

PATU 70-80



**OPERATION
MAINTENANCE
SPARE PARTS**

PATU 70/80 Timber trailer
From serial number 293003

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MAINTENANCE

This part of the manual deals with scheduled maintenance and necessary overhauls and adjustments.

- * Greasing*
- * Overhauls and service procedures*
- * Repair welding*
- * Replacing the bearings*
- * Replacing the hydraulic components*
- * Measures for storage*
- * Tensioning torque*

Safety instructions



- * Keep the trailer on firm ground during maintenance, repairs, adjustments and cleaning. Shut off the tractor engine, engage the parking brake and remove the key from the ignition.*
- * If you must dismantle trailer structures, support the trailer with suitable mounting trestles. Never leave the trailer depending solely on the jack, because it might yield.*
- * Do not leave any part of the trailer depending on the hydraulic cylinders solely, but support the trailer firmly.*
- * Be aware of the air, possible entering the hydraulic cylinders during maintenance, because it might lead to sudden and uncontrollable trailer movements.*
- * Observe extreme caution when filling worn and old trailer tyres with air. The tyre might explode. Deadly peril!*

Safety instructions when handling oils and greases

- * *Avoid skin contact with oil or grease. They might contain additives harmful when continuously in skin contact. Follow the instructions and regulations of the manufacturers and authorities.*
- * *Always wear proper protective clothing when handling oils and greases.*
- * *Never use clothes soiled with oils or greases.*
- * *Never keep oily tools or other oily objects in the pockets.*
- * *If oil or grease result in skin changes, contact a physician immediately.*
- * *Waste oil from maintenance or repairs shall be sent away to be duly treated.*

GREASING

The given lubricating intervals are valid, provided the trailer is operated with normal load and under normal working conditions. Shorten the intervals, if the trailer is heavily loaded or the working conditions unfavourable, dirty, damp etc.

LUBRICATING GREASES, GENERAL

RECOMMENDED GREASES

<i>BP</i>	<i>Energrease</i>
<i>CASTROL</i>	<i>LM Grease</i>
<i>ESSO</i>	<i>Beacon EP 2</i>
<i>KESOIL</i>	<i>Universal grease</i>
<i>MOBIL</i>	<i>Mobilux EP 2</i>
<i>NESTE</i>	<i>Universal grease GP2</i>
<i>SHELL</i>	<i>Alransa EP grease 2</i>
<i>TEBOIL</i>	<i>Multi-Purpose Extra</i>
<i>TEXACO</i>	<i>Martak All Purpose</i>

All greases containing solid additives, like molybdenum sulphide (Mo S2) and calcium based greases, might cause a quicker than normal wear of bearings and even damage the bearing surface.

Overhauls and service procedures

ALERT !

The trailer also has structures and components, that must be gone through periodically.

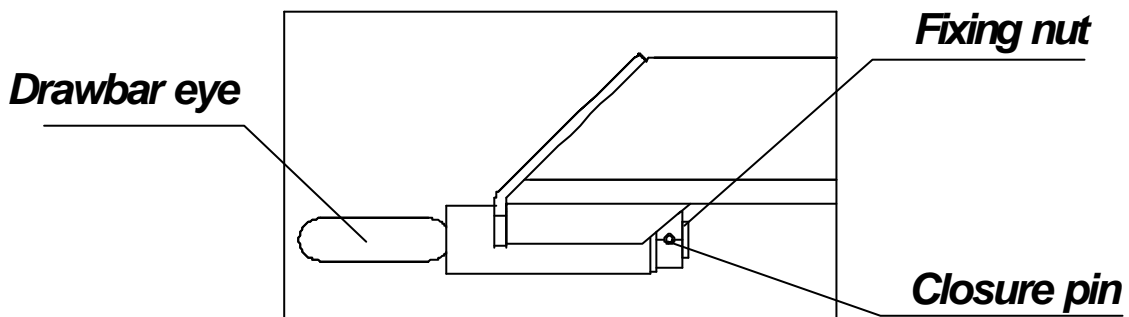
Pull loop

** Check the drawbar eye four times every year.*

- Check the condition of the drawbar eye axle and link. Replace the drawbar eye, if they are worn. Never weld a drawbar eye!

- Make sure, that drawbar eye fixing nut is in good condition and the closure pin of the nut is in its place and undamaged. Replace, if needed.

- Lubricate the drawbar eye axle with grease before assembling.



Lubricating the drawbar eye axle

- Lubricate the axle once a week with transmission oil.

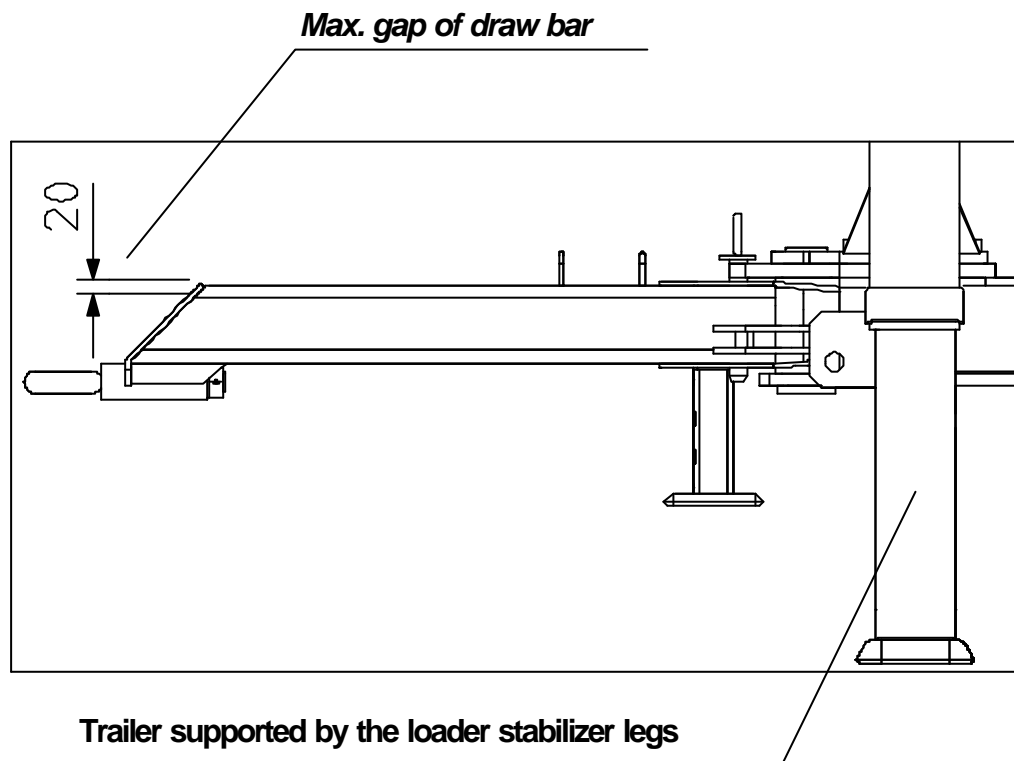
Checking the drawbar pivot

* Check the drawbar pivot twice a year.

- Check the condition of the pivot pin, collar nut and star washer. The threads and the washer shall be undamaged. Replace if needed.

- Check the gap in the drawbar pivot by twisting the pull loop upwards with the trailer supported behind the link.

- The vertical gap may not exceed 20 mm (3/4"), measured from the front end of the drawbar. If the gap is bigger, replace the bushings and most likely also the pin. Refer to item Replacing the bearings.



