

User manual

MACHINE HITCH

S30 | S40 | S45 | S60 | S70 | S80



Article 9000705 | Version 1.12 | 2025-11-26



Preface

Dear Customer,
Thank you for choosing a product from engcon.

engcon is the market leader in tiltrotators and tools for excavators. We represent innovation, knowledge and experience, and we develop our products with a focus on the customer's needs. Please visit our website for contact information and details about the rest of our product range.

www.engcon.com

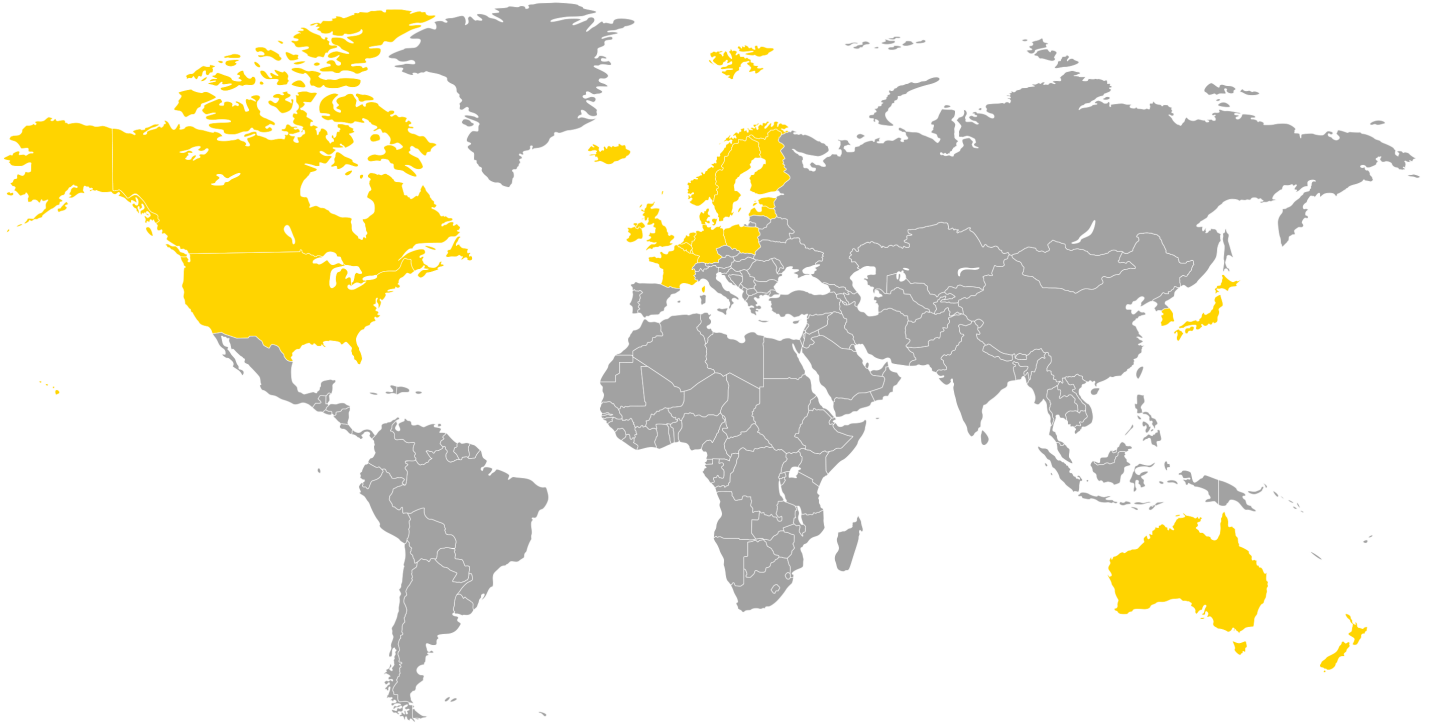


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1. Introduction

1.1. General

This user manual contains important information about your product's functions and characteristics, and how to use it in the best way. Before you begin using the product, it is important that you read and understand the content of these instructions, especially the sections that address safety.

In addition to these instructions, you must study and understand the applicable safety information for the relevant base machine as well as any other equipment involved.

The user manual is supplied with supplementary documentation providing more detailed descriptions of the installation, fitting, operation and maintenance of control systems and custom modifications for your specific product.

Information, images, illustrations and specifications used in the instructions are based on product information that was available at the time of going to press. Images and illustrations used in the instructions are typical examples and not intended to be exact depictions of various parts of the product. We reserve the right to make changes without prior notice.

Always store the user manual together with any other supplementary information in a safe manner and such that it is always available.

1.2. Scrapping and recycling

engcon makes constant efforts to reduce its environmental impact. engcon's products comprise at least 99 per cent recyclable material. All assembly and service work must take place in compliance with legislation and ordinances governing the environment, health and occupational safety. This refers to all work with residual materials including handling, storage and processing. To prevent contamination of soil and water, spillages must be avoided. Should a spillage occur, it must be dealt with.

Hazardous waste may only be disposed of by those authorised to do so. All waste produced must be disposed of in compliance with applicable legislation and ordinances:

- Metal and plastics to be recycled.
- Hydraulic hoses are normally used for energy recovery (sort as hazardous waste).
- Oils and greases are normally used for energy recovery (sort as hazardous waste).
- Electronic components to be recycled for materials (sort as hazardous waste).
- Packaging to be sorted at source and recycled for materials.
- Paper to be sorted at source and recycled for materials.

If in doubt, contact the environmental manager at engcon.

1.3. Transport and storage

There are no lifting or attachment points on the machine hitch. For haulage, transportation or handling, the machine hitch must be strapped to a pallet.

1.4. Warranty

This product was designed, dimensioned and manufactured by engcon. It is forbidden to modify, alter or convert this product such that it no longer corresponds to the manufacturer's specifications. When replacing parts or making repairs, contact an authorized workshop.

Warranty: One (1) year providing the product has not been subjected to abuse or other abnormal operation.

1.5. Technical support and spare parts

Contact information for support and spare parts can be found at www.engcon.com.

1.6. Product approval

1.6.1. EU Declaration of Conformity

Manufacturer: engcon Nordic AB - Industricentragatan 4, 833 93 Strömsund, Sweden

THE OBJECT OF THE DECLARATION DESCRIBED BELOW CONFORMS WITH

Directive: Machinery Directive 2006/42/EU, EMC Directive 2014/30/EU.

Type designation:

Part no:	Serial No:
Max jacking point:	Max hydraulic pressure:
Date:	Other:

Harmonised standards

SS-EN ISO 12100:2010	SS-EN 474-1:2022
SS-EN 474-5:2022	SS-ISO 13031:2016
SS-ISO 20474-1:2017	SS-ISO 20474-5:2017

The standards and regulatory directives have been applied and the product complies with the requirements for CE marking. This declaration and engcon's warranties will cease to be valid immediately if spare parts other than engcon original spare parts are used, or if any changes or other interventions are made without engcon's permission.

