User Manual
STENSBALLE sweepers

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GMR maskiner produce high quality machines for professional users. The warranty period on our machines is 12 months from the date of purchase and covers compensation in the event of material and production faults.

Any parts that may have suffered damage as a result of material and production faults will be replaced by GMR maskiner a/s at no charge. Consequential damage and wearing parts will not be replaced.

A condition for the processing of claims is that this registration of use is submitted to GMR maskiner a/s. This can be done via our website [www.gmr.dk](http://www.gmr.dk) or by completing and scanning/submitting the coupon below to: Nesbo A/S
    Daniavej 31
    DK-9550 Mariager
    nesbo@nesbo.dk

**NOTE:**
In order to maintain the warranty, the dealer is required to complete and submit the registration of use within one month of delivery to the purchaser.

### Registration of Use:

<table>
<thead>
<tr>
<th>Machine number</th>
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<tbody>
<tr>
<td>Model</td>
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<td>Delivery date</td>
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<td>Purchaser</td>
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<td>Adress</td>
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<tr>
<td>Dealer</td>
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EU declaration of conformity

Manufacturer: GMR maskiner a/s
Saturnvej 17, 8700 Horsens, Denmark
Tel.: +45 7564 3611 Fax: +45 7564 5320

hereby declares that

machinery: STENSBALLE ___________________________
Machine no. ___________________________

is in conformity with the applicable requirements of:


Signature: ___________________________
For safety reasons and to take full advantage of the sweeper, you should read the user manual before starting to use the machine.

Congratulations! You are now the proud owner of a GMR sweeper!

Since 1965, GMR maskiner a/s has produced quality products with a focus on user friendliness and efficiency.

GMR maskiner is one of the leading producers of implements and implement suspension for the municipal sector. The range consists of lightweight implements for tractors up to 30 HP and a professional series for tractors above 30 HP.

See our website at www.gmr.dk.

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Bank: Sydbank a/s
Bank account: 7160 2034572
Swift code: SYBKDK 22
Using the sweeper

Read the user manual before assembling or using the sweeper. If you are in any doubt, contact the dealer. Use only original parts in your STENSBALLE machinery and implements.

Safety instructions

The following safety instructions are used in the user manual:

**WARNING**
Risk of personal injury/death
A technical procedure or similar, which may be associated with a risk of personal – or even fatal – injury.

**CAUTION**
Damage to machinery or attachments
A technical procedure or similar, which may be associated with a risk of damage to the machinery or attachments.

**NOTE**
Important information
Refers to a very important technical procedure or similar.

Never allow

- Unauthorised persons to use the machine unattended.
- A PTO shaft to be used without a CE mark.
- The machine to be used without factory installed safety guards.
- People to stand close to the machine while it is in use.
- Repair or maintenance work to be carried out while the tractor is in operation.

Always make sure

- To maintain the machine in accordance with the manufacturer's instructions.
- To check that nuts and bolts are tightened. To perform a check after 15 hours of operation.
- That the user is familiar with the tractor.
- That assistants and others do not approach the machine during operation.
- To disconnect the tractor's PTO and stop the tractor before carrying out maintenance or repairs.
- That the user is familiar with the machine's hydraulic functions.
- That the tractor PTO never runs at less than 90% of the sweeper's rated PTO speed.
Mechanical sweepers can be front mounted on most tractors with a 3-point hitch or A-frame front mounting system. Mechanical sweepers can be front mounted on most tractors with a 3-point hitch or A-frame front mounting system.

Hydraulic sweepers can be front mounted on most tractors with a 3-point hitch or A-frame front mounting system.

Designed for lightweight tractors with a min. output of 10 kW on a mechanical/hydraulic PTO shaft.

Designed for tractors with a min. output of 15 kW on a mechanical/hydraulic PTO shaft.

Designed for tractors with a min. output of 20 kW on a mechanical/hydraulic PTO shaft.

Designed for tractors with a min. output of 25 kW on a mechanical/hydraulic PTO shaft.

Designed for tractors with a min. output of 55 kW on a mechanical/hydraulic PTO shaft.
All sweeper types require that the tractor is equipped with twin hydraulic connections on the front to power the sweeper’s swing function.

Sweeper types HF/LF, HF/MA, HF/MF, HF/PA and HF/SP require that the tractor has front mounted hydraulic operating connections. The operating lever must be able to be locked in the operating position.

