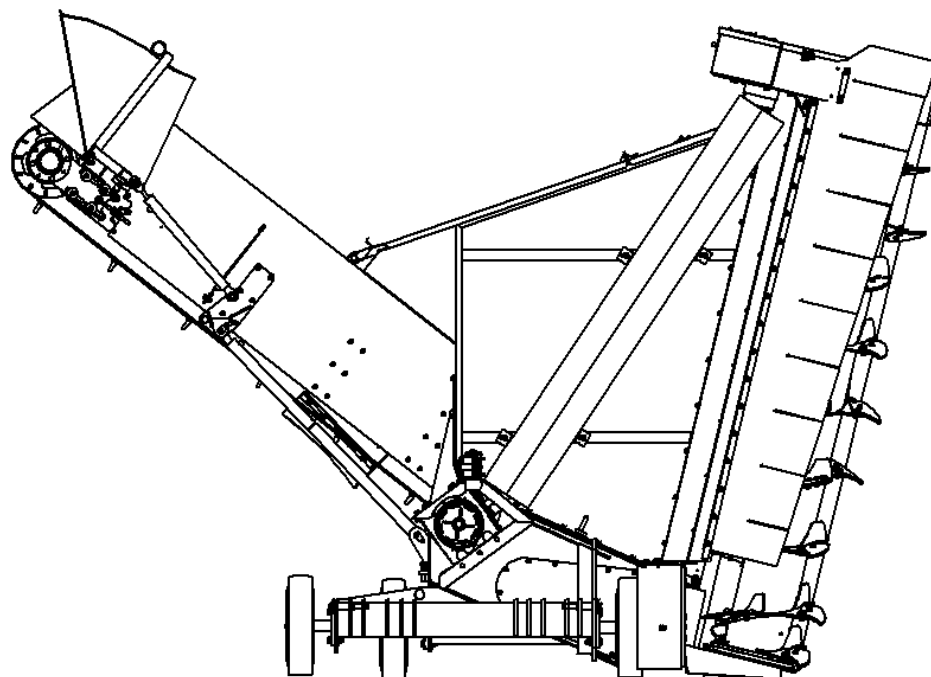


# OPERATION MANUAL

## Compost Windrow Turner

TBU 3 - Punkt



# TRANSLATION OF THE ORIGINAL INSTRUCTIONS

### Table of contents

	Page
<b>1.0 GENERAL</b>	<b>5</b>
1.1 Foreword	5
1.2 Operator's obligation	5
1.3 Undertakings to be given by the personnel	5
1.4 Explanation of symbols	6
1.5 Guarantee and liability	7
1.5.1 Warranty and fair trading requests	7
1.5.2 Acknowledgement and compensation	8
1.5.3 Special agreements	9
1.6 Copyright	9
<b>2.0 DESCRIPTION OF THE PRODUCT</b>	<b>10</b>
2.1 Tasks of the machine	10
2.2 Intended use	11
2.3 Working place	12
2.4 Technical characteristics	14
2.5 Equipment	15
<b>3.0 SAFETY PRESCRIPTIONS</b>	<b>17</b>
3.1 Personnel requirements	17
3.1.1 Skills	17
3.1.2 Training of personnel	17
3.1.3 Personal protective equipment	18
3.1.4 Informal safety measures	18
3.2 SAFETY INFORMATION and potential dangers in use of the machine	19
3.2.1 Protective devices	19
3.2.2 Safety precautions to be observed during normal duty	19
3.2.3 Machine control	19
3.2.4 Dangers caused by hydraulic energy	20
3.2.5 Passing out of noxious steams and gases	20
3.2.6 Noise level produced by the machine	20
3.2.7 Service and maintenance, elimination of faults	21
3.2.8 Constructional modification of machine	21
3.2.9 Cleaning of machine and disposal	22
3.3 WARNINGS and special dangers in use of the machine	23
3.3.1 Danger by rotating blades of milling drum!	23
3.3.2 Danger by discharge conveyor	23

<b>4.0</b>	<b>FUNCTIONING</b>	<b>24</b>
<b>4.1</b>	<b>Processing task</b>	<b>24</b>
<b>4.2</b>	<b>Construction</b>	<b>24</b>
<b>4.3</b>	<b>Functional principle</b>	<b>24</b>
<b>4.4</b>	<b>Safety equipment</b>	<b>26</b>
4.4.1	Drive shaft protection	26
4.4.2	Cleanings flap	27
4.4.3	Milling drum drive	27
<b>5.0</b>	<b>COMMISSIONING / START-UP</b>	<b>28</b>
<b>5.1</b>	<b>Introduction</b>	<b>28</b>
<b>5.2</b>	<b>Transport</b>	<b>30</b>
<b>5.3</b>	<b>Before first commissioning: adjustment of the cardan shaft</b>	<b>31</b>
5.3.1	Adjustment of cardan shaft using a diagram	31
5.3.2	Mounting of the TBU 3P	33
5.3.3	Mounting of the TBU 3P to the tractor	33
<b>5.4</b>	<b>Setting up the TBU 3P</b>	<b>34</b>
<b>6.0</b>	<b>OPERATION</b>	<b>35</b>
<b>6.1</b>	<b>Adjustments</b>	<b>36</b>
<b>6.2</b>	<b>Checking of the discharge conveyor belt tension</b>	<b>36</b>
<b>6.3</b>	<b>Replacement of wear parts</b>	<b>37</b>
6.3.1	Replacement of milling tools	37
6.3.2	Replacement of milling drum drive power belt	37
<b>6.4</b>	<b>Fault finding table</b>	<b>39</b>
<b>7.0</b>	<b>MAINTENANCE</b>	<b>40</b>
<b>7.1</b>	<b>Maintenance points, maintenance intervals</b>	<b>42</b>
<b>7.2</b>	<b>Changing of hydraulic oil</b>	<b>43</b>
<b>7.3</b>	<b>Oil filling amounts for the gear</b>	<b>43</b>
<b>7.4</b>	<b>Grease types to be applied</b>	<b>43</b>
<b>7.5</b>	<b>Proof of service routines</b>	<b>44</b>
<b>7.6</b>	<b>Service addresses</b>	<b>45</b>
<b>8.0</b>	<b>REPAIR</b>	<b>46</b>
<b>9.0</b>	<b>PUTTING THE MACHINE OUT OF ACTION</b>	<b>46</b>
<b>10.0</b>	<b>DISPOSAL</b>	<b>47</b>
<b>11.0</b>	<b>INSTRUCTIONS FOR ORDERING OF SPARE PARTS</b>	<b>48</b>
<b>12.0</b>	<b>General terms and conditions</b>	<b>49</b>

**PRODUCT IDENTIFICATION**

Maschinen type : TBU 3P  
 Year of construction : .....  
 Maschine-No. : .....  
 Chassis-No. : .....  
 Motor Typ : .....  
 Motor-Nr. : .....

Manufacturer address :  

J. Willibald GmbH
Bahnhofstrasse 6
D-88639 Wald-Sentenhart

  
 Phone-number : +49 (0) 7578 / 189 0  
 Fax-number : +49 (0) 7578 / 189 170  
 E-mail-address : info@willibald-gmbh.de

Dealers address :  


Clients Service Address :  


The vehicle identification plate is attached on the front right at gear of the machine.



## 1.0 GENERAL

### 1.1 Foreword

**Thoroughly read and observe all information, warnings and safety notes contained in this operation manual *before* commissioning of the machine.**

- Knowledge of all basic safety information and warnings contained in this operation manual is the basic prerequisite for the appropriate handling and troublefree operation of the machine.
- This operation manual contains all important information necessary in order to operate the machine in an appropriate and safe manner.
- This operation manual, especially the safety information contained herein, must be observed by all persons working on or with the machine.
- In addition, all rules and prescriptions valid and in force in regard to accident prevention must thoroughly be observed and complied with by all means.

### 1.2 Operator's obligations

The operator is obliged and undertakes to only allow persons to work on or with the machine who

- are no younger than 18 years;
- are familiar with all basic rules and prescriptions operative in regard to safety at work and to accident prevention and who have been introduced into the handling of this machine and have been assigned to their duties;
- have read and fully understood the chapter contained in this manual referring to safety information and warnings and who have confirmed to have done so by their signature.
- The operator undertakes to control his personnel in regard to safety conscious working in regular intervals.

### 1.3 Undertakings to be given by the personnel

Before starting to work, all persons charged to work on or with this machine commit themselves

- to observe the basic rules and prescriptions valid and in force in regard to safety at work and prevention of accidents;
- to read the chapter on safety information and warnings contained in this operation manual and to confirm to have fully understood its contents and to have done so by their own signature.

## 1.4 Explanation of symbols

In this operation manual the following safety symbols, warnings and descriptions are used to mark possible dangers:



### DANGER

This symbol indicates an imminently dangerous situation which will result in death or serious injury if the safety measures are not followed. Inobservance of this guidance entails serious consequences to the health of persons and can cause severe bodily or fatal injuries.



### WARNING

This symbol indicates a potentially dangerous situation that can result in death or serious injury if the safety measures are not followed. Inobservance of this guidance can entail serious consequences to the health of persons, be causal for severe bodily injuries or be fatal.



### CAUTION

This symbol indicates a potentially dangerous situation that can lead to minor injuries when security measures are not followed. Inobservance of this guidance may result in light injuries or be causal for damage to property.



### NOTICE

This symbol indicates a potential for property damage which may arise when security measures are not followed.

This symbol indicates important information given in regard to the appropriate handling of the machine. Inobservance of this information may result in disturbance or malfunction of the machine or may cause interferences with the environment.



*This symbol indicates important information, application tips as well as other useful information.*

*The above symbols are to help you to utilize all functions of your machine in the best possible way.*

## 1.5 Guarantee and liability

Basically, our "General Standard Sales and Delivery Conditions" are operative, of which the operator, at its latest, will receive a copy at the date of the conclusion of contract. See annex on the page 49. The producer does not assume liability for any personal injury and damage to property whatsoever if any such damage is attributable to one or several of the following causes:

- Machine not applied in compliance with the intended use;
- Inexpert mounting, commissioning, start-up, handling and servicing of the machine;
- Operation of machine with defective, inoperative or not properly mounted safety devices and protective gear;
- Non-observance of information and warnings contained in this operation manual in regard to transport, mounting, commissioning, operation and set-up of the machine;
- Use of parts that aren't original WILLIBALD spare parts;
- Unauthorized constructional modification of the machine;
- Unauthorized modification of the TBU 3P (e.g. gear ratios, output and r.p.m.), hydraulic pressure;
- Insufficient control of machine parts subject to wear;
- Repairs performed in an inexpert manner;
- Disasters caused by the influence of foreign bodies or substances or by force majors.