SIGNED FOR AND ON BEHALF OF



Krister Blomgren – Signatory, engcon Nordic AB
Strömsund, 2025-11-04

Qualified person authorised to compile the technical documentation:

Fredrik Jonsson, Head of R&D, engcon AB

1.6.2. Type certification for lifting hook

The following certification is valid for machine hitches supplied with a lifting hook.



TYPE CERTIFICATE

Application of
Council Directive 2006/42/EC

CERTIFICATE NO.: **20-MAL-CM-0101**
SUPERSEDES CERTIFICATE NO.: **15-SKM-CM-0115**

THIS IS TO CERTIFY THAT THE PRODUCT

Safety hooks

WITH THE TYPE DESIGNATION

**Safety hook U200, U201, U202, U203, U204, U206,
U208, C201, C202, C203, C204, C205, C206, C208,
C210, C218**

MANUFACTURED BY

PEJO AB

IN

Sweden

is found to comply with the relevant Essential Health and Safety Requirements in Annex I of 2006/42/EC
and standards EN ISO 12100:2010

Conformity assessment documented in
Report No.: 20-MAL-CM-0101

This Certificate is valid until 20250226.

MALMÖ, 20200226
Kiwa Inspecta AB

A handwritten signature in black ink, appearing to read "Jörgen Skarphagen".

Jörgen Skarphagen
Certification Engineer

Notice: Any significant changes in design or construction of the product, or amendments to the Directive 2006/42/EC (AFS 2008:3) or standards referenced above may render this receipt invalid. The product liability rests with the manufacturer or his representative in accordance with the Directive 2006/42/EC.

Kiwa Inspecta AB – Box 7178 170 07 Solna Sweden Phone: (+46) 10 479 3000 www.kiwa.se

2. Safety

2.1. General

It is important that you read and understand all warnings prior to installation work on this product or before you use it and any accessories supplied. The warning texts highlight potential risks and describe how to avoid them. The following warning levels are used in this user manual:

**DANGER**

Indicates that an accident will occur if the regulation is not followed.
Risk of personal injury or death.

**WARNING**

Indicates that an accident may occur if the regulation is not followed.
Risk of personal injury or death.

**CAUTION**

Indicates that an accident may occur if the regulation is not followed.
Risk of personal injury.

IMPORTANT

Indicates that an accident may occur if the regulation is not followed. Risk of damage to property, process or the surroundings.

REMARKS

Specifies additional information that may make performance or understanding of specific operations easier.

3. Design and function

3.1. General

The engcon machine hitch is mounted on the excavator's stick. The machine hitch renders tool attachment and detachment more efficient.

**DANGER**

Do not exceed tipping load limits. The weight of the product and the increased reach may impair stability. Risk of personal injury and damage to property.

3.2. Q-Safe

Q-Safe is a warning system that monitors the connection of tools to the machine quick hitch and/or the quick hitch beneath the tiltrotator. It has a double mechanical lock to prevent the tool coming loose from the hitch, even if some part of the locking system should fail. The alarm outputs are connected to a QLM module mounted on the stick. It uses sound and light warning signals when a tool is incorrectly connected, as the primary safety purpose of the quick hitch is to protect personnel nearby. The operator must inform personnel concerned what the alarms mean.

**WARNING**

Stop work immediately and begin troubleshooting if the system warns of a faulty tool connection during operation. Risk of personal injury and damage to property.

**CAUTION**

Use hearing protection when in close proximity to or operating the Q-Safe machine hitch when connected. Risk of hearing loss.

3.2.1. Overview

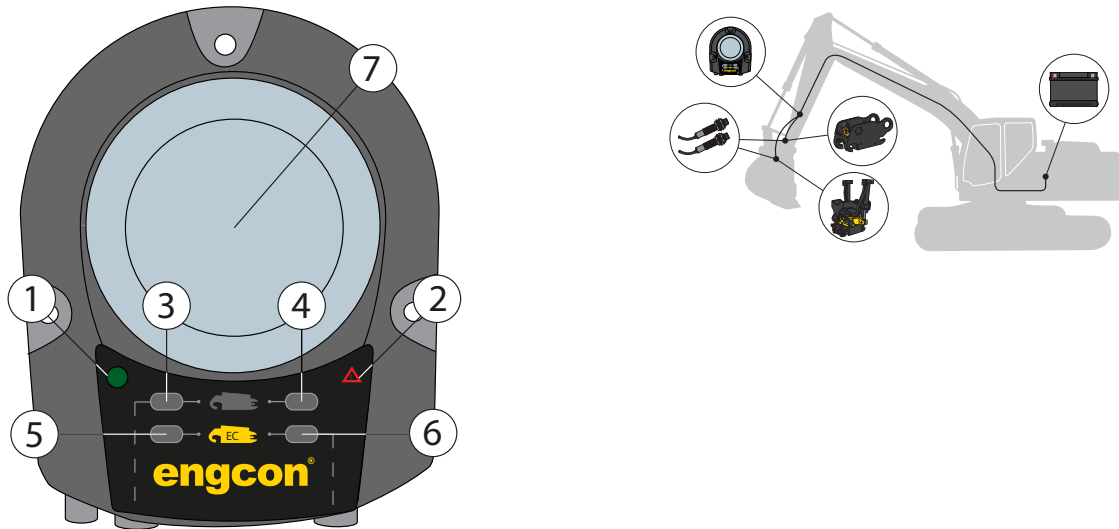


Figure 1.

Position	Description
1	Power supply
2	Alarm indication
3	Sensor, machine hitch hook
4	Sensor, machine hitch ejector
5	Sensor, quick hitch hook
6	Sensor, quick hitch ejector
7	Warning lamp

Table 1.

For indications, see section 7.1.1. Indications.

3.3. EC-Oil

engcon's system for more efficient tool changes. It provides the ability to switch hydraulic tools without leaving the cab. The system is designed for maximum reliability in harsh environments. It is a fully hydraulic system that handles the connection of tools under full system pressure.

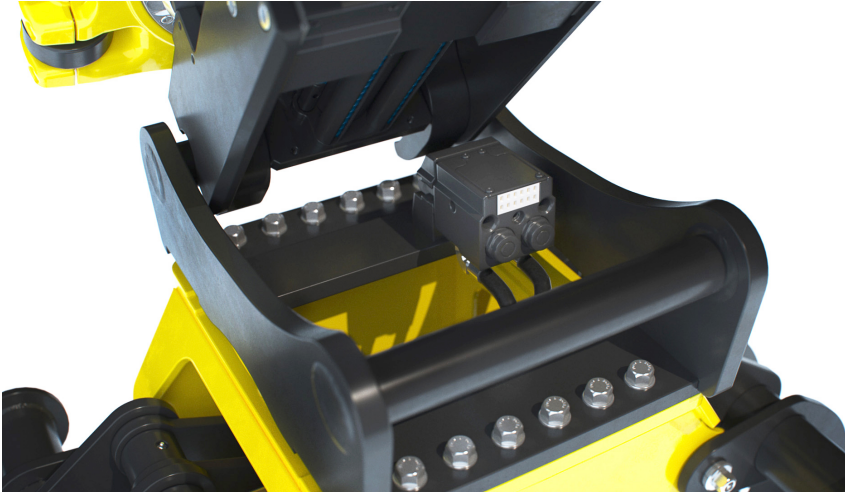


Figure 2.

