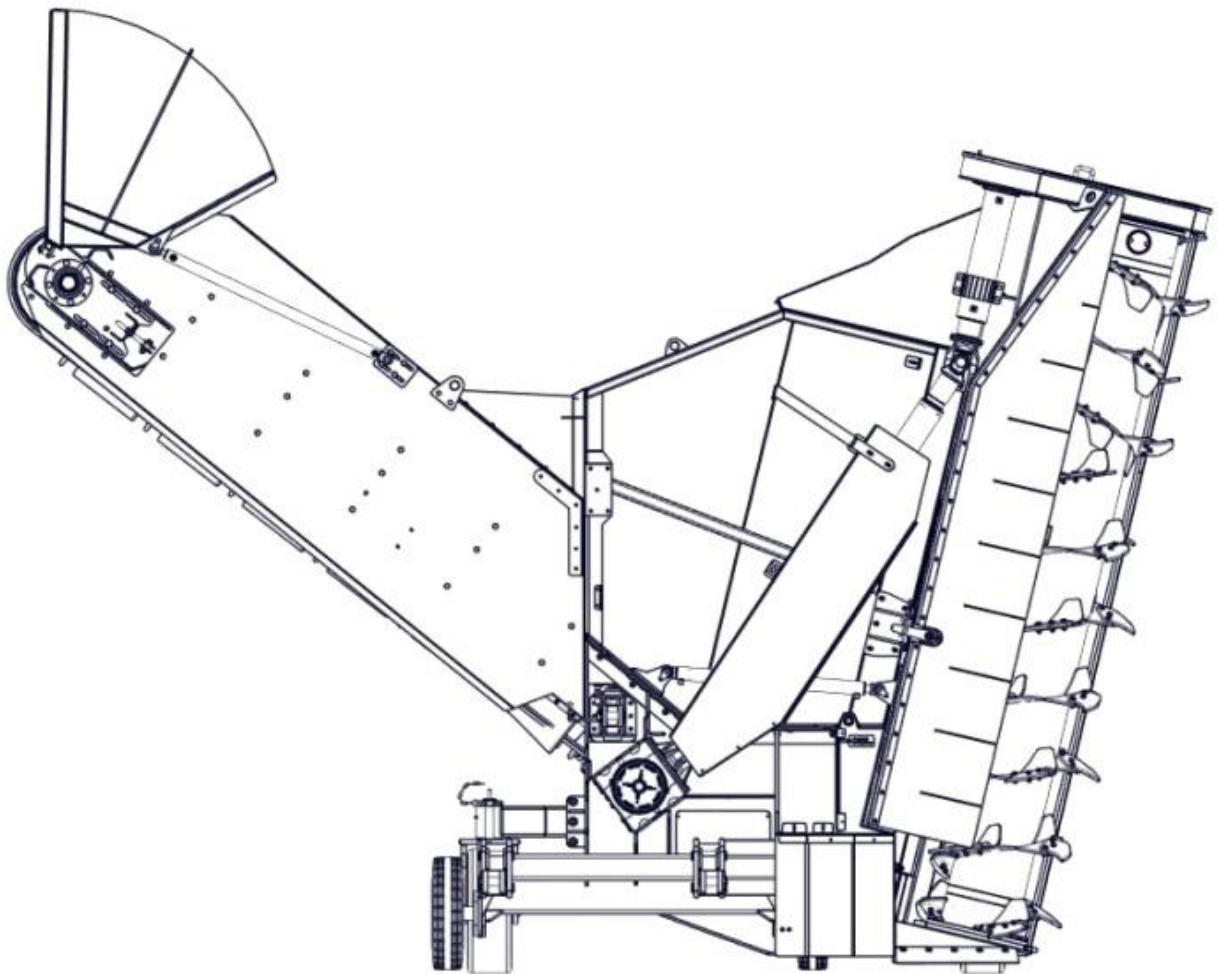


OPERATING MANUAL

Compost Windrow Turner

TBU XL



TRANSLATION OF ORIGINAL OPERATING MANUAL

Important safety notes

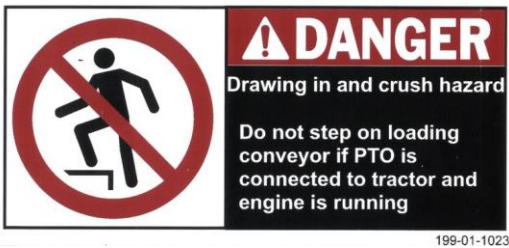
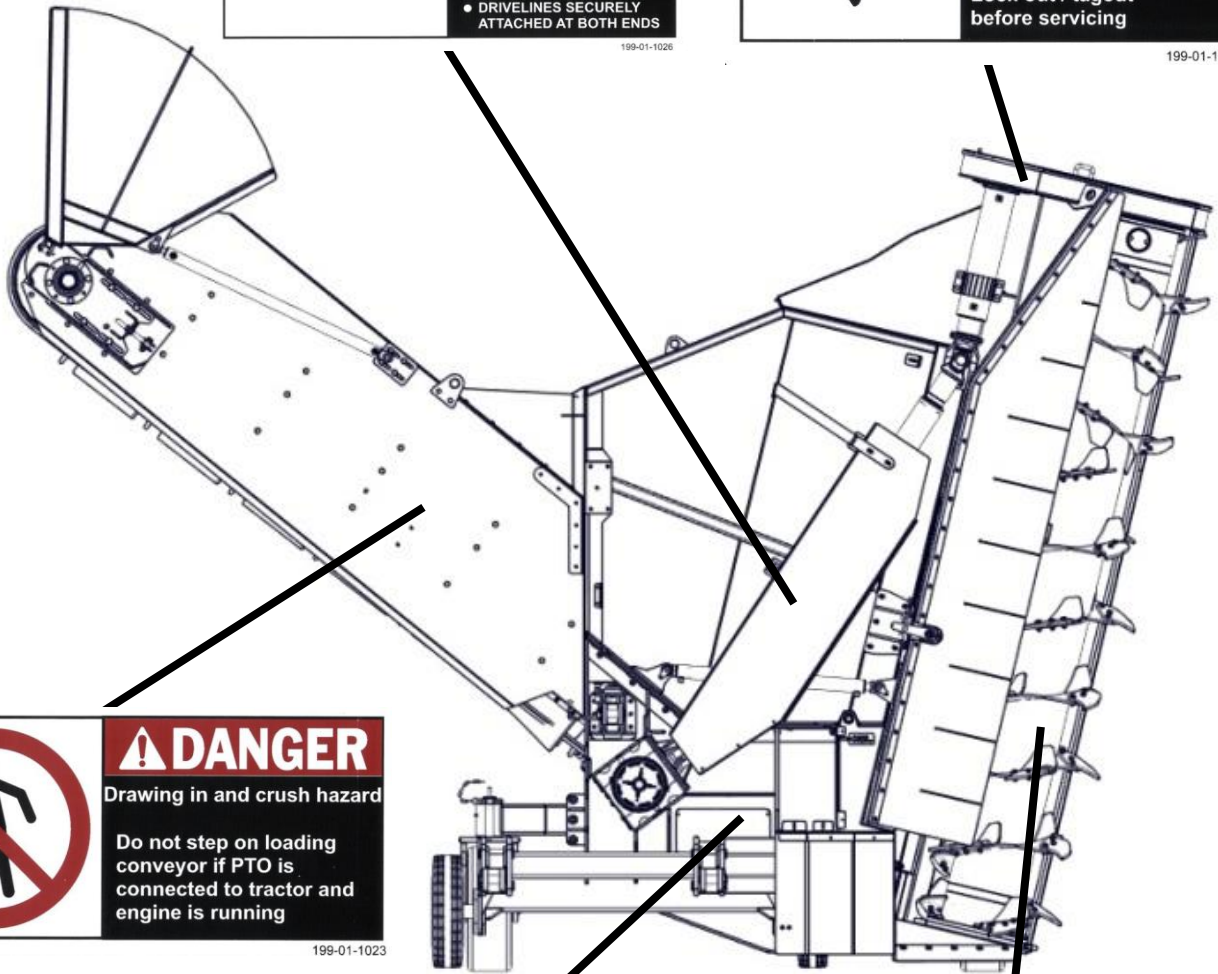


- This manual is part of the machine. Keep it in a safe place and pass it on along with the machine;
- Read this manual in order to be able to use the machine properly and to protect yourself against residual risks;
- The operating personnel must have access to the operating manual at all times;
- Observe all the warning signs;
- Have maintenance and repair work done only by qualified personnel.

Intended Use

Use the machine only in the manner and for the purpose described in this manual.

Safety decals - implement; replace immediately if damaged



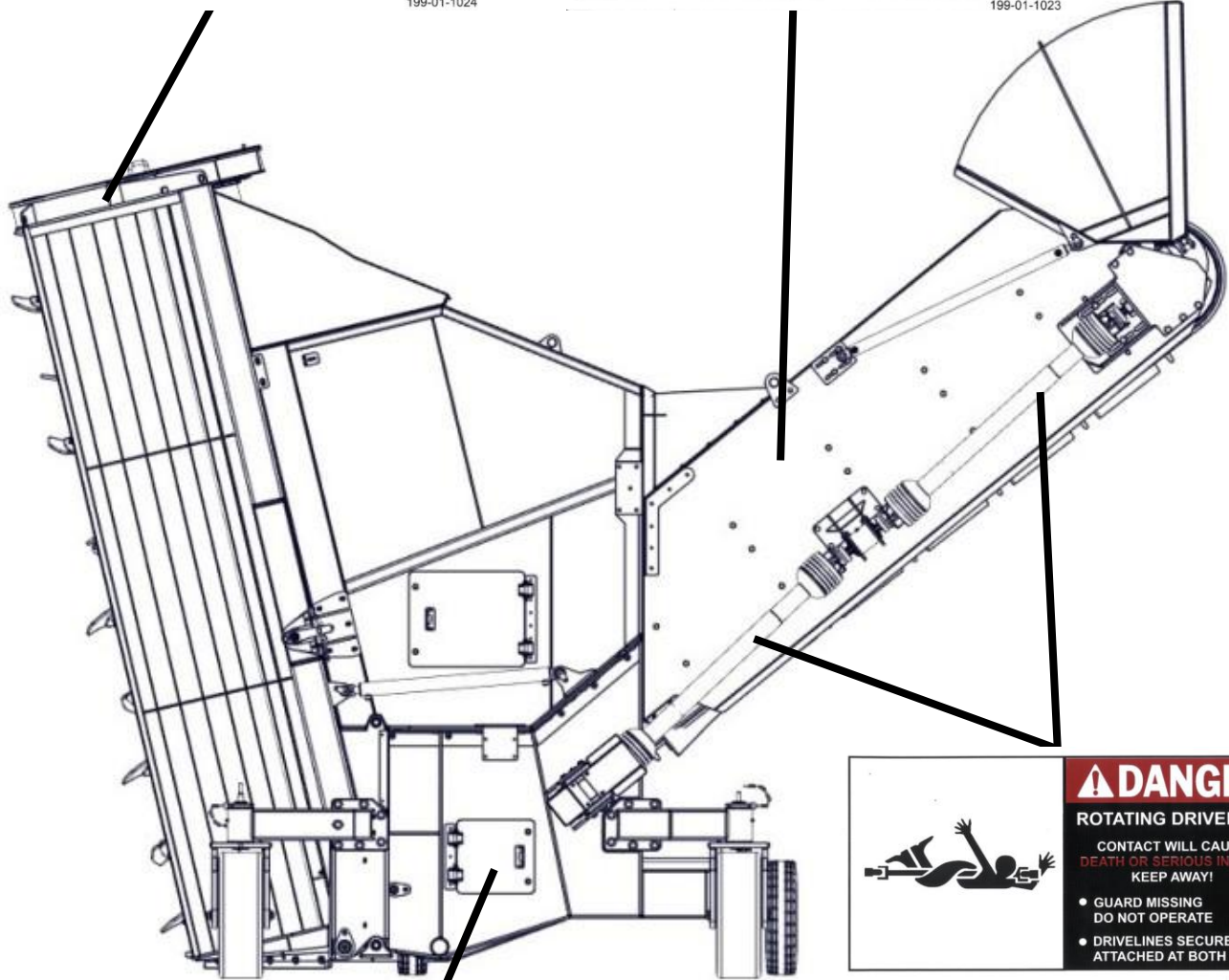
Safety decals - implement; replace immediately if damaged



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PRODUCT IDENTIFICATION

Machine type : TBU XL
 Year of manufacture :
 Machine no. :
 Chassis no. :

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

Dealer address :

After-sales service address :

The rating plate is affixed to the front right of the machine gear.



