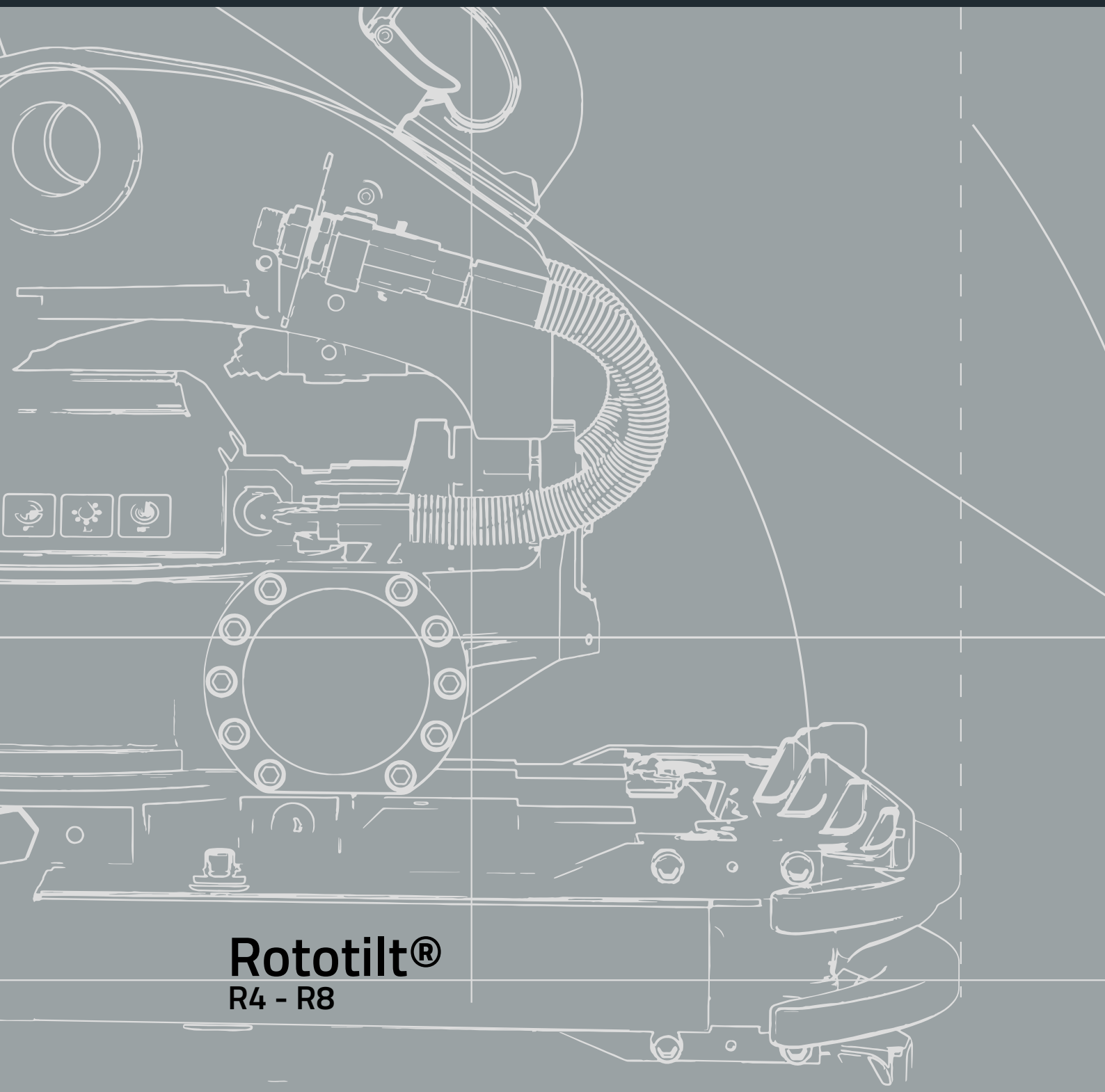
ROTOTILT®

Repair Manual
in translation

EN



Rototilt®
R4 - R8

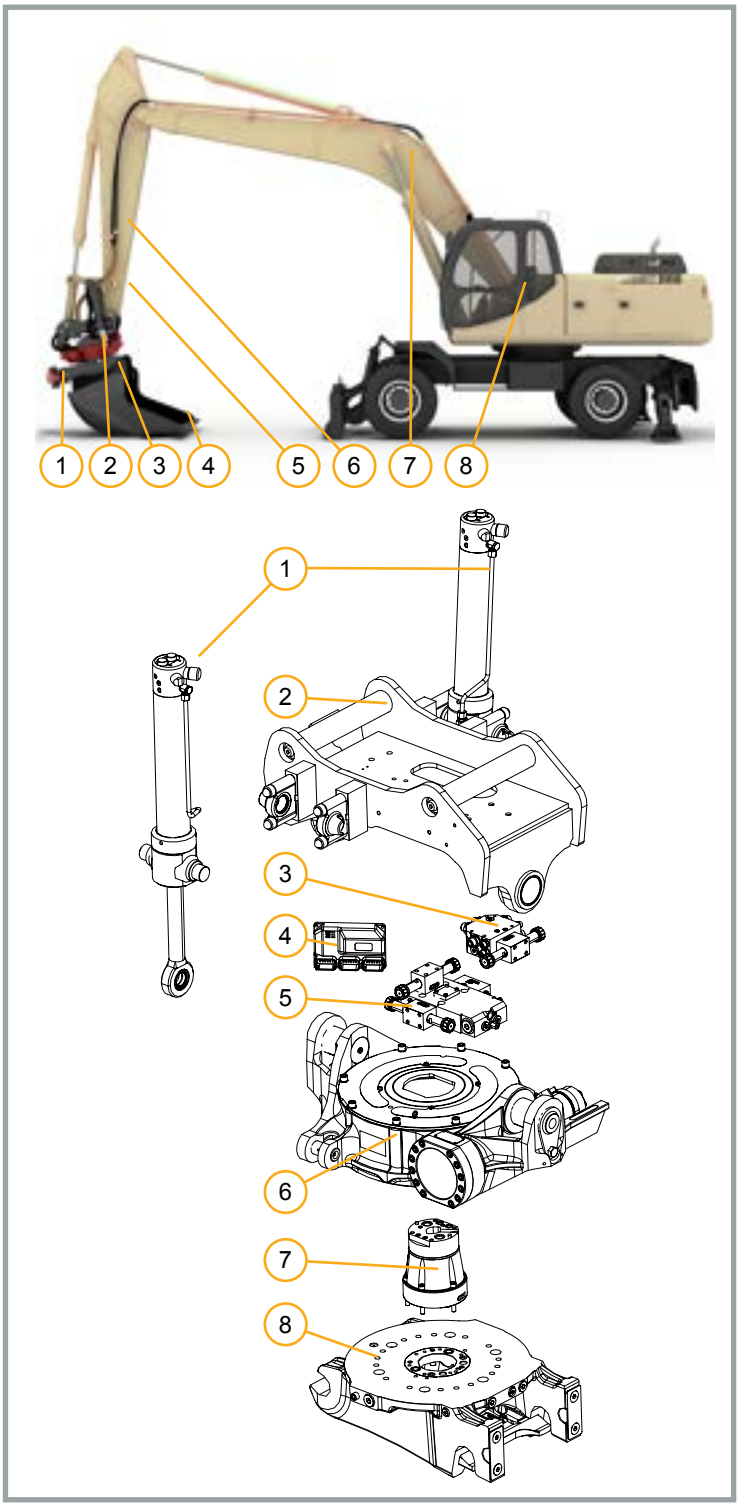
2200368_0000 2016 10 03 | English

Overview

The product described – Rototilt® – is a hydraulically driven tool. Its primary functions are the rotation and tilting of tools connected to the base machine. Other products presented in the document are original tools for Rototilt®. Contact your dealer to supplement your Rototilt® with original tools**. The overviews show standard equipment and options.

See illustrations and lists below.

* The term base machine refers to excavators or backhoe loaders.
** Accessories from other manufacturers may be fitted to Rototilt® on the condition that Rototilt Group AB has supplied or approved the product.



Installed Rototilt®

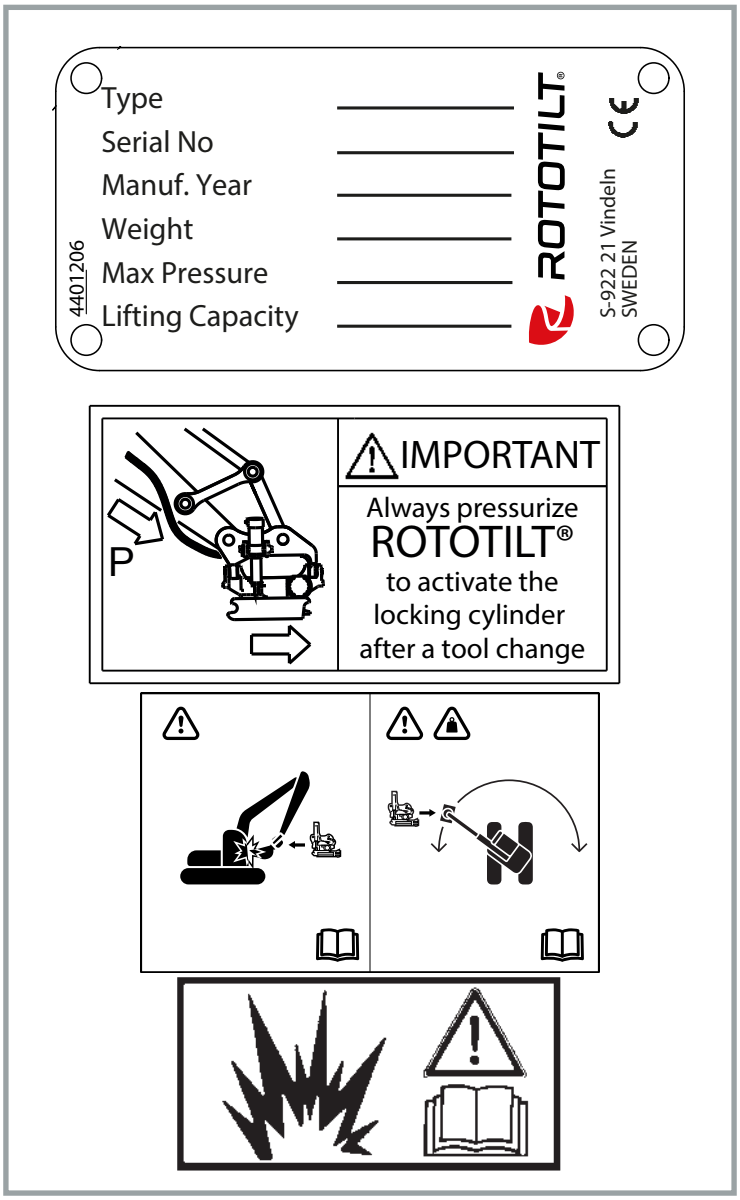
1. Grapple module, RG800
2. Tiltrotator, R4
3. Quick coupler, S60
4. Tool, grading bucket

Base machine

5. Arm
6. Boom cable
7. Boom
8. Operator’s position

Rototilt®, components

1. Tilt cylinder, 2 pcs
2. Hitch
3. Hydraulic manifold, tilt
4. Control unit, TCU
5. Hydraulic manifold, swivel
6. Rotor
7. Swivel
8. Quick coupler



Information plate.

