engcon®

User manual

1-SERIES TILTROTATOR

EC102 | EC104 | EC106

Article 9001035 | Version 1.1 | 2026-03-03

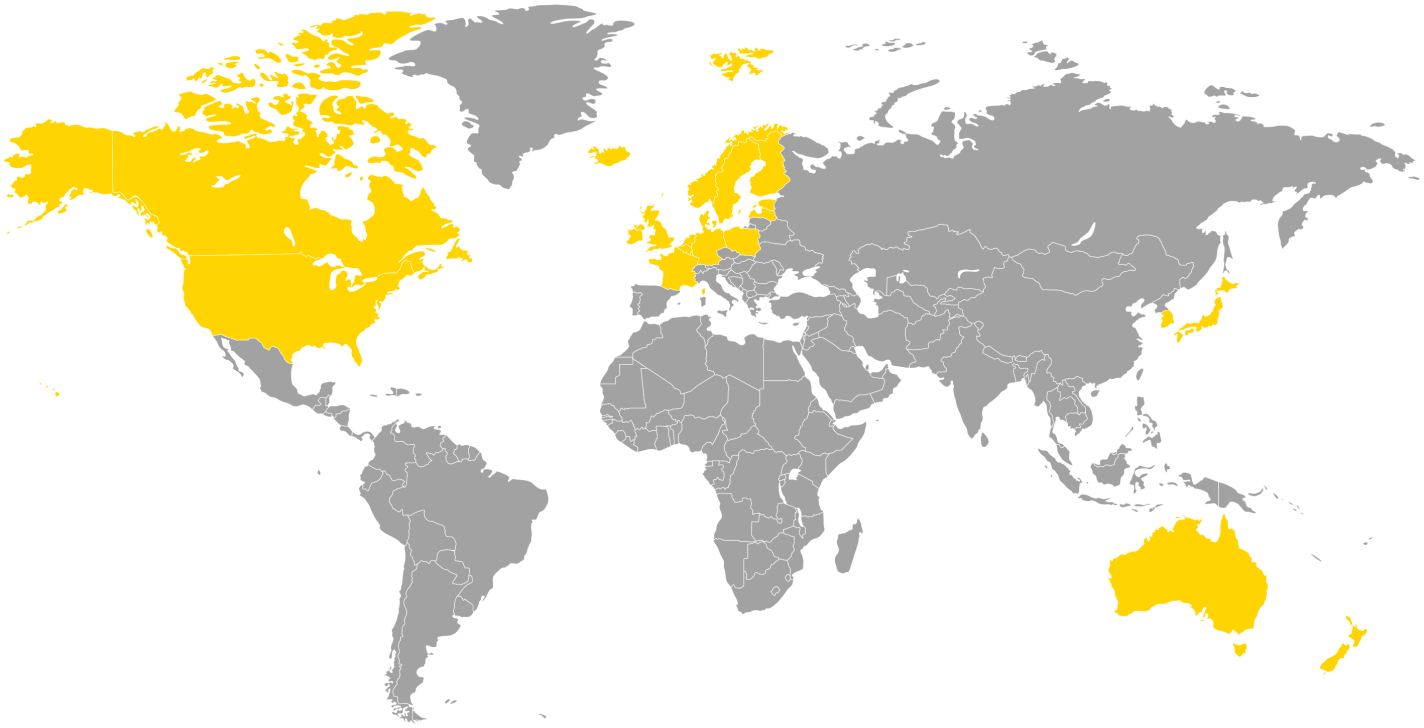
Original Instructions

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 contain 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 part 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 tiltrotator. The tiltrotator may only be handled, moved or transported while strapped to a pallet.

When storing the piston rod of a cylinder for a long period, treat it with corrosion protection or push it inside the cylinder.

1.3.1. Temperature during operation and storage

Description	Temperature
Operating temperature	-30° to +50°C

Description	Temperature
Temperature range during storage	-30° to +50°C

1.4. Warranty

All customers receive a 2-year warranty on their tiltrotator.

We encourage you to register your tiltrotator to enjoy faster service. Visit www.engcon.com and search for "register your product".

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
Address: Box 111, SE 833 22 Strömsund, SWEDEN
Telephone: + 46 670 178 00
Email: info@engcon.se

engcon hereby declares that the below is manufactured in conformance with Machinery Directive 2006/42/EU.

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

Because the following standards and regulatory directives are also applied, the product complies with the requirements for CE marking.

- EMC Directive 2014/30/EU
- SS-EN ISO 12100:2010, SS-EN 474-1:2022 och SS-EN 474-5:2022, SS-ISO 13031:2016
- ISO 10567:2007, SAE J2506:2012, SAE J1362:2018

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.

Krister Blomgren - Signatory for engcon Nordic AB

Qualified person authorised to compile the technical documentation:

Fredrik Jonsson, Head of R&D, engcon AB

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 tiltrotator adds flexibility and efficiency to an excavator and allows it to be used for more operations. The product provides the ability to both tilt and rotate a tool.

3.2. Tool(s)

engcon's tiltrotators are designed to be used with engcon's hydraulic tools and tools that are type-approved in the base machine's operator's manual.

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.

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.

4.1. Oil

On delivery, your product is filled with Fuchs Hydraway White 46, a white oil-based hydraulic oil.

An oil drain pan must be available during installation.
T and P are labelled with:

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.

