



Combinator

Manual_Combinator_EN_2108

CB120-160-200-240

EC DECLARATION OF CONFORMITY CONCERNING MACHINES
According to Directive 2006/42/EG, annex 2, point 1, A

GKB Machines B.V.
Middelweg 1
2992 SP Barendrecht
Nederland

hereby declares that the

GKB Combinator

Type: CB120 - CB160 - CB200 - CB240

to which this declaration relates are in conformity with the provisions of:

- Directive 2006/42/EC Machinery Directive

At Barendrecht, 20/02/2023



T.J.W. Kraaijeveld

UKCA DECLARATION OF CONFORMITY CONCERNING MACHINES
According to Machinery (Safety) Regulations 2008

Manufacturer:
GKB Machines B.V.
Middelweg 1
2992 SP Barendrecht
Nederland

UKCA Delegate
GKB Machines Ltd.
Warwick House, Ermine Buseniss Park, Spitfire Close
Huntingdon PE29 6XY
United Kingdom

hereby declares that the

GKB Combinator

Type: CB120 - CB160 - CB200 - CB240

to which this declaration relates are in conformity with the provisions of:

- Machinery (Safety) Regulations 2008

At Barendrecht, 20/02/2023



T.J.W. Kraaijeveld

TABLE OF CONTENTS

1.	FOREWORD.....	5
2.	INTRODUCTION	5
3.	CONTACT	5
4.	WARRANTY	6
5.	SAFETY	6
5.1.	General	6
5.2.	Safety instructions	7
5.3.	Product specifications Combinator.....	8
6.	CONSTRUCTION OF THE COMBINATOR	9
6.1.	The Frame.....	9
6.2.	The rotor.....	9
6.3.	The belts	9
6.4.	The guide rollers	9
6.5.	The hydraulic components	9
6.6.	Milling options.....	10
7.	COMBINATOR OPERATION.....	12
7.1.	Connecting and disconnecting the Combinator	12
7.2.	Start with milling	13
7.3.	Transport and storage.....	13
8.	MAINTENANCE	14
8.1.	Maintenance schedule	14
8.2.	Lubrication scheme	15
8.3.	Performing maintenance	16
9.	FAILURES.....	17
10.	END OF LIFE	17
	ANNEX I TIGHTENING TORQUE	18
	ANNEX II RISK ANALYSIS	19
	ANNEX III SAFETY STICKERS.....	20

1. FOREWORD

The information contained within these operating instructions covers the necessary use, safety, operation, and maintenance of the machines mentioned in the CE declaration. Before operating anyone of the machinery has to read this operating manual in its entirety. The manufacturer will not be held liable for an injury or damage which occurs from improper use.

It is the goal of the manufacturer to create excellent products, therefore we hold the right to make changes at any time and will not be held under obligation to previously delivered machines. Certain aspects, such as weight and dimensions, may change at any time without notice. Images are also not bound to interim changes.

All rights reserved.

2. INTRODUCTION

The Combinator is designed to mill the top layer of natural or hybrid grass fields. The released materials are extracted using two conveyor belts. In addition, this machine can be applied as scarifier and infill materials can be removed from artificial grass fields.

Every machine is marked with a code, as seen in the image below.

Example:

Model 'CB120':

CB	120	
		Working width of the machine
		Machine type (Combinator)

The manufacturer shall not be held liable for any damage resulting from unintentional use.

3. CONTACT

Manufacturer:

GKB Machines B.V.
Middelweg 1
2992 SP Barendrecht
NETHERLANDS
info@gkbmachines.com
www.gkbmachines.com

Productnumber Manual: See footer/ front page

Your personal Dealer:

Your GKB dealer:

4. WARRANTY

The statutory warranty period of two years from the invoice date applies to the machines. Warranty repairs or product replacements do not extend the warranty period of the machine or parts. The guarantee does not apply to items arising from normal wear and tear or ageing.

A warranty procedure starts with an investigation to determine whether the problem is covered by the warranty. Your cooperation is required to verify that the warranty conditions have been met. To this end, keep a record of the maintenance and repairs carried out in a maintenance logbook.

If the manufacturer receives a warranty notification, it will be determined whether the defect is covered by the warranty. If this is the case, a suitable solution will be found in consultation with the customer. In all cases, consult with the dealer before you try to solve the problem yourself. Warranty can only be given if the machine is in its original condition.

