



GKB

THE WORKER IS KING



Drainmaster

Manual_Drainmaster_EN_2302

DM150

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 Drainmaster

Type: DM150

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

- Directive 2006/42/EC Machinery Directive

At Barendrecht, 07/02/2023



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 Drainmaster

Type: DM150

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- Machinery (Safety) Regulations 2008

At Barendrecht, 07/02/2023



T.J.W. Kraaijeveld

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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.

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2. INTRODUCTION

The Drainmaster is intended to drain natural grass pitches and thus accelerate the drainage of surface water. The machine cuts slots in the turf, which are filled with sand in the same pass. The machine's tires press the sand slots to create a stable surface. The milled material is immediately transported by means of a conveyor belt.

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

Example:

Model 'DM150':

DM	150	
		Working width of the machine
		Machine type (Drainmaster)

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.

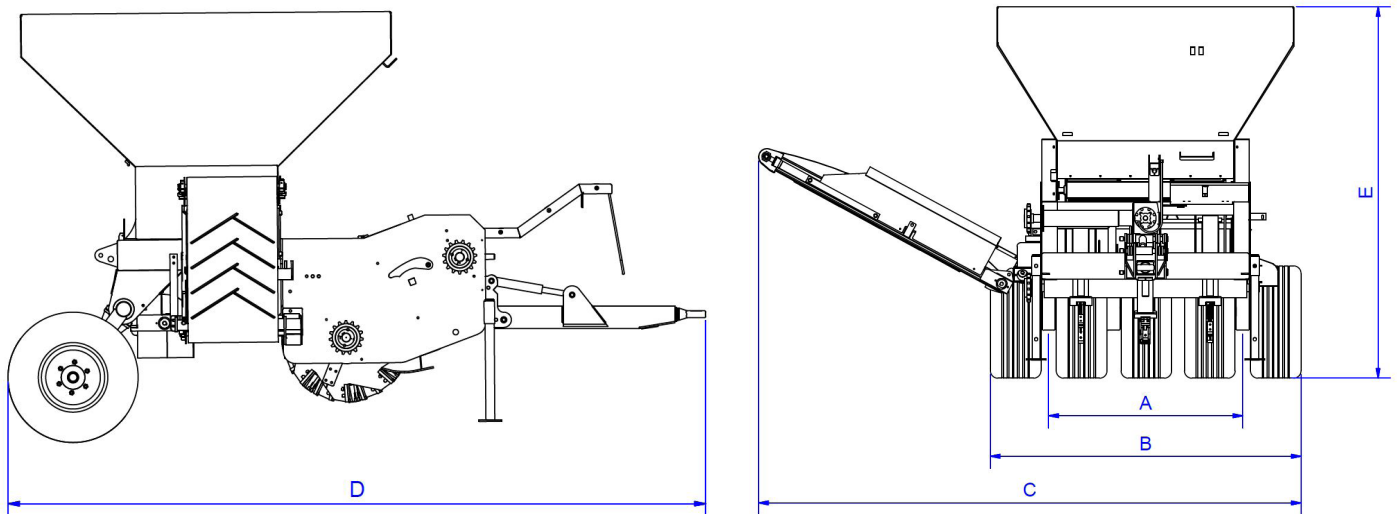
5.3. Product specifications Drainmaster

	Unit	DM150
Dimensions		
Working width A	cm	150
Transport width B	cm	250
Total width C	cm	450
Length D	cm	465
Height E	cm	290
General specifications		
Empty weight	kg	3300
Content bunker	m ³	4
Max. noise*	dB(A)	80
Outgoing engine shaft speed	l	540
Towing vehicle		
Power**	hp	85-120
Pump capacity oil***	l/min	20
Max. hydraulic pressure	bar	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.

*** Three connections needed to use all cylinders on the machine



6. CONSTRUCTION OF THE DRAINMASTER

This chapter describes the various parts of the Drainmaster and their functions.

6.1. The Frame

The frame of the Drainmaster is the basis for the various components of the machine. The machine is connected to the towing vehicle by means of a drawbar eye and PTO shaft.