4.2. Identification

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

The rating plate is located on the tiltrotator's yellow frame or its black protective cover.

Rating plate content:
Part number
Type designation
Serial number
Year of manufacture
Weight
Max jacking point
Max hydraulic pressure

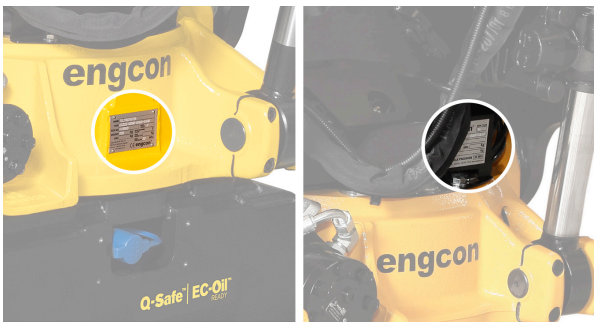


Figure 1.

4.3. Mechanical

The following assembly and installation instructions refer to direct attachment of the tiltrotator.

If the tiltrotator will be installed on a machine hitch, use the user manual for connecting tools.

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.

4.3.1. Attaching the tiltrotator

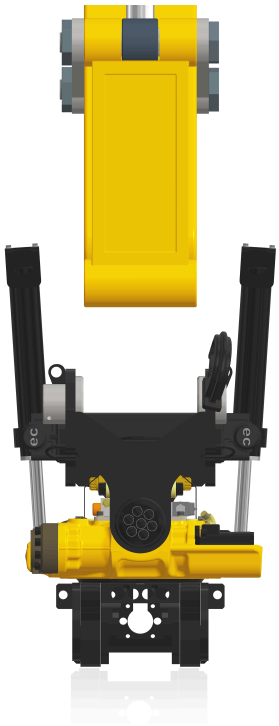


Figure 2.

Before installation

1. Check the tipping load limits. Take tiltrotator weight and the extended risk area into account. Installation may entail a necessary reduction in the volume of the tool.
2. Position the base machine and the tiltrotator on a flat, non-slip surface. Make sure the tiltrotator is upright and in line with the stick and break link.
3. If necessary, use a firmly planted ladder.

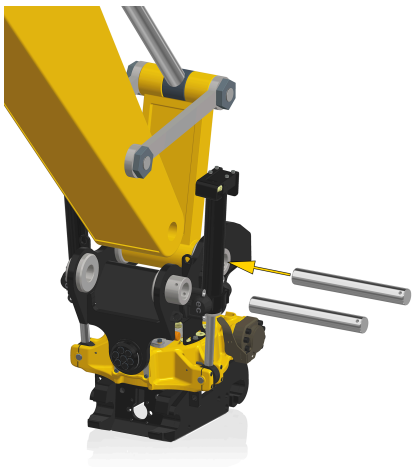


Figure 3.

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 upper section of the tiltrotator.
3. Shim the width if necessary.
4. Insert the intended shaft journal.
5. Fit the shaft journal lock and make sure it locks correctly.

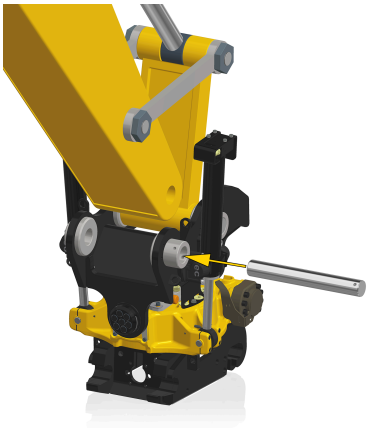


Figure 4.

6. Align the break link such that it corresponds to the holes in the upper section of the tiltrotator/rotator.
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 5.

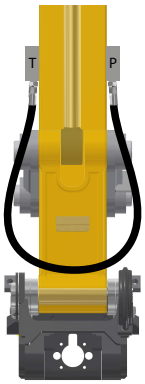
IMPORTANT
Fill the bushings and the cavity in the stick with grease. Central lubrication only provides top-ups.

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

4.4. Electrical and hydraulics

For electrical and hydraulic hose installation, refer to the separate installation instructions supplied with the selected control system. Also available on the website or by contacting engcon.

4.4.1. Filter the hydraulic oil



1. Connect a hydraulic hose between (P) and (T) on the excavator's hydraulic circuit.
2. Open shut-off valves for (P) and (T).
3. Run the hydraulic oil through the excavators oil filter for approximately 3 minutes to make sure that the hoses and pipes are clean.
4. Close shut-off valves for (P) and (T).
5. Remove the hydraulic hose from the excavator's hydraulic circuit.

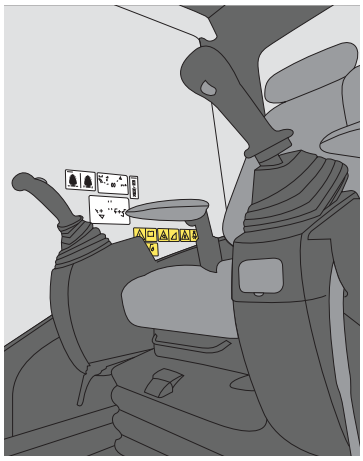
IMPORTANT
Maintenance and repair of the electrical system may only be carried out by professionally qualified persons.

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.

4.5. On completion

4.5.1. Apply decals



Affix the warning decal supplied in a conspicuous place in the cab where it 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.

4.5.2. Function check

Carry out a function test according to the following items.