4. Installation

It is important to check the necessary additional documentation before installation. At time of delivery, your product and supplementary documentation are as far as possible adapted to your base machine.

**WARNING**

Never attempt to increase the maximum capacity of the equipment by modifications not approved by the supplier. Risk of personal injury and damage to property.

**WARNING**

Welding is not permitted. It can have a negative impact on safety. Risk of personal injury and damage to property. For welding, contact your dealer or engcon Nordic AB.

**WARNING**

Beware of moving parts. A lack of awareness may lead to crush injuries. Risk of personal injury.

IMPORTANT

Ensure miscibility with the base machine's hydraulic oil prior to installation. If you are in any doubt, contact your lubricant supplier. An incorrect mixture could damage hydraulic components.

4.1. Identification

Check that your product's rating plate matches the information according to 1.6.1. EU Declaration of Conformity. If there is any deviation, contact the supplier before you begin initial installation.

Rating plate content:

Part number
Type designation
Serial number
Year of manufacture
Weight
Max jacking point
Max hydraulic pressure

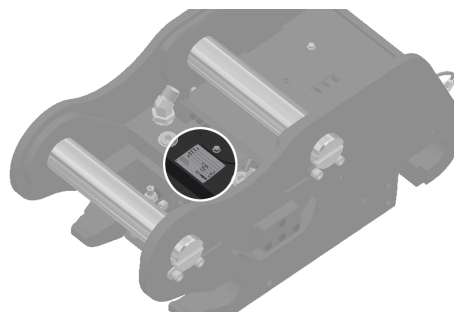


Figure 3.

4.2. Locking hydraulics

The following mounting and installation instructions assume the excavator to be equipped with the appropriate locking hydraulics. If the base machine does not have locking hydraulics, contact engcon for reference to the recommended installation kit.

**DANGER**

Do not exceed tipping load limits. The weight of the product and the increased reach may impair stability. Risk of personal injury and damage to property.

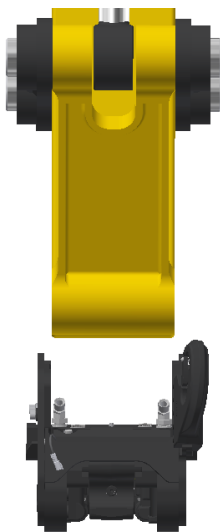
**WARNING**

If you have any doubts concerning the safety aspects of your knowledge, the equipment or work, contact a dealer or engcon Nordic AB. Incorrect installation affect safety.

IMPORTANT

Assembly and installation may only be carried out at a workshop authorised by the manufacturer. Changes to the assembly may not be carried out without the manufacturer's consent.

4.3. Attaching the machine hitch

**Before installation**

Check the tipping load limits. Take the product's weight and the increased reach into account. Installation may make it necessary to reduce the capacity of the tool.

Position the base machine and machine hitch on a flat, non-slip surface. Make sure the product is upright and in line with the stick and the dog bone linkage.

Figure 4.

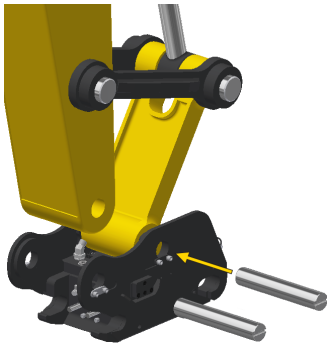


Figure 5.

Installation

1. Fit any O-rings if such must be used.
2. Position the dog bone linkage to align with the appropriate holes in the machine hitch.
3. Shim the width if necessary.
4. Insert the intended shaft journal.
5. Fit the shaft journal lock and make sure it locks correctly.

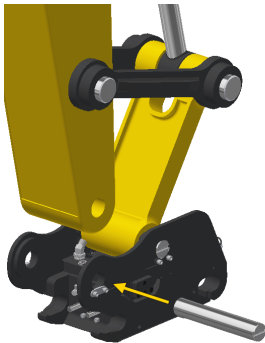


Figure 6.

6. Position the stick so that it is aligned with the appropriate holes in the machine hitch.
7. Lower the stick carefully; make sure that no shear forces occur.
8. Shim the width if necessary.
9. Apply plenty of grease in the cavity and bushings.

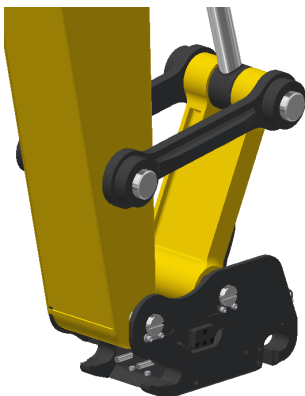


Figure 7.

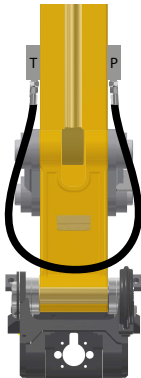
IMPORTANT

Fill the bushings and the cavity in the stick with grease. Central lubrication only provides top-ups.

10. Insert the intended shaft journal.
11. Fit the shaft journal lock and make sure it locks correctly.

4.4. Electrical and hydraulics

4.4.1. Filter the hydraulic oil



1. Connect the pressure (P) and return (T) lines on the excavator.
2. Run the hydraulic oil through the excavators oil filter for approximately 3 minutes to make sure that the hoses and pipes are clean.

IMPORTANT

Maintenance and repair of the electrical system may only be carried out by professionally qualified persons.



WARNING

Switch off power when working on the electrical system and remove any live objects before starting work Risk of personal injury.



WARNING

Be meticulous with the insulation of electrical conductors and components when installing/fitting electrical equipment. Short circuits in electrical wiring can result in fires.

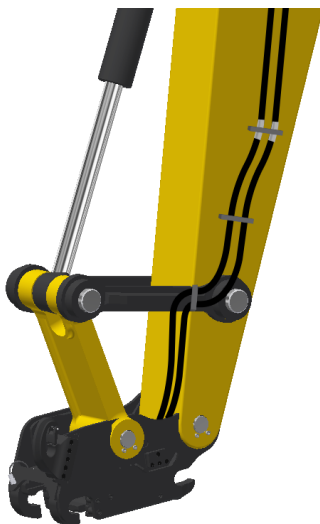


Figure 8.

4.4.2. Installing hydraulic hoses

Make sure hose lengths are such that they do not hang too much or are stretched when tilting the product.
Fit the hydraulic hoses as shown in Figure 8.

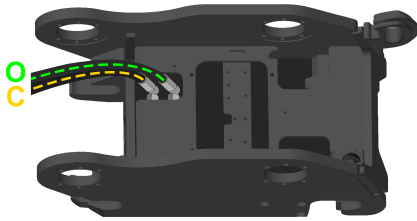


Figure 9.