Tightening the drawbar pivot pin

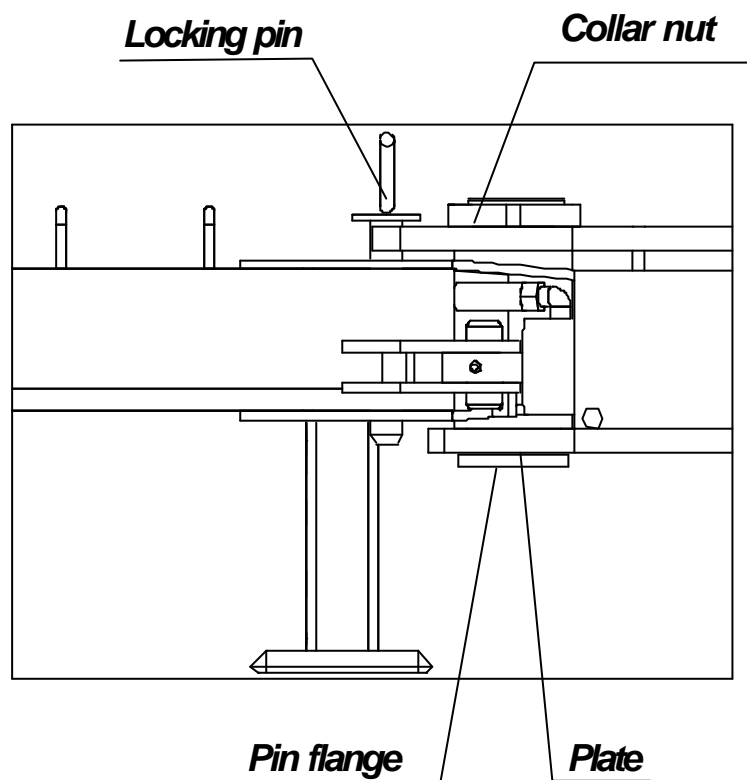
** Check the tension twice a year.*

** Tighten the nut, if there is a gap between the pin flange and the pivot plate.*

1. Release the collar nut locking.

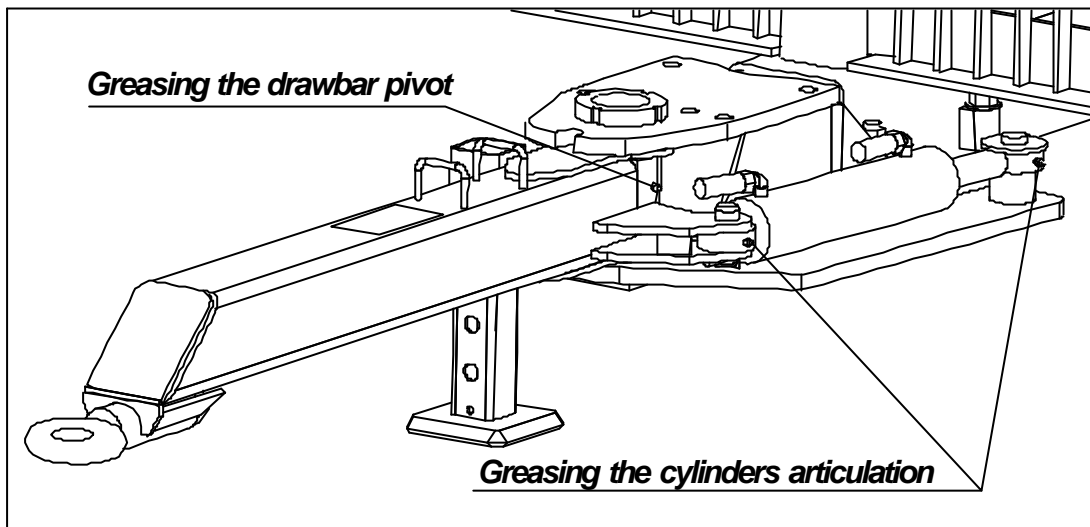
2. Tighten the nut some, by screwing with a suitable spanner wrench or using a mandrel and a hammer.

3. Lock the nut with a star washer.



Greasing the drawbar pivot

- Grease the drawbar pivot daily.
- Swing the drawbar while greasing the pivot so, that the grease will spread evenly.
- Use only that much grease, that you can see some ooze out from the pivot.



Greasing the articulation cylinder

- Grease the spherical bearings of the cylinder with grease every week.
- Use only that much grease, that you can see some ooze out from the bearings.

Checking the pivots of the rocking beams

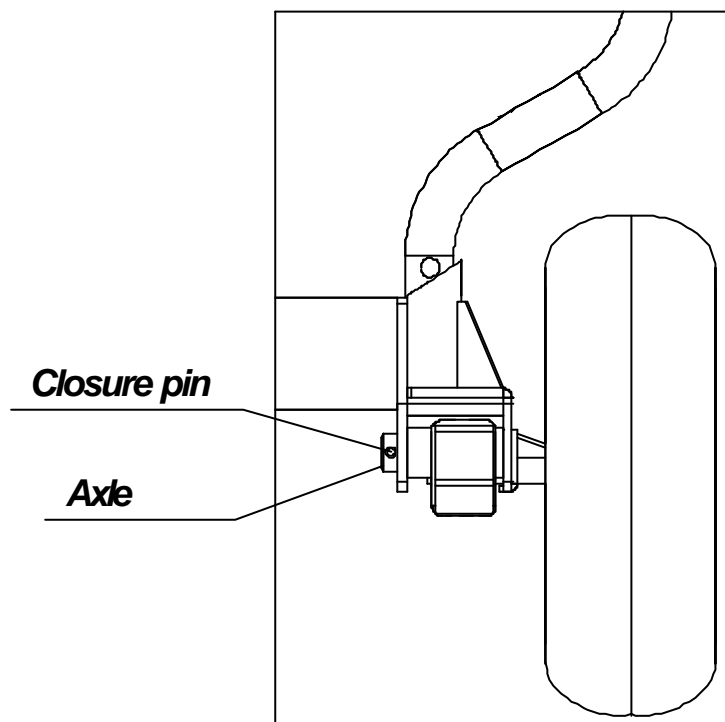
* Check the pivots of the rocking beams twice a year.

- Check the closure pins of the rocking beam axles. They shall be in place and undamaged. Replace, if needed.

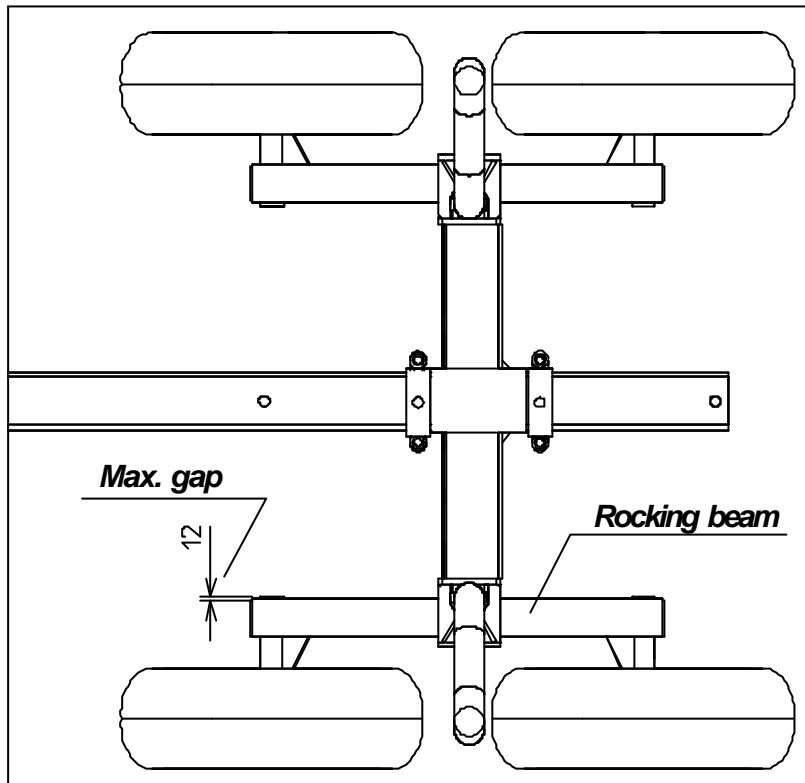
- Measure the gap of the rocking beams by twisting sideways from the end of the rocking beam. The bogie assembly shall at this point be raised above ground.

- The gap may not exceed 12 mm (1/2") measured from the end of the rocking beam.

- If the gap is bigger, replace the bushings and probably also the axles. Refer to item Replacing the bearings.

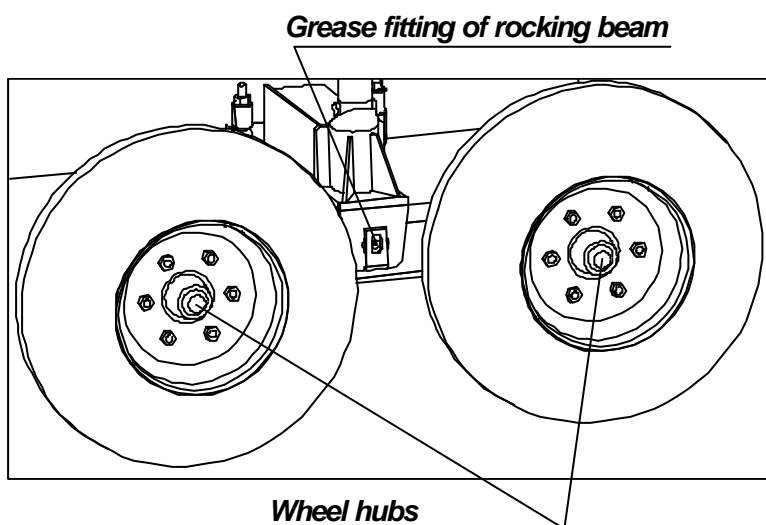


The measuring of the link gap of rocking beams is shown in the drawing below. The gap may not exceed 12 mm (1/2"), measured from the end of the rocking beam.



Greasing the rocking beam axles

- * Grease the rocking beam axles with grease every week.
- * Use only that much grease, that you can see some ooze out from the pivot.



Tightening the wheel bearings

** Check the tightness twice a year.*

** If you can feel a gap in the bearings, when rotating the wheel by hand, the gap shall be adjusted.*

1. Remove the hub cap.

2. Remove the cotter pin and tighten the crown nut so, that you can feel a small resistance, when rotating the wheel by hand.

3. Open the crown nut about $\frac{1}{4}$ of a turn and lock it again with the cotter.

4. Finish by once again checking the rotation of the wheels and the bearing gap.

Greasing the wheel hubs

** Grease the wheel hubs with grease twice a year.*

1. Open the hub cap.

2. Fill the cap with grease and press it back in place.

- If the grease of the hub looks very dirty and contains sand etc., replace all the grease.

Tyre control

** Check the tyres of the trailer every week and always before driving on public roads.*

- Check that there tyre surface has no deep slashes or bruises, which can damage the fabric. Replace the tyre if the fabric is damaged.

- Also UV radiation and the ozone in the air can reduce the carrying capacity of a tyre. This is revealed by the tyre surface turning brittle and cracking. A tyre, where the cracks go all the way to the fabric, shall be discarded.