- Run all the tiltrotator functions a few times to remove any air from the system. Important for preventing uncontrolled movement.
- Check that the tiltrotator functions according to section 5.3. Manoeuvring.
- Make sure the tool operates when the hydraulics are activated.
- Check that hoses and cables are not exposed to wear or pinching.

5. Operation

5.1. Before and during use

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 tiltrotator may be used only for the brackets and tools it is intended 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.

WARNING
Using the tiltrotator to lift people or work platforms is prohibited. 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

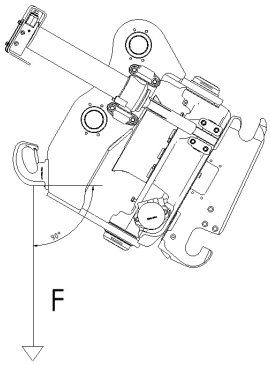


Figure 6.

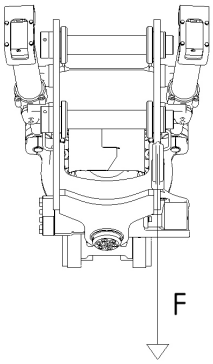


Figure 7.

Not approved

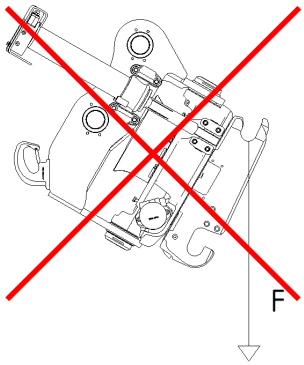


Figure 8.

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.

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. Manoeuvring

The functions described for each control system apply to the recommended installation/configuration. Deviations may occur depending on the user's preferences for alternative button functionality and configuration.

5.3.1. Control system SS1

See separate user manual; you can find the latest version at documents.engcon.com

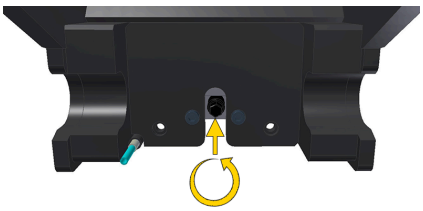
5.4. Changing tools

The following instructions concern general operation of the engcon quick hitch. For further information and instructions, refer to the separate user manual for the quick hitch concerned.

5.4.1. Connecting the tool, mechanical lock

1. Open the quick hitch lock with a suitable tool.

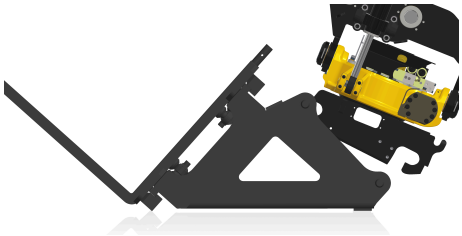
On models fitted with a screw, turn the screw anticlockwise until the locking bolts engage and the indicator rod* is in its outermost position.



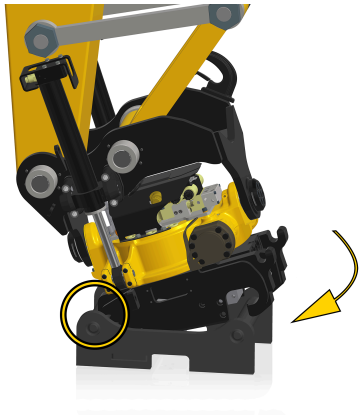
On models with a lever, use an extension pipe and move the lever to its end position. The indicator rod* will then be in its outermost position and the lock clamp will keep the locking bolts open.

2. Move the quick hitch towards the tool.

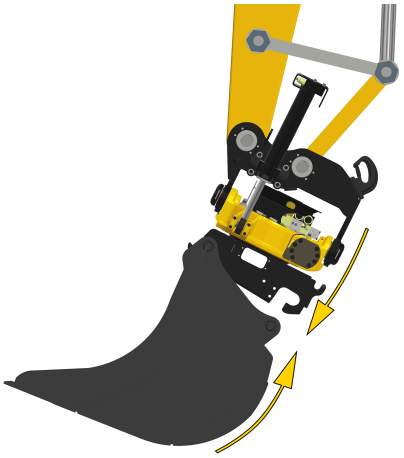
To avoid overloading the quick hitch during use, turn the quick hitch locking pins to face away from the forklift tines when connecting.



3. Connect the quick hitch to the tool.



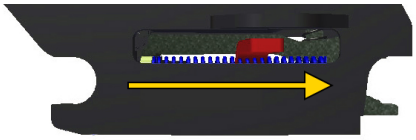
4. Raise the tiltrotator very slightly above the ground so that the tool moves towards the quick hitch.



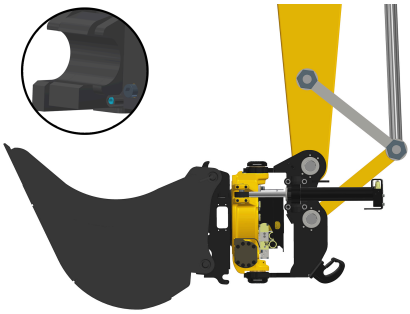
5. Close the machine hitch with an appropriate tool.

On models with a screw, turn the screw clockwise until the locking bolts are retracted and the indicator rod* is in its innermost position.

On models with a lever, the lock closes automatically when the adaptor axle forces the lock clamp up.