1.0 GENERAL

1.1 Explanation of Symbols

Warnings are indicated by symbols in this operating manual. Always observe the warnings and act cautiously to avoid accidents, injury and property damage!

DANGER



This symbol indicates an immediately dangerous situation which will lead to death or severe injury if the safety precautions are ignored.

WARNING



This symbol indicates a potentially dangerous situation which can lead to death or severe injury if the safety precautions are ignored.

CAUTION



This symbol indicates a potentially dangerous situation which can lead to slight or minor injuries if the safety precautions are ignored.

NOTE

NOTE

This symbol indicates possible property damages which can occur if the safety precautions are ignored.

This symbol indicates important information for proper handling of the machine.



Under this symbol you will find tips for use and particularly useful information.

This helps you to use all the machine functions optimally.

1.2 Notes on the Operating Manual



Read and observe the information and safety notes in this operating manual *before* putting the machine into operation.

- Knowledge of the basic safety notes and safety regulations is a prerequisite for safe handling and trouble-free operation of this machine.
- This operating manual contains all the important information for safe operation of the machine.
- This operating manual and especially the safety notes must be observed by all individuals who work on the machine.
- In addition, the rules and regulations for the prevention of accidents valid for the application site must be observed.

1.3 Owner Obligations

The owner is obliged only to allow individuals to work on the machine who

- are older than 18 years.
- are familiar with the basic regulations regarding work safety and accident prevention and instructed in the handling of the machine.
- have read and understood the safety chapter and the warnings in this operating manual and have confirmed this with their signature.
- The safety-conscious working of the personnel will be checked at regular intervals.

1.4 Personnel Obligations

All persons deployed to work on the machine undertake before beginning work:

- to observe the basic work safety and accident prevention regulations
- to read the safety chapter and the warnings in this operating manual and confirm by signing that they have understood them.

1.5 Warranty and Liability

Our “General Terms of Sale and Delivery” apply basically. See page 75. These are available to the owner since conclusion of contract at the latest. Warranty and liability claims for personal and property damages are excluded if they are due to one or more of the following causes:

- Use of the machine not for the intended purpose,
- Improper installation, commissioning, operation and maintenance of the machine,
- Operation of the machine with defective safety devices or improperly fitted or defective safety and protection devices,
- Failure to observe the instructions in the operating manual regarding transport, storage, installation, commissioning, operation, maintenance and setup of the machine,
- Not using original spare parts (Willibald parts),
- Unauthorized constructional modifications of the machine,
- Unauthorized modifications of the TBU XL (for example, drive conditions: output and speed),
- Deficient monitoring of machine parts that are subject to wear,
- Incorrectly executed repairs,
- Incidents due to influence of foreign bodies and force majeure.

1.5.1 Warranty and Goodwill Claims

- a) Warranty and goodwill claims must be put in writing. Our warranty and goodwill claim form must be used.
- b) Parts and units that are to be replaced under the terms of the warranty must be sent to us for examination without special demand 4 weeks after the damage occurred at the latest and *free of charge*. Warranty work must be notified to us and approved in writing before execution.
- c) Spare parts and units ordered from us are always charged regardless of whether or not they are required for warranty work. A credit note can only be issued after examining and acknowledging the appropriate warranty and goodwill claim.
- d) Transport damages are generally not our responsibility;
- e) Warranty or goodwill claims should reach us 2 weeks, at the latest 4 weeks, after occurrence of the damage. Claims that are received later will only be processed by prior agreement.

1.5.2 Acknowledgment and Payment

Upon acknowledgment of a warranty or goodwill claim we will pay:

- a) components that appear necessary in our discretion and within the scope of our business obligations,
- b) the work expenses necessary in our discretion for replacement of the parts replaced under the terms of the warranty,
- c) the travel expenses necessary in our discretion but only when the customer cannot reasonably be expected to visit the after-sales service workshop,
- d) maintenance work and the associated work expenses are not covered by our warranty. This also includes neglected maintenance work that has caused machine damage and is rectified in the course of warranty work,
- e) It generally applies: Only WILLIBALD original spare parts may be used.

1.5.3 Separate Agreements

Warranty agreements deviating from these cited warranty and goodwill conditions must be put in writing.

Warranty periods for WILLIBALD machines:

- a) The warranty period is 6 months from the date of delivery.
- b) The warranty for purchased parts such as drive components, hydraulic cylinders or the conveyor belt, etc. can only be accepted insofar as we can claim and will be granted warranty against and by the supplier of the external products.
- c) Excluded from the warranty are wearing parts such as: rubber covers, milling tools.

1.6 Copyright

The copyright to this operating manual is owned by J. Willibald GmbH. This operating manual is intended only for the owner and his personnel.

It contains regulations and instructions which may be neither wholly nor in part:

- reproduced
- distributed or
- otherwise disclosed

Violations will be liable to prosecution.

Wald-Sentehart,

J. WILLIBALD GmbH
Recyclingtechnik

2.0 SAFETY NOTES



Read the operating manual!

All individuals who use, service, maintain or inspect this machine must read and observe this operating manual to avert dangers.

- Knowledge of the safety notes and safety regulations is a prerequisite for safe handling and trouble-free operation of the machine.
- Failure to observe the handling instructions and safety notes contained in this manual could constitute considerable risks.
- Read this chapter carefully before working with the machine! Always observe the notes and warnings described!
- Individuals who operate and maintain the machine must have been instructed by specialists! Your safety and the safety of other persons depends on how you maintain and operate this machine.

2.1 Owner Responsibility

- The machine is used commercially. The owner is therefore subject to the legal obligations regarding work safety.
- The owner shall ensure that all staff working on or with the machine have read and understood the operating manual.
- The owner is responsible for ensuring that the machine is always in a perfect technical condition.
- The owner is responsible for ensuring that the machine is serviced according to the service intervals.
- The owner must regularly inspect that all safety devices are intact and in perfect working order.

2.2 Intended Use

The TBU XL compost windrow turner is designed and built exclusively for turning pre-shredded organic material and may only be used for this purpose!

Any other use above and beyond this shall be considered improper use.

J. Willibald GmbH will not be liable for any damages resulting from this.

Intended use also includes observation of all instructions in the operating manual and compliance with the prescribed inspection and maintenance work.

Unauthorized modifications to the machine will exclude liability for any resulting property damages and personal injury.

DANGER



Danger due to use not for the intended purpose

Any use of the machine above and beyond the intended purpose can lead to dangerous situations and annulment of the operating license.

The machine must only be used for the intended purpose.

Danger due to improper use

NOTE

Improper use of the TBU XL can lead to major machine damage which could also affect the safety devices so that the safety of persons can no longer be ensured by the owner.

The TBU XL may especially not be used for:

- turning building rubble
- turning scrap metal and other metal parts
- turning ceramic waste

2.3 Personnel Requirements

2.3.1 Qualifications



CAUTION

Risk of injury if inadequately qualified!

Improper handling can lead to considerable injury and property damage.

Therefore: all activities may only be performed by individuals with the described qualifications.

- **Instructed personnel** are individuals who have been briefed regarding the tasks assigned to them and potential hazards resulting from improper conduct.
- **Specialists** are individuals whose technical training, knowledge and experience as well as familiarity with the pertinent regulations allow them to perform the assigned tasks in a professional manner.
- **Operating personnel** are individuals who are responsible for the installation, operation, setup, maintenance, cleaning, repair or transport of machines.

2.3.2 Personnel Training

WARNING



Danger for unauthorized persons

Unauthorized persons who do not meet the requirements described here are not aware of the dangers in the work area.

- Only trained and instructed personnel may work on the machine.
- The personnel responsibilities must be clearly defined for installation, commissioning, operation, maintenance and repair.
- Personnel under training may only work on the machine under supervision by an experienced individual.

2.4 Personal Protective Equipment

Personal protective equipment must be worn when handling the machine or its components to minimize health hazards.

Therefore, put on the respective prescribed protective equipment before all work and wear it throughout!

- The necessary personal protective equipment must be provided by the owner.
- All available safety devices must be inspected regularly.
- Always wear the personal protective equipment necessary for the respective work during work.
- Observe the signs for personal protective equipment in the work area.

Hard hat



For protection against falling and flying parts.

Eye protection



To protect the eyes against flying parts.

Ear protection



To protect against hearing damage due to noise.

Safety shoes



To protect against heavy falling parts and slipping on slippery surfaces.

Safety gloves



To protect hands from rubbing, grazing, stabbing or deep injuries as well as touching hot or caustic parts or fluids.

2.5 SAFETY NOTES and Potential Risks when Handling the Machine

2.5.1 Safety Measures in Normal Operation

- Only operate the machine with all protective device is full working order.
- Make sure that no-one is in danger from the starting machine before switching on the machine.
- Inspect the machine for external signs of damage and proper functioning of the safety devices at least once per shift.

2.5.2 Machine Control

NOTE**NOTE**

Risk of property damage due to incorrect handling of the control

- Only instructed personnel are allowed to operate the control.

2.5.3 Hazards due to Hydraulic Energy

WARNING

Lethal danger due to hydraulic energy

Hydraulic energy can cause severe to even fatal injuries.

Hydraulic fluid can escape at high pressure from individual damaged components.

- Only specialists with special knowledge and experience in hydraulics may work on hydraulic devices.
- Depressurize system sections and pressurized lines to be opened before starting repair work.
- Replace hydraulic hoses at reasonable intervals even if no defects relevant to the safety are visible.

2.5.4 Escape of Harmful Gases and Vapors

WARNING



Hazard from escaping harmful gases and vapors

The windrow turner is towed by a tractor. This can emit harmful gases and vapors during operation.

- The windrow turner may not be operated in enclosed spaces.

2.5.5 Machine Noise

WARNING



Hearing damage due to noise

The sound pressure level emitted by the machine is approx. 83 dB (A).

A higher sound pressure level can occur depending on local conditions which can cause hearing difficulties.

- The sound pressure level emitted by the machine is underneath the tractor.
- A higher sound pressure level can occur depending on the tractor which can cause hearing difficulties.
- In both cases, the operating personnel must be protected by the appropriate protective equipment and protection measures.



2.5.6 Maintenance and Service, Troubleshooting

WARNING



Risk of injury due to improper maintenance, inspection and repair work!

The TBU XL must be unhitched from the tractor for all maintenance, inspection and repair work.

- All maintenance work must be performed according to the maintenance schedule;
- Observe all time intervals or reaching of a certain number of operating hours;
- Perform prescribed setting, maintenance and inspection work as scheduled and enter in the list on page 64,
- Inform operating personnel before starting maintenance and service work,
- Secure all upstream and downstream system parts and operating media such as compressed air and hydraulics against unintentional starting,
- Fasten and secure larger sub-assemblies to lifting gear carefully when replacing,
- Check loosened screw connections for tight fit,
- Check the function of safety devices at the end of maintenance work.