The manufacturer's written permission is required to ensure that the machine does not deviate in any way from the aforementioned purpose of use. Use other than as described will lead to the loss of product liability and warranty.

Product liability obliges the manufacturer and the dealer, when selling machines, to provide a manual and to instruct the user on the operating, safety and maintenance instructions.

The manufacturer is not responsible for any (unintended) damages to grass or sport fields.

Caution! The operating instructions must also be supplied if the machine is subsequently exchanged or resold by the user. Also inform the new user of the regulations.

5. SAFETY

5.1. General

The safest operation requires these machines are operated exactly according to these instructions. In addition, there are also safety warnings on the machines to warn of potential dangers and instructions on how to handle them. The only way to 100% guarantee no property damage or personal injury occurs is to follow these instructions. While using this machine, keep this handbook nearby and always ensure that safety markings on the machines are visible.

Any local safety regulations, including road traffic regulations, must be observed at all times.

The warranty, CE marking, and product liability automatically expire upon changes being made to the machine without consultation of the manufacturer.

The machine is equipped with several safety stickers, to instruct the user how to handle the machine with care. An example of a safety sticker is shown next.

Annex III describes every type of safety sticker. Read them carefully before using the machine.



5.2. Safety instructions

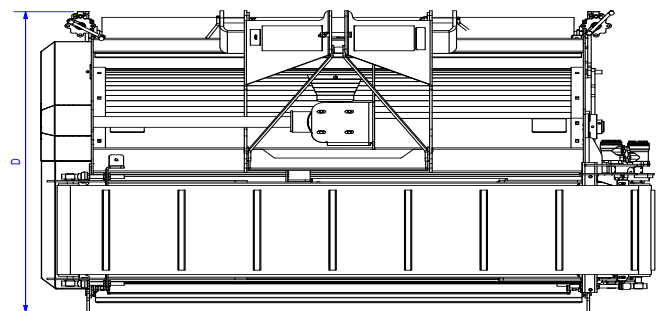
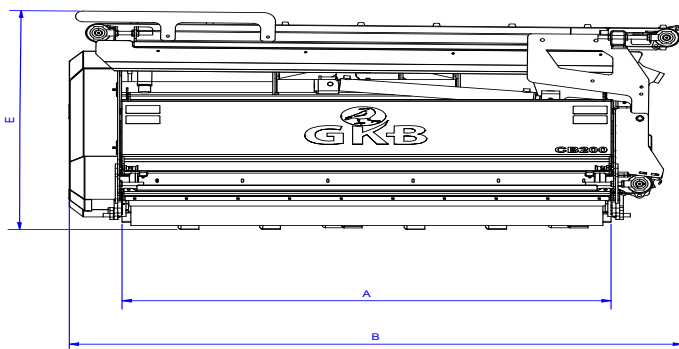
1. These operating instructions must be read and understood by everyone who works, checks or maintains the machine in order to avoid risks and to avert dangers.
2. Pass on all safety and operating instructions to all users.
3. The machine may only be used for the intended work.
4. For optimum performance, the surface to be worked on must be flat and free of obstacles.
5. Only use parts and accessories specified by GKB. The installation and/or use of non-original parts and accessories may change or impair the specific characteristics of the machine. GKB is excluded from any liability for damage resulting from the use of non-original parts and accessories.
6. Before working with the machine, it is necessary to become familiar with all control components, their functions, safety aspects and risks. The machine may therefore only be operated and maintained by qualified personnel.
7. Maintenance must be carried out in accordance with the instructions in the manual. The maintenance carried out must be recorded. Never come under the machine in any situation!
8. Before commissioning, the safety of operation and transport must be checked. The inspection includes, but is not limited to, the correct functioning of the mechanical, hydraulic and electrical components.
9. If leaks are suspected, stop the entire hydraulic system and allow it to cool down before carrying out maintenance.
10. Before use, check that there are no persons and/or obstacles within the working area of the tractor and the machine.
11. There are several warning labels on the machine. These stickers contain important instructions for safe use and must always be clean and visible.
12. All safety devices must be attached to the machinery and be in good working order. Timely replacement of worn and damaged protective equipment is required. This also applies to the warning labels. Fixed guards must always be present during operation.
13. The operator's clothing must be close-fitting. If necessary, wear head and hearing protection.
14. Driving on the machine during work and transport is not permitted.
15. When using the machine on public roads, the (local) traffic regulations of the respective country apply. Observe the markings, lighting and safety devices applied. Only drive if all required permits and approvals have been obtained.
16. Maintain an adjusted speed when the machine is hanging behind the tractor. Especially when driving over thresholds or poor road conditions. Always place the topline in the round hole!
17. The driver is responsible for ensuring that the tractor and the machine are on public roads in accordance with the regulations. Permitted axle loads and weights must be considered.
18. If the driver is unable to oversee the carriageway immediately behind him, he must be instructed when reversing. Instructors must be within the driver's field of vision only and never between the tractor and the machine.
19. Connect the machine with the tractor according to prescribed tools.
20. When connecting and disconnecting, parking or storing the machine, it must be prevented that the machine moves unintentionally. Depending on the machine, this can be prevented by applying the brakes, using the parking position or locking the wheels by placing wedges.
21. During use, transport or storage on a sloping slope or during maintenance, one should be aware of the risk of tipping over.
22. Prevent burns by careful use of hot components such as oil lines and engines. When carrying out maintenance work, allow the system to cool down completely.
23. It is not allowed to drive or maintain the machine under the influence of medication, drugs or alcohol.
24. Using headphones or hearing protection with music or radio is not permitted.
25. Smoking and open fire is prohibited in and around the machine.

