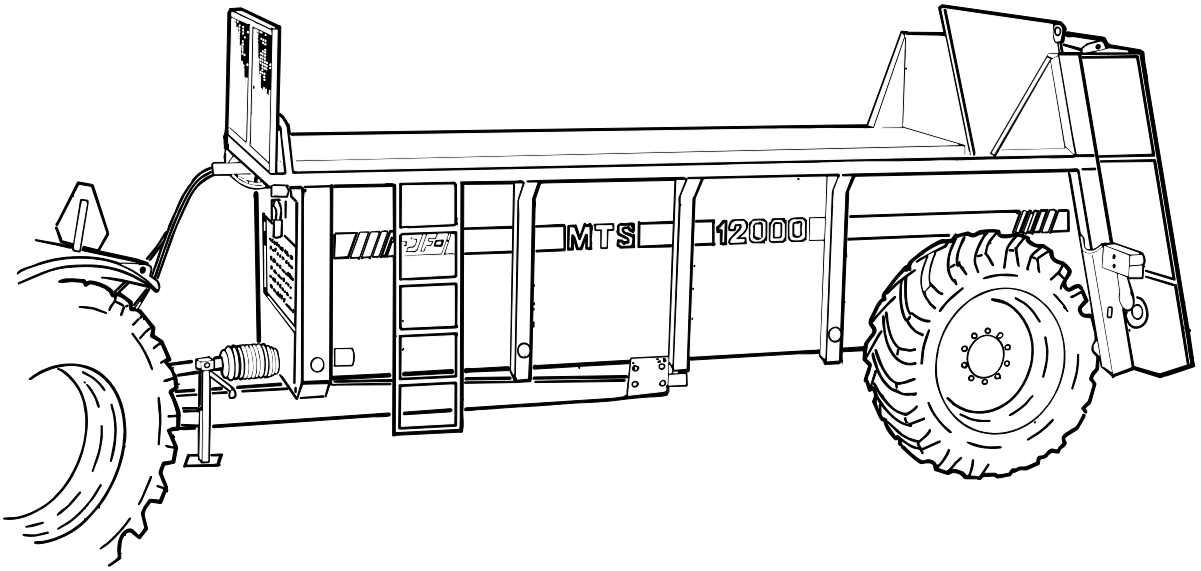
MTS 12000

Manure Spreader

Instruction manual



Edition: 4 October 2004

EU Declaration of Conformity

Manufacturer:

JF-Fabriken - J. Freudendahl A/S
DK 6400 SØNDERBORG DENMARK
Phone +45 74 12 52 52

Hereby declares that:

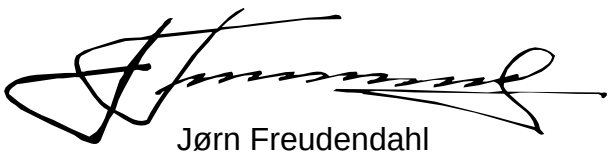
Machine type: MTS 12000

a: was manufactured in conformity with the provisions in the COUNCIL DIRECTIVE of 14 June 1989 on mutual approximation of the laws of the Member States on the safety of machines (89/392/EEC as amended by directive 91/368/EEC, 93/44/EEC, 93/68/EEC) with special reference to Annex 1 of the Directive on essential safety and health requirements in relation to the construction and manufacture of machines.

b: was manufactured in conformity with provisions in the EMC directive 89/336/EEC, as amended by 92/31/EEC.

c: was manufactured in conformity with the requirements in DS/EN 690:1995.

Sønderborg 2004-10-27



Jørn Freudendahl
Responsible for construction and manufacturing

FOREWORD

DEAR CUSTOMER!

We appreciate the confidence you have shown our company by investing in a JF-product and congratulate you with your new machine. Of course, it is our wish that you will experience complete satisfaction with the investment.

This instruction manual contains information about correct and safe use of the machine.

When buying the machine you will receive instructions about use, adjustment and maintenance.

However, this first introduction cannot replace a more thorough knowledge of the correct technical use of the machine to keep the machine operational and ensure long life.

Therefore you should read this instruction manual before using the machine. Pay special attention to the safety instructions.

To make it easier for you to start working with the machine, the information in this instruction manual is mentioned in the order you will need it i.e. from the necessary operation conditions to use and maintenance. Apart from this, we have made the instruction manual easier to read by using pictures with text in each chapter.

”Right” and ”Left” are defined from a position behind the machine, facing the direction of travel.

All the information, illustrations and technical specifications in this instruction manual describe the latest version on the time of publication.

As JF-Fabriken wishes to constantly improve the technical standard in order to meet the requirements to a modern farm machine, the company reserves the right to make changes or improvements in the design or construction of any part without incurring the obligations to install such changes on any unit previously delivered.

We recommend you to keep this instruction manual so that it can be supplied with the machine in case it is sold later on.

PIGB-091X-04 MTS 12000 1004

CONTENTS

1. INTRODUCTION

INTENDED USE

The manure spreader **MTS 12000 is solely made for usual work in agriculture, i.e.:** Usual work in fields such as shredding and spreading of farm manure, deep bedding, compost, sludge or the like intended for manure for plants or for the improvement of the soil structure. Besides, the MTS 12000 can also be used as a forage trailer. Unloading and driving in clamps must be made very carefully to avoid any risk of tipping over.

Never dismount the beater bar of the trailer and then only use the remaining unit as a special unloading trailer, as it will be neither legal nor safe.

The manure spreader may only be mounted on a tractor which considers the specifications of the trailer and is legal to use.

Any use beyond this is outside the intended use. JF-Fabriken A/S is not responsible for any damage resulting from such use, the user bears that risk.

It is assumed that the work is performed under reasonable conditions, including that the loaded material is kept clean of various foreign matter.

The manure spreader is constructed for temperate climatic conditions. When the manure spreader is started in frosty weather the driving mechanism of the conveyor chain might be blocked. Manure might give off heat and therefore does not freeze. If you want to work in frosty weather special precautions must be considered.

Intended use also means that the information prescribed by JF-Fabriken A/S in the instruction manual is observed.

The manure spreader MTS 12000 should only be used, maintained and repaired by persons who, through relevant instructions and after reading the instruction manual, are familiar with the machine and, in particular, are informed of possible dangers.

In the following there is a number of general and special safety instructions which **must** be observed altogether.

If changes are made on the machine and its construction without permission from JF-Fabriken A/S, JF-Fabriken A/S cannot be held responsible for any damage resulting from this.

SAFETY

Within agriculture there are generally many working-related injuries due to operation errors and insufficient instruction. The safety of persons and machines is an integral part of JF-Fabriken's development work. **We wish to ensure the safety of you and your family in the best possible way**, but this also requires an effort on your part.

A manure spreader cannot be constructed in such a way that it guarantees the full safety of persons and at the same time performs an efficient piece of work. This means that it is very important that you as user of the machine pay high attention and use the machine correctly and thereby avoid exposing yourself and others to unnecessary danger.

The machine demands skilled operation, which means that ***you should read the instruction manual before you connect the machine to the tractor***. Even though you have been driving a similar machine before, you should read the manual - this is a matter of your own and other persons' safety!

This is also the reason why you should **never** leave the machine to others before you have made sure that they have received the necessary instructions how to operate the machine correctly.

DEFINITIONS

The safety decals and the instruction manual of the machine contain a line of safety notes. The safety notes mention certain measures, which we recommend you and your colleagues to follow as to increase the personal safety as much as possible.

We recommend that you take the necessary time to read the safety instructions and inform your staff to do the same.

In this instruction manual this symbol is used with reference to personal safety directly or indirectly through maintenance of the machine.

CAUTION: The word CAUTION is used to ensure that the operator follows the general safety instructions or the measures mentioned in the instruction manual to protect himself and others against injuries.

WARNING: The word WARNING is used to warn against visible or hidden risks, which might lead to serious personal injuries.

DANGER: The word DANGER is used to indicate measures which, according to legislation, must be followed to protect oneself and others against serious injuries.

GENERAL SAFETY INSTRUCTIONS

The following is a brief description of the measures, which should be a matter of common knowledge to the operator.

1. Apart from the instructions in the instruction manual, you should always folllow the generally applying safety rules.

2. Before you start working, you should become acquainted with the arrangement and operation of the machine as it is too late to do this while you are working.

