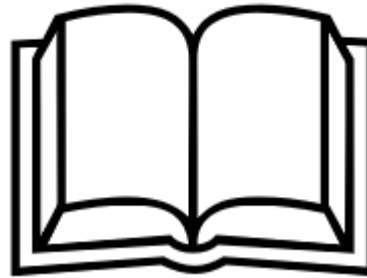


# Users' Guide

## Mechanical chain mulchers



Read the Users' Guide prior to utilisation of the machine!

Applies to the following models / from CE number

M160S M160PC M174PC	8121001	→
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Revision B

**Tokvam AS**

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Original language: Norwegian

## DECLARATION OF CONFORMITY

Manufacturer: Tokvam AS  
Vestre Totenvei 1135  
N-2840 REINSVOLL  
Norway

Organisation number: 979 746 156  
Telephone: +47 61 19 63 77  
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We hereby declare that the following product:

Chain mulcher Model: Serial number:  
  
M160S, M160PC, M174PC / 8121001 ->

to which this declaration relates is in conformity with the relevant provisions of the following standard or other normative documents:

- Directive 2006/42/EC on machinery
- NS-EN ISO 12100:2010

Place and date of issue: Reinsvoll, 15 February 2021



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Finn Kristian Tokvam (Managing Director)

Original language: Norwegian

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## 2 Technical data and dimensional sketches

### 2.1 Technical Data

Table 1 Technical data

Machine	M160S	M160PC	M174PC
Working width	150 cm	150 cm	164 cm
Weight basic machine	675 kg	780 kg	820 kg
Lifting the cutting pan	Hydraulic	Hydraulic	Hydraulic
Hydraulic connection	1 single-acting outlet	1 single-acting outlet	1 single-acting outlet
Oil pressure max. bar	210	210	210
Rotational speed PTO	540-1000 rpm	540-1000 rpm	540-1000 rpm
Direction of travel	B*	B* F** R***	B* F** R***
Transmission	Belt drive + gear	Belt drive + gear	Belt drive + gear
Range from centre of tractor, basic machine.	3420	3420	3545
Range from centre of tractor with lateral movement**** max/min	4020 / 2820	4020 / 2820	4145 / 2945
Max. angle up	90°	90°	90°
Min. angle down	-35°	-35°	-35°
Collision guard	Spring in puller	Spring in puller	Spring in puller
Chain size, cutting unit	10 mm and 13 mm	10 mm and 13 mm	10 mm and 13 mm
PTO spline size	1-3/8" Z6	1-3/8" Z6	1-3/8" Z6

