of our partner systems that you use in your everyday work - Machine Control System, Weighing System, Tiltrotator Control System etc.

Automatic tiltrotator settings

As standard function in our Quantum system each work tool (ToolRec module) can be configured with custom tiltrotator settings. This helps the operator to always optimize tiltrotator performance.

Easy to add new work tools

Setting up a new work tool in Quantum ToolRec is very easy. Just mount the ToolRec module on the work tool, open the Quantum app and tap the new work tool that appears automatically. Name the work tool to your liking and it is now available to any supporting system.

Keep track of your work tools

With Tool Recognition you will have the option to localize your work tools on the workplace as they are tracked. We monitor both the physical position as well as utilization. If you have regular service intervals on your work tools we can automatically call your attention to when the service is due.

Tool Recognition

- Autodetect used work tools and set profile in MCS
- Adjust tiltrotator automatically depending on work tools
- Keep track of your work tools

Quick Coupler Safety

- Full Quick Coupler safety

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STEELWRIST POWERED WORK TOOLS – GRAPPLES

Grapples for your everyday tasks

Steelwrist grapples are made to last and to make your day easy, although each model has its specialized purpose, all are still extremely useful for multipurpose use. You choose the grapple that fits your needs, but you will end up using wit for many more tasks.

	Machine Weight	Grapple	Load Area yd3	Opening width (inch)	Max load	Weight
Multi grapple	0-4400 lbs	**MG12**	90	42"	2 204 lbs	121 lbs
	6600-13200 lbs	**MG20**	180	54"	6 615 lbs	423 lbs
	13200-26500 lbs	**MG25**	180	59"	11 025 lbs	688 lbs
	17700-35300 lbs	**MG32**	240	72"	13 227 lbs	904 lbs
	26500-30900 lbs	**MG40**	300	76"	15 432 lbs	1 237 lbs
Sorting grapple	13200-26500 lbs	**SG20**	180	49"	6615 lbs	437 lbs
	17700-35300 lbs	**SG25**	180	67"	13 227 lbs	831 lbs
	22000-44100 lbs	**SG32**	240	72"	15 432 lbs	1 190 lbs
	35300-57300 lbs	**SG40**	300	87"	17 363 lbs	1 581 lbs
Finger grapple	13200-26500 lbs	**FG20**	180	55"	6615 lbs	483 lbs
	17700-35300 lbs	**FG25**	180	61"	13 227 lbs	897 lbs
	26500-44100 lbs	**FG32**	240	72"	15 432 lbs	1 389 lbs
	35300-57300 lbs	**FG40**	300	77"	17363 lbs	1 596 lbs

Multi Grapples

Application areas are general purpose and log handling such as heavy lifting, stone laying, sorting, loading of cut-to-length timber and waste wood handling.

By-passing jaws that close fully, so that also thin objects can be handled with ease. Hardox 500 in all wear plates and optimized roll in/roll out geometry for log handling.

- By-passing jaws
- Optimized roll in/roll out geometry
- Wide opening and full closure

Sorting Grapples

Application areas are the tougher tasks as large rock handling, recycling, scrap, sorting and medium duty demolition work. High clamp force and wide opening give you the flexibility that you need.

- Tip-to-tip closing
- Mechanical end-stops
- Turnable and bolted cutting edges in HB500 steel

Finger Grapples

A heavy duty five or seven finger universal grapple where dedicated application areas are handling of stumps, debris, scrap and forest residue.

- By-passing jaws
- Hardox 500 in all wear plates and hard face
- HB500 welding in jaws for long life time
- Wide opening and full closure

Common features between all models:

- Wide opening. Also available with SQ top, or other standards as S-type, CW-type and HS-type
- Expander pins
- Dual guide bars
- 5° bracket angle to make grapple level with tiltrotator rotation plane
- Integrated load holding valves
- High clamp force

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STEELWRIST POWERED WORK TOOLS – COMPACTORS

Compaction made easy

Steelwrist Compactors are designed for quiet, safe, comfortable and maintenance free compaction of soil, pipeline trenches, embankments, pits and shafts.

The low height and off-center bracket position increase the reach and you can use the compactor under obstacles and in other narrow positions.

The open design allows the compactor plate to self-clean and prevent backfill material to jam the compactor.

The angled housing design and rubber buffers provides optimum force distribution for the compaction work and makes it possible to use in rough terrain. The 15 degree angle also reduce stress on the rubber buffers resulting in less wear.

Additionally the job site safety level is improved as the need for personnel directly in the work area is reduced.

Compactors

- 15° housing for best force distribution
- Pressure and flow rate control for overload protection
- Off centre bracket position allows for compaction under obstacles
- Bolt on top brackets available with S-, SQ-, CW- and HS-type standards
- Excenter motor permanently lubricated
- Low noise motor and rubber buffers reduce oscillation to the operator's cabin

Machine Weight	Compactor	Force kN	Flow gpm	Weight
4 400-13200 lbs	HC20	20	6.8-11.4	551 lbs
11000-26500 lbs	HC40	40	13.6-18.2	853 lbs
22000-48500 lbs	HC60	60	20.4-27.2	1367lbs
35300-66100 lbs	HC90	90	27.2-31.8	2136 lbs

STEELWRIST POWERED WORK TOOLS – SWEEPERS

High performance excavator sweeper

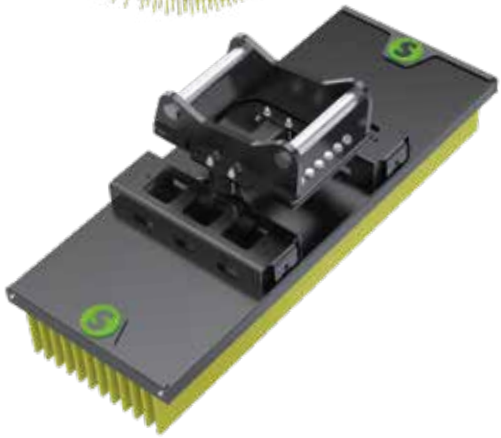
Sweepers

- Works great with our SQ technology
- Dual direct drive hydraulic motors
- Bolt on top brackets available with S-, SQ-, CW- and HS-type standards
- Integrated parking stand
- Mudflap as standard

Regardless if you have a need for cleaning pavements, cable trenches, railway switches, tram tracks, roofing, containers, flooding or other disaster areas from debris, material or snow, the Steelwrist sweeper range give you the tool to take on the job.

Instead of using manual shovels, snow plows or other similar work tools the Steelwrist sweeper range will give you access to the work area in a completely different and much more effective way.

Dual direct drive hydraulic motors safeguard the torque needed for efficient brushing and together with Beeline brushes, a long lifetime. The mechanical fixed brush can easily be used under the tiltrotator.



Model	Width	Weight	Motor	Option	Flow req.
SW1000	3'-3"	375 lbs	Dual Motor Direct Drive	Twisted core Cartridge brushes	11-34 gpm
SW1500	4'-11"	441 lbs	Dual Motor Direct Drive	Twisted core Cartridge brushes	11-34 gpm
SW2000	6'-7"	551 lbs	Dual Motor Direct Drive	Twisted core Cartridge brushes	11-34 gpm

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STEELWRIST BUCKETS AND WORK TOOLS

Lighter, more durable, more affordable

Our buckets are constantly evolving based on customer feedback and we are now on our forth generation. The main benefits are even further optimized geometry and volumes.

High grade steel allows us to make a more wear resistant bucket without increasing the weight. Thanks to the sharp growth of our bucket business we have acquired economies of scale in production - the benefit for you is that we can offer high quality buckets at a more affordable price.

Most work tools we have on stock for fast delivery.