2.5.7 Constructional Modifications to the Machine

- No modifications, additions or conversions may be made to the machine without the manufacturer's approval. This also applies for welding of supporting parts.
- All conversion measures require written confirmation by J. Willibald GmbH.
- Replace defective machine parts immediately.
- Use only original WILLIBALD spare and wearing parts.

Only the original spare parts approved by us are tested by us and therefore have the suitable requirements for use of the machine. Parts procured from other sources have no guarantee that they are designed and built to meet stress and safety requirements.

WARNING**Risk of injury due to wrong spare parts**

Wrong or defective spare parts can lead to damage, malfunction or total failure and impair the safety.

- Only use original spare and wearing parts.

NOTE

- Please state the machine number and chassis number in all correspondence and inquiries.
- Order spare parts through contract dealers or directly from WILLIBALD.

2.5.8 Cleaning the Machine and Disposal

Regular cleaning is a prerequisite for maintaining the service life and functional reliability of the machine. Only use approved cleaning agents.

The cleaning agents must be adapted to the respective material which must be examined before beginning work. They must not attack the corrosion protection of the parts.

Acids and aggressive cleaning agents as well as cleaners containing solvents are generally unsuitable and can cause irreparable damage.

Surface-active agents with a pH value between 5 and 8 should be used for cleaning if possible. Ask the manufacturer about suitable cleaning agents if in doubt.

Handle and dispose of used substances and materials (filters, solvents for cleaning) properly, especially

- when working on lubricating systems and devices
- when cleaning with solvents

CAUTION**Risk of injury from escaping liquids**

- Do not tighten or open pressurized pipes and hoses (hydraulic oil circuit).
- Only keep operating fluids in containers which cannot be confused with drinking containers.

2.6 WARNINGS and Special Hazards when Handling the Machine

2.6.1 Hazards from Rotating Knives of the Milling Drum

DANGER



**Hazards from rotating knives of the milling drum!
Risk of entanglement of persons in the milling drum.**

The milling drum continues rotating after switching off the PTO drive!

- Do not stand near to the rotating milling drum!
- When the universal shaft is running, make sure that no-one is standing in the danger zone.
- Before reversing, make sure that no-one is standing in the danger zone of the TBU XL and tractor! (Figure 3.2)
- Get a second person to give directions if visibility is poor!

This warning sign is affixed to both sides of the machine.

Designation: Rotating blade hazard! Do not touch machine parts until they have come to a complete standstill.



2.6.2 Hazards from the Discharge Belt

DANGER

Risk of entanglement and crushing from moving discharge belt!

The moving discharge belt can cause severe injuries.

Failure to observe these instructions can have serious health consequences with life-threatening injuries and even death.

- No persons may stand in the vicinity of the milling drum or the discharge area of the TBU XL when the PTO is running!
- Do not stand in the vicinity of the discharge belt!

This warning sign is affixed to both sides of the machine.

Designation: Do not step on loading conveyor if PTO is connected to tractor and engine is running!



2.6.3 Hazards from the Milling Drum Drive

DANGER



Risk of entanglement and crushing by opening of the protective cover of the milling drum drive when the machine is running!

Risk of entanglement by rotating chain!

Entanglement by rotating universal shaft!

The milling drum rotates at very high speed, 330 rpm (330 min⁻¹).

The universal shaft and milling drum drive are therefore protected by fixed guards.

Failure to observe these instructions can have serious health consequences with life-threatening injuries and even death.

- Only carry out maintenance work on the chain drive when the machine is at a standstill.
- Make sure that the machine cannot be started by unauthorized persons!

This warning sign is affixed to the top of the chain drive cover.

Designation: Do not operate with guards removed.



2.6.4 Hazards from the Deflector Roller of the Discharge Belt

WARNING



Risk of entanglement and crushing by opening the cleaning flaps when the machine is running!

The moving discharge belt can cause severe injuries.

- Always only carry out maintenance and repair work with the machine at a standstill.

- Cleaning flaps may not be opened when the TBU XL is running!

This warning sign is affixed to the cleaning flaps on both sides of the TBU XL.

Designation: Do not operate with guards removed.



2.7 Protection Devices

WARNING



Lethal danger from non-functioning protection devices

- All protection devices must be fitted and working properly before starting the machine every time;
- Protection devices may only be removed when the machine is at a standstill and secured against restarting;
- The protection devices must be fitted by the owner as specified on delivery of partial components.

2.7.1 Universal Shaft Protection

DANGER



Risk of entanglement from machine running without universal shaft protection!

The milling drum is driven by a universal shaft. The universal shaft rotates at high speed. It is therefore protected by fixed guards.



- When the universal shaft is running, make sure that no-one is standing in the danger zone.
- Damaged parts of the universal shaft protection may not be used! They are part of the inspection by the employers' liability insurance association.

Universal shaft guard



2.7.2 PTO Protection

WARNING

Risk of entanglement by the machine running without PTO protection!

The universal shaft is driven by the tractor PTO. The universal shaft rotates at high speed 1,000 rpm (1,000 min⁻¹)

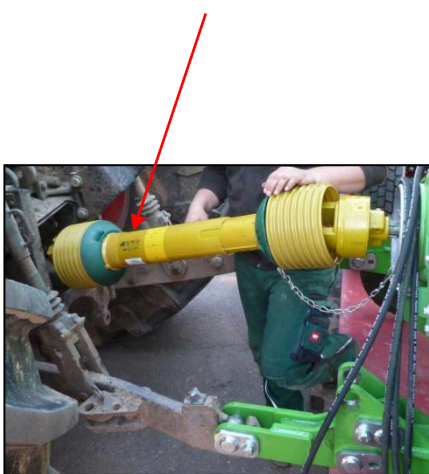
PTO protection



It is therefore protected by a guard.

- Damaged parts of the universal shaft protection, damaged protection flaps and rubber protectors may not be used! They are part of the inspection by the employers' liability insurance association.

PTO



PTO from the TBU XL to the tractor (with overload clutch)

2.7.3 Cleaning Flap

WARNING



Risk of entanglement by opening the cleaning flap while the machine is running!



The moving discharge belt can cause severe injuries.

- The cleaning flap must be closed and locked by flap plugs when the universal shaft is running.
- Cleaning work must be performed with the machine at a standstill.

Cleaning flaps



2.7.4 Milling Drum Drive

DANGER



Risk of entanglement and crushing by opening the protective cover of the milling drum drive while the machine is running!

The chain tension must be checked after a certain number of operating hours.



- The milling drum drive may not be opened on top when the TBU XL is running!
- This maintenance work on the TBU XL may only be performed with the tractor and the milling drum at standstill!
- The protective cover must be sealed and screwed tight when the universal shaft is running.

Milling drum drive



Protective cover

Screws



2.8. Informal Safety Measures

- The operating manual must be kept at the machine site at all times.
- The generally valid and local regulations for the prevention of accidents and environmental protection must be provided and observed in addition to the operating manual.
- All safety and danger notices on the machine must be kept in a legible condition.

2.8.1 Symbols and Labels on the Machine

- These symbols, information signs, pictograms, warning signs and mandatory signs are adhesive labels with information on how to handle the machine. They serve for your safety and must always be observed!
- Make sure that the signs are always legible. The signs must be replaced immediately when damaged or lost!

2.8.3 Illustration of Adhesive Labels and Warning Signs

1

WARNING

Read and understand the operating manual before using the machine.

Failure to follow the operating instructions can lead to death or severe injury!

199-01-1015

2

CAUTION

Hard hats required!

199-01-1016

CAUTION

Eye protection required

199-01-1017

CAUTION

Ear protection required

199-01-1018

CAUTION

Safety shoes required

199-01-1019

CAUTION

Safety gloves required

199-01-1021
199-01-1142

3

DANGER

ROTATING BLADE HAZARD

Keep hands clear while machine is running!

KEEP AWAY

199-01-1022

4

DANGER

Drawing in and crush hazard

Do not step on loading conveyor if PTO is connected to tractor and engine is running

199-01-1023

5

DANGER

Drawing in and crush hazard

Do not operate with guards removed.

Lock out / tagout before servicing

199-01-1024

6

WARNING

Drawing in and crush hazard

Keep guards in place.

Follow lock-out procedures before servicing.

199-01-1025

8

NOTE

Important - oil changing. The gearbox is filled with oil type GLS SAE 85W-140. To be changed the first time after 100 working hours. Thereafter to be changed every 500 working hours.

199-01-1027

9

NOTE

LIFT POINT

199-01-1028

7

DANGER

ROTATING DRIVELINE

CONTACT WILL CAUSE SERIOUS INJURY OR DEATH. KEEP AWAY!

- GUARD MISSING DO NOT OPERATE
- DRIVELINES SECURELY ATTACHED AT BOTH ENDS

199-01-1029

10

NOTE

LIFT POINT

199-01-1028

11

NOTE

Clean with high pressure after working at the end of the day!

199-01-1029

12

NOTE

Clean with high pressure after working at the end of the day!

199-01-1031

13

NOTE

Changing conveyor tension

199-01-1032

14

NOTE

Transport position on trailer

- Move out the support feet
- Remove the red marked protection:
 - ▶ Screw front + back
 - ▶ Bolt front + back
 - ▶ Conveyor protection covering inside front + back
- Swing drum out

199-01-1033

15

NOTE

Support feet high position

199-01-1034

16

NOTE

Support foot back low ↑ high	Drum out out ↑ on	Support foot front low ↑ high
---------------------------------------	----------------------------	--

199-01-1035

17

Input power
max. 1000 rpm

199-01-1036

18

Grease nipple

199-01-1037

19

NOTE

Check and retighten all bolts!

199-01-1038

20

NOTE

max. 3.7 mph

Drive back in the working lane:

- Maximum speed 3.7 mph
- Lift the lower link only

199-01-1041

21

DIN lashing points
2000 daN (kg)
4409 lb

199-01-1077

22

J. WILLIBALD GmbH
Maschinenfabrik
Bahnhofstr. 6 · 88639 Wald-Sentenhart · Tel. 0 75 78/189-0

Type _____

Masch.-Nr. _____



24

NOTE

Attention!

Check the gear centering when adjusting the belt. The transmission must run vibration-free.

199-01-1168

25

NOTE

Attention!

Do not switch off the power take-off shaft until the tractor is idling because the drum + belt continues to run!