5.3. Product specifications Combinator

	Unit	CB120	CB160	CB200	CB240
Dimensions					
Working width A	cm	120	160	200	240
Width during transport B	cm	175	210	250	290
Width during milling C	cm	305	390	465	540
Length D	cm	125	170	170	170
Height E	cm	95	110	110	110
Max. transportheight during milling F	cm	100	120	135	150
General specifications					
Empty weight	kg	630	925	1150	1270
Max. noise*	dB(A)	80	80	80	80
Outgoing engine shaft speed	l	540	540	540	540
Towing vehicle					
Power**	hp	35-45	40-70	65-95	90-110
Pump capacity oil	l/min	20	40	40	40
Max. hydraulic pressure	bar	150	150	150	150

* When using personal protective equipment, bear in mind that in many cases the sound of the Sandspreader is drowned out by the towing/powering vehicle.

** Low gear shift needed.



6. CONSTRUCTION OF THE COMBINATOR

A Combinator has many different components and parts. This chapter will describe each of them.

6.1. The Frame

The frame of the Combinator forms the basis of the different components of the machine. The three-point hitch connects the machine to the towing vehicle.

6.2. The rotor

In the heart of the Combinator one can find a rotor shaft. Depending on its application, this shaft can be applied with (hybrid) milling knives, scarifying knives, or it can be replaced by a brush rotor. These applications are suitable for the following types of fields:

- Reinforced natural grass: (Hybrid milling)
- Natural grass: (Milling + scarifying)
- Artificial grass: (Infill removal)

A PTO-shaft is placed between the towing vehicle and the machine. Using a gearbox and string transmission the rotor is driven.

6.3. The belts

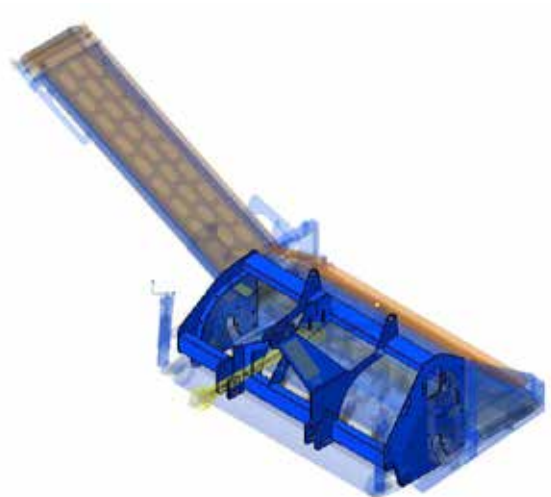
A conveyor belt is placed behind the rotor. Using the centrifugal power of the rotor the material is thrown on the conveyor belt. A second conveyor belt eliminates the material at the preferred height.

6.4. The guide rollers

Using the patented shuttle system of the rolls the depth of the operation is set. The height of these two rolls can be adjusted using two spindles.