Grading buckets

- Rounded back without corner for easy fill/empty cycle
- Conical shape for work with tiltrotator
- Hardox 500 material in all wear plates
- 20° cutting edge angle
- Cutting edge in HB 500 material

Cable/Trench buckets

- Hardox 500 material in all wear plates
- Cutting edge in HB 500 material
- 30° cutting edge angle
- Available with or without teeth
- Conical or standard shape

Digging buckets

- Hardox 500 material in all wear plates
- 30° cutting edge angle
- CAT J-style tooth system

Skeleton buckets

- Hardox 500 material in all wear plates

Sorting buckets

- Hardox 500 material in all wear plates
- 500 Brinnell steel rods

Utility buckets

- Hardox 500 material in all wear plates
- Cutting edge in HB 500 material
- Dimensions for working in water and sewage applictions
- 30° cutting edge angle

V-ditch buckets

- Hardox 500 material in all wear plates

Asphalt cutter

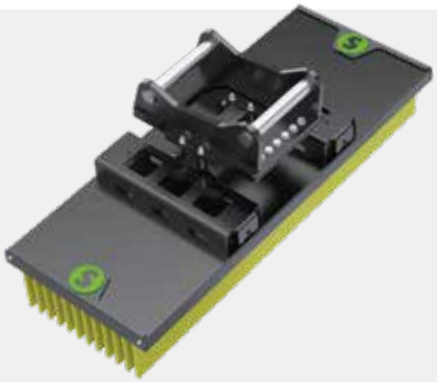
- Asphalt cutter for 6.6–66100 lbs excavators

Ripper

- Ripper S30 to S70

Pallet fork

- Pallet forks for 6.6–66100 lbs excavators, hydraulic and mechanical versions



Brush

- The mechanicalfixed brush can easily be used under the tiltrotator

Grading beam

- Grading beam for leveling and compaction of material over large areas with tiltrotator

STEELWRIST BUCKETS AND WORK TOOLS – CUSTOM BUILD

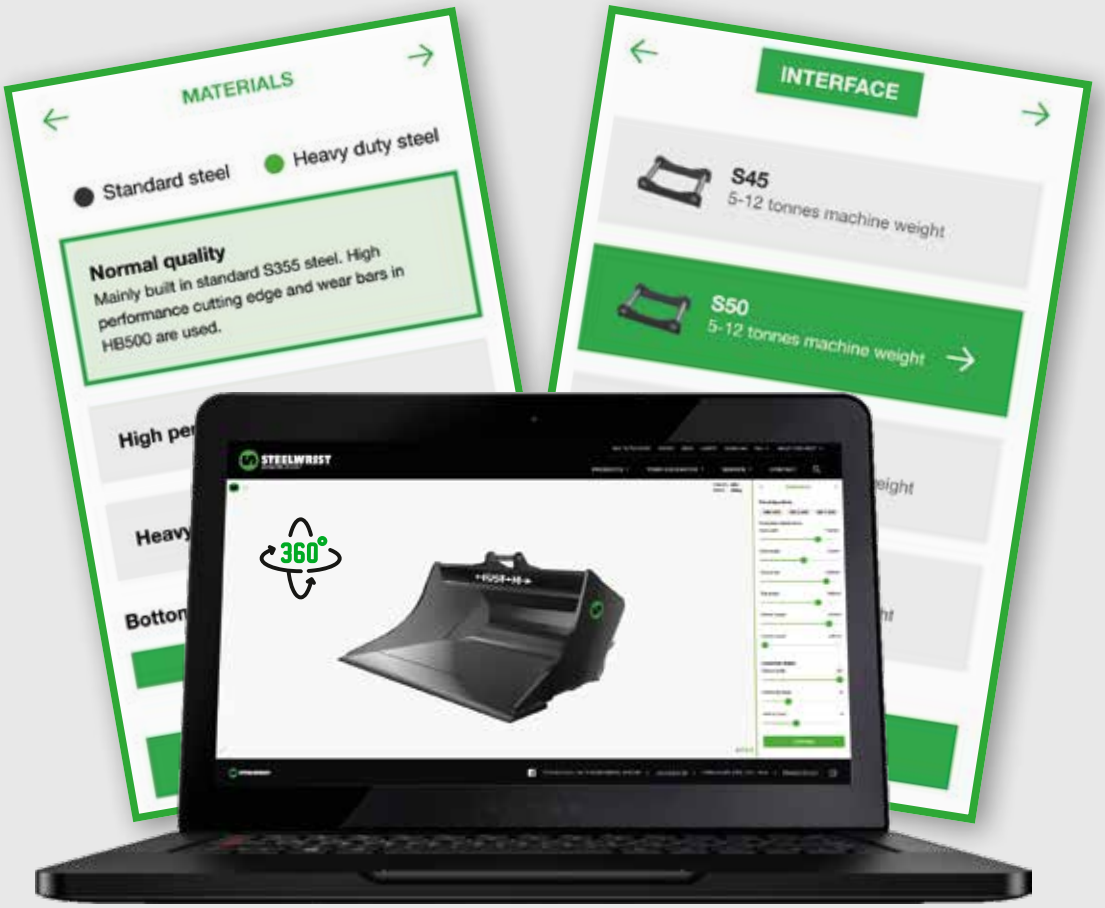
Design your own buckets!

If I only had that specific bucket shape then I would be able to do this job much faster... Ever had that feeling?

We know that many experienced operators may have specific needs! As a technology leading work tool supplier we have the tools available so that you can design your own custom built bucket online. Super easy!

Visit our homepage at steelwrist.com/custombuild and design your own bucket.

You can shape the bucket to your own desire, add teeth and determine material specifications. Price will adjust automatically depending on your choices. Once you have fixed the design and paid we will manufacture the bucket and ship it to the address of your choice.



steelwrist.com/custombuild/

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STEELWRIST SUPPORT

Fast service wherever you are

What do you do when the unexpected happens and something is broken?

- We train and support our dealers for the best service. This means that you get help as soon as something happens. If your dealer does not have the part in stock, we can dispatch from one of our regional warehouses.
- With the Quantum platform we can also connect to your system directly from our support line. Steelwrist support is built around a number of core concepts in order to give both end customers and Steelwrist dealers the best possible support, 24/7.
- With product registration you get two year warranty.

SUPPORT LINE
Our telephone and remote support organisation for end customers and dealers.

SERVICE PARTNERS
Both machine dealers and independent service partner. Our first line support locally in each market.

SUPPORT WEB
Available to all dealers and service partners. A comprehensive site with technical information.