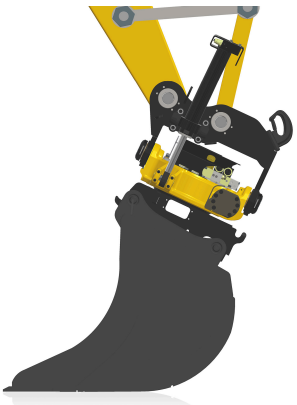


6. Check that the quick hitch lock function has engaged.
   On engcon's other quick hitches, the blue indicator rod will no longer protrude from the hitch. Indicator rod* location may vary depending on the tiltrotator model.

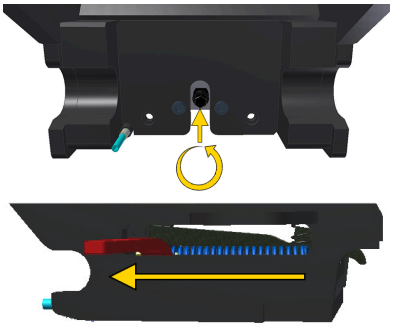


5.4.2. Disconnecting the tool, mechanical lock

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



2. Open the quick hitch lock with a suitable tool.

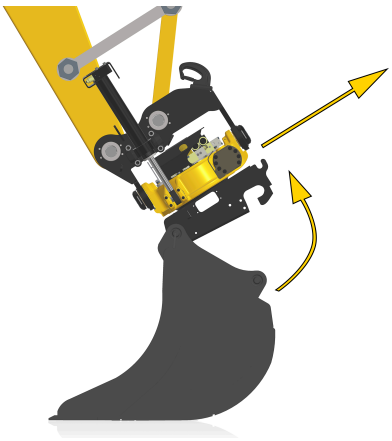


On models fitted with a screw, turn the screw anticlockwise until the locking bolts engage and the indicator rod* is in its outermost position.

On models with a lever, use an extension pipe and move the lever to its end position. The indicator rod* will then be in its outermost position and the lock clamp will keep the locking bolts open.

In this position the tool is free !

3. The locking bolts are now in the open position and the tool is free. Carefully raise the tiltrotator from the tool.



5.5. Fitting and setting up quick hitch locks

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

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

Shim the quick hitch and the tool for minimum play. Check that minimum locking wedge engagement is not below the minimum value:

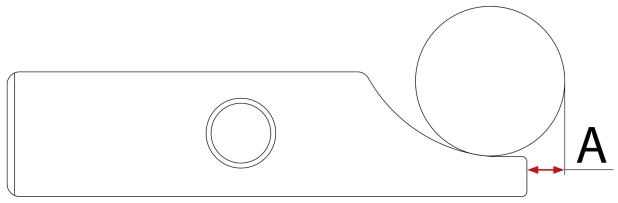


Figure 9.

Quick hitch	A (max)
S30	5mm
S40	10mm

Table 1.

5.6. 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.

5.6.1. Before performing work under water

- Fill the tiltrotator with grease as described in section 6.3.3. Worm gear lubrication. Ideally, use grease that is more water repellent. Always check with your dealer to ensure miscibility.
- Fill all connectors with contact grease. Ideally, use contact grease that is water repellent.
- Check the condition of the O-ring between the rotator frame and the quick hitch. See section 9.2. Tiltrotator overview.

5.6.2. After performing work under water

- Always finish the working day by rotating, tilting and filling grease via the central lubrication to expel water from bearings.
- Apply oil to shiny surfaces.

6. Maintenance

Daily maintenance is essential for ensuring optimal function of your product. Neglected maintenance may result in loss of warranty.

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.

6.1. General

Scheduled greasing and inspections to be performed by the operator:

- **Daily:** To be performed according to section 6.2. Daily inspections.
- **Every 8 operating hours:** Lubrication according to section 6.3.2. Lubrication every 8 operating hours.
- **Every 250 operating hours:** Perform according to section 6.4. Service every 250 operating hours.

In addition to the above, service must be performed by a service technician during the first machine service or no later than 500 operating hours. Then at 500-hour intervals according to section 10.1. Service schedule.

Fill in section 10.4. Service record after completed service.

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

Check that:

- Visible fasteners are tightened (see section 6.8. Tightening torque).
- The shaft journal lock attachment points are not loose.
- No damage or cracks are present.
- The tiltrotator is correctly attached to the machine and tool.
- Warning decals are present and legible.
- The quick hitch is clean, without visible damage and is functioning normally.
- No breakout play or rotational play is present (see section 6.5. Checking axial and radial play (EC104-106)).
- There are no hydraulic leaks.
- No grease leakage is present on hoses or in connectors.

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.

6.3. Tiltrotator lubrication

6.3.1. Grease recommendation

The tiltrotator's worm gear is factory filled with the recommended lithium-based universal grease (NLGI 2). This grease is often miscible with other greases of similar type.

Always check with your dealer to ensure miscibility. The use of inferior grease categories will lead to increased consumption.

IMPORTANT
Do not use greases containing solid particles such as molybdenum, graphite or copper. Such particles can lead to failure of the lubrication block.

IMPORTANT
Ensure the highest possible cleanliness when greasing or connecting the lubrication system. The lubrication system is sensitive to dirt.

IMPORTANT
Grease with a higher base oil viscosity will be required in greater quantities during heavy excavation and when using hydraulic tools.