Tyre pressure



- *Check the tyre pressure twice a month.*
- *Before putting more air into the tyres, check their condition. A damaged tyre can explode, when the pressure is raised. Deadly peril!*
- *Max. pressure of tyres is 4,5 bar (64 PSI).*

Checking the load-bearing steel structures and weld seams

- *Check the load-bearing steel structures and weld seams of the trailer twice a year for ruptures, cracks or other permanent deformation.*
- *Also check, that no irrelevant altering or repair weldings have been done to the structures.*
- *If there is something in the items above to call attention to, repair the faults immediately, refer to item Repair weldings.*

Repair weldings

Safety instructions



** Prior to modifications or repair weldings always contact Kesla Oy to get necessary welding instructions. A modification or repair welding, performed wrongly or without proper knowledge, might cause sudden structure breakdown. Risk of accidents!*

General welding instructions

- *A competent welder (preferable qualified).*
- *Quality class WC.*
- *Grind the paint away from the spot to be welded.*
- *Open the spot to be repaired with a grinder before repair welding.*
- *Clean oily surfaces.*
- *Always connect the earth conductor to the part to be welded (no joints in between).*
- *Use absolutely dry electrodes.*
- *Suitable electrode OK-48.30 or corresponding.*
- *Filler metal OK-Autrod 12,51 or corresponding for MIG/MAG welding.*

Replacing the bearings

** So called thin-walled bushings are used in the structures.*

- 1. Use a suitable mandrel, when putting in a new bushing, to hinder the bushing from getting damaged.*
- 2. Mount the bushing seam on the side, where the strains are less or so, that the grease holes are against each other.*
- 3. Fill the small grease pockets of the bushings carefully with recommended grease, before mounting the axle.*
- 4. Also check the axle. If the surface is worn or scratched, replace the axle.*

Replacing hydraulic components

When replacing parts of the hydraulic system, like hoses, connectors, gaskets and so on, always make sure that they to their characteristics meet the factory installed parts. Use original spare parts to ensure trouble-free and safe loader function.

Storing the trailer

If the trailer is to be stored for a longer period, carry out following preparations:

- Clean the trailer thoroughly. If using a high pressure washer, do not direct the spray on bushings or cylinder rod seals.*
- Lubricate all service spots immediately after washing. A fresh grease will surpress the water from the bearing surfaces and prevent corrosion and wear.*
- Proctect all cylinder rods with grease.*
- Brush paint on the spots, where it is cracked or worn.*
- By repairing all faults and defects now and performing the adjustments necessary, the trailer will be in faultless condition when retaken into use.*
- Store the trailer in a sheltered and out of way place, preferable under roof. If you have to leave it under open sky, use a tarpaulin.*
- Protect the tyres and hoses from direct sunlight.*
- Lower the tyre pressure to about 2 bar (28 PSI).*
- Support no part of the trailer directly on the ground, but use pieces of wood as supports.*
- Support the trailer well, to prevent it from tipping over.*
- Prevent children from using the trailer as a playground.*

Reusing after storage

- Clean the trailer thoroughly after storing.
- Lubricate all service spots.
- Remove the protective grease from the cylinder rods.
- Tighten all bolts and nuts.
- Adjust the tyre pressure (4.5 bar / 64 PSI)
- Check for all adjustments.
- Refresh your memory by re-reading the manual.

Tensioning torques for bolts and nuts

M 70 x 2 drawbar joint nut of Patu 70/80	50 - 70 Nm (37 - 52 lbft)
M 20 bolts and nuts	430 Nm (320 lbft)
M 16 bolts and nuts	200 Nm (150 lbft)
M 12 bolts and nuts	83 Nm (60 lbft)
M 10 bolt and nuts	48 Nm (35 lbft)
M 8 bolts and nuts	24 Nm (18 lbft)

Maintenance schedule

MAINTENANCE SPOT	MEASURE	MAINTENANCE INTERVAL
General	<i>Tighten the mounting bolts</i>	<i>2 times / year</i>
	<i>Check/replace hose couplings and hoses</i>	<i>2 times / year</i>
	<i>Check for cylinder leakage and the piston rods</i>	<i>2 times / year</i>
	<i>Check/repair the condition of load-bearing structures and weld seams</i>	<i>2 times / year</i>
	<i>Repair worn or cracked paint</i>	<i>2 times / year</i>
Draw bar / HD-articulation	<i>Grease the drawbar joint</i>	<i>Daily</i>
	<i>Tighten the drawbar joint axle</i>	<i>2 times / year</i>
	<i>Check/replace the drawbar joint bearings</i>	<i>2 times / year</i>
	<i>Grease the articulation cylinder</i>	<i>Every week</i>
Bogie assembly / wheel hubs	<i>Grease the rocking beam axles</i>	<i>Every week</i>
	<i>Check/replace the rocking beam bushings</i>	<i>2 times / year</i>
	<i>Grease the wheel naves</i>	<i>2 times / year</i>
	<i>Check/adjust the gap of the wheel bearings</i>	<i>2 times / year</i>
Drawbar eye	<i>Grease the pull loop axle</i>	<i>Every week</i>
	<i>Check the condition of the drawbar eye</i>	<i>4 times / year</i>
Tyres	<i>Check the tyre condition</i>	<i>Every week</i>
	<i>Check the tyre pressure</i>	<i>2 times / month</i>

Safety instruction



** Absolutely follow all the operating and safety instructions when repairing or eliminating the causes for trailer malfunction.*

Trouble shooting table

The table shows the most common malfunctions with causes and the measures to eliminate them.

MALFUNCTION	PROBABLE CAUSE	MEASURE
Only one set of tyres are worn	-Gaps in rocking beam bushings due to wear -Gaps in the wheel bearings	-Replace the bushings and possible also the axles. -Adjust the bearings.
The wheel/wheels do not rotate	-Wheel bearing damaged -The wheel brake does not release	-Replace the bearing. -Adjust the braking mechanism to more sensitive and check the return springs.
The drawbar swings only a little, when HD-articulation is used	-Clogged return line	-Check the coupling of the return hose and the compatibility of the quick couplings.
The drawbar does not move, when using HD-articulation	-Empty tractor HD-oil tank -The quick coupling is poorly coupled -The pump does not generate pressure	-Add oil. -Check the coupling and the compatibility of the quick couplings - Measure the pressure from the quick coupling or the pressure line of the pump
Stabilizer legs immobile	-Empty tractor oil tank Add oil. -The pump does not generate pressure	-Measure the pressure from the quick coupling or the pressure line of the pump.
Stabilizer legs yield	-Worn/damaged seals in stabilizer leg cylinder. -Valve spool worn.	-Replace seals. - Replace spool or block.
The brakes do not hold	-Quick coupling poorly coupled or coupled to the wrong coupling -Empty tractor HD-oil tank -Worn-out brake shoe	-Check the coupling and the compatibility of the quick coupling. - Add oil. - Measure the pressure from the quick coupling or the pressure line of the pump. - Replace brake shoes.

OPERATION

Operating the trailer

This section deals with the working procedures.

- * *General*
- * *Operating principle of trailer*
- * *Choice of working place*
- * *Way of working*

Safety instructions



- * *Do not start-up unless you have read and understood the instructions for operation and safety. Follow these instructions when working.*
- * *Always keep the tractor parking brake engaged when loading.*
- * *Do not start loading the trailer, unless having ensured that the loader risk zone is clear of any unauthorized persons or children.*
- * *Keep hands and other parts of your body away from the trailer . Risk of getting jammed!*
- * *Observe the safe approach distances to live el. conductors.*
- * *Never leave the machine running and unattended.*
- * *Avoid any sudden steering movements when pulling the trailer and never drive into steep turns with great speed. Risk of tipping over!*
- * *Ensure the trailer stability on soft ground or when driving and loading on sloping ground.*
- * *Make sure that you have free visibility over the whole working area.*
- * *Never use a faulty trailer.*

General

ALERT !

** Good knowledge of the equipment as well as sound practical experience are the conditions for safe and effective use.*

** Every trailer model has different characteristics and therefore even a very experienced operator should thoroughly post himself up on the characteristics of a new trailer before he starts to work.*

Operating principle of the trailer

The Patu timber trailer is a central beam framed trailer to be connected to a farm tractor and equipped with crossbeams and side posts. It is applied to transporting timber and other kinds of longish piece goods in difficult terrain and also transporting round bales with round bale equipment.

Choise of working place

Already before gathering or acquiring the material to be loaded, observe the needs and restrictions of the trailer.