Type - Tiltrotator model designation
Serial No - Tiltrotator serial number
Manuf. Year - Year of manufacture
Weight - Tiltrotator weight in kilograms (kg)
Lifting Capacity - Not applicable

The information plate is located on the tiltrotator rotor housing.

Warning decals

Install the warning decal for changing tools in the cab.

Install the warning decals for collision risk and weight parameters in the cab.

Fit the warning decal 'lock cylinder, risk of increased pressure', to the lock cylinder.

IMPORTANT - the decals are extremely important for safety when operating the product. Keep the warning decals fully legible.

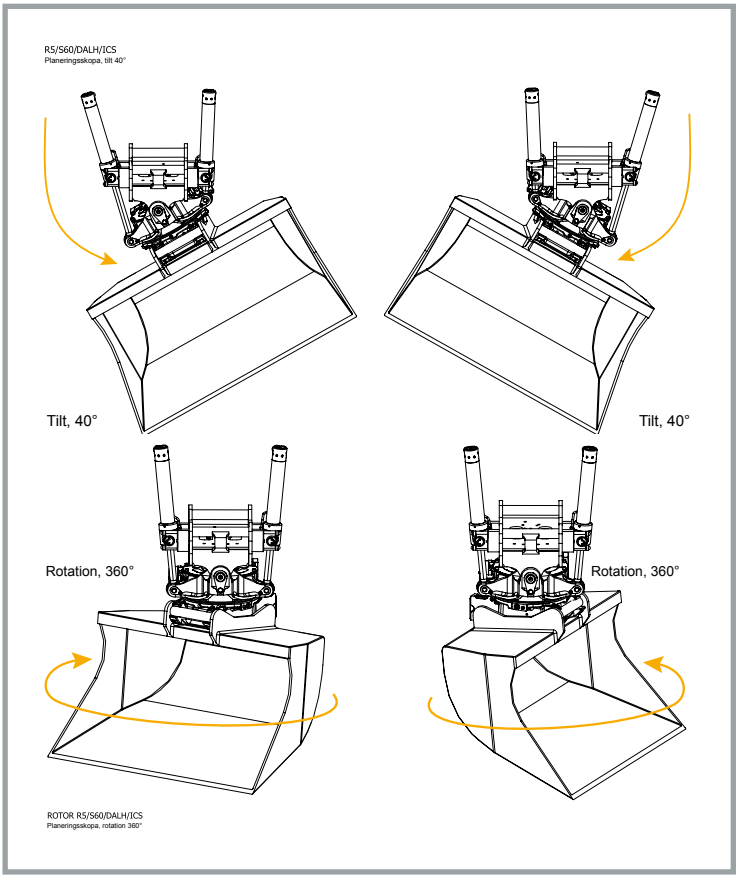
In the event of an accident

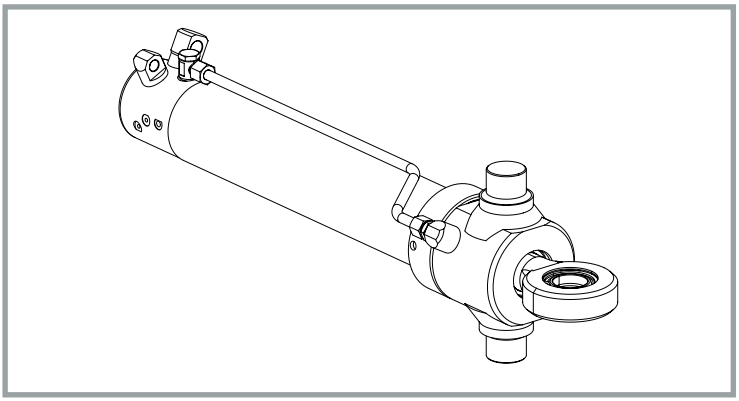
Always park the tiltrotator on a firm, flat surface and with no tool attached. Make sure the Rototilt® cannot tip over.

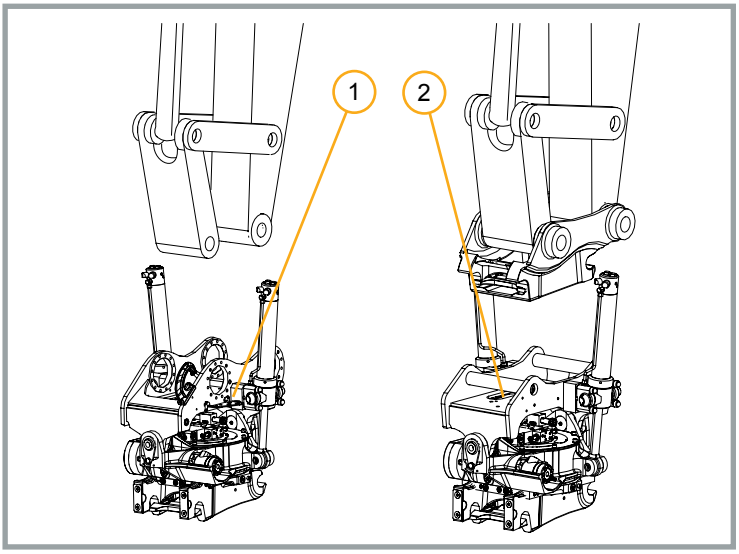
Take care of the environment; make sure no hydraulic oil leaks out. Use a drip pan.

Disconnect hydraulic hoses and cables that run between the Rototilt® and base machine. Then remove the tiltrotator from the base machine.

Contact an authorized service workshop.







Rototilt®, functions

Tilt, lateral movements to the left and right.

Rotation, unlimited rotation in both directions.

Tilt cylinder

Till cylinders are available in three versions:

Single-acting cylinders with load-holding valves

Double-acting cylinders with load-holding valves

Double-acting cylinders without load-holding valves

A load-holding valve is a safety device.

Larger Rototilt® models are equipped with two tilt cylinders with optional single-action or double-action.

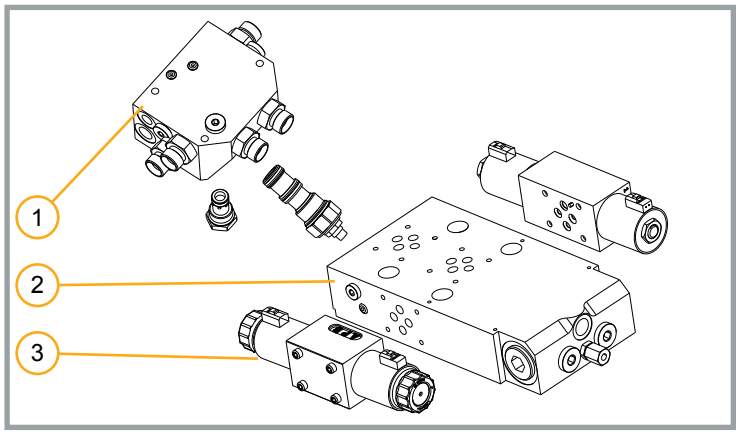
The smallest Rototilt® models are equipped with one double-acting tilt cylinder.

Attachment

Rototilt® can be adapted to fit directly on the base machine's arm or to its quick coupler*.

1. Attachment to arm
2. Attachment to quick coupler

* When attaching to the base machine's quick coupler, consult the base machine's instructions for use regarding this function.

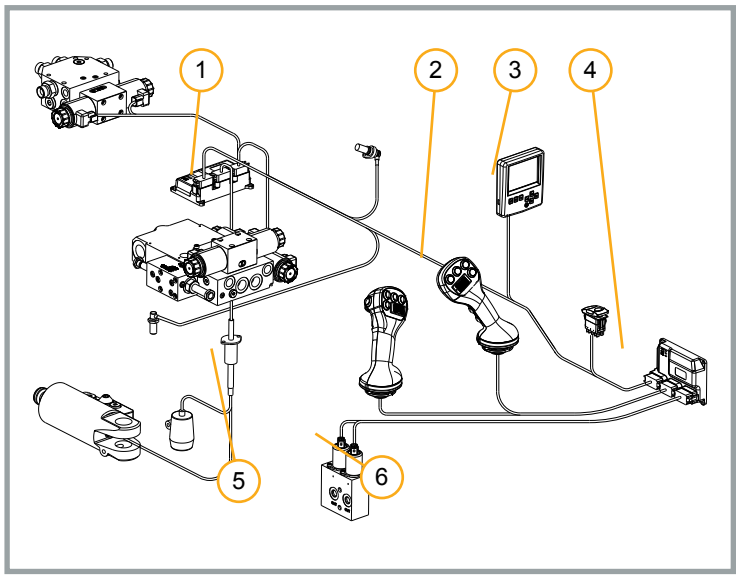


Hydraulic components

Hydraulic oil is distributed from the hydraulic manifold to the tilt and rotation functions and other hydraulically operated functions.