### 1.5.1 Warranty and fair trading requests

a) Warranty and fair trading requests require written form. Here our warranty and fair trading request form must be used.

b) Parts, units or sets changed under the guarantee coverage must - without being asked to do so - be provided to us *free of costs* for detailed examination and be sent in no later than four 4 weeks after occurrence of the damage complained about.

c) Basically, all spare parts, sets and units ordered from us will be billed to our customers, no matter if needed for any works to be performed under the granted guarantee coverage or not. A possible credit note

can take place only after examination and acknowledgment of the appropriate warranty and fair trading request.

d) Transport damages do not go in principle to our loads.

e) Warranty or fair trading requests is to have arrived 2 weeks, at the latest 4 weeks after damage entrance with us. Later received requests can be worked on only after previous arrangement.

## 1.5.2 Acknowledgement and compensation

If the customer's application for services to be rendered under the granted guarantee coverage and/or for accommodation ex gratia was acknowledged, WILLIBALD shall compensate for the following:

a) After our discretion and in the context of our business obligation appearing necessary construction units, see page 44 maintenance proof.

b) Subject to our discretion: all expenditure of works as deemed necessary for the replacement of parts and components under said guarantee coverage.

c) Subject to our discretion: costs spent on travelling to WILLIBALD, which applied only, however, if the customer – due to important reasons – cannot be expected to visit an after-sales-workshop. The compensation from hourly rate and km are from Willibald for guarantees stated.

d) Maintenance and service routines and related expense of works do not form part of the guarantee coverage. Same also applies if the customer has failed to perform such work and routines as prescribed to the result of damages caused to the machine, which the customer tries to have retrieved by works rendered under the granted guarantee term. For cargo is normal transport compensate, only. No Express.

e) Fundamental applies:

The exclusive WILLIBALD - original spare parts must be used.



## 1.5.3 Special agreements

Any guarantee terms other than the terms set forth herein must be in writing.

Guarantee terms operative for WILLIBALD machines:

a) The guarantee term granted is 12 months as of the date of delivery.

b) The guarantee for elements and technical components used in the machine other than of our own make, such as engine, hydraulic pumps, hydraulic motors, electronically components etc. can only be assumed insofar as we ourselves can enforce claims against our suppliers under the guarantee coverage granted to us, and only to such extent as we are entitled to receive such performances.

c) The above guarantee does not include wear parts, such as flails, plug-in shaft, tool kit, V-belts, filters, bearing etc.

## 1.6 Copyright

The company J. WILLIBALD GmbH holds the sole copyright in present operation manual. This operation manual is for the exclusive use by the operator and his personnel.

It contains prescriptions, information and notes, which may neither partially nor completely

- be copied
- distributed or
- communicated otherwise.

Contravention to the above may entail penal measures and result in legal consequences.

J. WILLIBALD GmbH  
Machine fabric

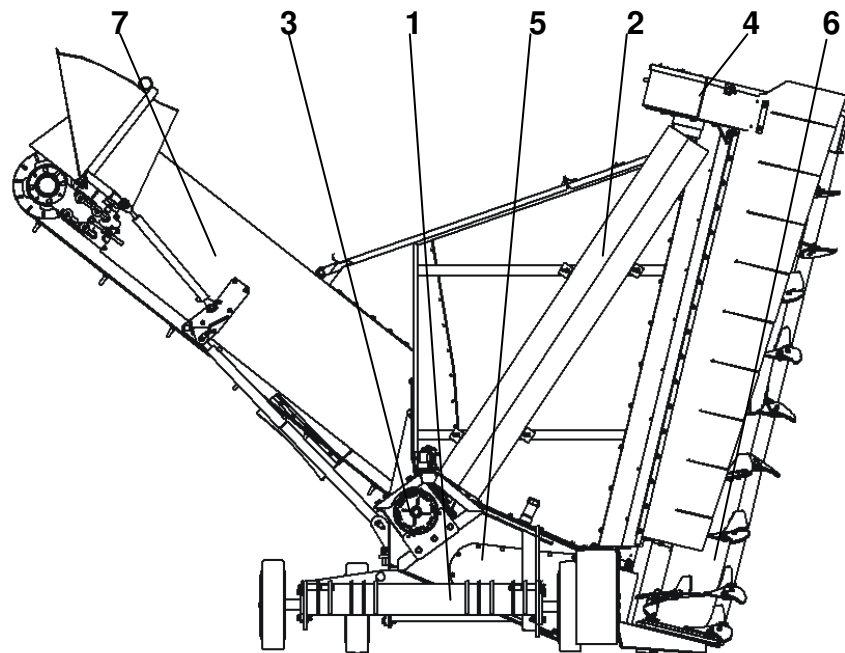
## 2.0 DESCRIPTION OF THE PRODUCT

The Machine TBU 3P is built according to the state of the art and the recognized safety rules.

### 2.1 Tasks of the machine

A task of the machine is Conversion of organic material for composting (garden waste material from the landscaping, lumber, cemetery waste).

Illustration 2.1  
TBU 3P  
Side view



1. Chassis
2. Cardan shaft
3. Gear & Drive shaft for tractor
4. Drive
5. Conveyor drive
6. Milling drum
7. Discharge conveyor

Inexpert use of the machine can result in serious injury to the user or third, respectively, damage to the machine or other property. The machine must be applied only:

- for its intended use;
- in perfect condition that as regards safety technique only.

Any disturbances or malfunctions that could impair safety have to be eliminated immediately.

## 2.2 Intended use

The compost windrow turner TBU 3P is built exclusively for conversion organic material and should be used for that only.

Any use beyond this will be considered as not in accordance with the intended use.

The Producer, J. WILLIBALD GmbH, does not assume any liability for damages resulting from it whatsoever

The risk is taking upon exclusively the operator.

Intended use also means and includes observance of all information contained in this operation manual and due compliance with all inspection works and service routines as prescribed herein.

Unauthorized modifications of the machine exclude liability for any resulting property damage and personal injury.



### DANGER

#### Not intending use danger.

Any use beyond intended use is considered as not in accordance with the intended use and / or other use of the machine, resulting in dangerous situations, and it extinguished operating permit.

The machine should be used as intended only.



### CAUTION

#### Danger of inappropriate use

Inappropriate use of the TBU 3P may cause bigger damages to the machine and may also affect safety devices and protective gear to the result that the operator's personal safety can no longer be guaranteed.

In particular, the TBU 3P must not be used for the following operations:

- The conversion of rubbish from construction sites and ceramic wastes;
- The conversion of metal scrap and other metal parts;
- The conversion of ceramic scrap.

## 2.3 Working place

### Using area

The machine TBU 3P is used for the processing of pre-cut organic material (pre-shredded wood packaging, wooden bulky waste, industrial wood waste, building demolition wood)). The large volumes material can be converted on the spot.

### Destination

The objective of the conversion process is to achieve in the shortest possible time of higher and homogeneous qualities for composting.

### Operator

The compost windrow turner TBU 3P is moved at the place of work (compost windrow) by the operator, also a tractor too. The operator is on the driver's seat.

The machine must be operated in compliance with the instructions by trained personnel who are at least 18 years old.

In order to start or stop the machine, the operator must approach it and go away from it by passing through the zone shown in illustration 2.2 above.

Do not approach for not authorized Persons by normal enterprise in the zone of the machine outlined in illustration 2.2. These zones are never entered with working machine.

### Working place / Danger zones

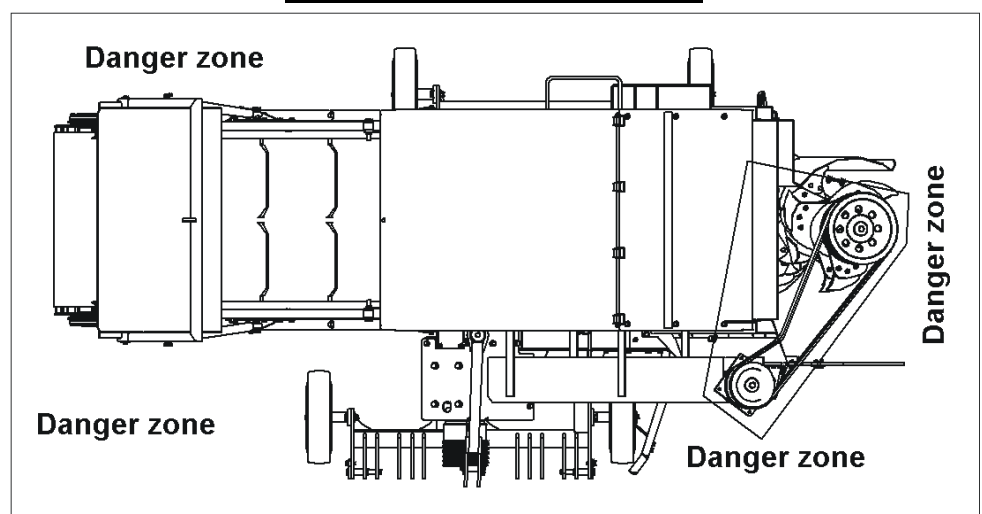


Illustration 2.2  
TBU 3P  
Danger zones

**Method**

The compost windrow turner TBU 3P is pulled by tractor. It is driven by a drive shaft. The turner is taken up by 3 - point admission. Before starting operation, the machine has to be lowered hydraulically. A large milling drum is then slightly inclined and guided along the windrow flank.