6.2. The fraise rotor

At the front is a rotor with milling bits. The chisels cut slots of 4 centimeters wide and a maximum of 25 centimeters deep. The distance between the slots is 85 centimeters.

A conveyor belt is placed behind the rotor. By rotating the chisels, the material is thrown onto the conveyor belt. A second conveyor belt transports the material at the desired height.

6.3. The sand fill unit

Within the same working pass, the milled trenches are filled with sand. The amount of sand is adjustable. To obtain an optimal result, the trenches are amply filled with sand. The machine's tires press the sand into the trench to create a stable surface.

6.4. The hydraulic components

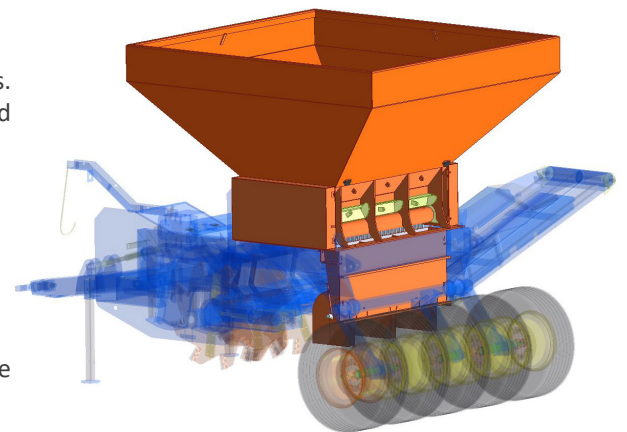
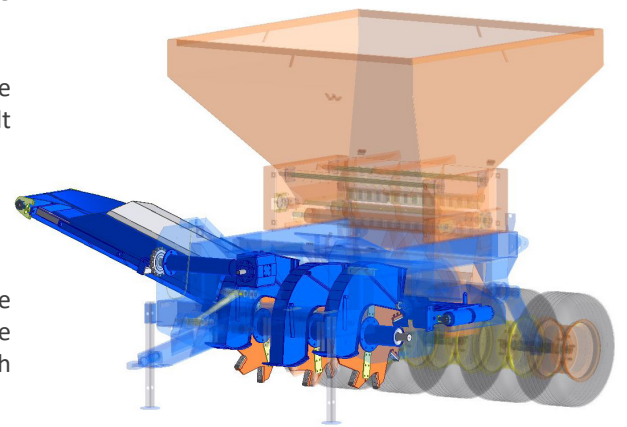
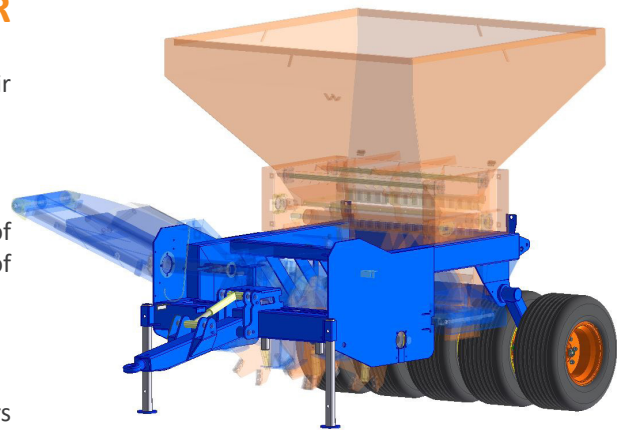
The hydraulic components are controlled from two hydraulic systems. For example, components are controlled directly from the tractor and components are connected to the hydraulic system on the machine. The following components are controlled from the tractor:

- Wheel set cylinders;
- Cylinder drawbar of the machine;
- Cylinder for unfolding conveyor belt.

The PTO shaft is connected to a gearbox. Two hydraulic pumps are connected to this. These pumps control the following components:

- Hydromotor control sand supply in the trenches;
- Hydromotor control conveyor belt discharge material;
- Hydromotor control conveyor belt raising material;
- Hydromotor control subsoilers in bunker and sand conveyor.

The milling rotor is driven by the gearbox.