6.5. The hydraulic components

The conveyor belts and the cylinder for unfolding the conveyor belt are hydraulically driven from the tractor.



6.6. Milling options

The Combinator can be applied with different types of knives. Depending on the type of field, the following options are available:

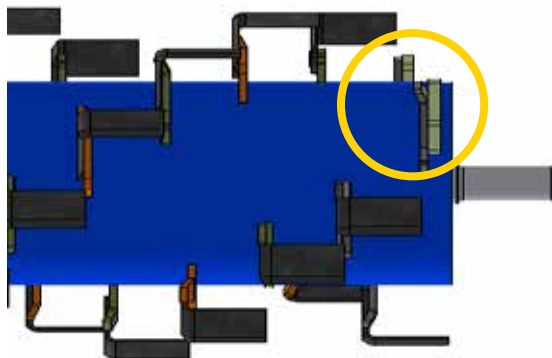
FIBER-REINFORCED NATURAL GRASS: MILLING

Fiber-reinforced natural grass consists of natural grass with roots which are intertwined with plastic fibers in the turf. Hybrid chisels mill the top layer without damaging the grass roots or plastic fibers. This chisel is shown in figure 1. The chisel mills the top layer up until 4 centimeter deep.



NATURAL GRASS: MILLING

For milling natural grass, L-shaped milling knives are applied. The top layer is milled up until 4 centimeter deep. The roots stay behind in the soil. The result of the milling knives is shown in figure 4:



PAY ATTENTION! When fraising blades are fitted, no blades will fit on the last 2 knife holders on the non-drive side. This is because they would then mill through the side. To keep the rotor in balance, 2 balancing weights are mounted. These are only required if the machine is equipped with fraising blades.

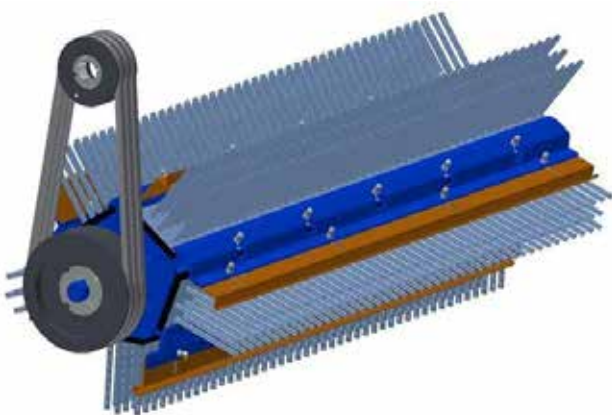
NATURAL GRASS: SCARIFYING

Natural grass fields can be provided with straight slots using scarifying knives. The knives cut a slot in the turf and place the removed materials on the elevating belt. The distance between the slots is 25mm or 50mm by default, depending on preferences.



ARTIFICIAL GRASS: BRUSHING

Using a brush rotor the infill material is brushed out of the artificial grass. The material is placed onto the conveyor belt, after which it can be eliminated. The brushing depth is determined by setting the height of the machine. The brush bars can be replaced separately.



7. COMBINATOR OPERATION

7.1. Connecting and disconnecting the Combinator

For operating all components you require one towing vehicle with one PTO shaft, two hydraulic outputs and one pressureless return.

Connecting:

1	Make sure that the tractor and machine are placed horizontal;
2	<p>Connect the machine to the three-point hitch of the tractor and secure the attachment points with the locking pins;</p> <p>Connect the hydraulic hoses and PTO-shaft;</p> <p>Attach the top link in the round hole of the hitch and adjust it to level the combination horizontal.</p>
3	Lift the machine and check if the distance between the machine and ground is equal on the left and right side. If necessary, change the positions of the adjustable stabilizer arm;
4	<p>During the milling process the Combinator rests on two rollers. The front roller is provided with two spindles for setting the height of the Combinator. Whilst accelerating the front roll, the rear roller will automatically be set as well.</p> <p><i>Always ensure that the machine can't move and is switched off.</i></p>



See risk analysis: Transmission/ Machine environment



Disconnecting:

1	<p>Make sure that the tractor and machine can't move and are placed horizontal;</p> <p>Remove infillmaterial before leaving the field.</p>
2	<p>Lower the machine slowly until it completely rests on the field;</p> <p>Disconnect the tree-point hitch and move the tractor away from the machine.</p>