\*B = Rear mount, pulling

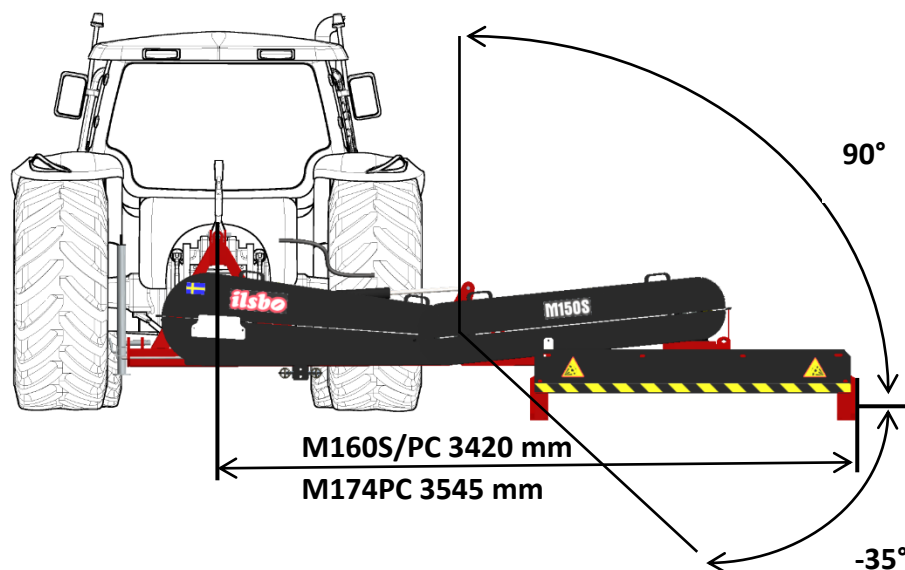
\*\*F = Front mount

\*\*\*R = Reversing, rear mount

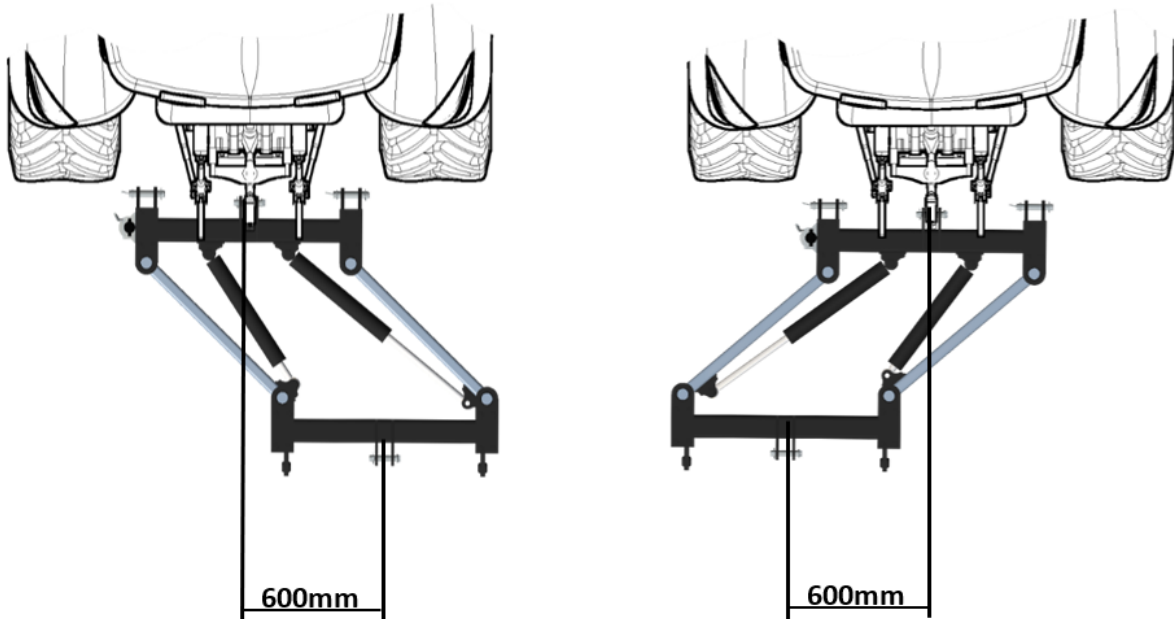
\*\*\*\*Optional equipment

### 2.2 Dimensional sketches

Basic machine



## Lateral movement frame



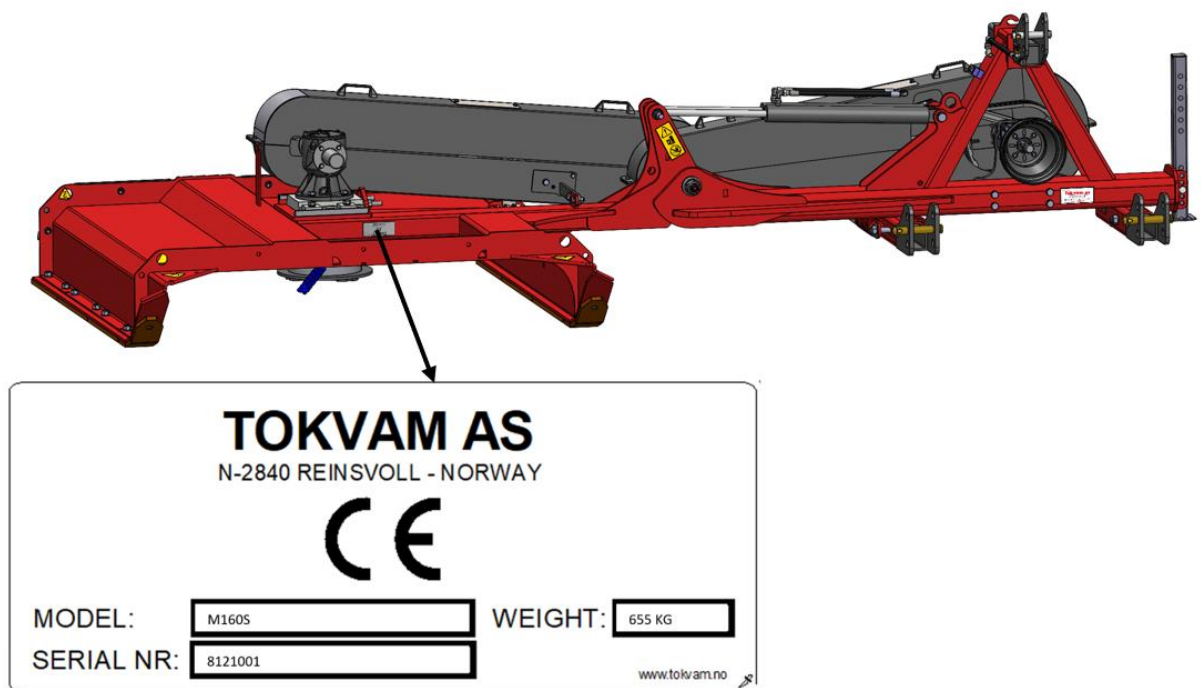
### 2.3 Machine label / CE mark

All machines carry a machine label. The machine label is fitted below the gear box at the centre of the machine (see illustration below).

The following information is provided on the machine label:





Model (machine type)

Serial no.: The number is made up of the machine number (2 digits) + production year (2 digits) + production number (3 digits).



### 3 Warning labels on the machine – significance of the symbols

Please read and learn the warning symbols.

	Lifting point The machine can be lifted using the holes beside this mark
	Risk of loose objects There is a risk that loose objects such as stones may be ejected by the machine
	Risk within a 50-metre-radius There is a risk involved in being closer to the machine than a 50-metre-radius. Make sure that persons and animals are outside this radius when using the machine
	Keep a safe distance! Risk of crushing injuries Moving parts. Risk of crushing injuries. Keep a safe distance from this area when the machine is in operation or parked. Persons must not be allowed to move between the chain mulcher and the carrier during assembly or disassembly of the chain mulcher

#### Read the Users' Guide carefully prior to utilisation of the machine!

Read the Users' Guide in detail before starting the machine and prior to preventive maintenance. Get to know the equipment and read all the instructions. Store the Users' Guide so that it is easy to find during use of the machine. **NB!** This Users' Guide has been published for all markets. Please note that optional equipment may therefore vary. Please ignore information on any equipment not found on your machine.

We make constant improvements to our products and therefore reserve the right to make changes and amendments as we see fit. Improvements and changes are not implemented on products (machines or optional equipment) that have already been delivered and are in use. We reserve the right to amend data and specifications for new machines without prior notice. The same applies to instructions for maintenance and other service initiatives.

### 4 Safety



**The driver is responsible for ensuring that the tool is not utilised or handled incorrectly.**

Make sure that the tool has the correct dimensions for the relevant type of carrier. Factors of particular importance are power requirement, weight and working width. Any nonconformities in this area may result in a limited product warranty. Pay special attention when using lateral movement. This results in displacement of the centre of gravity, and there is a risk of the carrier tipping over.

- Children must not be allowed near the machine.
- Never start the carrier unless all persons are at a safe distance from the machine.
- In all events, make sure there are no persons nearby the machine when it is in operation.

- Never allow persons to stand between the machine and its carrier when the machine has been fitted to the carrier. Unintended events may result in crushing injuries.
- Pay special attention to loose objects such as stones being ejected from the machine during operation.

Modifications, amendments and reconstructions that have not been approved by the manufacturer may lead to limitations in the warranty or render the warranty void. This also applies to the use of spare parts or optional equipment that have not been delivered or approved by the manufacturer. Tokvam AS cannot be held liable for personal injuries or damage to property which has occurred due to the above.

When ordering spare parts or optional equipment, please state the machine type and serial number. Use of non-original spare parts on the chain mulcher is prohibited.

## 5 Product description

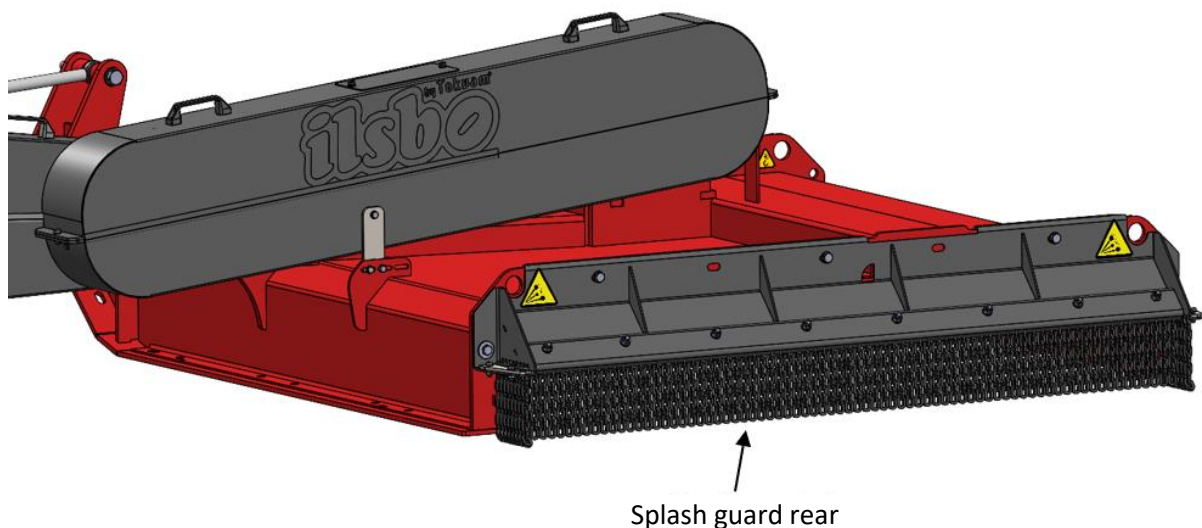
The machine has been designed to remove vegetation such as grass, shrub and bushes from ditches, roadsides, cultivated fields, power lines etc. The machine has been designed for use on a tractor, using the tractor's PTO as drive source.

### 5.1 Safety equipment



The following safety equipment is provided with the machine and **utilisation is obligatory**:

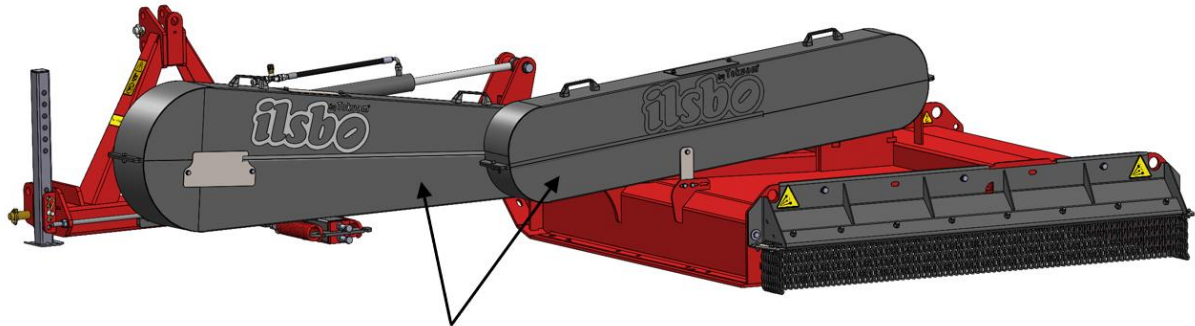
#### 5.1.1 Splash guard rear.