Timber hauling from the wood

- Choose such driving routes that the loading place will be as level and firm as possible.*
- Try to place the wood piles so that the timber can be loaded without damaging the remaining stand.*
- Observe the space needed by the machine unit when choosing the places where to turn in the woods.*
- Make as straight skidroads as possible to avoid damaging the stand of forest as much as possible.*
- Observe that the stability of the machine unit is poorer when loading on sloping or soft ground.*

Way of working

Special safety instruction



- * Do not start working unless all preparations and safety procedures are carried out.*
- * Stop working immediately, if there is any hazard.*
- * Ensure the machine unit's appropriate stability.*
- * Make sure the working light will be sufficient.*

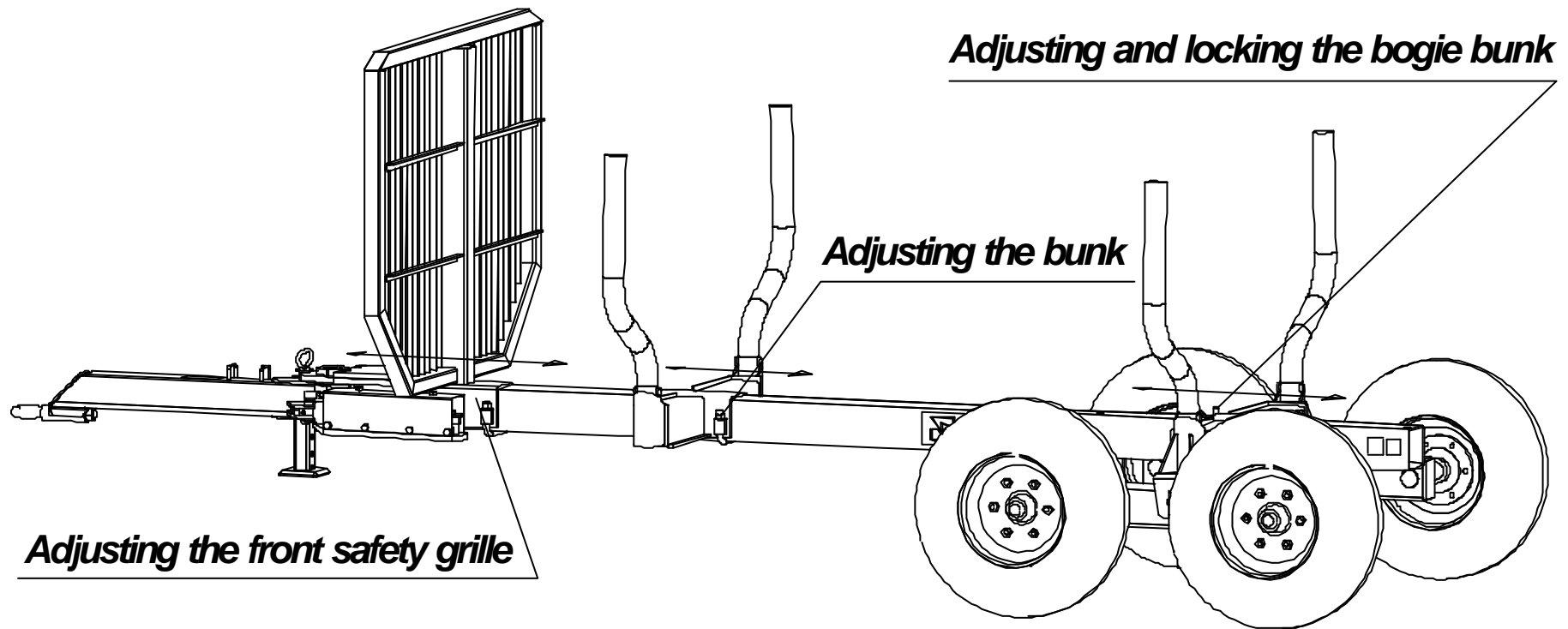
Working

General

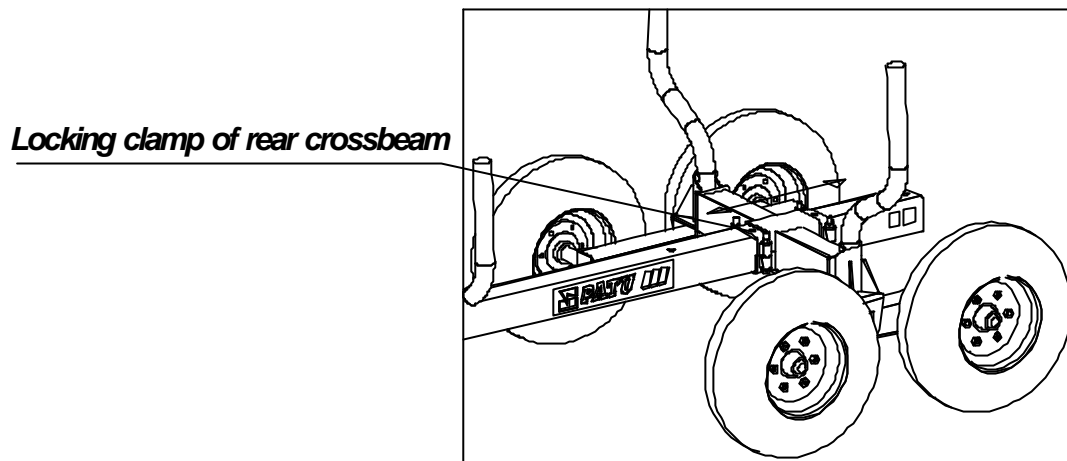
- The loading of the trailer will progress best with a hydraulic Patu loader.*
- Load the trees on the trailer with the butt end towards the tractor.*
- Adjust the position of the crossbeams according to timber length.*
- When transporting short timber (e.g. 3 m or 8 ft), keep the bogie assembly about 0,7... 1,0 m (2 ft) in front of the back end of the timber. By moving the head rack backwards the loading of the tractor's hitch hook will decrease.*
- Reduce the load size if the ground is uneven, sloping or soft.*

Adjusting the bunks and front safety grille

- Open the locking bolts and move the bunks and the front safety grille into a position that is suitable for the timber length.



* The bogie bunk can be adjusted in 4 positions on the main beam. One of the bogie bunk locking clamp has a pin, which shall be placed in the hole on the main beam. This will keep the bunk in place even if stressed heavily.



With rigid drawbar

A trailer with rigid drawbar tends to take a short cut when turning. The agility can be improved by always keeping the bogie assembly as far in front as the length of the timber transported permits.

With hydraulic articulation

- The trailer can be steered with hydraulic articulation, if needed. You can anticipate the turning and turn the trailer to avoid the hindrance before turning the tractor.
- When driving on sloping ground the trailer stability is improved by turning the main beam in uphill direction.
- Look out for the trailer tipping over when turning downhill. The agility and stability of the trailer increase when the bogie is moved closer to the tractor.

How to use the brakes

* The brakes engage when the lever of the single-acting outlet is pulled back. In the middle position the brakes are on and they are released by pushing the lever forward.

TRAFFIC ON PUBLIC ROADS

This section informs of the safety instructions prevailing when trafficking on public roads with the trailer connected to a tractor. Follow these instructions to avoid risks of accident. The manufacturer or retailer will not assume any liability for damage, if these instructions are ignored.

Transport position



**** Make sure that all parts of the trailer are correctly in place and that accessories and the load are tied so, that they could not, if moving, cause any accident.***

Make sure that you have full control of functions and stability.

** Ensure the machine unit's appropriate stability. You shall have control of the unit in every situation.*

** Check the lights, reflectors and the SMV-triangle as well as other possible safety equipment.*

** Always tie the load carefully before driving onto the main road.*

** Do not exceed the notified axle and total weights or transport dimensions.*

** Check the tyre pressures.*

** Do not start to drive, unless having cleared the vicinity of the machine unit and checked that the visibility is free.*

Driving, drive speeds and passengers

** Comply with all the statutes and decrees of the Road Traffic Law when trafficking on public roads.*

** Adapt the driving speed to the driving situation. Drive carefully along slopes and on hills and avoid sudden turns.*

** Also observe, that a machine unit increases the braking distance and be aware of slipperiness and uneven surface.*

TRAFFIC ON PUBLIC ROADS

** It is forbidden to transport passengers on a Patu timber trailer.*

INTRODUCTION

This section of the manual deals with the preparations and special safety instructions prior to start-up.

Special safety instructions



** Make sure that the drawbar pivot always is locked with the locking pin during use, if the trailer does not have a hydraulic articulation.*

** Always check before starting to work, that the tyres are undamaged and the tyre pressure correct.*

** Never start working unless having checked, that the trailer hydraulic hoses do not rub or touch the tractor wheels when turning.*

Preparations at introduction

- * How to connect the trailer to the tractor*
- * How to equip the trailer with a Patu grapple loader*
- * Coupling the hydraulic system*
- * How to equip the trailer with hydraulic articulation*
- * How to connect the brakes*
- * Covering of hydraulic hoses*
- * Cylinder covering*

How to connect the trailer to the tractor

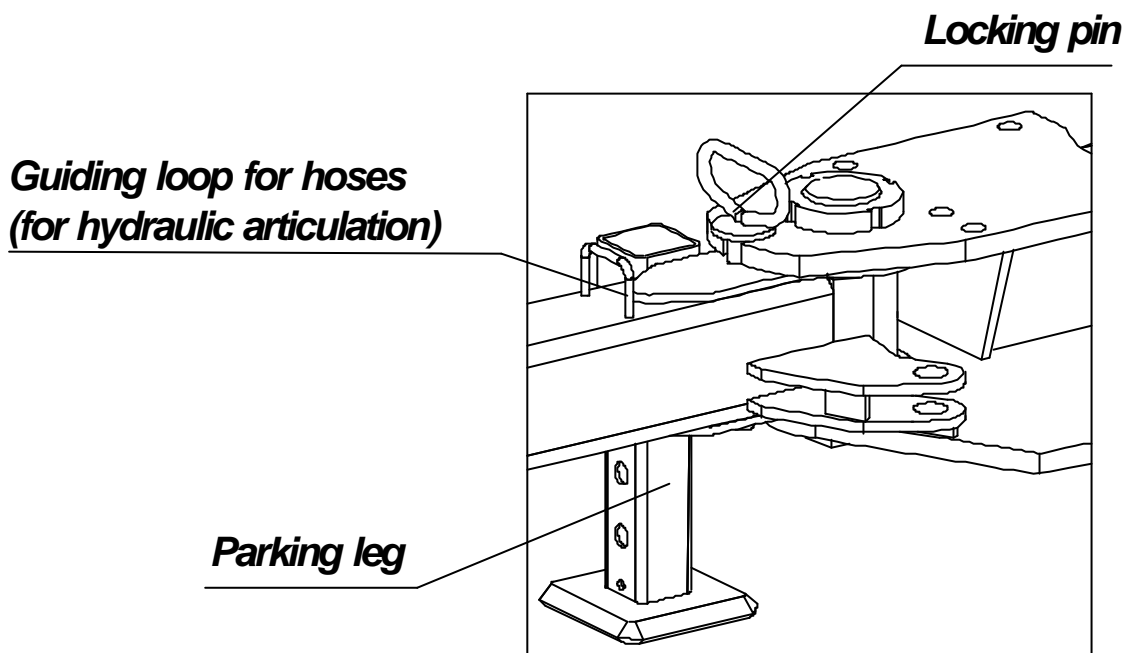
Safety instruction



* When connecting the trailer to the tractor, you have to work between the machines. There is a risk of getting jammed, so be extra cautious!

