



M series/H series/S series

RIGID POWER HARROWS

WHEN FARMING MEANS BUSINESS

Realising the full potential of farming is about growing and developing your business, not only your crop or livestock, but also your profit. Improve productivity and profitability by focusing on the positives and minimising disadvantageous aspects, through strong, dedicated management.

Success springs from determination and clear targets, from laying down the appropriate strategy and allocating correct investments for the future. Quality results require the right ideas and equipment. When there is work to be done, you need the optimal setup and smart solutions that support you towards an easier, more profitable way of working. You need solutions that make tough and demanding conditions less complicated.





TILLAGE

Preparing and cultivating your soil in order to achieve the highest possible yield is about choosing the correct tillage system.

YOUR KVERNELAND

INTELLIGENT FARMING SOLUTIONS

Choose the best farming solution for you and your land. Combine the highest possible yields with sustainability. This will start with the correct tillage. The choices you make depend on various factors and should match your specific circumstances, like soil structure, crop rotation, residue management, economic and ecological viabilities.

The choice is yours!

You must consider environmental and legal issues. From conventional methods to conservation tillage: the balance of operations at the right time has to be found to achieve high yields with the best soil condition (air, moisture, biological activity, etc.) with a minimum amount of energy, time and investment. For this, Kverneland offers a full range of intelligent farming solutions.

CONVENTIONAL TILLAGE

Conventional Tillage

- **Intensive** method of cultivation
- Complete soil inversion e.g. by a plough
- Less than 15-30% crop residues left on soil surface
- Seedbed preparation done by an active tool or special seedbed harrow
- High phytosanitary effect by reduced pressure of weed and fungi diseases - fewer herbicides and fungicides needed
- Better dry-off and faster increase of soil temperature for better nutrients absorption

CONSERVATION TILLAGE

Mulch Tillage

- **Reduced** intensity in terms of depth and frequency
- More than 30% of residues are left on soil surface
- Extended repose period of the soil
- Cultivator and/or discs incorporate the crop residues within the top 10cm of soil for stable bearing soil
- Full-width tillage - seedbed preparation and seeding in one pass
- Protection against soil erosion; reduce soil loss by run-off and improve water storage capacity.
- Improvement of soil moisture retention

Strip Tillage

- **Zonal strip loosening** before or during seeding of up to 1/3 of the row width (Loibl, 2006). Up to 70% of the soil surface remains untouched
- Strip-till combines the soil drying and warming benefits of conventional tillage with the soil-protecting advantages of no-till by disturbing only the area of the soil where the seeds are placed
- Exact fertilising deposit
- Soil protection against erosion and drought

Vertical Tillage / No-Till

- **Extensive** method
- Working soil vertically avoids additional horizontal layers or density changes
- Increasing water infiltration, root development and nutrient take-up
- Plants' roots dictate the overall health of the plant, as they deliver nutrients and water throughout the season, contributing to a higher yield
- A strong set of roots make plants more resistant to wind and drought.
- Lower energy input required





WHY POWER HARROWING? FOR SUCCESSFUL GERMINATION

An optimal seedbed with a load-bearing seed horizon into which the seeds can be embedded at an absolutely even depth over the whole area of the field is the basis for high field emergence and thus for high yields. It requires an unbroken association between the seed horizon and the capillary water conducting lower layer to ensure germination in the absence of rainfall. Additionally, rapid heating of the soil and adequate oxygen supply to the germination seeds and a fine crumbled and uniform reconsolidated seedbed for an optimal seed coverage is important too.

Power harrows have long since become typical combination machines because they are largely independent of the soil conditions. On heavy soils it reaches an intensive crumbling. Under light conditions, it can work flat and at a lower rotor speed. The sets of tines rotate on vertical axles for totally horizontal tillage of the soil – no inversion of soil layers and no vertical compression leading to hardpan formation. Consequently, there is no better alternative for seedbed preparation.

A perfect seedbed is the basis for high yields.

A power harrow together with a seed drill is finally an economic high performance combination. Seed bed preparation and seeding in one pass!

All Kverneland power harrows models are exclusively designed to be combined with Kverneland seed drills either modular with front tank and coulterbar or with cultivator mounted seed drills.

Perfect Seedbed

- **Uniform distribution of plant residues (influences lighting conditions and nutrient reservoir).**
- **No deep tracks or compacted zones in the ground.**
- **Constant working depth, avoidance of unnecessarily deep cultivation.**
- **Soil structuring with fine soil in the sowing horizon and coarser crumb structure at the surface to achieve a weatherproof finish.**

QUALITY THAT LASTS!

ACTIVE INTENSIVE SEEDBED PREPARATION

Kverneland power harrows have a self-supporting gearcase, therefore a heavy frame is not necessary. The power harrows are a successful and tested construction principle for heavy duty operations. The advantages are compelling: High stability for the whole working width, the rotor drive is isolated from distortion or bending stresses. All mechanical stresses are transferred directly on to the shock absorbing headstock.

One concept - That fits together!

1

Self-supporting gearcase

Strong resistance to abrasion and torsion is one of the main characteristics of the double bending gearcase in sandwich design. The "laminated bottom" and the wide, wear-resistant gear profile ensure reliable heavy-duty use. The tapered bearings have a high basic load rating which offers increased security and reliability, giving an extended working life.

2

Tine holder & Tine

First priority is durability and protection against stones and good access. The rotor shaft and tine holder consist of two parts for easy maintenance and long-lifetime, even in stony conditions. Very important - the tines are easy to change due to the Quick-Fit system. The two large bearings are very strong and the

large distance between the bearings ensure maximum resistance to radial stress, even in the most extreme conditions. The forged boron steel tines prepare the seedbed by cutting, crumbling and levelling the ground. The tines are extremely hard wearing and fracture-resistant. The outer tines turn inwards, which together with the side deflectors avoid ridge formation. An important characteristic is the helical tine positioning which minimises the risk of damage (from stones) and ensures a more homogeneous and even load on the gearcase. In addition, this special design also reduces the amount of wet soil brought to the surface (especially important in the spring time); the moisture stays next to the seed for improved germination.

3

Rotor clearance

Four rotors (8 tines) per metre ensures coverage of the entire working width. This represents an optimum number for thorough crumbling of the soil. Minimal torque on drive gears means minimal wear.

4

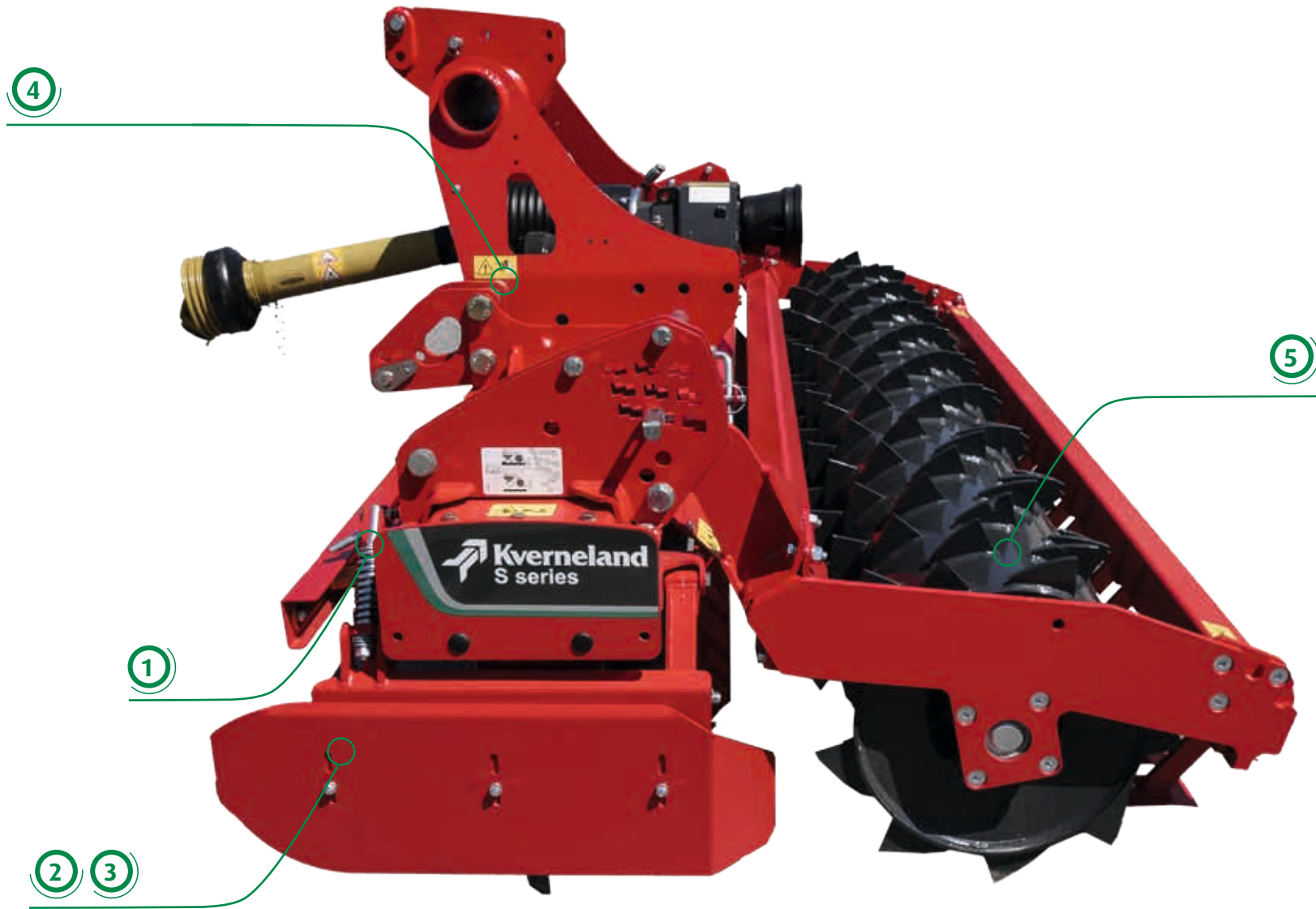
Robust headstock

The headstock is very strong due to the use of thick-walled steel offering several possibilities for combining with mounted and semi-mounted seed drills. The length thus optimising weight transfer.

5

Roller

The final step of perfect seedbed preparation is consolidation. A weatherproof finish allows moisture retention when dry and transition (water infiltration) through the profile in wet conditions.



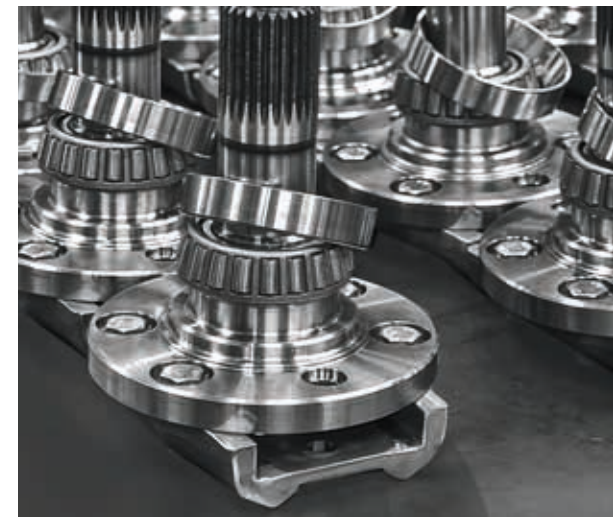
STRENGTH AND POWER FOR LONGER DURABILITY

Sophisticated technologies are used for each development such as static load test, finite elements method (FEM), 100% check of bearings and gears with PTO drive during assembly and random stress-tests in the stone pitch. High quality components like hardened gears with optimum distances and dimensions are taken to achieve best working results in all conditions.

Proven Reliability - Made in Germany!

Finally, the machines are tested in the field under different conditions to reconfirm that the requirements to all functions and strength are met. "We are testing according to a strict LOR and test protocol which are defined to meet all kind of soil conditions " mentioned Rainer Schauer, team leader industrialisation.

Gregor Kottenstedde, engineer of the power harrows added that the complete power harrow range has been designed to be combined with the Cracker packer or Actipack roller, which are the heaviest rollers in the range. "We considered all the most aggressive scenarios like deep working when turning, combination with seed drills or coulter bars as well as random stress tests in stone pitch to make the different power harrow models as strong as possible. And this is guaranteeing the proven Kverneland quality".







Helical tine positioning

The tines are arranged in varying angle positions in order to prevent damage caused by stones and ensure even levelling. 4 rotors per meter and the helical tine positioning reduce the peak loads on the driveline which results in smoother running and less fuel consumption. All gears are hardened in the gearcase for a long lifetime.

LONG LIFETIME

ROBUST GEARCASE AND TRANSMISSION

For optimum performance in difficult soil conditions, the robust, self-supporting gearcase design provides a large clearance between the tine holder and gearcase bottom. Large amounts of residues and stones can pass freely without blocking and provides excellent results in mulch conditions.

Robust but less weight.

The gearcase, which is the backbone of the whole machine is extremely rigid against bending and torsional stress. On the H and S series the gearcase is made as a sandwich double bending beam to give additional stability. With this new gearcase and headstock design the weight of the S series is reduced by 15% compared to the former model. There are differences in dimensions between the models, but the headstock is the same on all models and absorbed together with the gearcase all mechanical forces.

Special emphasis has been given to reliability. This has been achieved by having a large distance between the conical bearings, hardened gears inside a stable gearcase, precise distance between the gears and the heavy-duty rigid gearcase design. The robust headstock for easy connection to all tractors and combination with heavy seed drills ensures safe working.



Model	Gearcase	Gearcase profile	Gearcase dimension (mm)	Gears	Ø Shaft (mm)	Bearings (mm)	Bearing distance (mm)	Rotor clearance (mm)
M series	rigid	bended plate bolted with reinforcement plate	140 x 400	tempered	40 & 45	80-90	70	98.25
H series	rigid	6mm sandwich profile with reinforcement plate	165 x 400	tempered & hardened	45 & 50	90-100	84.5	90,5
S series	rigid	6mm sandwich profile with reinforcement plate	200 x 400	hardened	55 & 60	110-120	110.5	100

OPTIMUM PENETRATION WITH STANDARD AND ACTIVE TINES

All models can be fitted with Standard and Active tines (active tines not on M series) as well as with the proven Quick-Fit system to meet customer demand for efficiency. The Quick-fit tines are secured by a special pin and clip mounted in the tine holder. The tines can therefore be exchanged quickly without any tools.

The **Active tines** ensure optimum penetration in hard or not cultivated soil. The tine, due to its shape, pulls itself into the ground. This gives a constant working depth and also prevents the machine from lifting out of the ground in hard dry soil conditions. In addition, it creates additional recompaction at the packer roller. The Active tine lifts the material and pushes it in front of the power harrow. This gives an optimum levelling effect even in tractor tracks. In mulch conditions the active tines can work directly into stubble and hard soil. The special shape of the tines keeps residues on the surface and this gives a big advantage against erosion.

Maximum resistant again radial stress

Kverneland has designed the tine carrier as wide as possible in order to reduce the loads and protect the tines and the holder.

Active tines (Option)

The special shape of the active tines ensure good penetration. The Active tines lift the soil and throw the clods as well as the plant residues into the front working zone. This ensures a perfect levelling even in the tractor tracks and leaves a stable crumbling structure.



Standard



Active



Carbide coated

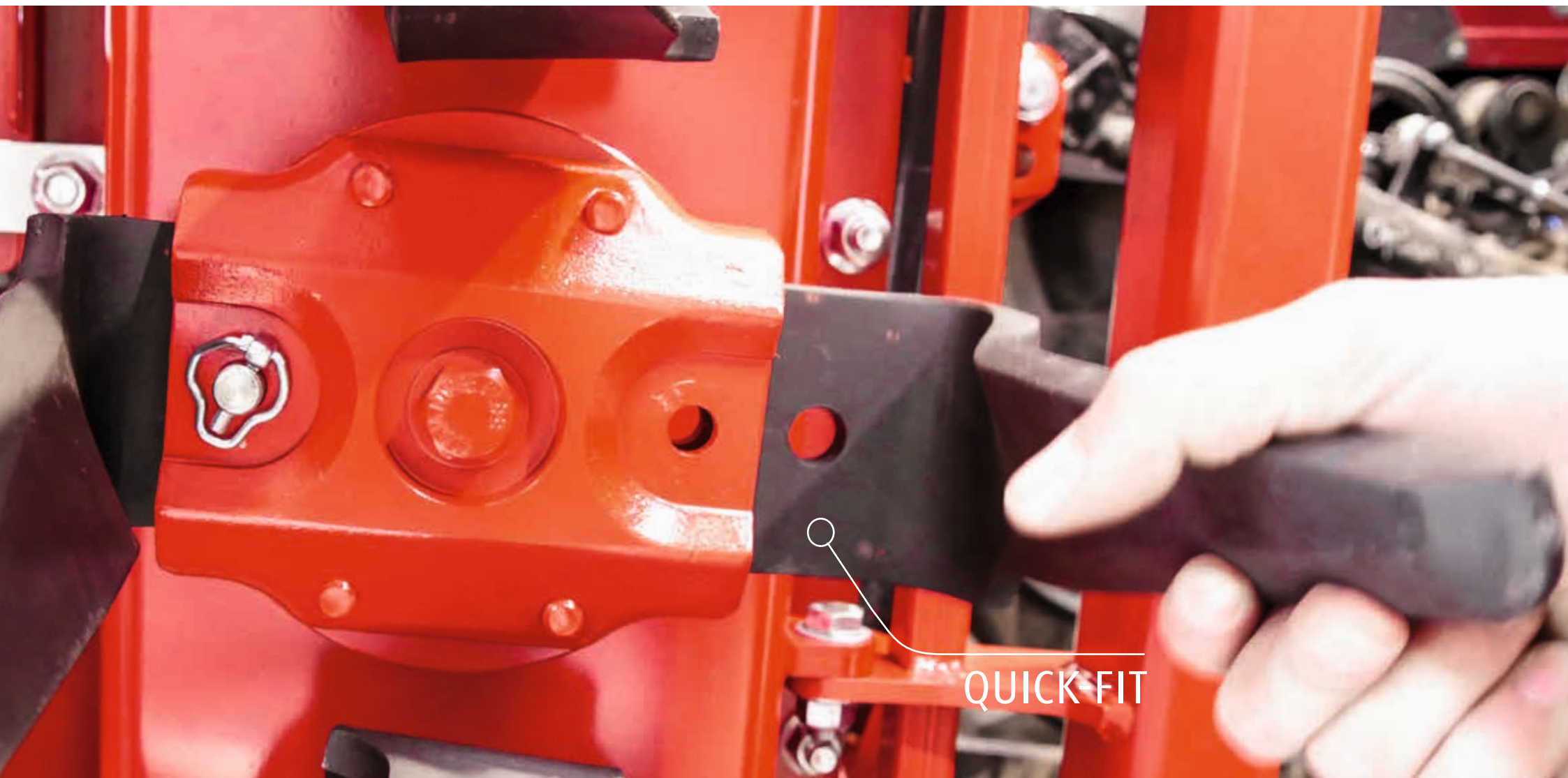


XHD Carbide

XHD tines (Option)

The XHD Carbide reinforced tines are your perfect weapons against extremely abrasive soil conditions. These tines are designed to offer you longer lifetime, keeping costs and downtime to a minimum in environments where standard tines are wearing too fast. Available as spare part.





QUICK FIT

PERFECT LEVELLING

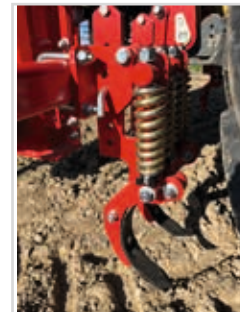
LEAVING AN EVEN SEEDBED

In order to create an even surface for a fine seedbed, Kverneland offers different options: a levelling bar, side deflectors and track eradicators.

When it comes to avoiding dams and to leave the soil as long as possible in the working area the parallelogram guided **side deflectors** move vertically up and down following the ground contours. If stones are trapped between deflector and outer rotor, the deflector can open via coil spring overload protection. The lower part is adjustable in height to match the tine wear. For strict transport regulations, the deflectors can easily be set in a raised transport position, just by removing one pin.

Kverneland's rear **levelling bar** is infinitely height adjustable. The turnbuckle adjustment is easy to use, even with a seed drill mounted. A scale ensures an even height across the full working width. An in-built spring system maintains the bar in an effective and consistent operating position. Recommended when working on heavy, cloddy ground or at very shallow depth.

Track eradicators with overload protection are available to suit to any situations.







EASY TO USE - EASY TO MAINTAIN FOR PERFECT WORKING RESULTS

In conventional and conservation tillage processes, in solo use and in combination with seed drills or subsoilers - a powerful power harrow can be used in many ways. The combination of working depth, rotation speed and rotation direction of the tines makes it possible to create a fine-crumble and even seedbed under almost all conditions.

Kverneland has focussed on ease of maintenance. The gearcase is filled with special grease to ensure positive rotor lubrication from initial start up. The tine carrier design is of two separate pieces, allowing the oil seal to be replaced without opening the gearcase. The rotors are sealed with cassette seals, ensuring no wear on the shaft and minimum maintenance.

Time saving settings with minimal maintenance.



On the rigid power harrows the working depth is adjusted via pin and holes. A square pin avoids rotations and ovalization and the wide contact area, minimize wearing. 18 different slots for several working depths are available. The reinforced roller arms support stability with heaviest rollers and seeders.

EFFECTIVE IN COMBINATION

FLEXIBLE WITH QUICK COUPLING SYSTEMS

All Kverneland power harrows can be combined with Kverneland mounted pneumatic or mechanical seed drills or coulters bars with front hopper system.

Despite the integrated concept of a power harrow seed drill combination, the coulters bar can be coupled or uncoupled quickly via EURO-CONNECTION coupling system. Allowing the power harrow also to be used solo.

Flexibility is key!

The coulters bar is attached with the EURO-CONNECTION directly to the roller frame. The coupling hook is similar to the front loader coupling. This can quickly and easily be hitched thanks to the readily accessible hydraulic and electronic interface. Track markers are attached to the power harrow. The seed hopper can be removed too. Therefore, the power harrow is ready for solo operation within short time.

Alternative coupling systems like a hydrolift in order to combine the power harrow e.g. with a precision seeding unit, a triangle quick hitch or an mechanical hitch are available as an option.

Combination	M	H	S
DA	●	●	●
s-drill	●	●	●
e-drill compact	●	●	●
e-drill maxi	-	●	●
e-drill maxi plus	-	●	●
f-drill CB rigid	●	●	●

● Possible - Not available



Flexible use of the power harrow whether with seed hopper or in solo operation depending on soil conditions.



Hydrolift

The hydrolift is fitted with twin hydraulic cylinders for easy and even lifting of heavy hoppers. A mechanical locking device ensures safe transport.



Quick-hitch

All models can be fitted with a Kverneland seed drill quick-hitch for fast and easy attachment and demounting.



Mechanical hitch

A mechanical 3 point seed drill hitch is available for conventional seed drills.





S SERIES: COMPACT AND ROBUST DESIGNED FOR UP TO 250HP



A heavy-duty power harrow for all kinds of operations in all types of soil conditions. Robustly designed for use on tractors up to 250HP, with the Kverneland heavy-duty gearcase design and Quick-Fit tines the S series is the right solution for large farms and farm contractors.

The standard gearbox with a rotor speed of 298rpm is fitted with replaceable gears. Due to different soil conditions it is important to control the rotor speed. Therefore, additional gear sets to achieve 365rpm or 435 rpm are available as an option. Outer parallelogram-guided side deflectors with overload protection allow smooth operation and a ridge free soil surface, even when working in the most difficult conditions.

The S series is equipped with Quick-Fit tines as standard. These are secured by a special pin and clip mounted in the tine holder. Tine replacement is therefore very easy without the need of tools. Depending on soil conditions, forward active tines are available with more aggressive action. For optimum performance in difficult soil conditions, the gearcase design provides a large clearance between the tine holders and the gearcase bottom. This allows large amounts of residue and stones to pass freely without blocking.





H SERIES: HIGH CLEARANCE AND VERSATILE DESIGNED FOR TRACTORS UP TO 180HP

The robust medium-sized power harrow for effective operation in most conditions. By using a double bending sandwich section for the gearcase, it has been possible to increase its strength, making it self-supporting without increasing the weight whilst keeping a clean and tidy design. Main features like the rotor distance of 25cm, the double conical bearing, heavy-duty headstock and the modular tine carrier have been considered too.

Two profiled 6mm plates ensuring precise rotor spacing, high bending resistance of the 140 x 400mm gearcase. Tine shaft of 50mm with two large conical bearings, Ø 45mm and Ø 50mm with a distance of 55mm and 40mm gears and an ample clearance of 95mm between the gearcase bottom and the tine holder ensure good soil flow and allow surface residues to pass easily through the machine.

Tine dimension

15 x 330mm





M SERIES: POWERFUL AND RELIABLE DESIGNED FOR TRACTORS UP TO 140HP



The Kverneland M series is a medium-sized power harrow for tractors up to 140HP. It is the lightest model in the Kverneland power harrow range but not only the heavy-duty headstock follows the design concept of the robust S series but also the self-supporting gearcase construction, as well as the optional 'Quick-Fit' tine holders and double conical bearings offer the optimum performance.

The gearcase of the M series consists only from one bended part which is bolted on top. There is no welding which increases stability especially in combination with a seeder e.g. e-drill compact. Screws of the shaft are protected inside the gear case. The bended bolted plate together with the supporting reinforcement plate form the 140 x 400mm gearcase. Two conical bearings, with a large distance as well as a rotor clearance of 98.25mm between the gearcase bottom and the tine holder provide high stability.

Tine dimension
12 x 280mm



THE NEED FOR CONSOLIDATION REDUCES THE RISK OF EROSION IN THE TOPSOIL

Rollers have been designed to ensure an efficient soil compaction to reduce the soil porosity and limit evaporation in dry conditions but also to prepare an optimal seedbed as a good start for perfect growth and high yields.

The rollers are parallelogram guided. Combined with a coulter bar which is mounted on the roller frame, the depth control is independent of the power harrow.

The roller on a power harrow is an elementary tool with different tasks:

Cracking performance.

- Supporting the exact working depth of the machine is especially in light conditions.
- Optimal soil to seed/root contact to enable efficient nutrient transfer.
- Breaking of clods in order to have a fine seedbed but at the same time keeping the soil structure for reduced soil erosion, as the soil is both structured and stable.
- Improved drainage and water infiltration, especially important in wet years when a good, consolidated soil structure ensures access to plant root systems for water, air and nutrients.
- No separation or raising of straw and residues. Minimal moisture loss, is especially important in dry years when crops which lack moisture suffer badly.
- Reliable working without stick of the soil surface by slipping. Easy maintenance and cleaning.



Work done with an Actipack roller: left side skids lifted up (not active), right side skids down in action.



CONSOLIDATION

ROLLERS FOR ALL TYPE OF SOIL



MEDIUM TO HEAVY

Actipack Ø 560mm - 205 kg/m

- The Actipack roller displays its superb working qualities especially on medium to heavy soils and also in wet, stony and sticky conditions thanks to the independent skids and knives.
- The cutting discs break the larger clods whilst the adjustable knives cut the remaining clods resulting in optimal clod breakdown and fine seedbed preparation.
- If the knives are out of work position, the roller leaves a rough weatherproof surface which protects the top layer and prevents wind or water erosion.
- Scrapers between the discs support the cleaning effect especially in sticky conditions.
- Results like an active soil working tool.



The ring and shoulder angle design of the Actipack roller provides consolidation to depth without tightening up surface aggregates. Provides good weathering effect and transition of moisture through profile.



LIGHT TO MEDIUM TO HEAVY

Actiline ø 550mm - 185kg/m

- Trapezoidal roller with relatively narrow crest width of 40mm
- Stripe-wise consolidation and V shape furrow in front of the CX-II seed coulters bar for a perfect seed placement and even field emergence
- Supporting water holding capacity and oxygen exchange
- Optimum performance on light to heavy soil.
- Good carrying capacity with full self-cleaning effect.
- Crests support the constant drive of the roller and avoid slip in light or tough and wet conditions.
- Two different ring distances of 12.5cm and 15cm
- Carbide-coated scrapers on request
- Standard or EURO-CONNECTION (15cm version excl. with EURO-CONNECTION) possible

- Offering all plants the same access to nutrients, moisture and light.
- Finer soil particles are deposited in the lower level of the tilth to promote rapid and uniform germination.
- Prevent loss of moisture whilst the coarser clods are kept on the surface in order to reduce the risk of surface capping.



LIGHT TO MEDIUM TO HEAVY

Tooth Packer roller ø 575mm - 160kg/m

- Optimum performance on medium to heavy soils.
- Good carrying capacity.
- Good self-cleaning effect.
- Central adjustable scraper bar with independently adjusted scrapers.
- Carbide-coated scrapers on request.
- Most versatile roller – especially as part of heavy power harrow/seed drill combinations.



LIGHT TO MEDIUM

Cage roller ø 550mm - 90 kg/m

- 10 bars for a good loading capacity and operation in wet conditions.
- Suitable for light to medium soils and dry working conditions e.g. seed bed preparation for potato-planting.
- Included in the front-mounting kit for additional depth control in front of the machine.

ORIGINAL PARTS & SERVICE

LET'S FOCUS ON YOUR BUSINESS

ORIGINAL
PARTS

- 
- ① LONG LASTING - HIGH QUALITY SPARE PARTS
 - ② OVER 100 YEARS OF PARTS KNOWLEDGE
 - ③ SUPPORT FROM A WIDE NETWORK OF DEALERS
 - ④ 24/7 SPARE PARTS SERVICE
 - ⑤ HIGHLY SKILLED DEALER TECHNICIANS

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TECHNICAL DATA

Model	M series		H series			S series			
Maschine type	rigid		rigid			rigid			
Working width (m)	2.5	3.0	3.0	3.5	4.0	3.0	3.5	4.0	4.5
Transport width (m)	2.5	3.0	3.0	3.5	4.0	3.0	3.5	4.0	4.5
Gearcase dimension (mm)	140 x 400		165 x 400			200 x 400			
PTO input speed (rpm)	540 or 1,000		1,000			1,000			
Overload protection on PTO shaft (Nm)	2,000		2,000			2,500			
Number of rotors	10	12	12	14	16	12	14	16	18
Standard rotor speed 540rpm (rpm)	311		-			-			
Standard rotor speed 1000rpm (rpm)	-		336			298			
Optional rotor speed 540rpm (rpm)	358		-			-			
Optional rotor speed 1000rpm (rpm)	351		362 and 450			365 and 435			
Tapered bearing distance (mm)	70		84.5			110.5			
Rotor clearance (mm)	98.25		90.5			100			
Number of tines	20	24	24	28	32	24	28	32	36
Tine dimension (mm)	12 x 280		15 x 330			18 x 330			
Quick-Fit tines	○		●			●			
Active tines	-		○			○			
3-point Linkage: Top	CAT 2/CAT 3		CAT 2/CAT 3			CAT 2/CAT 3			
3-point Linkage: Low	CAT 2/CAT 3N/CAT 3		CAT 2/CAT 3N/CAT 3			CAT 2/CAT 3N/CAT 3			
Depth adjustment	manual		manual			manual			
Rear levelling bar	○		○			○			
Track eradicator	○		○			○			
Roller offering	Cage roller (ø 550mm), Tooth Packer roller (ø 575mm), Actiline roller (ø 550mm), Cracker Packer roller (ø 550mm), Actipack roller (ø 560mm)								
Ready to carry or integrate seeding eq.	○		○			○			
Lighting set	○		○			○			
Total weight (kg)*	1,350	1,550	1,610	1,850	2,100	1,900	2,080	2,290	2,560
Minimum power requirement (kW/HP)	51/70		63/85			74/100			
Maximum power requirement (kW/HP)	103/140		132/180			184/250			

* Approx. weight with levelling bar, tooth packer roller Ø 575mm and PTO shaft approx.

● Standard equipment ○ Option - Not available

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