Warranty

As stated on the warranty certificate you receive when you purchase the machine, a one year warranty is offered which covers all malfunctioning parts where the fault is demonstrated as being due to a structural or material defect. Claims under the warranty should be made within three days of the fault's occurrence enclosing the receipt and guarantee certificate. The warranty provides for the gratuitous replacement of defective parts. Damage caused by improper treatment, non-observance of the operating instructions, insufficient care or external influences is not covered by the warranty. Careful observance of the instructions contained in the operating instructions is, therefore, a precondition for perfect machine operation.

Improper operation leads to malfunctions which are not covered in the warranty.

Wiedenmann GmbH * Am Bahnhof * D 89192 Rammingen * Fax: 0049 / 7345 / 953233

EC-Declaration of Conformity

We Wiedenmann GmbH Am Bahnhof 89192 Rammingen declare under our sole responsibility, that the product Deer Aerator Terra Spike XP6 / XP8 / XP10 to which this declaration relates corresponds to the relevant basic safety and health requirements of the Directive 89/392 (ECC).

Rammingen, the 18. June 2001

(Place and date of issue) (Name, function and signature of authorised person)
Introduction

READ THIS MANUAL carefully to learn how to operate and service your machine correctly. Failure to do so could result in personal injury or equipment damage. This manual and safety signs on your machine may also be available in other languages (see your dealer to order).

THIS MANUAL SHOULD BE CONSIDERED a permanent part of your machine and should remain with the machine when you sell it.

MEASUREMENTS in this manual are given in both metric and customary U.S. unit equivalents. Use only correct replacement parts and fasteners. Metric and inch fasteners may require a specific metric or inch wrench.

RIGHT - HAND AND LEFT - HAND sides are determined by facing the direction the implement will travel when going forward.

WRITE PRODUCT IDENTIFICATION NUMBERS (P.I.N.) in the Specification or Identification Numbers section. Accurately record all the numbers to help in tracing the machine should it be stolen. Your dealer also needs these numbers when you order parts. File the identification numbers in a secure place away from the machine.

BEFORE DELIVERING THIS MACHINE, your dealer performed a pre-delivery inspection to ensure best performance.

THIS MACHINE IS DESIGNED SOLELY for use in customary agricultural and forestry operations, for lawn and park care, i.e. collecting grass, leaves and paper ("INTENDED USE").

Use in any other way is considered as contrary to the intended use. The manufacturer accepts no liability for damage or injury resulting from this misuse, and these risks must be borne solely by the user. Compliance with and strict adherence to the conditions of operation, service and repair as specified by the manufacturer also constitute essential elements for the intended use.

THIS MACHINE SHOULD BE OPERATED, serviced and repaired only by persons familiar with all its particular characteristics and acquainted with the relevant safety rules (accident prevention).

The accident prevention regulation, all other generally recognized regulations on safety and occupational medicine and the road traffic regulations must be observed at all times.

Any arbitrary modifications carried out on this material collection system will relieve the manufacturer of all liability for any resulting damage or injury.

THE TRACTORS must be conform with the EN836
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.

Observe road traffic regulations

Always observe local road traffic regulations when using public roads.
1.0. Safety

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 earplugs to protect against objectionable or uncomfortably 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.

Wear close fitting clothing. Stop the engine and be sure PTO driveline is stopped before making adjustments, connections, or cleaning out PTO driven equipment.

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, turn off engine and remove key before removing any guards or shields.

Keep hands, feet and clothing away from moving parts.
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 heating:
- If you sand paint, avoid breathing the dust. Wear an approved respirator.
- If you use solvent or paint stripper, clean 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.

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

1.1. Safety Decals

Pictorial safety signs

At several important places on this machine safety signs are affixed in order to signify potential danger. The hazard is identified by a exclamation point in a warning triangle. An adjacent pictorial provides information on 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.

Protectors

Never reach into areas of crushing hazard as long as any parts may move.
1.0. Safety

1.1. Safety Decals

Parking position
Before parking fix rear roller with ring pins and secure it.

Tools
Never touch moving parts of the machine. Wait until they have come to a complete standstill.

Tools
Be careful to avoid cutting of foot.

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

1.2. Safety Equipment

GENERAL SAFETY SIGN REQUIREMENTS

A safety sign with the following safety practices or similar set of messages shall be provided on the machine. The label should be visible to an operator’s position, if possible.

a) Read the operator’s manual.

b) Do not operate the machine without guards, shield, and safety devices in place and working.

c) Do not operate the machine when children and others are around.

d) Do not allow operation of the machine by untrained personnel.

ATTENTION - DANGER!

Never use TERRA SPIKE without safety equipment. Otherwise, you expose yourself and others to extreme danger. Moving parts may cause serious injuries.

Where to Find Safety Equipment on your Machine

A = Screwed fenders right / left as spacers.

B = Back roller with arms locked with ring pin and secured.

C = Hinged hood, secured by a lock and holders.

D = Cover removable by ring tools only.
2.0. Construction and Method of Operation

2.1. Construction

TERRA SPIKE consists of the following parts:

- Welded machine body
- Drive
- Adjustable tools

Three gear speeds can be selected on TERRA SPIKE.

2.2. Method of Operation

TERRA SPIKE is hauled by the tractor and driven by means of a PTO shaft.

A gear unit inside TERRA SPIKE provides for movement of the tines.

The moving tines are forced into the soil.

The angle of entry is adjustable.

With an entry angle of 90° at low speed the punched holes are almost vertical.

With a smaller entry angle, the soil displacement or fracturing is greater due to the forward movement.

This breaks up the soil. (Effective down to 70°)

2.3. Product observation

We are bound law to observe our products starting with the delivery.

This serves your safety.

Please immediately inform us about:

- Defects of the safety devices.
- Repeated malfunctions.
- Altered setting.
- Problems in handling the TERRA SPIKE.
3.0. Transport

3.1. General

⚠️ CAUTION DANGER!

- TERRA SPIKE is delivered fastened to a shipment frame.
- Only use a forklift with sufficient load-carrying capacity.
- Keep well clear of lifted loads. There is danger to your life if the load crashes down.

Improper transport and mounting of TERRA SPIKE may cause:

- Injury to persons
- Damage to property.

Pay special attention to the driving direction when lifting TERRA SPIKE with the shipment frame.

We will not accept any liability for damage resulting from improper handling.
3.0. Transport

3.2. Transporting TERRA SPIKE

⚠️ CAUTION DANGER!
Watch out when cutting through the taut bands.
There is a risk of being injured by the suddenly opening bands.

Transport Using a Forklift
If TERRA SPIKE is still fastened to the shipment frame:

• Insert the fork under the shipment frame
• Unload TERRA SPIKE from the carrier vehicle when balanced.
• Cut through the taut bands.
• Connect TERRA SPIKE to the tractor and lift it from the shipment frame.
  (See item 4.2.)

Transport Using a Crane
• Fasten ropes or belts at ring screw (A) only,
• Unload TERRA SPIKE when suspended reliably.

Note:
Immediately inform in writing the transport company and Wiedenmann GmbH or the supplier about shipping damage or missing parts.
4.0. Connecting to the Tractor

4.1. General

Always pay attention to:
- The load of the three point hitch.

Connect / disconnect TERRA SPIKE only with:
- The engine turned off
- Disengage PTO shaft
- With fixed and secured back roller (in parking/stand position)

Use TERRA SPIKE only with:
- the special PTO shaft assigned to TERRA SPIKE
- covered PTO shaft and protected power-take-off shaft.

Rest TERRA SPIKE on the front roller (A) and back roller (B) only.
4.2. Connecting to the tractor

Prerequisite for connecting:
• a three-point hitch.

NOTE:
° if possible use the lower location hole for mounting the lower guide rod.
  This provides the maximum lifting distance.
° observe the bending angle of the PTO shaft.

Mounting steps:

1. Mount the lower guide rod by:
   inserting the bolt (1) and locking it with the pin (2).

2. Mount the upper link.
   To do so:
   depending on the tractor,
   insert the bolt for category 1 with diameter (3a) and fix it with the cotter key (4).
   Or, for Category 2 with diameter (3b), use both the cotter key (4) with chain and fix the ring on the respective opposite side.

3. Tighten the tension jack (5) of the stabilizing chain.

4. Adapt the PTO shaft
   (see separate operating instructions).

5. Mount the PTO shaft by:
   pushing in the slide pin of the PTO shaft,
   slipping on the PTO shaft, secure the PTO shaft protector against rotating with the shaft.

⚠️ CAUTION DANGER!
Check for correct connection before starting operation.
5.0. Disconnecting from the Tractor

5.1. General

Only rest TERRA SPIKE:
- on a solid and even base,
- on fully lowered front and secured back roller.

This provides for a safe stand of TERRA SPIKE and prevents the tines from being damaged.

5.2. Resting TERRA SPIKE

Proceed as follows:

1. Switch off the tractor,
2. Turning down the roller to the lowest position, (see item 6.5. “Adjusting the roller”),
3. lowering TERRA SPIKE using the rear hydraulics of the tractor,
4. pull ring pin(A) out of position (C),
5. bring rear roller in position, fix with ring pin (A) and secure it with pin (B) as shown in picture 415.22,
6. loosen and remove the upper guide rods,
7. loosen and remove the lower guide rods,
8. dismount the PTO shaft,
9. disconnect the hydraulic.

NOTE:
The working depth is changed due to wear of the tools.
Therefore it is necessary to readjust the working depth:
1. after each tool replacement,
2. after long working periods with the same adjustment.
6.0. Before Using

6.1. General

⚠️ ATTENTION!

It is important to become familiar with all devices and operating elements as well as their action before starting service to make sure that all protective devices have been properly mounted. It will be too late for this during operation!

Make sure that no one is in the risk area of the appliance and the turning PTO shaft before turning on the power take-off shaft.

Observing the operating instructions, also pay attention to general safety specifications and rules for prevention of accidents!

Corresponding specifications must be observed on public roads!

The weight on the axle in front must be enough to maintain steerability (if needed, put on ballast weights, see operator’s manual of tractor).

Be careful working on slopes - risk of overturning! -
6.0. Before Using

6.2. Indicating and adjustment elements

Shift lever (A) for the 3 gear speeds of the machine (speed 3 is seen on the photo 415.14).

NOTE: The shift lever (A) must snap into place with an audible sound. If necessary move the gear by applying pressure to a tine holder while standing up.

Crank (B) for adjusting the working depth (by raising or lowering the roller).

Scale (C) for tool length; depth scale (D) to read the set operating depth; ruler (E) and pointer (F)

Crank (G) and spindle (H) for adjusting the entry angle.

On the machine types XP8 and XP10, crank (G) and spindle (H) are present on both sides; this means that the adjustment of the entry angle must be done on both sides. Take care to adjust the same entry angle on both sides!
6.0. Before Using

6.3. Mounting the Tools

NOTE

When mounting the tines:
1. Lift up TERRA SPIKE with tractor hydraulic.
2. Adjust front roller to lowest position.
3. Put down TERRA SPIKE on front roller.
4. Shift the tine holder you are working with upwards (by pressing an upper tine holder).
5. Lubricate the tine holder in the receiving area.
6. In installation position the pointed end of the tine (A) must be backward (in driving direction).
7. To protect the cone support of tine holders, screws and washer are installed. The cylindric supports which are not in use are protected by plastic caps.
8. Wrench (B) is for adjusting and removing the tines.
6.0. Before Using

6.3.1. Mounting the tines into the tine head:

1. Shift up the tine holder (A).
2. Screw (D) and remove washer (E).
3. Adjust nut (B) with provided wrench so that you can see one thread (C) of the tine.
4. Place tine (F) into the conical support and bolt it completely into nut (B).
5. The slanted edge of tine should be pointed toward front of the machine so that when looking at the machine from the rear, the slanted edge cannot be seen.
6. By removing the tines (F) adjust position edge.
7. Put wrench on nut (B).
8. Hold tine with one hand firmly.
9. Fix tine by tightening the nut (B).

NOTE
Check all tines for tight fit:
- Before using them
- If they just have been mounted, after three minutes of use.
6.0. Using

6.3.2. Mounting tines into the cylindrical receiver:

1. Remove plastic cap (D) at tine holder (A).
2. Loosen nut (C).
3. Place 1/2" tine (E) or 5/16" tine (F) with bushing (G) as shown in illustration.
4. Fix screw (B) in lowering of tines.
5. Fix counter nut (C) to fix screw (B).
6. Check the tines for tight fit.

NOTE
Check all tines for tight fit:
- Before using them
- If they just have been mounted, after three minutes of use.
6.0. Before Using

6.4. Adjusting the TERRA SPIKE

NOTE
Always make adjustments when the device has been attached and lifted out.

On delivery of the TERRA SPIKE the rake angle is set to zero position.

Each time the device is adjusted, the tool length "A" needs to be measured. The measure "B" represents the desired working depth.

Sequence when adjusting the TERRA SPIKE:

1) Adjust working depth:
   a) Release spring pin (A)
   b) Shift locking piston (B) into direction of arrow
   c) Unscrew nut and bolt (E). Adjust the pointer on ruler (C) to the measured tool length and tighten it with bolt and nut (E).
   d) Rotate the crank until the pointer (D) has reached the desired working depth on the scale (F).
   e) Push the locking piston (B) back and insert the spring pin (A) in order to lock it again.
6.0. Before Using

6.4. Adjusting the TERRA SPIKE

2) Release the stop-motion device of the trailing cylinder, for this end plug the pin (A) into the hole (C).

3) Lower the TERRA SPIKE onto a cylinder feeler.

4) Put the TERRA SPIKE into a vertical position, for this end:
   - Unscrew the locknut (D) of the upper link
   - Use the upper link (E) to adjust the device

   **ADJUSTMENT:**
   the front edge (V) must be placed vertically
   - draw up the lock nut (D) of the above pull rod.

5) The hoeing effect of the tools in the ground is achieved by the crank (G) and the spindle (H).

   We recommend using a position from 0 to 15.

   ← Position 0
   ↑ Position 5
   → Position 10
   ↓ Position 15

**NOTE:** On the models XP8 and XP10, the adjustment must be done on both sides. Take care to set the same adjustment!
6.0. Before Using

6.4. Adjusting the TERRA SPIKE

6) For working with hollow tines we recommend putting the trailing cylinder upright; for this end:
• Lift out the TERRA SPIKE
• Lift off the trailing cylinder by hand
• Release pin (A) and plug it into the bottommost hole of the adjusting strap (F).

6.5. Travel adjustments

By default, the link rods (A) are mounted in position P1 as shown in Fig. 415.27.

At a maximum travel of 350 mm (14 in.), a maximum working depth of 350 mm (14 in.) can be achieved.

The max. tine length is 350 mm (14 in.).

If it is desired to achieve a maximum working depth of 400 mm (16 in.), the link rods can be mounted in position P2 as shown in Fig. 415.28. There are no additional parts required.

The max. tine length is 400 mm (16 in.).

When work is done using the long travel setting, it is necessary to adjust the device one step lower than when using the short travel.

The lowest position of the tool carriers is always the same.
6.0. Before Using

6.6. Setting the number of holes

NOTE

The number of holes (per tine and minute) depends on:
• The speed of the tractor's power take-off shaft,
• The chosen gear speed, (lever (A) in gear speed 3 see photo).

For 3/4" or 1" tines use gear I and II only!
If the hole distance is too small:
• Increase the driving speed, or
• Decrease the speed of the power take-off shaft.
If the hole distance too wide:
• Low driving speed or
• raise PTO.

<table>
<thead>
<tr>
<th>Gear speed</th>
<th>300</th>
<th>350</th>
<th>400</th>
<th>450</th>
<th>500</th>
<th>540</th>
</tr>
</thead>
<tbody>
<tr>
<td>I</td>
<td>80</td>
<td>84</td>
<td>107</td>
<td>121</td>
<td>134</td>
<td>145</td>
</tr>
<tr>
<td>II</td>
<td>92</td>
<td>107</td>
<td>122</td>
<td>138</td>
<td>153</td>
<td>165</td>
</tr>
<tr>
<td>III</td>
<td>104</td>
<td>121</td>
<td>139</td>
<td>156</td>
<td>173</td>
<td>187</td>
</tr>
</tbody>
</table>
6.0. Before Using

6.6.1. Setting the hole distance

The hole distances depend on:
- the speed of the power take-off shaft and,
- the driving speed.

<table>
<thead>
<tr>
<th>Driving speed</th>
<th>0.3</th>
<th>0.6</th>
<th>0.9</th>
<th>1.2</th>
<th>1.6</th>
</tr>
</thead>
<tbody>
<tr>
<td>mile/hour</td>
<td></td>
<td></td>
<td></td>
<td></td>
<td></td>
</tr>
<tr>
<td>Speed of</td>
<td>Gear Speed</td>
<td>Gear Speed</td>
<td>Gear Seed</td>
<td>Gear Speed</td>
<td>Gear Speed</td>
</tr>
<tr>
<td>power take-off</td>
<td>I</td>
<td>II</td>
<td>III</td>
<td>I</td>
<td>II</td>
</tr>
<tr>
<td>shaft</td>
<td></td>
<td></td>
<td></td>
<td></td>
<td></td>
</tr>
<tr>
<td>300 rpm</td>
<td>101</td>
<td>90</td>
<td>80</td>
<td>208</td>
<td>181</td>
</tr>
<tr>
<td>350 rpm</td>
<td>88</td>
<td>78</td>
<td>69</td>
<td>177</td>
<td>156</td>
</tr>
<tr>
<td>400 rpm</td>
<td>78</td>
<td>68</td>
<td>60</td>
<td>156</td>
<td>136</td>
</tr>
<tr>
<td>450 rpm</td>
<td>69</td>
<td>60</td>
<td>53</td>
<td>138</td>
<td>121</td>
</tr>
<tr>
<td>500 rpm</td>
<td>62</td>
<td>54</td>
<td>48</td>
<td>124</td>
<td>109</td>
</tr>
<tr>
<td>540 rpm</td>
<td>57</td>
<td>50</td>
<td>44</td>
<td>115</td>
<td>101</td>
</tr>
</tbody>
</table>

Example for setting a square hole distance.

<table>
<thead>
<tr>
<th>Typ</th>
<th>Hole distance</th>
<th>Speed off power take-off shaft</th>
<th>Gear speed</th>
<th>Speed of forward drive</th>
</tr>
</thead>
<tbody>
<tr>
<td>XP</td>
<td>130</td>
<td>540 U/min</td>
<td>III</td>
<td>0.9 mile/hour</td>
</tr>
</tbody>
</table>
7.0. Operation

7.1. General

⚠️ ATTENTION!

The user of TERRA SPIKE is responsible for persons inside the working area.
Never operate the TERRA SPIKE without its safety devices. If you do operate the TERRA SPIKE without safety devices, you expose yourself and others to extreme danger.
Always check the immediate surroundings when starting to drive (be careful of CHILDREN!).
Do not drive backwards when the TERRA SPIKE is operating.
Avoid big changes in direction while using yielding tractors.

Operate with closed hood only.
Check to see if the hood is secured on both sides by fastener.

The power take-off shaft:
• never switch on when the motor is switched off
• always switch off when it is not required,
• always switch off before you lift up the TERRA SPIKE
7.0. Operation

7.2. Correct sequence for engaging

**NOTE:**
Only lower the lifted TERRA SPIKE:

- on the area you want to work and
- only switch on the drive of the power take-off shaft just before touching the ground.

Sequence:
1. Lower TERRA SPIKE close to (but not onto) the ground.
2. Switch on PTO.
3. Lower TERRA SPIKE completely.

7.3. Malfunctions and remedies

<table>
<thead>
<tr>
<th>Description</th>
<th>Cause</th>
<th>Remedy</th>
</tr>
</thead>
<tbody>
<tr>
<td>TERRA SPIKE makes knocking noises</td>
<td>Speed of power take-off shaft is too high.</td>
<td>Reduce speed of power take-off shaft or choose lower gear speed.</td>
</tr>
<tr>
<td>TERRA SPIKE &quot;jumps&quot;</td>
<td>The ground is too hard or too dry.</td>
<td>Reduce working depth. Work ground several times at several working cycles.</td>
</tr>
<tr>
<td></td>
<td>Stones in the ground.</td>
<td></td>
</tr>
<tr>
<td>TERRA SPIKE does not operate although PTO shaft is running.</td>
<td>Gear speed at gear unit is not correct.</td>
<td>Check the gear speed at the gear unit.</td>
</tr>
<tr>
<td>Slotted holes form during work.</td>
<td>The ground is too wet.</td>
<td>Wait until ground is dry enough to be worked. Reduce driving speed.</td>
</tr>
<tr>
<td></td>
<td>The driving speed might be too high.</td>
<td></td>
</tr>
<tr>
<td>Sod is torn out.</td>
<td>Not enough roots in the lawn.</td>
<td>Mount a pressure pad (additional equipment).</td>
</tr>
</tbody>
</table>
8.0 Maintenance

8.1. General

ATTENTION

Only perform maintenance work when the TERRA SPIKE is mounted. Switch off the tractor and secure it against unintentional starting.

Immediately switch off the TERRA SPIKE in case of malfunctions, heavy wear, unusual noises or danger.

After the maintenance, remove all parts not belonging to the TERRA SPIKE. Then mount the cover. (See chapter "Safety" point 1.2.)

8.2. Maintenance and inspection list

<table>
<thead>
<tr>
<th>Operating hours</th>
<th>Check</th>
<th>Procedure</th>
</tr>
</thead>
<tbody>
<tr>
<td>3</td>
<td>• Check tools for tight fit</td>
<td>Check</td>
</tr>
<tr>
<td></td>
<td>• Check bolts and screws for tight fit</td>
<td>Retighten screws, if required</td>
</tr>
<tr>
<td></td>
<td>All cover</td>
<td>See chapter &quot;Safety&quot;</td>
</tr>
<tr>
<td>8</td>
<td>• Check bearing for leaks</td>
<td>Optical control</td>
</tr>
<tr>
<td></td>
<td>• Check oil level in gear unit</td>
<td>Lubricate</td>
</tr>
<tr>
<td></td>
<td>• See points for manual lubrication 8.3</td>
<td></td>
</tr>
<tr>
<td>40</td>
<td>Check gear unit, clutcher, PTO, etc.</td>
<td>Check for noises, see separate Operating</td>
</tr>
<tr>
<td></td>
<td>Check PTO for lubrication</td>
<td>Instructions</td>
</tr>
<tr>
<td></td>
<td>Check tools for cleanliness</td>
<td>Clean</td>
</tr>
<tr>
<td></td>
<td>Check guides for cleanliness and lubrication</td>
<td>Optical control</td>
</tr>
<tr>
<td></td>
<td>See points for manual lubrication point 8.3</td>
<td>Lubricate</td>
</tr>
<tr>
<td>100</td>
<td>• Check for wear and cleanliness</td>
<td>Tighten screws or replace parts, if required</td>
</tr>
<tr>
<td>600</td>
<td>Change oil in gear unit</td>
<td>See lubrication point 8.3</td>
</tr>
<tr>
<td>Lubrication in general</td>
<td></td>
<td>See points for manual lubrication 8.3</td>
</tr>
</tbody>
</table>
8.0 Maintenance

8.3. Lubrication

- Switch off the machine for all lubrication work.
- Lubricate more often, if required, (Until all lubrication points are sufficiently lubricated).
- If you refill oil, always use the same type of oil.
- Keep all exposed machine parts, threaded spindles and guides slightly lubricated.
- Clean grease nipple before lubricating it.
- Clean up leaking grease.
- Before starting the machine after a longer standstill, lubricate and maintain the entire machine.

Points for manual lubrication

See figures.
The figures only show one of several corresponding assembly groups with lubrication points.

All information, illustrations and specifications in this manual are based on the latest information available at the time of publication. The right is reserved to make changes at any time without notice.
8.0 Maintenance

8.4. Cleaning TERRA SPIKE

Clean the TERRA SPIKE regularly. You will prolong the service life of expensive components and simultaneously detect:

- Loose components
- Damaged cables or lines
- Wear and unintended collision points.

NOTE:
Do not bring plastic and sealing elements in contact with aggressive liquids (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
Cleaning with water
• All dirty parts, but use caution: water causes rust.

Cleaning with dry cloth
• All sight glasses, signs and labels.

Cleaning with compressed air

⚠️ ATTENTION
Attention when you use 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. Changing the oil of the gear unit

- Place the collecting trough beneath drain screw (A).
- Remove the drain screw (A)
- When the gear unit is empty, insert the drain screw and tighten it.
- Remove the exhaust filter and the fuel level pluger (E).
- Insert the funnel into the opening ↓.
- Add the required amount of oil.
- Insert the screw (E) and tighten hem.

<table>
<thead>
<tr>
<th>Type</th>
<th>Amount of oil</th>
<th>Type of oil</th>
</tr>
</thead>
<tbody>
<tr>
<td>XP 6</td>
<td>1.0 US. gal.</td>
<td>SAE 90</td>
</tr>
<tr>
<td>XP 8</td>
<td></td>
<td></td>
</tr>
<tr>
<td>XP 10</td>
<td></td>
<td></td>
</tr>
</tbody>
</table>

8.6. Replacing the buffers

⚠️ ATTENTION
Tine holders are under spring-tension. Risk of injuries caused by backwards swinging tines.

1. Swing tine holder (A) by hand up to stop,
2. remove the screw (B),
3. replace the buffer (C),
4. tighten the screw (B),
5. Swing back tine holder (A) carefully to working position.
8.0 Maintenance

8.7. Setting scraper

Adjust scraper at front and rear roller.
Scraper should be set with a clearance of 1 mm to the roller.

8.8. Care and maintenance of the hydraulic system

- The hydraulic system is under high pressure!
- Looking for leaks use proper devices due to risk of injury!
- To work on the hydraulic system it is imperative to switch off the motor and secure the tractor against rolling away!
- Connecting hydraulic cylinders and motors, attention must be paid to the prescribed hydraulic tube's connection!
- Exchanging the connections the functions will be inversed (f. raising / lowering)
- Examine periodically the hydraulic tubes conditions for damages or aging and change them if necessary!
- High-pressure fluids, (fuel, hydraulic oil) emerging under high pressure can penetrate the skin causing severe injuries. Therefore contact immediately a physician, otherwise severe infections can be caused.
- Oils, fuels and filter must be duly cleared!
- Be careful raking hot oil off
  -RISK OF BURNING!-
8.0 Maintenance

8.9. Dismounting / Disposal

⚠️ ATTENTION!

Take care when you dismount the TERRA SPIKE. Read the chapter "Safety and Precautions" and observe local safety regulations.

The following dangers exist:
- Residual pressure in lines and adjusting elements,
- Heavy parts might fall down after dismounting,
- Sharp edges,
- The machine might tilt and crush someone.

Dismounting for disposal
1. Place the TERRA SPIKE on stable ground.
2. Remove the oil of the gear unit and dispose of it.
3. Disassemble TERRA SPIKE from the top downwards.

NOTE

Strictly observe the regulations and laws concerning the disposal of environmentally hazardous substances. Get detailed information about their disposal.

8.10. Unauthorized modification and spare part manufacturing

- Modifications of the TERRA SPIKE are only authorized with the permission of the manufacturer!

- Original spare parts and accessories authorized by the manufacturer guarantee your safety. The use of other parts might change the characteristics of the TERRA SPIKE. In this case we do not accept any liability. Place contact us.
9.0. Additional Equipment

9.1. Set of tines

<table>
<thead>
<tr>
<th></th>
<th>XP 6</th>
<th>XP 8</th>
<th>XP 10</th>
</tr>
</thead>
<tbody>
<tr>
<td>* Tines 5/16&quot;x6&quot;</td>
<td>pcs</td>
<td>24x</td>
<td>32x</td>
</tr>
<tr>
<td>* Tines 1/2&quot;x10&quot;</td>
<td>pcs</td>
<td>24x</td>
<td>32x</td>
</tr>
<tr>
<td>* Tines 1/2&quot;x12&quot;</td>
<td>pcs</td>
<td>24x</td>
<td>32x</td>
</tr>
<tr>
<td>Tines 3/4&quot;x14&quot;</td>
<td>pcs</td>
<td>12x</td>
<td>16x</td>
</tr>
<tr>
<td>Tines 3/4&quot;x20&quot;</td>
<td>pcs</td>
<td>12x</td>
<td>16x</td>
</tr>
<tr>
<td>* Hollow tines 5/16&quot;x5&quot;</td>
<td>pcs</td>
<td>---</td>
<td>---</td>
</tr>
<tr>
<td>* Hollow tines 5/8&quot;x7&quot;</td>
<td>pcs</td>
<td>24x</td>
<td>32x</td>
</tr>
<tr>
<td>* Hollow tines 3/4&quot;x7&quot;</td>
<td>pcs</td>
<td>24x</td>
<td>32x</td>
</tr>
<tr>
<td>Hollow tines 1&quot;x10&quot;</td>
<td>pcs</td>
<td>12x</td>
<td>16x</td>
</tr>
</tbody>
</table>

NOTE
* recommended to work with turf retainer.
## 9.0. Additional Equipment

### 9.2. Option

<table>
<thead>
<tr>
<th></th>
<th>XP 6</th>
<th>XP 8</th>
<th>XP 10</th>
</tr>
</thead>
<tbody>
<tr>
<td>Turf retainer for tines dia 5/16” and 1/2”</td>
<td>X</td>
<td>X</td>
<td>X</td>
</tr>
<tr>
<td>Turf retainer for tines dia 3/4” and 1”</td>
<td>X</td>
<td>X</td>
<td>X</td>
</tr>
<tr>
<td>Multi tine holder w/o tines</td>
<td>X</td>
<td>X</td>
<td>X</td>
</tr>
<tr>
<td>TERRA TRONIK Compl. With wiring and installation sheet</td>
<td>X</td>
<td>X</td>
<td>X</td>
</tr>
<tr>
<td>Residue collector with rear roller</td>
<td>X</td>
<td>---</td>
<td>---</td>
</tr>
<tr>
<td>Windrowing equipment</td>
<td>X</td>
<td>---</td>
<td>---</td>
</tr>
<tr>
<td>Underbody with upside hitch</td>
<td>X</td>
<td>X</td>
<td>---</td>
</tr>
<tr>
<td>Underbody with bottom hitch</td>
<td>X</td>
<td>X</td>
<td>---</td>
</tr>
</tbody>
</table>
## 10.0. Specifications

### 10.1.1. Technical details with Typ XP 6

<table>
<thead>
<tr>
<th></th>
<th>Description</th>
<th>Value</th>
</tr>
</thead>
<tbody>
<tr>
<td>A</td>
<td>Height up to connection of lower guide rod under</td>
<td>28</td>
</tr>
<tr>
<td>B</td>
<td>Height up to connection of lower guide rod topside</td>
<td>32</td>
</tr>
<tr>
<td>C</td>
<td>Height up to middle of connection of upper guide rod</td>
<td>50</td>
</tr>
<tr>
<td>D</td>
<td>Height up to connection</td>
<td>39</td>
</tr>
<tr>
<td>E</td>
<td>Machine length, back roller included</td>
<td>52</td>
</tr>
<tr>
<td>F</td>
<td>Machine width, hoop guard included</td>
<td>85</td>
</tr>
<tr>
<td>G</td>
<td>Frame width</td>
<td>67</td>
</tr>
<tr>
<td>H</td>
<td>Machine height in parking position</td>
<td>64</td>
</tr>
<tr>
<td>K</td>
<td>Diameter of front roller</td>
<td>9</td>
</tr>
<tr>
<td>L</td>
<td>Diameter of back roller</td>
<td>6</td>
</tr>
<tr>
<td></td>
<td>Distance between mid guide rod connector and front end power take-off shaft</td>
<td>4</td>
</tr>
<tr>
<td></td>
<td>Working width</td>
<td>63</td>
</tr>
<tr>
<td></td>
<td>Weight</td>
<td>2116 Lb.</td>
</tr>
<tr>
<td></td>
<td>Max. tine length</td>
<td>16 in.</td>
</tr>
<tr>
<td></td>
<td>Max. working depth, tines included</td>
<td>16 in.</td>
</tr>
<tr>
<td></td>
<td>Max. working depth, hollow tines included</td>
<td>10 in.</td>
</tr>
<tr>
<td></td>
<td>Min. power required for tractor</td>
<td>17 (23) KW (HP)</td>
</tr>
<tr>
<td></td>
<td>Min. lifting power at lower guide rod (standard version)</td>
<td>2646 lb.</td>
</tr>
<tr>
<td></td>
<td>Step of power take-off shaft tractor</td>
<td>540 rpm</td>
</tr>
<tr>
<td>*</td>
<td>Length of machine with windrowing equipment</td>
<td>81</td>
</tr>
</tbody>
</table>
10.0. Specifications

10.1.1. Technical details with Typ XP 6
### 10.0. Specifications

#### 10.1.2. Technical details with Typ XP 8

<table>
<thead>
<tr>
<th></th>
<th>Description</th>
<th>Unit(s)</th>
</tr>
</thead>
<tbody>
<tr>
<td>A</td>
<td>Height up to connection of lower guide rod under</td>
<td>28</td>
</tr>
<tr>
<td>B</td>
<td>Height up to connection of lower guide rod topside</td>
<td>32</td>
</tr>
<tr>
<td>C</td>
<td>Height up to middle of connection of upper guide rod</td>
<td>50</td>
</tr>
<tr>
<td>D</td>
<td>Height up to connection</td>
<td>39</td>
</tr>
<tr>
<td>E</td>
<td>Machine length, back roll included</td>
<td>52</td>
</tr>
<tr>
<td>F</td>
<td>Machine width, hoop guard included</td>
<td>104</td>
</tr>
<tr>
<td>G</td>
<td>Frame width</td>
<td>91</td>
</tr>
<tr>
<td>H</td>
<td>Machine height in parking position</td>
<td>64</td>
</tr>
<tr>
<td>K</td>
<td>Diameter of front roller</td>
<td>9</td>
</tr>
<tr>
<td>L</td>
<td>Diameter of back roller</td>
<td>6</td>
</tr>
<tr>
<td></td>
<td>Distance between mid guide rod connector and front end power take-off shaft</td>
<td>4</td>
</tr>
<tr>
<td></td>
<td>Working width</td>
<td>83</td>
</tr>
<tr>
<td></td>
<td>Weight</td>
<td>2646</td>
</tr>
<tr>
<td></td>
<td>Max. tine length</td>
<td>16</td>
</tr>
<tr>
<td></td>
<td>Max. working depth, tines included</td>
<td>16</td>
</tr>
<tr>
<td></td>
<td>Max. working depth, hollow tines included</td>
<td>10</td>
</tr>
<tr>
<td></td>
<td>Min. power required for tractor</td>
<td>22 KW</td>
</tr>
<tr>
<td></td>
<td>Min. lifting power at lower guide rod (standard version)</td>
<td>3086 lb.</td>
</tr>
<tr>
<td></td>
<td>Step of power take-off shaft tractor</td>
<td>540 rpm</td>
</tr>
<tr>
<td></td>
<td>Length of machine with windrowing equipment</td>
<td>81 In.</td>
</tr>
</tbody>
</table>
10.0. Specifications

10.1.2. Technical details with Typ XP 8
### 10.0. Specifications

#### 10.1.3. Technical details with Typ XP 10

<table>
<thead>
<tr>
<th></th>
<th>Description</th>
<th>Value</th>
</tr>
</thead>
<tbody>
<tr>
<td>A</td>
<td>Height up to connection of lower guide rod under</td>
<td>28 in.</td>
</tr>
<tr>
<td>B</td>
<td>Height up to connection of lower guide rod topside</td>
<td>32 in.</td>
</tr>
<tr>
<td>C</td>
<td>Height up to middle of connection of upper guide rod</td>
<td>50 in.</td>
</tr>
<tr>
<td>D</td>
<td>Height up to connection</td>
<td>39 in.</td>
</tr>
<tr>
<td>E</td>
<td>Machine length, back roll included</td>
<td>52 in.</td>
</tr>
<tr>
<td>F</td>
<td>Machine width, hoop guard included</td>
<td>124 in.</td>
</tr>
<tr>
<td>G</td>
<td>Frame width</td>
<td>106 in.</td>
</tr>
<tr>
<td>H</td>
<td>Machine height in parking position</td>
<td>64 in.</td>
</tr>
<tr>
<td>K</td>
<td>Diameter of front roller</td>
<td>9 in.</td>
</tr>
<tr>
<td>L</td>
<td>Diameter of back roller</td>
<td>6 in.</td>
</tr>
<tr>
<td></td>
<td>Distance between mid guide rod connector and front end power take-off shaft</td>
<td>4 in.</td>
</tr>
<tr>
<td></td>
<td>Working width</td>
<td>102 in.</td>
</tr>
<tr>
<td></td>
<td>Weight</td>
<td>3175 lb.</td>
</tr>
<tr>
<td></td>
<td>Max. tine length</td>
<td>16 in.</td>
</tr>
<tr>
<td></td>
<td>Max. working depth, tines included</td>
<td>16 in.</td>
</tr>
<tr>
<td></td>
<td>Max. working depth, hollow tines included</td>
<td>10 in.</td>
</tr>
<tr>
<td></td>
<td>Min. power required for tractor</td>
<td>30 (40)</td>
</tr>
<tr>
<td></td>
<td>Min. lifting power at lower guide rod (standard version)</td>
<td>3748 lb.</td>
</tr>
<tr>
<td></td>
<td>Step of power take-off shaft tractor</td>
<td>540 rpm</td>
</tr>
<tr>
<td>*</td>
<td>Length of machine with windrowing equipment</td>
<td>81 in.</td>
</tr>
</tbody>
</table>
10.0. Specifications

10.1.3. Technical details with Typ XP 10
10.0. Specifications

10.2. Speed of the Power Take-off Shaft

Speed of power take-off = number of holes per tine:

<table>
<thead>
<tr>
<th>Gear speed</th>
<th>Speed of Power Take-off Shaft (rpm)</th>
</tr>
</thead>
<tbody>
<tr>
<td></td>
<td>300</td>
</tr>
<tr>
<td>I</td>
<td>80</td>
</tr>
<tr>
<td>II</td>
<td>92</td>
</tr>
<tr>
<td>III</td>
<td>104</td>
</tr>
</tbody>
</table>

10.3. The hole Distances (Standard Values, in mm)

The hole distances depend on:
- the speed of the power take-off shaft and,
- the driving speed.

<table>
<thead>
<tr>
<th>Driving speed</th>
<th>0.0</th>
<th>0.6</th>
<th>0.9</th>
<th>1.2</th>
<th>1.6</th>
</tr>
</thead>
<tbody>
<tr>
<td>mile/hour</td>
<td></td>
<td></td>
<td></td>
<td></td>
<td></td>
</tr>
<tr>
<td>Speed of power take-off shaft</td>
<td>Gear Speed</td>
<td>Gear Speed</td>
<td>Gear Speed</td>
<td>Gear Speed</td>
<td>Gear Speed</td>
</tr>
<tr>
<td>I</td>
<td>II</td>
<td>III</td>
<td>I</td>
<td>II</td>
<td>III</td>
</tr>
<tr>
<td>300 rpm</td>
<td>101</td>
<td>90</td>
<td>80</td>
<td>208</td>
<td>181</td>
</tr>
<tr>
<td>350 rpm</td>
<td>88</td>
<td>78</td>
<td>69</td>
<td>177</td>
<td>156</td>
</tr>
<tr>
<td>400 rpm</td>
<td>78</td>
<td>68</td>
<td>60</td>
<td>156</td>
<td>136</td>
</tr>
<tr>
<td>450 rpm</td>
<td>69</td>
<td>60</td>
<td>53</td>
<td>138</td>
<td>121</td>
</tr>
<tr>
<td>500 rpm</td>
<td>62</td>
<td>54</td>
<td>48</td>
<td>124</td>
<td>109</td>
</tr>
<tr>
<td>540 rpm</td>
<td>57</td>
<td>50</td>
<td>44</td>
<td>115</td>
<td>101</td>
</tr>
</tbody>
</table>
### 10.0. Specifications

#### 10.4. Metric bolt and cap screw torque values

<table>
<thead>
<tr>
<th>Property Class and Head Markings</th>
<th>4.8</th>
<th>8.8</th>
<th>9.8</th>
<th>10.9</th>
<th>12.9</th>
</tr>
</thead>
<tbody>
<tr>
<td></td>
<td>![Image](30x187 to 435x669)</td>
<td>![Image](30x187 to 435x669)</td>
<td>![Image](30x187 to 435x669)</td>
<td>![Image](30x187 to 435x669)</td>
<td>![Image](30x187 to 435x669)</td>
</tr>
</tbody>
</table>

<table>
<thead>
<tr>
<th>Property Class and Nut Markings</th>
<th>5</th>
<th>10</th>
<th>10</th>
<th>12</th>
</tr>
</thead>
<tbody>
<tr>
<td></td>
<td>![Image](30x187 to 435x669)</td>
<td>![Image](30x187 to 435x669)</td>
<td>![Image](30x187 to 435x669)</td>
<td>![Image](30x187 to 435x669)</td>
</tr>
</tbody>
</table>

<table>
<thead>
<tr>
<th>Size</th>
<th>Class 4.8</th>
<th>Class 8.8 or 9.8</th>
<th>Class 10.9</th>
<th>Class 12.9</th>
</tr>
</thead>
<tbody>
<tr>
<td></td>
<td>Lubricated*</td>
<td>Dry*</td>
<td>Lubricated*</td>
<td>Dry*</td>
</tr>
<tr>
<td></td>
<td>N·m</td>
<td>lb-ft</td>
<td>N·m</td>
<td>lb-ft</td>
</tr>
<tr>
<td>M6</td>
<td>4.8</td>
<td>3.5</td>
<td>6</td>
<td>4.5</td>
</tr>
<tr>
<td>M8</td>
<td>12</td>
<td>8.5</td>
<td>15</td>
<td>11</td>
</tr>
<tr>
<td>M10</td>
<td>23</td>
<td>17</td>
<td>29</td>
<td>21</td>
</tr>
<tr>
<td>M12</td>
<td>40</td>
<td>29</td>
<td>50</td>
<td>37</td>
</tr>
<tr>
<td>M14</td>
<td>63</td>
<td>47</td>
<td>80</td>
<td>60</td>
</tr>
<tr>
<td>M16</td>
<td>100</td>
<td>73</td>
<td>125</td>
<td>92</td>
</tr>
<tr>
<td>M18</td>
<td>135</td>
<td>100</td>
<td>175</td>
<td>125</td>
</tr>
<tr>
<td>M20</td>
<td>190</td>
<td>140</td>
<td>240</td>
<td>180</td>
</tr>
<tr>
<td>M22</td>
<td>260</td>
<td>190</td>
<td>330</td>
<td>250</td>
</tr>
<tr>
<td>M24</td>
<td>330</td>
<td>250</td>
<td>425</td>
<td>310</td>
</tr>
<tr>
<td>M27</td>
<td>490</td>
<td>360</td>
<td>625</td>
<td>450</td>
</tr>
<tr>
<td>M30</td>
<td>675</td>
<td>490</td>
<td>850</td>
<td>625</td>
</tr>
<tr>
<td>M33</td>
<td>900</td>
<td>675</td>
<td>1150</td>
<td>850</td>
</tr>
<tr>
<td>M36</td>
<td>1150</td>
<td>850</td>
<td>1450</td>
<td>1075</td>
</tr>
</tbody>
</table>

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 designed to fail under predetermined loads. Always replace shear bolts with identical property class.

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

---

*a* "Lubricated" means coated with a lubricant such as engine oil, or fasteners with phosphate and oil coatings. "Dry" means plain or zinc plated without any lubrication.

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.
10.0. Specifications

10.5. Serial_Number

Record product identification No. (serial no.) in the space provided below. Always quote this number when ordering spare parts or making warranty claims.

Product Identification Number: _________________________________