Mounting with rigid drawbar

- Lock the trailer pivot with the locking pin and connect the trailer as normally to the tractor's hitch hook. Raise the parking leg of the trailer and lock it there.



Mounting with hydraulic articulation

- Connect the trailer as normally to the hitch hook of the tractor.

- Connect the articulation cylinder to the double-acting outlet of the hydraulics. The hoses shall go through the guiding loops on the drawbar, so that they will not jam between the tractor rear wheel and the drawbar when turning.

INTRODUCTION

- Raise the pitking leg of the trailer and lock it there.

How to mount a Patu grapple loader on the trailer

** A Patu loader can be mounted on the trailer beam by using a loader mounting triangle, available as accessory. When mounting a Patu 525 loader on the trailer beam, no loader mounting triangle is needed.*

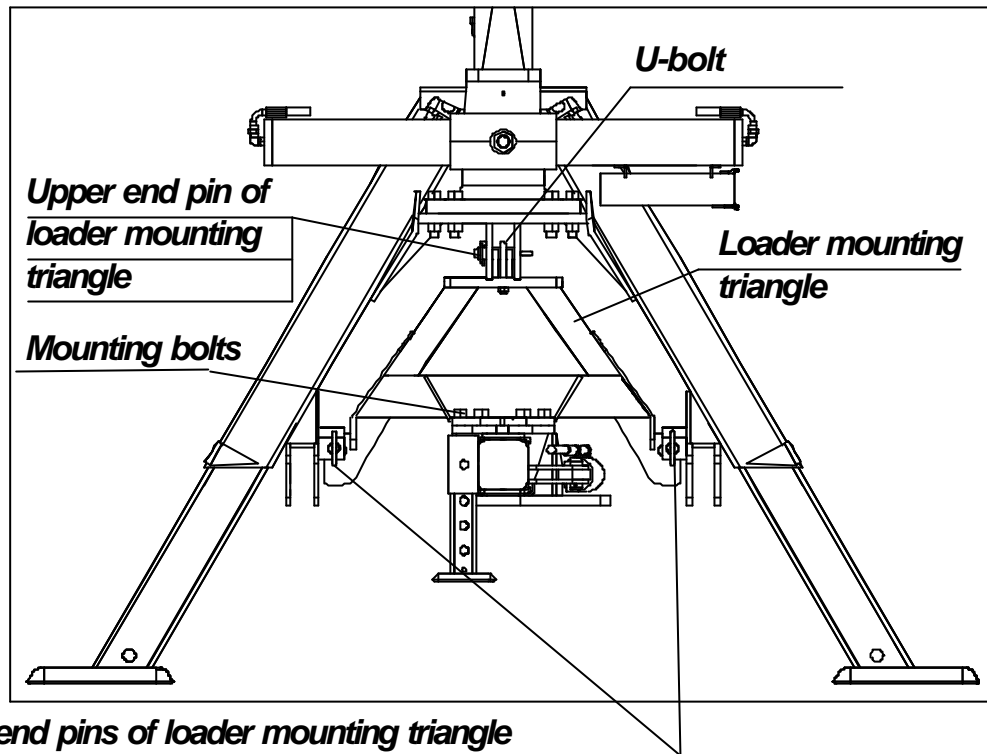
Safety instruction



** When connecting the loader to the trailer beam you have to work between the machines. Risk of getting jammed!*

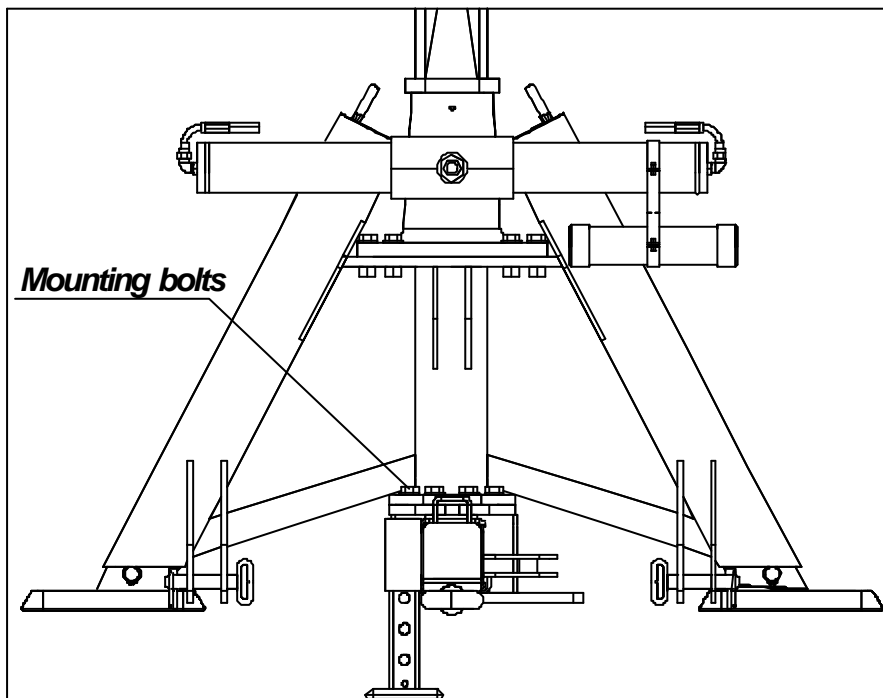
Mounting a loader on trailer beam with loader mounting triangle

- Lower the trailer hook onto the ground.*
- Reverse the loader, placed on the 3-point hitch, onto the loader mounting triangle, which has been mounted on the trailer beam, and press the loader grapple onto the trailer's main beam or the grapple attachment (accessory).*
- Detach the top link from loader and lower the loader carefully downwards so, that the side pins of the loader mounting triangle go into the loops of the loader's lower link brackets and the upper end U-bolt in to the pin located in the rearmost hole of the top link bracket.*
- Fasten the lower end insert pins and cotters and tighten the upper end closely with the U-bolt.*



Drawing showing the mounting of a 575/595 loader on the trailer beam

** Patu 525 loader mounted on the trailer beam without loader mounting triangle.*



Drawing showing the mounting of a 525 loader on the trailer beam.

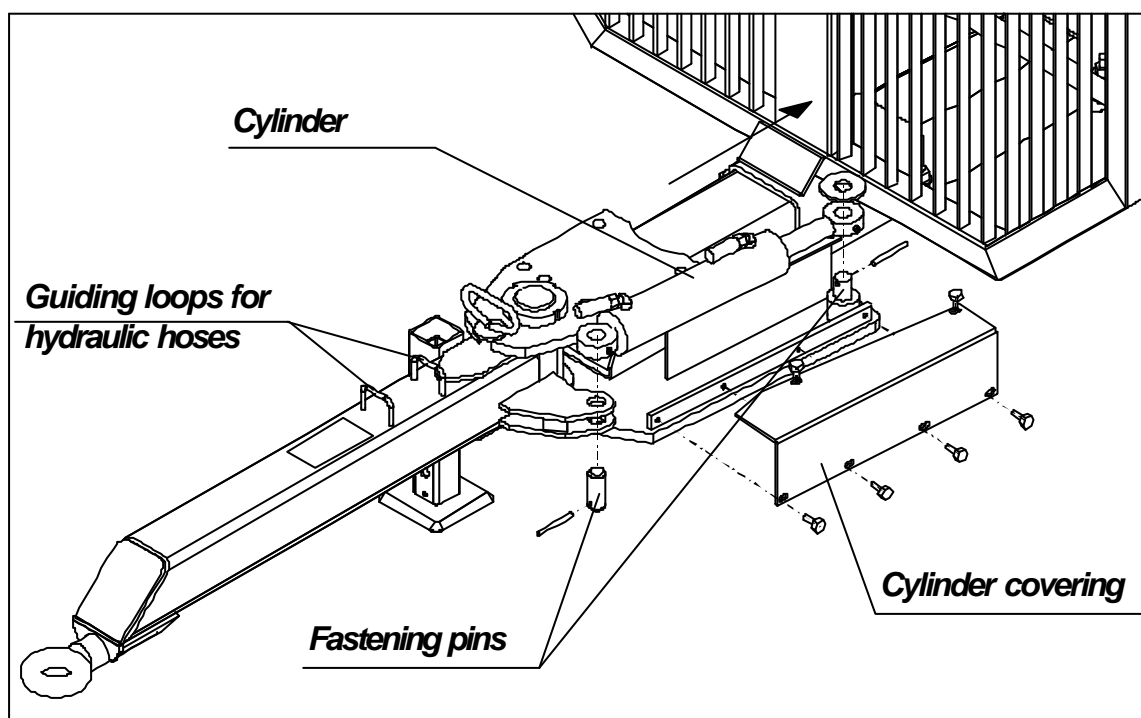
Coupling the hydraulic system

ALERT !