199-01-1169

26

Support foot front left

Support foot back right

199-01-1138

2.8.4 Position of the Adhesive Labels on the Machine



16 21 8 13 25 11 15 10 13 18



7 21 13 14 17 15 10 19 26 8 21 11 16



8 13 1 2 3 6 5 4 16 25 17 14



14 17 19 16 5 6 4 3 2



23



9



10

15

13

26

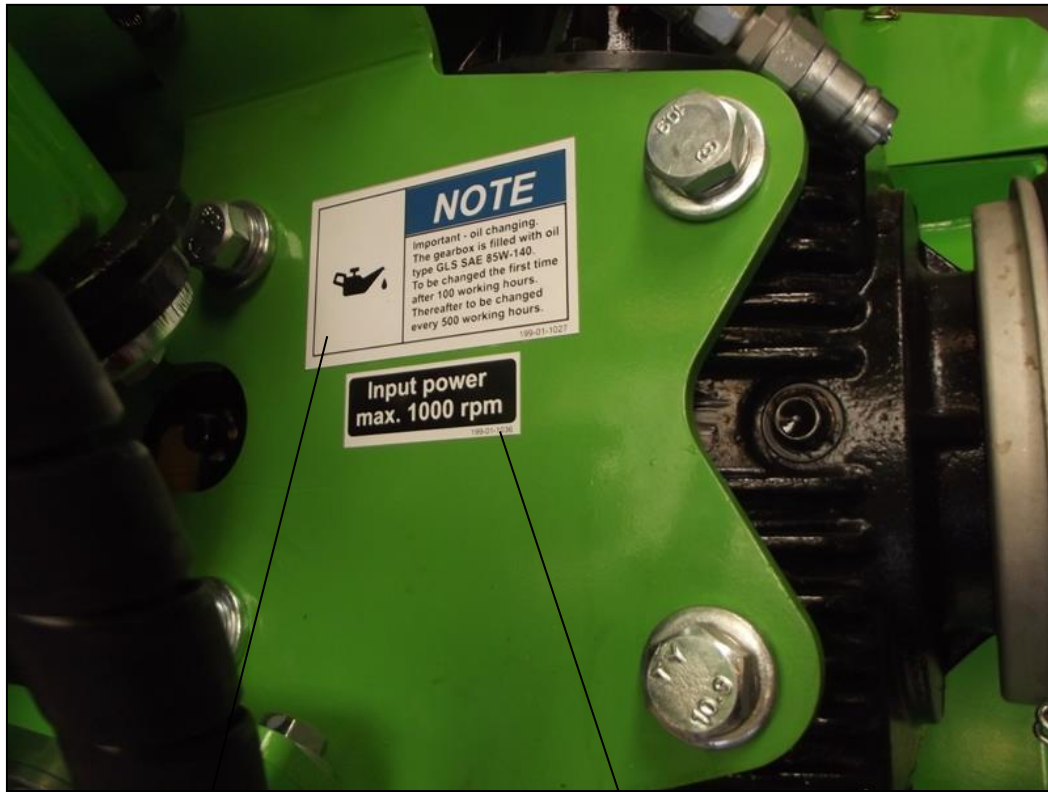
18



11

10

15



12

20



21

8

21

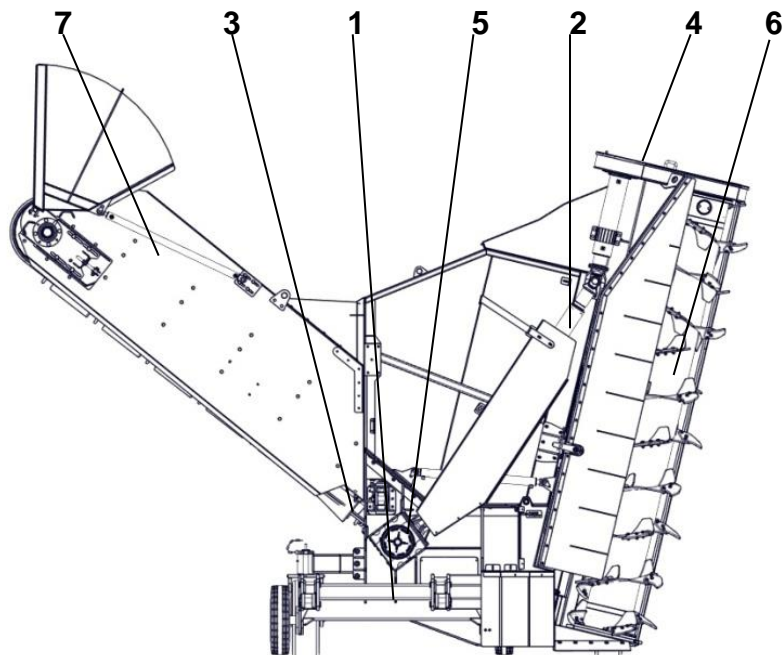
3.0 PRODUCT DESCRIPTION

The TBU XL machine has been built according to the state of the art and recognized safety rules.

3.1 Tasks of the Machine

- Turning of organic material for composting (garden waste, material from agriculture, wood cuttings, cemetery waste).

Figure 3.1
 TBU XL
 Side view



1. Frame
2. Universal shaft
3. Gear + PTO to tractor
4. Milling drum drive
5. Discharge belt drive (through-drive at rear)
6. Milling drum
7. Discharge belt

Improper use of the machine can endanger life and limb of the user or third persons or damage the machine or other property values. The machine may only be used:

- for the intended purpose,
- in perfect technical condition.

Faults which could impair the safety must be repaired immediately.

3.2 Work Place

Area of application

The TBU XL machine can be used for processing pre-shredded organic material (pre-shredded wooden packagings, old timber, industrial timber waste, demolished building timber).

The large quantities of material can be turned on site.

Aim

The aim of the turning process is to achieve greater homogeneous quality of the composting in the shortest possible time.

Operating personnel

The TBU XL windrow turner is moved by the operator at the application site (compost windrow). The operator sits in the driver seat.

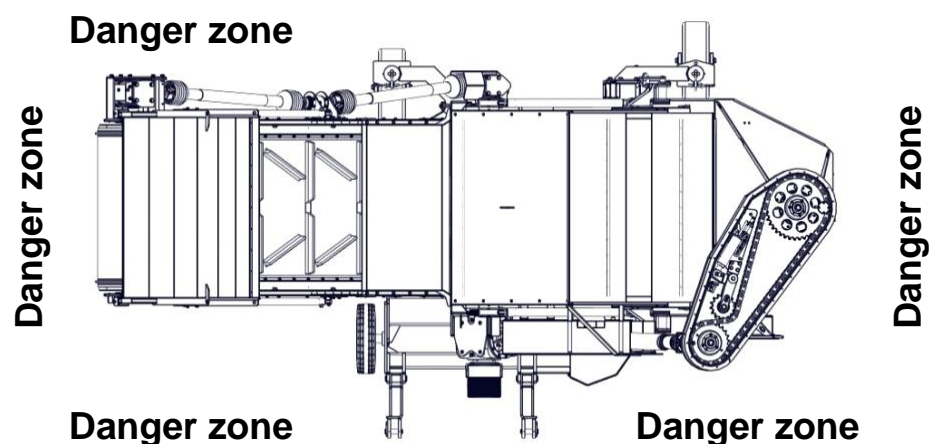
The machine may only be operated by trained personnel at least 18 years of age under observation of the operating manual.

For starting, switching off and transporting the machine, the operator must approach and leave the machine in the zone illustrated in figure 3.2.

For normal operation during turning, unauthorized persons must not approach the zone illustrated in figure 3.2. These zones must never be entered when the machine is in operation.

Work place / danger area

Figure 3.2
 TBU XL
 Danger area



Procedure

The windrow turner is towed by a tractor. It is driven by a universal shaft. The turner is taken up by a 3-point linkage. The device is lowered hydraulically before starting work. A large milling drum is then moved along the windrow at a slight angle.

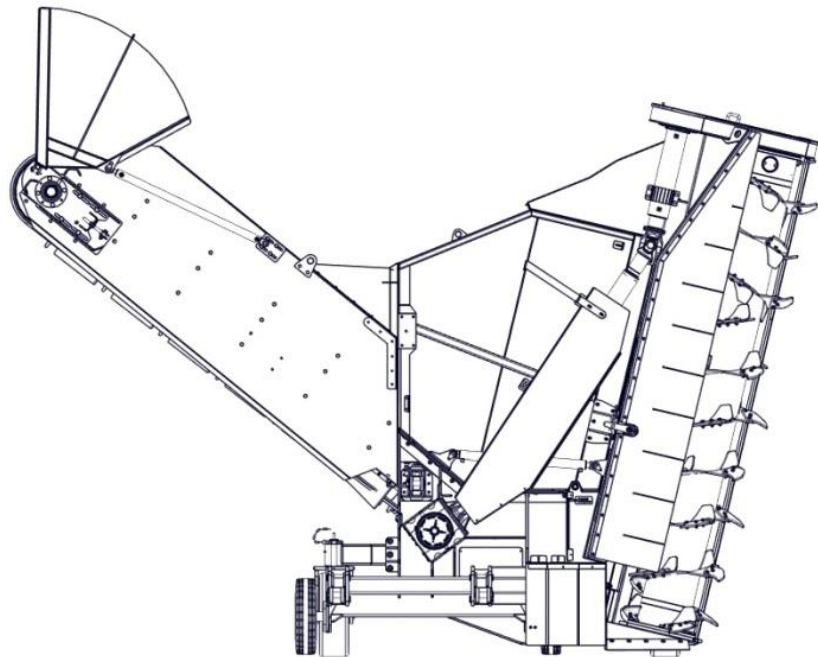
By the angled position of the milling drum, compost material is cut by aggressive tools to a layer of 1.64 feet (50 cm).

The cut material is moved aside by means of a high-performance discharge belt. The steep upward position of the discharge belt allows a new windrow to be stacked parallel at a distance of approx. 16,4 feet (50 cm) with a height of up to 11.48 feet (5 m) at the minimum.

The machine is lifted approx. 10 inches (250 mm) with the lower links at the end of the windrow. The upper link is free and is not needed. Then, the machine can be pushed backwards through the windrow lane on the swinging wheels.

4.0 TECHNICAL DATA

Figure 4.1
 TBU XL
 Side view



Operating mode:	Mounted on the 3-point linkage of a tractor from 180 HP and a creep speed of 0.3 mph
Drive:	by the tractor PTO
Throughput rate:	up to 1.500 cu./yd (1,200 m ³ /h) (depending on the tractor power)
Operation:	Tractor hydraulics
Working speed:	approx. 0.3 – 0.6 mph (0.5 – 1 km/h)
Dimensions LxWxH:	24.48x8.04x12.63 feet
	6550x2450x3850 mm
on trailer LxWxH:	26.9x8.04x11.81 feet
	8200x2450x3600 mm
Weight:	approx. 11000 pounds (5000 kg)
Discharge belt width:	3.94 feet (120 cm).
Cutting depth:	approx. 1.19 feet (50 cm)
Drive speed:	1000 rpm (1000 min ⁻¹)
Universal shaft connection	1 3/4" 6 part gear
Necessary driving power	at least 180 HP
Necessary driving power	max. 240 HP
Milling drum speed	approx. 330 rpm (330 min ⁻¹)
Number of knives	35

4.1 Equipment

Standard version of a compost windrow turner

- Original Willibald reinforced special discharge belt with rubber belt for maximum requirements;
- Milling drum with cutting tools arranged in screw form;
- Easy handling by 3-point lift;
- Hydraulically adjustable discharge flap for optimum windrow height/width;
- Removal in horizontal layers ensures optimum mixing of outer and inner windrow layers;
- The very special knife arrangement on the milling drum allows clean cutting without the risk of the walls collapsing.
- Paintwork RAL 6018.

* Auxiliary equipment:

- Trailing axle;
- Hydraulic slide frame with lower link

* Trailing axle

Max. road speed 15.5 mph (25 km/h). The trailing axle can be dismantled for narrow lanes.

* Slide frame

The windrow turner can be moved hydraulically 0.82 feet (250 mm). It is operated from the tractor.

Labeling of the product

Labeling of the product such as rating plate, machine no. and CE mark are on the front right of the machine at the gear.

EC Declaration of Conformity

in the sense of the EC Machinery Directive 2006/42EC, Annex II A

We hereby declare the following machine

Machine designation: Compost Windrow Turner

Type designation: TBU XL

Company: J. Willibald GmbH, D - 88639 - Wald - Sentenhardt

in its design and construction and in the version marketed by us complies with the pertinent regulations of the following EC directive:

EC directives to be fulfilled:

EC Machinery Directive 2006/42 EC

The following harmonized standards are 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 will be void in the case of machine modifications not approved by us.