**WARNING**

The hydraulic system must be de-pressurised before work on the system is begun. Risk of personal injury and damage to property.

Minimum supply pressure for lock hydraulics is 22 MPa (220 bar). Observe maximum supply pressure. See Chapter 9. Technical data. As far as possible, use free return to tank. The back pressure in the return line should not exceed 2.5 MPa (25 bar).

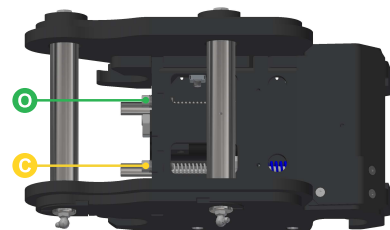


Figure 10.

For EC-Oil S30 (DC2)

Install the hydraulic hoses according to Figure 10.

- Close (C)
- Open (O)

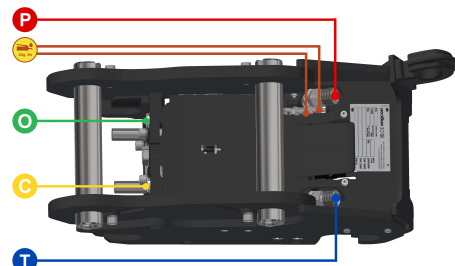


Figure 11.

For EC-Oil S40 (DC2)

Install the hydraulic hoses according to Figure 11.

- Close (C)
- Open (O)
- Tank (T)
- Pressure (P)
-  Central lubrication

Option no hyd. for EC-Oil S40 (DC2)

Install the hydraulic hoses according to Figure 12.

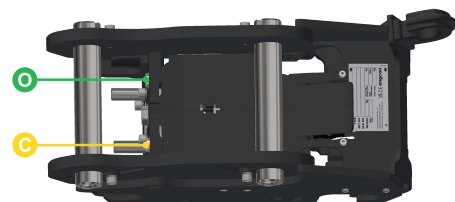


Figure 12.

- Close (C)
- Open (O)

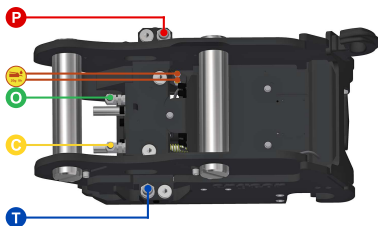


Figure 13.

For EC-Oil S45 (DC2)

Install the hydraulic hose according to Figure 15.

- Close (C)
- Open (O)
- Tank (T)
- Pressure (P)
-  Central lubrication

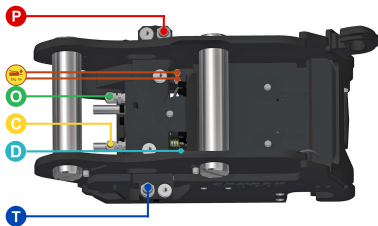


Figure 14.

Option 5 hyd. for EC-Oil S45 (DC2)

Install the hydraulic hose according to Figure 15.

- Close (C)
- Open (O)
- Drain (D)
- Tank (T)
- Pressure (P)
-  Central lubrication

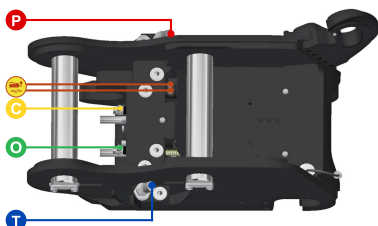


Figure 15.

For EC-Oil S60 (DC2)

Install the hydraulic hose according to Figure 15.

- Close (C)
- Open (O)
- Tank (T)
- Pressure (P)
-  Central lubrication

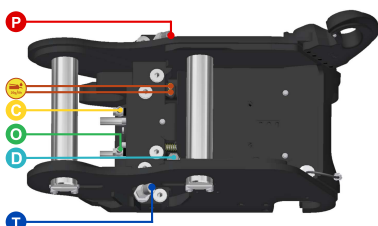


Figure 16.

Option 5 hyd. for EC-Oil S60 (DC2)

Install the hydraulic hoses according to Figure 16.

- Close (C)
- Open (O)
- Drain (D)
- Tank (T)
- Pressure (P)
-  Central lubrication

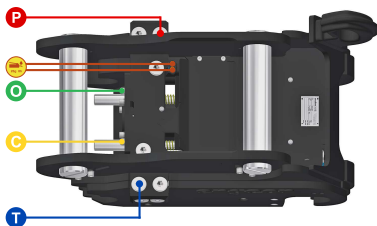


Figure 17.

For EC-Oil S70 (DC2)

Install the hydraulic hoses according to Figure 17.

- Close (C)
- Open (O)
- Tank (T)
- Pressure (P)
- Central lubrication

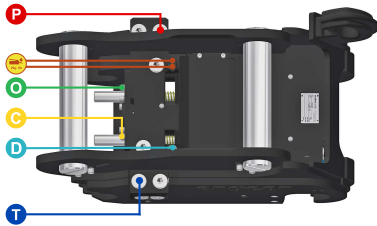


Figure 18.

Option 5 hyd. for EC-Oil S70 (DC2)

Install the hydraulic hoses according to Figure 18.

- Close (C)
- Open (O)
- Drain (D)
- Tank (T)
- Pressure (P)
- Central lubrication

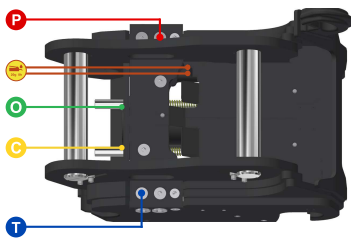


Figure 19.

For EC-Oil S80 (DC2)

Install the hydraulic hoses according to Figure 13.

- Close (C)
- Open (O)
- Tank (T)
- Pressure (P)
- Central lubrication

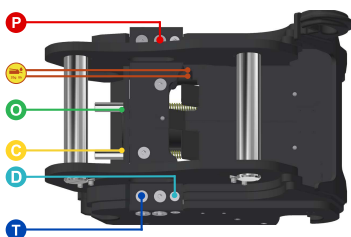


Figure 20.

Option 5 hyd. for EC-Oil S80 (DC2)

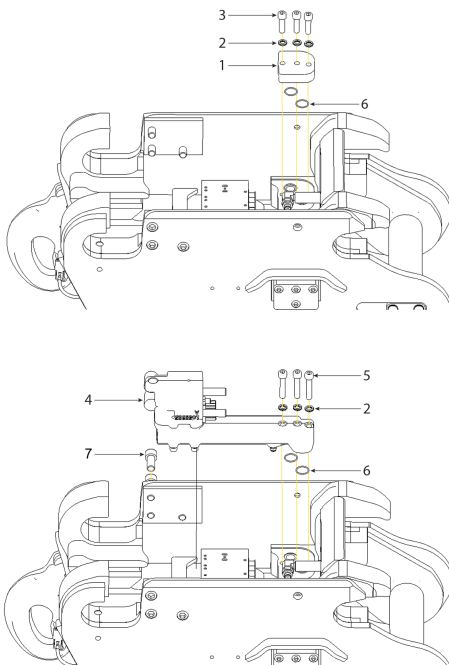
Install the hydraulic hoses according to Figure 14.