The hydraulic components are specially adapted for use with various Rototilt® control systems and also for use with different accessories and tools.

1. Hydraulic manifold, tilt
2. Hydraulic manifold, swivel
3. Solenoid valve

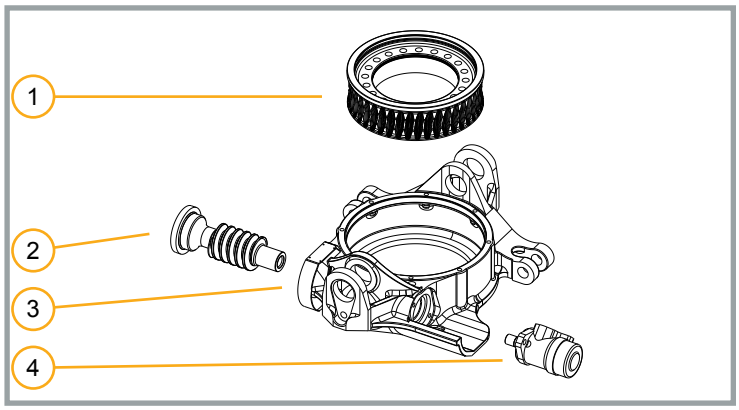


Control system

The tiltrotator control unit is operated by means of purpose-built cables via a control unit and handles located in the base machine's cab.

Rototilt® control systems are available in several versions; standard with multiple extra functions, and machine specific.

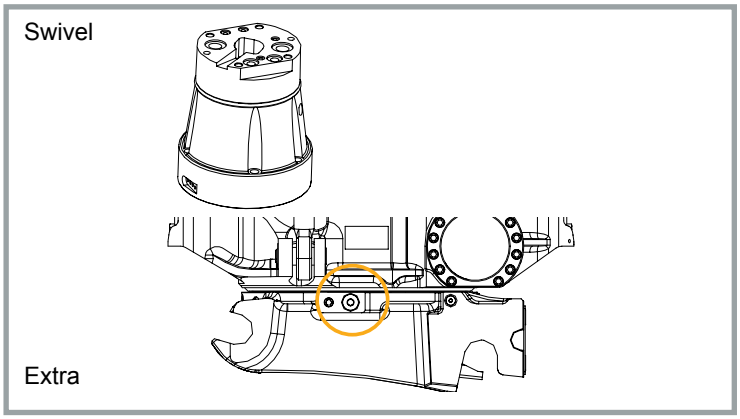
1. Rototilt® control unit, TCU
2. Handles
3. Display.
4. Cab control unit, CCU
5. Electric swivel
6. Shunt



Rotor

The rotor consists of a worm gear with unlimited rotation in both directions. The worm gear is self-braking and acts as a brake during digging movements. The gear operates in an oil bath and is powered by a low-speed hydraulic motor.

1. Worm wheel
2. Worm gear
3. Rotor housing
4. Hydraulic motor



Swivel

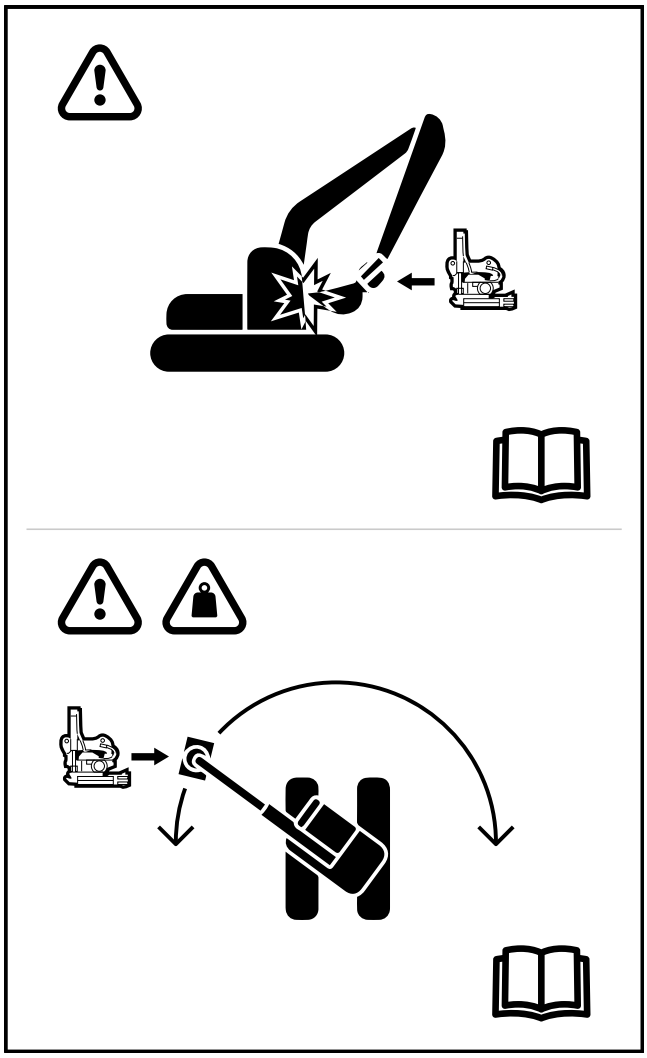
The oil passes from the operating valve through the swivel and on to the quick coupler.

Rototilt® has one or more extra functions that allow the use of hydraulically operated tools.

The quick coupler has a hydraulic locking function that enables rapid tool changes from the operator's position.

Operation

Before use, make sure nobody is within the base machine's hazard area. People and property remain at risk even when Rototilt® is used correctly.



WARNING!
Do not use Rototilt® if it is not functioning correctly! Contact your dealer / maintenance service provider immediately if you detect faults.

Limitations

An installed tiltrotator will change the base machine's geometry and weight parameters. The values specified in the base machine lifting capacity table must be reduced by the weight of the Rototilt®. Pay attention to the risk of collision between the base machine, tools and/or its load.

Because there is a risk that the load or part of the load will fall, nobody may be present beneath a hoisted object.

Do not modify the tiltrotator's characteristics with foreign objects. Where the use of chains or straps is necessary for lifting, use the base machine's lifting hook.

The tiltrotator and its installed tool must be used for objects intended for lifting. Under no circumstances may it be used for lifting people.

Rototilt® is approved for use in outdoor temperatures between -30° C and +50° C.

Rototilt® is not intended for tree felling.

At startup

Carry out daily checks; *see Service*.

Run the Rototilt® up to operating temperature before starting work.

Run the rotor slowly in one direction for around one minute.

Operate the tilt function slowly backward and forward for around one minute.

Test the tiltrotator and check that it functions correctly in every respect.

WARNING!
Always pressurize Rototilt® to activate the lock cylinder.

WARNING!
Take extra care when handling long objects in a grapple due to the forces of inertia and the extended risk area.

IMPORTANT – all tools and attachments must be commensurate with base machine capacity.

WARNING!
The base machine's overload warning system must be used when working with grapples or pallet forks.

WARNING!
There is a risk of collision with the base machine when rotating loads in grapples or pallet forks.

IMPORTANT – The base machine's center of gravity will be displaced when rotating hanging loads in the grapple or handling goods in pallet forks.

During use

Maneuver the base machine and tool using smooth movements. This achieves greater precision and less wear.

Remain constantly on the lookout for signs of degraded functions.

Use the tiltrotator within the stipulated load, working pressure and grasp limits. *See information plate*

Always pressurize Rototilt® to activate the lock cylinder in the quick coupler. Consult *the instructions for use for the quick coupler and those for the control system.*

Finishing work

Remove and park the tool on a firm, flat surface; make sure it cannot tip over.

Carry out daily checks; *see Service*.

Always park the tiltrotator on a firm, flat surface and with no tool attached.

Make sure it cannot tip over.

Tools connected below a Rototilt®unit are assumed to be of a type normally used for work with the base machine. All tools must be commensurate with the capacity of the base machine concerned.

The list below provides examples of recommended tools. If you have any questions, contact your authorized dealer.

Recommended tools

1. Grading bucket
2. Excavation buckets
3. Trenching buckets
4. Multi-grapple
5. Rock grapple
6. Sorting grapple
7. Compactors
8. Grapple module
9. Asphalt cutter
10. Hydraulic concrete breaker
11. Pallet fork

Any other tools or attachments are used at the user's own risk.

Tools such as grapples, pallet forks, compactors and hydraulic concrete breakers must be CE marked to be approved for use.

Load carrying tools

The pallet fork may only be used to move goods over short distances and/or small-scale listing of goods loaded on pallets. The pallet fork may not be used for loading and unloading goods from great heights.

The base machine's overload warning system must be used when working with pallet forks.

The base machine's center of gravity will be displaced when handling goods with a pallet fork.

There is a risk of collision with the base machine when rotating loads in pallet forks.

IMPORTANT – all tools and attachments must be commensurate with base machine capacity.

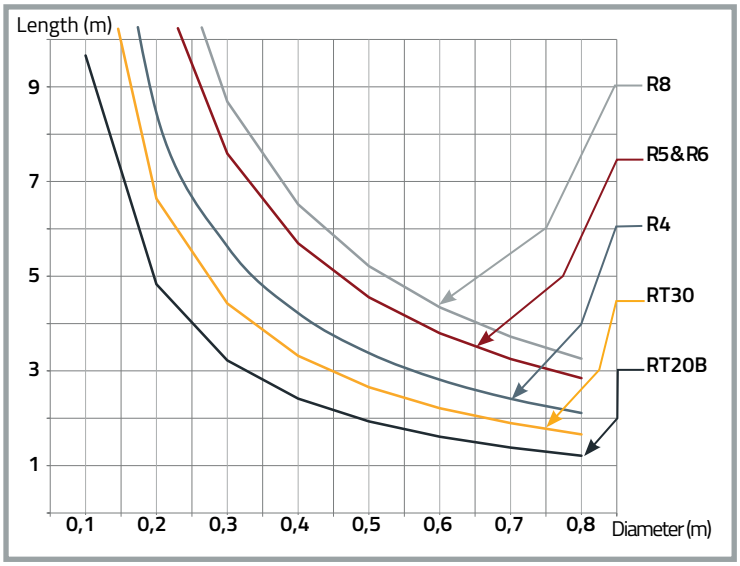
WARNING!
Tilt cylinder load holding valves are mandatory for pallet fork use.