Full technical documentation is available. The operating manual for the machine is available:

- in the original version
- in the user's language

Person authorized for collecting the technical documents:

A. Willibald

J. Willibald GmbH, Recyclingtechnik, Bahnhofstrasse 6, D-88639 Wald- Sentenhardt

Manufacturer:

J. Willibald GmbH, Recyclingtechnik, Bahnhofstrasse 6, D-88639 Wald- Sentenhardt

D-88639 Wald-Sentenhardt

Place, date, signature

J. Willibald -CEO-

A. Willibald -CEO-

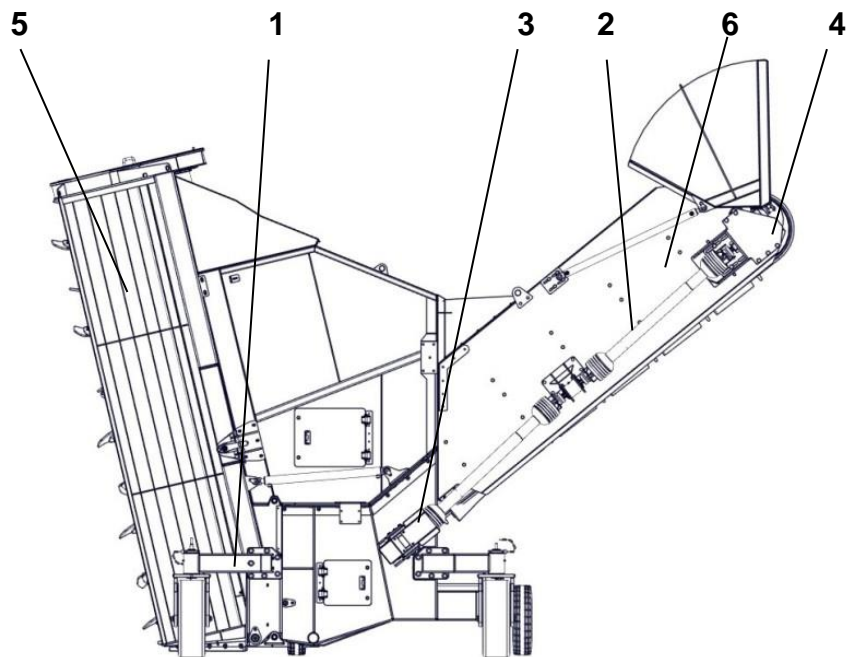
4.2 FUNCTION

4.2.1 Process Principle

The TBU XL compost windrow turner is intended exclusively for turning pre-shredded organic material.

4.2.2 Structure (Figure 4.1)

Figure 4.2
 TBU XL
 Structure



- | | |
|--------------------------------|-----------------------------|
| 1. Frame | 2. Universal shaft |
| 3. Discharge belt drive bottom | 4. Discharge belt drive top |
| 5. Milling drum | 6. Discharge belt |

4.2.3 Functional Principle

Loading the machine

TBU XL drives along a windrow and cuts certain amounts of material up to 1.64 feet (50 cm) depending on the type of tractor and nature of the material.

Material intake

A large milling drum is then moved along the windrow at a slight angle.

The compost material is cut in one action up to a layer of 1.64 feet (50 cm) by aggressive tools.

Turning material

The horizontal layering is lifted from the settling process by the vertical cutting and the material is re-mixed.

Discharging material

The cut, re-shredded and re-mixed material is placed to the side by a high-performance discharge belt.

Figure 4.3
TBU XL
Functional principle



5.0 TRANSPORT

NOTE

NOTE

Improper transport

Property damage due to improper transport

Improper transport can cause considerable property damage.

For transporting the TBU XL on a trailer the milling drum can be folded out into transport position and the baffle folded down. (See figure 5.1) This is necessary when a transport height of 13.12 feet (4 m) is exceeded.

Figure 5.1
 Transport position
 TBU XL





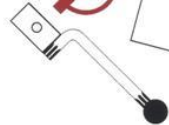


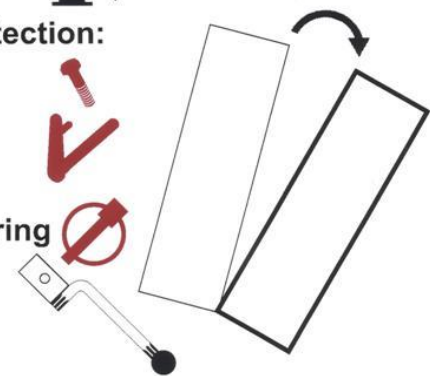
Working position

Before folding out the milling drum, the support feet must be extended and then the parts marked red removed before the milling drum can be swung out:

NOTE

Transport position on trailer

- Move out the support feet 
- Remove the red marked protection:
 - ▶ Screw front + back 
 - ▶ Bolt front + back 
 - ▶ Conveyor protection covering inside front + back 
- Swing drum out 

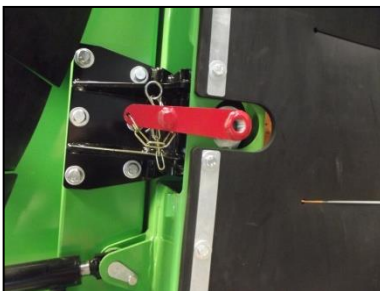


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1. Raise machine hydraulically



2. Remove parts marked red



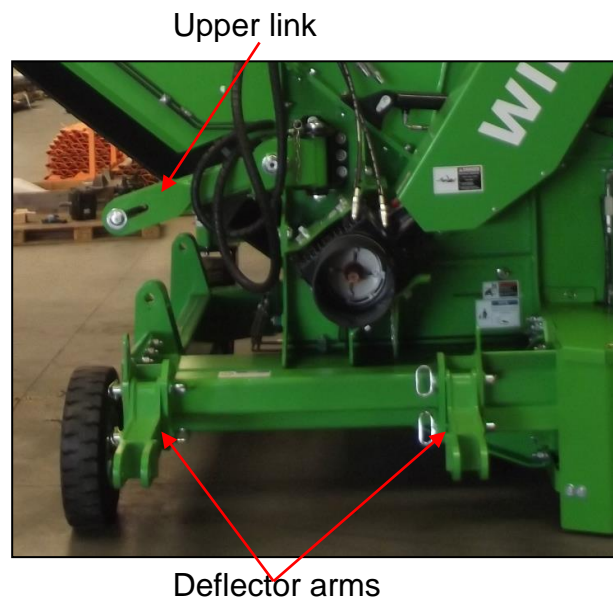
3. Swing out milling drum



4. Fold in and secure deflector arms (see figure 5.2)

5. Fold in upper link (see figure 5.2)

Figure 5.2

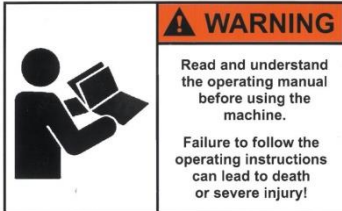


The machine may only be transported on the road with a licensed trailer.

6.0 COMMISSIONING

6.1 Introduction

CAUTION



Read and observe the information and safety notes in this operating manual *before* commissioning the machine!

Always keep this operating manual close at hand and pass it on with the machine when it changes owners!

Observe the pertinent accident prevention regulations and other generally recognized rules regarding safety, health and road traffic. Observe the maintenance intervals!

This avoids accidents, provides you with a reliable functioning machine and maintains the manufacturer's warranty.

DANGER

**Hazards from rotating knives of the milling drum!
Risk of entanglement of persons in the milling drum.**



The milling drum continues rotating after switching off the PTO drive!

- Do not stand near to the rotating milling drum!
- When the universal shaft is running, make sure that no-one is standing in the danger zone.
- Before reversing, make sure that no-one is standing in the danger zone of the TBU XL and tractor! (Figure 3.2)
- Get a second person to give directions if visibility is poor!





DANGER

Risk of entanglement and crushing from moving discharge belt!

The moving discharge belt can cause severe injuries.



DANGER
 Drawing in and crush hazard
 Do not step on loading conveyor if PTO is connected to tractor and engine is running

199-01-1023

- No persons may stand in the vicinity of the milling drum and discharge area of the TBU XL whilst the PTO is in operation!
- Do not stand in the vicinity of the discharge belt!

DANGER



Risk of entanglement and crushing by opening of the protective cover of the milling drum drive when the machine is running!

Risk of entanglement by rotating chain!

Entanglement by rotating universal shaft!

The milling drum rotates a very high speed of 330 rpm (330 min⁻¹).

The universal shaft and milling drum drive are therefore protected by fixed guards.

Failure to observe these instructions can have serious health consequences with life-threatening injuries and even death.



DANGER
 Drawing in and crush hazard
 Do not operate with guards removed.
 Lock out / tagout before servicing

199-01-1024

- Only carry out maintenance work on the chain drive when the machine is at a standstill.
- Make sure that the machine cannot be started by unauthorized persons!
- The milling drum drive may not be opened on top when the TBU XL is running!
- Therefore, make absolutely sure that no one is standing in the working area when the tractor PTO is started.



WARNING

Risk of entanglement and crushing by opening the cleaning flaps when the machine is running!

The moving discharge belt can cause severe injuries.

- Always only carry out maintenance and repair work with the machine at a standstill.
- Cleaning flaps may not be opened when the TBU XL is running!

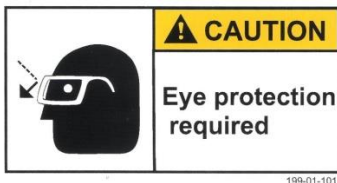


WARNING

Danger from flying parts during work.

Small flying parts and increased dust accumulation during operation of the TBU XL can injure the eyes.

- Therefore wear suitable eye protection.



NOTE

The noise level of the TBU XL is above 83 dB (A).

- Therefore, suitable ear protection must always be worn when operating the TBU XL.



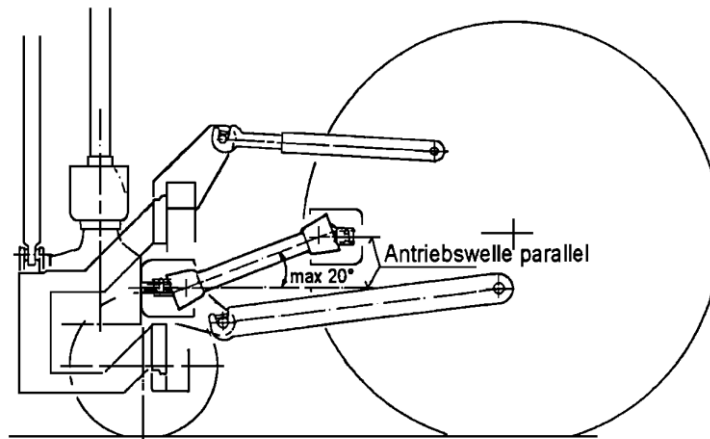
Before initial commissioning

NOTE

1. Read the operating manual.
2. Sign briefing confirmation.
3. Ensure correct tractor power.
4. Check the prescribed axle loads of the tractor, the minimum axle load of the rear axle must not be undercut, ballast if necessary.

6.2 Adapting Universal Shafts prior to Commissioning

Adapting universal shaft/with diagram



The universal shaft may have to be shortened before hitching up to the tractor. Make sure, hereby, that the maximum universal shaft angle is not greater than specified in the diagram.

Contact J. Willibald if it is.

6.3 Attaching the TBU XL to the Tractor



- The TBU XL is inserted in the two lower links of the Kat III and then fixed securely with the upper links.
- Take the universal shaft out of the suspension and mount on the PTO stump of the tractor.
- Fit the retaining chain correctly! Connect the hydraulic lines to the double-action control of the tractor.

WARNING

Risk of injury from rotating drive parts!