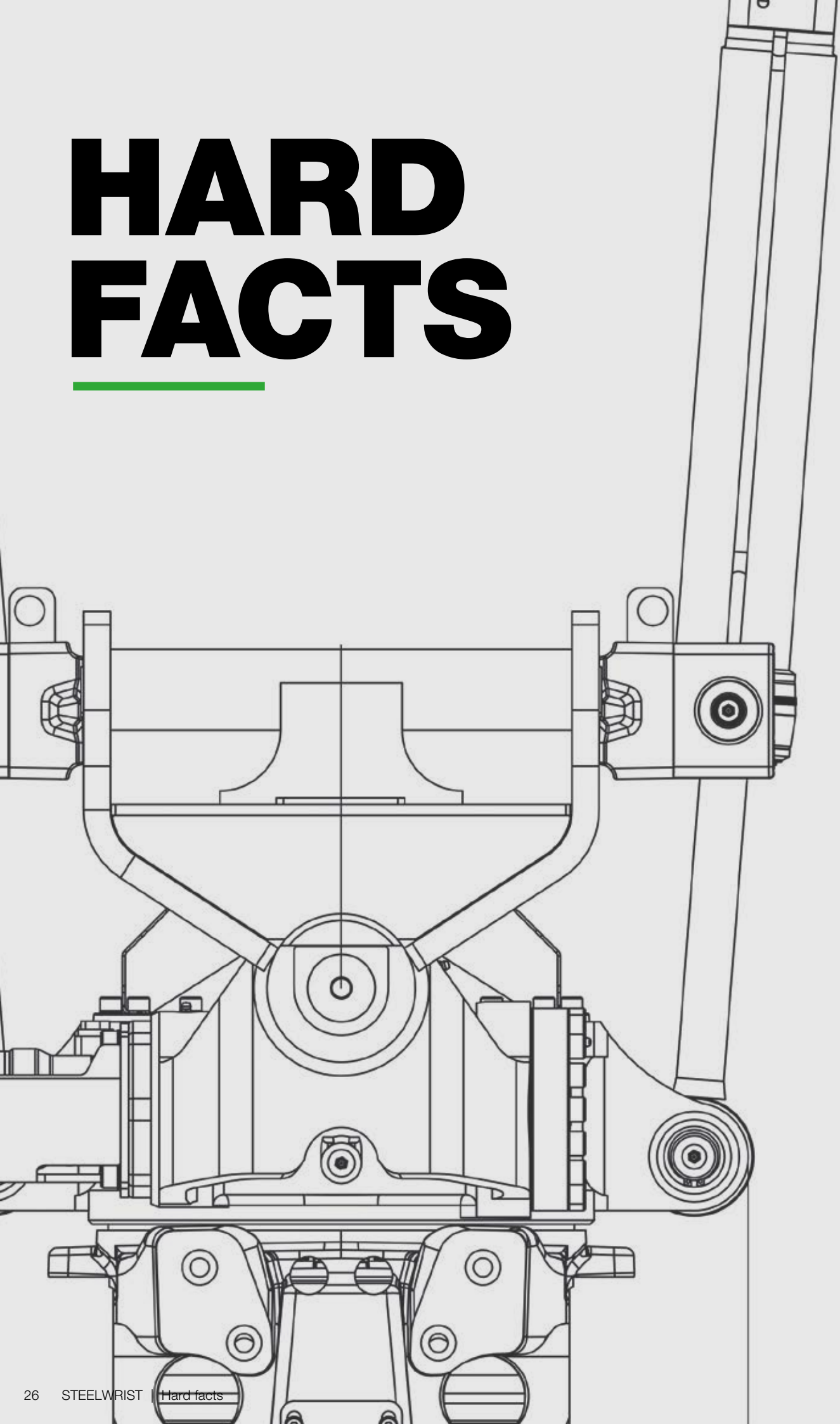
FULL SERVICE
Our refurbishment program at a fixed price.

APPLICATION TECHNOLOGY
Support for dealers and service partners. Available in each market.

SPARE PARTS MANAGEMENT
Shipment the same day from either local or central warehouses.

ACADEMY
Both onsite and online via the Support Web.

HARD FACTS



About tiltrotators

Although the tiltrotator was first invented in the late 1980's the technical development pace is today extremely high. The market penetration varies a lot between the most advanced markets where above 90 percent of all excavators have a tiltrotator, to start-up markets where only the true first movers looking for increased efficiency are active.

If you are an experienced user then you probably know what you want, but if you are in the process of investing in your first tiltrotator then here are some basic "good to know" facts that we hope will give you guidance to the best solution for you. Also check out "Ten tips when choosing a tiltrotator" on our homepage.

About quick coupler standards

The overall regulation for how quick couplers should be designed and controlled can be found in the standard ISO13031:2016, although local regulations may exist. ISO13031 divides quick couplers into three allowed types being Form-locked, Force-locked and Wedge-locked. Each type has its specific safety requirements.

Quick couplers can also be divided into Universal (force-locked) and Dedicated (may be form- or wedge-locked). The idea behind the Universal couplers is that they are supposed to pick up the excavator's original bucket. However since all excavator manufacturers have different linkage dimension (width, pin c-c distance and pin diameter) the universal couplers can often pick up buckets from several different manufacturers.

The advantage with universal quick couplers is that they are easy to start with. However, they normally have a high building height, are heavy with a relatively limited surface area to the bucket pin which normally increase wear, increase fuel consumption and reduce break out force at the tooth point. Several different types of Dedicated systems exist. They have in common that they are not trying to pick up the excavator's original bucket but instead all have a dedicated and standardized bucket interface. The advantage with dedicated couplers is that they are normally compact and lighter in design, however the bracket of the original bucket needs to be changed.

In more advanced markets where a dedicated standard is well established normally all buckets with new machines are delivered with standard coupler and a set of buckets with the corresponding bracket.

All Steelwrist products are available with interfaces following the symmetrical standard. However we also deliver products with the Dedicated Lehnhoff (HS) and Verachtert (CW). All SQ products follow the Open-S standard.

Symmetrical
Sandwich or Direct Fit

Universal
Direct Fit only

Lehnhoff
Sandwich or Direct Fit

Verachtert
Direct Fit only

Quick Coupler	Market area	Origin	Type	Standard	Function	Direct fit tiltrotator	Sandwich tiltrotator	Oil Couplings
Symmetrical	International	Scandinavia	Dedicated/ Wedge-locked	Open standard	Compact, light weight, growing internationally	Yes	Yes	Option (Open-S)
Universal	International	UK, Australia, New Zeeland	Universal/ Force-locked	N/A	Entry level coupler, high, heavy, important in Anglo-saxon markets	Yes	N/A	N/A
Verachtert CW	Mainly Holland and Belgium	Holland	Dedicated/ Wedge-locked	Verachtert/ Caterpillar	Heavy, safe	Yes	N/A	N/A
Bofors NTP	Finland	Sweden	Dedicated/ Wedge-locked	Open standard	Compact, need manual shiming, developed in 60's	Yes	Yes	N/A
Lehnhoff HS	Germany	Germany	Dedicated/ Wedge-locked	Lehnhoff/ Komatsu	Relatively compact, light weight - strong in Germany	Yes	Yes	Option

About Direct fit vs. Sandwich

Direct fit
In a direct fit configuration the tiltrotator is permanently mounted to the dipper arm of the excavator. Direct fit is common on compact excavators, and on couplers with high building height like CW and Universal.

Sandwich configuration
In a sandwich configuration the machine's quick coupler is first mounted on the dipper arm of the excavator. The top of the tiltrotator then has the same type of bracket as a bucket which means that it can be picked up with the machine's quick coupler.

This is often used for excavators of 14 ton and above and where work tools like hydraulic breaker is used frequently.

About Control Systems

In general two types of control systems exist for controlling the tiltrotator on an excavator. Four hose systems (or variants thereof) where the tiltrotator has on/off valves and the flow is controlled solely from the excavator. Four hose systems are often used for compact excavators as it is less costly and often good enough for the average compact excavator.

However the more demanding customers on mid size excavators often choose two hose systems because of the possibility to use all functions simultaneously, a more fine tuned solution.

In two hose systems the tiltrotator control systems takes care of it all.

Both four hose and two hose systems can be connected to Machine Control Systems like Leica, Topcon, Trimble, iDig and Novatron. The two hose systems are often further enhanced by adding joystick steering for both wheeled and tracked excavators, as well as boom swing control and blade control etc.