See risk analysis: Transmission/ Machine environment

7.2. Start with milling

1	<p>Turn out the conveyor belt;</p> <p>Check if the conveyor belts are moving in the right direction. If not, change the hydraulic supply valve with the return.</p>	
2	<p>Switch on the PTO shaft (540 tpm);</p> <p>Start driving, lower the combinator and start milling for a couple meters;</p>	
3	<p>Stop milling and stop the machine. Check if the desired depth is reached and if the entire surface is milled equally. If not, change the height by adjusting the spindles.</p> <p><i>Pay attention, never come under the machine!</i></p>	



See risk analysis: Machine environment

7.3. Transport and storage

Transport:

When transporting the machine, a suitable means of transport must be selected. Make sure that the machine is secured against rolling away and tipping over. If you don't have sufficient knowledge for a transport, carry it out by a specialised transport company. Provide at least four attachment points on the transporting vehicle.

Storage:

The following points must be taken care when storing the machine:

1. Before storage, clean the machine in such a way that no sand or other impurities are left behind;
2. Store the machine at a dry place;
3. Check if the machine is positioned right with the support legs or place wheel chocks in front and behind the wheels;
4. Never put the machine away on the brake (if applicable);
5. Empty the tanks of the machine if they are filled with water;
6. To prevent corrosion of uncoated parts, apply a protective oil layer;

If the machine is to be used again after storage, all maintenance points must be gone through. Before use, make sure that all components are working properly.

Lifting:

The machine may only be lifted at the designated attachment points. It is important that all existing attachment eyes are used to lift the machine safely. Attaching lifting equipment to other parts of the machine can cause serious damage to the machine and the environment. Make sure the machine is free of materials such as infill and seeds.



8. MAINTENANCE

8.1. Maintenance schedule

To maintain machine quality, adhere to the following diagram. The list of spareparts will show the correct parts to replace. See chapter 7.3 for safe execution of the maintenance points.

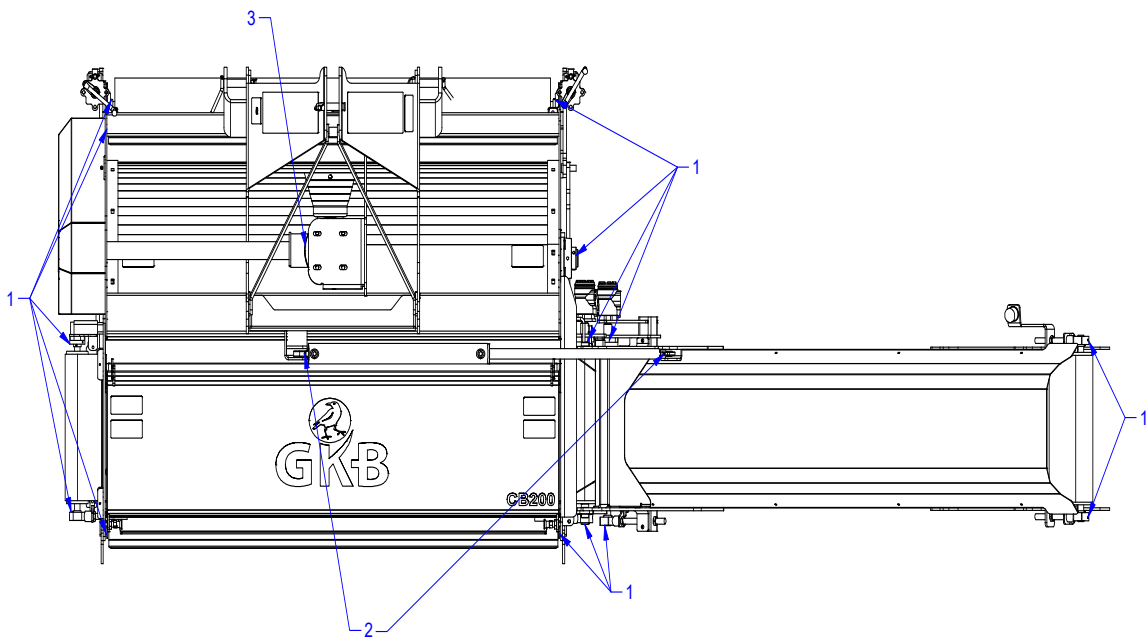
Always ensure that the machine is switched off, cannot move and has cooled down completely.