7. OPERATION OF THE DRAINMASTER

7.1. Connecting and disconnecting the Drainmaster

Volg onderstaande stappen voor het aankoppelen van de Drainmaster:


Connecting:

- | | | |
|---|---|--|
| 1 | <p>Check that the machine is safely positioned on all wheels and the front support leg;</p> <p>Place the tractor in front of the machine and make sure that the tractor and machine combination are both horizontal and in line;</p> <p><i>It is not allowed to connect the machine with a flexible head.
Only drive the machine when all tires are mounted.</i></p> |  |
| 2 | <p>Position the pull eye of the machine in the catch jaw of the tractor and place the pin through the pull eye;</p> <p>Connect the hydraulic hoses. Make sure that the connection points are free of sand and contamination;
Connects the PTO shaft of the machine to the tractor</p> <p>Connect the proportional control box and place it in the tractor. In addition, connect the electricity plug of the lighting.</p> |  |
| 3 | <p>Slide in the support leg and secure it with the locking pin;</p> <p>Make sure that the cutting blades are completely clear of the ground when driving the machine. To do this, operate the cylinders of the drawbar and the wheelset.</p> |  |



See riskanalysis: Hinged wheelset/ machine environment

Disconnecting:

- | | | |
|---|--|--|
| 1 | <p>Place the combination tractor and machine on a flat, firm and horizontal surface. Make sure that the combination cannot move unintentionally;</p> <p>Disassemble the support leg by removing the locking pin. Lower the support leg to the ground and secure it again with the locking pin;</p> <p>Dismantle the hydraulic hoses and electrical cables;
In addition, remove the PTO shaft and fix it in the bracket;</p> <p>Remove the pin from the drawbar eye and jaw of the tractor. The tractor can be driven away.</p> |  |
|---|--|--|



See riskanalysis: Hinged wheelset/ machine environment

7.2. Start with fraising

- 1 Check that the machine is correctly attached to the tractor and that the cultivating blades hang clear of the ground;

Fill the bunker with sand. It is possible to store 4 m³ of sand in the bunker. This makes it possible to make 1 working path in the longitudinal direction or two working paths in the width direction of a standard football field (100x70m).



- 2 Turn on the conveyor belt. A flow control valve is mounted on the trestle to change speed;

Switch on the PTO shaft slowly (540 rpm); The cutter blades start to rotate; Switch on the conveyor belts to discharge the milled material.

Start driving slowly, slowly lower the Drainmaster by lowering the wheel set;

Switch on the sand conveyor belt and sand supply motor during milling. Mill for several metres.




- 3 Stop milling and turn off the machine. Check that the desired depth is being milled. In addition, check whether the slots are completely filled and are also well pressed by the wheels;

If necessary, adjust the machine using the proportional control box. The amount of sand can be set by means of an adjustment knob on the trestle.

Caution: Never measure under the machine!



 See riskanalysis: Machine environment

Het resultaat van de bewerkte grond wordt bepaald door de snelheid van de rotor-as en de rijsnelheid van de trekker. Een zandige toplaag en droge weersomstandigheden zijn beter te bewerken met een laag toerental van de rotor-as en een lage rijsnelheid.

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:

There are fastening eyes provided at the machine for safe lifting. It's recommended to hoist the machine with lifting straps. Use at least two straps in all cases. The lifting points are indicated in the figure. Before lifting, make sure that the machine is free from loose materials like seeds or infill materials etc.