Four hose system

Excavator hydraulics	Tiltrotator (TR)			Comment
	Control System	Function	Valves in TR	
Circuit 1, dual direction, proportionally controlled from the excavator, original joysticks must have rollers or similar.	–	Rotation	On/Off (non directional)	Rotation controlled directly from the machine. Flow control depending on excavator hydraulics.
Circuit 2, dual direction, proportionally controlled from the excavator, original joystick must have rollers or similar.	On/Off control	Tilt	On/Off (non directional)	Tilt, extra functions and lock share the same circuit, and only one function can be used at the same time. Flow control depending on excavator hydraulics.
		Extra 1 (gripper option)	On/Off (non directional)	
		Extra 2 (work tools)	On/Off (non directional)	
		Coupler lock	On/Off (non directional)	

Two hose system

Excavator hydraulics	Tiltrotator			Comment
	Control System	Function	Valve type	
One circuit, single direction. Original joysticks will be replaced with Steelwrist joysticks with rollers.	Proportional control with compensation if several functions run simultaneously.	Rotation	Proportional (directional)	All functions can be used simultaneously.
		Tilt	Proportional (directional)	
		Extra 1 (gripper option)	Proportional (directional)	
		Extra 2 (work tools)	Proportional (directional)	
		Coupler lock	On/Off (non directional)	

About oil flow vs pressure drops

WE OFTEN GET QUESTIONS LIKE:

I have a work tool that needs 120 liters of oil, can I run it under the tiltrotator?

This is a more complicated question than it may seem at first glance. Let us walk you through the facts.

All hydraulic systems have internal resistance, which is correctly called pressure drop. Hydraulic systems with over-dimensioned hoses, large valves and straight channels have low internal resistance whereas hydraulic systems with under-dimensioned hoses, small valves and many sharp angles have higher internal resistance. The internal resistance in the system will define how much flow you can get through the system at any given pressure. So far quite straight forward and intuitive.

The relationship between pressure and flow is however exponential. If you want to increase flow you will need to increase the pressure exponentially. At very low flow, the additional pressure needed to get "X" liter in addition is not that much. However, in the same hydraulic system already at high flow, the pressure needs to be increased a lot in order to get the same amount of "X" in increased flow.

As a result it is possible to plot the relationship between pressure and flow. This will show how many liters per minute you can get through the system at a certain pressure level. For the sake of argument let's call this the Operating Limit Curve. We also need to add a second line describing the hydraulic pressure limit the machine can be used at. In most cases this pressure is always the same, independent of the flow. Let's call this one the Maximum Pressure Curve. The defined area in between the Operating Limit Curve and the Maximum Pressure Curve, is where the machine will work. Let's call this the Working area.

An example - let's say you have a maximum pressure of 200 bar and you rotate an hydraulic sweeper in the air as fast as you can. You would get 80 liters per minute through the system at point A. Now you engage the sweeper with the ground and start working.

Depending on how much you lower the boom and push the sweeper to the ground, the torque needed to the driver shaft of the sweeper increases. Let's say you push it so the motor needs 130 bar for the torque. The pressure needed for the work to be done, is only possible to reach at a flow of 40 liters per minute, at point B.

Since we started the sweeper in the air at full speed with maximum system pressure, workpoint A, the only way the hydraulic system can handle an increasing load is to reduce the flow. In this case, you have to control the boom lift so the sweeper does not stall and the flow in the system decreases to zero, workpoint C.

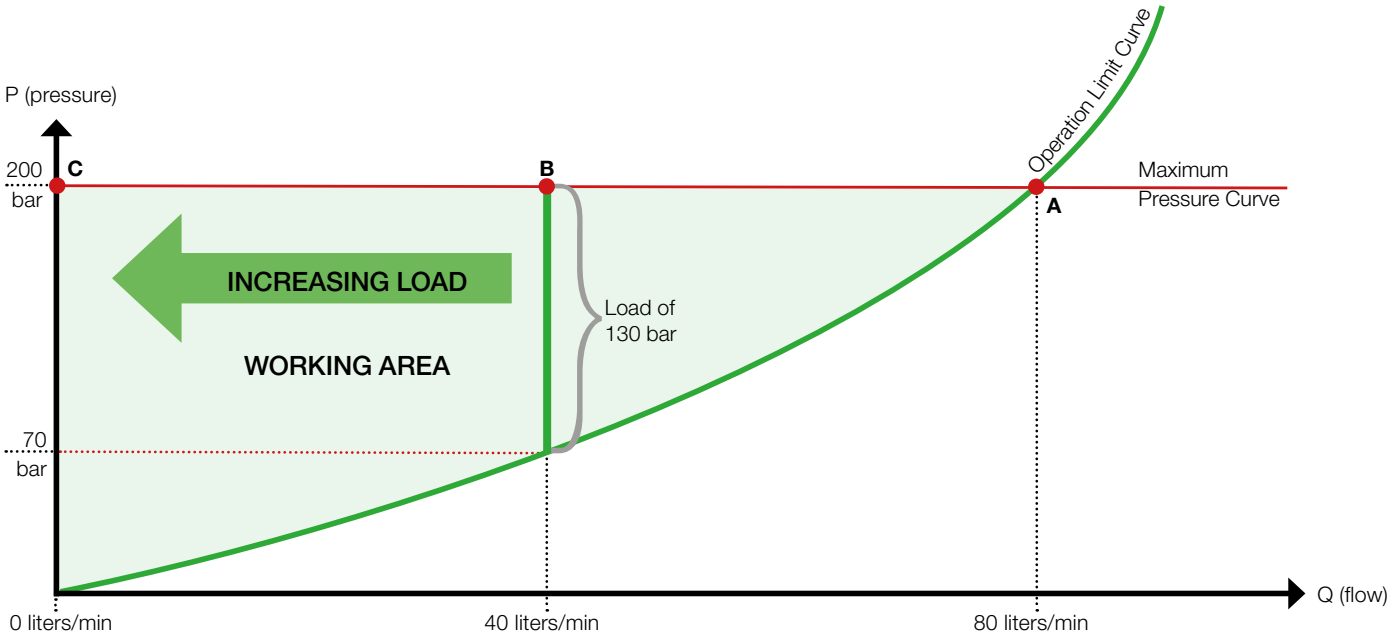
This is also applicable to a cylinder application and for example a gripper. If we are closing the gripper in the air with no load, with full speed, we will reach a flow of 80 liters per minute at point A. However, with increasing load to the gripper jaws the cylinder needs higher pressure to deliver a greater force. In most cases the point of using a gripper is to hold material as steady as possible which is achieved with maximum pressure in the cylinder - which is when the flow is down to zero.

It has to be mentioned that in practise using proportional valves and variable flow, you will end up with different workpoints, although limited by the defined working area.

So back to the original question. Is it possible to use the 120 liter tool below the tiltrotator? The answer is: '-It depends...'

Of course all work tools will move, but the question is how well the tool is matched against the capabilities of the machine as well as the match to the flow requirements of the work tool.

The Steelwrist High Flow Swivel will make the following available:
- 200 liters available at a pressure of 250 bar
- 150 liters available with a pressure drop of 40 bar



QUICK COUPLER											
Machine Weight [lbs]	0-4400	4400-13200	4400-13200	11000-26500	11000-26500	26500-44100	26500-44100	39700-70500	39700-70500	55100-94800	11000-26500
MODEL	**S30**	**S40**	**S40W**	**S45**	**S50**	**S60**	**S60W**	**S70**	**S70W**	**S80**	**S90**
Mechanical/Hydraulic	M/H	M/H	M/H	H	H	H	H	H	H	H	H
Building Height [inch]	3.2"	3.9"	4.7"	4.7"	4.7"	5.3"	6.7"	6.9"	7.9"	9.6"	10.4"
Weight from [lbs]	33	66	77	154	154	265	287	551	573	772	1543
Width [inch]	7.9"	7.9"	7.9"	11.4"	10.6"	13.4"	13.4"	17.7"	17.7"	23.2"	29.5"
Length [inch]	9.0"	11.8"	11.8"	16.9"	16.9"	18.9"	18.9"	23.6"	23.6"	26.4"	29.5"
Lifting hook [lbs]	1650	2200	2200	6600	6600	11000	11000	17700	17700	22000	33000
Front Pin Lock/Hook	Yes	Yes	Yes	Yes	Yes	Yes	Yes	Yes	Yes	Yes	Yes
Body	Casted	Casted	Casted	Casted	Casted	Casted	Casted	Casted	Casted	Casted	Casted
Shaft dia. dipper [inch]	1.0–1.4"	1.4–1.8"	1.4–2.0"	1.8–2.4"	1.8–2.4"	2.4–3.1"	2.4–3.1"	2.4–3.1"	2.7–3.5"	3.5–4.3"	3.5–5.1"
Width dipper arm [inch]	4.9	4.7–6.3	6.3–7.8	5.9–8.9	5.9–9.0	9.9–12.0	11.8–13.0	11.0–15.7	13.8–17.0	Max 18.9	Max 20.0
Pin distance [cc] [inch]	3.3–5.9	6.3–10.6	9.2–13.6	8.6–14.4	8.6–14.4	13.0–18.1	15.7–18.1	10.6–19.0	18.5–22.2	15.2–23.3	19.7–24.8