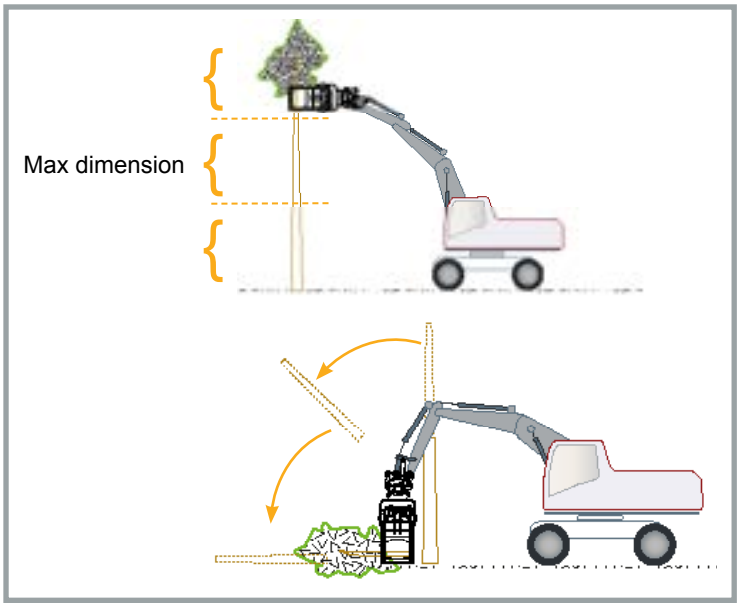
WARNING!
The base machine's overload warning system must be used when working with pallet forks.

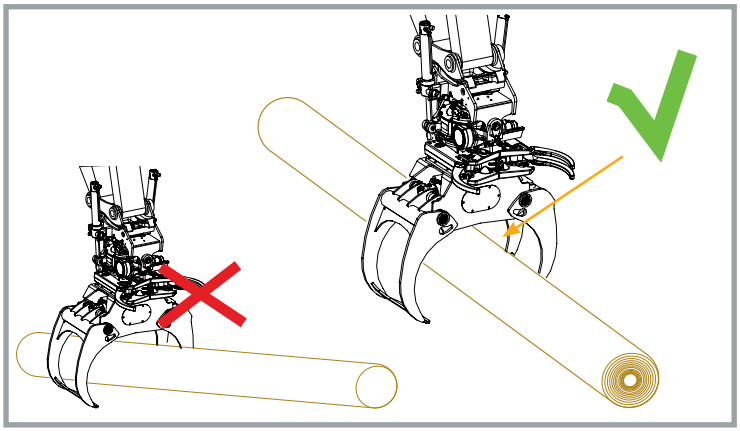
WARNING!
There is a risk of collision with the base machine when rotating loads in pallet forks.

WARNING!
The base machine's overload warning system must be used when working with grapples.

WARNING!
There is a risk of collision with the base machine when rotating loads in grapples.







Grapples

The base machine´s overload warning system must be used when working with grapples and grapple saw.

The base machine´s center of gravity will be displaced when rotating hanging loads in the grapple.

There is a risk of collision with the base machine when rotating loads in grapples. Exercise caution when handling long objects in grapples, due to the forces of inertia and the extended risk area.

In addition to previously mentioned limitations apply further restrictions when felling trees.

It is assumed that tree felling only will be performed within the specified values and with attachments intended for the task.
See table

Tree felling should be done in segments. Each segment must either coincide or fall below specified dimensions.
See chart and illustration

Tree felling should be done with the help of the base machines´ normal digging motion. Fell the tree straight ahead in direction from the base machine. Avoid stressing the rotation functions of the tilt rotator.
See illustrations

Always lift long objects at the center of gravity.
See illustrations

Service

Utför förebyggande underhåll för att säkerställa produktens prestanda, driftsekonomi och livslängd.

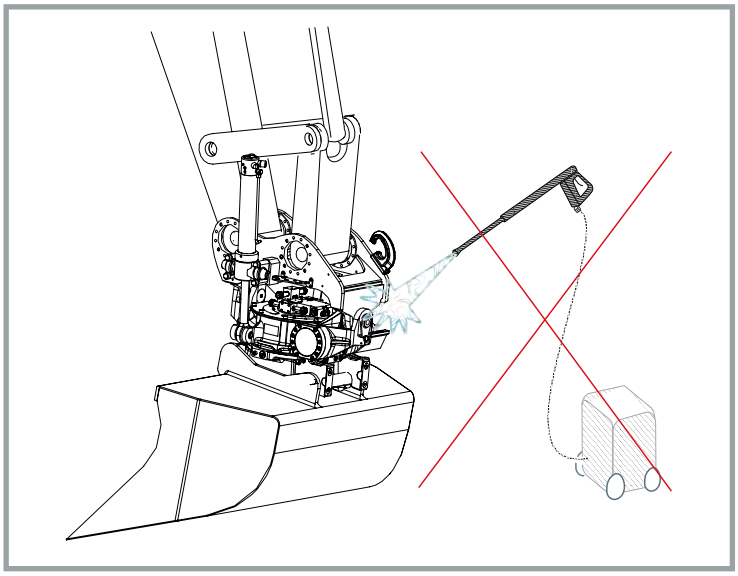
WARNING!
During service, maintenance or other work on the Rototilt®, disconnect electrical connections and all hydraulic hoses connected to the base machine Risk of personal injury, exercise caution!

WARNING!
Do not manually assist hydraulic valves. Risk of personal injury.

IMPORTANT – Take care of the environment.
Use a drip pan to avoid harming the environment.

IMPORTANT – More extensive adjustments and repairs must be carried out by an authorized service workshop. Contact your supplier for information on service providers.

IMPORTANT – Inspect the quick coupler and check that the lock function fully locks the tool in the coupler. Check for the occurrence of any play or cracks etc. Also check the attachment fitting and for any leaks.



Spare parts

Order spare parts through your dealer. Always mention the type of quick coupler and the tiltrotator manufacturing number as stated on the information plate.

Only use original spare parts from Rototilt Group AB. Rototilt Group AB assumes no liability for the product if other spare parts are used.

Consumable items

Only use recommended grease and hydraulic oil.

Cleaning

Take care when cleaning. Do not use a pressure washer. Pressure washers can force dirt into the product and cause serious damage.
Use an oil drain pan when replacing hydraulic oil. Hand in waste such as hydraulic oil, hoses and similar for recycling or destruction.

Welding

Remove Rototilt® from the base machine to avoid damage to electronic components.
Always contact your authorized service workshop before welding work on the Rototilt®.

Daily checks

Carry out checks and service before and after use.

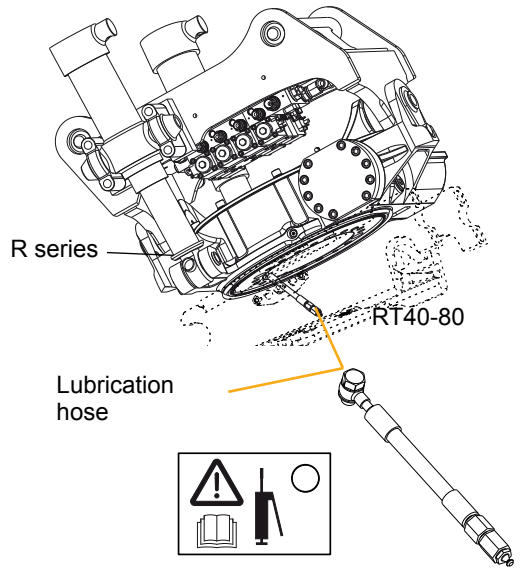
Keep the warning decals fully legible.

Remove gravel, dirt and foreign objects from the tiltrotator; in winter, remove snow and ice.

Check that there are no leaks.

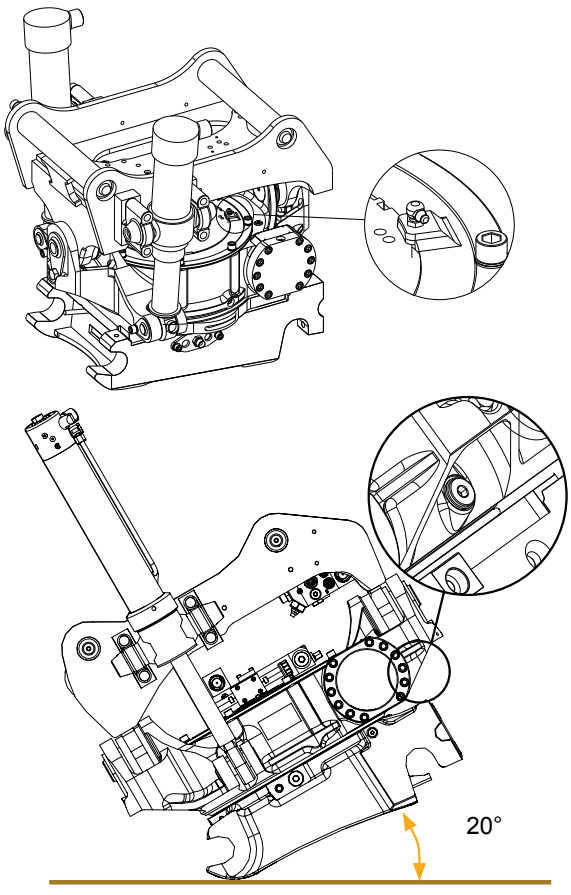
Check that switch indicator lights are functioning.

Carryout function checks.



IMPORTANT - The upper and lower rotor seals must be greased every 40 hours.

IMPORTANT - Take care when opening the oil level plug. The rotor housing may be under pressure.



Pins and bearings

Switch off the base machine engine when greasing.
Relieve hydraulic pressure trapped in the tilt cylinders by activating the tilt function to the left and right.

Use grease that is suitable for construction equipment. Grease conscientiously. If the lubrication duct is blocked, replace the lubrication nipple and clean the lubrication duct. Check the rotation stops for axles and pins.