- Observe cleanness when coupling the quick couplings. Contaminants in the hydraulic system will cause quick wear and malfunction.
- Keep the quick coupling dust caps in there places always when the hoses are loose.
- Check the hydraulic oil quantity after coupling.

How to equip the trailer with hydraulic articulation

- Move the head rack out of the way for the cylinder fastening.
- Fasten the cylinder from the rod side in the pin on the trailer frame and the bottom side in the fastenings of the drawbar with the pin, coming with the cylinder. Lock the pins with roll pins.
- Pull the hoses via the guiding loops on the drawbar.
- Fasten the cylinder covering.



Connecting the brakes

- Connect the brake hose to the single-acting outlet of the tractor (max. pressure 175 bar / 2500 PSI).

Covering the hydraulic hoses

ALERT !

- If the hydraulic hoses must be brought into the cabin, they must absolutely be covered so, that the oil spout will not hit the driver in case of hose burst.

- Place and protect the hoses so, that they are not exposed to needless rubbing or deformation and that they cannot get jammed when using the hitch or any other accessory.

Cylinder covering

- The manufacturer has covered the cylinder rods with storage grease. Remove the grease before taking the trailer into use. The thick grease and contaminants stuck to it can damage the seals.

Safety instructions

General safety instructions



- * The Patu trailer is designed for normal use in farming and forestry and can be operated by persons who have general knowledge of handling farm and forestry machines.*
- * Get familiar with the trailer, trailer functions and the manual prior to introduction. Do not use the trailer unless you first have read and understood the instructions for operation and safety.*
- * Be very careful when connecting the trailer to a tractor or a loader.*
- * Ensure that the trailer`s risk zone is clear of any person when working.*
- * Keep hands and other parts of the body away from the machine structure, pivots or from under the wheels when working. Also ensure that there is no risk for you of getting jammed between other parts of the trailer or between the tractor and trailer. Risk to get jammed!*
- * Observe the stability of the supporting ground, the inclination and load height when working. Danger of tipping over!*
- * Never leave the tractor running and unattended.*
- * When you finish your work, shut off the engine, engage the parking brake and remove the key to prevent unauthorized use.*
- * A defective trailer may cause accidents due to sudden machine breakdown.*
- * Never let the trailer to an outsider, unless you have made sure that he is familiar with the operating and safety instructions.*

Special safety instructions



Hitch hook of the tractor

Observe the following safety instructions, when connecting the trailer to the tractor's hitch hook.

- * *Make sure the carrying capacity of the trailer hook is sufficient when using a trailer.*
- * *Check, that the locking of the hitch hook is functioning and that the hook will not slip from its place while working.*
- * *To avoid getting jammed, use extreme caution when connecting the trailer to the tractor.*
- * *Raise the parking leg of the trailer beam to upper position and lock it there.*

Drawbar

Observe the drawbar safety instructions when working with the trailer.

- * *If no hydraulic articulation is installed, make sure that the drawbar always is locked with the locking pin during work. Risk of tipping over!*
- * *Watch out for tipping over, when turning the hydraulic articulation downhill on sloping ground.*
- * *Never use the hydraulic articulation, if there are people close by.*
- * *Maintain and check the drawbar according to service instruction.*

Hydraulic system

Observe the safety instructions for the hydraulic system when connecting and using the trailer hydraulics.

- * *No hydraulic device of the trailer may be engaged, when starting the tractor.*

** Keep the trailer hydraulic hoses and pipes in appropriate condition and replace the defective components. Defects in pipe or hose might cause that highpressurized oil will spout out, be injected into the skin and so give rise to a severe infection. In such a case you have to contact a physician immediately.*

** Be very cautious when restarting the hydraulic system after reparations or if air on any other ground might have entered the system. Air in the hydraulic system might cause unexpected trailer movements. Risk of accident!*

** When replacing hydraulic components, pipes and hoses with new ones, check for their appropriate pressure durability. An original spare part is always safer.*

Mounting accessories and structure modifications

** Always contact Kesla Oy before mounting an accessory not manufactured by Kesla Oy. The accessory might be inappropriate and thus cause risk of machine breakdown or accident.*

** Prior to any structure modification always contact the factory. Structure modification might cause situations of overload and therefore risk of accidents.*

Maintenance and repairs



** Use proper supports to prevent the trailer from moving during maintenance and repairs. Shut off the tractor engine, engage the parking brake and remove the key from the ignition.*

** If you have to repair weld the structure, never start to weld before having been in contact with the factory, to get necessary welding instructions and other facts to be noticed. Reparations by welding shall be performed by a qualified welder, since a sudden breakdown of an inadequately repaired structure might give rise to accidents.*

Storage

ALERT !

* *Check for the supporting, to prevent the trailer and the possible loader connected to it, from tipping when stored.*

* *When stored, make sure that the loader cannot be used as a childrens' playground.*

Safety instructions for traffic on public roads

* *When starting to drive, make sure that you have complete control of the machine unit in all situations. Also observe that the braking distance is longer.*

* *Before starting to drive, make sure that there are no projections on either side and that the load cannot come undone while driving.*

* *Tie down the load carefully before driving onto the main road.*

* *Before starting to drive, make sure that all necessary equipment, lights, reflectors and the SMV-triangle, are in correct places and functioning.*

* *Also check the tyre pressure.*

* *Comply with all the statutes and decrees of the Road Traffic Law when driving on public roads.*

* *Follow the given minimum safe approach distances to live electrical conductors when trafficking near electric or telephone lines.*

* *Observe the machine unit height when driving under flyover junctions.*

Safety instructions when handling oils and greases



- * Avoid skin contact with oil or grease when working or maintaining. These might contain additives harmful when continuously in skin contact. Follow the instructions and regulations of the manufacturers and authorities.*
- * Always wear proper protective clothing, skin protecting lotions or appropriate gloves when handling oils and greases.*
- * Never use lubricating oils or greases to clean your hands with. Metal particles and additives of the lubricants might damage the skin.*
- * Never use clothes soiled with oils and greases.*
- * Do not keep oily tools or other oily objects in the pockets.*
- * If oil or grease result in skin changes, contact a physician immediately.*
- * All waste oil from maintenance and repair shall be sent away to be duly treated.*

GENERAL

This manual is drawn up for persons with previous practice of handling tractor driven farming and forestry machines. Using the trailer further presumes normal general knowledge and skills in forestry economics.

**) The asterisk notifies information on the issue at hand.*

-) The dash indicates necessary/possible steps to be taken.



The WARNING! symbol denotes a very important safety instruction.

ALERT !

The ALERT! symbol notifies risk of damage for the product, process or environment.

** To make the manual quicker and easier to use, we have divided the paging into fifteen larger sections and headed the treated issue in the upper right page corner.*

** All descriptions, instructions and technical data are based on the latest knowledge of the machine structure at hand when preparing the manual. Due to continuous product developing the manufacturer reserves the right to change the product without advance notice.*

** Should malfunction occur, the trouble and its probable cause can be cleared and repaired with the assistance of the Trouble shooting table. If not, contact the seller or a maintenance shop authorized by the seller.*

NOTICE!

When ordering spare parts or asking for repair instructions, always supply the information from the machine plate to the seller or repairer, to get speedier help in case of malfunction and the correct spare part.

If you cannot solve the problem and neither the seller nor the service shop is able to help, contact the manufacturer, who will sort it out.