3. Activate the parking brake of the tractor and stop the tractor engine before you leave the tractor. Always disconnect the PTO drive shaft to the conveyor chain and the shredding unit, if you are going to stay in or under the trailer platform in order to:

- adjust the machine
- check the machine
- lubricate the machine
- clean the machine

4. Never start the tractor until all persons are safely away from the machine. Safety distance during operation is minimum 50 m.

5. Before the tractor is started, make sure that the machine has been connected correctly and that all tools have been removed from the machine.

6. Also make sure that damaged wearing parts have been replaced and that all guards are mounted correctly.

7. During work never wear loose clothes which can be pulled in by the moving parts of the machine. Always wear suitable shoes to avoid falling.

8. Do not change the guards or work with the machine when a guard is missing or defective.

9. Always drive with the statutory lights and safety marking during transport on public road and at night.

10. Limit the transport speed to maximum 30 km/h if the machine has not been marked with another maximum speed limit.

11. Do not stand near the machine while it is working.

12. When mounting the PTO drive shaft check that the number of RPM of the tractor matches those of the machine.

13. Always use hearing protectors if the noise from the machine is annoying or if you are working with the machine for a considerable period in a tractor cabin, which has not been silenced sufficiently.

14. Never bring passengers in the tractor unless it is intended for passengers, and never let anybody stand on the platform of the trailer during working or transport.

15. Never use the machine for other purposes than what it has been constructed for.

16. Do not allow any children to be near when you are working with the machine.

17. Never stand between the tractor and the machine during connection and disconnection.

CHOICE OF TRACTOR

Always follow the recommendations specified in the instruction manual of the tractor. If this is not possible, technical assistance must be sought.

The manure spreader is designed for 1000 RPM.

As standard the manure spreader MTS 12000 requires at least 1 double-acting hydraulic outlet. The adjustment of the conveyor chain uses 0-30 l/min as a standard operation.

As standard the trailer is equipped with hydraulic brakes, which require their own outlet.

The Danish Working Environment Service requires that external adjusting valves for instance for the drive mechanism of the conveyor chain is not in the tractor cabin (AT direction No. 2.2.0.1 October 1990).

The lighting equipment requires a 7-pole plug with 12V direct current.

Always choose a tractor with a closed cabin if you are going to work with the manure spreader.

CONNECTION AND DISCONNECTION

Always make sure that nobody is standing between the tractor and the manure spreader during connection and disconnection. An unintentional manoeuvre with the tractor may cause serious injury (see fig. 1-1).

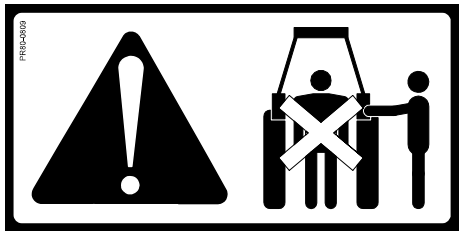
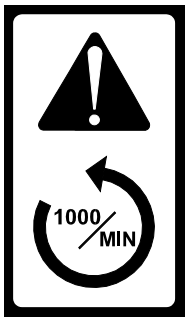


Fig. 1-1

The manure spreader must be connected to the prescribed tractor arrangement, hitch or drawbar.

During the disconnection of the trailer it is very important that the ground is even and stable to avoid that the manure spreader moves and hit persons or damages any equipment. We recommend that the parking brake of the manure spreader is activated.

Check that the manure spreader is intended for the number of revolutions of the tractor (see fig. 1-2). 1-2). A wrong number of revolutions might cause an unsatisfactory spreading.



Connection and disconnection of the PTO shaft must only be made while the tractor engine is stopped and after the ignition key has been removed.

Make sure that the PTO drive shaft has been mounted correctly. The lock pin must be in mesh and the support chain must be fastened at both ends.

Fig. **Fejl!**

The PTO drive shaft must be correctly protected. If the guard is damaged it must be replaced immediately.

The overload clutch on the PTO shaft must be positioned on the side of the manure spreader.

Hydraulic hoses must be checked by an expert before use, and after that minimum once a year. If necessary, they must be replaced. The working life of hydraulic hoses should not exceed 6 years, including max 2 years of storage. When replacing, always use hoses which comply with the requirements stated by the manufacturer. All hoses are marked with date of production.
Check that the hydraulic couplings are tight and that all hoses and fittings are undamaged before the hydraulic system is activated.
When the engine of the tractor has stopped also make sure that there is *no* pressure in the hydraulic hoses by activating the hydraulic tractor valve.

Hydraulic oil under pressure can penetrate the skin and cause serious infections. You should always protect your skin and eyes against oil splashes (see fig. 1-3). If, by accident, hydraulic oil under pressure hits you, consult a doctor immediately.

Fig. 1-3

ADJUSTMENT

When adjusting the manure spreader always:

- Disengage the PTO.
- Stop the tractor engine
- Wait until all moving parts have stopped.

It is very important that you do not approach the spreading unit until the rotating vertical beater bars have stopped moving. As the vertical beater bars have some inertia there is a risk of them overrunning.

Before you start working, check that the vertical beater bars can move freely. Furthermore, you should check that the shredding blades are intact and without any breakage. Of course it is necessary to replace shredding blades which have substantial defects in order to avoid blockages, damage and metal parts being thrown out of the vertical beater bars.

Check periodically if shredding blades and bolts are worn as mentioned in the instruction manual (see the section about maintenance).

The first time you use the manure spreader blade bolts, wheel rim bolts and drawbar bolts might get stuck and result in insufficient initial tension. Therefore, you should check the initial tension of the bolts after 1 working hour.

TRANSPORT

Limit the transport speed to maximum 30 km/h if the machine has not been marked with another maximum speed limit.

Before driving on public roads check that the brakes of the manure spreader work correctly.

Maintenance of brakes and hubs and replacement of tyres should only be made when you are sure that the manure spreader is parked on stable ground and is not able to move.

Repair of brakes, hubs and shafts depends on knowledge of correct use of the necessary tools. Therefore, you should leave this kind of work to authorised workshops.

Check the air pressure regularly and make sure that it observes the prescribed minimum values.

The statutory lights and safety markings must be connected and mounted correctly.

Reflectors and lighting must be cleaned regularly.

WORKING

Before working with the manure spreader you must ensure that there are no persons behind the spreading equipment of the manure spreader within a safety distance of minimum 50 m. There is a risk of severe damage to persons within this safety distance caused by stones and other foreign objects, which are in the manure by mistake and with high speed will be thrown out of the manure spreader.

Furthermore, it is important that the front grill has been mounted correctly in order to secure the tractor driver against stones and other foreign objects, which could be thrown out from the manure spreader's spreading equipment.

When driving in the field along side a public road the safety distance must also be observed in order not to be a danger to traffic.

The vertical beater bars can overrun because of a free wheel clutch in the transmission. Therefore, it is not enough to disengage the power take-off of the tractor, it is also necessary to wait until the rotating parts of the spreading platform and the shredding unit have stopped before approaching the manure spreader.

If the manure spreader is loaded from the rear end first, there is a risk of the trailer tipping over, especially if the manure spreader has not been connected to a tractor before it is loaded.

If the manure spreader is only loaded from the front of the trailer there is a risk that the manoeuvrability of the tractor is reduced caused by front maximum concentrated weight. In this case you should adjust the speed according to the conditions.

Never load the trailer more than the allowed total axle load.

On hilly grounds the maximum incline in the driving direction must not be more than 20% to avoid that a fully loaded trailer will tip over.

PARKING

MTS 12000 is equipped with a parking brake, which is placed on the right hand side of the manure spreader.

PREPARATION

In order to prepare the manure spreader it might be necessary to enter or get under the trailer in order to remove foreign objects.

When preparing or maintaining the manure spreader never work more than one person at a time on the trailer. This reduces the risk of getting fingers caught because another person by accident turns the revolving parts while you are still working with them.