- Close (C)
- Open (O)
- Drain (D)
- Tank (T)
- Pressure (P)
- Central lubrication

4.5. EC-Oil

REMARKS

Applies to retrofitting of ec-oil block.



1. Remove the cover and its associated bolts and washers.

2. Install the connection block and its associated bolts and washers with tightening torque 79Nm.

4.5.1. S45

Position	Part number	Description
1	1073648	Covering plate S45
2	611040	Washer NL 8mm
3	6000143	Screw MC6S M8x25 12.9 ZFSL
4	1078272	Block ECO45 W-S45-quick hitch
5	611597	Screw MC6S M8x50H 12.9 Geomet ISO4762
6	710912	O-ring 15,6x1,78
7	6000164	Screw MC6S M12x25 12.9 ZFSL

4.5.2. S60

Position	Part number	Description
1	1071029	Cover plate S60 - without ECO-block
2	611041	Washer NL10-DPE 10,7x16,6x2,7
3	612019	Screw MC6S 10x35 12.9 ZFSL ISO4762
4	1071930	Block ECO60 W-S60-quick hitch

Position	Part number	Description
5	612022	Screw MC6S 10x55 12.9 ZFSL ISO4762
6	7001829	O-ring 21,95x1,78 NBR 90 shore
7	6000197	Screw MC6S M14x30 12.9 ZFSL

4.5.3. S70

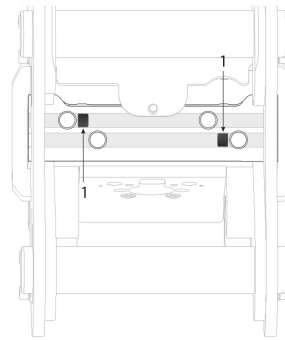
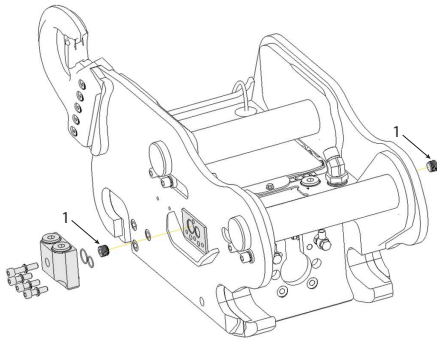
Position	Part number	Description
1	1073694	Covering plate S70
2	611041	Washer NL 10mm
3	6000195	Screw MC6S M10x25 12.9 ZFSL
4	1074950	Block ECO70 W-S70-quick hitch
5	6000110	Screw MC6S M10x70 12.9 ZFSL
6	7001901	O-ring 31,47x1,78
7	6000201	Screw MC6S M16x30 12.9 ZFSL

4.5.4. S80

Position	Part number	Description
1	1080105	S80 ECO80 Cover Plate
2	611042	Washer NL 12mm
3	6000454	Screw MC6S M12x45 12.9 ZFSL
4	1080053	Block ECO80 W-S80-QH -3hy right
5	6000148	Screw MC6S M12x80 12.9 ZFSL
6	7002057	O-ring 34,65x1,78
6	7001829	O-ring 21,95x1,78
7	6000410	Screw MC6S M16x35 12.9 ZFSL

4.5.5. Direct feed

In the case of direct feed to a separate function via the right EC-Oil block, the connection block must be plugged.



4.5.5.1. S45

Position	Part number	Description
1	711522	Pipe Plug DIN 906 3/8" 180154

4.5.5.2. S60

Position	Part number	Description
1	711524	Pipe Plug DIN 906 1/2" 180156

4.5.5.3. S70

Position	Part number	Description
1	7000261	Pipe Plug DIN 906 3/4"

4.5.5.4. S80

Position	Part number	Description
1	1082524	Plug direct feed S80

4.6. Q-Safe



See separate installation instructions.
Also available on the website or by contacting engcon.

4.7. On completion

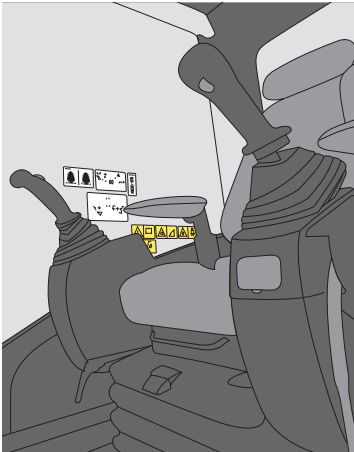


Figure 21.

1. Affix the warning decal supplied in a conspicuous place that does not distract the operator.



WARNING

Replace damaged or illegible signs and decals before using the machine. Risk of personal injury and damage to property.

2. Carry out a function check; contact your service partner.
 - Run all the tool functions a few times to remove any air from the system. Important for preventing uncontrolled movement.
 - Check that the machine hitch works. Activate the quick hitch lock.
 - Check that the hoses are not subjected to pinching, cutting or stretching.

5. Operation

5.1. Before using

Check your base machine manufacturer's recommendations for calculating tipping loads, and be sure to include the increased weight and reach the product entails.

**DANGER**

Do not exceed tipping load limits. The weight of the product and the increased reach may impair stability. Risk of personal injury and damage to property.

The machine hitch may only be used with the brackets and tools it is designed for.



See additional information in the separate user manual for each tool.

**WARNING**

Take care when handling long objects. Take dynamic load and the extended risk area into account. Risk of personal injury and damage to property.

**WARNING**

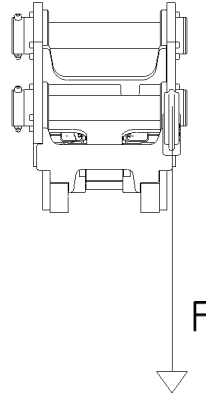
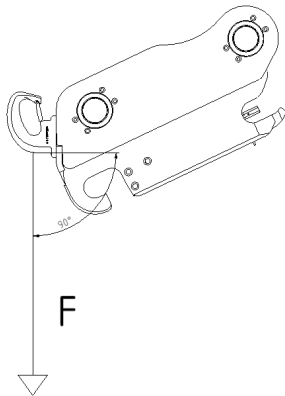
Always make sure of a good grip when handling objects. Risk of personal injury and damage to property.

IMPORTANT

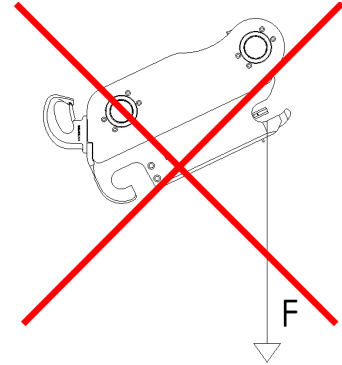
Check the base machine's specified max capacity. Any use of the product in excess of base machine max capacity may damage the machine.