8. MAINTENANCE

8.1. Maintenance schedule

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

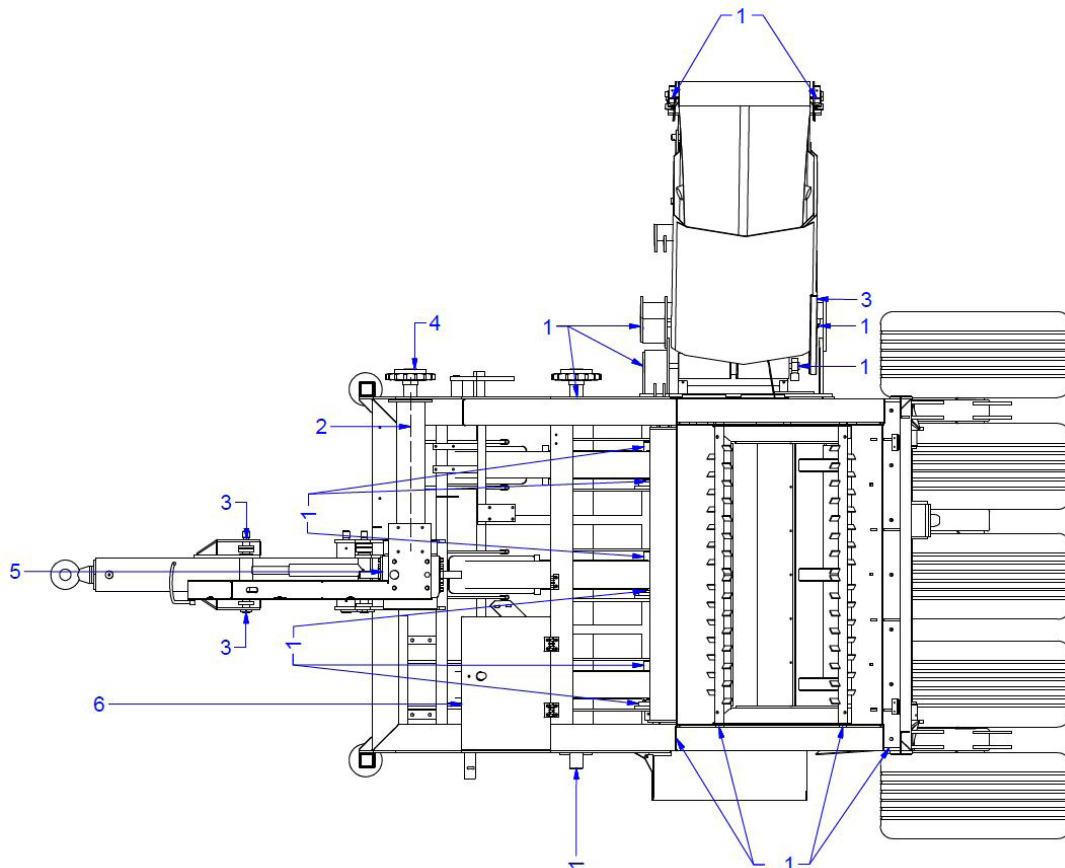
Always ensure that the machine is switched off, cannot move and has cooled down completely.

		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/ stirrers and dosing valve	x					
	Check state of wearing parts for broken pieces or deformation	x					
Hydraulic	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			
Electronic	Inspect wires for cracks			x			
	Check lightening cable for cracks/ damages	x					
	Check correct operation of lightening. Replace light bulbs if needed	x					
	Inspect correct operation of the proportional control box	x					
Others	Chains - Check tension on the chains (1-2cm speling)			x			
	Conveyor belt - Check for cracks on the surface or at the edges			x			
	Conveyor belt - Check tension on the belt (3-10mm for 1 meter. Tension once per time)			x			
	Check locking pins and tensioners of the dosing valve	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 grease	1 Lubricate bearings		x				
	3 Lubricate hinge points cilinders			x			
	4 Lubricate chain when it has been replaced (2kg grease)						
SAE90 oil	5 Check oil level of the gearbox	x					
	5 Change oil of the gearbox		x(1 ^{ste})		x		x
	6 Check oil level of the tank	x					
	6 Change oil of the tank		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 the chain transmission:

- Remove the round cap on the shielding of the chain transmission;
- Loosen the two bolts; (orange marked)
- The chain can be tensioned by turning out the bolt; (green marked)
- Tension the chain until a tolerance of 1-2cm is reached;
- Align the two pulleys by turning the nuts; (red marked)
- Replace the chain when the tensioner is completely unscrewed;
- Refill the chain shielding with 2-3 kilogram grease.

Change dosing valve opening:

- Open the valve at the backside of the machine;
- Loosen the bolt of the tensioner; (green marked)
- Change the valve at the desired height.