The purpose of the rear splash guard is to reduce the risk of loose objects being ejected from the machine, and must always be in place.



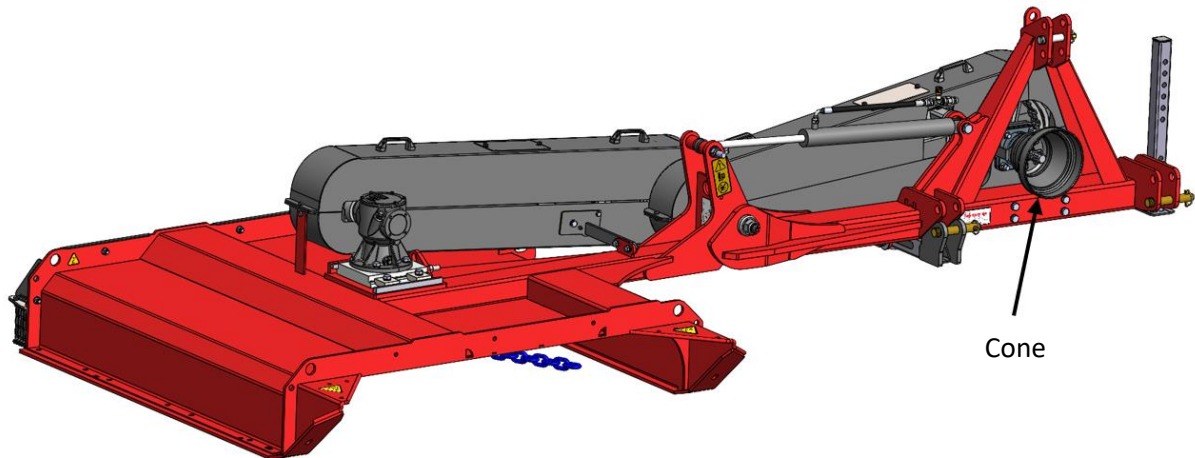
#### 5.1.2 Cover over belts and belt pulleys.



Cover over belts and belt wheel

The cover prevents access to belts and belt pulleys during operation, and protects the drive gear from branches etc., and

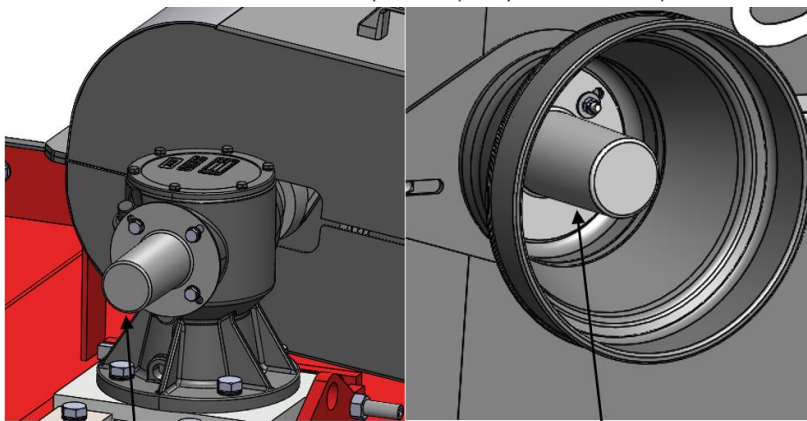
#### 5.1.3 Cone



Cone

Cone for protection of the transition from the PTO shaft to the drive shaft on the chain mulcher. Must always be used.

#### 5.1.4 Protection for shaft splines (only PC models)



Protection for shaft spline on gear

Protection for drive shaft spline

Protection for shaft splines that are not in use must always be in place

## 5.2 Standard and available optional equipment

The table below provides an overview of the equipment supplied as standard on most markets (S) and optional equipment (E).

For fitting instructions for optional equipment, please refer to the Users' Guide which accompanies the optional equipment when delivered with the machine. If optional equipment is ordered after the machine order, the Users' Guide will be supplied with the optional equipment.

Table 2 Available optional equipment

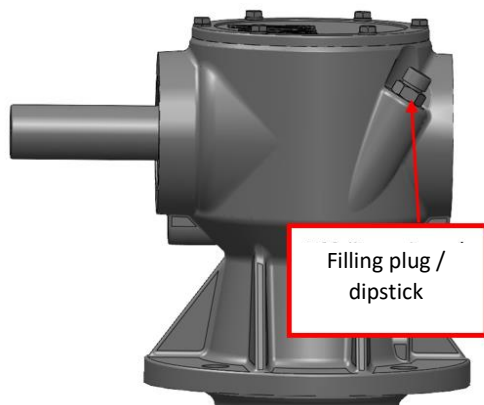
Equipment	Brief description	M160S	M160PC	M174PC
Lateral movement frame	Provides lateral movement of the chain mulcher, $\pm 60$ cm	E	E	E
Splash guard, front	Reduces the risk of loose objects being ejected at front of machine	E	E	E
D-link chain, 1 pair	Optimal function when cutting grass where there are also a lot of stones.	E	E	E
Replaceable wear skid shoe	Protects the machine hull from wear and tear	E	S	S
PTO for rear mount	PTO shaft with free wheel	E	E	E
PTO for front mount	PTO shaft with free wheel	-	E	E

## 6 Preparations prior to use

### 6.1 Check to make sure there is enough oil on the gear

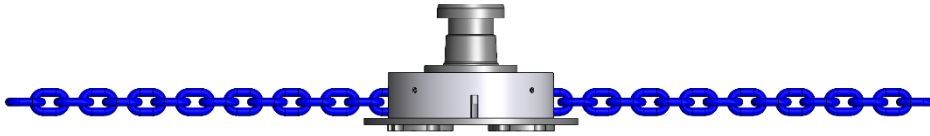
Check to make sure there is enough oil on the chain mulcher gear. The oil level shall be at the same height as the dipstick on the oil filling plug on the chain mulcher gear.

On delivery from the factory, the gear is filled with 1.4 litres of oil: Mobilgear 600 XP 150



## 6.2 Loosen the impact chain

The impact chains are wound around the chain attachment and are held in place with cable ties. Cut the cable ties before starting.



## 6.3 Adaptation of the PTO shaft

For operation of the chain mulcher, use a PTO shaft from the tractor's PTO to the chain mulcher. It is important to make sure the PTO shaft has a free wheel, so that it can swivel after the PTO has been turned off. This helps protect the drive gear on the chain mulcher. The length of the PTO shaft must be adapted to the tractor to ensure that the PTO shaft's telescope function can move freely. If cutting the PTO shaft, it is important to trim the cut surfaces properly before reassembling the shaft.

# 7 Transport

The machine shall always be placed on a level, stable surface which can withstand the weight of the machine. Ref. technical data for the machine in question to find the weight of the machine.

## 7.1 Placing the machine on a pallet


The pallet must be intact and have the correct dimensions to withstand the total weight of the machine.

## 7.2 Lifting/moving

Always make sure that the tool utilised to lift the machine has the correct dimensions to lift the total weight of the machine.

The machine shall only be lifted/moved using one of the three alternatives described below.