SQ COUPLER								
Machine Weight [lbs]	11000-28660	26500-41000	26500-41000	30900-48500	39700-72700	39700-72700	55100-94800	88200-154300
MODEL	**SQ50**	**SQ60-4**	**SQ60-5**	**SQ65**	**SQ70**	**SQ70/55**	**SQ80**	**SQ90**
Dimensions [same as]	S50	S60	S60		S70		S80	S90
Weight [lbs]	100	135	135	190	245	310	430	750
Couplings	5	4	5	5	5	6	6	9
3/8”	2	–	2 *	–	–	–	–	1
1/2”	3	2	1	2	2	2	2	3
3/4”	–	2	2	3	1	2	2	1
1”	-–	-–	–	–	2	2	2	4
Electrical Connector	Yes	Yes	Yes	Yes	Yes	Yes	Yes	Yes

* 1/4" Option in Germany

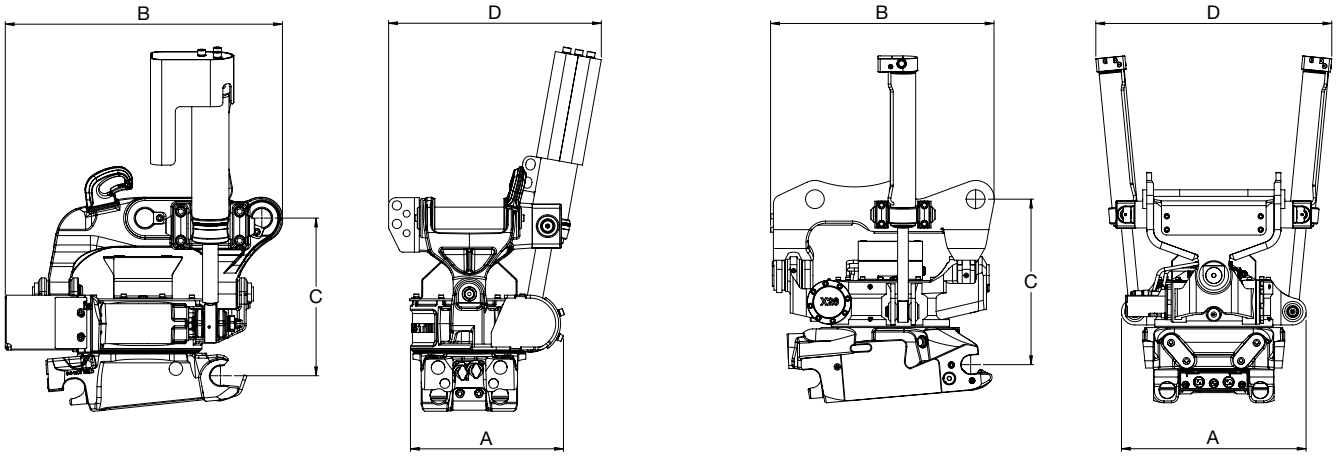
TILT COUPLER / TCX									
Max Machine Weight [lbs]	0–6600	4400–13200	11000–15400	11000–26500	11000–26500	26500–44100	26500–44100	39700–52900	39700–52900
MODEL	**TCX S30**	**TC050/ S40**	**TC070/ S40**	**TC100/ S45**	**TC100/ S50**	**TC180/ S60**	**TC180/ SQ60-5**	**TC240/ S70**	**TC240/ SQ70**
Weight [lbs]	62	209	320	463	463	794	838	1367	1433
Building Height [inch]	7.4"	14.0"	15.0"	17.5"	17.5"	19.4"	19.2"	23.5"	24.8"
Width [inch]	9.2"	8.6"	8.6"	12.2"	12.2"	15.5"	15.5"	19.6"	19.6"
Max tilt angle [degree]	±30°	±90°	±90°	±90°	±90°	±60°	±60°	±60°	±60°
Tilt Torque [kNm]	–	2.6	4.3	6.6	6.6	13.3	13.3	17.8	17.8
Holding Torque [kNm]	–	9.4	14.8	20.4	20.4	40.7	40.7	53.1	53.1
Required Oil Flow [gpm]	1.3–2.6	2.4–7.4	4.0–7.9	5.0–15.3	5.0–15.3	6.9–20.6	6.9–20.6	9.3–27.7	9.3–27.7
Lifting hook [lbs]	1.6	6.6	6.6	6.6	6.6	11.0	11.0	17.6	17.6
Max Circuit Pressure [psi]	2538	3900	3900	3900	3900	3900	3900	3900	3900
Bracket	S30	S40	S40	S45	S50	S60	SQ60-5	S70	SQ70

TILTROTATOR (VALUE WITH GRIPPER)										
Machine Weight [lbs]	2200-4400	4400-8800	8800-13200	11000-15400	15400-26500	22000-30900	26500-39700	35300-44100	39700-57300	55100-72700
MODEL	**X02**	**X04**	**X06**	**X07**	**X12**	**X14**	**X18**	**X20**	**X26**	**X32**
Upper coupler	**DF S30**	**DF S40 HS03**	**DF S40 HS03**	**DF S40 S45 S50**	**DF S45 S50 SQ50 HS08**	**DF S45 S50 SQ50**	**DF S60 SQ60-5 HS10**	**DF S60 SQ60-5 SQ65* HS10**	**DF S70 SQ70 SQ70/55 HS21**	**DF S70 SQ70 SQ70/55 S80 SQ80**
Attachment coupler Dedicated *(Not all can be combined with all upper couplers)*	**S30**	**S40 HS03 CW05**	**S40 HS03 CW05**	**S40 S45 S50 HS08 CW10**	**S45 S50 SQ50 HS08 CW10**	**S45 S50 SQ50**	**S60 SQ60-5 HS10 CW20**	**S60 SQ60-5 SQ65* HS10 CW20**	**S70 SQ70 S70/55 SQ70/55 HS21 CW30**	**S70 SQ70 S70/55 SQ70/55 CW40 S80 SQ80**
Max tilt angle [Degrees]	± 40	± 45	± 45	± 45	± 45	± 45	± 45	± 45	± 45	± 45
Req hydraulic oil flow [gpm]	4–	6–11	6–11	8–13	18–24	21–26	21–26	26–32	26–32	32–37
Max pressure [psi]	2538	3050	3050	3050	3050	3050	3050	3050	3050	3050
Hydraulic extra functions	1	1(0)	1(0)	1(0)	2(1)	2(1)	2(1)	2(1)	2(1)	2(1)
A. Width [inch]	16.9"	12.4" (18.1")	12.4" (18.1")	14.4" (22.4")	22.3" (22.7")	24.3" (25.0")	24.3" (28.2")	27.2" (28.2")	27.2" (31.8")	28.7" (31.8")
B. Length [inch]	10.2"	20.7" (25.3")	20.8" (25.3")	24.3" (31.1")	24.6" (30.1")	28.5" (32.0")	28.6" (37.5")	32.1" (39.5")	32.6" (43.9")	34.3" (45.9")
C. Building height from [inch]	10.2"	13.5"	13.5"	15.6"	16.7"	17.9"	18.0"	20"	21.1"	24.6"
D. Width cylinders [inch]	12.8"	19.6"	19.6"	20.1"	26.6"	27.0"	29.0"	28.9"	32.5"	36.9"
Weight from [lbs]	132	254 (333)	298 (377)	430 (553)	628 (767)	838 (977)	882 (1130)	981 (1228)	1257 (1515)	1852 (2110)
Gripper reach [inch]	–	(16.7")	(16.7")	(20.2")	(20.0")	(20.0")	(32.3")	(32.3")	(37.8")	(37.8")
Tilt force [kNm]	5.9	10.6	11.0	13.8	29.0	41.0	41.0	47.0	61.0	73.0
Rotation force [kNm]	1.9	3.9	4.9	5.2	5.4	7.8	7.8	8.8	8.8	9.8
Central Lubrication	–	Option	Option	Option	Option	Option	Option	Option	Option	Option
DATATAG	–	Option	Option	Option	Option	Option	Option	Option	Option	Option