Rotating drive parts can cause injury when attaching the TBU XL to the tractor.

- Damaged parts of the universal shaft protection, damaged protection flaps and rubber protectors may not be used! They are part of the inspection by the employers' liability insurance association.

6.4 Installing the TBU XL

DANGER



Danger from flying parts! Danger from rotating knives!

Parts can be flung around by the milling drum when cutting the windrow!

Touching the rotating milling drum causes very severe injuries!

- Do not stand near to the rotating milling drum!
- Do not walk near to the running conveyor belt!

The TBU XL is installed in three steps

- Switch the tractor hydraulics on the tractor to passage.
- Raise the TBU XL slightly with the tractor hydraulics.
- The TBU XL should be next to the windrow so that the milling drum can remove about 1.64 feet (50 cm) of material (*working width*) at once when moving along an approx. 11.48 feet (3,5 m) high windrow.

The wheels are adjusted so that the runner on the milling drum is approx. 0.03 feet (1 cm) above the ground.

Lower the TBU XL to the stop with the tractor hydraulics for this.

- Switch on the PTO drive on the tractor, the milling drum turns and the conveyor belt runs.
- Drive slowly along the windrow. Choose the gears on the tractor so that neither the tractor nor the TBU XL is overloaded and the material is turned completely to the new windrow and nothing is left over.

Switch off the PTO at the end of the windrow!

7.0 OPERATION

The machine may only be operated by instructed individuals or trained personnel.

WARNING



Hazard due to incorrect operation

Improper use can lead to severe injury and considerable property damage.

- Make sure that all covers and protection devices are working properly before starting work.
- Never deactivate safety devices during operation.
- Pay attention to tidiness and cleanliness in the work area! Components and tools stacked loosely or left lying around are a source of accident.

WARNING



Risk of injury due to wrong spare parts

Wrong or defective spare parts can lead to damage, malfunction or total failure and impair the safety.

- Only original **WILLIBALD** spare parts may be used to replace wearing parts. Otherwise, we can provide no guarantee for the function and operational safety of the machine.
- Make sure that the tractor is switched off and the milling drum is at a standstill for all work.

DANGER



Hazards from rotating knives of the milling drum!

The milling drum continues rotating after switching off the PTO drive!

- Do not stand near to the rotating milling drum!
- Make sure that no-one is standing in the danger area of the TBU XL and the tractor before reversing! (Figure 3.2)
- Get a second person to give directions if visibility is poor!

Baffle



7.1 Settings

7.1.1 Baffle (Ejector flap)

- The discharge width of the TBU XL can be changed by adjusting the baffle from the tractor. The discharge width should be reduced at the beginning of a new windrow to form a windrow quickly.
- Slight changes in the drum speed and the speed of the discharge belt are possible due to the PTO speed and the tractor engine speed.
- Reduce the PTO speed and switch off the PTO, raise the TBU XL slightly and reverse at the end of a cutting lane.
- Start a new cutting lane as described above.

7.1.2 Hydraulic Control Block

The control block is on the left of the machine. The control block contains valves for controlling the support feet and milling drum positions.

NOTE		
Support foot back	Drum out	Support foot front
low	out	low
↑↓	↑↓	↑↓
high	on	high

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Rear support foot out/in

Drum out/in

Front support foot out/in



Support foot extended



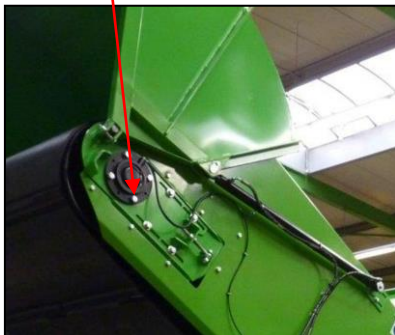
Support foot retracted

The support feet must be extended when transporting the TBU XL on a trailer.

The support feet must be retracted for normal operation.

7.2 Checking Discharge Belt Tension

1. Clamping plate



Check the tension of the discharge belt once a day.

The discharge belt must not sag too much because the inside belt stripper is otherwise ineffective.

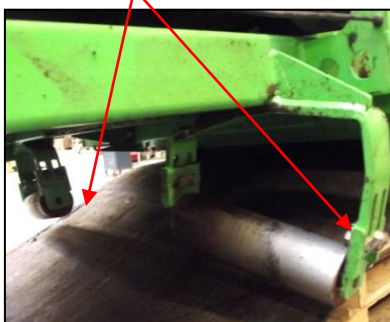
The discharge belt running is adjustable.

1. At the end of the discharge belt by adjusting the upper deflector roller.

To do this, loosen the tensioning bolts of the upper deflector roller, tighten by turning the tensioning nuts of the discharge belt and then tighten the lock nuts.

Tighten the tensioning bolts evenly otherwise the discharge belt will run "skew"!!!

2. Angled rollers



2. By adjusting the lower angled rollers in the discharge belt.



7.3 Replacing Wearing Parts

7.3.1 Replacing Milling Tools

DANGER



Danger from rotating knives!

Touching the rotating milling drum causes very severe injuries!

- Do not stand near to the rotating milling drum!
- When the universal shaft is running, make sure that no-one is standing in the danger zone.

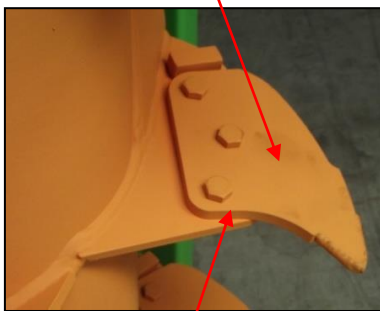


The milling tools must be replaced before the holder is worn.

The tools of the milling drum are replaced as follows:

Loosen the nuts from the bolts;
Remove the old tools and replace by new ones;
Fix the tools with bolts and nuts, tighten the bolt with torque.
Bolt torque is 101 Nm.

Milling tools



Bolts

7.3.2 Replacing the Chain of the Milling Drum Drive

DANGER

Risk of entanglement and crushing by opening the protective cover of the milling drum drive while the machine is running!

The chain may only be replaced with the milling drum at standstill.

Failure to observe these instructions can have serious health consequences with life-threatening injuries and even death.



The chain is replaced in the following steps:

- The PTO is switched off.
- The milling drum is at standstill.

Caution! The parts are heavy!

Chain



- Open the protective box.
- Loosen and remove bolts.
- Unhook the tensioning spring.
- Move back the tensioning roller.
- Take off the old chain and fit the new one.
- Fold back the tensioning roller.
- Hook the coupling cylinder back in.
- Seal the protection flap and screw on, trial run.

Make sure that the chain runs smoothly.

Fill up grease.

7.4 Troubleshooting Table

Fault	Possible cause	Remedy
Low turning performance, engine in low rev range	Tractor power too low	Change cutting depth
Discharge belt not running	Angular gear or universal shafts defective	Check gear and universal shafts
Discharge belt slipping on the drive roller	Tension of the discharge belt too low	Tighten discharge belt
Discharge belt running skew and scraping the side guides	Upper drive roller of the discharge belt skew or lower angled rollers loose	Straighten the deflector roller at the tensioning bolts Move the angled roller

8.0 MAINTENANCE

WARNING



Risk of injury due to improper maintenance

- Maintenance work on the TBU XL may only be carried out with the machine at standstill!
- Make sure that the machine cannot be started by unauthorized persons!
- No persons may stand in the discharge area of the TBU XL when the universal shaft is running!

The TBU XL is exposed to heavy mechanical stress and dust development during operation. Moving parts must therefore be serviced frequently. Regular maintenance improves and prolongs the operational capability of the TBU XL considerably.

The lubricating points are labeled in red. Grease should be pressed in until it emerges from the bearing point to be greased. This presses the old grease out of the bearing point with contaminations and condensation (chapter 8.4 Grease Types).

Replacing worn parts on time increases the operational capability of the TBU XL and make an important contribution to maintaining work safety.

All screws should be checked for tight fit and re-tightened if necessary after the first 10 operating hours and thereafter daily.

The specified maintenance intervals refer to daily single-shift operation of the TBU XL.

NOTE



The separate operating instructions of the manufacturer must be observed for maintenance of the PTO.

This must be done by an authorized specialist workshop.