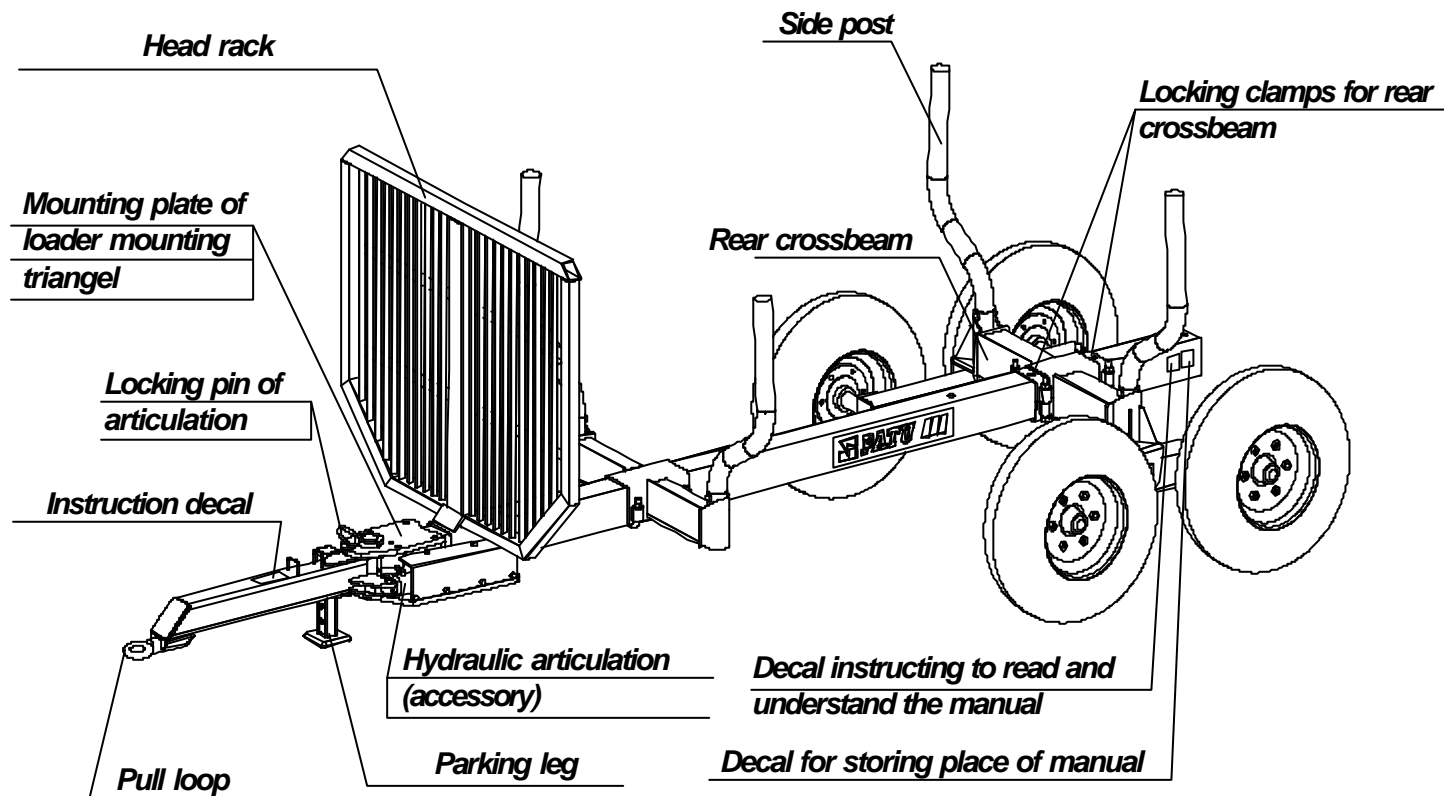
NOTE!

Copy the information on the machine plate onto the picture below:

		SF-59800 Kesälahti Finland ☎ 013 - 682 841	
Tyvödi Työ Työ	<input type="text"/>	Paino Vikt Weight	<input type="text"/> kg
Valm.No Tillv. nr Serial No	<input type="text"/>	Valm. V. Tillv. år Year	<input type="text"/>
	<input type="text"/>	Nosturil. Kranklass Loader class	<input type="text"/>
			3280507

MACHINE PRESENTATION

The trailer is designed to follow the pulling tractor smoothly and exactly in forest conditions, without damaging the growing trees. The trailer drawbar enables steering while driving, if the trailer is fitted with a hydraulic articulation. The tandem axle crosses lightly over uneven terrain and notably compensates the sideways swing. Thanks to four wheels, the surface pressure remains insignificant. The round tyre profile reduces root damage of the growing stand.



The Patu 70 trailer equipped with hydraulic articulation

MACHINE PRESENTATION

Warning and instruction decals on the trailer

The numbered spots on the trailer have warnings and instructions informing of hazards during work and handling instructions. Follow these to avoid accidents or machine breakdown.

Decal # 1

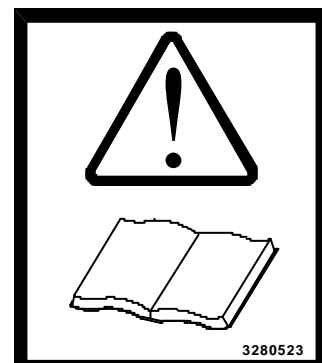
* Instruction decal for greasing the articulation.



Decal # 2

* The decal reminds the operator not to start-up, mount, maintain or repair the machine before the manual has been carefully read and understood.

* If the machine is operated by more than one person, the owner/possessor shall instruct them all to operate, mount, maintain and repair the machine and also oblige them to read and understand the manual.



* The owner/possessor shall fill out the Bill of Delivery and the Assurance of having read and understood the manual, and send these both documents to the manufacturer no later than fourteen (14) days since machine delivery from seller to customer (refer to Terms of Warranty). The address is: Kesla

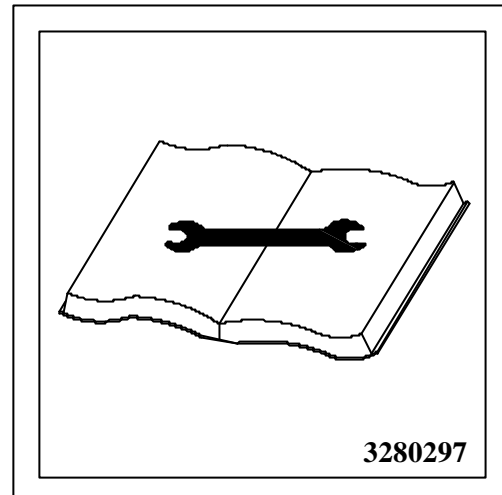
Oy, Metsolantie 2, FIN 59800 Kesälahti (Finland). (Fax +35813 6828100, phone +35813 682841).

Decal # 3

* Decal for manual.

* The decal shows the storing place of the manual.

* The manual must always be available for the operator in this case.



Alternative accessories

* A loader with stabilizer legs can be mounted on the main beam with a loader mounting triangle, available as accessory. When mounting a Patu 525 loader, no mounting triangle is needed.

Mounting recommendations

The Patu 70/80 trailer is designed to be used with loaders Patu 525, 575, 585, 595. A bigger loader than these may not be mounted on the main beam!

Accessories

* The Patu trailer has a wide variety of accessories, which will further facilitate and effectivate your work.

- hydraulic articulation (as standard in Patu 100)
- extra crossbeams
- loader mounting triangle
- grapple attachment

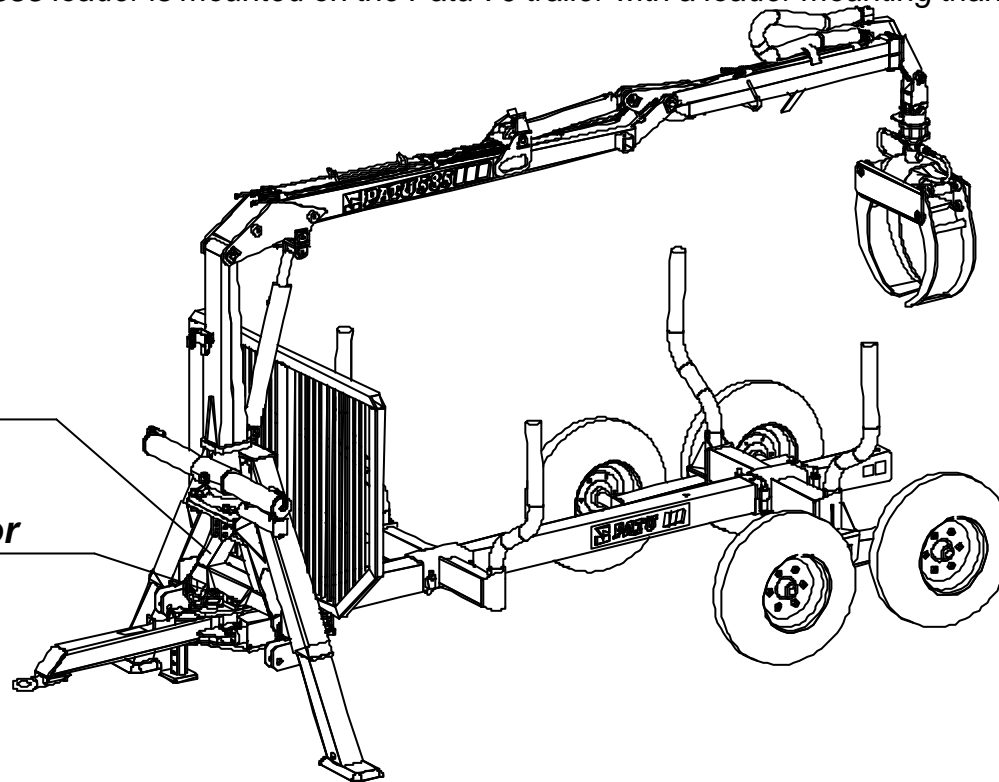
FUNCTION

Field of application

Patu 70/80 trailers are designed to be used together with loaders Patu 525, 575, 585 and 595 especially for harvesting in thinning stands, but it is also well suited for professional timber hauling. All kinds of timber, from firewood stems and pulpwood to logs, can be transported with the trailer. In addition the trailer lends itself to transport of round bales, if fitted with suitable round bale equipment. In the drawing below a Patu 585 loader is mounted on the Patu 70 trailer with a loader mounting triangle.

**Loader mounting
triangle**

**Mounting bolts for
loader mounting**



FUNCTION

Discarding the trailer

When the trailer is coming to the end of its service life, it shall be done away with in a way, which will cause no needless harm to the environment.

1. Deliver the trailer to a scrapped goods treatment plant, where it will be dismantled under surveillance.

2. If dismantled by yourself, follow these instructions:

- Drain the oil from the hydraulic system and send it to a waste oil treatment plant.*
- Remove all hydraulic hoses and tyres and send them to a waste (recycling) rubber collecting place.*
- Send the metal parts to a capital scrap collector.*

TECHNICAL DATA

This specification notifies the structural and functional measures as well as the weights, carrying capacity and loading space.