6.3.2. Lubrication every 8 operating hours

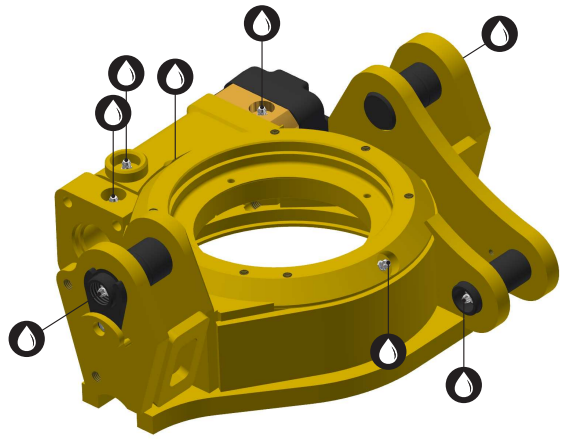
6.3.2.1. Manual lubrication

IMPORTANT
The quantities of grease specified refer to the minimum quantity that must be added.

EC102: 10g | EC104: 10g | EC106: 10g

Grease the tiltrotator by removing the protective cap from the grease nipple and connecting a grease gun. Grease the tiltrotator until grease forces its way out at all axles and bearings. Wipe the grease nipple and nozzle thoroughly clean before attaching the grease gun.

EC102



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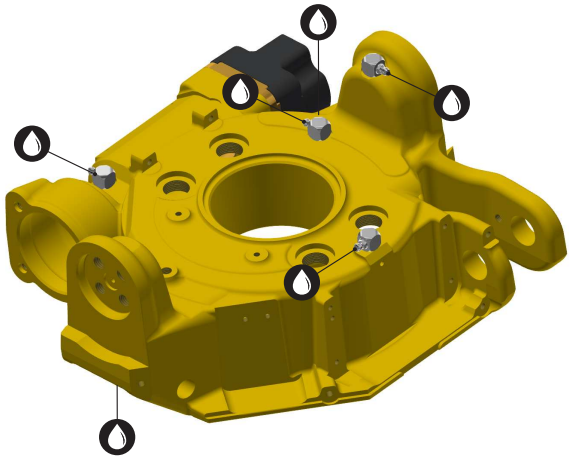
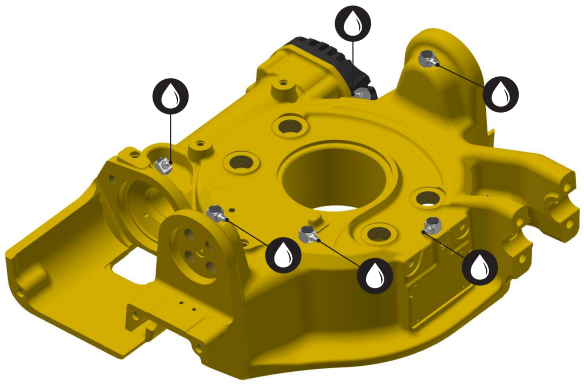


EC106



6.3.3. Worm gear lubrication

1. Remove the cover plate (if necessary) and the plug from the bolted joint.
2. Clean and remove all grease from the hole where the plug was installed.

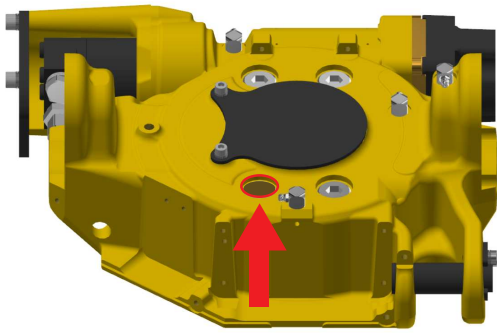


Figure 10. Plug

3. Rotate the worm wheel anticlockwise and note if grease accumulates in the hole.

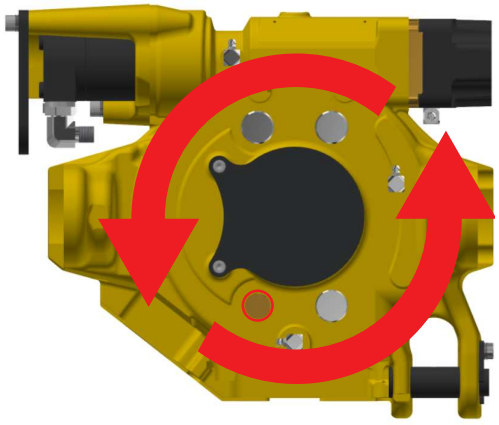


Figure 11. Rotation

4. If grease accumulates in the hole, no grease need be added. Otherwise add grease (while rotating if possible) and repeat step 3.

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

6.4. Service every 250 operating hours

- Review according to section 6.2. Daily inspections.
- Check the grease level according to section 6.3.3. Worm gear lubrication.
- Check the central lubrication system for any leaks at connections.
- Check the tilt axles according to section 6.4.1. Tilt axle checks.

6.4.1. Tilt axle checks

6.4.1.1. Shimming, tilt upper section

1. Make sure the tilt upper section abuts the base machine by using a suitable tool as a wedge. Insert the tool between the rotator body and the tilt upper section where the tilt axle points away from the cab.
2. Undo the tilt axial washer's two bolts.
3. Install shims on the inside of the tilt axial washer where the tilt axle points towards the cab.
4. Refit the tilt axial washer.