5.2. Lifting points

Approved

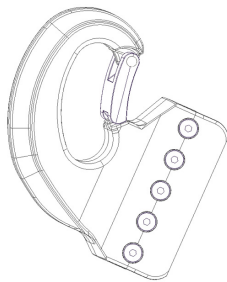


Not approved

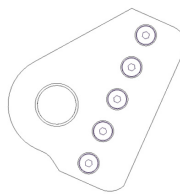


Check the maximum permitted load for the lifting point as stamped on the lifting hook / lug and rating plate. Designed with safety factor 5:1.

Lifting hook



Lifting lug



Part number	Designation	Max load
1072513	S60-upgrade kit-Lifting hook bolted 5T	5000 kg
1074575	S60-upgrade kit-Lifting ear bolted 5T	5000 kg



WARNING

The base machine must be equipped with a load-holding valve on the boom/stick and an overload warning when using a jacking point on the tiltrotator. Risk of injury and damage to property.

5.3. Changing tools

The following instructions concern general operation of engcon machine hitches.

5.3.1. Connecting tools

Activate the quick hitch lock function.

Activate the hydraulics to operate the locking bolts.

3. Check that the indicator rod is out.

Move the machine hitch towards the tool.

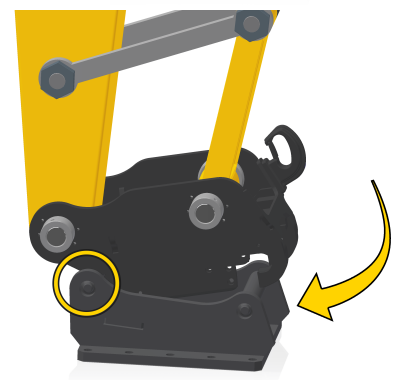
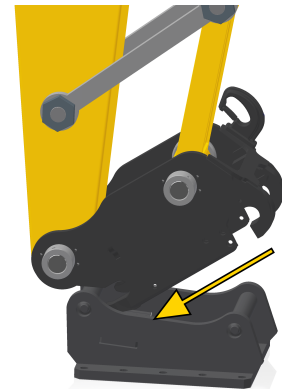
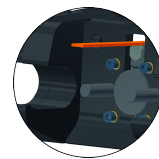
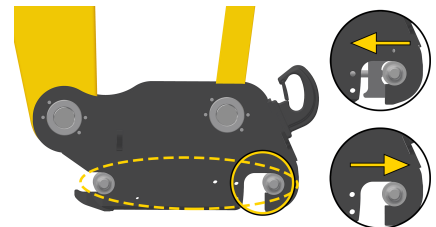
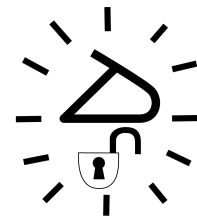
Make sure the tool is positioned such that the shaft with the EC-Oil block is located closest to the base machine. If the tool is positioned correctly, the block will be visible on the left side of the shaft as seen from the cab.

Connect the tool by moving the machine coupler toward one axle on the tool.

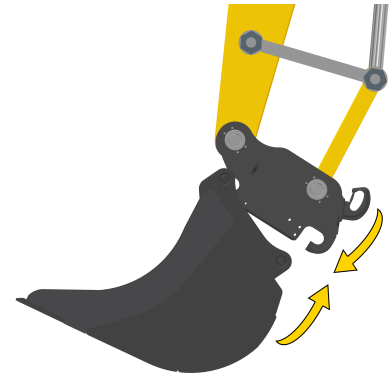
Q-Safe: The sound and light warning signals are activated.



CAUTION
Use hearing protection when in close proximity to or operating the Q-Safe machine hitch when connected. Risk of hearing loss.



Raise the machine hitch minimally above the ground so that the tool engages the machine hitch.



Activate the quick hitch lock function. The quick hitch lock is not fully connected to the attachment point until the hydraulic system is activated and the "open" indicator is no longer visible.



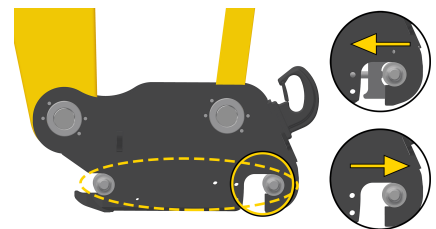
IMPORTANT

Always pressurize the machine hitch to activate the locking cylinder after changing tools.

Activate the hydraulics to operate the locking bolts.

IMPORTANT

Always pressurize the machine hitch to activate the locking cylinder after changing tools.

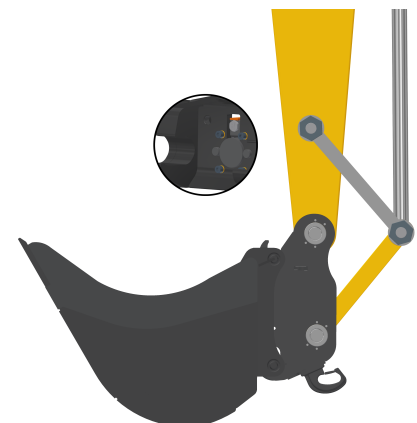


Check that the machine hitch lock function has engaged:
The closed position is achieved when the orange indicator rod no longer protrudes from the machine hitch. The sound and light signals discontinue when the hitch is correctly connected.



WARNING

Stop work immediately and begin troubleshooting if the system warns of a faulty tool connection during operation. Risk of personal injury and damage to property.



5.3.2. Disconnecting tools

Place the tool on the ground, with the locking bolts pointing away from the cab.

Activate the quick hitch lock function.

Activate the hydraulics and the locking bolts.

The locking cylinders are activated.

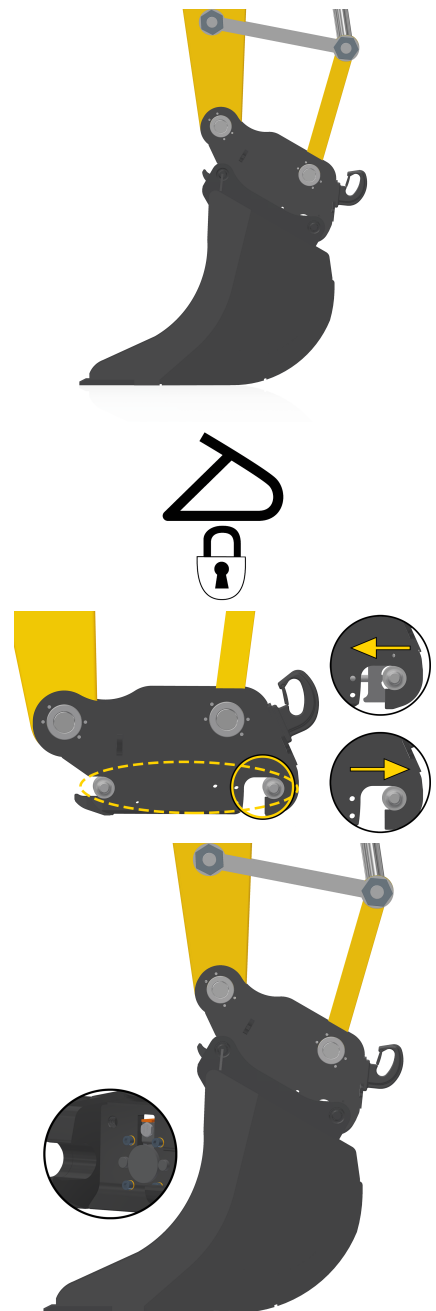
The open position is achieved when the orange indicator rod is visible.