	<i>Patu 70</i>	<i>Patu 80</i>
<i>- Total width</i>	<i>192 cm</i>	<i>207 cm</i>
<i>- loading space area</i>	<i>2,0 m²</i>	<i>2,0 m²</i>
<i>- loading space width</i>	<i>166 cm</i>	<i>166 cm</i>
<i>- loading space length</i>	<i>350 cm</i>	<i>350 cm</i>
<i>- loading space height</i>	<i>122 cm</i>	<i>122 cm</i>
<i>- bunks</i>	<i>2 pcs</i>	<i>2 pcs</i>
<i>- total length</i>	<i>532 cm</i>	<i>532 cm</i>
<i>- ground clearance</i>	<i>50 cm</i>	<i>50 cm</i>
<i>- weight</i>	<i>900 kg</i>	<i>990 kg</i>
<i>- carrying capacity</i>	<i>7000 kg</i>	<i>8000 kg</i>
<i>- tyre size</i>	<i>11.5 x 15.3 10 ply</i>	<i>400 / 60 x 15.5 14 ply</i>
<i>- slewing angle of hydr. draw bar</i>	<i>±38°</i>	<i>±38°</i>

DETERMINATION OF STABILITY

*The formulas in these instructions are based on standard SFS 4677 *). The standard is sold by the Finnish Standards Association SFS, P.O.Box 116 00241 HELSINKI, Phone. int. +358 0 149 9331*

**) Citations with the permission of SFS.*

Determination of stability by calculation

A loader mounted on the trailer beam or a tractor is considered stable, when the stability coefficient n , calculated from the formula below, is ≥ 1.0).

If the stability coefficient is between 0.75...1.0 only half of the, in the loading diagram given lifting values may be lifted with the loader, with the payload of the trailer being 25% of max. permissible.

Symbol definitions

G = Load mass

N = Loader mass without booms (incl. mounting base)

B = perpendicular distance from boom end (load) to tipping over verge

P = mass of booms (centre of gravity)

E = distance to centre of gravity of booms from slewing centre

L = loader reach from slewing centre

A = perpendicular distance between slewing centre of loader and tipping over verge

M

M = Rear axle weight less load

H = Distance of booms centre of gravity to tipping over verge

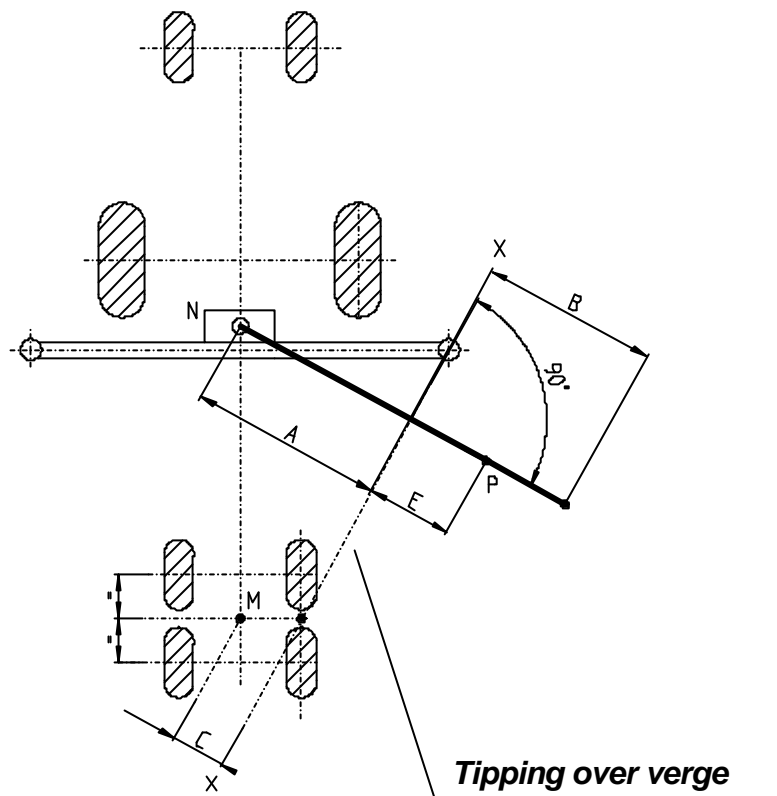
**) differ from standard SFS 4677*

Loader on trailer beam:

$$n = \frac{(N \times A) + (M \times C)}{(G \times B) + (P \times E)}$$

$$B = L - A$$

$$E = H - A$$



Determination of stability by test

Safety instruction



** Observe extreme caution during the test. Risk of tipping over!*

Test conditions

The trailer-loader unit shall be in normal running order less load, and be inclined 5° in the direction of the tipping over verge, when testing. The ground must be firm enough to withstand the loads of the wheels or other fulcrum points.

Performing the test

The test is carried out with the most unfavourable reach in regard to the stability and using an overload of 10 %. Observe extreme caution when driving all the movements, as normally driven, during the test. Incline the trailer 5° by adding a suitable platform under one of the bogie wheel pairs or driving the trailer onto a suitable sloping ground.

Result evaluation

The trailer-loader unit is considered stable, if no more than one of the fulcrum points loses its hold from the ground during the test. If more than one fulcrum point loses its hold from the ground, only half lifting power may be used with the loader, when the load of the trailer is less than one fourth of the max. load.

DIRECTIVES AND STANDARDS APPLIED

When designing the timber trailer following directives and standards have been applied:

- Designing of load-bearing and loaded structures: standards SFS 4020, SFS 4023, SFS 4024, SFS 4028 and adaptive parts of SFS-ISO 5692.*
- Safety and protective equipment are designed using standard SFS-EN 294.*
- The manual delivered with the machine: according to Directive 89/392/EEC and 91/368/EEC and also standards SFS-EN 292-2 and SFS-EN 414.*
- EC declaration of conformity: Directive 89/392/EEC and its amendments as well as the national State Council Decision (Vnp) 1314/94.*
- CE marking according to Directive 93/68/EEC.*

TERMS OF WARRANTY

A manufacturer's warranty of six (6) months from the date of delivery is given to the products named in the enclosed Bill of Delivery.

The warranty will cover any defects in the machine or equipment due to faulty raw materials, structural failures and faulty workmanship. The defective part of the machine or equipment is replaced free of charge with a new or reconditioned part by the guarantor. The warranty for such a part is the remaining time of the original one.

The warranty shall not apply to any faults or defects arising from normal wear, negligence or improper operation, faulty installation or incorrect or inadequate maintenance. The manufacturer will not assume any liability for any economical losses or for any consequential damage to persons or property which may incur through product failure.

The warranty shall be invalidated, if any repairs to the warranted product have been made by others than the manufacturer or a service shop authorized by the manufacturer or if the equipment has been altered.

The warranty will apply provided that the enclosed combined Bill of Delivery and Possessors/ Owners Assurance of having read and understood the manual is returned to the manufacturer within fourteen (14) days from delivery.

A written warranty claim must be submitted to the guarantor without delay, within fourteen (14) days at most after the fault appeared.

RESPONSIBILITY FOR DAMAGE

Kesla Oy will not be responsible for any damage caused by the machine, if the instructions and safety instructions in the manual are not followed. The machine shall not be taken into use before the manual is thoroughly read and understood.

The responsibility of Kesla Oy for damage shall apply only, when the enclosed combined Bill of Delivery and Possessors/Owners Assurance of having read and understood the manual will be sent to the manufacturer within fourteen (14) days of delivery.

Kesla Oy

FIN 59800 KESÄLAHTI

Phone +35813 682841

Fax +35813 6828100

EU-DECLARATION OF CONFORMITY FOR MACHINERY

Manufacturer *KESLA OY*

Address *Metsolantie 2*
 FIN-59800 KESÄLAHTI
 FINLAND

Herewith declares that

Patu 70/80 Timber trailer serial number 195000 and followings

- is in conformity with the provisions of the Machinery Directive (Directive 89/392/EEC), as amended, and with national implementing legislation;*
- is in conformity with the provisions of the following other EEC directives:*

.....
.....

and furthermore declares that

- the following (parts/clauses of) harmonized standards have been applied:*

.....
.....

- the following (parts/clauses of) national technical standards and specifications have been used:*

.....

Kesälahti 16.10.1997

Asko Kinnunen
Managing Director

WARRANTY

___/___19___

SERIAL NUMBER_____

SELLER: _____

SERIAL NUMBER_____

KESLA OY
FIN 59800 KESÄLAHTI

Seller's copy

BILL OF DELIVERY

____/____ 19____	Owner/Possessor _____
Product _____	Building/Street _____
Serial number _____	Postcode and town _____
Accessories _____	Phone _____
	Seller _____

✂-----

KESLA OY

To be sent back to the manufacturer

Metsolantie 2
59800 KESÄLAHTI
Phone +358 13-682841 Fax +358 13-6828100

BILL OF DELIVERY/

OWNERS/POSSESSORS ASSURANCE OF HAVING READ AND UNDERSTOOD THE MANUAL

____/____ 19____	Owner/Possessor _____
Product _____	Building/Street _____
Serial number _____	Postcode and town _____

Accessories _____	Phone _____
	Seller _____

ASSURANCE

I have read and understood the user's instructions and the safety instructions of the manual.