1. Lifting the machine using a carrier connected to the machine's attachments.
2. Lifting the machine on a pallet using the forks on a forklift truck or other carrier.
3. Lifting the machine using straps or similar\* at the specified lifting point.

All lifting points are marked with 

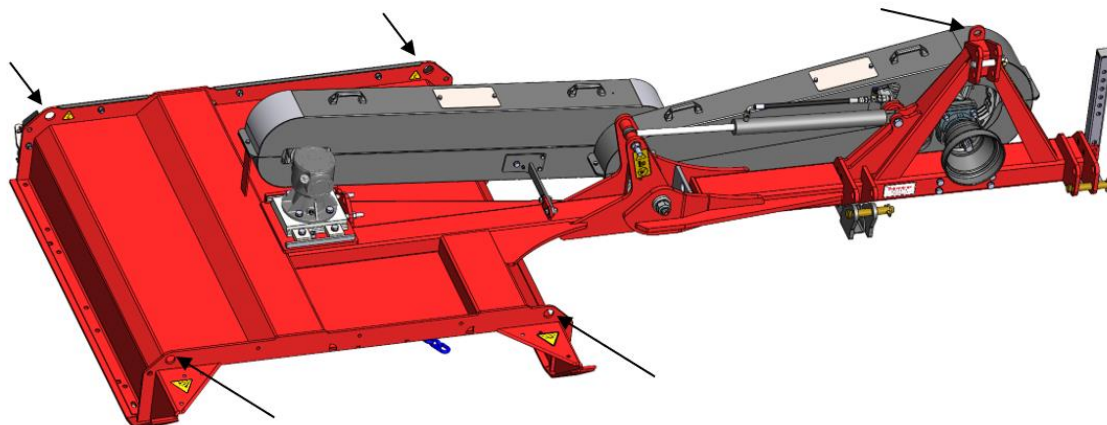


Figure 1 Lifting point on the S models x 5

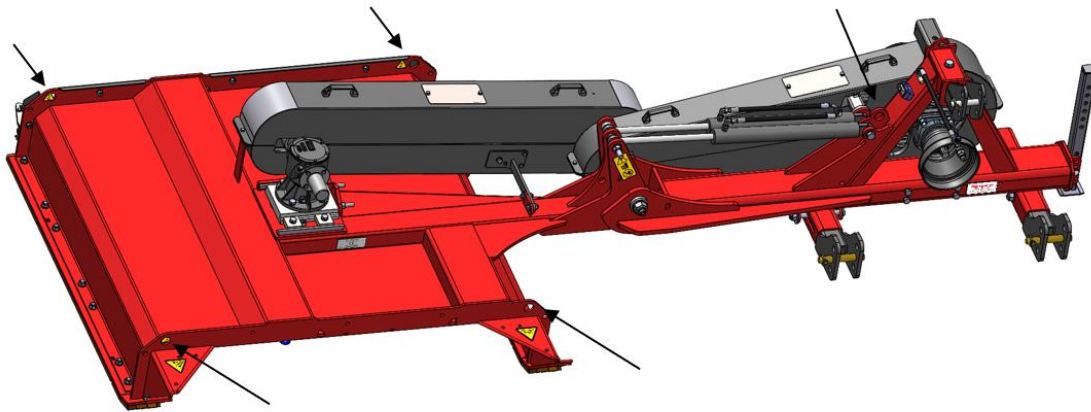


Figure 2 Lifting point on the PC models x 5


### 7.3 Transport by vehicle/on trailer


The transport company is responsible for ensuring that the machine is attached/strapped in accordance with the prevailing requirements for the method of transport in question. Straps, ropes or other tools to attach the chain mulcher during transport are not supplied.


## 8 Connection to carrier

The chain mulcher has been designed for use on tractors. The different models vary in relation to how they are fitted on the tractor, ref. Table 1 Technical data. S model chain mulchers are for rear mount only. All the chain mulchers are delivered from the factory for rear mount. The PC models can be set up for rear mount, rear mount/reversing and front mount.


Make sure the chain mulcher is in a stable position before fitting it to the tractor. Attach the chain mulcher to the tractor's three-point attachment.

 Keep in mind the weight and width of the chain mulcher in relation to the weight of the tractor. The centre of gravity for the tractor and carrier will be displaced laterally, and there is a risk of the tractor tipping over.

 Never allow any unauthorised persons to stand between the machine and carrier during connection/disconnection.

 Never allow any persons to stand between the machine and carrier when a person is seated in the driving seat in order to prevent crushing injuries.

 Never place hands or feet in the machine once it has been connected to the carrier.

 High-pressure hydraulic jets may penetrate the skin and cause serious injury. Consult with a doctor immediately if hydraulic oil has penetrated the skin or if you have hydraulic oil in your eyes. Hydraulic oil can also cause allergic reactions. If you get hydraulic oil on your skin, it is essential to wash the area immediately.

For assembly of other equipment, refer to the users' guide enclosed when such equipment is provided. In principle, any optional equipment provided by the manufacturer is supplied separately and must be fitted by the customer, unless otherwise agreed.

## 8.1 Connection – rear mount for pulling

Assemble the chain mulcher to the tractor's three-point attachment. Adjust the length of the top bar so that the chain mulcher's rear part is 2-5 cm closer to the ground than the front part. Remember to pull up the parking leg on the chain mulcher

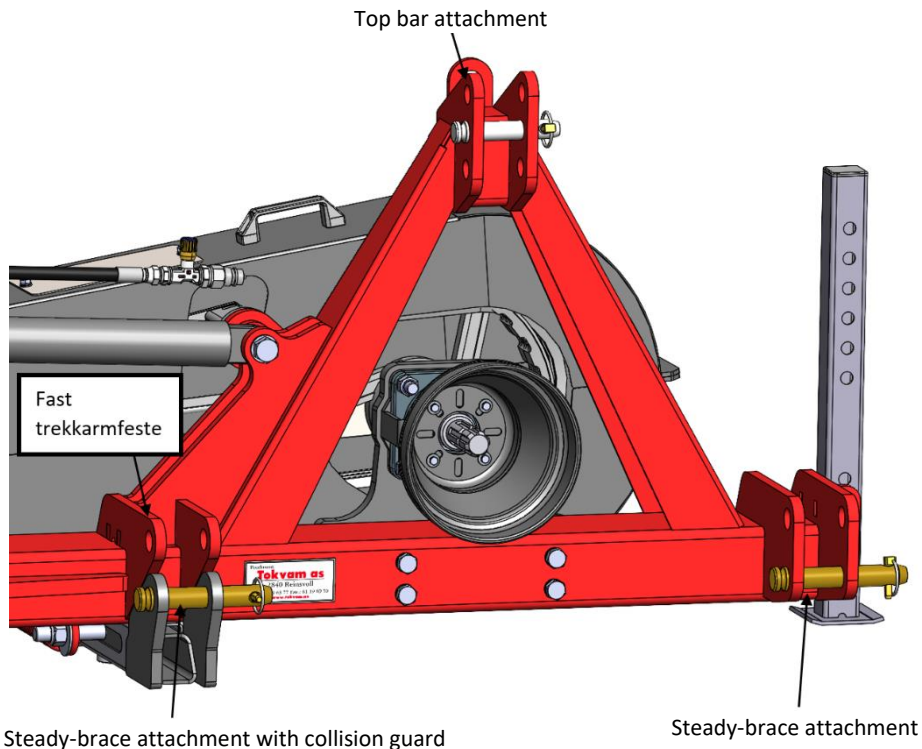


Figure 3 S models have a steady-brace attachment for permanent attachment and with collision guard