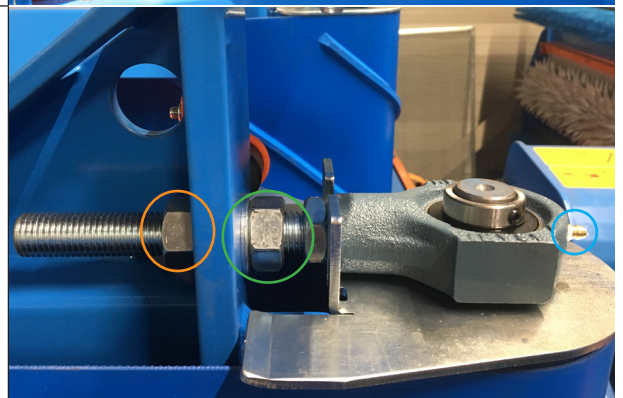


Tensioning conveyor belt:

- unscrew the bolt; (orange circled)
- The belt can now be tensioned using the bolt circled in green;
- If the belt slips, tighten the belt at 3-10mm per metre. If the belt still slips, tighten the belt again by 3-10 mm per metre.
- Tighten the orange circled bolt to lock the tensioner;

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

There is a grease nipple on each bearing to lubricate the bearings. (circled in blue)



Check and refill hydraulic tank:

- ..

9. FAILURES

If a malfunction is detected, please observe the points below before contacting your dealer.

Fraising blades		
<i>Symptom</i>	<i>Cause</i>	<i>Solution</i>
The result is not equal.	The driving speed is too high.	Lower the driving speed.
	Blades is moving too slow.	Increase the speed of the rotor(Until max. permitted speed).
	The structure of the field works negative.	Start fraising in the perpendicular direction.
The rotor is removing too less material.	The field is too dry.	Start raining the field.
	The driving speed is too slow.	Increase the driving speed.
	The rotor is moving too fast.	Reduce the speed of the fraising blades.
Material transport		
<i>Symptom</i>	<i>Cause</i>	<i>Solution</i>
Conveyorbelt skews while turning.	Pollution in between the belt and the transmission.	Check and clean the belt from soil residues etc.
Lost of ground loss during transport.	Wearance of the belt.	Tension the conveyor belt, check for wearance and replace the belt if necessary.
Sand transport		
<i>Symptom</i>	<i>Cause</i>	<i>Solution</i>
Conveyorbelt in the bunker skews while turning.	Conveyorbelt is polluted.	Check and clean the belt from soil residues etc.
Sandslot is not filled completely.	Accumulation of sand.	Inspect operation of stirrers.
	Conveyorbelt polluted.	Clean the belt and check by rotating the belt whether the sand is even on the belt. If not, inspect the dosing valve mounted on the front of the belt.
	Dosing unit is dirty.	Clean the dosing unit and make sure it's completely dry.

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]

		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 RISKANALYSIS

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
conveyorbelt	Crushing injuries by rotating parts	If a bodypart or clothing comes in contact with the conveyor belt, guiding rollers or bearings	Fixed shieldings placed which can only be removed with tools Safety stickers placed Safety instructions in manual
	Crushing injuries by moving parts		
V-belt or chain transmission	Crushing injuries by moving parts	If a bodypart or clothing comes in contact with the transmission of the V-belt/ chain and one of the pulleys	Fixed shieldings placed which can only be removed with tools Safety stickers placed Safety instructions in manual
Rotor and coulters	Crushing injuries by rotating of the rotor or coulters	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
Dosing valve	Crushing injuries by moving parts	If a person open or close the valve by hand	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 between the machine and the tractor and 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.	
	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".
	Serious general injuries to unprotected parts of the body from exploding or escaping hoses		Inspection of hydraulic components
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