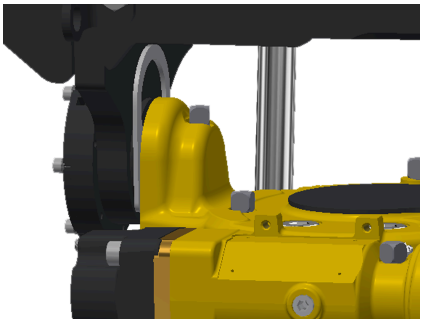


Figure 12.

6.4.1.2. Tightening the tilt axle

1. Tighten the bolts concealed behind according 6.8. Tightening torque

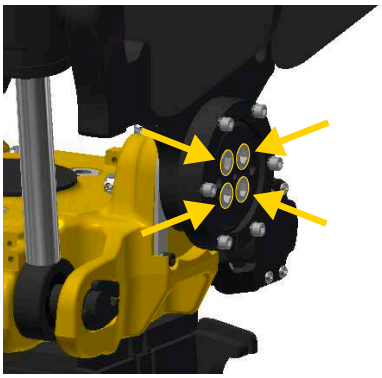


Figure 13.

6.5. Checking axial and radial play (EC104-106)

IMPORTANT
No tool may be connected during checks.

The following tools are required for checking lateral and rotational play:

- Extended 10 mm Allen key.
- Dial indicator with magnetic base.
- Long hexagonal socket
- Crowbar.

6.6. Checking lateral play

1. Raise the tiltrotator to a comfortable working height and switch off the machine.
2. Remove the cover plate (if necessary) and plug to the bolted joint. See Figure 14.
3. Clean and remove all grease from the hole where the plug was installed.
4. Rotate the worm wheel until a free surface without a bolt head is visible.
5. Lower the tiltrotator and press it against firm, level ground.

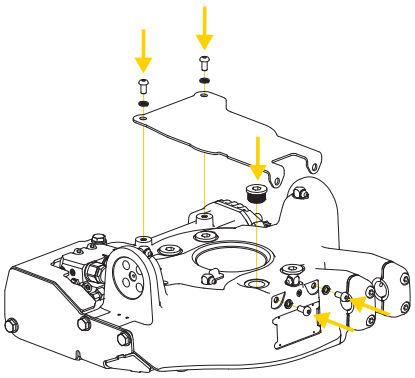


Figure 14. Remove the protective cover.

6. Insert the hex socket into the hole, making sure it connects with the worm wheel.
7. Mount the dial indicator with the magnetic base and zero the dial gauge to the top of the hex socket.
8. Carefully raise the tiltrotator off the ground and read the clock.

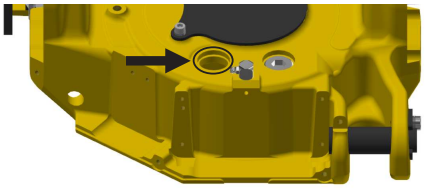


Figure 15. Free surface without bolt head.

EC104	EC106	Remarks
< 0,10mm	< 0,10mm	Requires action immediately.
0,10-0,15mm	0,10-0,15mm	Correct lateral play
0,16-0,20mm	0,16-0,20mm	Requires action soon.
>0,20mm	>0,20mm	Requires action immediately.

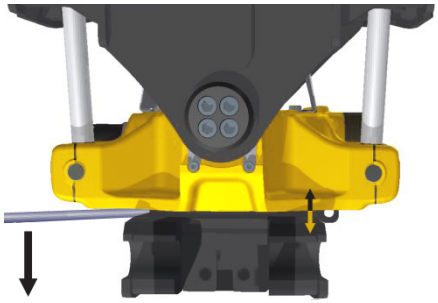


Figure 16. Prise apart with a crowbar.

9. Using the crowbar as a lever, read off any changes on the dial gauge.

6.6.1. Checking rotational play

1. Use the crowbar to move the quick hitch to the left.
2. Remove the motor bolts and the motor.
3. Clean the worm screw thoroughly and remove all grease.
4. Mount the dial indicator on the rotatorbody and reset the clock against the end of the worm screw.
5. Use the crowbar to move the quick hitch to the right and read off the clock.

Figure 17. Rotate the quick hitch to the left.

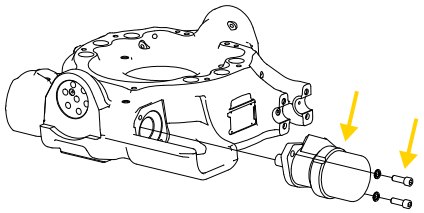


Figure 18. Remove the motor.

EC104	EC106	Remarks
<0,05mm	<0,05mm	Adjustment required
0,06-0,15mm	0,06-0,15mm	Correct rotational play
>0,15mm	>0,15mm	Adjustment required

Figure 19. Rotate the quick hitch to the right.

REMARKS
We recommend adjustment be carried out by a specialist in a workshop.

6.6.1.1. Significance of rotation play

Play of less than 0.12 mm will cause early overheating. Play greater than 0.25 mm will have a leverage effect causing impact and shocks to destroy the lubrication film between the thrust washers.

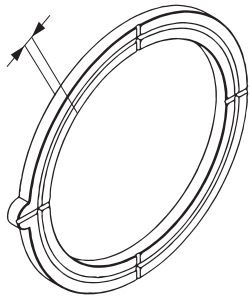
REMARKS
Lack of lubrication can deform the thrust washers.