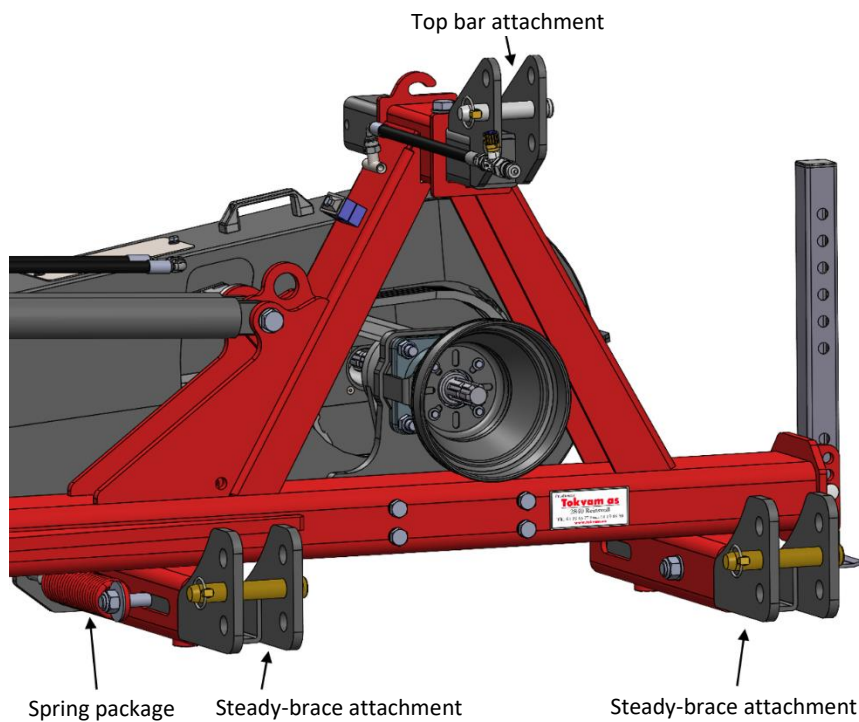
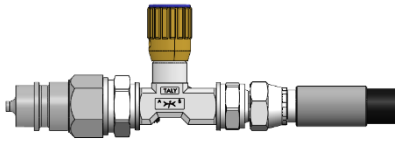


Figure 4 PC model set up for rear mounted pulling



Attach the hose to one of the tractor's hydraulic outlets. Max. pressure 210 bar. Adjust the choke valve so that the chain mulcher can be lifted/lowered at a comfortable speed.



You must make sure that all hydraulic connections are sealed and that all hoses are free of damage before activating the hydraulic system.

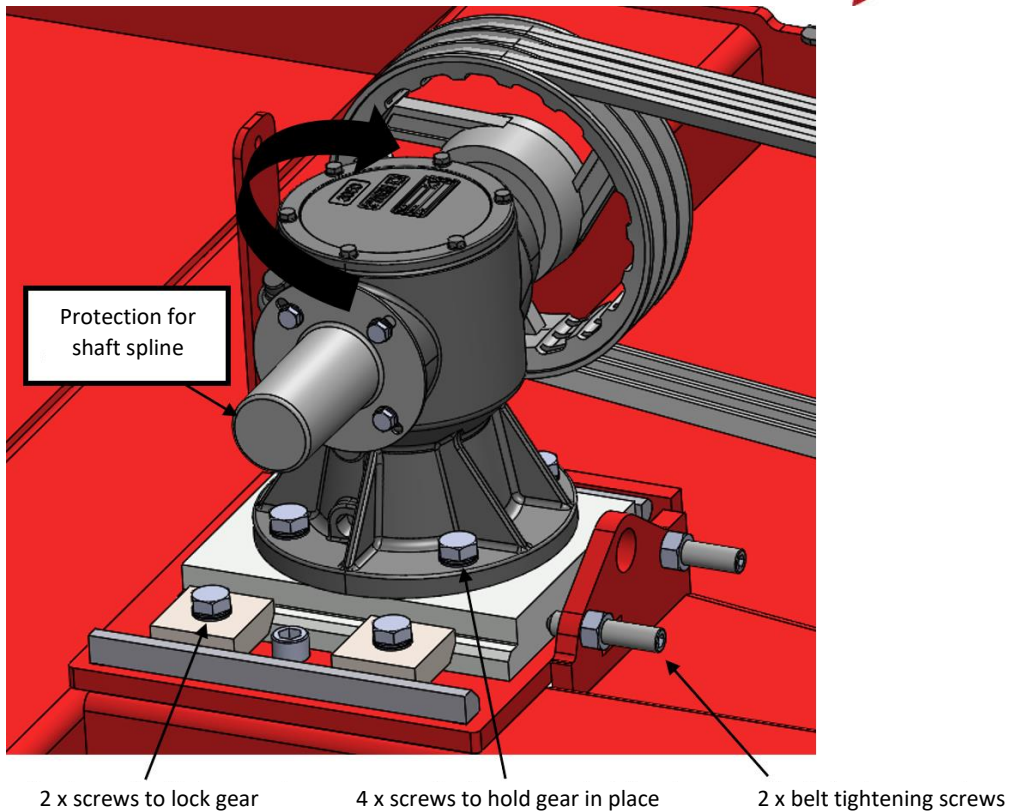
Connect the PTO shaft to the tractor. The PTO shaft must have a free wheel to protect the chain mulcher's drive gear. Make sure this is locked, both on the tractor and on the chain mulcher. Attach the chain on the guard to the PTO shaft to stop it from rotating. The chains must be attached to both the tractor and the chain mulcher. The length of the PTO shaft must be adapted to the tractor.

## 8.2 Connection – rear mount for reversing

For rear mounted chain mulchers for reversing, connection to the tractor is the same as for rear mounted chain mulchers for pulling. NB! The collision guard will not work in reverse, so extra caution is required when reversing.

If the chain mulcher is mainly to be used for reversing, the rotational direction of the impact chains should be changed. For pulling and front mount, the impact chain rotates clockwise so that any loose objects are ejected away from the tractor and the road. As such, it is necessary to change the direction of the impact chains when reversing. To do so, turn the gear box on the chain mulcher 180°:

- Remove the belt cover by the gear box
- Remove the protection for the shaft spline
- Loosen the two screws that lock the gear box. Loosen the two screws used to tighten the belt
- Remove the belts
- Remove the belt pulley
- Unscrew the four screws that hold the gear box
- Turn the gear box 180°
- Screw in the four screws that hold the gear box
- Fit the belt pulley in line with the opposite belt pulley
- Assemble the belts
- Tighten the belts and lock the gear box in place
- Fit the belt cover
- Fit the protection for the shaft spline



### 8.3 Connection – front mount

For front mounting (PC models), the top bar attachment and steady-brace attachments must be moved to the rear of the chain mulcher. NB! The spring package for the collision guard must be moved from the right steady-brace attachment to the left steady-brace attachment in order to maintain function