Output:
- 10 kW for HR/LF
- 15 kW for HF/MA and HF/MF
- 20 kW for HF/PA
- 25 kW for HF/SP

If using a tractor with higher power than indicated above, extra caution should be exercised.
See section “Using the sweeper”, page 20.
Mounting additional equipment could increase the technical demands on the tractor.
Handling

Noise

Sweepers produced by GMR maskiner are extremely quiet. The noise level depends on the type of tractor and is typically between 74 and 85 dB (A). The noise level is indicated in the tractor's user manual.

Hearing protectors

If the tractor operator is disturbed by noise, we recommend the use of hearing protectors or similar.

Handling

All sweepers are equipped with 2 support legs. When the support legs are fitted, the sweeper remains in a stable position when disconnected. Use a crane to move, transport or carry out maintenance. The crane must always lift in the centre of the main beam. See Fig. 1.

Fig. 1

Machine weight

Type plate
CAUTION
Risk of damage to brushes/brush rolls
Make sure that the support legs are fitted when the machine is being lifted with the crane.

WARNING
Safety zone
When lifting the machine, everyone must keep a distance of min. 3 metres from the machine as there may be unintended movements.

If the machine is lifted by crane for maintenance, the sweeper must be safely supported before work is carried out under the machine.

Labelling of hoses
Hydraulic hoses on STENSBALLE brushes are labelled at the factory with colours and letter designations.
Red = P (Pressure)
Blue = T (Tank)
Yellow = D (Drain)
Mounting on the tractor

Before mounting

The machine is delivered assembled and tested from the factory. Before mounting the machine, proceed as follows:

• Ensure that the sweeper is standing on a firm and level surface.
• Remove the plastic protection. Remove the PTO shaft on mechanical models.
• Check that the rpm and direction stated on the main frame is correct for the tractor in question. If not, you must contact your dealer!
• The machine is filled with oil at the factory. Check the oil level, which must be in the middle of the gears. If the oil level is too low, top up with 80W-90 gear oil.

To fit the sweeper on the tractor, manoeuvre the tractor so that it is at right angles to the machine.

NOTE: Remember to ensure that the sweeper uses the same coupling system as your tractor.

A-frame system

Fig. 2

• Lower the male section of the tractor and drive it under the female section. See Fig. 2.
• Lift the male section and click the locking system in place.
• Lift the machine slightly.
• Shut off the tractor engine.
• Remove the support legs or turn them so they are located over the brush guard.
• Fit the PTO shaft. Both forks must click into place. Attach the safety chains (mechanical machines only).
• Connect the hydraulic hoses, which drive the sweeper, to the tractor using the snap couplings (hydraulic machines only). Check the snap couplings for impurities. Clean if necessary.
• Connect the hydraulic hoses, which drive the sweeper’s swing function, to the tractor using the snap couplings.
• Check the snap couplings for impurities. Clean if necessary.
3-point tractor hitch

- Lower the hitch arms.
- Drive at right angles up to the machine.
- Shut off the tractor engine.
- Connect the hitch arms to the machine.
- Connect the top bar to the sweeper.
- Connect the PTO to the tractor. Check that the locking pin in both forks clicks into place.
- Fit the safety chains (mechanical machines only).
- Connect the hydraulic hoses, which drive the sweeper, to the tractor using the snap couplings (hydraulic machines only).

**CAUTION**

*Risk of engine explosion*

Check that the hydraulic couplings are of the correct type and that they are correctly engaged. Incorrect connection can cause the engine to explode.

- Connect the hydraulic hoses, which drive the sweeper’s swing function, to the tractor using the snap couplings.

**WARNING**

*Safety zone*

Never manoeuvre the tractor hitch if there are people in the vicinity.
Mounting on the tractor

**CAUTION**
**Damage to machinery or attachments**
Follow the instructions in the PTO shaft user manual. If you are in any doubt, contact the dealer.

**CAUTION**
**Hydraulic hoses**
Take care to connect the hydraulic hoses to the tractor so that they cannot come into contact with moving parts.

**NOTE**
**Shortening the hoses**
The hydraulic hoses are supplied in standard lengths. If the hoses need to be shortened, this should be done by the dealer.

*Other hitch systems*

If the hitch system on your tractor is different to that described in the user manual, follow the tractor user manual to mount the sweeper.

If the sweeper is not compatible with your tractor, please contact the dealer.
Setting up the machine

Top bar position

In order to lift the machine properly, the top bar must be fitted so that the top bar eye on the tractor (pos. 1) is mounted lower than the top bar eye on the sweeper (pos. 2).

If this is not possible, you can order a special bracket to raise the top point of the sweeper. The bracket can be ordered from your dealer.

NOTE
Risk of unnecessary wear
If the top bar is mounted differently than described, the sweeper will tip forward when raised/lowered, resulting in unnecessary wear on the PTO shaft.

Adjusting the top bar

Adjust the top bar to achieve best sweeping results and minimum wear on the brushes. The pivot joint between the mounting frame and main beam must be positioned vertically in the working position. The pivot joint moves when the sweeper is swung from one side to the other.
Basic settings

Controlling the swing function

- Start the tractor.
- Swing the sweeper from side to side. If this is the first time that the sweeper has been fitted, swing the machine 4-6 times to empty any air pockets from the cylinder and hoses.
- Make sure that the machine swings freely and unhindered.

Adjusting the brush guard

The brush guard is set at the factory to a distance of 30-60 mm between the brush and guard.
If the brushes begin to wear, adjust the guard straps to maintain this distance.
Adjusting brush pressure
The brush pressure determines how much force the machine uses to sweep.
In the following section, the term "brush line" is used. This is the line which is visible when the brushes are rotating. The brush line is located 0-100 mm above the ground and can be seen across the entire brush width.

The brush line marks the point at which the brushes have contact with the ground. The brushes bend backwards and then swing back into place as they lose contact with the ground.

Adjust brush pressure via the two bolts mounted on the right and left side panel respectively (see Figure "Bolt used to adjust brush pressure" on page 18).

To adjust brush pressure, adjust the spindle handles on the support wheels.
Set the brush pressure so that the brushes almost lose contact with the ground.

CAUTION
Damage to brushes, wheel and wheel fork
Never use the top bar to adjust brush pressure. If you do, the turning point will no longer be vertical, causing damage to the brushes, wheel and wheel fork due to incorrect loading.
Basic settings

Adjusting brush pressure (Point 2):
When the brush pressure is set, start the tractor.
- Activate the handbrake.
- Connect the PTO connection.
- Increase the engine speed to nominal rpm (machine is still in the middle position).

Adjusting brush pressure (Point 3):
The operator stays in the tractor and an assistant moves in front of the machine. Maintain a distance of at least 5 metres from the machine.

WARNING
Brushes
Avoid all physical contact with the sweeper brushes.
Adjusting brush pressure (Point 4):

- Lower the brush line (see “Adjusting brush pressure”, page 17).
- Check that the brush line is the same across the machine width. If this is not the case, the two bolts (Point 1) are not aligned.

Repeat points 1 to 4.

Adjusting brush pressure (Point 5):

The tractor operator swings the sweeper to one side. Check the brush line again. If it is not the same across the entire machine width, the pivot joint is not vertical. The top bar should be adjusted.

Repeat points 1-5.

The closer the brush line is to the ground, the lower the brush pressure.

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**CAUTION**

Damage to brush and machine parts

Brush pressure must not be set so hard that the brush line is more than 100 mm above the ground.

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**WARNING**

Safety zone

When releasing brush pressure once the machine is operating, always maintain a safe distance of min. 5 m from the machine.
### Use

STENSBALLE sweepers are used on asphalted roads, paths, pavements and other firm surfaces. The machine can remove everything from dust particles to small stones and snow.

#### WARNING

**Safety zone**

Never step in front of the sweeper when it is operating in a forward direction. Keep a safe distance of min. 10 m, as indicated on the warning sign.

#### NOTE

**Safety zone**

Stop the sweeper immediately if a person moves into the danger area. The safety zone of min. 10 m must be maintained.
Start-up

- Run the tractor at idle speed.
- Carefully lower the sweeper to the ground. Make sure that the tractor's front hitch is engaged in the hold position.
- Engage the PTO lever.
- Increase the PTO speed to the nominal rpm.

**CAUTION**

**Damage to machinery or attachments**

Never allow the machine to drop heavily to the ground. In the long term, this will damage the machine.

If the tractor does not have a hold position/function, or if the operator fails to engage hold position/function when operating the machine, the machine may be damaged due to incorrect transfer of weight from the tractor.

If the PTO rpm drops below 90% of the nominal speed, the machine could overload.

Operating speed

The operating speed is determined by the quantity and type of material that is to be swept. As a rule, the operator must drive at a speed which ensures that the machine sweeps effectively.

**NOTE**

**Operating speed**

Determined by gear selection – and not by increasing/decreasing the rpm of the engine.
Using the sweeper

Vibration

Mechanical sweepers are equipped with a PTO shaft.

Depending on the type of tractor and front hitch system used, the distance between the PTO connection and the ground may vary. Please make sure that the tractor is suitable for the sweeper.

Please be aware that there may be situations where the two universal joints on the PTO shaft are not at the same angle. This will typically occur when the sweeper is swung to one side.

If the brushes rotate very unevenly and the sweeper makes a lot of noise during operation, this indicates that the PTO axle is overloaded due to the lack of alignment between the 2 universal joints and/or too sharp turns.

Contact your dealer for more information.

NOTE

Unnecessary wear on the PTO shaft

If the PTO axle instructions are not observed, the machine may vibrate causing unnecessary wear on the PTO axle and other parts.

Ejecting material

When using the hydraulic swing function, material may be ejected to the right or left.

Please make sure that the indicated rpm is maintained and that the operating speed is always controlled so that the machine sweeps the ground cleanly.

CAUTION

Damage to machinery or attachments

When sweeping snow or large quantities of heavy material, you must regulate operating speed so that the machine sweeps the material to one side – rather than pushes it ahead of the brush roll. If material accumulates ahead of the machine, the gears will overload, causing serious damage to the machine.

If rope, steel wire, etc. becomes entangled in the brushes, stop the machine immediately and remove the items.
**Troubleshooting hydraulic and mechanical breakdowns**

In the event of a functional breakdown, stop the machine immediately. Disconnect the mechanical or hydraulic PTO connection and bring all hydraulic control handles to the neutral position. Stop the tractor before leaving the cabin.

The potential results of overloading could be chain rupture and destruction of the chain wheel, gear, PTO shaft or the parallel key connection between these components.

Chain rupture, destruction of the chain wheel, hydraulic hoses, hydraulic motor or the parallel key connection between these components.

Hydraulic motor failure. Faulty hoses or a broken parallel key connection between the motor and brush roll carrier.

On hydraulic machines, the snap coupling connections may have become loose.

A failure of the swing function may be caused by leakage in the hydraulic cylinder and hoses, mechanical blocking of the swing or by the snap coupling connections becoming loose.

Finally, the tractor's mechanical or hydraulic functions may be defective. In such situations, the dealer should be contacted immediately.

**WARNING**

Stop the tractor before leaving it

During repair and maintenance work, disengage the PTO connection, set the hydraulic control handle into neutral, and stop the tractor before leaving the cabin.
If the sweeper is removed, place it on a flat and firm surface.
• Swing the sweeper to the centre position and stop the tractor.
  Note: The sweeper must be lifted off the ground.
• Turn the supporting legs so that the feet are positioned under the brushes.
• Carefully lower the sweeper to the ground.
• Detach the PTO axle and safety chain (mechanical machines only).

**CAUTION**

**Chain attachment**
When not in use, the PTO axle chain must be attached to the sweeper (the detached end only).

• Remove the hydraulic hoses used to pull the sweeper.
• Fit the dust caps.
• Lay the hoses over the sweeper (hydraulic machines only).
• Detach the hydraulic hoses, which drive the sweeper's swing function, from the tractor.
• Fit the dust caps.
• Lay the hoses across the sweeper.

**A-frame system**

• Open the locking system to release the male section from the female section.
• Start the tractor and lower the hitch to release the male section.
• Reverse the tractor free of the machine.
3-point hitch

- Disconnect the top bar.
- Remove the pins from the eyes on the hitch arms so they can be disconnected from the machine.
- Start the tractor and reverse it free of the machine.

**WARNING**

**Safety zone**

Never use the tractor hitch if there are people in the vicinity. This may result in fatal injury.

- **Support legs turned under the brushes.**

**WARNING**

**Fit the support legs**

To ensure that the machine remains stable after being disconnected from the tractor, fit the support legs with the feet turned under the brushes. If the sweeper is unstable, there is a risk of injury.
Storage

If the sweeper is taken out of operation for a long period, it should be cleaned to remove dirt and other debris.

**Mechanical sweeper models**

Check gear oil level and top up if necessary (see section “Maintenance”, page 27).

**Hydraulic sweeper models**

Clean hydraulic hose snap couplings very carefully. Make sure that these couplings are protected from moisture. Store the sweeper where the humidity is low and the machine will not be exposed to rain and snow.
Introduction

Before carrying out any maintenance, it is important that the operator knows precisely what to lubricate, where and how often to check the machine, and which parts to replace and when.

Using the sweeper will throw up dirt and dust which will form a layer on the machine. Always observe the specified maintenance instructions.

Mechanical sweeper models

Type: FF/LA, FF/LSA, FF/MA, FF/MSA, FF/PA, FF/SP and FF/SPS

The PTO shaft must be lubricated according to the PTO shaft user manual.