6.6.2. Thrust washers

Check that the thrust washers are flat.

Max wear: Min 4.5 mm

We always recommend the installation of new thrust washers before adjusting.



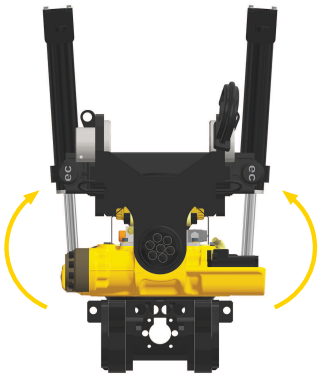
6.7. Testing load-holding valves

A lever is required when testing load-holding valves.

Load the tilt function in both directions; it must not move.

If it moves, replace the load-holding valve on the cylinder that can be extended (on the side where the tilt upper section moves away from the rotator body).

See also section 9.2. Tiltrotator overview.



6.8. Tightening torque

The rotator section is dimensioned to cope with major shear loads and torsional loads. For reasons of strength, it is essential that certain fasteners be torque tightened.

Bolts and threaded holes must be thoroughly clean.

EC102

Fastener	Dimension	Quality	Quantity	Torque
Screw cap	M10	12.9	4	79 Nm
Quick hitch/ Worm wheel*	M12	12.9	10	136 Nm
Yoke bracket	M10	12.9	4	79 Nm
Tilt axle	M6	12.9	2	17 Nm

Fastener	Dimension	Quality	Quantity	Torque
Hydraulic motor	M8	12.9	3	40 Nm

*Only needs to be tightened during the first service after installation.

Table 2.

EC104

Fastener	Dimension	Quality	Quantity	Torque
Screw cap	M10	12.9	4	79 Nm
Quick hitch/ Worm wheel*	M12	12.9	16	136 Nm
Yoke bracket	M12	12.9	4	136 Nm
Tilt axle	M12	12.9	8	136 Nm
Hydraulic motor	M8	12.9	2	40 Nm

*Only needs to be tightened during the first service after installation.

Table 3.

EC106

Fastener	Dimension	Quality	Quantity	Torque
Screw cap	M10	12.9	6	79 Nm
Quick hitch/ Worm wheel*	M14	12.9	16	217 Nm
Yoke bracket	M12	12.9	4	136 Nm
Tilt axle	M16	12.9	8	333 Nm
Clamping half	M10	12.9	4	79 Nm
Hydraulic motor	M12	12.9	2	136 Nm

*Only needs to be tightened during the first service after installation.

Table 4.

7. Decals

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

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

7.1. Decal disposition

7.1.1. Control system SS1

See separate user manual; you can find the latest version at documents.engcon.com

7.2. Warning decals

7.2.1. Warning decals in cab

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

7.2.1.1. 9000157

Figure 20. Warning decal to the right of operator.

7.2.2. Warning decals on product

7.2.2.1. 980101

Figure 21. Tilt cylinder warning decal (EC106).

7.2.2.2. 980102

Figure 22. Tilt cylinder warning decal (EC102-104).

7.2.2.3. 9000338

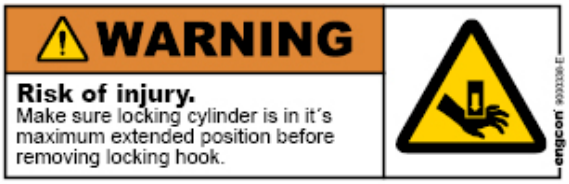


Figure 23. Warning decal on locking cylinder.

7.2.3. Symbol legend

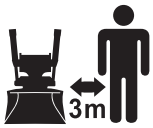
Important to subtract tiltrotator weight when calculating lifts.

Rotating equipment hazard. Stay clear of rotating equipment.

Tilting equipment hazard. Stay clear of tilting equipment.

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.

Read and understand the user manual before operating this machinery.

8. Technical data

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

8.1. Tiltrotator

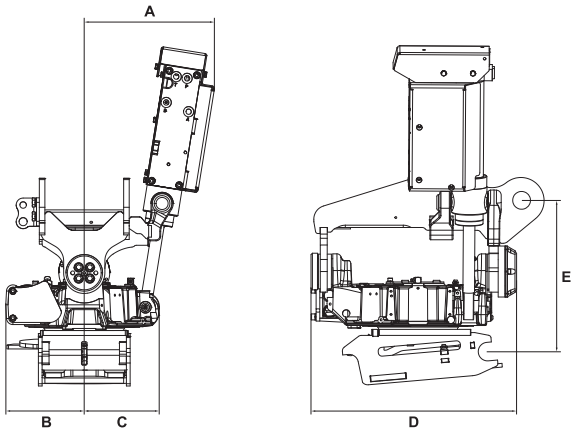


Figure 24.

Description		EC102	EC104	EC106
Max machine size	t	3	4	6
Standard bracket		S30	S40	S40
Width (A)	mm*	180	280	289
Width (B)	mm*	155	161	220
Width (C)	mm*	160	169	219
Overall length (D)	mm*	435	463	500
Construction height (E)	mm*	282	360	410
Weight	kg*	90	130	185
Max hydraulic pressure	MPa	22	22	22
Tilt angle	°	2x40	2×45	2×45
Rotation		∞	∞	∞
Electrical system	V	12	12	12/24

S40

*Table 5. *Standard attachment*

Description		EC102	EC104	EC106
Max breakout torque	kNm	20	28	45
Max bucket width	mm	900	1,000	1,200
Tilt duration from end position to end position	s / l/min	3/7	3/7	3/15
Rotation duration for one rotation under hydraulic flow	s / l/min	7/20	7/21	6.5/30
Rec max return line pressure	MPa	2.5	2.5	2.5

Table 6.
***Standard configuration*

8.2. Load-holding valve

Listed below are the torques required to defeat the load-holding valves on the tilt cylinders.