		Operating hours					
		Before use	50 h	250 h	500 h	1000 h	Annually
General	Outside cleaning of the machine	x					
	Check if all safety stickers are on the machine	x					
	Check for oil stains/ traces	x					
	Check freewheeling of the rotor	x					
	Check state of wearing parts for broken pieces or deformation	x					
Hydraulics	Clean the hydraulic main connections of the towing vehicle	x					
	Check the operation of hydraulic components	x					
	Check hydraulic components for damages/ leakages. Replace when needed	x					
	Check hoses and fittings for dehydrations/ cracks			x			
Others	V-belt - Check tension on the belt (1000 Nm)			x			
	V-belt - Check for dehydrations/ cracks and replace when needed			x			
	Conveyor belt - Check for cracks on the surface or at the edges			x			
	Conveyor belt - Check the connections of the guide belt and guide rollers			x			
	Conveyor belt - Check tension on the belt (3-10mm for 1 meter. Tension once per time)			x			
	Check locking pins	x					
	Tighten bolted connections of rotating parts		x				
	Tighten bolted connections of fixed parts			x			

8.2. Lubrication scheme

For optimum machine performance, please refer to the plan below for lubrication of the maintenance points.

		Operating hours					
		Before use	50 h	250 h	500 h	1000 h	Annually
EP2 lu- bricating grease	1 Lubricate bearing of stirrers		x				
	2 Lubricate hinge points cilinders			x			
SAE90 oil	3 Check oil level of the gearbox	x					
	3 Change oil in gearbox		x(1 ^{ste})		x		x

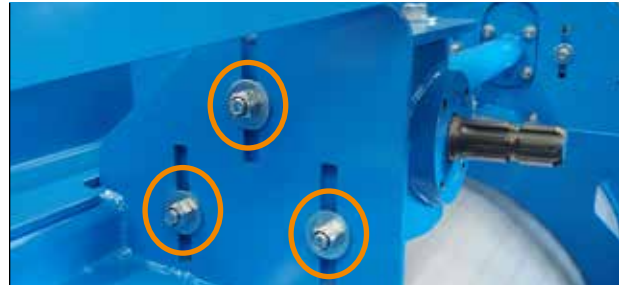


8.3. Performing maintenance

Always make sure that the machine is switched off, cannot move and has cooled down completely.

Tension V-belt:

Step 1: Loosen the three bolts to the left of the gearbox one turn; (orange circled)

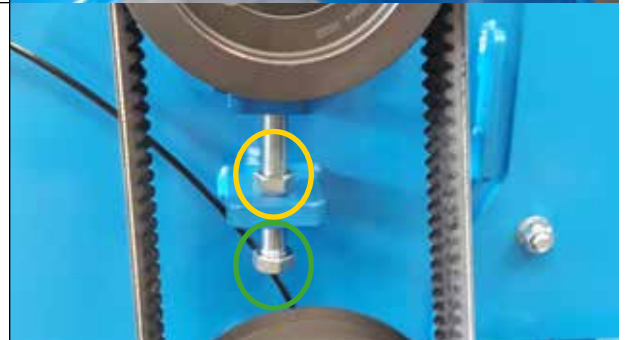


Step 2: Loosen the two bolts at the end of the drive rod one turn; (circled in red)



Step 3: Loosen the retaining bolt; (circled in yellow)
Step 4: Tighten the bolt to tension the V-belt; (circled in green)
Step 5: Repeat steps 3, 2 and 1 in this order to tighten the bolt.