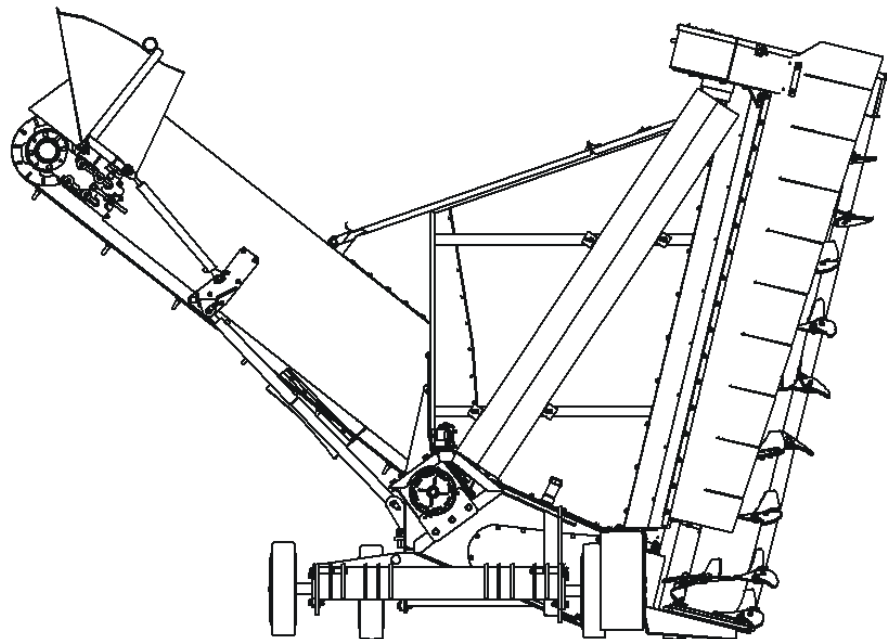
Through the inclination of the cutting drum with aggressive tools rotting material is milled up to a layer of 50 cm. The milled material is placed laterally with the help of a discharge conveyor. The steep position of the discharge belt allows to stack up a new windrow of up to 3,5 m height at a parallel distance of 5 m.

**Designations applied at the machine**

Designations, such as type plate and machine no is applied on the front right at gear of the machine.

## 2.4 Technical characteristics

Illustration 2.3  
TBU 3P  
Side view



Operating mode:	fixed at the 3-point linkage of a Tractor with a minimum of 130 hp
Drive :	Engine power with creep-speed Option that starts at 0,5 km/h via tractor power take off (PTO)
Throughput:	up to 1.200 m <sup>3</sup> /h (dependent on Tractor achievement)
Operating control unit:	via tractor hydraulic system
Working speed:	ca. 0,5 – 1 km/h
Dimension LxWxH:	4850x2450x3450 mm
When folded for transport LxWxH:	3250x2450x4250 mm
Weight:	**max. 3.200 kg
R.P.M.	1000 min <sup>-1</sup>
Cardan shaft connector:	1 3/4" 6 piece
Required driving power	min. 90 kW (122 HP) max. 136 kW (185 HP)
R.P.M: of milling cylinder	approx. 280 min <sup>-1</sup>

## 2.5 Equipment

### Standard version of Compost Windrow Turner:

- Original Willibald high duty rubber discharge conveyor;
- Milling drum with 28 knives;
- Easy Handling through 3-point lifter
- Hydraulically adjustable discharge flap for infinitely adjustable height and range;
- The removal of horizontal layers ensure that the outer and inner windrow layers are optimally mixed;
- The very special knife arrangement at the milling drum allows a clean milling without any danger of collapse of the walls.

## EC-Declaration of Conformity

Within the meaning the EC Machinery Directive 2006/42 EC, Annex II A

We here confirm that the following machine

<u>Designation of machine:</u>	Compost windrow turner
<u>Type designation:</u>	TBU 3P
<u>Machine no.:</u>	
<u>Manufacturer:</u>	J. Willibald GmbH, D - 88639 - Wald - Sentenhart

due to is designing and make and in the type version marketed by our company meets with the basic and relevant safety and health requirements as specified and set forth in the corresponding EC Directives.

### EC directives to be complied with:

EC- Machinery Directive 2006/42 EG

### The following harmonized standards have been applied:

DIN EN 12100       DIN EN 349       DIN EN 953       DIN EN 4413  
 DIN EN 13857       DIN EN 14119       EN 620       DIN EN 2332

This declaration of conformity becomes invalid if the machine or parts of the machines are changed or altered without our previous agreement and consent.

A complete technical documentation is available and at hand. The machine related operating instructions are available and hand:

in their original version       as version translated into the user`s native language

### Person authorized to compile the technical file:

A. Willibald  
J. Willibald GmbH, Maschinenfabrik, Bahnhofstraße 6, D-88639 Wald- Sentenhart

### Manufacturer:

J. Willibald GmbH, Maschinenfabrik, Bahnhofstraße 6, D-88639 Wald- Sentenhart

Place, Date, Signatur

J. Willibald -Managing Director-

A. Willibald - Managing Director-



## 3.0 SAFETY PRESCRIPTIONS

### 3.1 Personnel requirements

#### 3.1.1 Skills

In the operating manual the following skills for various activities are identified:

- **Trained staff** is a person who was in a teaching via its assigned tasks and potential hazards of improper behaviour taught.
- **Professional staff** is a person who is due to their specialized training, knowledge and experience and knowledge of the relevant provisions in a position to carry out the tasks entrusted to professional standards.
- **Operating personnel** is the person who is responsible for installing, operating, adjusting, maintaining, cleaning, repairing or transporting machinery.

#### 3.1.2 Training of personnel

### WARNING



#### Danger for unauthorized

- Unauthorized persons do not meet the requirements described here do not know the dangers in the work area.
- The trained and qualified personnel may work on the machine only.
- The responsibilities of the staff should be clearly indicated for the installation, commissioning, operation, maintenance and repair.
- The apprentice personnel must be trained under the supervision of an experienced person on the machine.

## 3.1.3 Personal protective equipment

At work is the wear of personal protective equipment required to minimize health hazards.

- The required personal protective equipment must be provided by the operator.
- All safety equipment must be checked regularly.
- You must to wear always the necessary personal protective equipment by each operation.
- Comply in the work area existing labels for personal protective equipment.



### Helmet

to protect against falling and flying parts.



### Protective goggles

to protect the eyes from flying parts.



### Hearing Protection

to protect against hearing loss by noise



This label is affixed to both sides of the machine.

Description: take during working the safety helmet, safety glasses and ear protection.

## 3.1.4 Informal safety measures

- This operation manual must permanently be kept and be at hand at the place of operation of the machine;
- Present operation manual and all prescriptions contained herein are supplemented by generally operative and local regulations in regard to accident prevention and to environmental protection. These too must be made available and complied with;
- All safety information and warnings applied at the machine must be kept in always legible condition.

## 3.2 SAFETY INFORMATION and potential dangers in the use of the machine

### 3.2.1 Protective devices



#### WARNING

#### Danger of non-functioning protective devices

- Emergency stop device must be always freely accessible;
- Make sure and control each time before actuation of the machine that all safety devices and protective gear are mounted properly and operative;
- Safety devices and protective gear mounted at the machine may only be removed after complete standstill and only if the machine has been protected against restart;
- In case of delivery of part components, the operator is responsible too that safety devices or protective gear will be mounted and installed as prescribed.

### 3.2.2 Safety precautions to be observed during normal duty

- Operate the machine only if sure that all safety devices and protective gear are fully operative;
- Before activation of the machine, make sure that nobody can be injured or endangered by the starting machine;
- Control the machine at least once per shift for visible damages at the outside and check for functionality of safety devices and protective gear.



### 3.2.3 Machine control

#### NOTICE

#### Danger of property damage due to incorrect handling of the control

- Instructed personnel are authorized to operate the machine control only.

## 3.2.4 Dangers caused by hydraulic energy

### WARNING



#### Dangers caused by hydraulic energy

The hydraulic energy can cause serious or even fatal injuries.

Hydraulically driven components can move unexpectedly.

Due to damage of individual components, hydraulic fluid can leak under high pressure.

- Only specially skilled and experienced personnel familiar with it may work on the hydraulic systems of the machine;
- Before performing any repair works, get free the pressurized system sections and pressure lines that have to be opened for these works;
- Replace hydraulic hoses in appropriate intervals, even if no safety relevant deficiencies can be detected.

## 3.2.5 Passing out of noxious steams and gases

### WARNING



#### Danger of escape of hazardous gases and vapors

The compost windrow turner TBU 3P is pulled by tractor. During operation from tractor can escape noxious gases and fumes.

Compost windrow turner must not be operated in closed rooms.

## 3.2.6 Noise level produced by the machine

### WARNING

#### Hearing damage from noise

The sound pressure level produced by the machine exceeds 83 dB (A).

Depending on the local operation conditions, a noise pressure level may be produced that can cause noise deafness

- The noise pressure produced by the machine is lower than the one produced by the tractor.
- Depending on the tractor used a noise pressure level may be produced that can cause noise deafness.
- The service personnel must, in both cases, be protected by corresponding safety equipment or safety measures.



## 3.2.7 Service and maintenance, elimination of faults

### WARNING



#### **Danger of injury due improperly performed maintenance, inspection and repair work!**

Before performing any service routines, inspection or repair works always make sure the TBU has been uncoupled from the tractor.

- All maintenance operations are carried out in accordance with maintenance schedule;
- Compliance with all time intervals or reaching a certain number of operating hours.;
- Take prescribed attitude, maintenance and inspection work punctually and register into the list on the page 44,
- Inform the service personnel before beginning of the maintenance,
- Secure against unintentional start-up all components and operating media such as compressed air and hydraulics,
- Mount and save carefully with lifting witnesses the larger building groups by the exchange,
- Control the solved bolt connections for tightness,
- After completion of the maintenance works or service routines, check all safety devices and protective gear for proper functioning.

## 3.2.8 Constructional modification of machine

- Never modify the machine or mount any attachments whatsoever without the manufacturer's prior consent. Same also applies for any welding performed on load carrying parts of the machine;
- All modifications whichever are subject to prior written consent by the company J. WILLIBALD GmbH;
- Any machine parts found being not in perfect condition must be replaced immediately;
- Use Willibald-original spare and wear parts only.

Only our approved original spare parts are checked by us and thus have the suitable conditions for the use of the machine. Third-party components is not guaranteed that they are designed to load and safety requirements and manufactured.