All dimensions are depending on configuration.

* 39600–48500 lbs

Technical specifications



MULTI GRAPPLE					
Machine Weight [lbs]	2200-4400	6600–13200	13200–26500	17700–35300	41900–57300
MODEL	**MG12**	**MG20**	**MG25**	**MG32**	**MG40**
Load area [in²]	90	180	180	240	300
Gripper reach [inch]	79"	54"	59"	71"	76"
Gripper reach, smallest object [inch]	3.3"	2.1"	3.8"	3.8"	4.2"
Max Load [lbs]	2200	6600	11000	13200	15400
Weight [lbs]	121	423	688	904	1237
Gripper force [kN] [tip against tip]	5.9	12.5	17	21	25
Height [tip against tip] [inch/ft]	24.3"	33.2"	36.2"	3.6'	3.7'
Height [max open] [inch]	22"	29.4"	30.7"	37.4"	37.1"
Width [inch]	11.6	19.8	23.4	26.0	27.2
Bracket	S30	S40, S45, S50, S60, SQ50, SQ60-4, SQ60-5, CW05, CW10, HS03, HS08	S40, S45, S50, S60, SQ50, SQ60-4, SQ60-5, CW10, HS08	S50, S60, S70, SQ50, SQ60-4, SQ60-5, SQ65, SQ70, SQ70/55, CW30, HS10	S60, S70, SQ60-4, SQ60-5, SQ65, SQ70, SQ70/55, CW30, HS10

STONE AND SORTING GRAPPLE				
Machine Weight [lbs]	13200-26500	17700-35300	22000-44100	35300-57300
MODEL	**SG20**	**SG25**	**SG32**	**SG40**
Load area [in²]	180	1180	240	300
Gripper reach [inch]	49"	67"	72"	86"
Max Load [lbs]	6615	13227	15432	17363
Weight [lbs]	437	831	1191	1581
Gripper force [kN] [tip against tip]	10	15	20	25
Height [tip against tip] [inch/ft]	25.8"	33.4"	3.3'	3.7'
Height [max open] [inch]	19.7"	24.0"	34.0"	32.5"
Width [inch]	20.4	23.6	25.8	27.6
Bracket	S40, S45, S50, S60, SQ50, SQ60-4, SQ60-5, CW05, CW10, HS03, HS08	S40, S45, S50, S60, SQ50, SQ60-4, SQ60-5, CW10, HS08	S50, S60, S70, SQ50, SQ60-4, SQ60-5, SQ65, SQ70, SQ70/55, CW40, HS21	S70, SQ60-4, SQ60-5, SQ65, SQ70, SQ70/55, CW40, HS21

FINGER GRAPPLE				
Machine Weight [lbs]	13200-26500	17700-35300	22000-44100	35300-57300
MODEL	**FG20-5/ FG20-7**	**FG25-5/ FG25-7**	**FG32-5/ FG32-7**	**FG40-5/ FG40-7**
Load area [in²]	310	387,5	496	620
Gripper reach [inch]	54"	61"	72"	77"
Max Load [lbs]	6615	13227	15432	17363
Weight [lbs]	483/534	897/968	1389/1499	1596/1731
Gripper force [kN] [tip against tip]	10	15	20	25
Height [tip against tip] [inch/ft]	32.2"	34.5"	3.4'	3.5'
Height [max open] [inch]	27.0"	27.6"	34.0"	34.1"
Width [inch]	19.8"	26.5"	27.5"	29.7"
Bracket	S40, S45, S50, S60, SQ50, SQ60-4, SQ60-5, CW05, CW10, HS03, HS08	S40, S45, S50, S60, SQ60-4, SQ60-5, CW05, CW10, HS03, HS08	S50, S60, S70, SQ60-4, SQ60-5, SQ65, SQ70, SQ70/55, CW40, HS21	S60, S70, SQ60-4, SQ60-5, SQ65, SQ70, SQ70/55, CW30, HS10

Grapples = Max operating pressure [psi] 3600

COMPACTOR/VIBRO				
Machine Weight [lbs]	4400–13200	11000–26500	22000–48500	35300–66100
MODEL	**HC20**	**HC40**	**HC60**	**HC90**
Vibration Force [kN]	20	40	60	90
Vibration Frequency [Hz]	38	38	38	38
Weight [lbs]	551	853	1367	2136
Length [inch]	27.6"	33.5"	37.8"	40.8"
Width [inch]	16.1"	24.0"	27.6"	31.5"
Height [inch]	19.4"	21.3"	23.4"	25.3"
Load Area [inch^2]	418.5	806	1038.5	1519
Hydraulic Pressure [rec/max] [psi]	2200/3600	2200/3600	2200/3600	2200/3600
Hydraulic Flow [gpm]	7.9–13.2	15.9–21.1	23.8–31.8	31.8–37.0
Bracket	S40, S45, S50, S60, SQ50, SQ60-4, SQ60-5, CW05, CW10, HS03, HS08	S40, S45, S50, S60, SQ50, SQ60-4, SQ60-5, CW10, HS08	S60, S70, SQ60-4, SQ60-5, SQ65, SQ70, SQ70/55, CW30, HS10	S70, SQ60-4, SQ60-5, SQ65, SQ70, SQ70/55, SQ80, CW40, HS21

SWEEPER			
MODEL	**SW1000**	**SW1500**	**SW2000**
Width [ft]	3'-2"	4'-9"	6'-5"
Motor	Dual Motor Direct Drive	Dual Motor Direct Drive	Dual Motor Direct Drive
Mudflap	Standard	Standard	Standard
Flow requirements [gpm]	10.6–34.3	10.6–34.3	10.6–34.3
Integrated parking stand	Yes	Yes	Yes
Brush / Option	Bee-Line / Twisted core cartridge brushes		
Bracket	S45, S50, S60, S65, S70/55, SQ50, SQ60, SQ65, SQ70, SQ70/55, HS08, HS10, CW10, CW20		
Weight from [lbs]	507	617	771

BRUSH		
MODEL	**FB1800**	**FB2500**
Width [ft]	5'-9"	8'-1"
Bracket	S40, S45, S50, S60, S70	S60, S70
Weight from [lbs]	507	617