Caution! When loosening and tightening the V-belt, make sure that the drive rod remains level and the tank wheel housing moves with it. If it does not move, this can cause serious damage to the bearing of the pulley



Tensioning conveyor belt:

Step 1: Loosen the bolt; (circled in red)

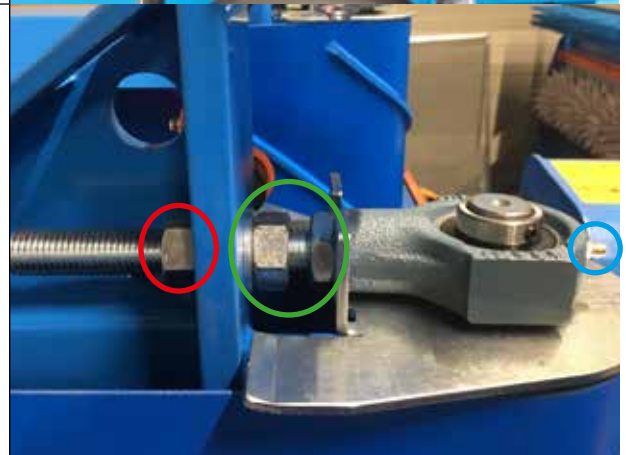
Step 2: The belt can now be tensioned using the bolts; (circled in green)

Step 3: The usual tension on the belt is between 3-10mm per meter of conveyor belt.

Step 4: Tighten the bolt to lock the tensioner; (circled in red)

Caution! Always tension the conveyor belt on both sides at the same time!

- A grease nipple is fitted to each bearing to lubricate the bearings. (circled in blue)



9. FAILURES

If a failure is detected, please go through the following points before contacting your dealer.

Result after fraising		
<i>Symptom</i>	<i>Cause</i>	<i>Solution</i>
The result is not equal	The driving speed is too high	Lower the driving speed
	The rotor is moving too slow	Increase the speed of the rotor (Until max. permitted speed)
The result of the left and right side is not equal	The machine isn't placed horizontally	Place the machine horizontal by adjusting the spindles
The brushes are removing too less infill material	The brush is missing hairs	Inspect the brush and replace if necessary
	The machine is placed too high	Lower the machine
Material transport		
<i>Symptom</i>	<i>Cause</i>	<i>Solution</i>
Conveyor belt skews while turning	Pollution in between the belt and the transmission	Check and clean the belt from soil residues etc.
Loss of ground loss during transport	Wearance of the belt	Tension the conveyor belt, check for wearance and replace the belt if necessary.

10. END OF LIFE

To dispose of a machine, follow all local regulations. Practice appropriate safety measures.

Follow these steps:

1. Decommission the machine and shut it down hydraulically;
2. Drain and recycle all consumables;
3. Dispose of the machine in accordance with the local regulations.

ANNEX I TIGHTENING TORQUE

When tightening bolts, observe the following maximum torques (ISO898/1).

The following types of bolts are used in the machine:

- Bolts for wear parts (chisels, etc.): 10.9
- Other bolts: 8.8

Tightening torque [Nm]				
		Bold strength:	8.8	10.9
Metric	M5	6	8,5	
	M6	10,3	14,7	
	M8	25,5	35,3	
	M10	50	70,6	
	M12	87,3	122,6	
	M14	138,3	194,2	
	M16	210,8	299,1	
	M20	411,9	578,6	
	M24	711	1000	




ANNEX II RISK ANALYSIS

Based on risk analysis, the machine has been designed with the safety of users and bystanders in mind. Below is a list of the measures that have been taken to ensure proper safety and prevent injury:

Item	Risk	When	Risk reduction
Transmission	Crushing injuries by the transmission	If a bodypart or clothing comes in contact with one of the parts of the transmission	Fixed shieldings placed Safety stickers placed Safety instructions in manual
Conveyor belt	Crushing injuries by rotating parts	If a bodypart or clothing comes in contact with the rotating guide rollers or transmission	Fixed shieldings placed which can only be removed with tools Safety stickers placed Safety instructions in manual
	Crushing injuries by moving parts	If a person is near the machine while the conveyor belt folds out	
V-belt transmission	Crushing injuries by moving parts	If a bodypart or clothing comes in contact with the transmission of the V-belt and one of the pulleys	Fixed shieldings placed which can only be removed with tools Safety stickers placed Safety instructions in manual
Rotor	Crushing injuries by turning of the rotor	If a bodypart or clothing comes in contact with the rotor	Fixed shieldings placed which can only be removed with tools Safety stickers placed Safety instructions in manual
		If a toe or feet comes under the machine during use.	
Towing eye	Crushing injuries by the towing eye	If a person comes under the machine due to unintentional use of the towing eye	Towing eye strengthened Safety stickers placed Safety instructions in manual
Machine environment	Being run over by the machine and/or tractor, resulting in serious injury	If the person is in between the machine and the tractor while the combination is moving (unintentionally).	Safety stickers placed Safety instructions in manual
		During transport on public roads.	
	Tilt risk of instability resulting in bruising / pinching injury	If the person is next to or under the machine during maintenance.	Safety stickers placed Safety instructions in manual
		If the person is on a slope next to the machine.	
	Injuries to the body caused by the ejection of material	If the person is behind the machine during operation.	Safety stickers placed Safety instructions in manual
	Breathing difficulties	Danger of breathing difficulties due to dust generation during use of the machine	
Hearing loss	Danger of hearing damage if someone is near the machine.		
Hydraulic system	Poisoning by hydraulic injection	If, in general or during maintenance, the person is in the immediate area of the hazard.	Hydraulic circuits equipped with components that comply with "EN 875". Inspection of hydraulic components
	Serious general injuries to unprotected parts of the body from exploding or escaping hoses		
Electrical voltage	Electrostatic shocks causing a shock reaction.	Depending on the weather conditions, the tires are statically loaded. In some cases, when touched, the person may be shocked.	Safety instructions in manual

ANNEX III SAFETY STICKERS

To promote safe practices and proper handling reminders, safety stickers are adhered to all machines. If a sticker cannot be read or found, it should be replaced immediately. The following page shows an overview of all the stickers and their positions.

GKB001	Comply with all maintenance instructions		GKB002	Refer to the owner's manual. It contains useful information about the use, safety and maintenance	
GKB003	Regular lubrication		GKB004	Switch off the power take-off before lifting the implement	
GKB005	Risk of retraction due to rotating parts		GKB006	Risk of finger cutting due to rotating parts	
GKB007	Danger of rotating parts		GKB008	Risk of retraction due to rotating parts	
GKB009	Risk of crushing		GKB010	Keeps distance when the machine is in operation due to swinging parts	
GKB011	Keep a distance when the machine is in operation due to flying parts.		GKB012	Risk of crushing between tractor and implement	
GKB013	Danger of retraction when opening the cover when the rotor is switched on		GKB014	Choice in minimum to maximum adjustment	
GKB015	Danger of retraction due to rotating parts		GKB	Place a safety piece before entering the danger zone	
HOT	Keep a safe distance from hot surfaces		018417	Required speed	

Location safetystickers

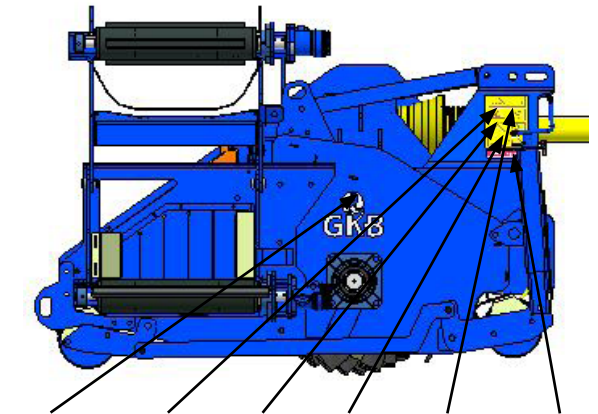
The illustrations below show all the safety stickers and their positions:

Front view:



GKB013 GKB010 LOGO GKB009 LOGO GKB011

Right view:



LOGO GKB005 GKB006 GKB007 GKB008 GKB015

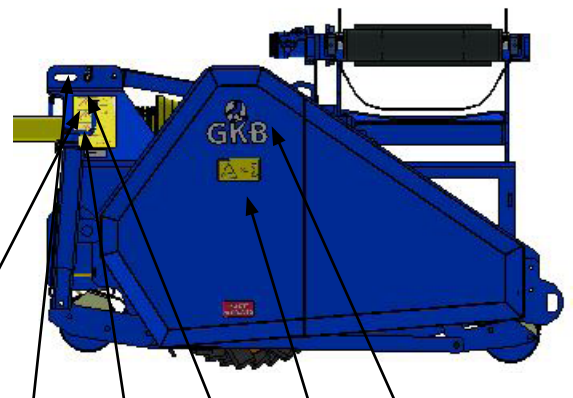
Rear view:



GKB012

GKB012

Left view:



GKB001

GKB002

GKB003

GKB004

GKB008

LOGO