## WARNING



### Danger of injury by improper replacement parts

Incorrect or faulty spare parts can cause damage, malfunction or failure and impair safety.

Use Willibald-original spare and wear parts only.

## NOTICE

- Give in all messages and inquiries the machine chassis number.
- Order replacement parts by dealers or direct from WILLIBALD.

### 3.2.9 Cleaning of machine and disposal

Regular cleaning is a basic condition to the preservation of service life and functional capability of the machine. Use approved cleaning agents only.

The cleaning agents must be coordinated with the appropriate material, which should be examined before starting work. The corrosion protection should not attack parts. In general, acids and crude detergent, and solvent-based cleaners are unsuitable and can cause irreparable damage.

To clean should find as possible wetting agent solution with a pH 5-8. Ask the manufacturer in case of doubt on the suitability of the cleaning agent.

All media, stuff and materials must be applied, handled and disposed in the appropriate manner, which particularly applies in regard to

- any works performed on greasing systems and lubrication contrivances
- Cleaning agents used for cleaning purposes,

## 3.3 WARNINGS and special dangers in the use of the machine

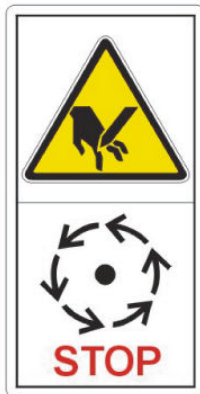
### 3.3.1 Danger by rotating blades of milling drum!

#### DANGER



#### **Danger by rotating blades of milling drum!**

#### **Danger because draw-in of the people in the milling drum.**



The milling drum runs after turn off the drive shaft!

- Do not come close to the running milling drum!
- If the universal drive shaft is driven, it must be ensured that nobody is in the danger zone.
- Before driving backwards: make sure no persons stay within the danger zone of both TBU and tractor! (Abbildung 2.2)
- In case of insufficient view: make sure there is a second person to assist you!

This label is located on the both side of the machine

Description: Attention rotating parts! Machine parts can be touching when they are stopped completely only.

### 3.3.2 Danger by discharge conveyor

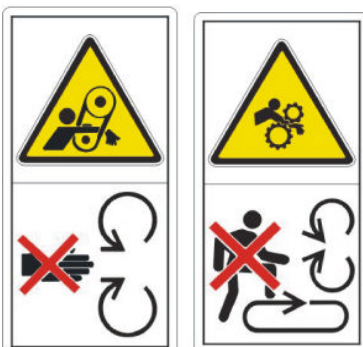
#### DANGER



#### **Drawing-in and crushing hazard across moving discharge conveyor!**

The moving discharge conveyor can cause serious injury.

Inobservance of this guidance entails serious consequences to the health of persons and can cause severe bodily or fatal injuries.



- Do not open the cleaning flap during operating of TBU 3P.
- Nobody may stay in the vicinity of the milling drum and the discharge area TBU 3P, if the drive shaft is running!
- Do not stand in the vicinity of the running discharge belt!

This label is located on the both side of the machine and additional on the cleaning flap of TBU 3P.

Description: Never walk on the loading area when the motor is on!

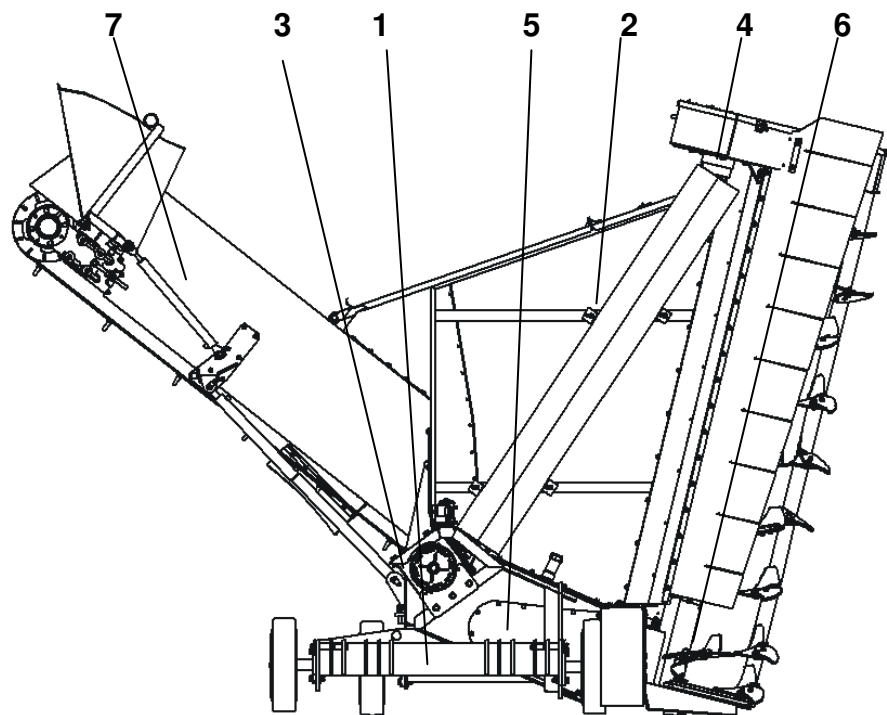
## 4.0 FUNCTIONING

### 4.1 Processing task

The compost windrow turner TBU 3P is designated for conversion for the processing of pre-cut organic material.

### 4.2 Construction (Illustration 4.1)

Illustration 4.1  
TBU 3P  
Construction



- |                                   |                 |
|-----------------------------------|-----------------|
| 1. Chassis                        | 2. Cardan shaft |
| 3. Gear & Drive shaft for traktor | 4. Drive        |
| 5. Conveyor drive                 | 6. Milling drum |
| 7. Discharge conveyor             |                 |

### 4.3 Functional principle

#### Loading the machine

TBU drives a windrow along and mills certain quantity from material to 50 cm depending upon tractor design and material condition.

#### Material infeed

The rotting material is milled in a single step with the help of aggressive tools.



## Material conversion

As the material is removed vertically, the horizontally settled layers are destroyed and material is mixed once again.

## Discharging the material

With a discharge conveyor the removed, slightly shredded, and mixed materials stacked up laterally.

*Illustration 4.2*  
*TBU 3P*  
*Functioning*



## 4.4 Safety equipment

### 4.4.1 Drive shaft protection



Cardan shaft protection



#### WARNING

#### Drawing-in hazard in the running machine without cardan shaft protection!

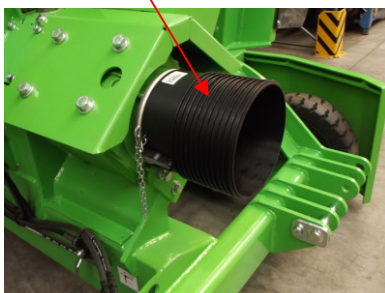
The drive of milling drum is via a drive shaft. The cardan shaft rotates at high speed. Therefore it is protected with a fixed covering.

- If the universal drive shaft is driven, it must be ensured that nobody is in the danger zone.
- Damaged parts of the cardan shaft protection may not be used! They are part of BG testing.

#### WARNING



Drive shaft protection



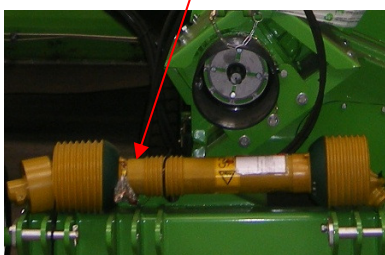
#### Drawing-in hazard in the running machine without drive shaft protection!

The drive of cardan shaft is via a drive shaft of tractor. The drive shaft rotates at high speed 1000 min<sup>-1</sup>

Therefore it is protected with a fixed covering.

- Damaged parts of the cardan shaft protection equipment, such as damaged safety flaps or rubber protections must not be used! Any such parts are subject to controls and inspections performed by the employer's liability insurance association.

Drive shaft

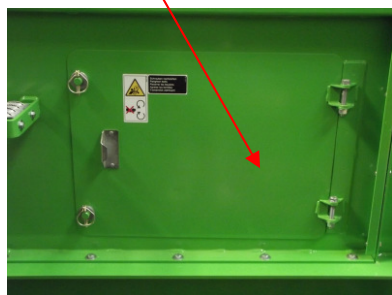


Drive shaft from TBU 3P to tractor

## 4.4.2 Cleanings flap



Cleaning flap



### WARNING

**Drawing-in hazard by opening the cleaning flap at the running machine!**

The moving discharge conveyor can cause serious injury.

- If the cardan shaft is driven, cleaning flap must be closed and locked with linch pin.
- The cleaning work must be carried out when the machine is stopped.

## 4.4.3 Milling drum drive

### DANGER



Milling drum drive



**Drawing-in hazard by opening the protective cover of milling drum drive at the running machine!**

After some hours of operation is have to check the tension of the power belt.

- Do not open the drum drive at the running TBU 3P!
- The maintenance of the TBU 3P must be carried out when the tractor and the milling drum are stopped only!
- If the cardan shaft is driven, the protective cover must be closed and locked with excentric locks and staked with cotter pin.

Protective cover



Excentric lock



Cotter pin

## 5.0 COMMISSIONING / START-UP

### 5.1 Introduction



#### CAUTION

**Thoroughly read and observe all information, warnings and safety notes contained in this operation manual *before* commissioning and start-up of the machine!**

Keep this operation manual always ready to hand and, in case the machine is sold or ownership is transferred otherwise, make sure to pass it on to the new owner(s)!

Comply with all relevant rules and prescriptions operative and in force in regard to accident prevention by all means. Also make sure to comply with all generally acknowledged rules and prescriptions on safety technique, industrial medicine and road traffic.

Strictly observe the indicated servicing intervals!

You avoid accidents, dispose the machine ready for operation and have got the manufacturer's warranty.



#### DANGER

**Danger by rotating blades of milling drum!**

**Danger because draw-in of the people in the milling drum.**

The milling drum runs after turn off the drive shaft!

- Do not come close to the running milling drum!
- If the universal drive shaft is driven, it must be ensured that nobody is in the danger zone.
- Before driving backwards: make sure no persons stay within the danger zone of both TBU and tractor! (Abbildung 2.2)
- In case of insufficient view: make sure there is a second person to assist you!