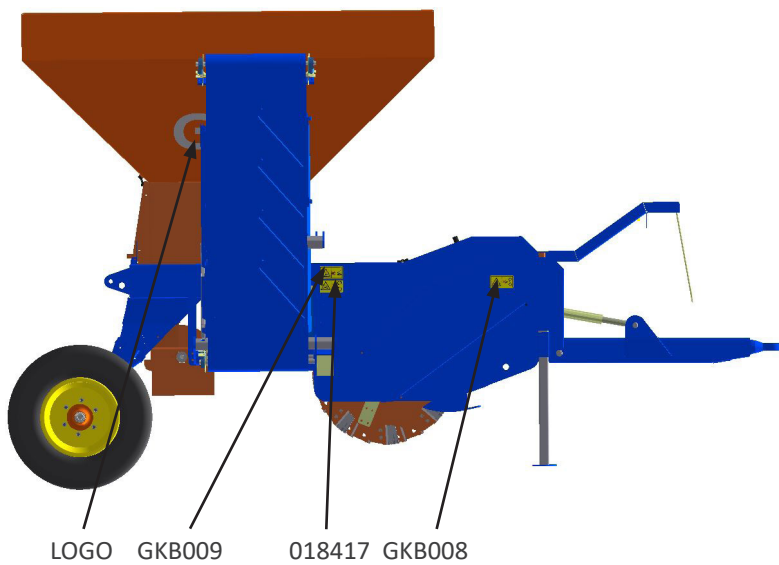
To promote safe practices and proper handling reminders, safety stickers are adhered to all machines. If a sticker cannot be read or found, it should be replaced immediately. The following page shows an overview of all the stickers and their positions.

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	

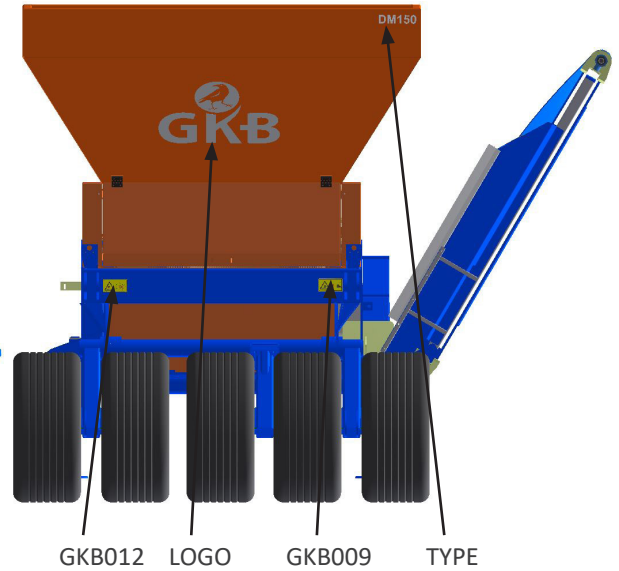
Location safetystickers

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

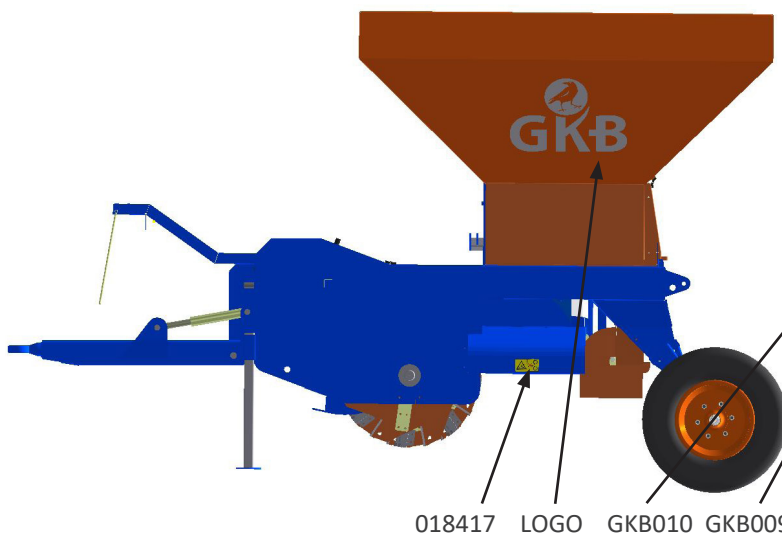
Left view:



Rear view:



Right view:



Front view:

