

# SEMI-MOUNTED REVERSIBLE PLOUGHS **DIAMANT 16**





## **Diamant 16 semi-mounted plough**

The demands placed on modern semi-mounted reversible ploughs are becoming ever more stringent as farms continue to increase in size. LEMKEN has developed its Diamant 16 semi-mounted plough to meet these high demands comprehensively, particularly in terms of handling, quality of work and increased productivity.

This plough is exceptionally manoeuvrable for rapid turning on narrow

headlands and maximum acreage performance.

Varying soil and weather conditions call for an easy-to-operate cutting width adjustment, which the V models deliver to make a significant contribution to arable farming that is both environmentally friendly and profitable.

The ploughs' superior stability is in keeping with increasing tractive



outputs on tractors and larger working widths.

Their design allows operators to plough right up to fences, ditches and field edges, despite large working widths. The skimmers can be easily and quickly adjusted without tools.

Equipped with Dural plough bodies in the basic equipment.

The DuraMaxx generation of plough bodies delivers a longer service life, less clogging and lower traction requirements, resulting in cost savings when using the plough.

The OptiStone overload protection allows plough bodies to be deflected in three directions.

The OptiLine adjustment system allows fuel savings of up to 10%.

The traction booster reduces slip and increases the load applying to the rear tractor axle, reducing fuel consumption.

The ploughs can be transported safely on roads, even at high speeds, without placing excessive loads on tractors.

# Diamant 16 – On-land or in the furrow...

In recent years, there has been a trend towards larger tractors with wider tyres with 710 mm, 800 mm or above. As a result there is not enough space for these large tyres in the furrows, resulting in soil compaction damage when driving across loosened soils and along furrow edges.

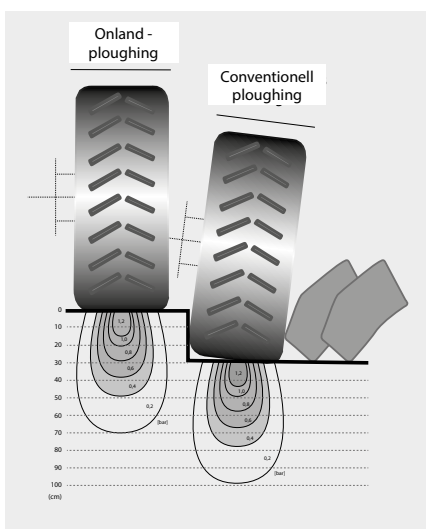
As GPS steering systems are becoming more popular, on-land ploughing is becoming more practicable for tractor operators. While it was previously mainly tractors with crawler tracks that were driven outside the furrow for systemic reasons, modern steering systems allow comfortable ploughing with precise furrow alignment even from standard tractors.

If damp soil surfaces prevent the optimal transmission of traction forces, or even just for ploughing the last furrows, Diamant 16 ploughs can be quickly and easily converted to in-furrow ploughing.

On-land ploughing with the Diamant 16 OF is particularly gentle to soils, as there is no tractor wheel running in the furrow.



## On-land and in-furrow ploughing



Lower soil compaction during on-land ploughing has a beneficial effect on the soil structure.

- For use with tractors with up to 4 metres external width.
- On slopes, operators can even plough downhill, and ploughing close to field edges is possible both on-land and in the furrow.
- During on-land operation, the frame can be swivelled into two positions. When working with smaller tractors and, for example, a 5-furrow Diamant 16, the swivel cylinder is extended half way. When working with ploughs with 7 or more furrows, the cylinder is extended fully to maintain an optimal distance to the furrow edge at all times and to plough without side pull.



## ... with maximum traction



### Optional traction booster

Diamant 16 ploughs can be fitted with an optional traction booster.

- An additional hydraulic cylinder transfers weight to the tractor's rear axle to boost its traction.
- This "smart ballasting" system reduces slip and therefore saves fuel.
- As soon as the hydraulic system raises the plough frame via the transport wheel, the pressure in the

traction booster is automatically reduced to ensure that full tractor stability is maintained at all times. As soon as the transport wheel is lowered, pressure is automatically increased again.



### Horizontal draw point adjustment (optional with OF version)

The height of the horizontal draw point is easily adjusted simply by repositioning a pin.

- This allows a precise load transfer to the rear axle of the tractor.
- When using crawler tracks, the draw point is set very low to ensure that even loads are applied to the tracks.
- Slip is minimised on all tractors through the optimal transfer of tractive forces.

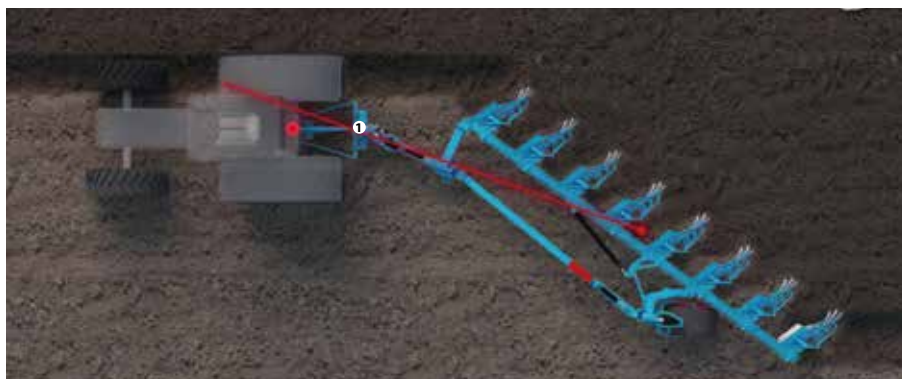


# OptiLine adjustment system

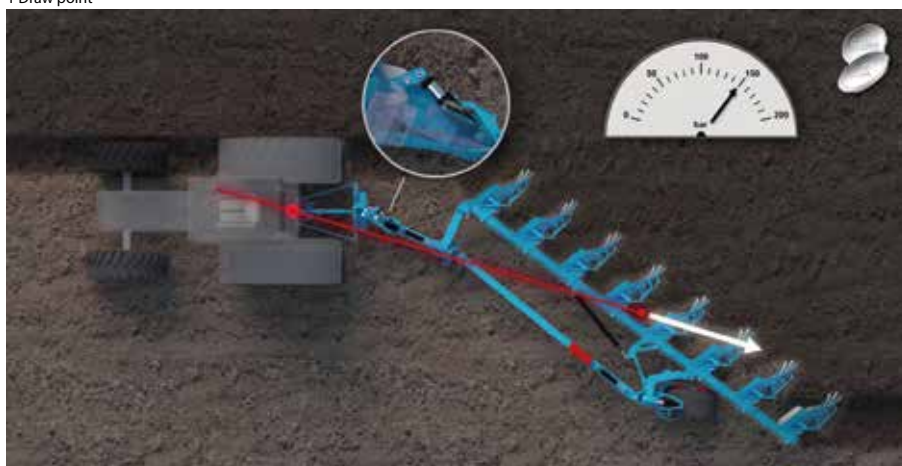
The draw point of the Diamant lies in front of the lower link connection. This position far to the front ensures an efficient tractor/plough traction line. Yet there is some side pull because the tractor/plough traction line does not extend through the centre of the rear axle.

An additional, pressure-controlled cylinder serves to transfer torque to the tractor to compensate for side pull. This shifts the tractor/plough traction line further towards the centre of the rear axle and thus reduces side pull in the Diamant.

- Fuel savings of up to 10%



1 Draw point



- No need for operators to counter-steer, resulting in considerably less operator strain
- Set hydraulic pressure for optimal landside pressure and minimal side pull in the tractor
- Optimal landside pressure for even front furrow widths and consistent results

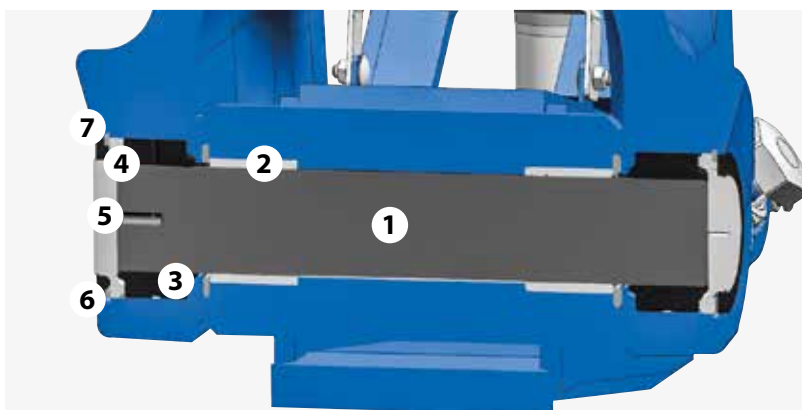


# Always the right bearing



## Superior safety and reliability

All main bearings feature highly robust spherical plain bearings, which have a particularly long service life and ensure high reliability of operation.



- |                           |           |
|---------------------------|-----------|
| 1 Bolt                    | 5 Cap     |
| 2 Bush                    | 6 Circlip |
| 3 Spherical plain bearing | 7 Gasket  |
| 4 O-ring                  |           |



## Adjustment brackets

The fixed bolted connection between the adjustment brackets and frame provides outstanding stability, reliable durability and a high degree of engineering precision.

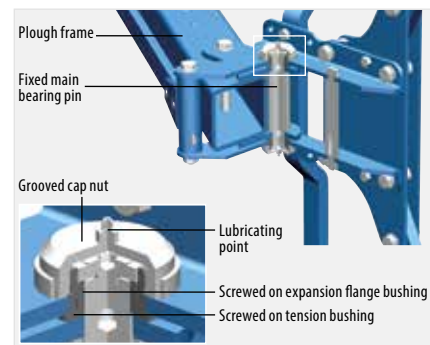
- Once the central bolt has been loosened, four working widths between 33 and 60 cm can be set (depending on interbody clearance).
- Skimmers and disc coulters are adjusted automatically.



## Continuously variable working width

The frame plates supporting the swivel brackets are bolted to the frame. This provides outstanding stability, increased durability and a high degree of engineering precision.

- The pivots for the swivel brackets, which are supported next to the frame, are located close to the plough body. This reduces strain on the bearings and other components.
- The working width is continuously adjustable via a double-acting hydraulic cylinder.



## Variable bearing

The main bearing bolt of the swivel bracket is equipped with tension bushes and locked against rotation with the frame plates.

- The swivel bracket has crimped flange bushings. The two bushes of the cutting width adjustment run within each other for a long service life.
- Each component can be replaced separately if worn.

# Mounting, parking and rotation



## Strong headstock

The continuous, flexible Cat. 3 and 4 cross shaft absorbs major impact loads to protect both the tractor and headstock.

- It can be rotated towards the rear to reduce side pull (in the version without OptiLine).
- The plough axle is surface hardened, mounted on tapered rollers and easy to lubricate for high strength and a long service life.



## Reliable reversing mechanism

Two reversing cylinders ensure that the plough can be rotated powerfully and smoothly by 180 degrees.

- Single-acting reversing mechanism via a telescopic cylinder with mechanical tilt adjustment.



## Height-adjustable stand

The stand height can be adjusted to various levels to ensure that the headstock is ideally positioned for coupling to and decoupling from the tractor.

- The stand is easily moved from the parking to the transport or working position by simply repositioning a pin.







### Tilt adjustment

The tilt adjustment is made via screws either side of the central framework.

- The tilt adjustment is made separately for each side by a simple mechanical device.
- The screw serves as a stop for the reversing cylinder.



### Straightforward uncoupling

The plough can be positioned vertically before uncoupling by removing the relevant tilt adjustment screw.

- This straightens the headstock to make coupling and uncoupling processes easier.



### Front furrow adjustment

The front furrow width is set via a turnbuckle. There is an option to make this adjustment hydraulically from the tractor cab.

- With on-land ploughing, this setting adjusts the distance between the tractor and the furrow.

## Turning procedure



The large clearance between the plough headstock and tractor permits a steering angle of up to 90°. The transport wheel is automatically



controlled during plough rotation. The optimal interaction between the reversing mechanism and transport wheel allows easy, rapid turning even



on narrow headlands and in hilly or difficult terrain.

# Quality and safety on fields and roads



## Road transport

The semi-mounted reversible plough is rotated into its centre position and locked via two stop valves for quick and safe road transport.

- It can then be safely towed behind the tractor just like any single-axle trailer.
- All Diamant ploughs feature a transport wheel damper as standard to protect both tractor and plough effectively against excessive loads.

- The ModuLight LED provides maximum safety during road transport.



## Comfortable working depth adjustment

The large transport wheel minimises soil compaction during ploughing and ensures the required safety for road transport.

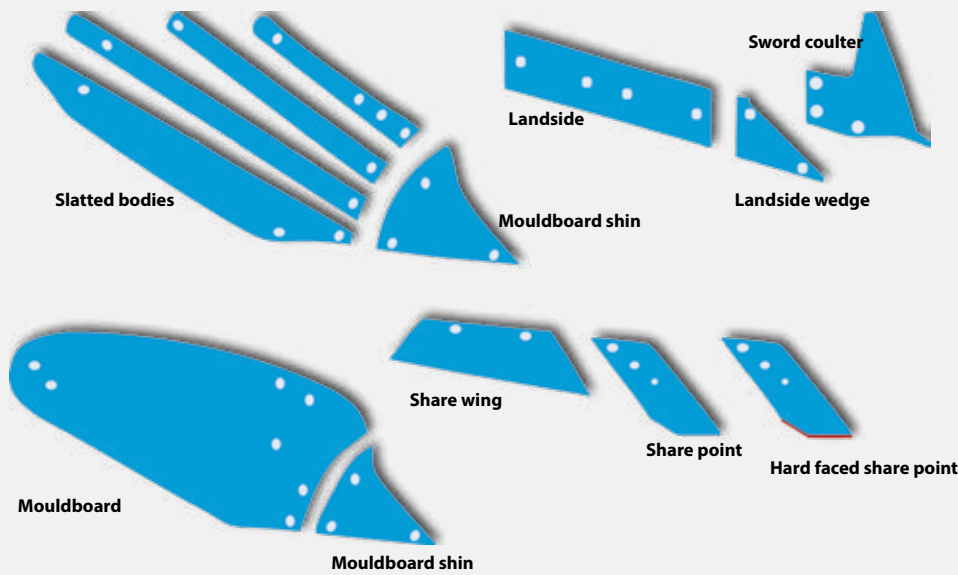
- The Diamant 16 features hydraulic depth adjustment. The working depth is set via the three-point linkage at the front and via the transport wheel at the rear, either via a mechanical (standard equipment) or optionally via a

mechanical-hydraulic or hydraulic/electrical mechanism. The relevant shut-off valve is set to either the SET or WORK position. This can be done manually or via a spool valve operated from the tractor seat.

- An easy-to-read display facilitates working depth adjustments and at the same time protects the lifting cylinder against dirt.

- The hydro-pneumatic suspension absorbs major impact loads.
- A range of wheel sizes is available upon request:  
Standard equipment  
400/55-22.5, 1,020 x 400 mm  
Optional  
500/45-22.5, 1,020 x 500 mm  
500/60-22.5, 1,200 x 500 mm

# Cost-effective plough bodies



## Dural mouldboard

The frog of the Dural body is tempered and extremely strong.

- The pitch of the plough bodies is adjustable to ensure consistently good penetration of the plough into the soil.
- The smooth transition from the share to the mouldboard and the low-resistance shape make the plough even easier to pull.
- The mouldboards are made of special hardened steel and are designed for low wear without screws or bolts in the main wearing zone.
- The extra large mouldboard shin can be replaced individually for greater cost-effectiveness.



Further information

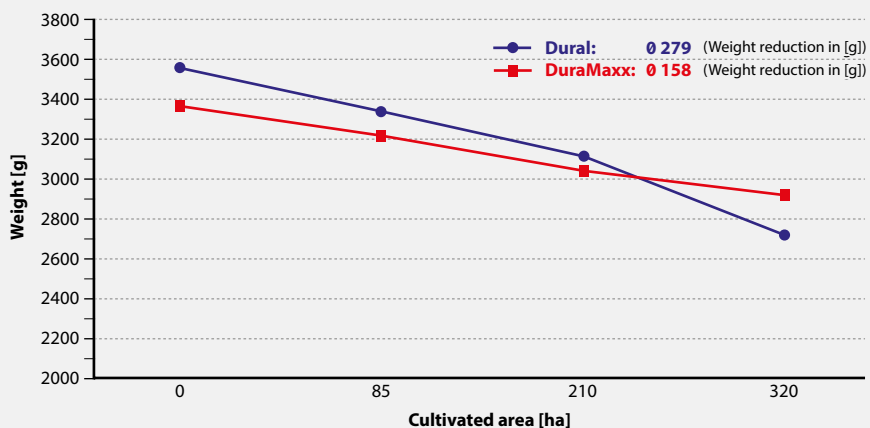


## Dural slatted bodies

The slats of the slatted bodies are made of thick, fully hardened special steel and can be individually replaced.

- The attachment screws are deeply sunk to ensure that the slats remain firmly in place throughout their extremely long service life.
- Slatted bodies and conventional mouldboards are based on the same basic body.
- The shares are divided and made of micro-alloyed boron steel.
- The overlapping design prevents roots or foreign objects from catching.
- High material density and firm attachment provide for resistance to wear and breakage.
- The wear zones of the share wings are significantly larger than with conventional shares.

# Reliable and cost-effective on all soils



Prof. Dr. Yves Reckleben, Kiel University of Applied Sciences



## DuraMaxx – the perfect plough body

The DuraMaxx plough body represents a radically new approach that increases service life by up to 150% whilst reducing set-up times by up to 80%.

- All DuraMaxx components are manufactured from much harder steel

than previous bodies. This was possible as the material is no longer weakened by drilled or punched holes.

- DuraMaxx plough bodies offer a longer service life, less clogging and low traction requirements.

- Mouldboards and slats are fully supported by the frog. They are no longer a load-bearing part of the plough body. With these bodies, almost the full part length is available for use, as there are no worn screw heads requiring slats or mouldboards to be replaced early.

Further information





### Quick, tool-less change

DuraMaxx plough bodies are designed to allow mouldboards, slats and mouldboard shins to be changed quickly and without requiring tools.

- The mouldboard shin, which can be easily detached after removing a lynch pin, also serves to keep the other components securely locked in place. The mouldboard or slats can then be simply pulled out of their connectors.
- The share point is attached with only a single screw, making a change much quicker than with conventional systems.



### Body assembly

The DuraMaxx plough body is available with mouldboards or slats.

- The mouldboard and slats are attached with no more than two hooks.
- On the slat bodies, the clearance between the slats and their support has been considerably increased. The support is aligned with the slats, which allows the plough to work without blockages even in difficult conditions.



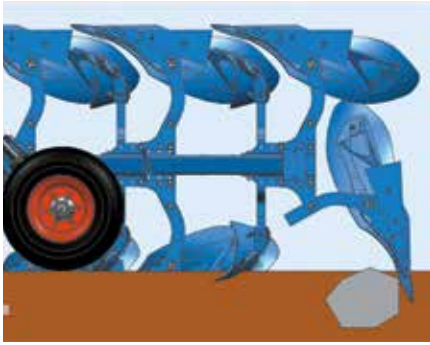
### DuraMaxx Hybrid for sticky soils

The DuraMaxx plough body can also be configured with plastic slats. These are ideal for use on extremely sticky soils and in soil conditions where only little pressure applies on the mouldboard.

- Optimal sliding properties are achieved by using plastic slats at the top and bottom areas of the plough body, which are most susceptible to adhesion.
- This ensures that the DuraMaxx body works without any adhesion even in extreme conditions.



# Disruption-free ploughing in any conditions



## Overload protection to prevent damage

All LEMKEN overload protection systems protect against damage from the share point impacting on obstacles.

- The Diamant features double-cut shear-off protection with a shear-bolt as standard. In ploughs with automatic overload protection, the shear bolt protects the plough against damage due to the system becoming trapped under rocks or roots.

- The Diamant U version features the OptiStone overload protection. The trigger force is set via a stopcock below the pressure gauge. The trigger force should be set as low as possible to protect the tractor and plough.

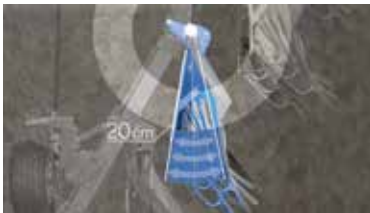
## Individual adjustment

Minimum and maximum trigger force values can be individually set between 120 and 200 bar via the hand wheel on the (optional) control valve, e.g. for shallow sections or sections with heavy soils.

- These limits can then be actuated via the control unit on the tractor.
- No readjustments based on pressure gauge readings are necessary.
- The fixed connection between the beam and frame permits low system pressures.



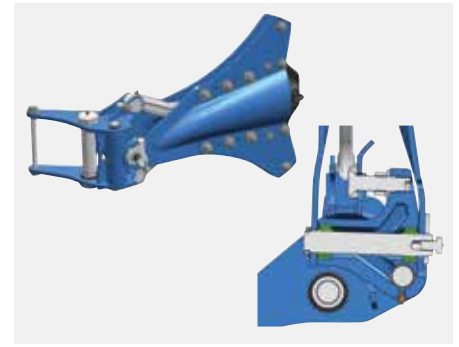
# With OptiStone hydraulic overload protection



## High vertical and horizontal triggering forces

The OptiStone overload protection is based on a new swivel bracket with high trigger and re-entry forces to ensure that the system is triggered softly and smoothly when an obstacle is encountered. This protects both tractor and plough. The overload element is easily able to deflect vertically up to 37 cm and horizontally up to 20 cm at the same time.

- This provides for a sufficiently large range of deflection to ensure consistently disruption-free work, even with deep ploughing.
- The high trigger forces can be conveniently and continuously adjusted to variable conditions from the tractor seat.



## Superior precision and operational reliability

The closed system of highly stable leg plates is reliably protected against dirt and foreign objects. A newly designed swivel bracket delivers high horizontal and vertical trigger forces while ensuring stable plough control. The system is supported in highly stable, easily accessible radial spherical plain bearings. The plough body is firmly connected to the three-dimensional bearing point – a clear advantage compared to the overload protection systems with four-point suspension commonly found on the market.

- Precise body alignment
- Stable and safe plough control
- No unhitching of the element
- Easy maintenance for a long service life and high operational reliability



# Always well prepared



## Tool-less skimmer adjustment

The working depth can be continuously adjusted via a pin on the flat stalk. This requires no tools.

This allows all skimmers on the plough to be adjusted evenly without repeated checks and readjustments.



## Flat stalk

The Diamant version with skimmers features robust flat stalks that are connected to the frame via two bolts.

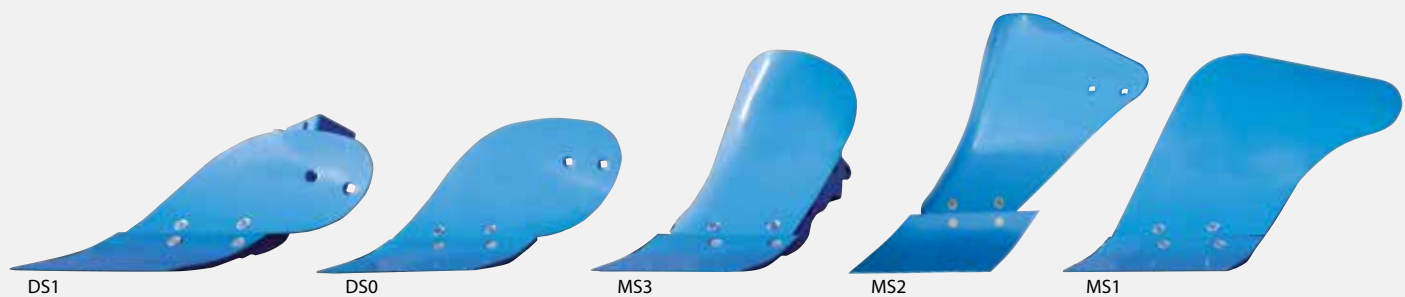
- The flat stalk prevents skimmer distortion.
- It can be easily removed for ploughing without skimmers.



## Trash boards for blockage-free work

The trash boards are mounted directly on the leg and can be set over a wide range.

- They ensure blockage-free work and the neat insertion of plant material.
- Trash boards are also available in plastic for sticky soil conditions.

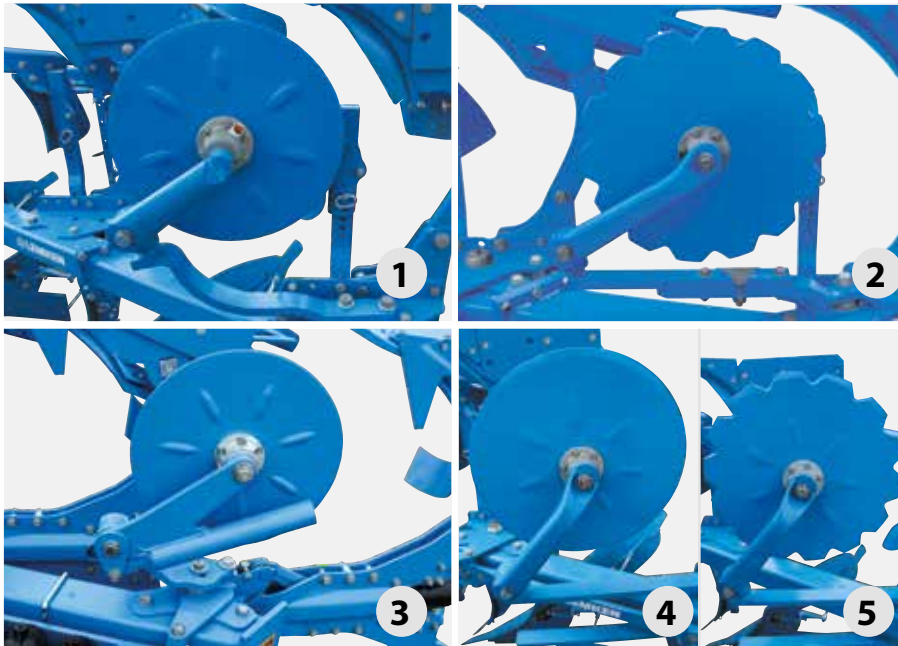


## Skimmers for blockage-free ploughing

New skimmers with different share lengths reliably prevent blockages during ploughing even in difficult conditions.

- The special share shape minimises wear and increases service life while creating excellent soil flow.
- The specially shaped mouldboard separates and neatly deposits the organic matter.
- Plastic mouldboards are available for sticky soils and in soil conditions where only little pressure applies on the skimmer.



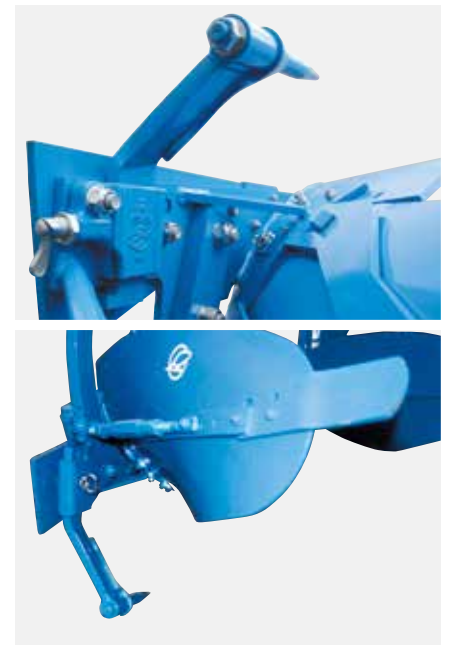


### Disc coulters

The smooth disc coulters are corrugated at the sides to provide continuous drive even when breaking up large amounts of organic material.

- The disc coulters arms are swivelled vertically for depth adjustment and can be fixed in position with a screw when engaged with the gears.
- The smooth bearings on the unploughed side are double-sealed against dirt ingress.

- The disc coulters are available in a range of versions and mounting positions:
  - 1)  $\varnothing$  500 mm, next to skimmers
  - 2)  $\varnothing$  590 mm, in front of/next to skimmers, adjustable
  - 3)  $\varnothing$  500 mm, suspended
  - 4)  $\varnothing$  590 mm, next to skimmers
  - 5) Alternatively, serrated discs are available in all diameters.



### Subsoiler for effective loosening

The specially shaped subsoiler delivers a particularly good loosening effect.

- The subsoiler depth can be adjusted without tools, and the subsoiler can also simply be removed without requiring tools, if necessary.
- All wear parts can be individually replaced. The stalk guard prevents wear on the stalk.



# Technical data

| Description   | Working width per furrow<br>[approx. cm] |           | Interbody clearance<br>[cm] | Number of furrows | Weight<br>[approx. kg] |           |
|---|--|-----------|-----------------------------|-------------------|------------------------|-----------|
|   | Diamant                                  | Diamant V |                             |                   | Diamant                | Diamant V |
| <b>With double-cutting shear bolt device</b>                    |  |           |                             |                   |                        |           |
| Diamant 16 (V) 5 L 100  | 33, 38, 44, 50                           | 30 - 55   | 100                         | 5                 | 2,584                  | 2,759     |
| Diamant 16 (V) 5+1 L 100  | 33, 38, 44, 50                           | 30 - 55   | 100                         | 5+1               | 2,834                  | 3,069     |
| Diamant 16 (V) 6 L 100  | 33, 38, 44, 50                           | 30 - 55   | 100                         | 6                 | 2,830                  | 3,040     |
| Diamant 16 (V) 6+1 L 100  | 33, 38, 44, 50                           | 30 - 55   | 100                         | 6+1               | 3,080                  | 3,350     |
| Diamant 16 (V) 7 L 100  | 33, 38, 44, 50                           | 30 - 55   | 100                         | 7                 | 3,076                  | 3,321     |
| Diamant 16 (V) 7+1 L 100  | 33, 38, 44, 50                           | 30 - 55   | 100                         | 7+1               | 3,326                  | 3,631     |
| Diamant 16 (V) 8 L 100  | 33, 38, 44, 50                           | 30 - 55   | 100                         | 8                 | 3,322                  | 3,602     |
| Diamant 16 (V) 8+1 L 100  | 33, 38, 44, 50                           | 30 - 55   | 100                         | 8+1               | 3,572                  | 3,912     |
| Diamant 16 (V) 5 L 120  | 40, 45, 53, 60                           | 30 - 60   | 120                         | 5                 | 2,634                  | 2,829     |
| Diamant 16 (V) 5+1 L 120  | 40, 45, 53, 60                           | 30 - 60   | 120                         | 5+1               | 2,896                  | 3,153     |
| Diamant 16 (V) 6 L 120  | 40, 45, 53, 60                           | 30 - 60   | 120                         | 6                 | 2,892                  | 3,124     |
| Diamant 16 (V) 6+1 L 120  | 40, 45, 53, 60                           | 30 - 60   | 120                         | 6+1               | 3,154                  | 3,448     |
| Diamant 16 7 L 120  | 40, 45, 53, 60                           |           | 120                         | 7                 | 3,150                  |           |
| Diamant 16 7+1 L 120  | 40, 45, 53, 60                           |           | 120                         | 7+1               | 3,412                  |           |
| <b>With additional Hydromatic hydraulic overload protection</b> |  |           |                             |                   |                        |           |
| Diamant 16 (V) U 5 L 100  | 33, 38, 44, 50                           | 30 - 55   | 100                         | 5                 | 2,844                  | 2,979     |
| Diamant 16 (V) U 5+1 L 100                                      | 33, 38, 44, 50                           | 30 - 55   | 100                         | 5+1               | 3,151                  | 3,338     |
| Diamant 16 (V) U 6 L 100  | 33, 38, 44, 50                           | 30 - 55   | 100                         | 6                 | 3,142                  | 3,304     |
| Diamant 16 (V) U 6+1 L 100                                      | 33, 38, 44, 50                           | 30 - 55   | 100                         | 6+1               | 3,449                  | 3,663     |
| Diamant 16 (V) U 7 L 100  | 33, 38, 44, 50                           | 30 - 55   | 100                         | 7                 | 3,440                  | 3,629     |
| Diamant 16 (V) U 7+1 L 100                                      | 33, 38, 44, 50                           | 30 - 55   | 100                         | 7+1               | 3,747                  | 4,988     |
| Diamant 16 V U 5 L 120  | 40, 45, 53, 60                           | 30 - 60   | 120                         | 5                 |                        | 3,049     |
| Diamant 16 V U 5+1 L 120  | 40, 45, 53, 60                           | 30 - 60   | 120                         | 5+1               |                        | 3,422     |
| Diamant 16 V U 6 L 120  | 40, 45, 53, 60                           | 30 - 60   | 120                         | 6                 |                        | 3,388     |
| Diamant 16 V U 6+1 L 120  | 40, 45, 53, 60                           | 30 - 60   | 120                         | 6+1               |                        | 3,761     |

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