Steady-brace attachment

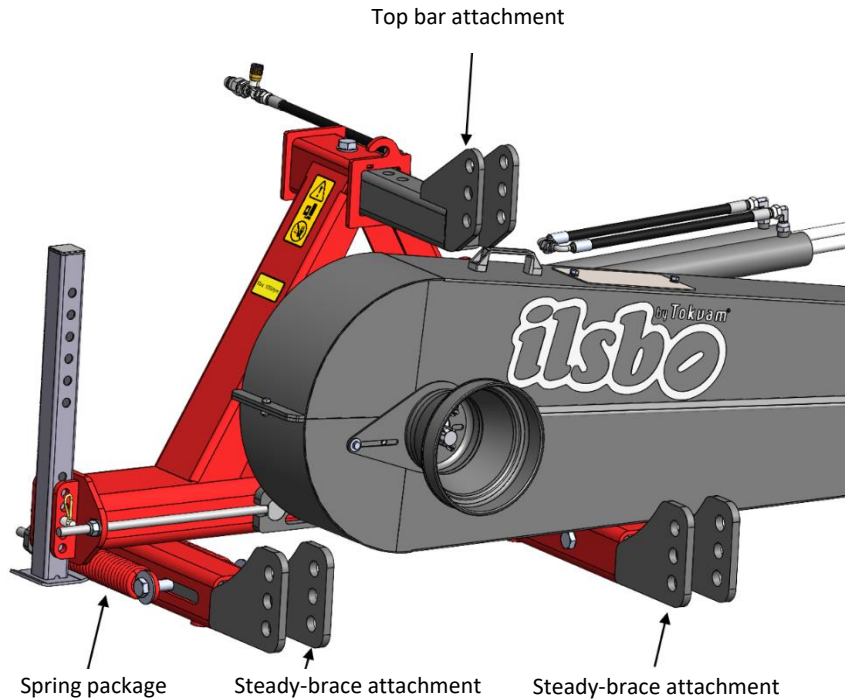
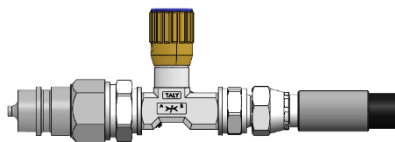


Figure 5 Set up for front mount

Assemble the chain mulcher to the tractor's three-point attachment. Adjust the length of the top bar so that the chain mulcher's rear part is 2-5 cm closer to the ground than the front part. Remember to pull up the parking leg on the chain mulcher

Attach the hose to one of the tractor's hydraulic outlets. Max. pressure 210 bar. Adjust the choke valve so that the chain mulcher can be lifted/lowered at a comfortable speed



You must make sure that all hydraulic connections are sealed and that all hoses are free of damage before activating the hydraulic system.

Connect the PTO shaft to the tractor. The PTO shaft must have a free wheel to protect the chain mulcher's drive gear. NB! The free wheel must have the reverse direction in relation to pulling. It is not possible to use the same PTO shaft for pulling and front mount. Make sure this is locked, both on the tractor and on the chain mulcher. Attach the chain on the guard to the PTO shaft to stop it from rotating. The chains must be attached to both the tractor and the chain mulcher. The length of the PTO shaft must be adapted to the tractor.

## 9 Operation of the machine



The driver is responsible for ensuring the safety of him/herself and others during operation of the machine.

Run the chain mulcher as close to the ground as possible to prevent loose objects being ejected from the machine. This will also provide a better result as the material will remain inside the machine for as long as possible, ensuring it is broken down into the smallest possible pieces.



The driving position should be such that the rear part of the chain mulcher is slightly lower towards the ground than the front part. Do not force the chain mulcher through vegetation that is too coarse. Adjust the propulsion speed of the carrier according to the amount of vegetation to be broken down.

Drive the tractor's PTO with a rotational speed of between 540 and 1,000 rpm. Find the speed that provides the best result in terms of propulsion speed and diesel consumption. We recommend a high rotational speed for the impact chain when operating in shrub and bushes. When operating over grass, the rotational speed should be reduced to lower the air outlet from the impact chain, which may blow the grass away from the impact chain.


A 13 mm chain is the best option for breaking down shrubs and bushes.


A 10 mm chain is the best option for grass, as it has a lower air outlet than a 13 mm chain.


We recommend a 10 mm D-link chain on grass, fields without stones and with few bushes


If there are a lot of stones or other solid objects on the ground and you have a low rotational speed, the chain may jump up and hit the pan or hit the ground before stretching out. This will cause more wear and tear to the pan and increases the risk of loose objects being ejected from the machine.


## 9.1 Safety during use – IMPORTANT!


 NB! Risk of loose objects ejected. Make sure no unauthorised persons are within range of the chain mulcher. The safe distance from the machine is minimum 50 metres.


 When driving on uneven ground, pay extra caution. Reduce the speed of the carrier.


 Notify the general public before driving through populated areas


 The chain mulcher must not be used if the splash guard or belt covers are damaged/have been removed

 Never leave the driving seat until the carrier's engine has been turned off


 Make sure no part of your body is in contact with the chain mulcher's moving parts until the carrier's engine has been turned off


 There is a fire hazard when driving the machine over dry ground


 Never place the chain mulcher on the ground/surface if persons or animals are in immediate proximity, due to the risk of crushing injuries.

 Please note that visibility may be impaired by the chain mulcher.

 Never walk/crawl under the chain mulcher when it is suspended on the carrier.

 If operating the chain mulcher in the dark, lights must be used to light up the work area

 If the chain mulcher starts to vibrate, it must be stopped immediately, inspected and any repairs carried out

 Only use original spare parts for the chain mulcher

## 9.2 Disconnection

Disconnect the machine as follows:

1. Place the machine on a level, stable surface.
2. Lower the parking leg.
3. Disconnect the hydraulic hose from the carrier.
4. Disconnect from the tractor's three-point attachment.
5. The machine is now disconnected and can be left in this position.

## 10 Service and maintenance



The chain mulcher shall be placed on the ground, then activate the parking brake on the carrier, turn off the engine and remove the ignition key before carrying out service and maintenance.

**Tighten the belts after 20 minutes of driving when the chain mulcher is new or when you have installed new belts.**

**Tighten all screws after the first 10 hours of operation.**

### 10.1 Inspection and maintenance intervals

#### 10.1.1 Daily inspection

- Check that the belt cover and splash guard are in one piece and are fully functional
- Inspect hoses and connections for leaks
- Check the quick-release couplings for dirt during assembly
- Check that all screws and nuts are properly tightened
- Check the chain mulcher for cracks/damage
- Check the oil level in the gear box
- Check that the belts are tight and damage-free – tighten if necessary
- Check that the impact chain is in one piece and has the correct number of links
- Check that the spring pins for the top of the chain attachment are in place and fitted properly

#### 10.1.2 Maintenance every 8 hours

- Lubricate the chain mulcher

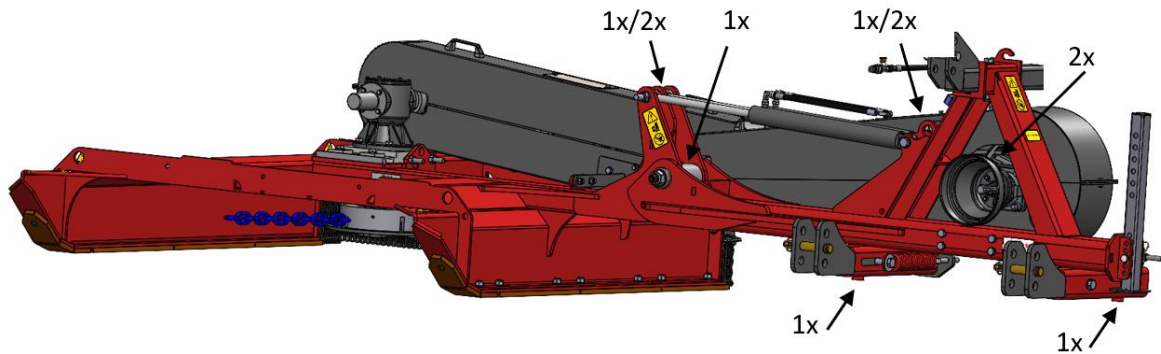
#### 10.1.3 Maintenance every 100 hours

- Change the gear oil

## 10.2 Maintenance

### 10.2.1 Lubricating the chain mulcher

- Clean the grease nipple
- Use a grease gun and press the grease into the grease nipple
- Use EP2 grease
- Lubrication points: Total 7 on S models and 9 on PC models