GRADING BEAM					
MODEL	**GR1250**	**GR1500**	**GR2000**	**GR2500**	**GR3000**
Width [ft]	4'-1"	4'-9"	6'-5"	8'-2"	9'-8"
Weight [lbs]	463	882	1058	1235	1411
Bracket	S40, S45, HS03, CW05	S40, S45, S50, HS03, CW05	S45, S50, S60, S65, S70/55, SQ65, SQ70/55, HS08, CW10, CW20	S60, S65, S70, S70/55, SQ65, SQ70/55, HS10, HS21, CW20, CW30-40	S60, S65, S70, S70/55, SQ65, SQ70/55, HS10, CW20, CW30-40

HYDRAULIC PALLET FORK	
MODEL	**HPF5000**
Width [ft]	4'-11"
Lifting capacity [lbs]	11000
Bracket	SQ50, S60, SQ60-4, SQ60-5, SQ65, SQ70, SQ70/55, SQ80

BUCKETS AND WORK TOOLS

Machine Weight [lbs]	**0–4400**	**0–4400**		**2200–6600**		**4400–8800**			**6600–11000**		**8800–13200**			**13200–17700**			**17700–**	
Bracket	S30*	S30*		S30*		S40, HS03			S40, HS03		S40, HS03			S45, S50, HS08			S45, S50,	
Grading bucket	**GB08**	**GB1**	**GB1**	**GB2**	**GB2**	**GB2**	**GB2**	**GB3**	**GB4**		**GB5**		**GB6**	**GB6**			**GB9**	
Volume [yd³] [ISO 7451]	0.05	0.08	0.10	0.12	0.13	0.12	0.13	0.2	0.26		0.33		0.39	0.39			0.47	
Volume [yd³] [SAE J296]	0.07	0.10	0.13	0.16	0.18	0.16	0.18	0.24	0.33		0.42		0.5	0.5			0.59	
Width [inch/ft]	27.6"	31.5"	3'-2"	35.4"	3'-2"	35.4"	3'-2"	3'-2"	3'-6"		3'-9"		4'-2"	4'-2"			4'-2"	
Weight [lbs]	88.8	110.2	143.3	143.3	165.3	154.3	176.3	220.4	297.6		374.8		429.9	462.9			540.1	
Digging bucket with teeth		**DB1T**		**DB2T**		**DB2T**	**DB2T**	**DB2T**	**DB3T**	**DB4T**		**DB5T**	**DB5T**	**DB5T**		**DB6T**	**DB6T**	**DB6T**	**DB9T**	**DB9T**
Volume [yd³] [ISO 7451]		0.05		0.09		0.05	0.09	0.13	0.13	0.18		0.25	0.27	0.34		0.22	0.27	0.37	0.21	0.27
Volume [yd³] [SAE J296]		0.07		0.11		0.08	0.11	0.16	0.16	0.24		0.31	0.34	0.43		0.28	0.35	0.46	0.27	0.35
Width [inch/ft]		15.7"		17.7"		11.8"	17.2"	23.6"	19.7"	23.6"		27.6"	29.5"	35.4"		23.6"	27.6"	35.4"	17.7"	23.6"
Weight [lbs]		99.2		121.2		110.2	132.2	165.3	187.4	242.5		297.6	319.6	352.7		319.6	341.7	418.9	407.8	462.9
Digging bucket	**DB08**	**DB1**		**DB2**		**DB2**	**DB2**	**DB2**	**DB3**	**DB4**		**DB5**	**DB5**	**DB5**		**DB6**	**DB6**	**DB6**	**DB9**	**DB9**
Volume [yd³] [ISO 7451]	30	0.05		70		0.05	70	100	100	140		190	210	260		170	210	0.37	160	210
Volume [yd³] [SAE J296]	0.05	55		85		60	85	125	120	180		240	260	330		215	265	355	205	265
Width [inch/ft]	15.7"	15.7"		17.7"		11.8"	17.7"	23.6"	19.7"	23.6"		27.6"	29.5"	35.4"		23.6"	27.6"	35.4"	17.7"	23.6"
Weight [lbs]	66.1	77.1		99.2		99.2	110.2	143.3	165.3	220.5		275.6	297.6	341.7		297.6	319.6	396.8	396.8	440.9
Cable/Trench bucket		**CB1**		**CB2**		**CB3**		**CB3C**		**CB3**	**CB3C**	**CB5**	**CB05**	**CB5**	**CB6**	**CB6C**	**CB6**	**CB6**	**CB9C**	
Volume [yd³] [ISO 7451]		0.03		0.04		0.07		0.07		0.07	0.07	0.08	0.12	0.13	0.13	0.10	0.13	0.14	0.10	
Volume [yd³] [SAE J296]	–	0.04		0.05		0.09		0.09		0.09	0.09	0.10	0.16	0.18	0.18	0.14	0.18	0.19	0.14	
Width [inch]		9.4"		11.4"		11.8"		15.7"/7.9"		11.8"	15.7/7.9"	11.8"	15.7"	17.7"	15.7"	15/11.8"	15.7"	17.7"	15.7"/7.8"	
Weight [lbs]		55.1		66.1		121.2		132.3		121.2	132.3	154.3	176.4	187.4	209.4	242.5	242.5	253.5	264.5	
Cable/Trench bucket with teeth				**CB2T**		**CB5T**				**CB5T**		**CB5T**		**CB5T**		**CB6TC**		**CB6T**	**CB12T**	
Volume [yd³] [ISO 7451]				0.04		0.13				0.13		0.08		0.13		0.10		0.14	0.20	
Volume [yd³] [SAE J296]	–	–		0.05		0.18				0.18		0.10		0.18		0.14		0.19	0.26	
Width [inch]				11.4"		17.7"				17.7"		11.8"		17.7"		15.0"/11.8"		17.7"	15.7"	
Weight [lbs]				88.2		209.4				209.4		165.3		209.4		242.5		264.5	496.0	
Utility bucket																				
Volume [yd³] [ISO 7451]																				
Volume [yd³] [SAE J296]]	–	–		–		–				–		–				–			–	
Width [inch/ft]																				
Weight [lbs]																				
V-ditch bucket				**VB2**		**VB3**				**VB4**		**VB4**		**VB6**		**VB8**			**VB8**	
Volume [yd³] [ISO 7451]	–	–		0.12		0.18				0.26		0.26		0.31		0.52			0.52	
Width [inch/ft]				35.4"/7.9"		3'-6"/7.9"				3'-9"/7.9"		3'-9"/7.9"		4'-1"/11.8"		5'-5"/11.8"			5'-5"/11.8"	
Weight [lbs]				143.3		264.5				429.9		429.9		463.0		639.3			639.3	
Sorting bucket				**SOB2**		**SOB3**				**SOB4**		**SOB4**		**SOB6**		**SOB8**			**SOB8**	
Volume [yd³]	–	–		0.17		0.17				0.26		0.26		0.39		0.48			0.48	
Width [inch/ft]				35.4"		35.4"				3'-2"		3'-2"		3'-9"		4'-2"			4'-2"	
Weight [lbs]				198.4		198.4				308.6		308.6		363.8		639.3			639.3	
Skeleton bucket				**SKB2**		**SKB4**				**SKB4**		**SKB4**				**SKB6**			**SKB8**	
Volume [yd³]	–	–		0.08		0.17				0.17		0.17				0.21			0.48	
Width [inch/ft]				19.7"		23.6"				23.6"		23.6"				31.5"			3'-2"	
Weight [lbs]				110.2		187.4				187.4		187.4				374.8			661.4	
Asphalt cutter						**AC5**				**AC5**		**AC5**				**AC10**			**AC10**	
Diameter [inch]	–	–		–		15.75"				15.75"		15.75"				18.50"			18.50"	
Thickness [inch]						0.31"				0.31"		0.31"				0.39"			0.39"	
Weight [lbs]						110.2				110.2		110.2				154.3			154.3	
Pallet fork						**PF2000**				**PF2000**		**PF2000**				**PF2500**			**PF2500**	
Lifting capacity [lbs]	–	–		–		4400				4400		4400				5500			5500	
Width [ft]						3'-9"				3'-9"		3'-9"				3'-9"			3'-9"	
Weight [lbs]						319.6				319.6		319.6				451.9			451.9	
Ripper		**RP30**		**RP30**		**RP40**				**RP40**		**RP40**				**RP45/RP50**			**RP45/RP50**	
Length [inch/ft]	–	26.38"		26.38"		27.95"				27.95"		27.95"				33.86"			33.86"	
Weight [lbs]		66.1		66.1		220.5				220.5		220.5				418.9			418.9	