#### DANGER

**Drawing-in and crushing hazard during opening the protective cover of milling drum at the running machine!**

Inobservance of this guidance entails serious consequences to the health of persons and can cause severe bodily or fatal injuries.

- Do not open the drum drive at the running TBU 3P!
- Make sure that no person are in the work area, when the drive motor is started.





## DANGER

### Drawing-in and crushing hazard across moving discharge conveyor!

The moving discharge conveyor can cause serious injury.

Inobservance of this guidance entails serious consequences to the health of persons and can cause severe bodily or fatal injuries.

- Do not open the cleaning flap during operating of TBU 3P.
- Nobody may stay in the vicinity of the milling drum and the discharge area TBU 3P, if the drive shaft is running!



## WARNING

### Danger caused from flying parts during working

Danger to your eyes because throwing out of the particles and due to increased production of dust while operating the TBU 3P.



## NOTICE

Always wear appropriate safety glasses, therefore!



### Before first commissioning

## NOTICE

- 1 Read this operation manual.
2. Confirm that you have been instructed and introduced to the handling and operation of the machine and sign it by your own hand. For this purpose fill in the form provided with this manual and sign it.
3. Indicate the engine output of the tractor used and sign it with your own hand, too.
4. Verify if the prescribed axle load of your tractor will be complied with. Make sure the minimum admissible load allowed on the front axle will not be undershot, if necessary provide for corresponding ballast.



## 5.2 Transport

### NOTICE



#### Improper Transport

#### Damage due to improper transportation

Improper transport can lead to considerable financial damage.

In the case of the transport of the TBU those must be folded discharge conveyor in transport position. (See illustration 5.1).

In the case of transport of the machine on the road attach warning notices and lighting if necessary, in accordance with StVZO.

Illustration 5.1

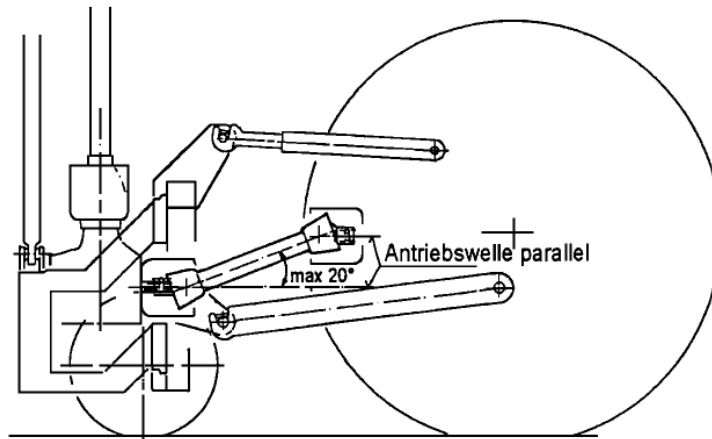


Transport position

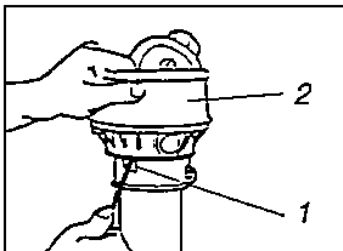
Working position

## 5.3 Before first commissioning: adjustment of the cardan shaft

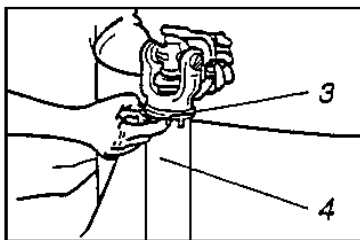
### 5.3.1 Adjustment of cardan shaft using a diagram



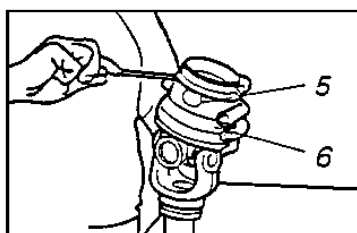
The cardan shaft must probably be shortened in length before it can be coupled to the tractor's live power take-off. Make sure thereby that the max. admissible joint shaft angle will not exceed the angle indicated in the diagram. In case the angle is exceeded, contact WILLIBALD first.



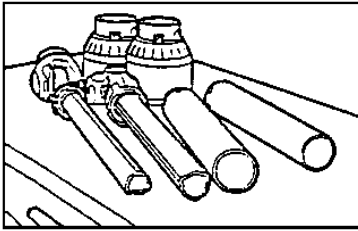
- Press the three fixing pins (1) locked in place in the thrust ring to the inside using a screw driver and disengage them.
- Remove the safety cone (2) that exists on the shaft, pull it away from the joint and take it off.



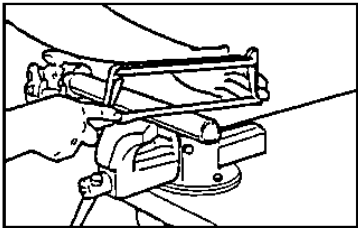
- Spread the friction ring (3) and remove it from the protective tube (4).
- Remove the protective tube from the shaft.



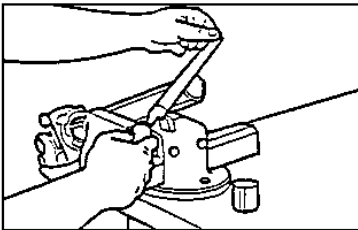
- Press the tongues of the friction ring halves to the inside (5) and remove the external yoke protection (6) by pulling it outwards.



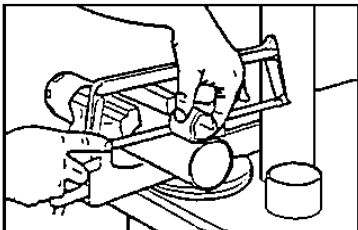
- All safety devices and protective gear are disassembled.



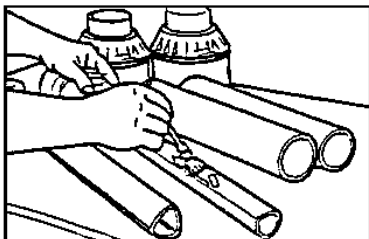
- Shorten the inside-profiled tube to the required length.



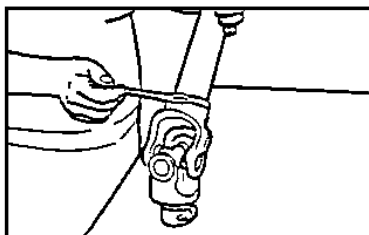
- Deburr the inside-profiled tube and remove the chips.



- Shorten the protective tubes by the same length as the sliding profiles.

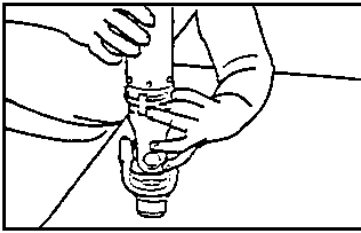


- Grease the inside-profiled tube.

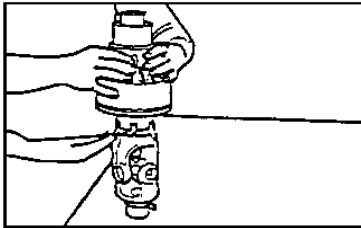


- Grease the raceway of the yoke.

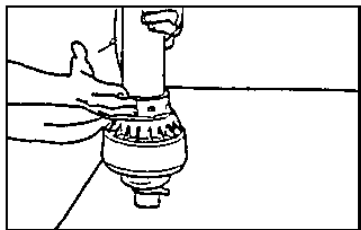




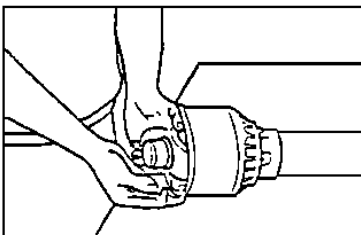
- Slip the friction ring on the shaft, then slip the protective tube on the shaft, too.
- Spread the friction ring and mount the protective tube underneath, so that the drill holes provided in the protective tube are positioned underneath of the respective claws of the friction ring.



- Slip the safety cone on the protective tube and align the position of the grease nipples.

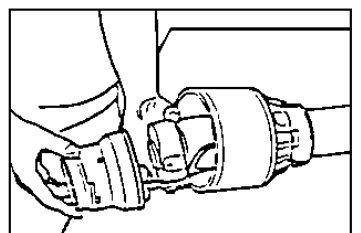


- Slip the safety cone on the protective tube and align the position of the grease nipples.
- Press the safety cone towards the articulated joint till the fixing cams of the friction ring fit into the corresponding mouths.



- Grease the raceways that exist in the external yoke.
- Place both friction ring halves into the raceways provided in the external yoke.

### 5.3.2 Mounting of the TBU 3P



- Adjust the external yoke protection exactly so that it is in the appropriate position above the thrust ring, press both tongues of the thrust ring halves to the inside and press the external yoke protection against the joint until the tongues engage in the external yoke area.

### 5.3.3 Mounting of the TBU 3P to the tractor

- Insert the TBU into the two lower connecting rods provided at the Kat III and after that lock it fast with the upper connecting rods.
- Remove cardan shaft from the suspension and mount it to the tractor's live power take-off.
- Make sure the holding chain is mounted properly!
- Connect the hydraulic lines to the double-action control system of the tractor.



## WARNING

### **Danger of injury due rotating parts!**

When mounting the TBU 3P to the tractor, can arise injuries caused by rotating parts.

- Damaged parts of the cardan shaft protection equipment, such as damaged safety flaps or rubber protections must not be used!

Any such parts are subject to controls and inspections performed by the employer's liability insurance association.

## 5.4 Setting up the TBU 3P



## DANGER

### **Danger caused from flying parts!**

### **Danger because draw-in of the people in the milling drum.**

During the milling of the windrow by the milling drum parts can be thrown out! The contact with the rotating milling drum leads to serious injury!

- Do not come close to the running milling drum!
- Do not come close to the running discharge conveyor!

## Setting up the TBU 3P involves the following steps

- Switch the control in the tractor to "passage".
- TBU 3P slightly raised via lateral adjustment slowly turn to the left.
- The TBU should be positioned next to the compost windrow, so that the milling drum can remove a material layer of about 50 cm depth while moving along a windrow of 3 m height (*working width*).
- The support wheels can be adjusted in height.