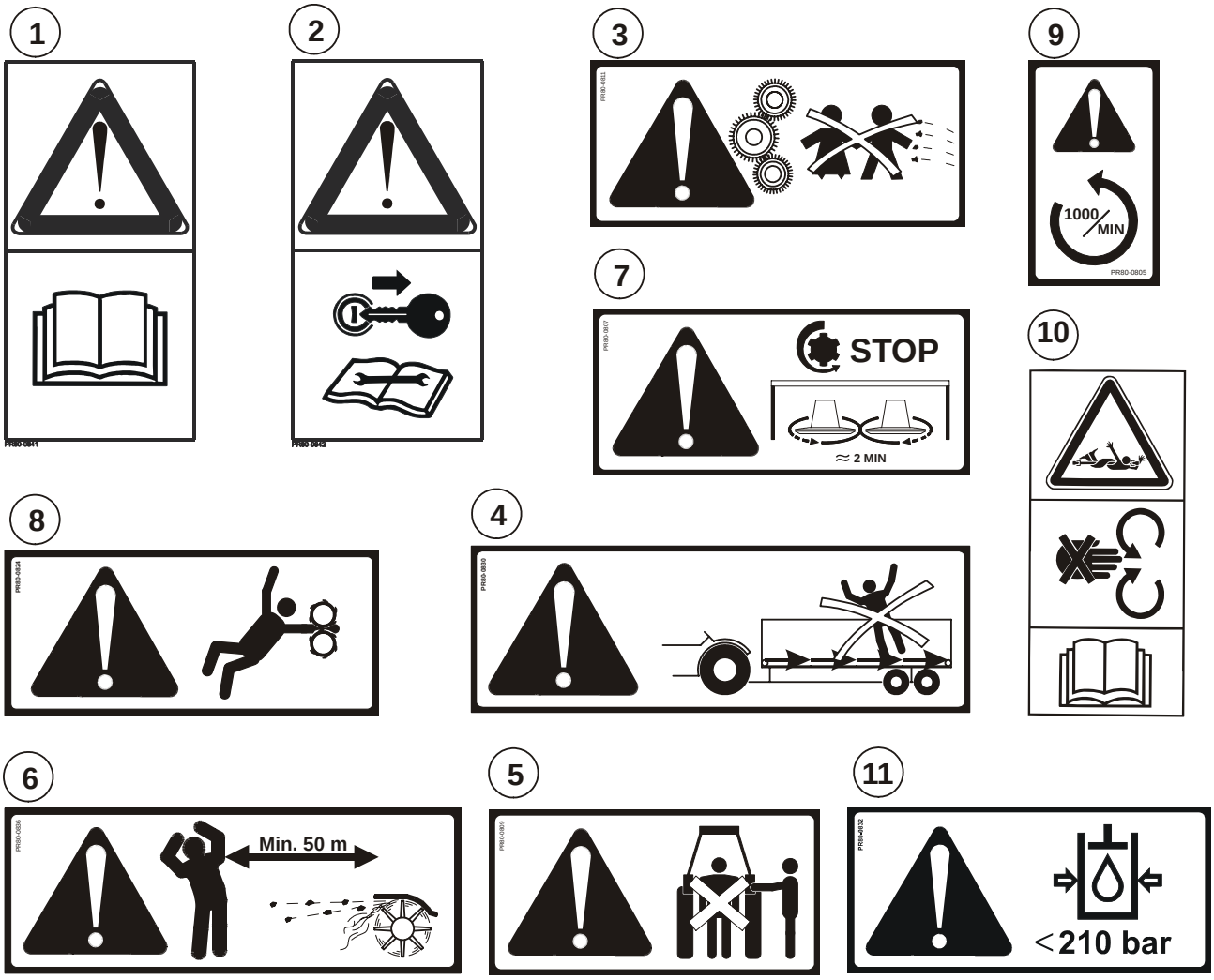
Always disengage the PTO, stop the tractor engine and activate the parking brake before you enter or get under the trailer. This also applies when you are going to clean or lubricate the trailer.

GREASING

Never try to clean, grease or adjust the machine before the PTO has been disengaged, the tractor engine has stopped and the parking brake been activated.

REPLACEMENT OF WEARING PARTS

Shredding blades and conveyor chains are made of high-alloyed, heat treated materials. This heat treatment results in a hardened and tough material, which is able to stand extreme stress. If a shredding blade or a chain link is damaged, it must be replaced with original JF spare parts in order to ensure optimal reliability.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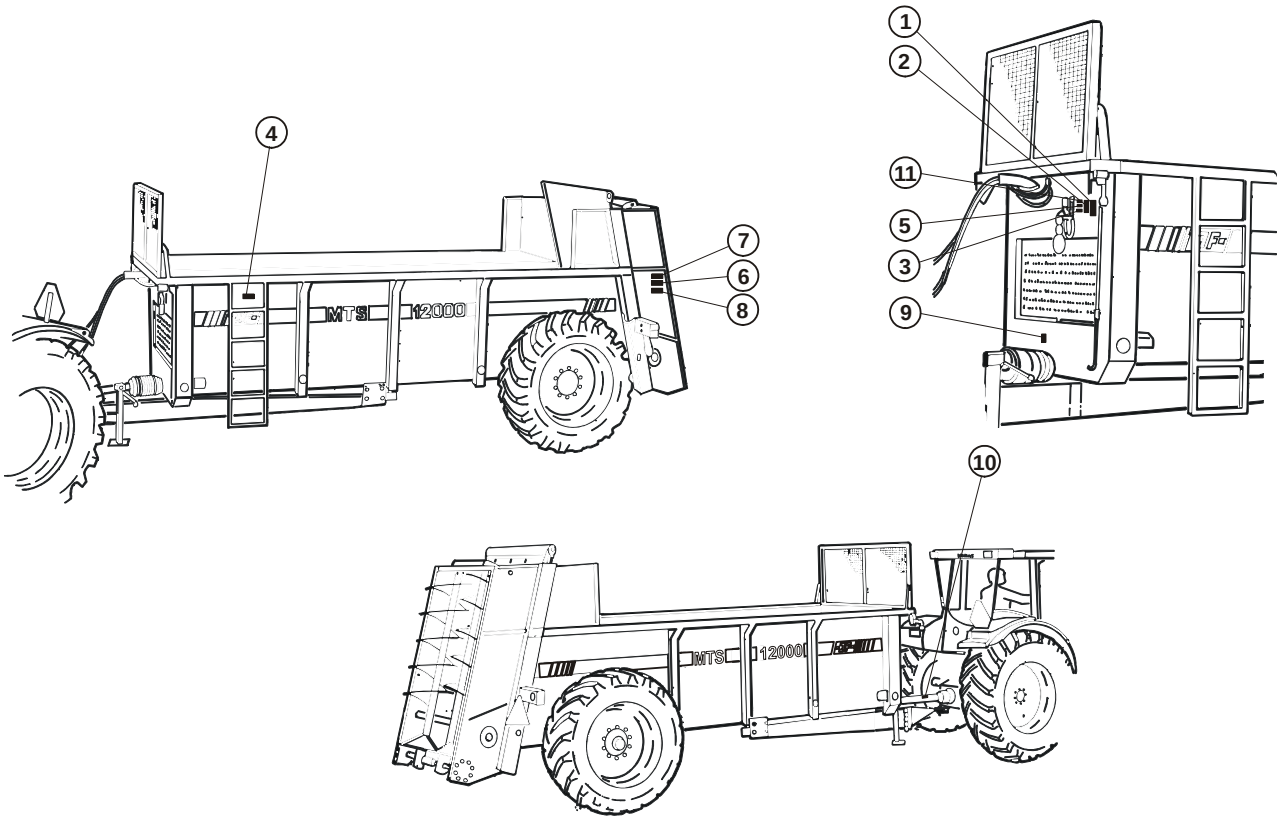
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MTS
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SAFETY DECALS

The safety decals shown on the previous page are positioned as shown on the drawings at the bottom of the page. Before using the machine, check that all decals are present: if not, require those missing. The decals have the following meaning:

1. Read the instruction manual and the safety instructions.
This is to remind you to read the delivered documents to ensure the machine is operated correctly and to avoid unnecessary accidents and machine damage.

2. Stop the tractor engine and remove the ignition key before touching the machine.
Always remember to stop the tractor engine before lubricating, adjusting, maintaining or repairing. Also remember to remove the ignition key to ensure that nobody starts the engine until you have finished.

3. Children
Never let children stand near the machine during operation. Especially not small children as they have a tendency to do unforeseen things.

4. Chain drive
Under this trailer there is a chain drive. Make sure that the tractor engine is stopped before you approach the chain drive.

5. Risk of getting jammed.
There is a risk of getting fingers etc. caught several places on the machine. Be careful when the machine is connected to the tractor and ready to work. The machine could with no problems damage parts of the body, which have been jammed.

6. Safety distance
There is a risk of parts being thrown out, and therefore nobody must be closer to the machine than 50 m while it is working.

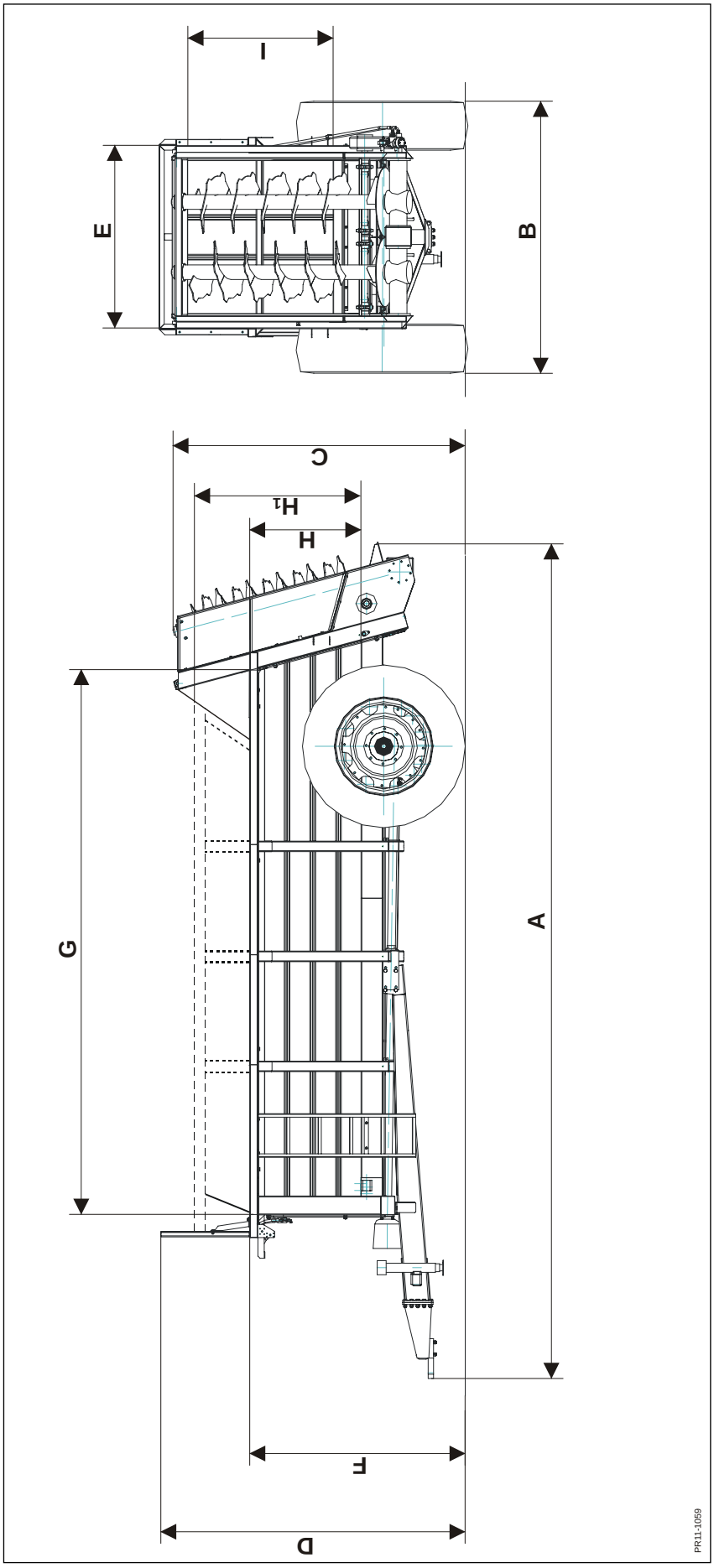
7. Rotating parts.
When the manure spreader's PTO is stopped, the rotating blades will overrun, which means that the spreading vanes and the shredding beater bars will keep on rotating for approx. 2 minutes. Wait until the spreading vanes have come to a complete stop before you remove any guards in order to check and maintain.

8. Risk of getting pulled into the machine
Do not stay near the spreading unit or under the trailer platform when the manure spreader is running. First make sure that the tractor engine has been stopped.

9. The number and the direction of rotations.
Check that the PTO drive shaft runs with the right RPM and in the right direction. A wrong number of rotations and/or direction of rotation can damage the machine with the risk of personal injury as a result.

10. The PTO drive shaft.
This decal has the purpose to remind you how dangerous the PTO drive shaft can be if it is not correctly mounted or protected.

11. Maximum 210 bar.
Make sure that the hydraulic components are not exposed to more pressure than maximum 210 bar as there could be a risk of explosive damage of parts. Hereby you expose yourself and others to serious danger of getting hit by metal parts with high speed or oil under high pressure.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TECHNICAL DATA

Type				**MTS 12000**
Volume with top			[m^3]	12
Tractor requirements	Power requirements (engine)		[kW]	Minimum 90
	Oil outlet			1 double acting
	Oil level		[l/min]	35
	Electricity (light)		[V]	12
Number of rotations when spreading			RPM	1000
Tyre dimensions				620/75 R34 (18.4 R34)
Own weight			[kg]	*4480
Effective load			[kg]	7520
Drawbar load			[kg]	3000
Dimensions **see figure 1.4** Dimensioned sketch	Length (A)		[mm]	7984
	Max. width (B)		[mm]	2950 (2500)
	Spreader height (C)		[mm]	2900 (2825)
	Max. height (D)		[mm]	3020 (2945)
	Trailer floor width (E)		[mm]	1500
	Loading height (F)		[mm]	2170 (2095)
	Trailer floor length (G)		[mm]	5193
	Trailer floor height (H)		[mm]	1065
	The beater bar's vertical gap (I)		[mm]	1600
Noise level in the tractor cabin	Machine connected	Window closed		76,5 dB(A)
		Window open		85.6 dB(A)
	Machine disconnected	Window closed		76,5 dB(A)
		Window open		80.7 dB(A)

* Incl. hydraulic rear door and 620/75R34 wheels.

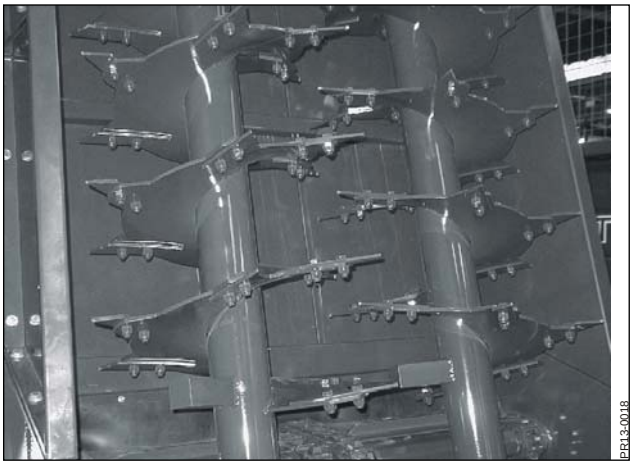

Fig. 2.1

Fig. 2.2

Fig. 2.3

Fig. 2.4

Fig. 2.5

Fig. 2.6

2. THE CONCEPT

MTS 12000 is an ”all-round” manure spreader intended for contractors and large professional farms.

It was a demand for the development of the manure spreader MTS 12000 that not only should it be capable of ensuring an efficient spreading, but also simple to operate, sturdy to foreign objects in the manure and finally suitable for different conditions. Therefore, we have made the following choices:

Fig. 2.1 A) Vertical beater bars with auger-shaped carriers.
B) Large gap at the auger turns.
C) Replaceable and turnable shredding blades.
D) Adjustable rear door.
E) Wide-angle PTO shaft with star tube, clam clutch and free wheel.
Fig. 2.2 F) Cast, over-dimensioned spreading transmission.
G) Double conveyor chain, hydraulic driven.
H) Separated shock valve for the conveyor chain.
Fig. 2.3 I) Spring relief for tightening of conveyor chain.
Fig. 2.4 J) Continuous adjustable driving mechanism for the conveyor chain.
Fig. 2.5 K) Electric remote-controlled adjustment of conveyor chain.
L) A trailer concept with tractor tyres.
Fig. 2.6 M) JF-link (additional equipment).

The vertical beater bars are made of wide auger plates, on which turnable shredding blades and a spreading disc at the bottom have been attached with bolts.

The auger plates will reduce the impacts if there are foreign objects such as stones in the manure and thereby ensuring a more even spreading. The spreading discs ensure that even sludge will be spread. As the spreading discs are a part of the vertical beater bars they are not exposed to nearly as much wear and tear as if spreading vanes and a separate spreading table were used.

Even if the average power requirement is manageable there might be torque peaks. This is of course why MTS 12000 as standard is equipped with an overload protection, which allows releases repeatedly without much wear and tear, and as option is equipped with a reducing gear.

DISTINCTIVE CHARACTERISTICS AND ADVANTAGES OF JF-LINK

• Chain tightening (automatic).
- Automatic when reversing.
- Manually from tractor.
- Chain slackening from tractor (when chain link is removed).
• Folding in of lights.
- Always clean lights.
- happens as the first thing before rollers and conveyor chain are activated.
• Electronic adjustment of conveyor chain speed.
- Maximum-speed function for fast spreader start and fast emptying.
- Conveyor chain speed is shown on display.
• Joint steering box for all functions.
- All functions are controlled from the same steering box.
- Minimum of hydraulic hoses between trailer and tractor (1 double acting).
• Wireless communication.
- No vulnerable signal wire between trailer and tractor.
• Electronic feedback.
- Green lamp indicates which functions are active.
• Macro programming of all hydraulic functions.
- Programmed macros/operations are carried out by one push on the steering box, one at the beginning (P1) and one at the end (P2).
• Functions to chose between:
- Speed up/down of conveyor chain,
- Folding in/out of lights,
- Hydraulic rear door up/down,
- Chain tightening,
- Start/stop of conveyor chain.
• The system can without problems be moved to other tractors (follows the trailer), which means that also older tractors can be used together with the newest technology.

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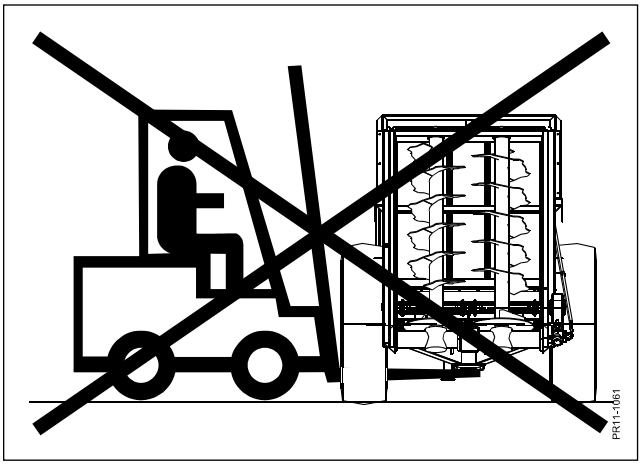

Fig. 3-1

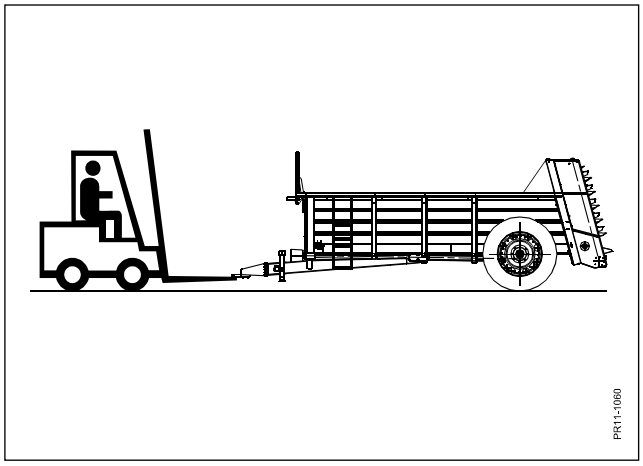

Fig. 3-2

3. TRANSPORT OF THE MACHINE

Fig. 3.1 MTS will be delivered from stock by means of a truck and if necessary by means of a loading hoist. Generally it will not be possible to load the manure spreader by means of a truck, as the weight of the manure spreader is too large.

Unloading the manure spreader should happen by means of a crane or a loading ramp.

Fig. 3.2 If a truck with a special towing hook is mounted the manure spreader can be trailed after the unloading. The drawbar weight when driving with a truck is 620 kg.

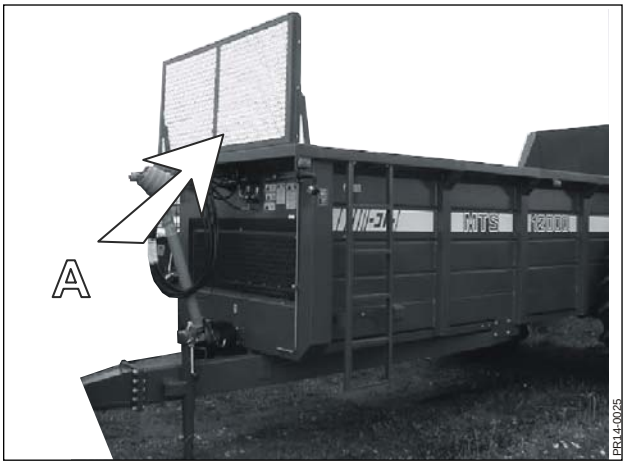

Fig. 4.1

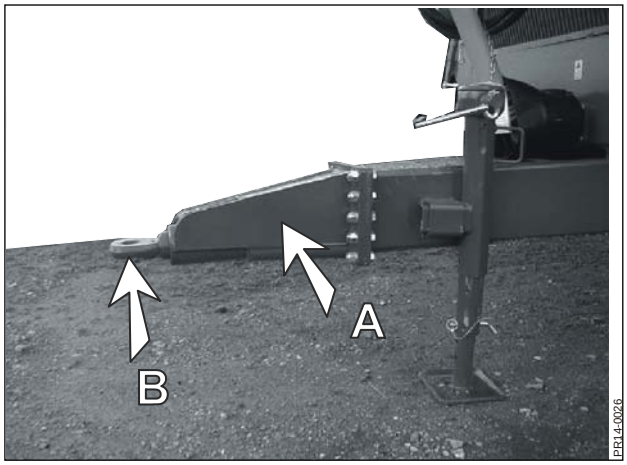

Fig. 4.2

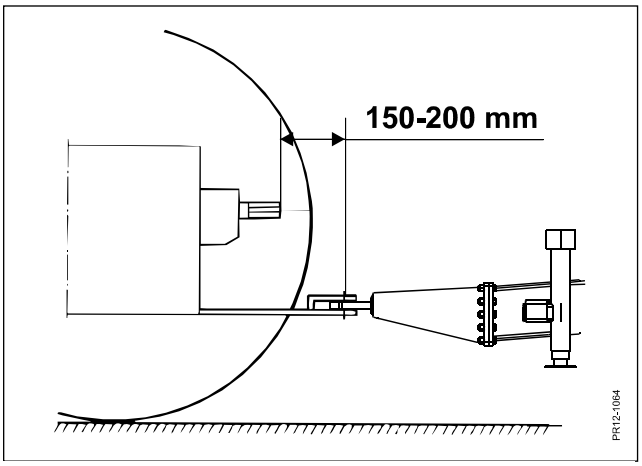

Fig. 4.3

4. PREPARATION AND CONNECTION

TRACTOR REQUIREMENTS

In order to perform a satisfactory work with the manure spreader MTS 12000 the following tractor is required:

- Minimum 90 kW (120 HP).
- One double-acting hydraulic outlet and one oil outlet for the brakes.
- Supplying min. 35 litre oil per minute at 1000 RPM (max. 210 bar).
- A power take-off, on which the shaft is able to rotate with 1000 RPM.

Please note that the power requirements is a guide for average consideration, which very much depends on what type of dung is spread and in which conditions the manure spreader is working.
For instance if you want to spread a thick deep bedding (directly from the stable) on hilly ground the power requirements will be maximum.

PREPARATION

When receiving the manure spreader MTS 12000 it must be prepared for and adjusted to your tractor. Together with the manure spreader you will receive:

- Front grill
- Drawbar
- Bush for drawbar eye
- PTO shaft

Fig. 4.1 The front grill (A) is mounted and ensures the tractor against stones or other foreign objects being thrown out unintentionally during the operation in the field.

CONNECTION

Fig. 4.2 The drawbar (A) of the manure spreader has 2 possible height adjustments. The difference of the 2 adjustments is approx. 150 mm.
Choose the position in which the connected manure spreader's trailer platform is horizontal.
Adjustment is made by demounting the 10 bolts holding the drawbar and turning it 180° around the longitudinal axis.

The drawbar eye bush (B) must always be mounted when the tractor is equipped with a fixed drawbar.

When connecting the manure spreader make sure that the drawbar of the tractor is approved to manage the maximum drawbar weight of the trailer and to pull the allowable total weight.

Fig. 4.3 As the PTO shaft is equipped with a wide-angle, the drawbar of the tractor must be adjusted so that the distance from the middle or end of the power take-off of the tractor to the middle of the bolt of the drawbar is 150- 200 mm.

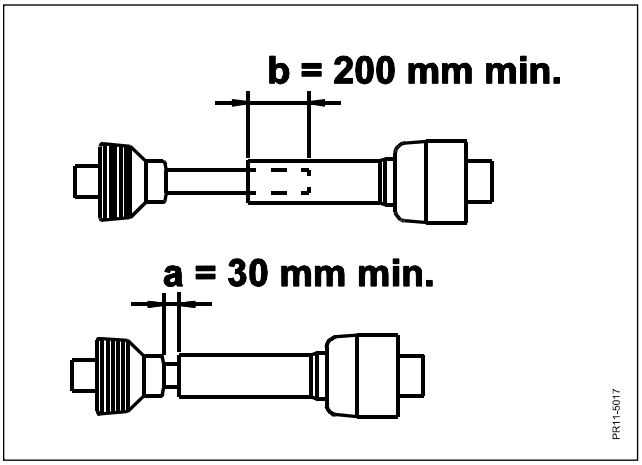

Fig. 4.4

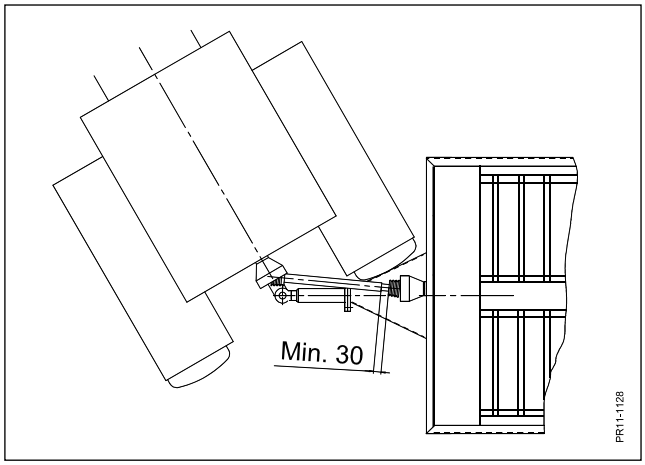

Fig. 4.5

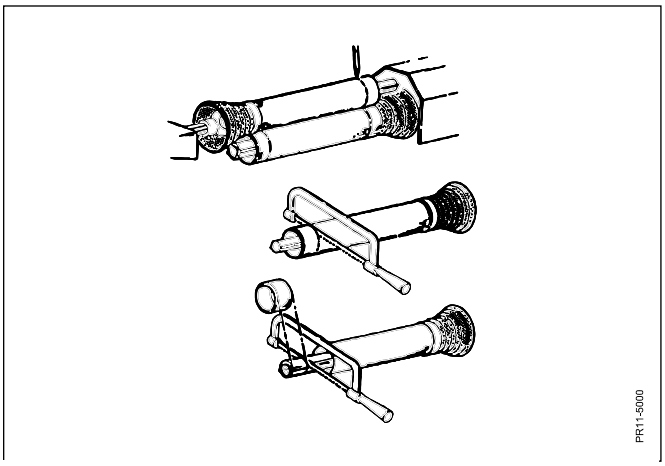

Fig. 4.6

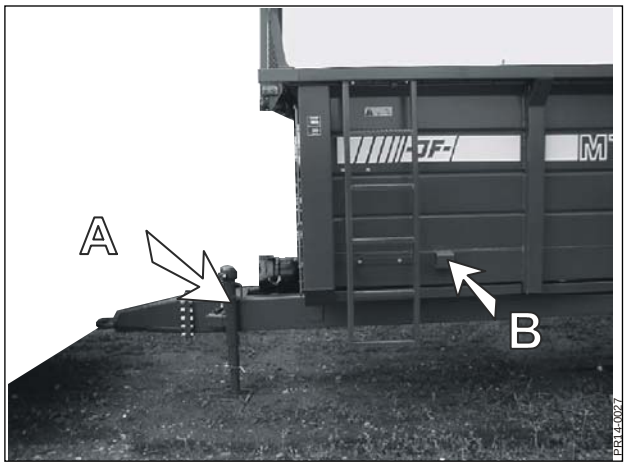

Fig. 4.7

ADJUSTMENT OF THE PTO DRIVE SHAFT

Fig. 4.4 Adjust the PTO drive shaft so that it:
has the biggest possible overlapping
i**n no position has less than 200 mm overlap** and **in no position it is closer to block or bottom than 30 mm.**

Fig. 4.5

WARNING: On tractors with a staggered or off-set power take-off in relation to the drawbar, the above-mentioned minimum distance of 30 mm must of course be tested by turning in the same direction as the power take-out is staggered or off-set.

Fig. 4.6 Slide the PTO shaft in to two halves and fasten the PTO drive shaft to PTO and PIC, respectively, when these are at the same horizontal level and opposite each other.
Keep the shaft end parallel to each other and mark the 30 mm (minimum).
Shorten all 4 tubes equally. The ends of the profile tubes must be rounded off and burrs must be removed carefully.

WARNING: Grease the profile tubes carefully before they are reassembled as they will otherwise be exposed to big friction forces.

JACK

Fig. 4.7 During operation the jack (A) must **always** be positioned in the support (B) on the side of the manure spreader.

AUTOMATIC CLUTCH

The PTO drive shaft between the machine and the tractor is equipped with an automatic clutch, which releases and stops the PTO drive shaft immediately when an overload torque occurs caused by a blockage. This declutching prevents an unnecessary heating and possible damage of the clutch, as it might happen with the friction clutch. When lowering the number of revolutions of the tractor the automatic clutch will engage again.

FREE WHEEL

The PTO drive shaft under the trailer is equipped with a free wheel, which ensures overrun of the rotating parts of the manure spreader, when the power take-off of the tractor is disengaged. Thereby you avoid overloading the rotating parts.

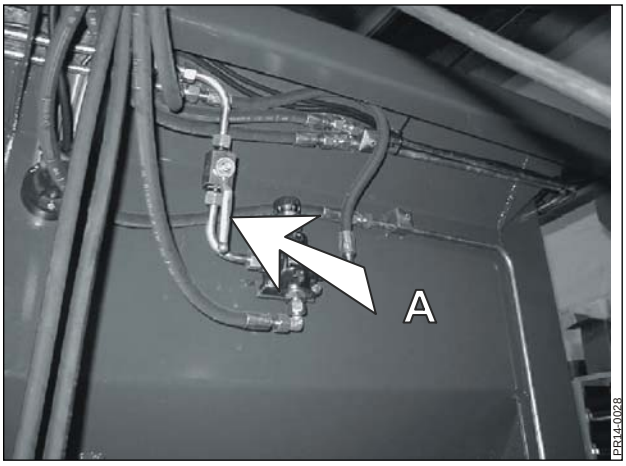

Fig. 4.8

CONNECTION OF HYDRAULIC HOSES

MTS 12000 uses common hydraulic connection valves (couplings), if the specifications correspond to the ISO standard 5675 for tractor connections.
It is important that the tractor connections are cleaned carefully so that impurities cannot penetrate and damage essential valve functions. When the hydraulic hoses are not connected to the tractor anymore, the couplings should be protected with caps.

The flow hose has a red cap and the return hose has a blue cap.

Fig. 4.8 If you use a John Deere tractor from a certain year (which has a closed centre system) the ball valve (A) must be blocked.

The brake hose is connected to the brake take-off of the tractor.

DANGER: **The hydraulic components must not be exposed to a higher pressure than 210 bar as a higher pressure may cause parts to be damaged. Hereby a serious risk of personal injury occurs.**

CONNECTION OF ELECTRIC SYSTEM

When driving on public roads the lighting equipment, which is standard on MTS 12000, must be used.

CHECK BEFORE USE

When the machine has been connected to the tractor you ought to do as follows before using it:

1. Read this instruction manual carefully!

2. Check that the manure spreader has been mounted correctly and that it is undamaged.

3. Check that the PTO speed of the machine (and of the tractor) is correct. Too high PTO speed can be dangerous. The correct speed is to be found in the scheme under **TECHNICAL DATA**.

4. Check the movements of the PTO drive shaft. If the PTO shafts are too short or too long it may damage the tractor as well as the machine considerably.
   Check that the protection tubes do not get jammed or damaged in any position.
   Check that the safety chains of the protection tubes have been secured properly and that they do not in any position get too tight or damaged.

5. Check that hydraulic hoses are correctly mounted and long enough.

6. Check that the electric connections are correct.

7. Check that the drawbar is correctly adjusted in relation to the tractor.

8. Re-tighten the wheel bolts. After a few hours of operation with your new machine all bolts must be tightened up. This is especially important on fast revolving parts. See the torque specification in the chapter **"MAINTENANCE"**. Also re-tighten after servicing the machine.

9. Check the tyre pressure. See the chapter ”**MAINTENANCE”.**

10. Check that the machine has been greased sufficiently and check the oil level in the spreading unit gearbox and the conveyor chain gearbox. See the chapter **”GREASING”**.

From the factory the revolving parts of the spreader have been tested and declared error-free. However, you should do as follows before using the machine:

11. Start the machine at a low number of revolutions. If there are no unusual scratching or knocking sounds, increase the number of RPM. If there is any doubt, stop the tractor and the machine according to the procedure described in the section ”**SAFETY”.** Check the machine visually to find possible error. Then seek authorised assistance.

Ad. 11: The test should be done with open rear window and without hearing protector:

CAUTION: **If you are in doubt whether the machine runs correctly, stop the tractor and the machine immediately.**

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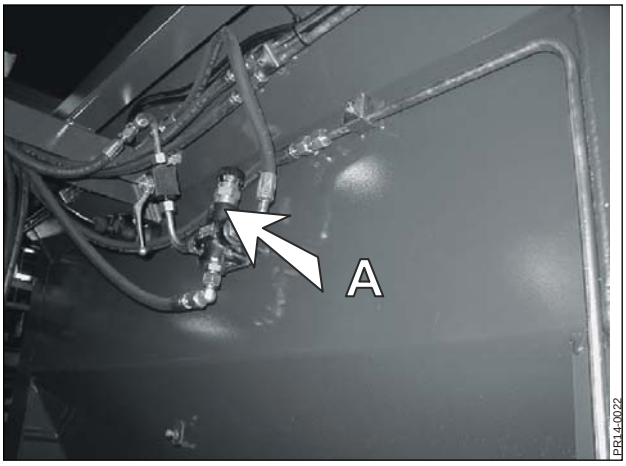

Fig. 5.1

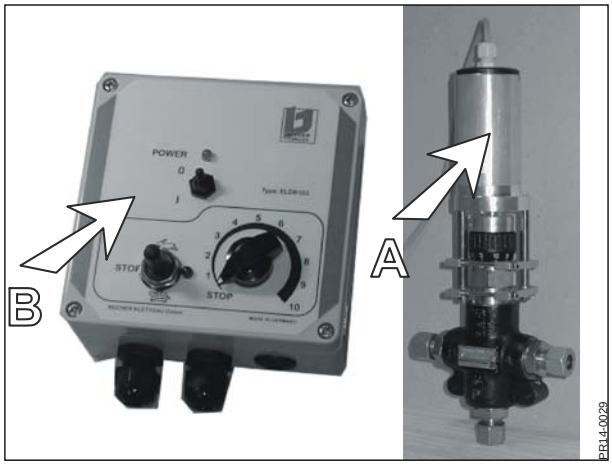

Fig. 5.2

5. ADJUSTMENTS AND DRIVING

SPREADING

Start up:
1) Start the manure spreader.
2) Lift up the rear door.
3) Start the conveyor chain.

Stop:
1) Stop the conveyor chain.
2) Lower the rear door.
3) Stop the manure spreader.

If the chosen speed for the driving mechanism for the conveyor chain repeatedly results in blocks, and thereby release of the automatic clutch, you must choose a lower speed of the conveyor chain.

SPREADING QUANTITY

If the trailer is equiped with JF-Link, see separate manual.

Fig. 5.1 The speed of the conveyor chain, which together with the forward speed determines the spread quantity, it can be adjusted by means of a continuous adjusting valve.
The adjusting valve (A) is a dividing valve, which has a simple scale adjustment, determining the flow to the hydraulic motor.

Fig. 5.2 If the speed of the conveyor chain is to be adjusted from the tractor seat we can offer you an electric adjustment of the conveyor chain (see the spare parts list regarding ordering No.). This set consists of a step motor (A), which is mounted on top of the existing valve and an electric control box (B).

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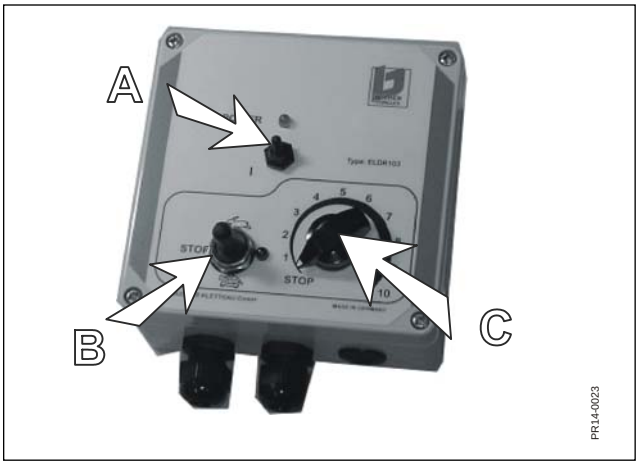

Fig. 5.3

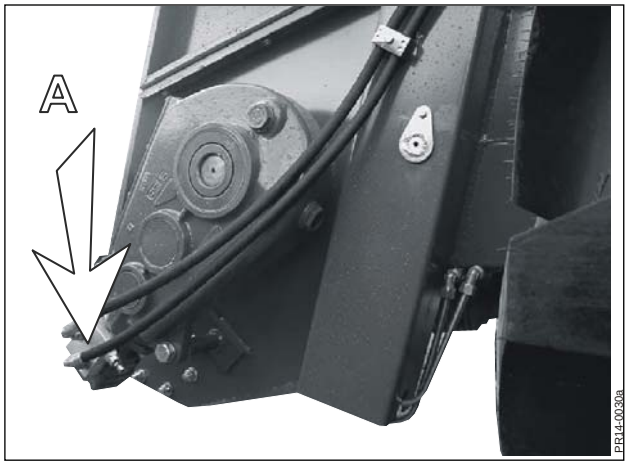

Fig. 5.4

Fig. 5.3 The electricity is connected through the contact (A), and then the speed (B) can be chosen. The figures below illustrate how the difference between the hare and the turtle should be understood. By means of the turning knob (C) the speed of the conveyor chain can now be adjusted.