Release the bucket; a lubrication hose and lubrication nipple will become visible. This applies to RT40-80.

On some quick couplers the lubrication nipple is located on the side of the coupler.
See illustration on left.

Rotor seals

The lower rotor seal must be greased manually even if the Rototilt® is fitted with ILS single-point lubrication.

Pump three strokes on the grease gun, rotate one half turn and apply three more strokes.

Grease the upper seal in the same way.
See illustration on left.

Checking the oil level in the rotor housing

Because of the viscosity of the oil, the oil in the rotor housing must be hot when checked.

Tilt the Rototilt® around 20º (Tilt RT30 & R3 around 30°).

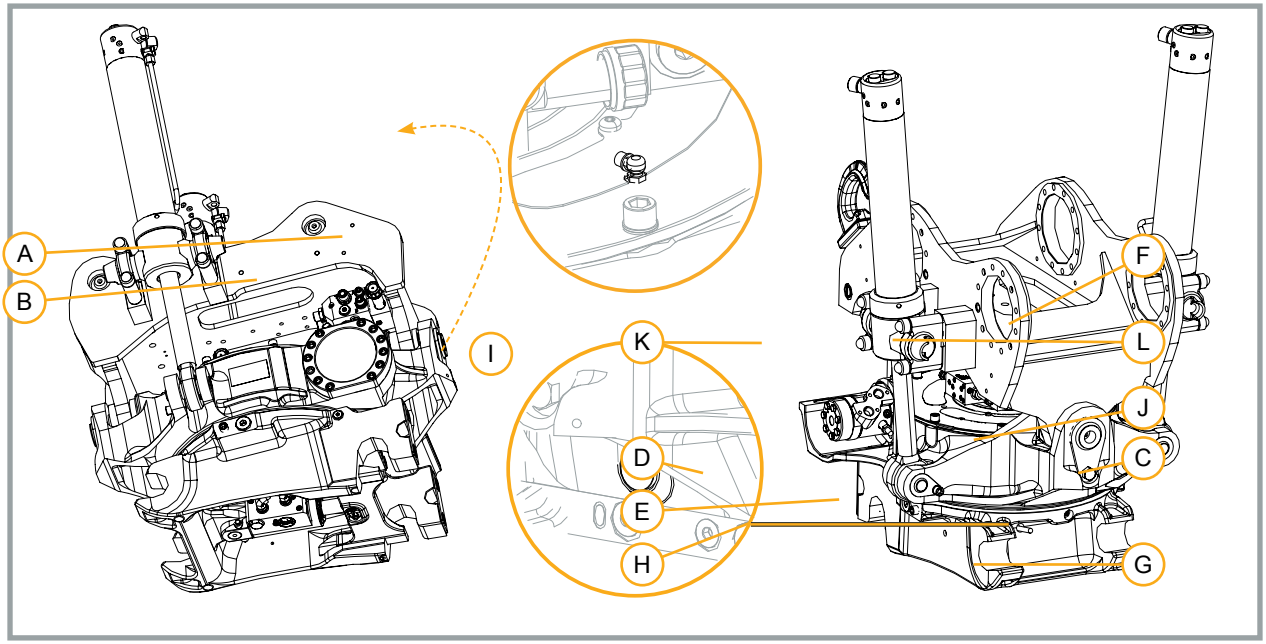
The correct quantity is when the surface of the oil is level with the fill a hole (4). When filling, use high viscosity gear oil.

For more detailed information, contact your supplier or authorized service workshop. Rototilt Group AB recommends Agrol Rotogear.

Maintenance

Interval Inspection & service	Daily	8 h*	40 h* ≥ weekly	160 h*	500 h* ≥ annually	Quantity, oil in liters
Warning decals	x					
Information plate	x					
Light indicators, switches	x					
Oil leaks	x					
Shank locks, quick coupler A		x				
Shank locks, tilt shafts C & D		x				
Shank locks, tilt cylinder E		x				
Cracks, hydraulic hoses			x			
Cracks, attachment F			x			
Cracks, quick coupler G			x			
Damage, cables			x			
Play, rotor – quick coupler H			x			
Oil level, rotor housing I				x		
Oil change, rotor I					x	
RT10						0.2
RT20B						0.45
RT30						1.2
R4, RT40B						1.5
R5, R6, RT60B						2.0
R8, RT80B						3.0
Grease, rotor seals B & J			x			
Grease, tilt shafts C & D**	x					
Grease, tilt cylinder pins E***	x					
Grease, tilt cylinder bearings K & L****	x					
Dirt, foreign objects	x					

** Time in hours; refers to tiltrotator operating hours*
*** All models, number of grease points 2*
**** RT10 & RT20B number of grease points 1, other models 2*
***** RT10 & RT20B number of grease points 2, other models 4*



Dismantling of mount

Number of persons: 1

Time: 30 mins

Equipment

Overhead crane

Lifting strops, 2 x

Tools

Allen key 8 mm

Allen key 10 mm

Socket 25 mm

Rubber mallet

U-ring spanner 24 mm, 2 x

Socket 32 mm

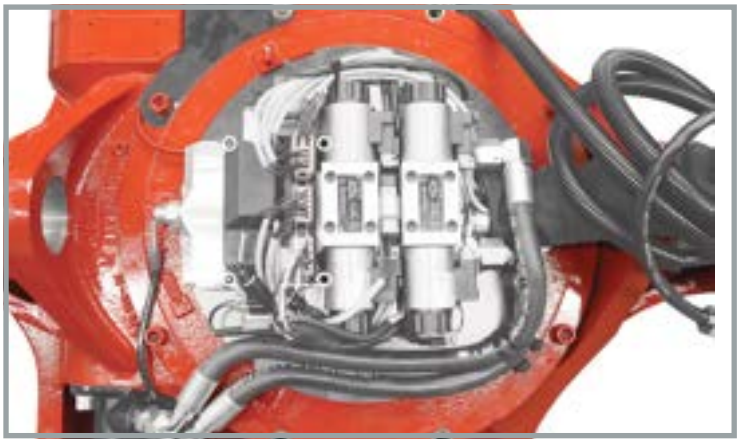
TORX T15

WARNING! Crush risk. When dismantling or mounting heavy components there is always a crush risk. Observe extreme caution and always secure the load.

Procedure

Secure the mount with an overhead crane or other approved lifting device. Allow the mount to be secured in the lifting device during the entire dismantling process.

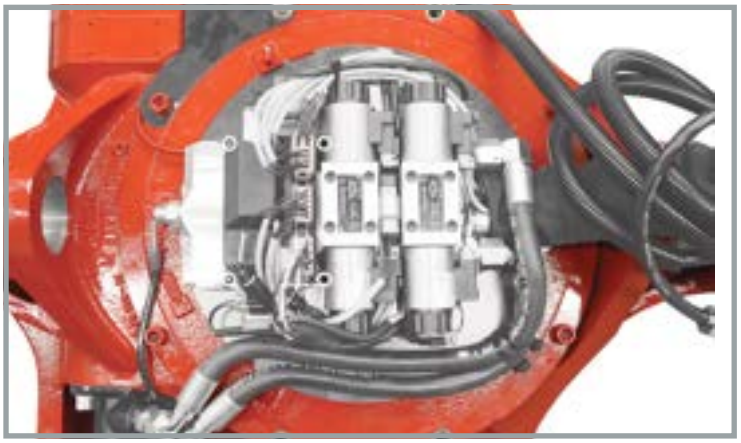
Remove the 4 screws holding the protective plate to the rotor housing.



This picture is from production where the mount has not been fitted.

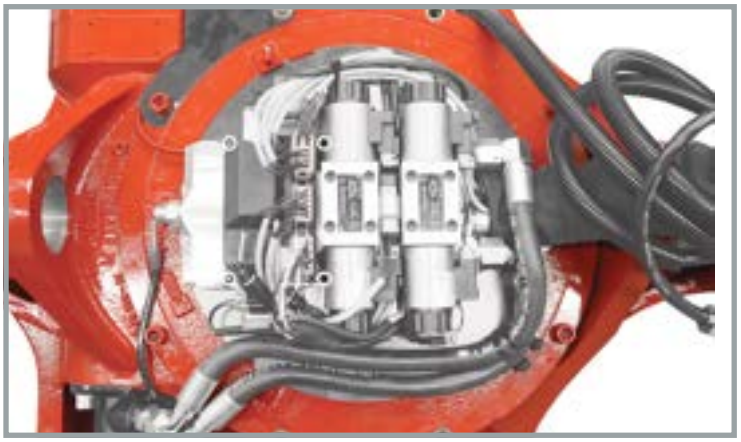
Cut all the cable ties.

Remove the 4 screws holding the TCU to the valve block.



This picture is from production where the mount has not been fitted.

Dismantle the electrical coils to the upper valves (2 or 4 depending on type).



This picture is from production where the mount has not been fitted.

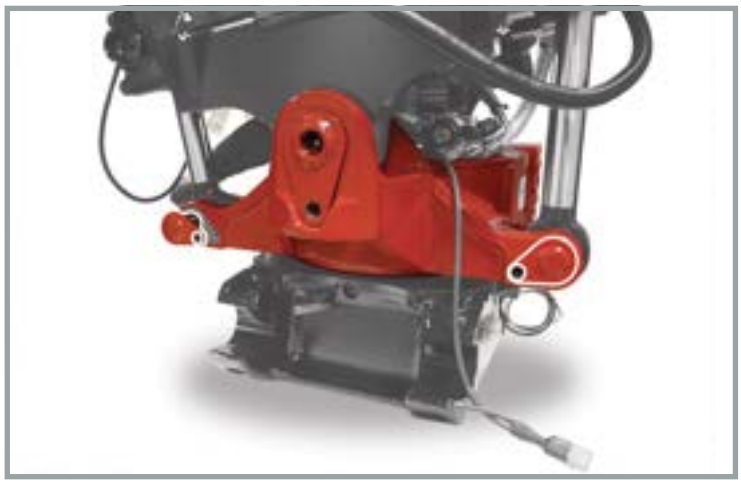
Dismantle the oil leakage line to the hydraulic motor on the valve block.

Remove the 4 screws holding the valve block to the swivel.

Disconnect the electrical supply to the sensors (1 x) between the electrical swivel and valve block; the cable is marked “EL SWIVEL”.

Fix the valve block in position in the mount using a belt or similar object.

Remove the 2 screws and locking washers holding the hydraulic motor in position. Using a suitable belt fix the hydraulic motor to the mount.



Remove the screws (1 per lug), that hold the cylinder lugs in position.

Remove the cylinder lug. Knock it out using a rubber mallet or suitably socket-shaped device. Take care not to damage the lubrication nipple.

Affix the tilt cylinder to the mount using a tightening strap or similar device.

Remove the through-screws with their locking nuts (1 per lug), affixing the mount’s lugs.

Remove the lugs using a beater (M30 thread) and remove the axial bearing washers.

Remove the mount and tilt cylinders from the rotor housing.

Mounting and dismantling of the hydraulic motor

WARNING! Crush risk. When dismantling or mounting heavy components there is always a crush risk. Observe extreme caution and always secure the load.

Number of persons: 1

Time: 15 mins

Tools

U-ring spanner 27 mm

Allen key 12 mm

Procedure

Disassembly

Remove the hydraulic hoses.

Remove the 2 screws and locking washers that fix the hydraulic motor to the rotor housing.

Remove the hydraulic motor by pulling it straight out.

Mounting

Mount the hydraulic motor by fitting the hydraulic motor's shaft into the splines.

Fit the 2 screws and locking washers that fix the hydraulic motor to the rotor housing, tighten to a torque setting of 90NM.

Fit the hydraulic hoses.

Carry out a function test in compliance with the regular start-up procedure.

Emptying of oil in the rotor housing

Number of persons: 1

Tools

Allen key 12 mm

Allen key 6 mm

Consumable materials

Oil

Environment

Oil must be collected in a vessel designated for that purpose, and be given in to an environmental station for recycling.

Use a collection vessel when changing the hydraulic fluid. Waste such as hydraulic fluid and hoses must be submitted for recycling or destruction.

Procedure

Lift the rotor with an overhead crane or other approved lifting device.

Reduce any excessive pressure by loosening the piping plug at the top of the rotor housing.

Remove the magnetic plug.

Empty the oil into a suitable collection vessel.

IMPORTANT -
Take care of the environment. Use collection vessels to avoid negative environmental impact.

Dismantling of worm-drive seals

Number of persons: 1

Time: 15 mins

WARNING! Crush risk. When dismantling or mounting heavy components there is always a crush risk. Observe extreme caution and always secure the load.

Tools

Crowbar

Centre punch

Allen key 10 mm

Sledge hammer

Spare parts

Seal

Pre-conditions

Hydraulic motor removed. Rotor body emptied of oil.

Procedure

Remove the 10 screws affixing the gable.

Unscrew the worm-drive a few turns to expose the seal. Use a suitable tool that grips the splines, for example, a chisel and an adjustable wrench.

Use a crowbar to remove the seal.

Use a centre punch with a somewhat narrower outer diameter than the seal, when a new seal is tapped/pressed in. Check, especially at the start of the operation to press the new seal in, that the seal is properly centred and will sit correctly.

Sensor replacement

Number of persons: 1

Tools

Allen key 4 mm

Allen key 3 mm

U-ring spanner 12 mm

Procedure

Rotation sensor

Depending on model, there are differences in the configuration of the rotation sensor's location. There are two different variations concerning the positioning of the rotation sensor.

Dismantling the rotation sensor from the gable

Remove 4 screws behind the decal affixed to the cover.

Remove the sensor's anchor screw and the cable's anchor screw.

Dismantle the contact by withdrawing the locking pin and then pull the cables out from the contact body.

Then pull the cable out through the cable manifold and pull the sensor outwards. Note that there is an O-ring on the sensor.

WARNING! Crush risk. When dismantling or mounting heavy components there is always a crush risk. Observe extreme caution and always secure the load.

Dismantling the rotation sensor from the hydraulic motor

Remove the sensor from the hydraulic motor.

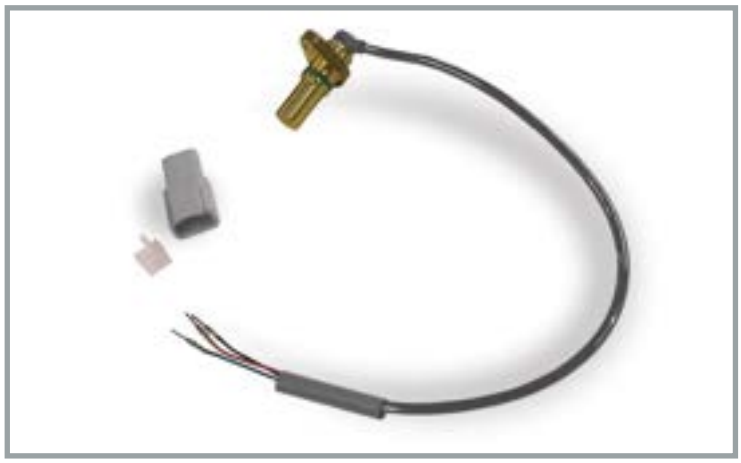
Mounting rotation sensor from the gable

Lubricate the O-ring and place the new sensor in position.

Place the shrink hose over the cable.

Mount the conductors in the contact as follows:

- Red in position 1
- Black in position 2
- Blue in position 3
- Mount the locking plate
- Place the white cable folded back underneath the shrink hose
- Heat the shrink hose - taking care not to damage the conductors' insulation.



Fit the cable's anchor screw.

Fit the sensor's anchor screw.

Refit the cover.

Zero position sensor

Disassembly

Release the locking nut.

Unscrew the sensor.

Mounting

Screw the sensor to its bottom position.

Unscrew the sensor 2 complete revolutions.

Tighten the locking nut.

WARNING! Crush risk. When dismantling or mounting heavy components there is always a crush risk. Observe extreme caution and always secure the load.

Disassembly of rotor parts

Number of persons: 1

Equipment

Overhead crane

Lifting strop

Tools

Allen key 12 mm

Allen key 10 mm

Rubber mallet

Crowbar

Pre-conditions

Disassembly of quick coupler, mount and hydraulic motor. Rotor body emptied of oil.

Procedure

Remove the screws (10 x for R4, 12 x for R6 and R8) that hold the gable in position.

Remove the sliding bearing. Note the orientation of the grooves in the sliding bearing.

Unscrew the worm-drive. Use a suitable tool that grips the splines, for example, a chisel and an adjustable wrench.

Remove the worm-drive from the rotor housing and disassemble the inner sliding disc. Note the orientation of the grooves in the sliding bearing.

Remove the screws (4 x for R4, 6 x for R6, 8 x for R8) holding the cover in position.

Remove the cover using a crowbar.

Remove the O-ring and upper rotor seal.

Remove 2 screws fastening the worm wheel to the adapter plate and mount two of the screws holding the quick coupler in the same screw hole.

Lift the rotor a few cm above the base using an overhead crane or other approved lifting device.

Remove the adapter plate from the worm wheel. Use a rubber mallet or similar tool.

Remove the screws.

Remove the O-ring and slide bearing (R4 Slide bearing, R6 R8 Guide ring).

Remove the sliding disc.

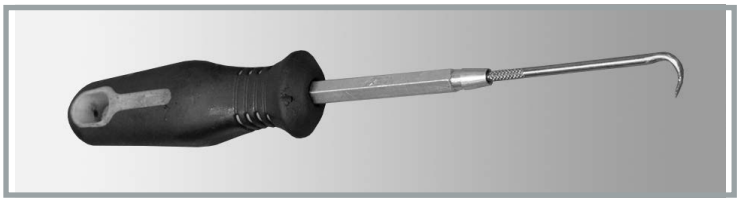
Remove the worm wheel, fit two M20 screws with a suitable lifting device and lift the work wheel out of the rotor housing.

Turn the rotor housing over.

Remove the lower rotor seal.

Mounting rotor parts

WARNING! Crush risk. When dismantling or mounting heavy components there is always a crush risk. Observe extreme caution and always secure the load.



Special tool

Number of persons: 1

Equipment

Overhead crane

Lifting strops, 2 x

Tools

Allen key 12 mm

Allen key 10 mm

Rubber mallet

Poker iron

Special tool

Consumable materials

Lubricating grease

Oil

Spare parts

Seal kit, rotor

Pre-conditions

Disassembly of quick coupler, mount and hydraulic motor. Rotor body emptied of oil.

Procedure

Clean all components using, for example, a degreasing agent and high-pressure washer. Check that the two seal grooves are properly cleaned. This is important for the correct positioning of the seals.

Fit the lower rotor seal so that the lip is directed towards the rotor. Form two arches in the seal when fitting to avoid the seal folding in on itself.

Lubricate the rotor seal with grease.

Check the adapter plate’s sealing surface for wear. There should be one groove.

Lubricate the adapter plate with oil, fit the sliding bearing and sliding disc.

Lubricate the sliding bearing with grease.

When fitting the adapter plate check that the lubrication oil channel to the lower rotor seal is directed away from the motor side.

Lower the rotor housing onto the adapter plate. Check that the seal runs over the adapter plate without becoming deformed.

Lubricate the O-ring with oil and fit it around the adapter plate.

Lubricate the rotor housing interior with oil.

Lower the worm wheel into the rotor housing.

Fit 2 screws and washers affixing the worm wheel to the adapter plate. Tighten to torque setting 200NM.

Mount the upper rotor seal; the recess of the seal must be facing upwards. Form two arches in the seal when fitting to avoid the seal folding in on itself.

Lubricate the rotor seal with grease.

Check the cover’s sealing surface for wear. There should be one groove.

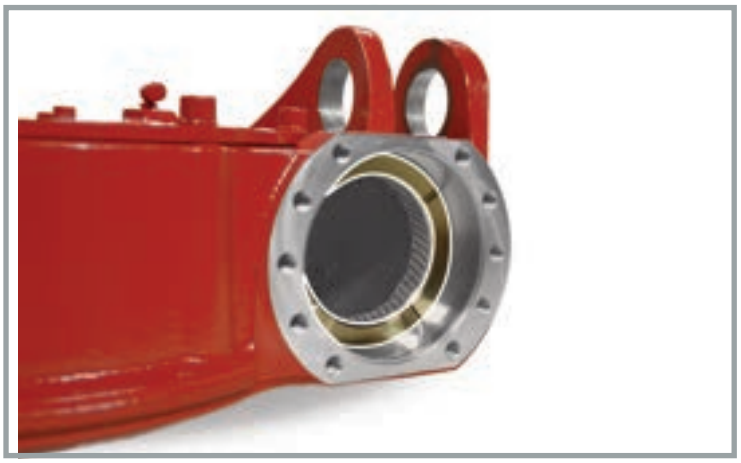
Lubricate the underneath of the cover and O-ring with grease, fit the O-ring to the inside of the cover.

Align the cover over the holes of the rotor housing. Using hand pressure push the cover down over the seal, or fit a number of screws and screw the cover down using alternating screw locations. Use the special tool to ensure the seal sits correctly under the cover.

Fit a number of the cover’s screws and locking nuts: tighten to torque setting 120NM. Leave the screws that fasten the safety plate.

Mount the worm-drive.

Lubricate the surfaces of the bearing race on the rotor housing and the worm-drive with oil.



Mount the inner sliding bearing with the groove outwards.

Screw the worm-drive in clockwise.

Affix the worm-drive from the opposite side using, for example, a stonemason’s chisel and a spanner.

Mount the outer sliding disc, this time with the groove inwards.

Mount the O-ring onto the gable and fill the gable with oil.

Fit the screw that affixes the gable, torque setting 120NM.

Replenishing rotor oil

WARNING! Crush risk. When dismantling or mounting heavy components there is always a crush risk. Observe extreme caution and always secure the load.

Equipment

Overhead crane

Lifting strop

Tools

Allen key 12 mm

Allen key 6 mm

Consumable materials

Oil

Procedure

Lift the rotor housing with an overhead crane or other approved lifting device.

Remove the piping plug on the topside of the rotor housing.

Remove the plug and fill the rotor housing with oil. With the rotor housing tilted at around 30 degrees, the oil level must be at the same height as the filler hole. Refer to the Technical Data for volume.

Fit the plug and piping plug.

Dismantling of quick coupler

Number of persons: 1

WARNING!
Crush risk. When dismantling or mounting heavy components there is always a crush risk. Observe extreme caution and always secure the load.

Equipment

Lifting eye

Overhead crane

Lifting strop

Tools

Allen key 4 mm

Allen key 8 mm

U-ring spanner 13 mm

Allen key 14mm

Pre-conditions

Mount, valve block and hydraulic motor dismantled.

Procedure

Dismantle the driving dog's locking device which is affixed by 2 screws and locking washers.

Fit one of the screws for locking the driving dog, so that it can be raised.

Turn the worm-drive so that the recess in the driving dog is directly in front of the heels in the cover - use a stonemason's chisel and a spanner.

Remove the driving dog.

Remove screws (different numbers depending on model) and washers affixing the rotor housing to the quick coupler. These screws are to be discarded. Leave the 2 screws affixing the rotor housing to the adapter plate.

Lift the rotor housing with an overhead crane or other approved lifting device. Use a crowbar and carefully bend if the rotor housing chafes against the quick coupler's tension pin.

Dismantling and fitting of swivel from quick coupler

Number of persons: 1

WARNING! Crush risk. When dismantling or mounting heavy components there is always a crush risk. Observe extreme caution and always secure the load.

Equipment

Lifting eye M16

Overhead crane

Lifting strop

Tools

Side cutting pliers

Allen key 4 mm

Allen key 8 mm

U-ring spanner 10 mm

Consumable materials

Cable ties

Oil

Spare parts

Seal kit

Pre-conditions

Dismantled mount, valve block and driving dog.

Procedure

Disassembly

Raise the quick coupler with an overhead crane or other approved lifting device so that the underside is accessible.

Cut away all cable ties from the quick coupler.

Disconnect the two cable connections.

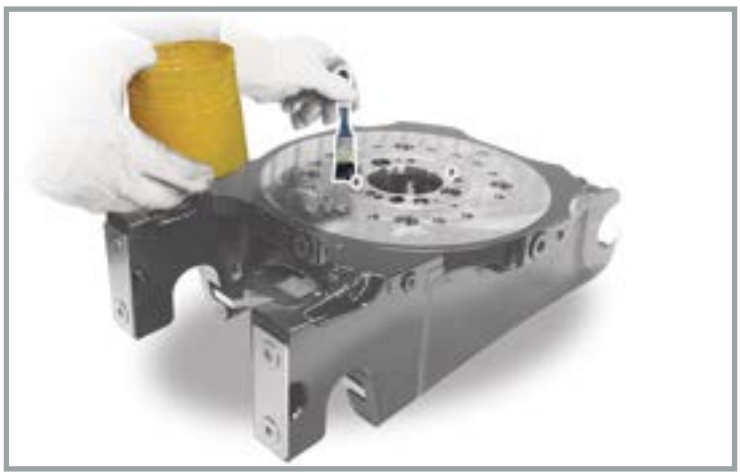
Remove the rubber grommet from its position.

Remove 2 screws affixing the electric swivel to the swivel and withdraw the electrical swivel with its cable.

Remove 6 screws affixing the swivel to the quick coupler.

NOTE! Note how the swivel is mounted before dismantling it.

Mount two of the swivel's anchor screws to the top of the swivel and use them when lifting the swivel. Be careful when lifting so that the swivel's two guide pins are not damaged (feel that they can be moved slightly).



Mounting

Mount the 11 O-rings to the quick coupler, lubricating them with oil.

Mount the 2 guide rings to the quick coupler, the threaded hole in the guide must point upwards.

Push the cable with the electrical swivel through the swivel.

Fit 2 screws affixing the electrical swivel to the swivel.

Fit the lifting device to the swivel.

Lower the swivel onto the guide rings.

Fit the 6 screws and locking washers that fix the swivel to the quick coupler, tighten to a torque setting of 90NM.

Mount the 2 guide rings to the top of the swivel, the threaded hole in the guide must point upwards.

Mount 7 O-rings onto the top of the swivel and lubricate them with oil.

Turn the quick coupler over.

Fit the rubber grommet into position.

Connect the cable connectors from the electrical swivel’s cable, affixing the cable with cable ties along the hydraulic hoses.

Swivel, replacing seals

Number of persons: 1

Tools

Rubber mallet

Locking ring tool

Special tools

Consumable materials

Oil

Spare parts

Seal kit 91/80/4.2

Seal 83.0/2.0

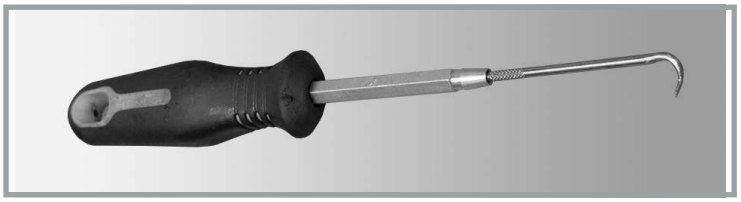
Seal 110x4 N70

Pre-conditions

Swivel dismantled.

Procedure

WARNING! Crush risk. When dismantling or mounting heavy components there is always a crush risk. Observe extreme caution and always secure the load.



Special tool

Dismantle locking ring and sliding bearing on the underside of the swivel.

Use a rubber mallet to strike the swivel crown so that the swivel crown and upper sliding bearing separate.

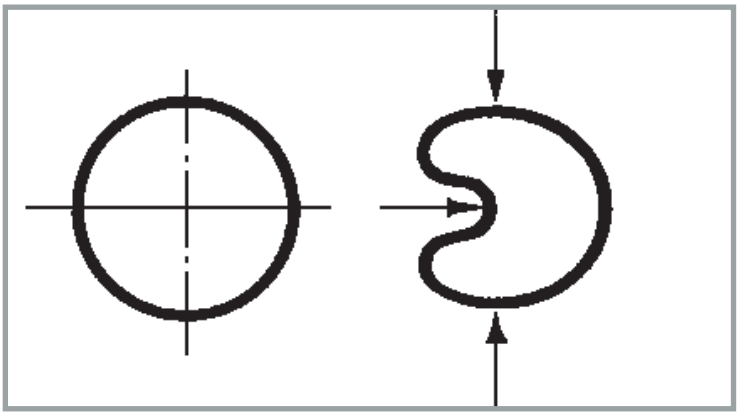
Dismantle the swivel crown.

IMPORTANT!
Exercise extreme caution to avoid causing damage to the sealing surfaces.

Remove the 7 sliding socket seals.

Clean and lubricate the swivel crown and swivel with oil.

Lubricate the sliding socket seals with oil.



Fit new sliding socket seals. When mounting, the sliding socket seals have to be carefully bent into a kidney-like shape. Avoid sharp bending: use a finger to help them regain their original form.

Mount a new seal and upper sliding bearing over the swivel crown and lubricate with oil.

Mount the swivel crown.

Mount a new seal and lower sliding bearing to the underside of the swivel crown and lubricate with oil.

Mount the locking ring.

Dismantling of tilt cylinder

Number of persons: 1

WARNING!
Crush risk. Offload the mount and tilt cylinder prior to dismantling.

Equipment

Overhead crane

Lifting strop

Tools

U-ring spanner 21 mm

U-ring spanner 22 mm

Allen key 14 mm

Socket 25 mm

Consumable materials

Lubricating grease

Procedure

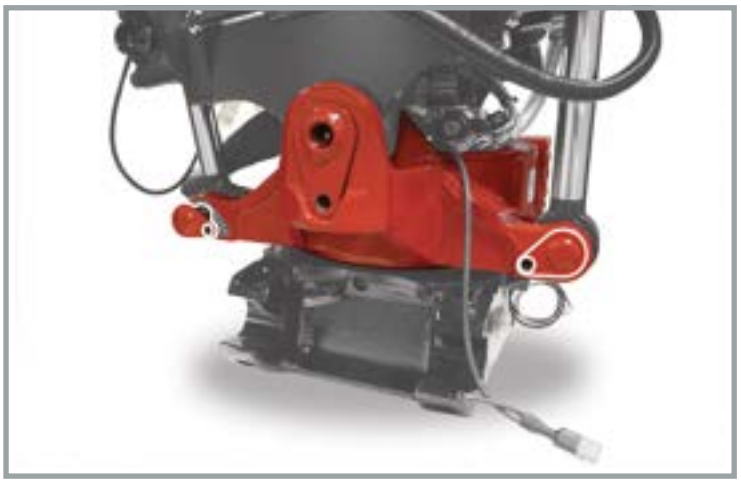
Offload the mount in an overhead crane or other approved lifting device.

Dismantle the hydraulic hoses from the cylinder.

Remove the 4 hexagonal screws affixing the cylinder mount.

Use a rubber mallet to strike the cylinder mount loose.

Dismantle the cylinder mount.



Lay the cylinder down.

Remove the cylinder lug. Knock it out using a rubber mallet or suitably socket-shaped device. Take care not to damage the lubrication nipple.

WARNING!
Crush risk. Offload the mount prior to mounting.

IMPORTANT! There are 4 different types of tilt cylinder -Single-action with or without load retention valves, and double-action with or without load retention valves. For cylinders with load retention valves the load retention valve must first be dismantled in order to extend the piston rod.

Mounting tilt cylinder

Number of persons: 1

Equipment

Overhead crane

Lifting strop

Tools

U-ring spanner 21 mm

U-ring spanner 22 mm

Allen key 14 mm

Socket 25 mm

Consumable materials

Lubricating grease

Procedure

Offload the mount in an overhead crane or other approved lifting device.

Fit the 4 hexagonal screws affixing the cylinder mount.

Fit the hydraulic hoses.

Dismantle the load retention valves; 2 at the top of each cylinder.

Lower the mount so that one of the cylinder’s piston rods is in position for the rotor housing’s attachment ear.

Pass a screwdriver or similar tool through.

Raise up using an overhead crane so that the cylinder’s piston rod is extended.

Repeat for the other cylinder.

Lubricate the cylinder lugs and affix the ears with lubricating grease.

Mount the cylinder lugs, use a rubber mallet.

Mount the fixing screws (1 per lug) with a Nordlock washer to the cylinder lugs, torque setting 120NM.

Mount the load retention valves, torques setting 50NM.

WARNING! Crush risk. When dismantling or mounting heavy components there is always a crush risk. Observe extreme caution and always secure the load.

Mount of Quick Coupler

Number of persons: 1

Equipment

Overhead crane

Lifting strops, 2 x

Tools

Allen key 4 mm

Allen key 8 mm

U-ring spanner 13 mm

Torque wrench

Hexagonal socket 14 mm

Spare parts

Seal kit

Tension pin

Screws M16 (R4 x 18, R6 & R8 x 22)

Procedure

Mount the swivel onto the quick coupler, if dismantled (refer to section Dismantling and Mounting Swivel).

Lift the rotor housing with an overhead crane or other approved lifting device. Fit the rotor housing to the adapter plate's tension pin and lower.

Fit screws (R4 x 18, R6 & R8 x 22) and washer that affixes the rotor housing to the quick coupler. New screws must be used, torque setting 330NM.

Turn the worm-drive so that the swivel is in the correct position, using. for example, a stonemason’s chisel and an adjustable spanner.

Mount the driving dog, turn the driving dog so that the notch in the driving dog goes past the heels of the cover.

Mount the driving dog’s locking device with 2 screws and locking washers.

WARNING! Crush risk. When dismantling or mounting heavy components there is always a crush risk. Observe extreme caution and always secure the load.

IMPORTANT - When mounting the mount there is a risk that hoses and electrical cable become pinched. Ensure that the mount is properly horizontal when mounting.

Mount of mount

Number of persons: 1

Time: 60 mins

Equipment

Overhead crane

Lifting strops, 2 x

Tools

Allen key 8 mm

Allen key 10 mm

Socket 25 mm

U-ring spanner 24 mm

Rubber mallet

Torx T15

Socket 32 mm

Consumable materials

Cable ties

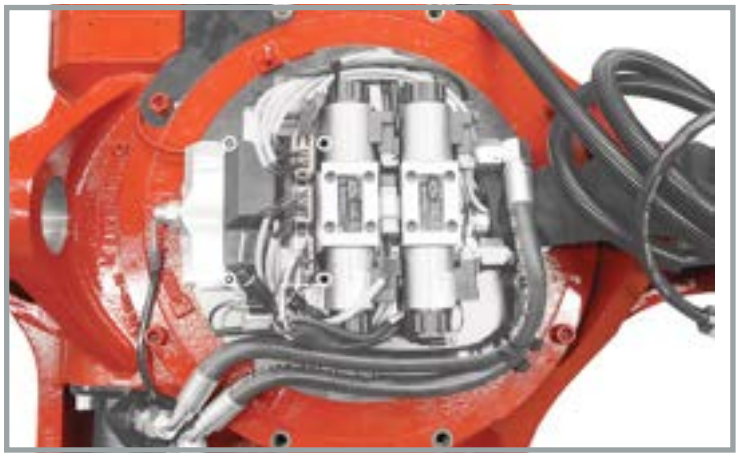
Lubricating grease

Procedure

Secure the mount with an approved lifting device. Allow the mount to be secured in the lifting device during the entire mounting process.

Lubricate the attachment ears of the rotor housing with lubricating grease.

Place the mount above the rotor housing.

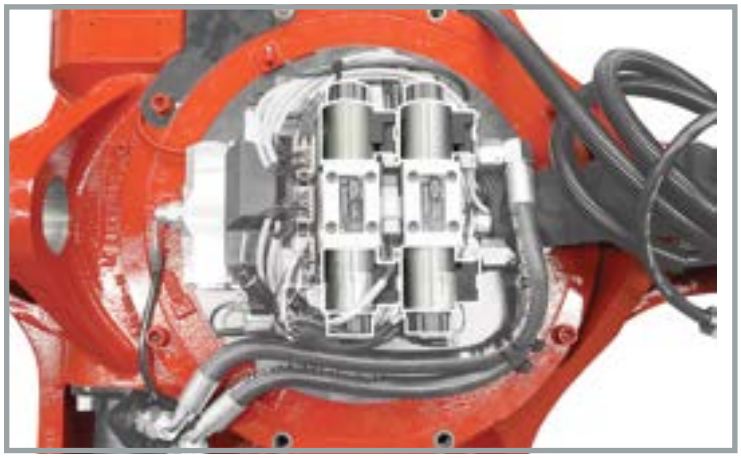


Pictures on the left are from production where the mount has not been fitted.

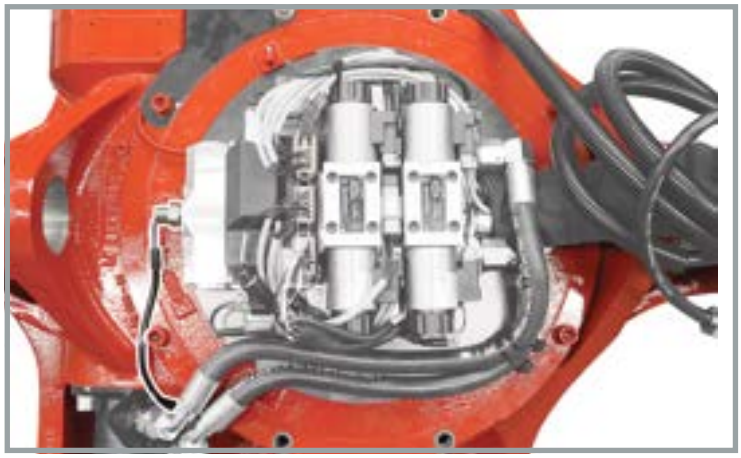
Mount the 2 screws and locking washers that affix the hydraulic motor. Torque setting 120NM.

Mount the valve block in the swivel using 4 screws, torque setting 90NM.

Mount the TCU in the valve block with 4 screws.



Fit the electrical coils to the upper valves (2 or 4 depending on type), torque setting 8NM.



Mount the oil leakage line to the hydraulic motor.

Lower the swivel onto the rotor housing.

Lubricate and mount sliding bearing onto the inner ear of the rotor housing. If the sliding bearing is worn it must be replaced.

Use a rubber mallet to fit the lugs.

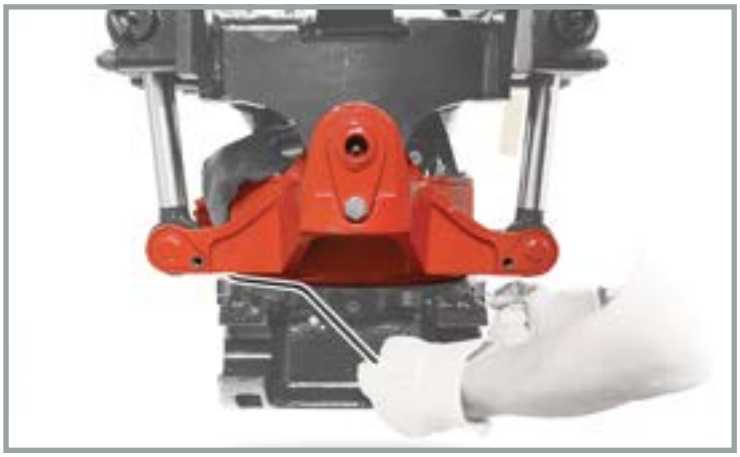
Affix the lugs with through-screws (1 per lug) and locking nuts, torque setting 120NM.

Mount the tilt cylinders' piston rods in the rotor housing. Refer to "Dismantling & Mounting Tilt Cylinder"

Mount the electrical connection to the sensors; the cable is marked "EL SWIVEL".

Affix the cables with cable ties.

Mount the safety plate over the valve block. Use 4 screws with rounded heads, torque setting 120NM.



Mount dust seal between quick coupler and rotor housing.