Q-Safe: The sound and light signals are activated.

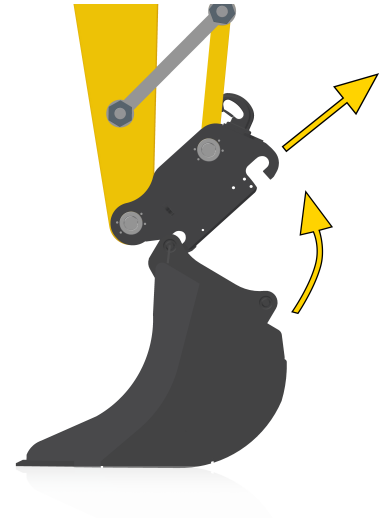


CAUTION
Use hearing protection when in close proximity to or operating the Q-Safe machine hitch when connected. Risk of hearing loss.

In this position the tool is free !



The locking bolts are now in the open position and the tool is released. Carefully lift the machine hitch away from the tool.



5.4. Work under water

We do not recommend work under water as this leads to increased wear and risks reducing tiltrotator service life. Work in brackish or salt water will reduce the service life of EC-Oil electrical connectors by more than half.

5.4.1. Before performing work under water

Fill all connectors with contact grease. Ideally, use contact grease that is water repellent.

5.4.2. After performing work under water

Apply oil to shiny surfaces.

6. Maintenance

6.1. General

Intervals for greasing and inspections to be performed by the user:

- Daily, carried out on all configurations before the machine is put into use for the working day.
- Every 8 operating hours, lubrication as per lubrication schedule.

Complete the service record, section 11.1. Service record following each service.

**DANGER**

Check the attachment points regularly and be alert for the formation of cracks. Risk of personal injury and damage to property.

**WARNING**

Make sure that service and maintenance is carried out according to the manufacturer's recommendations. Inadequate maintenance may cause defects on the base machine and its equipment.

**WARNING**

When changing hoses, only hoses with press couplings may be used. Screw connections may not be used. Risk of personal injury and damage to property.

IMPORTANT

Review the personal and environmental risks of hydraulic oil and grease by reading the safety data sheets for the hydraulic oil and grease in use. Risk of personal injury and damage to surroundings.

IMPORTANT

Be sure to keep your product clean. Inadequate cleaning can cause damage to your equipment.

6.2. Daily inspections

**WARNING**

Avoid contact with hydraulic oil. Risk of burns.

**WARNING**

Never use your hands to search for leaks in the hydraulic system. Use the necessary protective equipment. Pressurised hydraulic oil can penetrate the skin. Risk of personal injury.

**WARNING**

Beware of moving parts. A lack of awareness may lead to crush injuries. Risk of personal injury.

**WARNING**

The hydraulic system must be de-pressurised before work on the system is begun. Risk of personal injury and damage to property.

**WARNING**

Make sure the base machine is shut down and that the ignition is on before checking the quick hitch lock switches. Risk of personal injury and damage to property.

Check daily:

- No damage or cracks are present.
- that the machine hitch is correctly attached to both base machine and tool.
- Warning decals are present and legible.
- that the machine hitch is clean and without play.
- There are no hydraulic leaks.
- No grease leakage is present on hoses or in connectors.
- that Q-Safe sensors are free from dirt and metal

**WARNING**

Always make sure the locking bolts protrude as specified for the machine hitch concerned. Tools attached to the machine hitch may only be used if locking is properly executed. Risk of personal injury and damage to property.

**WARNING**

Welding is not permitted. It can have a negative impact on safety. Risk of personal injury and damage to property. For welding, contact your dealer or engcon Nordic AB.

**WARNING**

Replace damaged or illegible signs and decals before using the machine. Risk of personal injury and damage to property.

6.3. Special maintenance

6.3.1. EC-Oil

Cleaning

- Clean oil connections, electrical connectors, grease connections and dirt guards before and after use in order to avoid oil or grease leakage and safeguard EC-Oil function.
- If oil or grease leakage occurs despite cleaning, we recommend face seal replacement.
- Clean electrical connectors daily and spray with water repellent.



Figure 22.

Replacing face seals

Applies to hydraulic connectors on quick hitches.

1. Remove the existing face seal with the aid of a sharp tool.
2. Carefully install the new face seal by hand.

REMARKS

Install the tapered face seal with a narrow edge outward.

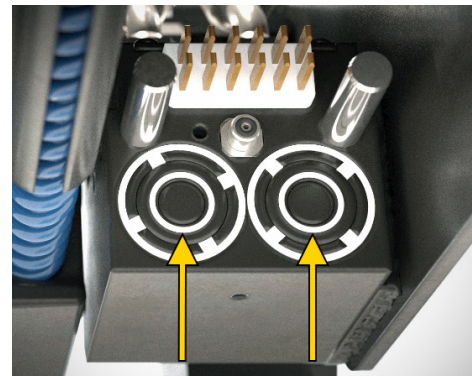


Figure 23.

6.4. Tightening torque

Torque tightening is essential for the strength of some bolted joints.

Bolts and threaded holes must be thoroughly clean.

S45

Fastener	Dimension	Quality	Quantity	Torque
Axle locking	M8	12.9	8	40 Nm

S60

Fastener	Dimension	Quality	Quantity	Torque
Axle locking	M12	12.9	8	136 Nm
Jacking point	M10	12.9	5	79 Nm

S70

Fastener	Dimension	Quality	Quantity	Torque
Axle locking	M12	12.9	8	136 Nm

S80

Fastener	Dimension	Quality	Quantity	Torque
Axle locking	M12	12.9	8	136 Nm

EC-Oil hydraulic connectors

Fastener	Dimension	Quantity	Torque
Hydraulic connector ECO	ECO40-80	2	60 Nm

Table 2.