The wheels must be adjusted in such a manner, that the blade provided at the machine to feed runaway material to the milling cylinder is approx. 1 cm above ground level. For this purpose, lower the TBU by means of the tractor's hydraulic system until the stop is reached and uniformly adjust the height of the support wheels.

- Activate the live power take-off at the tractor: milling drum and conveying belt start moving.
- Lower the TBU down to the support wheels by means of the hydraulic system of the tractor.
- Now slowly drive alongside of the windrow. The courses are to be chosen on the tractor so that neither the tractor nor the TBU 3P be overloaded, and the material is completely converted to the new hire, and nothing remains lie.

**Deactivate the drive shaft when reaching the end of the compost windrow!**

## 6.0 OPERATION

### General safety information

The operation of the machine must be performed by trained personnel or by professional staff only.



### WARNING

#### Danger of incorrect operation

Improper operation can cause serious person or property damage.

- Make sure before starting work, all covers and safety devices are working properly.
- Never use safety equipment during operation except power.
- Ensure cleanliness and tidiness in the work area! Loosely superposed lying parts and tools are sources of accidents.

### WARNING



#### Danger of injury by improper replacement parts

Incorrect or faulty spare parts can cause damage, malfunction or failure and impair safety.

- No parts other than original **WILLIBALD** spare parts must be used to replace worn off wear parts. If otherwise, we cannot guarantee for the proper functioning and operating safety of the unit
- At all work described in Chapter 5.3 the tractor must be off and to make sure that the milling drum is stopped.

### DANGER



#### Danger due to rotating blades of milling drum!

The milling drum runs after turn off the drive shaft!

- Do not come close to the running milling drum!
- Before driving backwards: make sure no persons stay within the danger zone of both TBU and tractor! (Illustration 2.2)
- In case of insufficient view: make sure there is a second person to assist you!

Guiding plate



### 6.1 Adjustments

- The throwing distance of the TBU 3P can be modified by an adjustment of the guiding plate. At the beginning of a new windrow the throwing distance should be reduced, to quickly form a new heap.
- Slight changes of the milling drum r.p.m. and discharge conveyor speed can occur via motor r.p.m. of tractor.
- At the end of a milling path reduce the drive shaft speed, and switch off the drive shaft, lift TBU 3P easily and reset it.
- Start the new milling path as described here above.

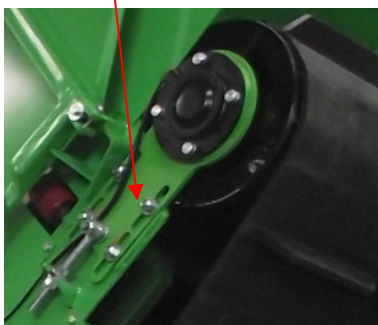


### 6.2 Checking of the discharge conveyor belt tension

Once daily check the discharge belt tension.

The conveying belt must not sag too much as it may otherwise rub on the base frame.

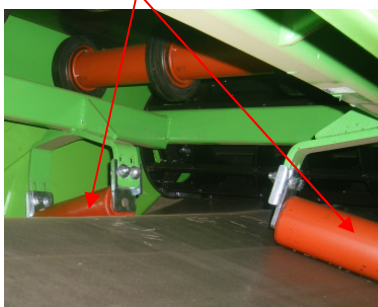
1. Tension plate



The belt run is adjustable:

1. At the end of the discharge conveyor by adjusting the upper guide pulley. Loosen the straining screws that exist at the upper deflection roller for this purpose and tighten the conveying belt by turning the straining screws. Retighten the counter-nuts subsequently. Tighten the straining screws consistently as the conveying belt may otherwise run untrue.

2. Slanting rollers



2. By rearrangement of the lower slanting rollers existing underneath of the belt.

## 6.3 Replacement of wear parts

### 6.3.1 Replacement of milling tools



#### DANGER

#### Danger due to rotating blades of milling drum!

The contact with the rotating milling drum leads to serious injury!

- Do not come close to the running milling drum!
- If the universal drive shaft is driven, it must be ensured that nobody is in the danger zone.

The milling tools must be replaced before their mountings get worn.

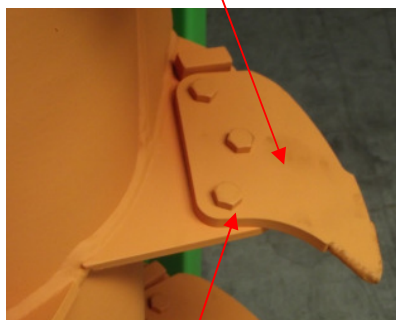
The tools of the milled drum be changed in the following steps:

Loose the nut from screws;

Remove the old tools and replace with new tools;

Fix the tools with screw and nut, tighten the screw with a tightening torque. Bolt torque is 101 Nm.

Milling tools



Screw

### 6.3.2 Replacement of milling drum drive power belt

#### DANGER

#### Drawing-in hazard by opening the protective cover of milling drum drive at the running machine!

Power belt must be changed at a standstill of the millinging drum only.

No care these suggestions can have duty effects of health, till vital wound with and without death result.



Power belt



The power belt of the milled drum drive be changed in the following steps:

- The drive shaft is switched off.
- The milling drum is stopped.

Caution! The parts are weighty!

- Open the protective case, before parts be unscrewed.
- Loose and pull out the screw.
- Hanging out the clutch cylinder.
- Press back the idler roll.
- Remove the used old power belts and fit new belts.
- Turn down the idler roll again.
- Sling the coupling cinder again.
- Check the distance between power belts and belt protection.
- Close the protection flap. Make the trial run.

**Take care the power belt does run absolutely well. It must not graze at the belt guides!**

### 6.4 Fault finding table

Fault / malfunction	Possible reason	Remedy
Work performance is low, engine of the tractor will strangled	Tractor performance is to low	Obtain the powerful tractor at least 90 KW (122 HP)
Milling drum is not running	Shear bolt broke on cardan shaft	Replace shear bolt
	Bushes at the drum shaft is too loose	Bushing tighten Tightening torque 35 Nm
	Power belt is too loose	Check the tension of power belt
Milling drum is running to slow	Bushes at the drum shaft is too loose	Bushing tighten Tightening torque 35 Nm
	Power belt is too loose	Check the tension of power belt
Discharge conveyor is not running	Chain in the chain case for loose or broken	Check the chain tension, replace possibly chain
	Bushing loose on the conveyor drive (sprocket)	Bushing tighten Tightening torque 35 Nm
Discharge conveyor is running to slow	Bushing on the conveyor drive are loose	Bushing tighten Tightening torque 35 Nm
Conveyor belt slides on the drive shaft	Tension of the conveyor belt to low	Tight the conveyor belt
Conveyor belt goes wrong and rubbing against the side guides	Top pulley of the conveyor belt is wrong, or lower slanting rollers are loose.	Set the locking screw of guide pulley straight. Tapered roller worn out

## 7.0 MAINTENANCE


### WARNING



#### Danger of injury due to improper maintenance

- Perform all maintenance work on the TBU 3P when the machine is stopped only.
- Make sure that the machine can not be started by unauthorized persons!
- Nobody may stay in the vicinity of the discharge area TBU 3P, if the cardan shaft is running!

While on duty, the TBU 3P is exposed to strong mechanic strain and to strong production of dust. Moving parts of the unit must be serviced at short intervals, therefore. Regular servicing improves and significantly extends the TBU 3P operating ability.

All greasing points are marked red. Press such a quantity of grease in till it emanates from the bearings to be greased. Thereby, the contaminated and used grease is pressed out of the bearing point together with the condensed water accrued there ( Chapter 7.4, Grease types).

Timely replacement of worn parts maintains the TBU 3P readiness for operation and contributes significantly to maintain its operational safety.

After the first 10 service hours, check all screws and bolts for tightness and from that point on check them each day and retighten them, if necessary.

The maintenance intervals indicated are based on a daily one-shift operation of the TBU 3P.

### NOTICE

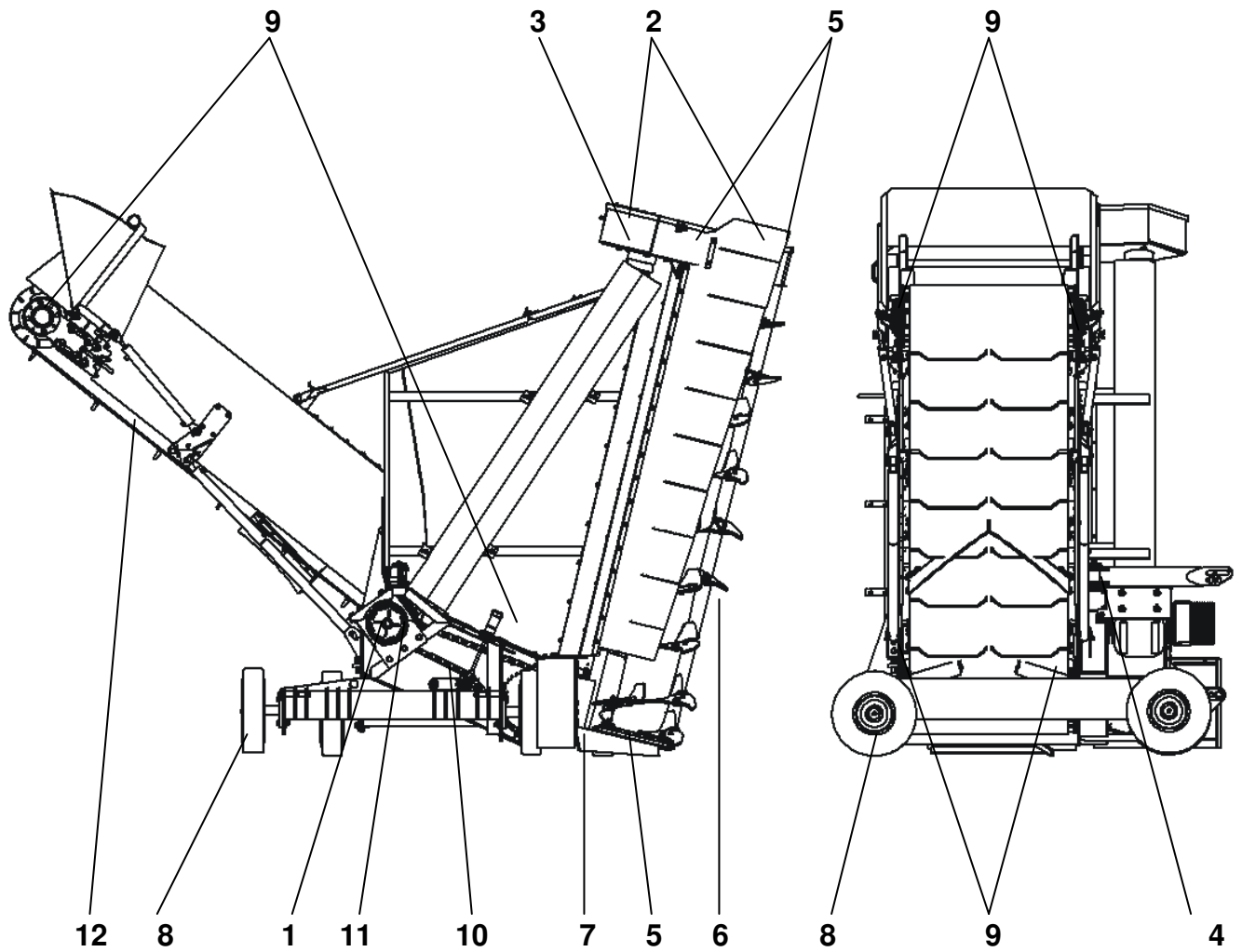
For the maintenance of the drive shaft is the separate operating instructions for the engine manufacturer's instructions.