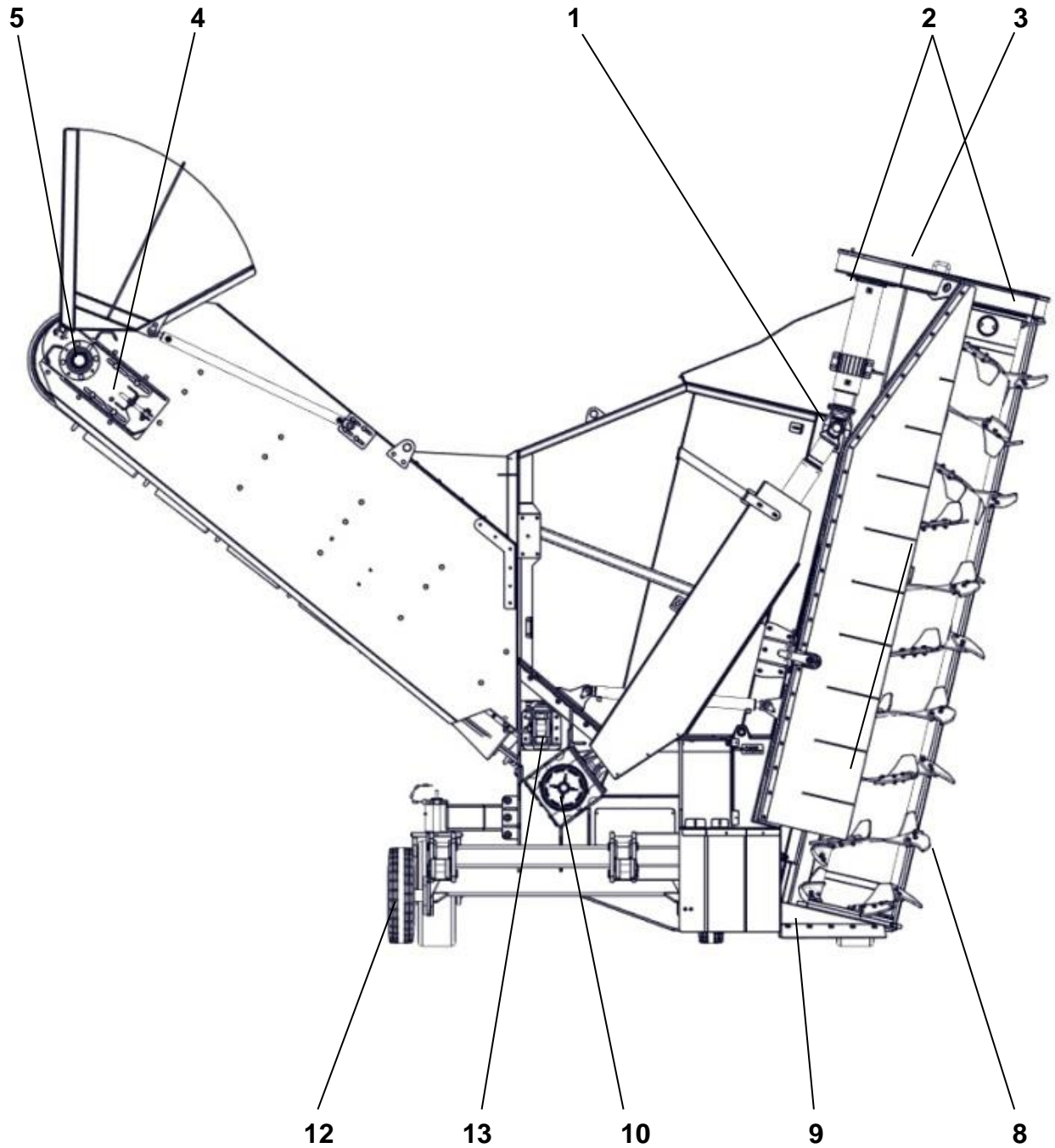


Figure 8.1

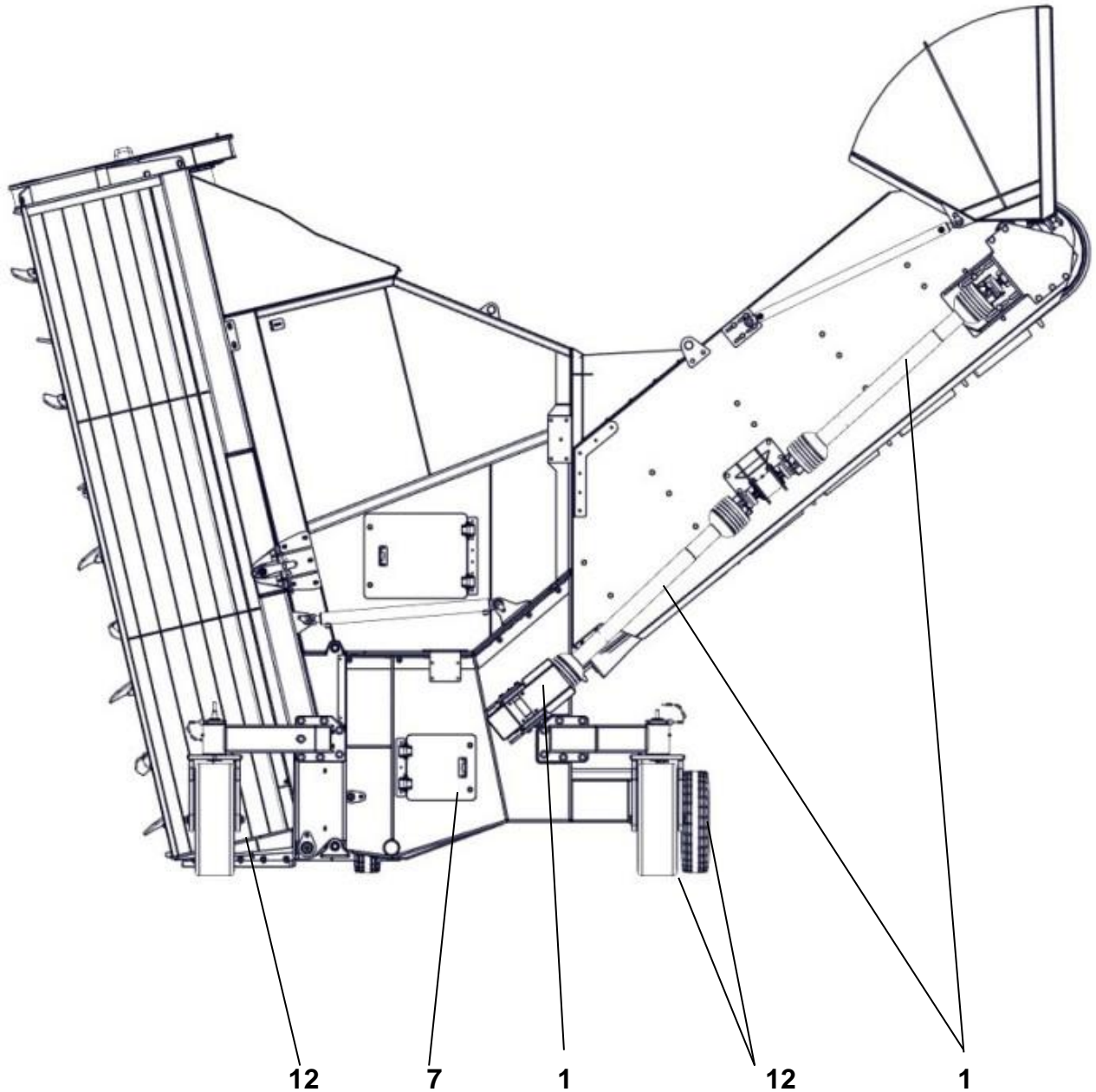


Figure 8.2

8.1 Lubrication Plan and Other Maintenance (Figure 8.1 and 8.2)

No.	Maintenance work	Maintenance intervals in operating hours				Remark
		10 /daily	50 hrs / week (100 hrs. initial service)	every 500	every 1000	
Basic machine						
1	Lubricate universal shaft 2x	X				Roller bearing grease, grease gun
2	Lubricate bearing drive, bearing drum top, bearing drum bottom 1x	X				Roller bearing grease, grease gun
3	Milling drum drive chain: Check chain tension, Check oil level	X	X			Liquid grease
4	Discharge belt: Check tension and setting of belt, clean sides	X				
5	Lubricate discharge belt on left and right	X				Roller bearing grease, grease gun
6	Lubricate discharge belt bearing	X				Roller bearing grease, grease gun
7	Clean deflector roller	X				
8	Check milling tools, replace in case of heavy wear	X				Replace before tool holder is affected
9	Check runner, weld on or replace part in case of wear		X			
Gear						
10	Check oil level, top up if necessary	X				
11	Oil change			X		Filling level up to middle of drive shaft
Chassis						
12	Lubricate 4x support wheels	X				Roller bearing grease, grease gun
13	Lubricate upper link	X				Roller bearing grease, grease gun
14	Towing eye: Visual inspection, replace bent or cracked eye, check tight fit and perfect condition of the fastening screws		X			Every time before driving on the road
15	Tires: Check tire pressure (8.5 bar) and tread, inflate or replace		X			Every time before driving on the road
16	Check function of lights		X			Every time before driving on the road
Central lubrication						
17	Lubricating blocks	X				Roller bearing grease, grease gun

8.2 Lubricant Table TBU XL

Component	Operating fluid	Filling quantity	Manufacturer designation	Viscosity mm ² /s (40°C)	Specification
Angular gear TBU - tractor	Gear oil	2.64 gallons 10 l	MEGOL H.G.ÖL GL5 85W 140	320	DIN 51517
Discharge belt gear bottom	Gear oil	0.4 gallons 1.5 l	MEGOL H.G.ÖL GL5 85W 140	320	DIN 51517
Discharge belt gear top	Gear oil	0.53 gallons 2.0 l	MEGOL H.G.ÖL GL5 85W 140	320	DIN 51517
Milling drum drive	Liquid grease	3.3 gallons 12,5 l	Gear fluid grease EP NGLI 0	130	DIN 51562
Lubrication	Lubricating grease		Meguin Langzeitfett C2LP	20,5	DIN 51502

8.3. Filling Quantities of the Gears

Angular gear 2.64 gallons (10 l) Hypoid Gear Oil GL5
SAE 85W-140

Chain drive 3.3 gallons (12,5 l) Liquid grease

Gear oils: Use only oils of viscosity 320 mm²/s at 40 °C.

8.4 Grease Types

Only roller bearing greases with an application temperature range of -68°F to + 275 °F (20 °C to + 135 °C) should be used.

The NLGI . No. for the penetration is "2". (No liquid grease)

Do not use liquid grease for central lubricating system.

Manufacturer designation

Autol Top 2000

Meguin long-term grease C2LP

8.6 Service Addresses

J. Willibald GmbH
Recyclingtechnik
Bahnhofstraße 6
D- 88639 Wald-Sentenhart

Tel.: +49 (0) 7578 / 1890
Fax: +49 (0) 7578 / 189150
E-Mail: info@willibald-gmbh.de
www.willibald-gmbh.de

**Willibald 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

Raiffeisen Agil Leese eG
Oehmer Feld
31633 Leese

Tel.: +49 (0) 5761 92110
Fax: +49 (0) 5761 9211-66
E-Mail: info@rwg-leese.de

9.0 REPAIR

WARNING



Risk of injury due to improper repair

Improper repair can lead to severe injury and considerable property damage.

- All maintenance work on the TBU XL may only be carried out with the tractor and milling drum at standstill!
- No persons may stand in the vicinity of the milling drum and discharge area of the TBU XL when the PTO is running!

NOTE

NOTE

Risk of property damage due to incorrect repair

Failure to observe the points listed below will void all warranty and liability claims in the event of personal injury and property damages.

- Perform all work procedures in exactly the described order; in addition the devices may not be manipulated in any way.
- Only listed operating fluids and auxiliary aids may be used.
- Use only original spare parts listed in the spare parts catalog.
- All repair work above and beyond the “Commissioning” and “Maintenance” chapters must be agreed in advance with the responsible service point (chapter 8.6 Service Addresses).

10.0 SHUT-DOWN



Shut-down and recommissioning of the TBU XL may only be carried out by trained specialists.

WARNING

Risk of injury due to improper work

Improper work can lead to severe injury or considerable property damages.

- Make sure that the machine cannot be started by unauthorized persons.
- All bearings must be greased after washing.
- PTO - see manufacturer's manual.

11.0 DISPOSAL

CAUTION



Environmental hazard due to improper handling

Improper handling and especially improper disposal of environmentally hazardous substances can cause considerable damage to the environment.

- Always observe the instructions below.
- Take suitable measures immediately when environmentally hazardous substances accidentally escape into the environment. Inform the responsible local authorities about the damage if in doubt.

The following environmentally hazardous substances are used:

Lubricants

Lubricants such as greases and oils contain toxic and environmentally hazardous substances. They must not be allowed to escape into the environment. They must be disposed of by a professional disposal company.

Hydraulic oil (from the tractor)

Hydraulic oils contain toxic and environmentally hazardous substances. Hydraulic oils must not get into the sewer system. Avoid penetration of surface and ground water and the ground.

In case of spillage of liquid-binding material (e.g. universal binding agent), clear this up and store at a suitable dump. Do not use water.

Old parts and wearing parts

Old parts and also wearing parts are subject to mandatory inclusion in the current recycling program.

Lubricants released during maintenance and repair work may not penetrate the ground or waste water.

12.0 CLEANING AND CARE

Regular care helps to preserve the value of the machine. Only clean the machine at a specially designated washing place. Dispose of empty containers and used cleaning materials according to environmental regulations.

12.1 Inside Cleaning

NOTE



Cleaning with a high-pressure cleaner kicks up a lot of dust and can harm the eyes.

Wear suitable eye protection for protection against flying particles.

12.1.1 Deflector Roller

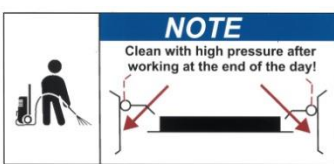
Open cleaning flaps;
Clean the rollers and strippers thoroughly.

- Cleaning is only allowed with the engine switched off.
- Clean the deflector roller at the end of the day!



12.1.2 Discharge Belt

- Cleaning is only allowed with the engine switched off.
- Clean with high-pressure at the end of the day after turning! Lift up the belt covers.



12.2 Outside Cleaning

NOTE

NOTE

Risk of property damage due to improper handling of high-pressure cleaners

When cleaning with high-pressure cleaners, move the water jet during cleaning. To avoid damage, do not aim the water jet directly at electrical components and hydraulic connections.

13.0 Regulations for Spare Parts (SP) Orders

Only use original WILLIBALD spare parts.

Only the original spare parts approved by us are tested by us and therefore have the suitable requirements for use of the machine.

The reliability and safety of these spare parts has been determined. We are unable to do this for other products, despite continuous observation of the market, and can therefore give no guarantee for these.