NOTE

Lubrication

It is the experience of GMR maskiner that the PTO shaft and therefore the machine itself will have a longer service life if it is lubricated after every 8 hours of operation.
Greasing

At 40-hour intervals, grease the following parts:

- brush roll support arms  Pos. 1
- brush roll flange bearing  Pos. 2
- wheel hubs  Pos. 3
- mounting frame rotary bushings  Pos. 4
- swing cylinder bearing bushings  Pos. 5
- chain  Pos. 6

Angular gear

The angular gear is half filled with oil at the factory. According to the gear manufacturer, the first oil change should be performed after 50 working hours and subsequently at intervals of 500-800 hours, but at least once per year. To prevent sedimentation, we recommend that you change the oil while the motor is warm. We recommend using SAE 90 EP oil. If necessary, use an oil syphon to remove the used oil. Oil syphons can be bought from GMR maskiner.

Oil syphons

**NOTE**

Oil spills

At start-up and after an oil change, oil may spill from the bleed plug on the gears.
Chain

GMR’s unique, self-adjusting chain tensioner system means you will never have to tighten the chain.

Chain tensioner

Check for wear on the fibre blocks in the chain tensioner system after every 40 hours of operation. When the fibre blocks are worn, they must be replaced.

Support arm adjusting screws

Prevent rust and corrosion by cleaning and lubricating the adjusting screws with a thin layer of grease.

WARNING

Oil and grease containers

Grease and oil can be hazardous to health. Observe the safety instructions on the oil and grease containers.
Hydraulic sweeper models

Type: HF/MA, HF/PA and HF/SP

The maintenance procedure for these machines is the same as for mechanical machines, except for the fact that hydraulic machines have no PTO axle and no angular gear. A maintenance-free hydraulic motor is fitted instead.

Type: HF/LF and HF/MF

Maintenance of the following is required:

- brush roll flange bearings  
- support wheel spindles
- wheel hubs
- mounting frame rotary bushings
- swing cylinder bearing bushings

Grease the above after 40 operating hours.
Support arm adjusting screws

Prevent rust and corrosion by cleaning and lubricating the adjusting screws with a thin layer of grease.

Type: HF/LF, HF/MF, HF/MA, HF/MP and HF/SP

Hydraulic hoses must be replaced when there are signs of:
• leaks in hose and rubber material
• cracks in rubber material

Snap couplings must be cleaned regularly to remove dust, sand, soil and other debris. Fit the dust caps.

Before storage, the couplings must be lubricated with a thin film of oil. Always store the machine (and therefore its snap couplings) in a dry place, where air humidity is low.

Replacing brushes

As the brush roll is suspended on two spline shafts, replacing the brushes is very easy.

• Remove the retaining screw(s) that secures the end stop for the right side panel. For HR/LF and HF/MF type sweepers, remove the bolt that secures the right side panel to the main beam then pull the side panel away from the main beam.
• Pull the side panel away from the main beam and the brush roll and place it to one side.

The brush roll can now be removed from the axle pin on the left side panel.
• Up-end the brush roll and remove the screws which attach the flange bushing to the brush roll.
• Remove the flange bushing.
• Remove the worn brushes and spacer rings.
  NOTE: The spacer rings can usually be reused.
• Install the new brushes with spacer rings. Start with one brush. The brushes are equipped with a carrier pin on the inner ring. This must be moved a 1/4 turn on the brush roll for each attached brush section. Otherwise there will be an imbalance in the brush roll, the machine will "jump", and the brushes will wear on one side.

Fit the flange bushing and tighten it diagonally. Check that the carrier pin on the last brush section is not jammed between the brush roll and the flange bushing but engages with the notch on the brush roll.

Before mounting the brush roll, clean the spline shafts and spline bushings and lubricate with grease.
The safety guards must protect the user against contact with moving parts and ejected material. Safety guards must not be removed under any circumstance. In the event of a fault, the safety guards must be replaced/repaired.

**Brush guard**

STENSBALLE sweepers are fitted with a protective brush guard over the brushes to protect the operator from ejected objects, to ensure operator visibility while working and to direct ejected material away from the machine.

**WARNING**

*Never remove the guards*

Safety guards must not be removed under any circumstance. Operating the machine without safety guards is irresponsible and may cause serious personal injury.

**Chain guard**

The purpose of the chain guard is to prevent physical contact with the chain during operation and to protect the chain itself from debris.

**WARNING**

*Never remove the guards*

Safety guards must not be removed under any circumstance. Operating the machine without safety guards is irresponsible and may cause serious personal injury.
Warning sign

Danger zone of min. 10 m in front of the brushes. Within this distance there is a risk of ejected stones and other objects.

If the warning sign falls off the machine, it must be replaced. A new warning sign can be ordered from GMR or from the dealer.

Type plate

Example:

The machine's type plate contains the following information:
• type description
• machine number
• power consumption
• net weight