This must be performed by an authorized service center.



Details for the lubrication can be found in the separate operating instructions of the manufacturer.





### 7.1 Maintenance points, maintenance intervals

Nummer	Wartungsstelle	Was ist zu tun?	Hilfsstoffe	Wartungsintervall
1	2 x cardan shaft	Lubrication	Roller bearing grease	Each day
2	Tension bushings at conveyor belt drive and milling drum	Check, Tightening, torque: 35 Nm		After the first 100 service hours, all 500 hours thereafter
3	Power belt	Tension check		After the first 10 service hours, all 20 hours thereafter
4	Lateral traverse	Lubrication	Roller bearing grease	All 20 hours
5	1 x drive bearing, upper and lower bearing of milling drum	Lubrication	Roller bearing grease	Each day
6	Milling tools	Visual control. Replacement in case of strong wear.		Each day before tool fixture gets attacked itself
7	Skid	Visual control. In case of strong wear: weld hard facing alloy on the part.		Each month
8	4 x support wheels	Lubrication	Roller bearing grease	All 20 hours
9	4 x bearing discharge conveyor	Lubrication	Roller bearing grease	Each day
10	Chain box	Checking of chains for tension, control of flow grease		All 50 hours
		Oil change	Gear oil, SAE 90	all 1000 hours or each year Filling quantity 7.5 l, Level 100-120mm
11	Angular gear	Check the oil level		All 50 hours
		Oil change	Fuchs Titan Supergear 85W 140	all 1000 hours or each year Filling quantity 10l, Level to mid of drive shaft
12	Discharge conveyor	Visual control, check tension and setting, clean laterally		Each day, if necessary several times daily

## 7.2 Hydraulic oil change

### NOTICE



#### Extinguishing the warranty claims due to non-approved operating supplies!

When using non-approved operating supplies will extinguish the warranty claims.

- Use the authorized fuels use only.
- Make sure to comply with the instructions of the respective hydraulic oil producer when replacing mineral oil by bio oil or vice versa.
- Before replacement of the complete hydraulic oil, please contact our service department. (👉 Chapter 7.6, Service addresses)

Before replacement of the complete hydraulic oil, please contact our service department. (👉 Chapter 7.6, Service addresses)

After 5 - 10 service hours check all screwed connections of the hydraulic system for tightness and retighten them, if necessary

## 7.3. Oil filling amounts for the gears

Angular gear	10 l	Megol Hypoid-Getriebeöl GL5 SAE 85W-140
Chaine drive	max 7,5 l	Mequin Getriebeöl CLP 320

Gear oils: It should be used oils with viscosity 320 mm<sup>2</sup>/s at 40 °C only

## 7.4 Grease types to be applied

The roller bearing grease types should be used basically, which the application of temperature ranges are from - 20 °C up to + 135 °C only.

The NLGI no. for penetration is: "2"(no liquid grease).

Do not use the liquid grease for central lubrication system.

Producer type

Autol            Top 2000  
Meguin Langzeitfett C2LP



## 7.6 Service addresses

J. Willibald GmbH  
Maschinenfabrik  
Bahnhofstraße 6  
D- 88639 Wald - Sentenhart  
Tel.: +49 (0) 7578 / 1890  
Fax: +49 (0) 7578 / 189150  
E-Mail: [info@willibald-gmbh.de](mailto:info@willibald-gmbh.de)  
[www.willibald-gmbh.de](http://www.willibald-gmbh.de)

Service & Instandsetzungszentrum  
Im Wolfgraben 5  
D-36414 Unterbreizbach  
Tel: +49 (0) 3 69 62 / 5 14 10  
Fax: +49 (0) 3 69 62 / 5 14 18  
E-Mail: [info.ubba@willibald-gmbh.de](mailto:info.ubba@willibald-gmbh.de)

## 8.0 REPAIR

### WARNING



#### Danger of injury due to improper repair

Improper repair can caused serious personal injury and property damage.


- Maintenance work on the TBU 3P must be carried out when the tractor and the milled drum are stopped only!
- Nobody may stay in the vicinity of the milling drum and the discharge area TBU 3P, if the drive shaft is running!

### NOTICE



#### Property damage caused by incorrect repair

In case of inobservance of the above items we deny assuming any claims for guarantee services and refuse to assume any liabilities in the event of personal injury and/or damage to property.

- Make sure all working cycles are strictly complied with in the prescribed order. Unauthorized manipulations of devices prohibited.
- No other than as the fuels and process materials listed herein must be used.
- Apply original spare parts only, do not use any parts other than those listed in the spare parts list.
- All maintenance works beyond those described in Chapters 6.3 and 7.0 must be cleared and discussed with the competent service agency first ( Chapter 7.6 Service addresses).

## 9.0 PUTTING THE MACHINE OUT OF ACTION

The decommissioning and recommissioning of the TBU 3P may be performed by trained personnel only.

### WARNING



#### Danger of injury due to improper works

Improper works can cause serious personal injury and property damage.

- Make sure that the motor can not be started by unauthorized persons!
- All bearings must be greased after washing the machine.
- See the drive shaft operation manual.

## 10.0 DISPOSAL

### CAUTION



#### **Environmental hazard by incorrect handling**

At an incorrect handling of environmentally hazardous substances, especially at a incorrect disposal, significant damage can occur to the environment.

- Observe always the below prescribed information.
- When accidentally get environmentally hazardous substances reach into the environment, take immediate and appropriate action. When in doubt, you must inform the responsible local authority of the loss.

The following environmentally hazardous substances are used:

#### **Lubricants**

Lubricants such as greases and oils contain toxic and environmentally hazardous substances. They must not be released into the environment. Disposal must be made by a waste disposal contractor.

#### **Hydraulic oil (from tractor)**

Hydraulic oils contain toxic and environmentally hazardous substances. Hydraulic oils must not enter drains. Avoid the intrusion into surface and groundwater as well as ground.

When leakage of absorbent material, collect this and dispose at suitable refuse site. Do not use water.

#### **Old parts and wear parts**

Old parts, as well as wear parts are subject to the mandatory inclusion in the current value of waste disposal.

At maintenance and repair work of all lubricants must not seep into the ground or the sewer.

## 11.0 Instructions for ordering of spare parts

Use the exclusive original WILLIBALD - spare parts only.

Our approved original spare parts are checked by us and thus have the suitable conditions for the use of the machine only.

For these parts, the reliability and safety has been established. For other products, we cannot do this, despite ongoing market monitoring to judge, and cannot vouch for it.

### WARNING



#### Danger of injury by improper replacement parts

Incorrect or faulty spare parts, in particular wear parts can cause damage, malfunction or failure and impair safety.

- Use Willibald-original spare and wear parts only.

### NOTICE

Orders for spare parts must be provided to and placed with the competent dealer and must contain the following particulars:

1. Machine type and machine no.
2. Part number and description of the required individual part.
3. Quantity of the desired spare parts
4. Indication of shipment address and postal code.
5. Desired way of shipment

***The vehicle identification plate is attached on the front right at gear of the machine.***



Information on hydraulic components:

In case hydraulic components of the machine must be repaired we recommend and advise to replace complete components only.

The illustrations shown in the spare part list will not always correspond exactly to the original spare parts, as parts may have changed due to technical advancement after completion of the list.

When ordering parts, the part number of which cannot be determined safely, a sample piece must be provided to WILLIBALD to avoid delivery of wrong parts.

If no demand to return said samples is made, these will be scrapped.

**Timely repair of the machine saves time and money!**



## 12.0 General terms and conditions J. Willibald GmbH Maschinenfabrik, 88639 Wald-Sentenhart

### I. Payment and late payment

1. The invoice amount becomes due on the day after the invoice date; our invoices are due for payment within 8 days, of the invoice date, or according to the individual terms of payment mentioned on the invoice in question.
2. If payment of an invoice becomes overdue, we will charge interest at 8% (per year) above the bank rate of the German Central Bank from the due date. Payment is considered to be late after the 30th day after the invoice date and there will be no special reminder.
3. If part payments have been agreed, the total remaining sum will become due for payment immediately - without taking into consideration the due date of any bills of exchange- if
  - a) the purchaser, who is a non-trader, will be totally or partly in arrears with a minimum of two back-to-back instalments and if the amount which is in arrears is minimum 1/10 of the purchase price.
  - b) the purchaser, who is a trader, will be 14 days in arrears with one instalment, or if he stops payment, or if composition or bankruptcy proceedings are applied to his assets.
4. Payment instructions, cheques and bills of exchange will be accepted for payment but collection and discount charges will in this case always be applied.
5. The purchaser may only offset against our claims if he has valid title or if his counter-claim against us is undisputed. Any right of retention for the purchaser, who is trader, is excluded and a claim can moreover only be lodged in so far as the claim is based on the contract of sale in question.
6. If the purchaser is in arrears with payments, where part payments have been agreed with arrears of two back-to-back instalments, we can without prejudice assert our rights under Section II and give written notice of a period of grace of 14 days with the declaration that after the expiry of this period we can decline the completion of the contract by the purchaser. If the period of grace expires without a successful outcome, we are entitled to give written notice that we are withdrawing from the sales contract or to claim for compensation due to non-fulfilment.