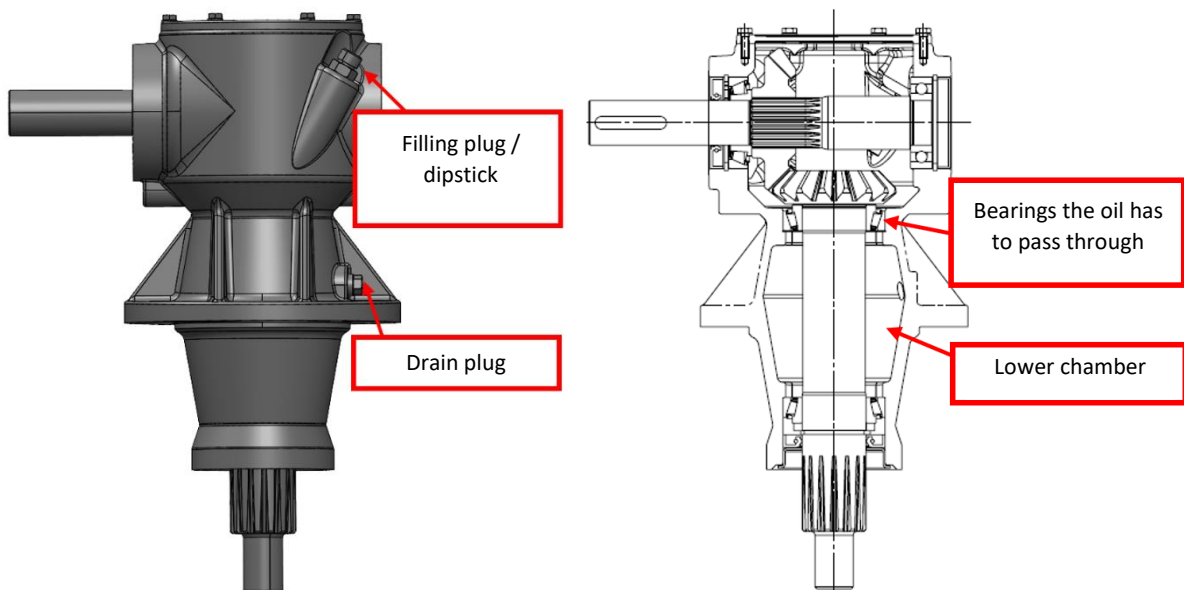


### 10.2.2 Changing the gear oil

- Oil volume: 1.4 litres
- Oil type: ISO VG 150 EP

Procedure:

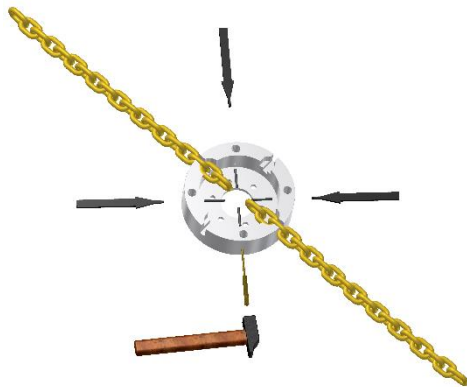
- Unscrew the drain plug.
- Unscrew the filling plug / dipsticks
- Use suction to remove all the oil, through both the hole for the drain plug and the filling plug / dipsticks.



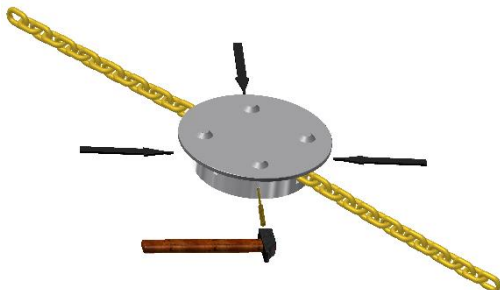
- Fill the oil through the hole for the filling plug / dipsticks. This will take some time as the oil has to flow down through a bearing inside the gear. You have to remove the drain plug to ventilate the air from the bottom chamber before the oil will run down through this bearing. Re-insert the drain plug when the oil starts to run out. Fill the rest of the oil. At this point, the dipstick will show too much oil, but this is because it takes so much time for the rest of the oil to flow through the bearing.

### 10.2.3 Replacing the impact chain

- Place the chain mulcher on a solid surface in a vertical position
- Stop the carrier and remove the ignition key



- Use a hammer and a  $\varnothing 5$  mm mandrel. Hammer in the four spring pins

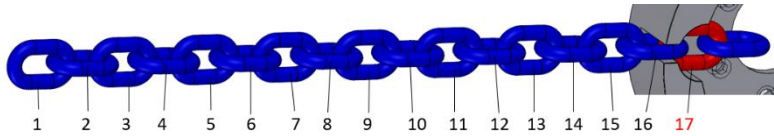


- Remove the chain cover
- Replace the chain with a new original chain. **It is important to use original chains to prevent damage to the chain mulcher and surrounding area**
- Replace the chain cover
- Hammer in **four new** spring pins. **If you use the old spring pins, there is a high risk that the chain cover and chains will fall off**

It is important to make sure you fit the chain with the correct number of chain links outside the chain attachment:

Chain / Machine size	H160S / M160PC	M174PC
13 mm chain	17 links in the attachment	19 links in the attachment
10 mm chain / 10 mm D-link	22 links in the attachment	25 links in the attachment

**Check that the chains do not come into contact with the pan on the chain mulcher before starting**

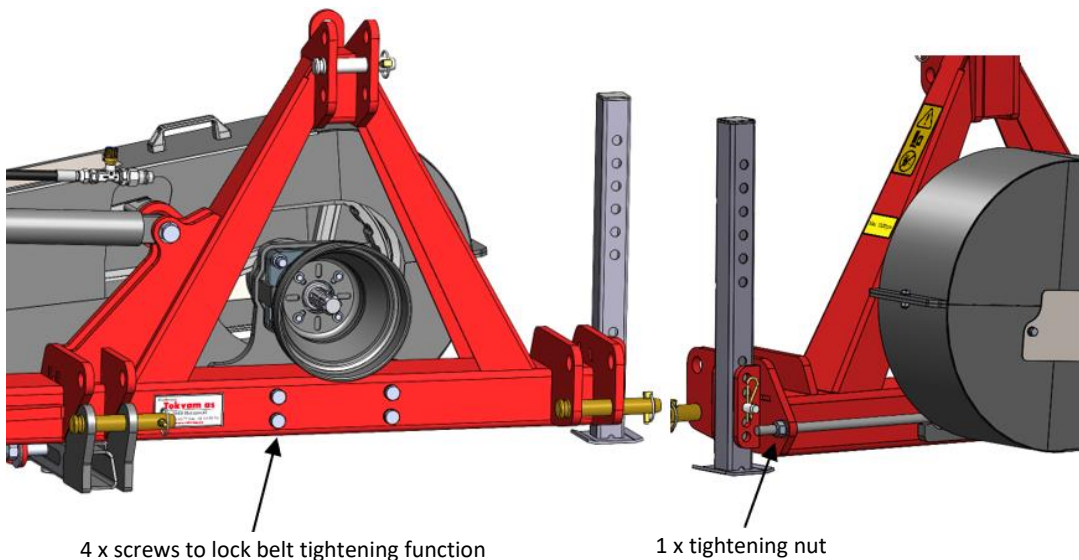


The example shows a 13 mm chain on the M160S / M160PC

## 10.2.4 Tightening and replacing belts

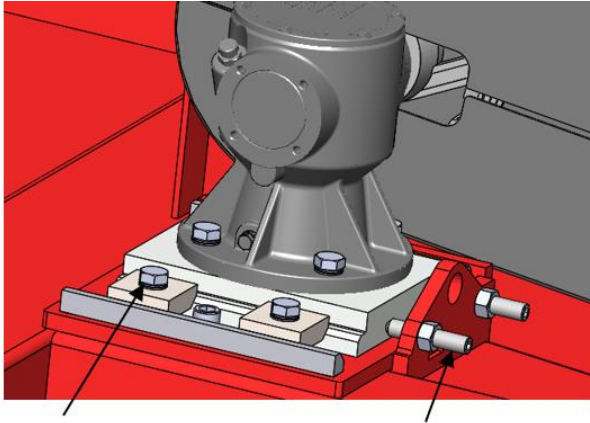
### 10.2.4.1 Tightening belts – inner belts

- Stop the engine on the tractor and remove the ignition key
- Loosen by two rotations the four screws used to lock the belt tightening function
- Tighten the adjustment nuts so that the belts are significantly stretched
- Tighten the four screws used to lock the belt tightening function
- With the PC models, it may be necessary to move the cone for power transmission behind the belt cover after tightening the belts



### 10.2.4.2 Tightening belts – outer belts

- Loosen by two rotations the two screws used to lock the gear
- Loosen the counter nuts on the belt tightening screws
- Tighten the belt tightening screws so that the belts are significantly stretched
- Tighten the counter nuts
- Tighten the two screws that lock the gear



2 x screws to lock gear

2 x belt tightening screws with counter nuts

#### 10.2.4.3 Replacing belts

- Stop the engine on the carrier and remove the ignition key
- Unscrew the belt cover
- Loosen the belts
- Remove the belts
- Install new belts. Always use original belts that have been tested by the manufacturer. **You must replace all the belts at the same time.**
- Tighten the belts until they are significantly stretched
- Re-tighten the belts after 10-20 minutes of driving. New belts have to be re-tightened several times when first installed. This will increase the lifetime of the belts and prevent unnecessary shut-downs

If the belts slip (shriek) during operation, they must be tightened immediately

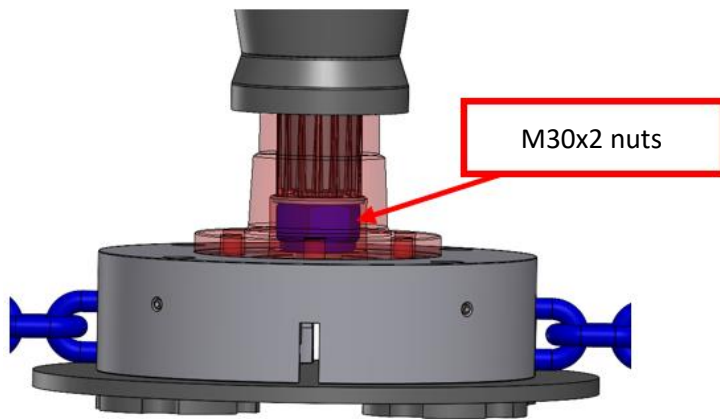
### 10.3 Tightening attachment fittings

As the chain mulcher is exposed to a lot of vibrations, it is important to tighten all screws and nuts regularly.

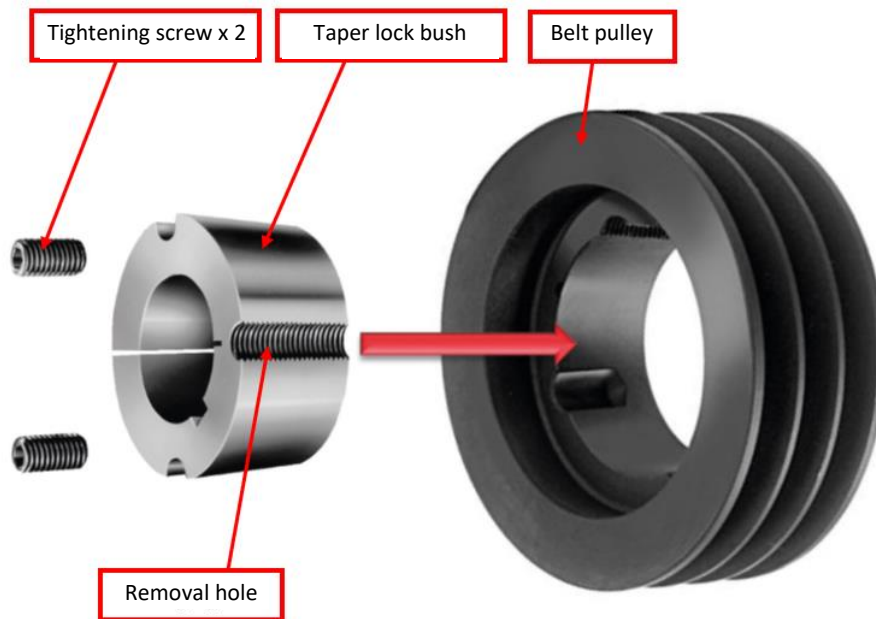
Tighten the attachments using the torque shown in the table below (torque range  $\pm 5\%$ )

	<i>Tiltrekningsmoment i Nm Styrkeklasse:</i>		
	<i>8.8</i>	<i>10.9</i>	<i>12.9</i>
<i>M4</i>	2,6	3,9	4,5
<i>M5</i>	5,2	7,6	8,9
<i>M6</i>	9	13,2	15,4
<i>M8</i>	21,7	31,8	37,2
<i>M10</i>	43	63	73
<i>M12</i>	73	108	126
<i>M14</i>	117	172	201
<i>M16</i>	180	264	309
<i>M18</i>	259	369	432
<i>M20</i>	363	517	605
<i>M22</i>	495	704	824
<i>M24</i>	625	890	1041
<i>M27</i>	915	1304	1526

The make-up torque for M30x2 nuts that attach the chain attachment flange to the gear: 1390Nm



## 10.4 Assembly and removal of belt pulleys



### 10.4.1 Assembling the belt pulleys

- All treated surfaces on the taper lock bush and belt pulley must be cleaned and all grease wiped off
- Hang the belt pulley on the shaft
- Insert the taper lock bush in the shaft
- Rotate the belt pulley so that the threaded holes in the belt pulley fit over the assembly holes in the bush
- Insert the tightening screws. Use Locktite – screw them in loosely so that the bush and belt pulley can still be pushed in and out of the shaft.
- Check that the belt pulley is in line with the opposite belt pulley.
- Tighten the tightening screws. For correct centring of the taper lock bush, the tightening screws must be tightened alternately
- Tighten the tightening screws with the torque specified in the table below



Chain mulcher type	Taper lock bush on gear	Other taper lock bush
M160S / M160PC	50Nm	90Nm
M174PC	90Nm	90Nm

#### 10.4.2 Removing the belt pulley

The belt pulley must be removed manually, without hammering

- Unscrew both tightening screws in the taper lock bush.
- Screw one of the tightening screws into the removal hole. The bush will expand and loosen from the shaft and the belt pulley

## 11 When the season ends / for long-term storage

Compliance with any national regulations relating to annual/periodic inspection is obligatory.

The product shall be carefully cleaned and lubricated before storage.

Lubricate visible parts of cylinder bars with oil or grease

## 12 Scrapping

Once the machine has reached the end of its lifetime, it shall be scrapped in accordance with the prevailing legislation and regulations in the country where the machine has been used.

If there are oil products in the machine, these shall be removed and disposed of in accordance with the prevailing legislation and regulations in the country where the machine has been used.

## 13 Complaints and warranties

Tokvam AS guarantees that the product is delivered from the factory without faults or defects. A warranty is issued in accordance with prevailing legislation.

The customer must notify the seller of any complaints within reasonable time after he/she has detected or should have detected any defects.

The warranty does not cover any faults or defects caused by the product being exposed to overload or any other form of careless use (ref. this Users' Guide).

The warranty does not cover faults or defects caused by lack of maintenance (ref. this Users' Guide).

The warranty does not cover normal wear and tear to the product and its components.