WARNING



Risk of injury due to wrong spare parts

Wrong or defective spare parts, especially wearing parts, can lead to damage, malfunction or total failure and impair the safety.

- Only use WILLIBALD genuine spare parts.

NOTE

Spare parts orders can be submitted directly or through the responsible dealer and must contain the following information:

1. Machine type and machine number
2. Part number and name of the desired spare part
3. Quantity of desired spare parts
4. Dispatch address with ZIP code
5. Desired dispatch type

The rating plate with the chassis number is at the front right of the machine at the gear.



Notes on hydraulic parts:

For repairs on hydraulic components, we recommend replacing only complete sub-assemblies.

The figures in the spare parts list do not always show the original part. This may have been changed in the course of improvements after completion of the spare parts documents.

For parts for which the number cannot be determined with certainty, a sample part or a photo should be sent to avoid wrong deliveries.

Samples which are not demanded back will be scrapped.

Early repair of the machine saves time and money!

14.0 General Terms of Business J. Willibald GmbH Maschinenfabrik, 88639 Wald-Sentenhart

I. Payment and default

1. Our invoices become liable for payment on the work day following billing. Our invoices are due for payment within 8 days of the invoice date or according to the terms of payment stated in the invoice.

2. In the event of non-compliance with the respective payment goals, we will charge 8 % p.a. interest above the official rate of the Deutsche Bundesbank from the due date. Default will come into effect with expiry of the 30th day after the invoice date without special reminder.

3. If payment by installments has been agreed, the total remaining amount - irrespective of the due date of any bills of exchange - will be due payable when

a) the purchaser who is a non-merchant is wholly or partially in default with two consecutive installments and the amount with the payment of which he is in default is at least 1/10 of the purchasing price,

b) the purchaser who is a merchant is 14 days in default with an installment, discontinues his payments or his assets are subject to settlement or bankruptcy proceedings.

4. Payment orders, checks and bills of exchange will only be accepted as payment with accounting of the redemption and bank rates.

5. The purchaser is only entitled to settle against our demands if his counter-demand is undisputed by us or a legal title exists. A right of retention for purchasers who are merchants is excluded and otherwise can only be enforced if it is based on rights from the respective contract of purchase.

6. If the purchaser gets into default with two consecutive installments when payment by installments has been agreed, we can set the purchaser an extension to the deadline of 14 days in writing notwithstanding our rights from section II. with the declaration that we will

refuse fulfillment of the contract by the purchaser at the end of this deadline.

Upon expiry of the deadline extension without result, we are entitled to withdraw from the contract by written declaration or to demand damage compensation due to non-fulfillment.

II. Retention of title

1. The object of contract remains our property until settlement of our demands under the terms of the contract. The retention of title also remains for all demands against the purchaser that we have acquired later in connection with the object of contract, for example, due to repairs or spare parts deliveries and other services.

At the purchaser's demand we are obliged to forgo the retention of title when the purchaser has fulfilled all the demands in connection with the object of contract and reasonable security otherwise exists for the other demands from a current business relation.

The purchaser is entitled to possess and use the object of contract for the duration of the retention of title as long as he fulfills his obligations from the retention of title and is not in default with payment. If the purchaser gets into default or fails to fulfill his obligations from the retention of title, we may demand surrender of the object of contract (even in part) by the purchaser and, after written notification with reasonable period of notice, turn the object of contract into account with charging of the realization proceeds on the purchasing price by sale in the open market as best possible.

All costs of redemption and utilization of the object of contract will be paid by the purchaser. They amount to 10 % of the realization proceeds including VAT without documentary proof. They are to be set higher or lower if we prove higher or the purchaser proves lower costs. The

proceeds with be credited to the purchaser after deduction of the costs and other demands incurred by us in connection with the contract of purchase.

2. For the duration of the retention of title, the purchaser undertakes to use the object of contract carefully, to carry out the designated maintenance work and to take necessary repair measures immediately.

Insofar as our title expires by connection with another product, it is agreed that the purchaser's (co-)ownership of the common object will be transferred to us proportionally (invoice value). Pledges or assignments as security to third parties require our prior consent. Demands resulting from resale or other legal reason for the purchaser regarding the goods subject to retention of title shall be fully assigned to us already as security. The third-party must be notified of this assignment .

III. Delivery and delivery default

1. Delivery dates or delivery deadlines which can be agreed binding or non-binding must be put in writing. Delivery deadlines begin with conclusion of contract. In the case of later contract amendments it may also be necessary to agree a new delivery date or delivery deadline.

2. In the case of non-binding delivery dates, the purchaser can demand to us in writing to deliver within a reasonable period of time. We will be in default on expiry of this period of time. The purchaser can only demand compensation for default damage in addition to the delivery if we are guilty of willful intent or gross negligence.

The purchaser can set us a reasonable extension in the case of default with the indication that he will refuse acceptance of the object of contract upon expiry of the deadline. Upon expiry without result, the purchaser is entitled to withdraw from the contract by written declaration or to demand damage compensation due to non-fulfillment. In the event of delivery default due to minor negligence, damage compensation for the purchaser is limited to maximum 10 % of the purchasing price.

If the purchaser is a legal person of public law, a public special asset or a merchant for whom the contract belongs to the pursuance of his commercial trade, he is only entitled to claim compensation damages in the event of willful intent or gross negligence. The right for delivery is ruled out in the cases of this paragraph.

If, by chance, delivery becomes impossible for us whilst we are in default, we are liable nevertheless in accordance with paragraphs 1 and 2 unless the damage would also have been incurred in the case of on-time delivery.

3. On exceeding a binding delivery date/delivery deadline, we are already in default on exceeding the same. The default rules according to no. 2 above also apply accordingly in this case.

4. The purchaser is obliged to accept the object of contract at the latest within 14 days after notification of readiness. He has the right to test the object of contract at the agreed acceptance site within this period of time.

If the offered object of contract shows considerable defects which, after notice which must be given within 14 days, cannot be remedied within a further 14 days, the purchaser can refuse acceptance.

If he does not comply with this contractual acceptance deadline, we can set the purchaser an extension of a further 14 days with the declaration that we will refuse acceptance upon expiry of this deadline. Upon expiry of the deadline without result, we are entitled to withdraw from the contract by written declaration or to demand damage compensation due to non-fulfillment.

The notice of readiness and the setting of an extension are not necessary if the purchaser has previously refused acceptance finally or is evidently unable to pay the purchasing price even when granted an extension.

5. In the event of default of acceptance we will claim damage compensation to the amount of 15 % of the purchasing price. The damage amount will be set higher or

lower if we prove a higher or the purchaser proves a lower damage amount.

6. In the event of default of acceptance we have free right of disposal of the object of contract and may deliver a similar object of contract under the terms of contract in its stead within a reasonable period of notice.

7. Force majeure, insurgence, strike, lockout and considerable business disruptions through no fault of our own will change delivery dates and deadlines by the duration of the service disruptions due to these circumstances.

IV. Modifications of the object of contract

We reserve the right to make modifications to design or form, deviations in color as well as modifications to the scope of supply during the delivery period insofar as the object of contract is not modified considerably and the modifications are reasonable for the purchaser. Illustrations and data in the catalogs and brochures are therefore not binding.

Data in descriptions valid at conclusion of contract are contents of the contract; they are to be considered approximate and do not constitute guaranteed properties. They serve as a measure for determining the freedom from defects of the object of contract.

V. Liability

1. Our liability, for whatever legal reason, is limited to the cases of culpable cause also by our legal representatives or agents.

We are liable to the purchaser without limitations in accordance with the rules of the product liability law in the case of willful intent or gross negligence.

For the cases of minor negligence, our liability is subsidiary to any services of the social insurances, private accident insurance or private property insurance. If these insurances do not fully cover the damage, our liability also comes into effect in cases of minor negligence but is limited to a total maximum amount of 10 % of the contract price. Losses in value of the object of contract, loss of use and profits

will not be compensated within the scope of liability for minor negligence. The same applies for damages in the case of improvements.

2. The purchaser's warranty rights remain unaffected by this.

3. The purchaser is obliged to notify us immediately and in writing of damages and losses for which we are liable and give us the opportunity to have these recorded by us or a third party appointed by us.

4. The liability of our legal representatives, agents and staff to the purchaser is limited to cases of willful intent and gross negligence.

VI. Place of fulfillment and dispatch

Dispatch is always effected at the risk and in the case of ex-factory deliveries also to the account of the orderer or recipient. The place of fulfillment is Wald-Sentehart unless agreed otherwise.

VII. Warranty

1. We grant warranty for the respective state of the art of the type of the object of contract for 6 months for used machines, 12 months for new machines from delivery based on single-shift operation.

2. The warranty assumes observance of the agreed terms of payment.

It implicates that all parts will be replaced free ex-factory that prove to be unfit when handled properly in single-shift operation during the warranty period as a result of material faults, design faults or defective workmanship. Natural wear is excluded from this warranty.

3. For handling of the purchaser's right to improvement it is agreed that the rights will be enforced with us or the local Willibald representative through which the object of contract was purchased. The fault must either be reported in writing immediately upon detection to the enterprise responsible for the claim or recorded by them.

If additional prescribed maintenance work becomes necessary due to improvements, their costs including the costs of required

materials and lubricants will be borne by us.

Warranty will be granted for the parts installed in the course of improvement until expiry of the period of warranty of the object of contract based on the contract of purchase.

Any extended warranty above and beyond this is excluded.

If the object of contract becomes useless as a result of a fault covered by the warranty, the purchaser must contact our nearest contract workshop. This workshop shall decide whether the necessary work is carried out on site or in a workshop. In the latter case, the purchaser shall not be charged for the recovery costs.

4. If a fault cannot be rectified or further improvement attempts are unreasonable for the purchaser, he can demand redhibition (cancellation of the contract) or reduction (reduction of payment) instead of improvement. A right to replacement delivery does not exist, however, we can determine delivery of a similar service in place of the originally delivered object of contract as a replacement service.

5. Changes of ownership of the object of contract do not affect the warranty obligations.

6. Improper handling, failure to report damages, prevention of improvement possibilities, overstressing of the object of contract, repair, maintenance and care by unauthorized companies, installation of non-original parts the use of which we have not approved, unauthorized modifications of the object of contract and violation of obligations to exercise diligence will void our warranty.

7. Right for damage compensation due to non-fulfillment remains unaffected in case of missing guaranteed properties.

8. The above warranty rights come under the statute of limitations with expiry of the warranty obligation in accordance with No.

1. The warranty is granted for faults reported within the period of warranty but not yet rectified until such faults are rectified. The statute of limitation is suspended for this fault to this extent.

9. No other rights exist, in particular the right to compensation for consequential damages of defects and further rights from positive contract violation, insofar as no liability insurance comes into effect.

VIII. Written form

1. All contracts are only considered concluded when they have been confirmed by us in writing. This also applies for subsidiary agreements and promises as well as for contract amendments. Any terms of purchasing contrary to our terms of payment and delivery only apply when we have expressly accepted them in writing; otherwise, the priority of our general terms of business is hereby agreed.

2. Transfer of rights and obligations from the contract requires our written consent.

IX. Place of jurisdiction

Place of jurisdiction is Landgericht Konstanz/Amtsgericht Überlingen.

This place of jurisdiction applies for all present and future demands from the business relation with full merchants including bills of exchange and check demands.

The same place of jurisdiction applies when the purchaser has no general place of jurisdiction in the country, has moved his place of residence or usual place of abode out of the country after conclusion of contract or his place of residence or usual place of abode is unknown at the time of commencement of proceedings.

X. Other agreement/individual case ruling

General terms of business and delivery of our respective contract partners have no effect in the mutual relations unless these have been confirmed by us in the individual case of every contract conclusion.

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