* S30/180

26500	24300–28600		28600–33000						33000–35300		35300–39700				39700–48500		48500–72700		61800–94800		
HS08	S45, S50, HS08, S60		S60, HS10						S60, S65, HS10		S60, S65, HS10				S60, S70, S70-55, HS21		S70, S70-55, HS21		S80		
GB9	**GB12**	**GB12**	**GB14**						**GB15**		**GB17**				**GB20**		**GB25**	**GB30**	**GB30**	**GB35**	**GB40**
0.52	0.65	0.72	0.82						0.95		1.1				1.33		1.67	2.0	2.0	2.42	2.98
0.65	0.82	0.9	1.03						1.19		1.39				1.66		2.09	2.5	2.5	3.02	3.73
4'-6"	4'-6"	4'-9"	4'-9"						5'-2"		5'-5"				5'-9"		6'-2"	6'-5"	6'-5"	7'-2"	7'-8"
551.1	771.6	914.9	1300.7						1455.0		1631.4				2138.4		2623.4	3417.1	3527.3	4232.8	4828.0
DB9T	**DB9T**	**DB12T**	**DB12T**	**DB12T**	**DB13T**	**DB14T**	**DB14T**	**DB14T**	**DB14T**	**DB15T**	**DB15T**	**DB17T**	**DB17T**	**DB17T**	**DB17T**	**DB20T**	**DB20T**	**DB25T**	**DB30T**	**DB30T**	
0.34	0.46	0.33	0.48	0.56	0.60	0.29	0.35	0.67	0.90	0.77	1.16	0.43	0.75	0.86	1.07	0.94	1.15	1.44	1.63	1.63	
0.43	0.58	0.42	0.61	0.71	0.75	0.36	0.46	0.86	1.12	0.96	1.45	0.56	0.94	1.08	1.35	1.19	1.43	1.79	2.04	2.04	
27.6"	35.4"	23.6"	31.5"	35.4"	35.4"	17.7"	39.3"	3'-1"	3'-9"	3'-2"	4'-6"	4'-6"	35.4"	39.4"	3'-9"	3'-4"	3'-9"	4'-1"	4'-2"	4'-2"	
518.0	628.3	584.2	749.6	804.7	970.0	738.6	804.7	1135.4	1388.9	1212.5	1675.5	981.0	1300.7	1410.9	1587.3	2050.2	2314.8	2579.3	3328.9	3483.2	
DB9	**DB9**	**DB12**	**DB12**	**DB12**	**DB13**	**DB14**	**DB14**	**DB14**		**DB15**		**DB17**	**DB17**	**DB17**	**DB17**	**DB20**		**DB25**		**DB30**	
0.34	0.46	0.33	0.48	0.56	0.60	0.29	0.35	0.67		0.77		0.43	0.75	0.86	0.86	0.94		1.44		1.63	
0.43	0.58	0.42	0.61	0.71	0.75	0.36	0.46	0.86		0.96		0.56	0.94	1.08	1.08	1.19		1.79		2.04	
27.6"	35.4"	23.6"	31.5"	35.4"	35.4"	17.7"	23.6"	37.4"		3'-3"		23.6"	35.4"	3'-3"	3'-3"	3'-4"		4'-1"		4.3'	
496.0	606.2	529.1	683.4	738.6	870.8	694.4	727.5	1025.1		1113.3		903.9	1212.5	1300.7	1322.7	1785.7		2314.8		3218.7	
CB9		**CB12**			**CB15**		**CB15C**			**CB15C**		**CB17**				**CB20**		**CB25**	**CB30**	**CB30**	
0.16		0.20			0.30		0.18			0.18		0.35				0.43		0.56	0.77	0.77	
0.22		0.26			0.40		0.25			0.25		0.48				0.58		0.76	1.05	1.05	
15.7"		15.7"			19.7"		18.9"/11.8"			18.9"/11.8"		21.6"				23.2"		25.6"	31.5"	31.5"	
297.6		463.0			727.5		584.2			584.2		815.7				1212.5		1344.8	1741.6	1851.8	
CB12T		**CB12T**			**CB15T**					**CB15T**		**CB15T**				**CB15T**					
0.20		0.20			0.30					0.30		0.30				0.30					
0.26		0.26			0.40					0.40		0.40				0.40		–		–	
15.7"		15.7"			19.7"					19.7"		19.7"				19.7"					
496.0		496.0			804.7					804.7		804.7				804.7					
–		–			**UB15**		**UB15**			**UB15**		**UB17**				**UB20**		**UB25**	**UB30**	**UB30**	
					0.47		0.47			0.47		0.60				0.76		0.82	1.03	1.03	
					0.65		0.65			0.65		0.82				1.07		1.12	1.41	1.41	
					27.5"		27.5"			27.5"		31.5"				35.4"		35.4"	3'-2"	3'-2"	
					925.9		925.9			925.9		1102.3				1212.5		1455.0	1675.5	1675.5	
VB8		**VB8**			**VB15**					**VB15**		**VB15**				**VB20**		**VB20**			
0.52		0.52			0.65					0.65		0.65				0.78		0.78		–	
5'-5"/11.8"		5'-5"/11.8"			5'-7"/11.8"					5'-7"/11.8"		5'-7"/11.8"				6'-5"/13.8"		6'-5"/13.8"			
639.3		639.3			859.8					859.8		859.8				1256.6		1256.6			
SOB8		**SOB8**			**SOB14**		**SOB15**			**SOB15**		**SOB17**				**SOB20**		**SOB25**		**SOB25**	
0.48		0.48			0.85		0.98			0.98		1.18				1.44		1.83		1.83	
4'-2"		4'-2"			5'-2"		5'-2"			5'-2"		6'-5"				6'-5"		6'-5"		6'-5"	
639.3		639.3			970.0		1388.9			1388.9		1543.2				2028.2		2314.8		2491.2	
SKB8		**SKB8**			**SKB14**																
0.48		0.48			0.81					–		–				–		–		–	
3'-2"		3'-2"			4'-2"																
661.4		661.4			1168.4																
AC10		**AC10**			**AC15**					**AC15**		**AC15**				**AC20**		**AC20**			
18.50"		18.50"			18.50"					18.50"		18.50"				18.50"		18.50"		–	
0.39"		0.39"			0.39"					0.39"		0.39"				0.39"		0.39"			
154.3		154.3			220.5					220.5		220.5				352.7		352.7			
PF2500		**PF2500**			**PF5000**					**PF5000**		**PF5000**				**PF5000**		**PF5000**			
5500		5500			11000					11000		11000				11000		11000		–	
3'-9"		3'-9"			3'-9"					3'-9"		3'-9"				3'-9"		3'-9"			
451.9		451.9			727.5					727.5		727.5				881.8		881.8			
RP45/RP50		**RP45/RP50**			**RP60**					**RP60**		**RP60**				**RP70**		**RP70**			
33.86"		33.86"			3'-4"					3'-4"		3'-4"				4'-1"		4'-1"		–	
418.9		418.9			749.6					749.6		749.6				1410.9		1410.9			

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