Description		EC102	EC104	EC106
Torque	Nm*	N/A	N/A	7,000 (tilt right)
Torque	Nm*	N/A	N/A	6,000 (tilt left)

Table 7.
**Values calculated with a universal tilt upper section; values may vary depending on the tilt upper section.*

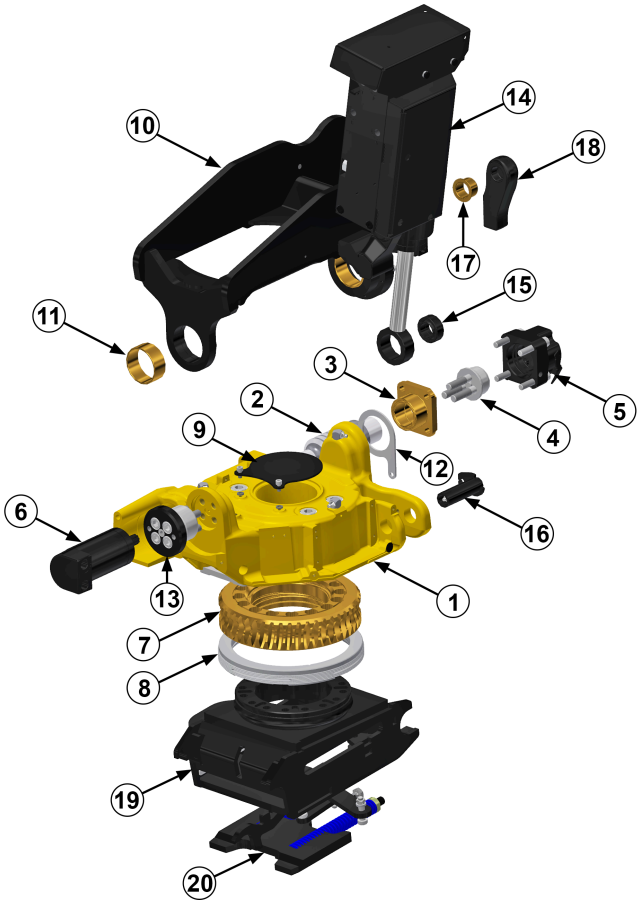
9. Glossary

9.1. Designations

Term	Description
Base machine	The machine carrying the equipment concerned. Excavator or backhoe loader.
ECxxR (e.g. EC219R)	Rotator, no tilt function.
ECxxU (e.g. EC219U)	Tiltrotator without the valve block and swivel.
ECxxW (e.g. EC219W)	Tiltrotator equipped with an extra-wide tilt upper section.
Dog bone linkage	The link between the breakout cylinder and the machine hitch or directly attached tiltrotator.
Dynamic load	Swinging/hanging load
Machine hitch	Quick hitch mounted directly on the excavator's stick
Quick hitch	The part of the tiltrotator that connects to the bucket or other tool.
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.

9.2. Tiltrotator overview

Pos.	Designation
1	Body
2	Worm screw
3	Screw bushing
4	Washer Worm screw
5	Screw cap
6	Hydraulic motor
7	Worm wheel
8	Bearing ring
9	Cover plate
10	Tilt upper section
11	Bushing, tilt axle
12	Shim set, tilt axle
13	Tilt axle
14	Tilt cylinder
15	Spherical bearings
16	Cylinder axle
17	Bushing, yoke bracket
18	Yoke bracket
19	Quick hitch
20	Lock kit



10. Service

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
Make sure the locking cylinder is in its maximum extended position before removing the locking hook. Risk of 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.

10.1. Service schedule

10.2. Service every 500 operating hours

To be performed by a service technician during the first machine service or no later than 500 operating hours. Then every 500 operating hours.

- Check the product compliance with the rating plate and user manual.
- Complete check items according to section 6.2. Daily inspections.
- Tighten bolted joints according to section 6.8. Tightening torque.
- Check connectors and cabling for wear and pinching.
- Check hoses for wear and pinching.
- Perform tests according to section 6.7. Testing load-holding valves.
- Check the tilt axles according to section 6.4.1.1. Shimming, tilt upper section.
- Check lubrication according to section 6.3. Tiltrotator lubrication .
- Perform function checks according to section 4.5.2. Function check.
- Perform checks according to section 6.5. Checking axial and radial play (EC104-106).
- Visual inspection of bushings and spherical bearings; see section 9.2. Tiltrotator overview.

10.3. Service every 250 hours

To be performed by the operator according to section 6.4. Service every 250 operating hours.

10.4. 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.

Date	250 h	500 h	Remark/Action	Stamp/Signature
.....	☐	☐	.....	
.....	☐	☐	.....	
.....	☐	☐	.....	
.....	☐	☐	.....	
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Date	250 h	500 h	Remark/Action	Stamp/Signature
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Date	250 h	500 h	Remark/Action	Stamp/Signature
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