7. Troubleshooting

7.1. Q-Safe

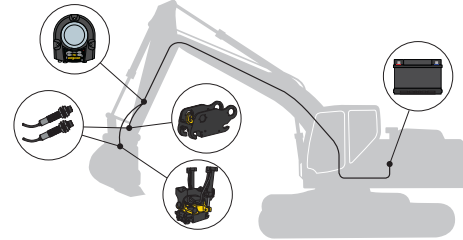
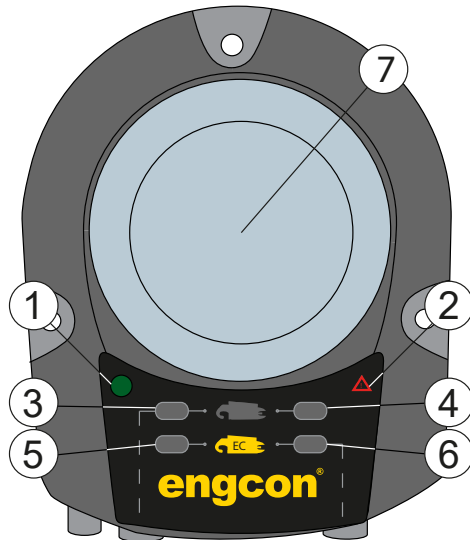


Figure 24.

7.1.1. Indications

Position	Behaviour	Indicates	Remarks
1	1 flash * * *	Power supply OK	Applies to DC2 without QSC
	2 flashes ** ** *	Power supply OK	Applies to QSC
	Constant light	Power supply OK	Applies to SS0-SS9 without QSC
2	1 flash * * *	CAN time out	Applies to QSC
	2 flashes ** ** *	Short circuit, power to sensor in EC	Applies to SS0-SS9 without QSC and QSC during start
	3 flashes *** *** **	Short circuit, power to sensor in RF	Applies to SS0-SS9 without QSC and QSC during start
	3 flashes *** *** **	Short circuit, power to sensor in EC	Applies to DC2
	Inactive	No fault	
3	Constant light	Connected tool	Sensor, hook for quick hitch on machine
4	Constant light	Connected tool	Sensor, ejector for quick hitch on machine

Position	Behaviour	Indicates	Remarks
5	1 flash * * *	Tiltrotator removed	Applies to DC2
	Constant light	Connected tool	Sensor, hook for quick hitch underneath tiltrotator
6	1 flash * * *	Tiltrotator removed	Applies to DC2
	Constant light	Connected tool	Sensor, ejector for quick hitch underneath tiltrotator
7	Flashing white and intermittent siren (normal behaviour during the connection sequence)	Unsafe tool connection	Check attachment

Table 3.

For an overview, see section 3.2.1. Overview.

8. Decals

Machine instructions, decals and warning signs must be kept clearly legible. Contact your supplier to order replacements.



8.1. Warning decals

8.1.1. Warning decals in cab

The decals are usually placed to the right of the operator in clearly visible locations.

8.1.1.1. 9000157



Figure 25. Warning decal to the right of operator.

8.1.2. Warning decals on product

8.1.2.1. 9000338



Figure 26. Warning decal on locking cylinder.

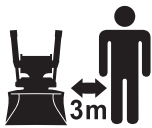
8.1.3. Symbol legend



Take care when handling long objects. Bear in mind inertia and the extended risk area when handling long objects.



Falling material hazard. Never stand under or pass beneath a raised tool.



Keep clear. Moving and rotating equipment. Hazard zone 10 feet.



Crushing hazard. Stay clear of moving parts.



Tipping hazard. Never exceed the base machine's approved tipping load.



Suspended load hazard. Stay clear of suspended loads.



Important to subtract tiltrotator weight when calculating lifts.



Read and understand the user manual before operating this machinery.

9. Technical data

The illustration shows a typical configuration. Technical data may vary.
We reserve the right to make changes without prior notice.

9.1. Machine hitch

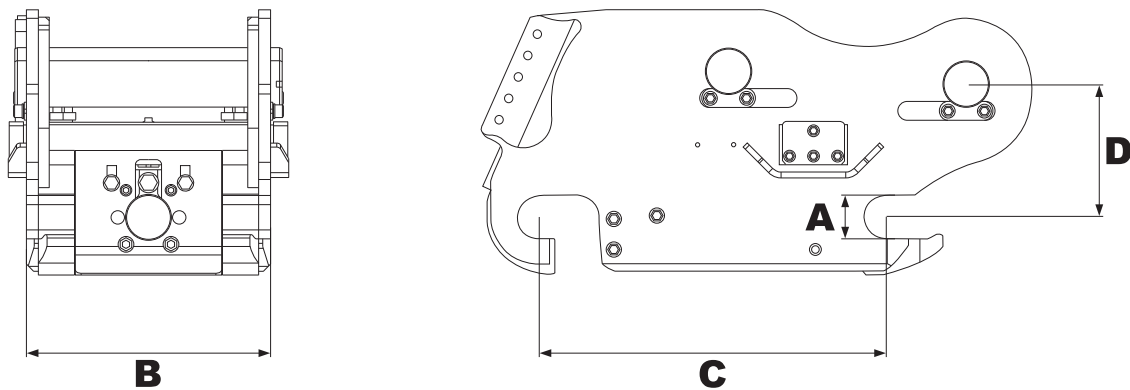


Figure 27.

Description		S30	S40- EC204	S40- EC206	S45	S60	S70	S80
Axle diameter (A)	mm	30	40	40	45	60	70	80
Width (B)	mm	180	200	200	290	338	450	590
Length (C)	mm	230	300	300	430	480	600	670
Construction height (D)	mm	100	103	135	150	185	205	255
Weight*	kg	-	-	-	-	-	-	-
Recommended hydraulic pressure open/closed	MPa	21 / 3-6	21-25	21-25	21-25	21-25	21-25	21-25
Max hydraulic pressure	MPa	22	22	22	35	35	35	35
Base machine weight**	t	1-2	2-6	2-6	6-11	12-19	20-30	27-40

Table 4.

*Depending on the configuration, see the rating plate for current weight

**Machines outside weight recommendations might also be approved, depending on breakout torque

10. Glossary

10.1. Designations

Term	Description
Base machine	The machine carrying the equipment concerned. Excavator or backhoe loader.
EC-Oil	Automatic oil connection system for changing hydraulic tools from the cab. See section 3.3. EC-Oil.
EC-Oil block H (Hitch)	Located in the machine or in the quick hitch.
EC-Oil block T (Top)	Located on the upper section of the hydraulic tool and/or the tiltrotator.
Dog bone linkage	The link between the breakout cylinder and the machine hitch or directly attached tiltrotator.
Machine hitch	Quick hitch mounted directly on the excavator's stick
Stick	The 'arm' at the very front of the excavator.
Tipping load	Specifies the maximum weight the excavator is able to lift without tipping forward.

10.2. Abbreviations

Term	Description
QLM	Warning light and sound that alerts if the bucket or other tool is incorrectly connected.
QSC	engcon's standardised locking system for controlling all types of machine hitches and quick hitches.

11. Service

11.1. Service record

On the service record, there is space to note actions performed on the product that these instructions for use refer to. Specify the date of the action, what was done and who did it. Service partners may also use a stamp in the space provided. This will make sure your product is a safe buy for any future owner.

[illegible]

[illegible]

Service- interval	Date	Operating hours	Remark/Action	Stamp/ Signature
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