### II. Retention of title

1. Until the settlement of bills outstanding from the contract, the object of the contract is our property. The retention of title also applies to all bills outstanding, which we have against the purchaser in connection with the object of the contract, for example because of repairs or spare parts deliveries as well as other services, which have been purchased subsequently.  
On request from the purchaser we are bound to abandon the retention of title if the purchaser has paid all bills outstanding in connection with the object of the contract and if for the remaining bills outstanding in the current business relationship otherwise adequate collateral exists.  
As long as the purchaser is meets his obligations out of the retention of title and is not in default of payment, he is authorised during the period of the retention of title to own and use the object of the contract. If the purchaser is in default of payment or if he does not meet his obligations out of the retention of title, we can demand the return of the object of the contract (even in part) from the purchaser and after written notice with a appropriate period, dispose of the object of the contract at the best possible price through private sale, making a charge for the disposal against the purchase price.  
All costs of taking back and disposal of the object of the contract shall be borne by the purchaser. This shall, if there is no evidence, be 10% of the revenue from the disposal, including purchase tax. If we can provide evidence of higher costs, or if the purchaser can demonstrate lower costs, then they must be set higher or lower. The proceeds will be credited to the purchaser, after deduction of costs and other receivables incurred by us out of the contract of sale.
2. For the period of retention of title, the purchaser undertakes to use the object of the contract carefully, to carry out services as scheduled and to take prompt action when repair work is necessary. As far as our ownership through a connection with a different product expires, it is agreed, that the customer's (co-) ownership of the same item will pass to us as a proportional value of the invoice amount. Our prior consent is required for pledges or transfers by way of security to a third party. The receivables accrued to the purchaser out of the resale or out of any other cause in law concerning the reserved goods are to be surrendered to us in full as a precaution. This must be disclosed to the third-purchaser.

### III. Delivery and default in delivery

1. Delivery dates or delivery periods, which may be agreed as binding or non-binding, must be submitted in writing. Delivery periods start with the signing of the contract. In the event of subsequent alterations to the contract, a new delivery date or period must be agreed at the same time..
2. In case of non-binding delivery periods, the purchaser is may make a request in writing that we should deliver within an appropriate period. Once this period expires, we are in default. Only if there is a charge of intent or gross negligence against us, may the purchaser claim compensation for the delay in addition to delivery.  
In the event of default the purchaser may give us a fair period of grace, in written form, notifying us that he will, after expiry of the period of grace, decline acceptance of the object of the contract. After expiry of the period of grace without a successful outcome the purchaser may withdraw from the contract in writing or claim compensation for non-fulfilment. In the event of late delivery due to slight negligence, compensation for the purchaser is restricted to a maximum of 10% of the purchase price. If the purchaser is a legal entity in public law, a separate estate under public law or a trader, for whom the contract is part of the operation of his business, he is only entitled to make a claim if there is intent or gross negligence on our part. In the cases described in this paragraph, any claim for delivery is excluded.  
If when we find ourselves in arrears it is impossible to make a delivery, we would then notwithstanding be liable under the terms of Paragraphs 1 and 2, unless the damage would also have occurred in the event of a timely delivery.
3. If we overrun a binding delivery time/period we are already in default. In this case, too the rules of default stipulated in Item 2 above, shall apply accordingly.
4. After notification of readiness to make delivery has been received, the purchaser is bound to accept the object of the contract at the latest within 14 days. Within this period he has the right, to inspect the object of the contract at the agreed place of acceptance.  
If the object of the contract shows serious defects, which must be reported in the above mentioned 14-day period, that cannot be completely put right within a further 14 days, then, the purchaser may refuse to accept. If the purchaser does not observe the contractual acceptance period we can set a period of grace of a further 14 days, with the mention that we will decline any acceptance after expiry of this period. We are entitled, after unsuccessful expiry of the period of grace, to withdraw from the contract in writing or to claim compensation due to non-fulfilment. In the event of a final refusal from the purchaser, or if it is manifest that in case of a period of grace he still would not be able to pay the purchase price, a notification of readiness to make delivery and the setting of a period of grace, are not required.
5. In the event of a delay in acceptance of delivery we claim compensation of 15% of the purchase price. If the purchaser can provide evidence for a lower claim or we can provide evidence for a higher claim, the amount of compensation must be set higher or lower.
6. In the event of a delay in acceptance we are entitled to dispose of the object of the contract as we wish and within an appropriate period deliver an equivalent object of the contract to fulfil the terms of the contract.
7. Force majors, rebellion, strike, lockout and extensive breakdown through no-one's fault shall cause delivery dates and delivery periods to be changed by the duration of the interruptions brought about through these circumstances.

### IV. Changes to the object of the contract

We reserve the right to make changes during the delivery period to the design or shape, and to vary colours as well as to make changes to the scope of delivery provided the object of the contract is not changed extensively and the changes are acceptable to the customer. The figures and the specifications in catalogues and brochures are therefore without obligation. Details in valid descriptions on conclusion of a contract are subject matter of the contract; they are to be considered as approximate and do not describe guaranteed qualities. They serve as standard for identification of the correctness of the object of the contract.

### V. Liability

Our liability, regardless of on which legal ground is restricted to cases of culpable cause, also by our legal agent or assistant. In cases of intent or gross negligence we are liable without restriction to the purchaser according to the stipulations of Product Liability Law.  
In the event of slight negligence our liability is subsidiary to any social security benefits, private accident insurance or private property insurance. If these insurance policies do not completely cover our liability then we are also liable in cases of slight negligence, but this is limited to a maximum of 10 % of the contract price. Depreciation of the object of the contract; loss of use and loss of profit will not be replaced in the context of liability for slight negligence. The same applies for damages caused by rectification of defects.  
The warranty rights of the purchaser are unaffected by this.  
The purchaser must notify us in writing of damages and losses for which we are answerable and create the opportunities for us or a third party specified by us to deal with them accordingly.  
The liability of our legal agents, assistants and employees towards the purchaser are limited to cases of intent and gross negligence.

### VI. Place of performance and delivery

Delivery is always made at the risk of, and in the case of ex works deliveries also on the account of, the ordered or recipient. Unless there is an arrangement to the contrary, Wald-Sentenhart is the place of performance.

### VII. Warranty

We guarantee that the current state of technology of the appropriate type for the object of the contract will be free of faults for 6 months in the case of used machines, 12 months for new machines from the time of delivery, assuming one-shift operation.  
The warranty calls for compliance with the agreed terms of payment. It includes the replacement free of charge ex-works of all parts that are found to be unserviceable during the warranty period when used properly in one-shift operation due to material defect, design fault or defective execution. Natural abrasion is excluded from this warranty.  
For processing of the claims by the purchaser for the rectification of defects, it is agreed that claims will be asserted at our company or at the local Willibald-agency through which the object of the contract was purchased. The company against whom the claim is made must be notified in writing of the defect immediately if it is discovered or the company must be allowed to record it for itself.  
If additional specified servicing becomes necessary because of the rectification of defects, the costs will borne by us, including the cost of any materials and lubricants required.  
The parts installed during the rectification of defects are guaranteed until the expiry of the warranty period for the object of the contract on the basis of the contract of sale. Any extended guarantee beyond that is excluded.  
In the event that the object of the contract is not serviceable as a result of a defect covered by the warranty, the purchaser must contact our nearest authorised workshop. This company will decide if the necessary work will be carried out on the spot or in a work shop. In the latter case the purchaser will not be charged towing costs  
If a defect cannot be rectified or if the purchaser finds further attempts to rectify the defect are unacceptable, he may request conversion (cancellation of the sale contract) or contraction (reduction of payment) instead of the defect rectification. He does not have the right to request a replacement; however we can specify that we will deliver by way of compensation a service of equal performance in place of the object of the contract originally delivered.  
Change of ownership of the object of the contract does not affect the obligations under the warranty.

Incorrect handling, failure to report damage, the hindrance of opportunities to rectify defects, overuse of the object of the contract, repairs and maintenance carried out by unauthorised companies, installation of parts from other companies, which we have not approved for use, unauthorised changes to the object of the contract and offence against duty of care are excluded from our warranty.

In the absence of guaranteed qualities, any claim for compensation because of non-fulfilment remains unaffected.

Existing warranty claims lapse on expiry of the warranty obligations according to No. 1. For claims asserted within the warranty period, but where the fault has still not been rectified, the warranty will apply until rectification of the same. The limitation period is put back to this extent for this fault.

There can be no further warranty claims, in particular for compensation for consequential damage caused by defects and further claims arising from a definite default in performance of contract, unless there is liability insurance.

### VIII. Written form

All contracts are not deemed to have been concluded until they have been confirmed by us in writing. This also applies to subsidiary agreements and confirmations as well to subsequent contract changes. Sales conditions that conflict with our terms of payment and delivery are only valid if we have expressly stated in writing that we are in agreement with these; otherwise we herewith agree that our general terms and conditions shall have priority.

The transfer of rights and duties arising out of the contract require our written agreement.

### IX. Court of Jurisdiction

The court of jurisdiction shall the District Court in Constance/Local Court in Überlingen. This court of jurisdiction applies for all current and future claims arising out of the business relationship with full traders, including bills of exchange and cheque receivables.

The same court of jurisdiction applies if the purchaser does not have a general court of jurisdiction in his own country, or if after conclusion of the contract he changes his residence or usual domicile in his own country or if his residence or usual domicile is unknown at the time when the claim is lodged.

### X. Other agreement/ruling in individual cases

The general business and delivery terms of our current contracting partners shall not have any effect in reciprocal relationships, unless this was confirmed by us individually in each case when the contract was concluded.