



**Translation of original  
Operating Instructions**

# **Verticutting harrow Terra Rake 170**

## **521.001**

**From equipment I.D. No. :**

**Status : April 2017**

**521 99 01**



# EC DECLARATION OF CONFORMITY

We

**Wiedenmann GmbH  
Am Bahnhof  
89192 Rammingen**

declare under our sole responsibility that the product

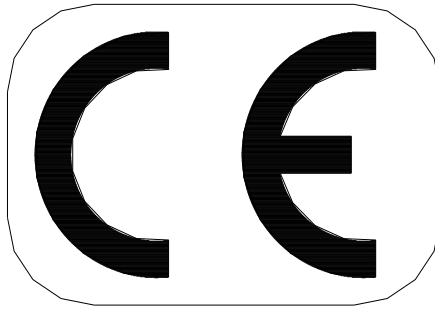
**Verticutting harrow  
Terra Rake 170**

to which this declaration refers, corresponds with the relevant basic safety and health requirements of the machinery directive 2006/42/EC.

<b>Rammingen, the 10.03.2015</b>	<b>Horst Wiedenmann</b>
(Place and date of issue)	<b>Managing Partner</b>
	(Name, function and signature of authorised person)

<b>Rammingen, the 10.04.2017</b>	<b>Markus Remmele</b>
(Place and date of issue)	<b>Technical office manager Authorised representative for tech. documentation</b>
	(Name, function and signature of authorised person)

**NOTE: The declaration of conformity is no longer valid if changes are made to the machine that have not been agreed with the manufacturer.**



## Declaration of conformity

We

**Wiedenmann GmbH  
Am Bahnhof  
89192 Rammingen**

hereby declare that the product

**Verticutting harrow  
Terra Rake 170**

referred to by this declaration complies with the requirements of  
Machinery Directive 2006/42/EC.

<b>Rammingen, the 10.03.2015</b>	<b>Karl Wiedenmann</b>
(Place and date of issue)	<b>Sales Manager</b>
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# Preface

**READ THESE OPERATING INSTRUCTIONS CAREFULLY** to familiarise yourself with the correct way to operate and service your machine, and to prevent personal injury or damage to the machine.

These operating instructions and the adhesive safety signs on your machine can also be obtained in other languages (your dealer can order these for you).

**THESE OPERATING INSTRUCTIONS ARE** a permanent part of your machine and should be handed over to the new owner if the machine is sold.

**MEASUREMENTS** in these operating instructions are given in the metric system. Only use suitable parts and screws. Different wrenches are required for metric and inch screws.

**"LEFT"** are based on the forward direction of travel of the mounted equipment or attached machine.

**ENTER THE PRODUCT IDENTIFICATION NUMBERS** in the appropriate "Technical data" or "Product - Identification Number" sections. Please ensure that all figures are accurately entered. These numbers can be of invaluable assistance for tracing the machine should it be stolen. Your dealer also needs these numbers when you order spare parts. We recommend that you additionally file these identification numbers in a secure place away from the machine.

**BEFORE DELIVERY OF THIS MACHINE**, your dealer performed a pre-delivery inspection to ensure optimal performance.

**THE VERTICUT HARROW IS DESIGNED SOLELY** for commercial use and for conventional use on artificial turf surfaces used for sports grounds for the digging and roughing up of the ground surface, as well as for the removal of thatch. It is also used on artificial turf surfaces to loosen the filling material. The "strain relief kit" extra equipment must be fitted to the machine where it is used on artificial turf surfaces ("SPECIFIED USE").

Usage for any other purpose beyond this is considered as contrary to the intended use. The manufacturer accepts no liability for damage or injury resulting from this improper use. These risks are borne solely by the user. Compliance with and strict adherence to the operating, maintenance and repair conditions as specified by the manufacturer also form essential elements of the intended usage.

**VORHERSEHBARER FEHLGEBRAUCH/MISSBRAUCH.** Es darf kein Transport von Personen und Gegenstände mit dem angebauten oder angehängten Gerät vorgenommen werden.

**THIS MACHINE MUST ONLY BE** operated, maintained and repaired by persons familiar with all its particular characteristics and acquainted with the relevant safety regulations. The relevant accident prevention regulations, all other generally recognised safety-related, occupational medicine and road traffic regulations must be adhered to. Any modifications carried out to this machine without the express approval of the manufacturer excludes the manufacturer of all liability for any resulting damage.

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# 1.0. Safety

## Recognize safety information

This is the safety-alert symbol. When you see this symbol on your machine or in this manual, be alert to the potential for personal injury.

Follow recommended precautions and safe operating practices.



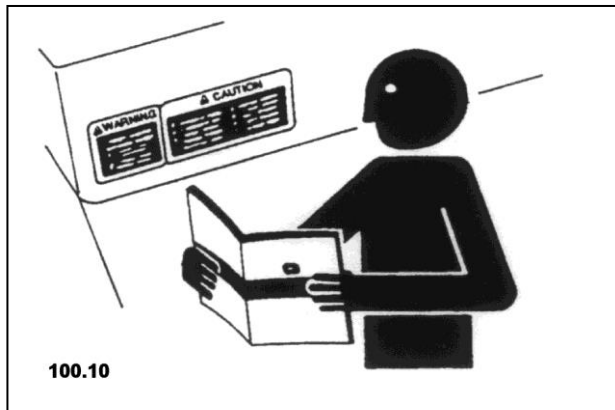
## Follow safety instructions

Carefully read all safety messages in this manual and on your machine safety signs. Keep safety signs in good condition. Replace missing or damaged safety signs. Be sure new equipment components and repair parts include the current safety signs. Replacement safety signs are available from your dealer.

Learn how to operate the machine and to use controls properly. Do not let anyone operate without instruction.

Keep your machine in proper working condition. Unauthorized modifications to the machine may impair the function and/or safety and affect machine life.

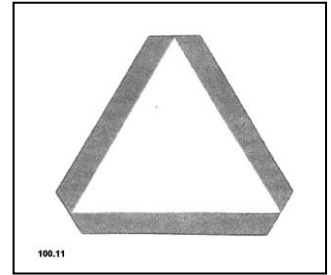
If you do not understand any part of this manual and need assistance, contact your dealer.



# 1.0. Safety

## Observe road traffic regulations

Always observe local road traffic regulations when using public roads.



## Wear protective clothing

Wear close fitting clothing and safety equipment appropriate to the job.

Prolonged exposure to loud noise can cause impairment or loss of hearing.

Wear a suitable hearing protective device such as earmuffs or earplugs to protect against objectionable or uncomfortable loud noises.

Operating equipment safety requires the full attention of the operator. Do not wear radio or music headphones while operating machine.



## Stay clear of rotating drivelines

Entanglement in rotating driveline can cause serious injury or death.

Keep tractor master shield and driveline shields in place at all times. Make sure rotating shields turn freely.

Keep tractor master shield and driveline shields in place at all times. Make sure rotating shields turn freely.



# 1.0. Safety

## Guard and shields

Keep guards and shields in place all the times. Ensure that they are in good condition and installed correctly.

Always disengage the driveline, shut off engine and remove key before removing any guards or shields.

Keep hands, feet and clothing away from moving parts.

## Avoid high - pressure fluids

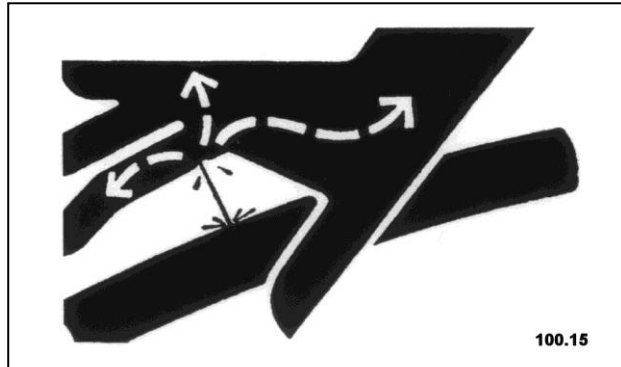
Escaping fluid under pressure can penetrate the skin causing serious injury.

Avoid the hazard by relieving pressure before disconnecting hydraulic or other lines. Tighten all connections before applying pressure.

Search for leaks with a piece of cardboard. Protect hands and body from high pressure fluids.

If an accident occurs, see a doctor immediately. Any fluid injected into the skin must be surgically removed within a few hours or gangrene may result.

Doctors unfamiliar with this type of injury should reference a knowledgeable medical source.



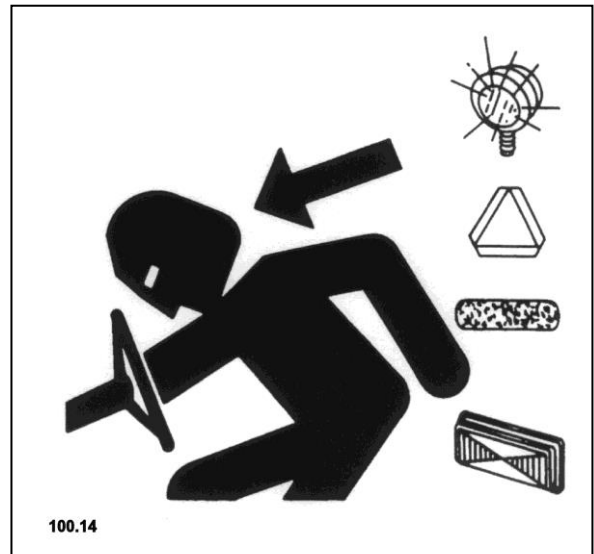


## 1.0. Safety

### Use safety lights and devices

Prevent collisions between other road users, slow moving tractors with attachments or towed equipment, and self-propelled machines on public roads. Frequently check for traffic from the rear, especially in turns, and use hand signals or turn signal lights.

Use headlights, flashing warning lights, and turn signals day and night. Follow local regulations for equipment lighting and marking. Keep lighting and marking visible and in good working order. Replace or repair lighting and marking that has been damaged or lost. An implement safety lighting kit is available from your dealer.



### Avoid heating near pressurized fluid lines

Flammable spray can be generated by heating near pressurized fluid lines, resulting in severe burns to yourself and bystanders. Do not heat by welding, soldering, using a torch near pressurized fluid lines or other flammable materials. Pressurized lines can be accidentally cut when heat goes beyond the immediate flame area.



# 1.0. Safety

## Remove paint before welding or heating

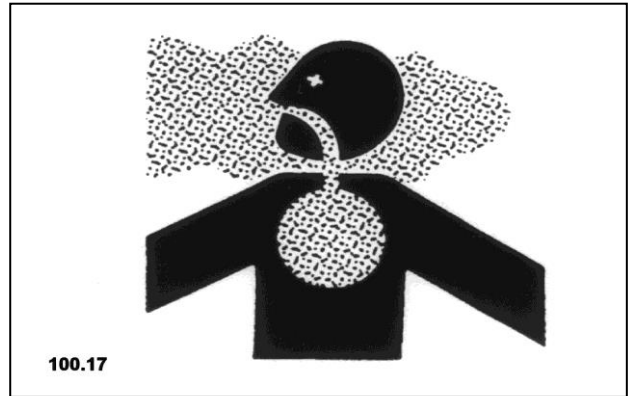
Avoid potentially toxic fumes and dust.

Hazardous fumes can be generated when paint is heated by welding, soldering, or using a torch.

Do all work outside or in a well ventilated area. Dispose of paint and solvent properly.

Remove paint before welding or heatingh:

- If you sand or grind paint, avoid breathing the dust. Wear an approved respirator.
- If you use solvent or paint stripper with soap and water before welding. Remove solvent or paint stripper containers and other flammable material from area. Allow fumes to disperse at least 15 minutes before welding or heating.



# 1.0. Safety

## 1.1. Safety Decals

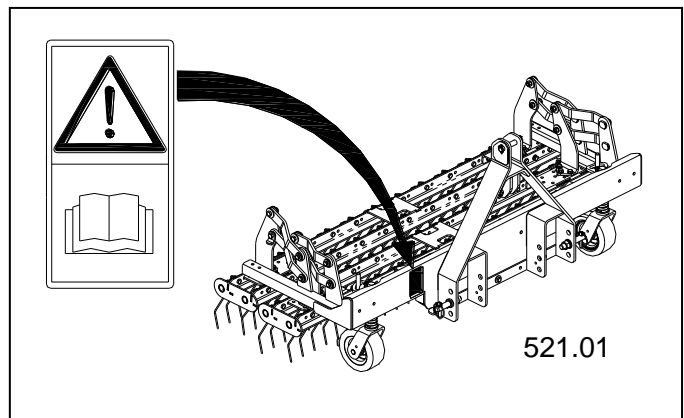
### Pictorial safety signs

At several important places of this machine safety signs are affixed intended to signify potential danger. The hazard is identified by a pictorial in a warning triangle. An adjacent pictorial provides information how to avoid personal injury. These safety signs, their placement on the machine and a brief explanatory text are shown below.



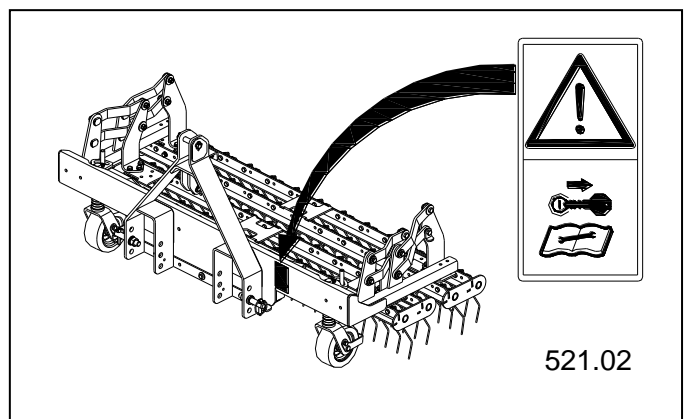
### Operator's manual

This operator's manual contains all important information necessary for safe machine operation. Carefully observe all safety rules to avoid accidents.



### Service

Before performing service or repair work, turn off engine and remove key.



# 1.0. Safety

## 1.2. Safety instructions



Apart from the information in these operating instructions, please also observe generally applicable safety and accident-prevention standards!

During work operation, the user is responsible for the safety of third parties!

During operation on public highways, the relevant traffic regulations must be observed!

Before moving off, ensure that the immediate area of the machine is clear e.g. no children nearby.

Ensure that your visibility is not impaired.

Keep clear of the danger zone of the machine!

Always ensure there is sufficient front-axle load; the steering capability of the vehicle must be maintained.

Observe the max. permissible axle load of the tractor.

The driving and operational characteristics of the tractor may be influenced by the attachment of the Terra Rake. Always adapt your driving style to match the terrain and ground conditions.

Special care should be taken when working and turning on a slope.

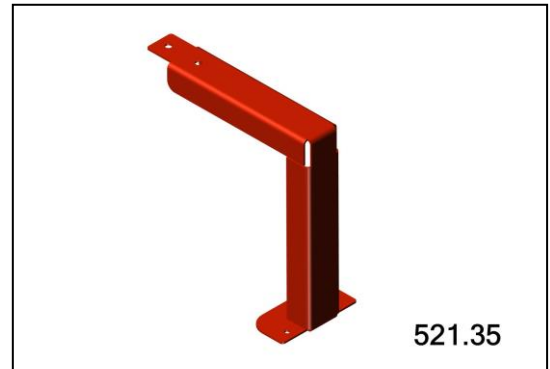
## 2.0. Assembly

### 2.1. General Information

Only attach the machine on firm, even ground.

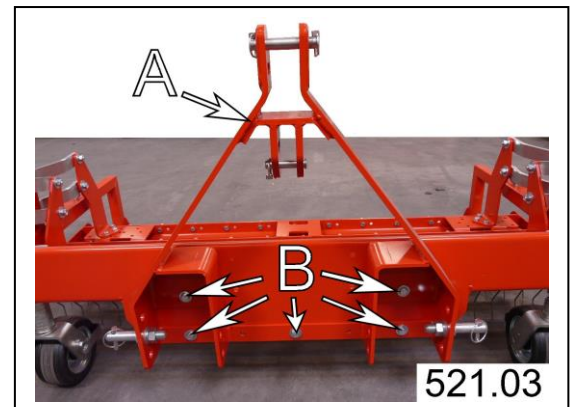
The Terra Rake is secured to the pallet by two transport feet when delivered. Once removed, the transport feet are no longer required and can be disposed of.

For this work, please use your personal protective equipment (PSA) such as: gloves, goggles, ear protectors.



### 2.2. Fitting the three-point frame

Securely bolt the three-point frame (A) onto the appropriate hole pattern using five hexagon bolts (B).



### 2.3. Electric connection to battery

Only appropriately qualified professionals may carry out the connection work.

Electrical connection is necessary for supplying the electrospindle with electric power.

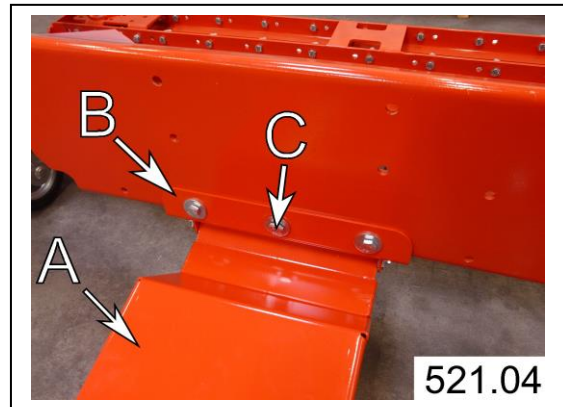
See the accompanying instructions for the installation description.



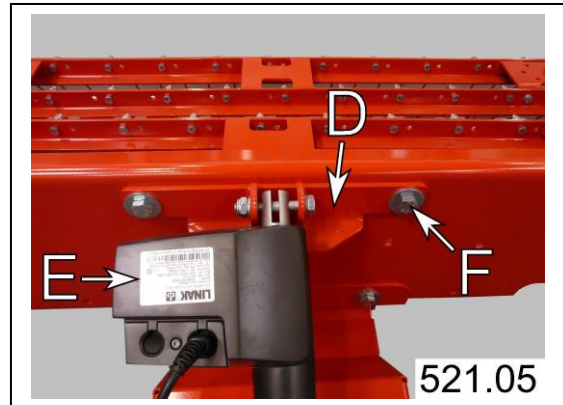
## 2.0. Assembly

### 2.4. Installing the drawbar

Securely bolt the drawbar (A) to the bracket (B) on the basic unit using the three bolts (C).



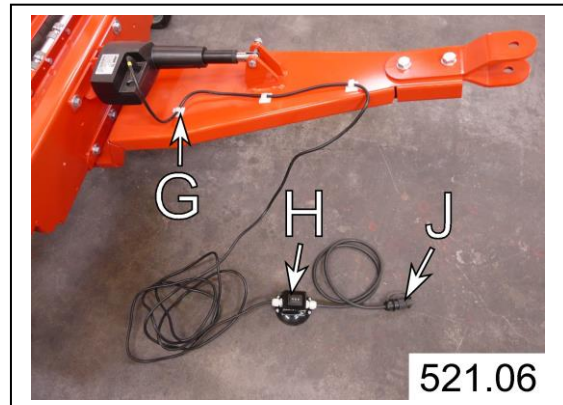
Secure the bracket (D) of the electrospindle (E) to the basic unit frame using the bolt (F).



**NOTE:**

Electro spindle (A) must NOT be energised.

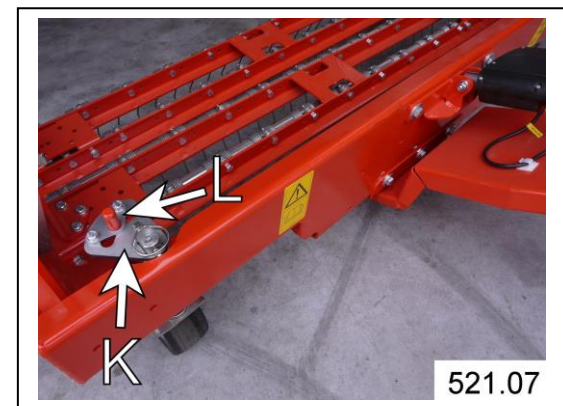
Secure the cable to the drawbar using the fastening clamps (G).



Install the electric cable with rocker switch (H) and plug (J) to the tractor.

Connect the plug (J) to the appropriate socket.

For the trailer version, the sensing wheels must be secured in place. To do this, the bracket (L) is bolted to the pivot bracket (K) as shown in Fig. 521.07.



## 2.0. Assembly

### 2.5. Mounting the strain relief kit



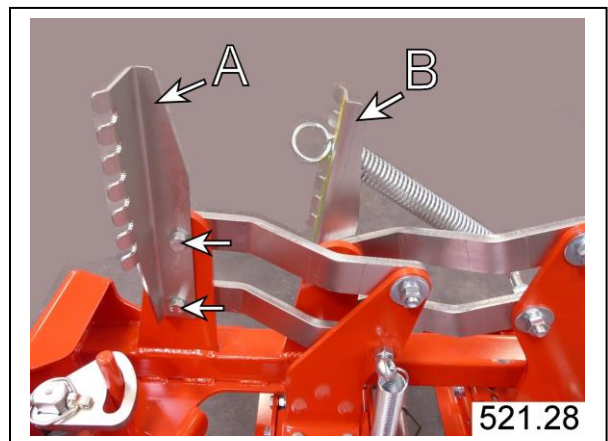
#### ATTENTION DANGER!

The machine shall be set down on an even, secure surface for the mounting of the strain relief kit.

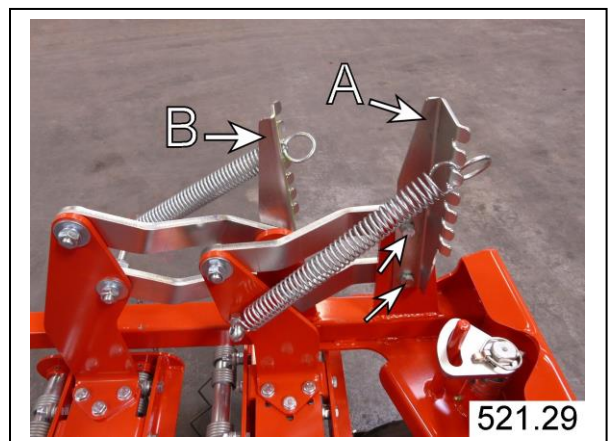
Remove the screw, spring circlip and washer. The removed washer will be replaced.



Secure spring holder I (A) on right with washer, spring circlip and screw as shown in figure 521.28.



Secure spring holder II (B) on right with washer, spring circlip and screw as shown in figure 521.29.



## 2.0. Assembly

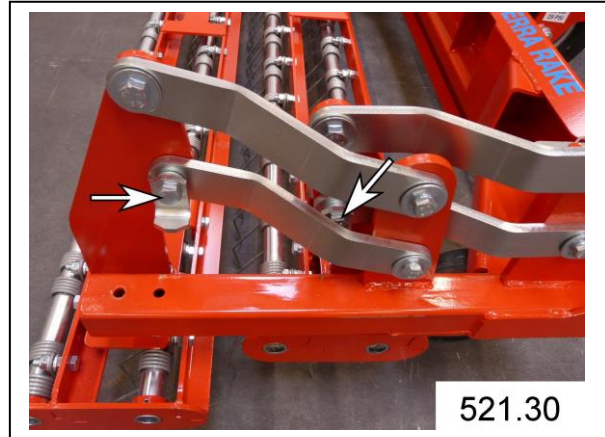
### 2.5. Mounting the strain relief kit



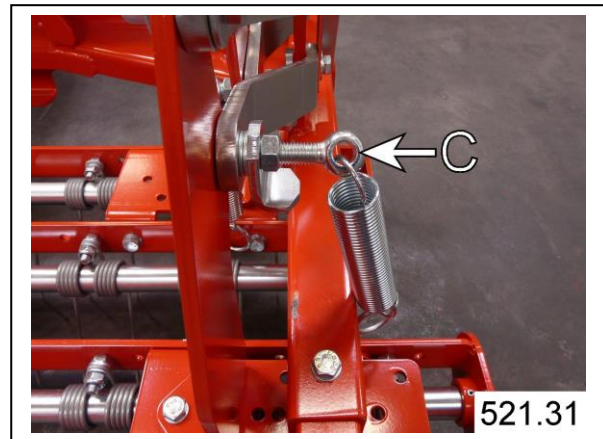
#### ATTENTION DANGER!

The machine shall be set down on an even, secure surface for the mounting of the strain relief kit.

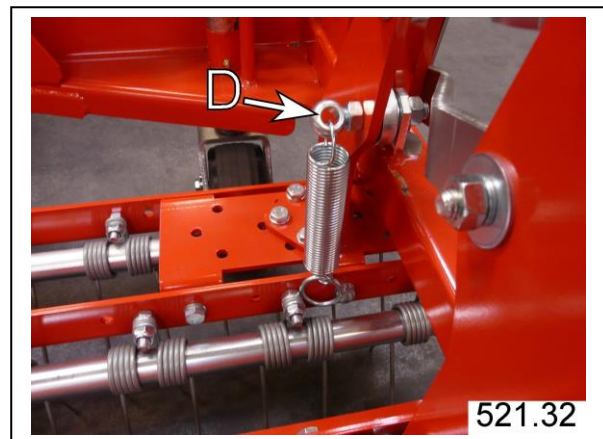
Remove the screw, spring circlip and nut. The removed washer will be replaced.



Secure the tension spring with long eye bolt (C) from the outside, instead of the removed screw on the right, with washer, spring circlip and screw (see figure 521.31).



Secure the tension spring with short eye bolt (D) from the inside, instead of the removed screw on the right, with washer, spring circlip and screw (see figure 521.32).



The adjustment process is described in section 6.3.



## 3.0. Transport

### 3.1. General Information

The Terra Rake is delivered secured to a transport frame.



Use only forklift trucks and lifting equipment with a sufficient load bearing capacity.



Never stand under lifted loads. There is an imminent danger to life if the load falls.



Improper transport and assembly of the Terra Rake can:

- injury to persons
- damage to property.

### 3.2. Transportation of the Terra Rake



Caution must be exercised when cutting through the securing straps. Risk of injury due to ends "springing open".

#### Transport Using a Forklift

If the Terra Rake is still secured on the transport frame:

Insert the forks under the transport frame (pay attention to the direction of approach), carefully lift the transport frame,

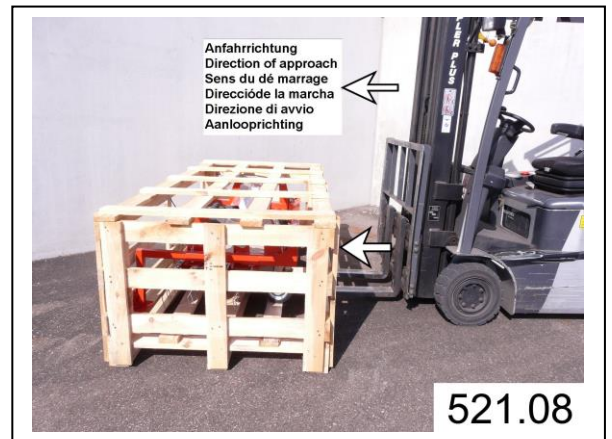
unload the Terra Rake from the transport device,

cut through the securing straps,

#### NOTE :

After unpacking, check that all parts for the Terra Rake are present.

The shipping company and Wiedenmann GmbH or the delivery company must be notified immediately in writing of any transportation damage and missing parts.



## 3.0. Transport

### 3.3. Transportation with the Terra Rake

#### 3.3.1. Version with three-point linkage

Raise the attached equipment with the tractor rear hydraulic system and secure against inadvertent lowering.

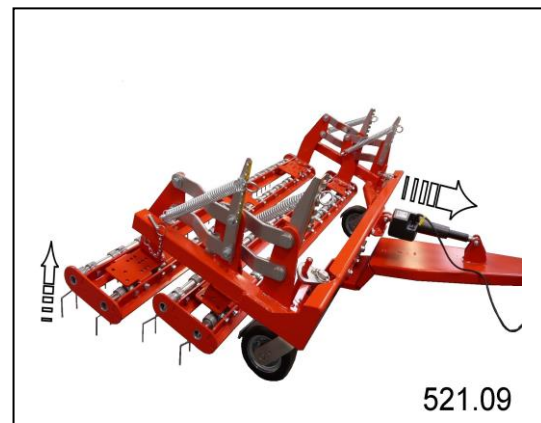
#### 3.3.2. Version with drawbar

Fully retract the electrospindle piston rod by activating the rocker switch.

This ensures that the attached machine is angled forwards and the harrows are lifted off the ground.

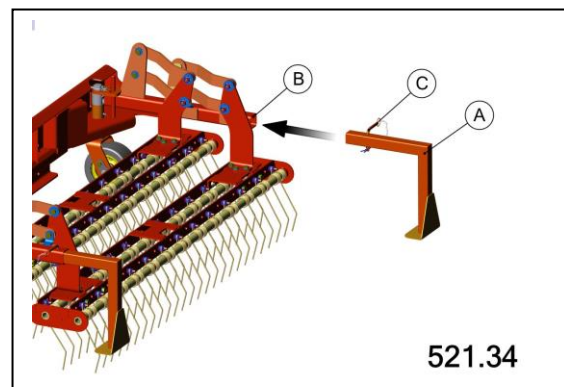
#### **CAUTION !**

The equipment version with a drawbar is **NOT** approved for travel on public roads!



#### 3.3.3. Parking and loading safety

When parking the machine or transporting it on a trailer, slide the parking stands (A) on both sides into the frame (B) and secure with the pin (C).



## 4.0. Connecting to the Tractor

### 4.1. General Information



#### CAUTION DANGER!

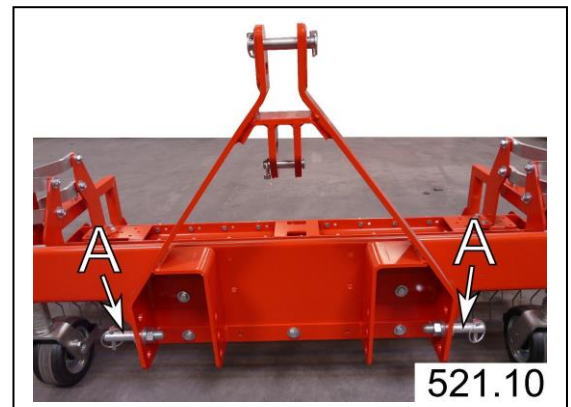
Secure the tractor against rolling away.

Switch off the tractor and secure it against inadvertent switching on.

### 4.2. Mounting with cat.1

**Mount the lower guide bolt on the outside in the lowest possible location bore. You thus achieve a maximum lift travel.**

1. Mount lower guide to bolt (A) and secure with linch pin.
2. **In the case of rear hydraulics of tractors with float position:** insert upper guide with bolt (B) into bore hole (C) on three-point frame and secure with linch pin.

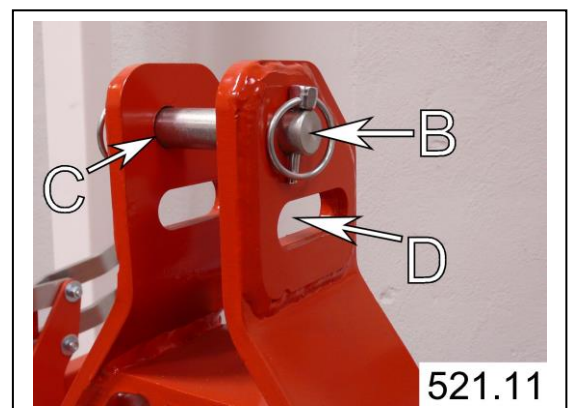


**In the case of rear hydraulics of tractors without float position:**

insert upper guide with bolt (B) into slotted hole (D) on three-point frame and secure with linch pin.

Adjust the upper guide so that the bolt is located in the middle of the slotted hole in the working position.

3. Tighten turnbuckles (5) of the stabilisation chain.

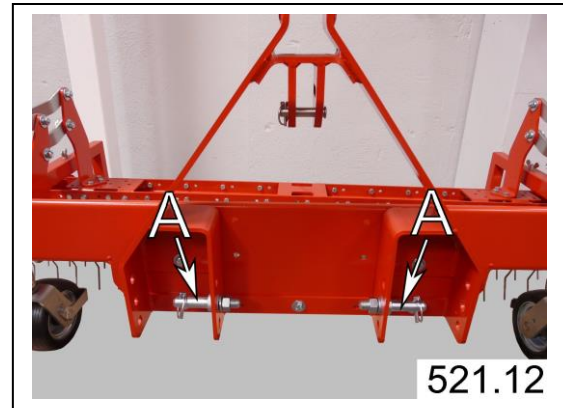


## 4.0. Connecting to the Tractor

### 4.3. Mounting with cat.0

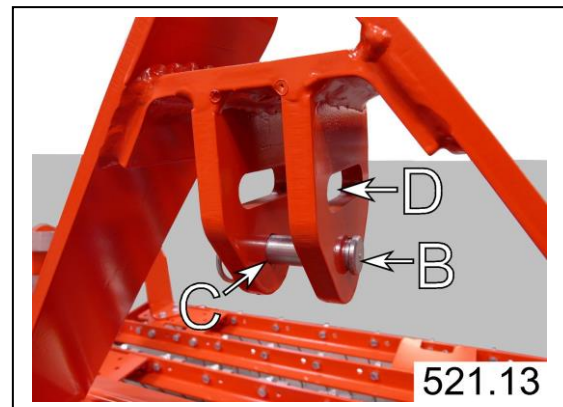
Mount the lower guide bolt on the inside in the lowest possible location bore. You thus achieve a maximum lift travel.

1. Mount lower guide to bolt (A) and secure with linch pin.
2. **In the case of rear hydraulics of tractors with float position:** insert upper guide with bolt (B) into bore hole (C) on three-point frame and secure with linch pin.



**In the case of rear hydraulics of tractors without float position:** insert upper guide with bolt (B) into slotted hole (D) on three-point frame and secure with linch pin. Adjust the upper guide so that the bolt is located in the middle of the slotted hole in the working position.

3. Tighten turnbuckles of the stabilisation chain.



### 4.4. Mounting with drawbar

Insert the drawbar on the tractor and secure it.

Lay the electric cable with rocker switch and plug to the tractor.

Connect the plug to the matching three-pin socket.



## 5.0. Disconnecting from the Tractor

### 5.1. General Information



#### **CAUTION DANGER!**

**Switch off the tractor and secure it against inadvertent switching on.**

Secure the tractor against rolling away.

**When removing the machine, always set it down on a firm and even surface.**

### 5.2. Removing the Terra Rake

The removal sequence is the reverse of the attachment sequence.

#### 5.2.1. Version with three-point linkage

- Lower verticutting harrow onto the ground.
- Detension upper guide and detach on three-point frame.
- Withdraw lower guide from bolt.
- Remove bolt for upper guide and all lynch pins on three-point frame.

#### 5.2.2. Version with drawbar

- Lower the verticut harrow onto the ground.
- Disconnect the electrospindle connection cable from the three-pin socket.
- Remove the locating pins from the drawbar.

## 6.0. Before Initial Operation

### 6.1. General Information



#### **ACHTUNG GEFAHR!**

During work operation, the verticut harrow user is responsible for the safety of third parties.

When moving off, ensure that the immediate area of the machine is clear e.g. no children nearby!

Take particular care when working on a slope

#### **- DANGER OF TILTING !**

The warning and information signs attached to the machine contain important information to ensure safe operation. Observe these instructions for your own safety!

Beware of foreign bodies when working.

Never reverse the verticut harrow while in the working position.

#### **IMPORTANT!**

**The spring relief kit must be fitted when the machine is used on artificial turf surfaces.**

Was usage of the "TERRA RAKE" maintenance machine approved by the groundsman or synthetic turf manufacturer?

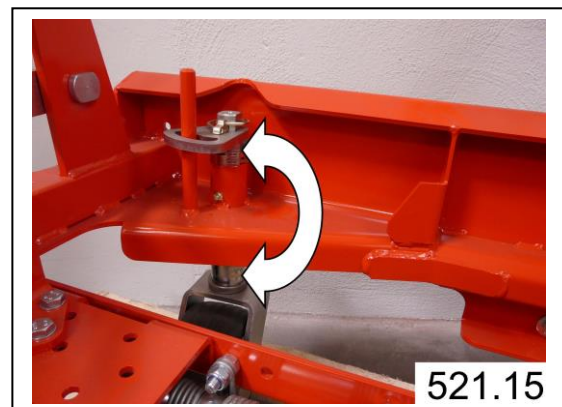
### 6.2. Depth adjustment

The harrows are adjusted by moving the spacer rings on the two support wheels by exactly the same amount.

No additional adjustment needs to be carried out on the trailer version.

#### 6.2.1. Version with three-point linkage

- Raise the verticut harrow using the tractor rear hydraulic system
- Moving the spacer rings from the top to the bottom reduces harrow aggressiveness.
- The spring relief kit supports reducing aggressiveness, which is important for artificial turf surfaces.



## 6.0. Before Initial Operation

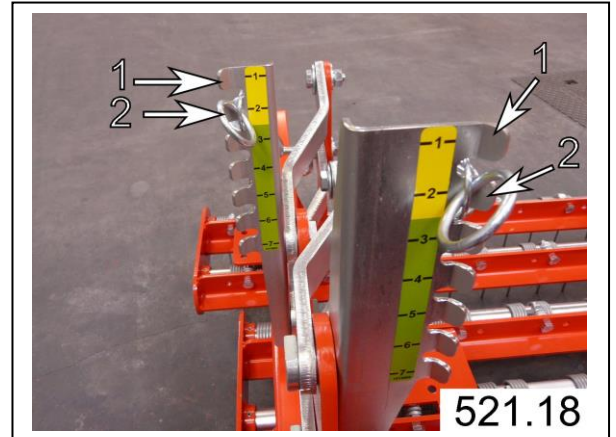
### 6.3. Setting the strain relief kit

The strain relief kit reduces the tine penetration depth in synthetic turf (mandatory) or sensitive lawns (option).

#### Setting for synthetic turf

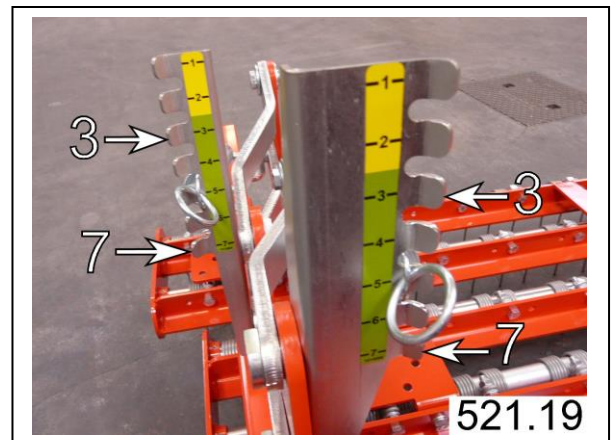
The strain relief kit must be mounted (i.e. mandatory) before the machine is used on synthetic turf.

All tension springs are fitted at position 1 or 2.

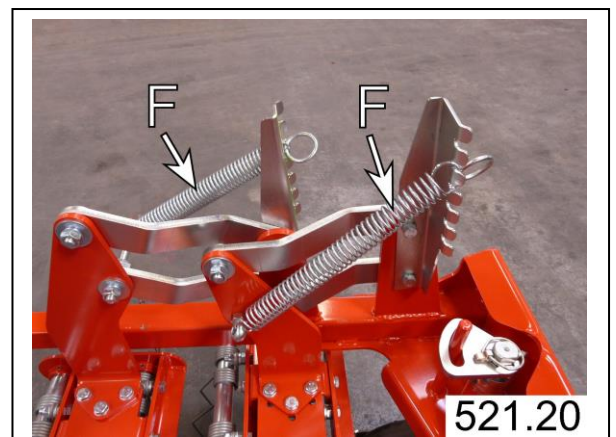


#### Setting for lawns

All tension springs are fitted at positions 3 to 7 in the case of mounted strain relief kit.



Fit tension springs (F) at the desired position on the spring holders.



## 7.0. Operation

### 7.1. General Information



#### **ATTENTION DANGER !**

During work operation, the verticut harrow user is responsible for the safety of third parties.

When moving off, ensure that the immediate area of the machine is clear e.g. no children nearby!

Take particular care when working on a slope

#### **- DANGER OF TILTING !**

The warning and information signs attached to the machine contain important information to ensure safe operation. Observe these instructions for your own safety!

Beware of foreign bodies when working.

Never reverse the verticut harrow while in the working position.

#### **Use on artificial turf surfaces:**

Drive at a moderate speed.

Avoid abrupt braking and acceleration or the synthetic grass surface may shift or the synthetic grass blades could be sheared off.

The same applies for steering movements.

Avoid tight curves since the synthetic turf could shift.

### 7.2. Driving characteristics



#### **CAUTION !**

- Attaching the Terra Rake may influence the driving and operational characteristics of the tractor.
- Always adapt your driving style to match the

terrain and ground conditions.

- Special care should be taken when working and turning on a slope.  
**- DANGER OF TOPPLING !**



## 7.0. Operation

### 7.3. Adjusting the working depth

#### **Starting operation**

Drive the tractor onto the surface to be worked on

Lower the machine

Start driving operation

Operating speed

10 to 15 km/h

[6.2-9.3 mile/hour]

Pay attention to the effectiveness of the adjustment when performing work.

To adjust the effectiveness of the spring tines, change the depth adjustment (see section 6.3.).

#### **Ending operation**

Stop driving

Lift out machine

Check the machine for completeness.

Switch off the tractor engine

Clean the verticutting harrow

## 8.0. Maintenance

### 8.1. General Information



#### CAUTION !

Perform maintenance tasks only with the machine installed. Shut down the tractor and secure it against accidental starting.

After completion of the maintenance work, remove everything that does not belong to the verticutting tines. Reinstall all paneling.

When working on the tools, safety precautions should be taken to prevent injury (e.g. gloves).

Switch off the tractor engine before performing any maintenance work.

When performing maintenance and repair work, the installed machine must always be lowered to the ground.

Machine maintenance involves not only lubrication but also cleaning. After completion of work, the machine should be washed and thoroughly checked over.

Use **only original parts**.

Third-party parts often do not match the required quality and thus endanger your safety. Moreover, the sustained warranty and recognition of justified warranty claims can only be guaranteed, if you exclusively use **original**

**parts from Wiedenmann.**

We expressly point out to you that non-original parts that have not been delivered by Wiedenmann also have not been approved and released by Wiedenmann. The installation and/or use of such products may actually have a negative impact on the constructional properties of your vehicle and thus may affect the active and/or passive safety. Damages arising from the use of non-original parts are excluded from the scope of the manufacturer's liability.

## 8.0. Maintenance

### 8.2. Lubrication – General Information

The tractor engine must be switched off during all maintenance work.

Where required, lubricate more often than specified.

Keep all exposed machine parts, threaded spindles and guides slightly lubricated.

Clean lubrication nipple before use.

Clean up leaking grease.

Before starting the machine after a longer standstill, lubricate and maintain the entire machine.

### 8.3. Lubricating point

Support wheel bearing



## 8.0. Maintenance

### 8.4. Cleaning the verticutting harrow

Clean the verticutting tines on a regular basis. This lengthens the service life of the components and, in the process, you discover loose components, wear and areas of unwanted corrosion.

**NOTE:**

**Do not bring plastic and sealing elements in contact with aggressive fluids (e.g. carbon tetrachloride, tri, benzene, caustic solutions, acids etc.).**

**Bind drops of oil with a binding agent and dispose of it according to the regulations. Eliminate the cause. Only use wire brush and caustic solutions in case of emergency.**

#### Auxiliaries and application

When performing cleaning work, the installed machine must always be lowered to the ground.

#### Cleaning with water

All dirty parts, but use caution:

⇒ water causes rust

#### Cleaning with dry cloth

All inspection glasses, signs and labels

#### Cleaning with compressed air

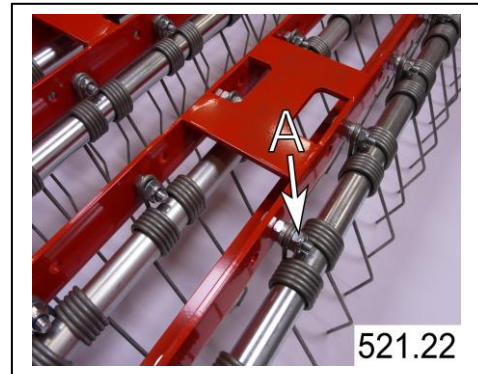
**Exercise caution when using compressed air. Put on safety glasses! Without safety glasses you risk eye injuries! Furthermore you blow dirt into the guides and bearings. For this reason, avoid this cleaning method.**



## 8.0. Maintenance

### 8.5. Replacing the spring tines

Loosen all hexagon nuts (A) of the faulty spring elements

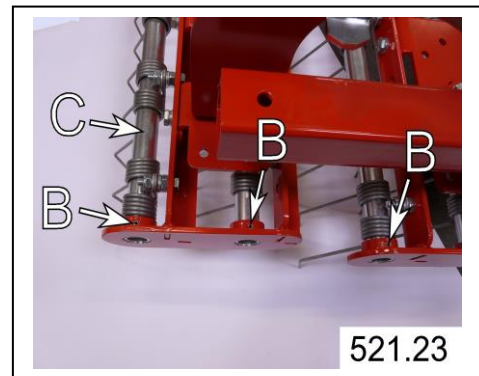


Remove the clamping sleeves (B) on the left and right of the axle.

Pull the axle (C) outwards.

Replace spring elements

Insert axle (C)



Tap the clamping sleeves (B) on the left and right into place.

Tighten all hexagon nuts (A) of the replaced spring elements

## 8.0. Maintenance

### 8.6. Disassembly / disposal



#### **ATTENTION DANGER !**

Exercise care when disassembling.

Please refer to the chapter "Safety measures" and local safety regulations.

#### **The dangers are as follows:**

- Heavy parts might fall down after being disconnected,
- sharp edges,
- The machine might tilt and crush someone.

#### **Disassembly for disposal :**

Place verticutting tines on firm ground.

Disassemble verticutting tines, working from top to bottom.

#### **IMPORTANT :**

Specifications and laws concerning the disposal of hazardous substances and pollutants must be observed in all cases. Familiarize yourself completely with the procedure for disposal.

## 8.0. Maintenance

### 8.7. Unauthorized conversion and spare part manufacture

Conversion or modifications to the verticutting tines are permissible only after consultation with the manufacturer !

The use of original parts and accessories authorized by the manufacturer is in the interest of safety. The use of other parts can change the properties of the verticutting tines. In this case, the manufacturer is exonerated from liability in the event of damage.

## 9.0. Equipment

### 9.1. Scope of Delivery

Basis unit

with three-point linkage

or

drawbar

Operating instructions,  
transfer declaration with  
guarantee card.

### 9.2. Machine designs

	Version 1	Version 2
Verticutting harrow 1700	<b>S</b>	<b>S</b>
Attachment frame complete Cat.1 and O	<b>W</b>	
Drawbar		<b>W</b>
The strain relief kit must be mounted (i.e. mandatory) where the machine will be used on synthetic turf	<b>O</b>	<b>O</b>

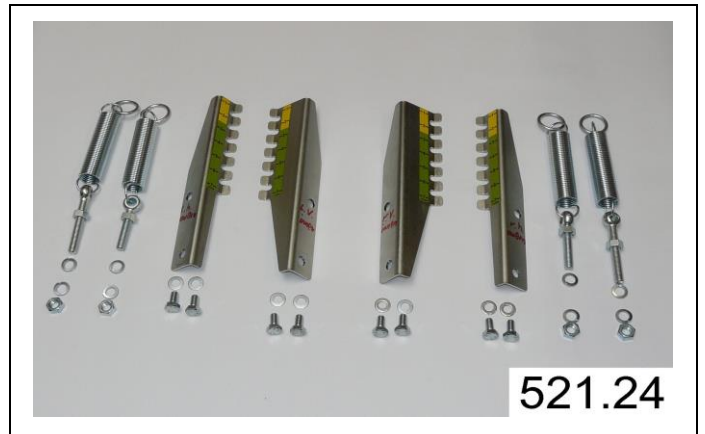
<b>S = standard</b>	<b>W = selective</b>	<b>O = optional</b>
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## 9.0. Equipment

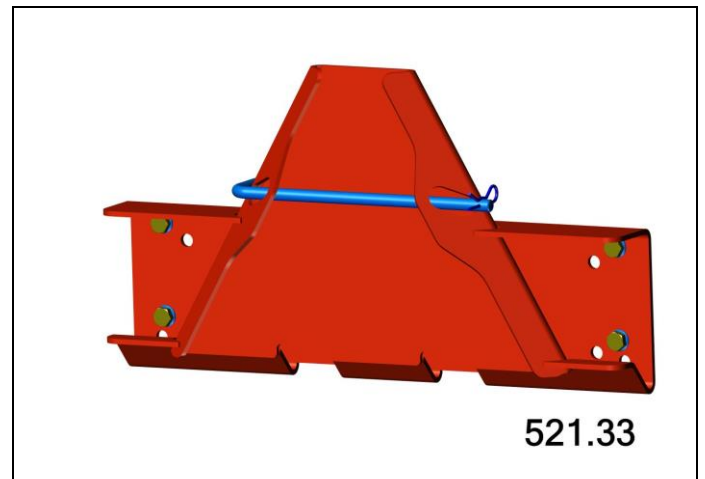
### 9.3. Special equipment

Strain relief kit



### 9.4. Attachment components

Attachment  
Torro 7210



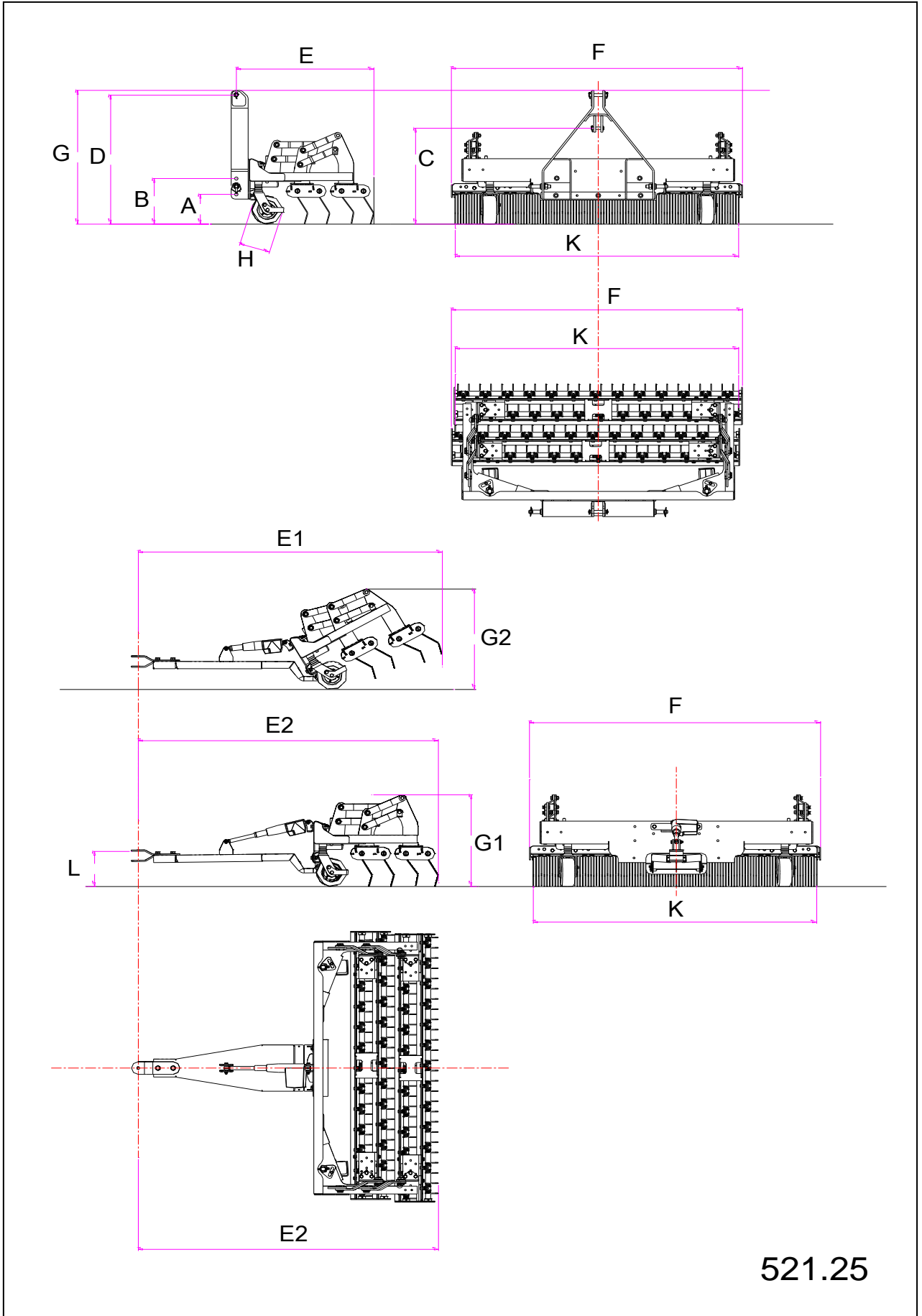
## 10.0. Technical Specifications

### 10.1. Technical Data

<b>A</b>	Height up to lower pull rod connection (down)	mm	235
<b>B</b>	Height up to lower pull rod connection (up)	mm	335
<b>C</b>	Height up to middle of upper guide bar connection cat.0	mm	650
<b>D</b>	Height up to middle of upper guide bar connection cat.1	mm	860
<b>E</b>	Machine length	mm	990
<b>E1</b>	Machine length in the transport position	mm	1770
<b>E2</b>	Machine length in the working position	mm	1770
<b>F</b>	Machine width	mm	1718
<b>G</b>	Machine height in parking position	mm	890
<b>G1</b>	Machine height in the working position	mm	580
<b>G2</b>	Machine height in the transport position	mm	610
<b>H</b>	Diameter of sensing wheels	mm	180
<b>K</b>	Working width	mm	1674
<b>L</b>	Max. height to upper edge of attachment bracket	mm	350
	Min. power required for tractor	KW (PS)	18 (25)
	Weight of the three-point version	kg	162
	Weight with strain relief kit	kg	165
	Weight of the trailer version	kg	168
	Weight with strain relief kit	kg	171

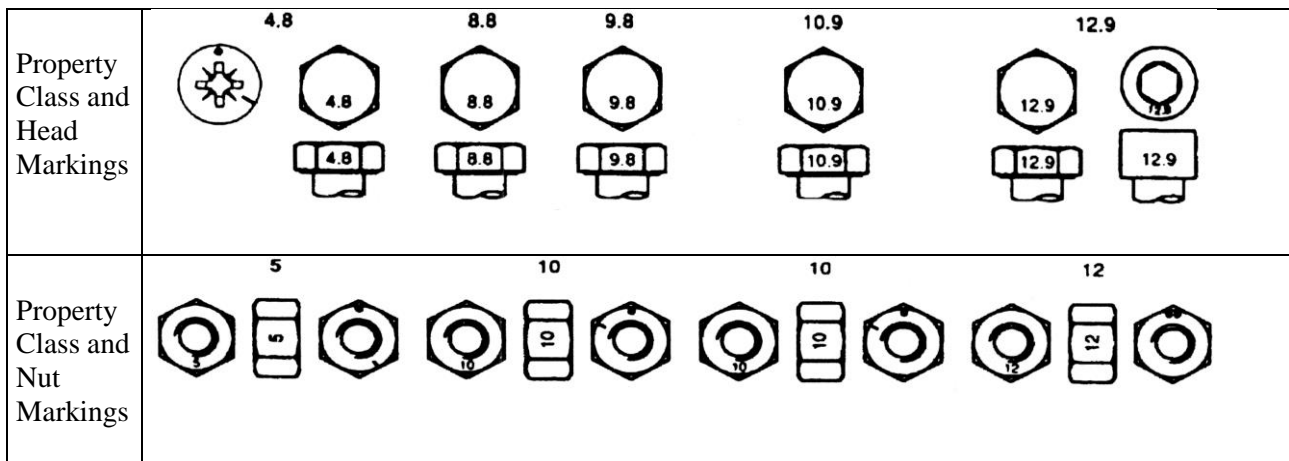
# 10.0. Technical Specifications

## 10.1. Technical Data



# 10.0. Technical Specifications

## 10.2. Metric bolt and cap screw torque values



Size	class 4.8				class 8.8 or 9.8				class 10.9				class 12.9			
	Lubricated *		Dry **		Lubricated *		Dry **		Lubricated *		Dry **		Lubricated *		Dry **	
	N-m	lb-ft	N-m	lb-ft	N-m	lb-ft	N-m	lb-ft	N-m	lb-ft	N-m	lb-ft	N-m	lb-ft	N-m	lb-ft
M6	4,8	3,5	6	4,5	9	6,5	11	8,5	13	9,5	17	12	15	11,5	19	14,5
M8	12	8,5	15	11	22	16	28	20	32	24	40	30	37	28	47	35
M10	23	17	29	21	43	32	55	40	63	47	80	60	75	55	95	70

M12	40	29	50	37	75	55	95	70	110	80	140	105	130	95	165	120
M14	63	47	80	60	120	88	150	110	175	130	225	165	205	150	260	190
M16	100	73	125	92	190	140	240	175	275	200	350	255	320	240	400	300

M18	135	100	175	125	260	195	330	250	375	275	475	350	440	325	560	410
M20	190	140	240	180	375	275	475	350	530	400	675	500	625	460	800	580
M22	260	190	330	250	510	375	650	475	725	540	925	675	850	625	1075	800

M24	330	250	425	310	650	475	825	600	925	675	1150	850	1075	800	1350	1000
M27	490	360	625	450	950	700	1200	875	1350	1000	1700	1250	1600	1150	2000	1500
M30	675	490	850	625	1300	950	1650	1200	1850	1350	2300	1700	2150	1600	2700	2000

M33	900	675	1150	850	1750	1300	2200	1650	2500	1850	3150	2350	2900	2150	3700	2750
M36	1150	850	1450	1075	2250	1650	2850	2100	3200	2350	4050	3000	3750	2750	4750	3500

DO NOT use these values if a different torque value or tightening procedure is given for a specific application. Torque values listed are for general use only. Check tightness of fasteners periodically.

Shear bolts are designet to fail under predetermined loads. Always replace shear bolt with identical property class

Fasteners should be replaced with the same or higher property class. If higher property class fasteners used, these should only be tightened to the strength of the original.

\*\* "Lubricated" means coated with a lubricant such as engine oil, or fasteners with phossphate and oil coatings.

Make sure fasteners threads are clean and that you properly start thread engagement. This will prevent them from failing when tightening.

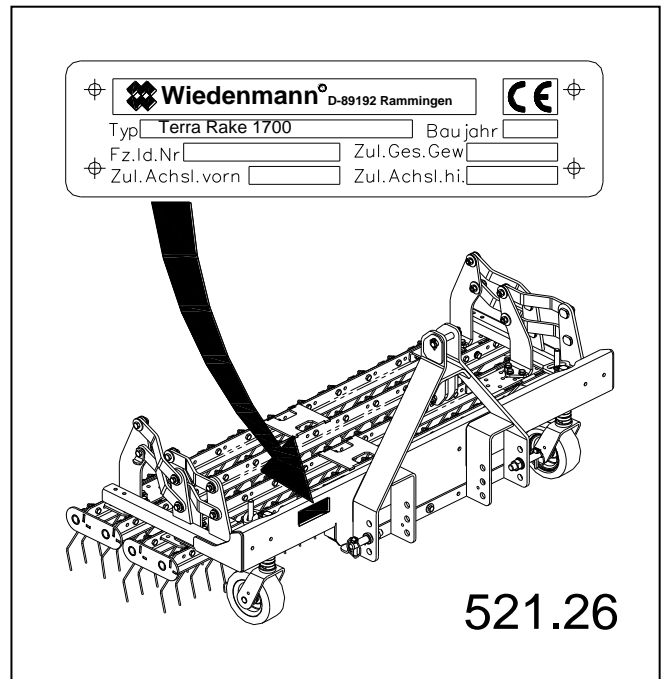
Tighten plastic insert or crimped steel-type lock nuts to approximately 50 percent of the dry torque shown in the chart, applied to the nut, not to the bolt head. Tighten toothed or serrated-type lock nuts to the full torque value.

\*\* "Dry" means plain or zinc platend without any lubrication.

# 10.0. Technical Specifications

## 10.3. Chassis Number

Enter the respective product identification no. in the space provided below. Always quote this number when ordering spare parts or in case of warranty claims.



Fz. Id. Nr. \_\_\_\_\_