WARNING: **The adjustment must under no circumstances be used during reversing. There is automatically full flow through the valve.**

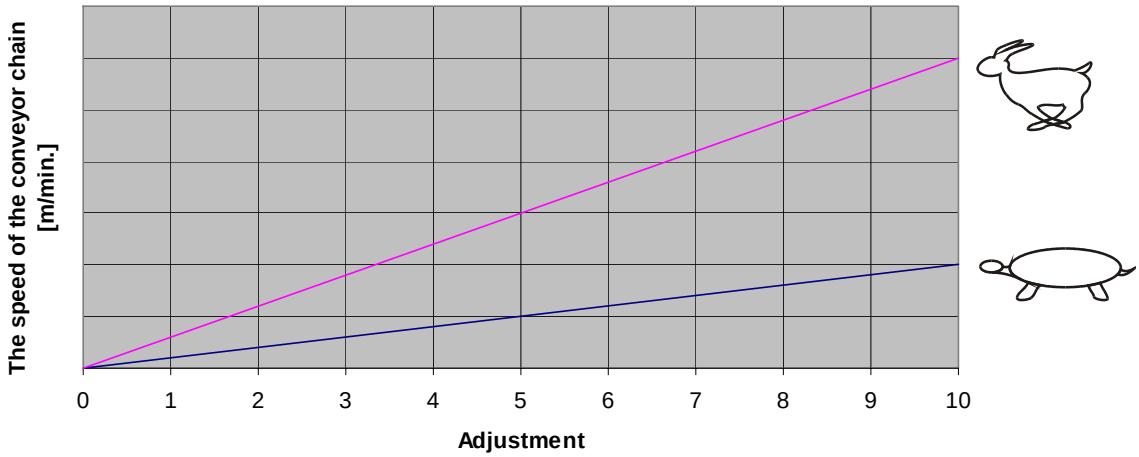

Fig. 5.4 In order to secure the conveyor chain against overload in case of a blockage it is equipped with a pressure relief valve (A).

WARNING: **The pressure relief valve has been set from the factory and must under no circumstances be changed.**

SPREADING WIDTH

The spreading width of the MTS 12000 is dependent on the manure, as it appears from the scheme below, in which the guiding spreading widths are listed.

Manure	Density [kg/m^3] *)	Spreading width [m]
Compost	300	5
Ashes	300	8
Cattle manure	700	10
Pig manure	800	10
Sewage sludge - dry	900	12
Chicken manure - moist	1000	12

*) The density is very much dependent on the content of water and straw.

There are alternative spreading blades, which in certain kinds of manure are able to increase the spreading width by approx. 2 m. (see the spare parts list as regards the ordering No.).

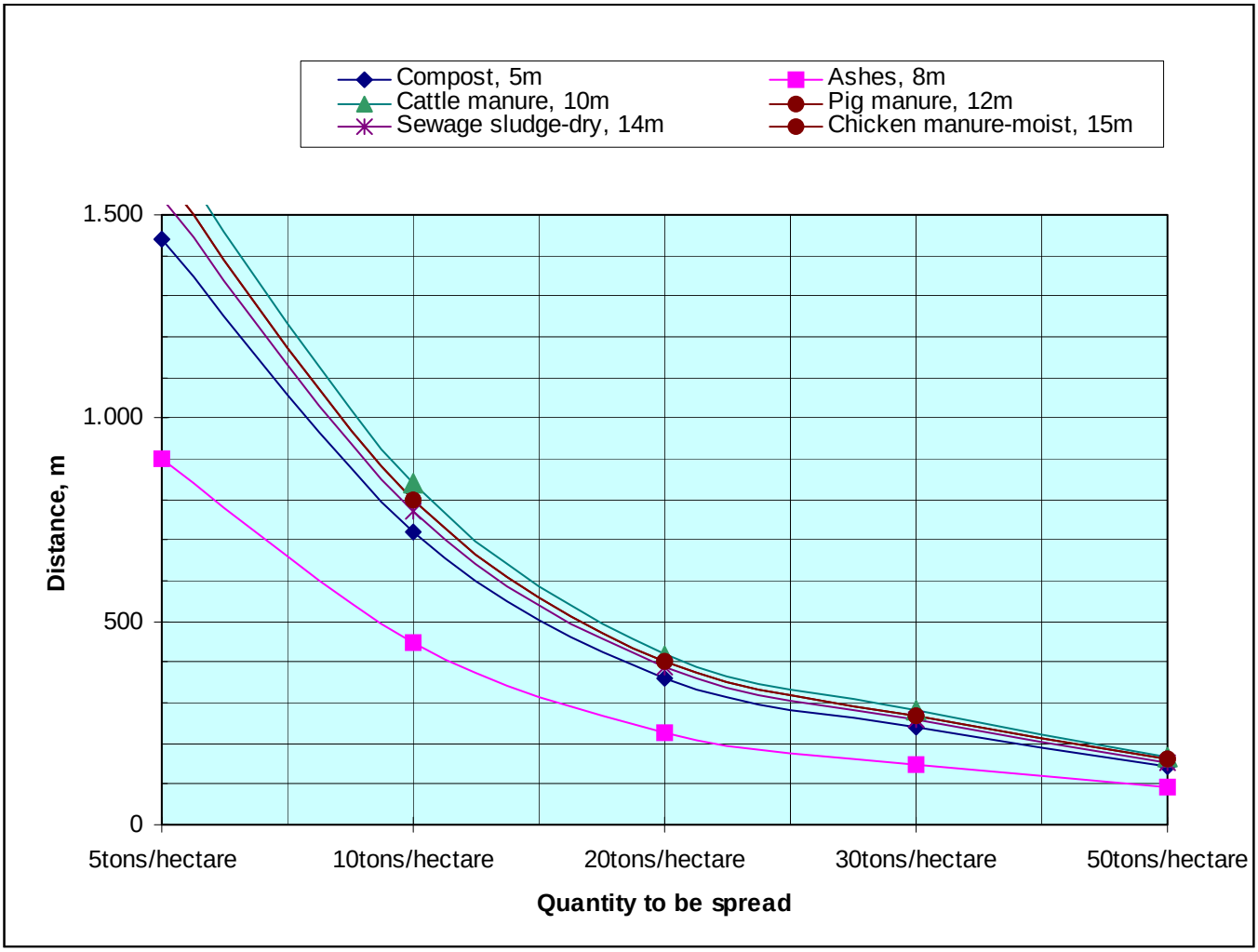
Compost, 5m
Cattle manure, 10m
Sewage sludge-dry, 14m
Ashes, 8m
Pig manure, 12m
Chicken manure-moist, 15m
1.500
1.000
500
0
Distance, m
5tons/hectare
10tons/hectare
20tons/hectare
30tons/hectare
50tons/hectare
Quantity to be spread

Fig. 5.5

SPREADING DIAGRAM

Fig. 5.5 **An example:**
30 tons of cattle manure per hectare is to be spread. In the scheme above the optimal spreading width for this type of manure is 10 m. Find the 30 tons per hectare in the scheme and go to the graph for cattle manure. The result is a distance of 280 m.

Then the driving instructions are as follows:
Choose the distance 10 m between the wheel tracks and adjust the speed on the tractor and conveyor chain, so that the manure spreader fully loaded will be unloaded after 280 m.

Please note!
Large variations might occur as different contents of water and straw cause different results.

REVERSE

In case the beater bars are blocked it might be necessary to reverse the driving mechanism of the conveyor chain in order to release them again:
1) Stop the conveyor chain.
2) Stop the manure spreader.
3) Reverse the conveyor chain until the beater bars are free.
4) Start the manure spreader.
5) Start the conveyor chain.

If it is a blockage caused by a foreign object it is necessary after the reverse to remove the foreign object manually and check that the beater bars are undamaged.

WARNING: **The conveyor chain must <u>under no circumstances</u> be reversed unless it has been tightened correctly (see chapter 7 "MAINTENANCE") and never fully loaded.**

WARNING: **The adjustment must under <u>no</u> circumstances be used during reversing. There is automatically full flow through the valve.**

Dividing of the chain will not be accurate until it has been worn a bit. Therefore, the conveyor chain should not be reversed before the manure spreader has spread the first 100 loads.

Reversing the conveyor chain must happen with the tractor engine idling.

ADJUSTMENT OF THE REAR DOOR

The rear door is operated hydraulically and determines the vertical gap, which influences the spreading quantity at a given speed on the conveyor chain.
The rear door is adjusted directly from the tractor.
However, it should not be used to adjust the spreading quantity unless the manure has sufficiently low dry matter content, for instance sludge with 22% dry matter content or the like.

LOADING

The trailer must not be loaded more than allowed. Therefore, the scheme below shows how much can be loaded.

The manure density [kg/m^3]	Loading height above the trailer floor [m]
500	1,60
600	1,60
700	1,45
800	1,25
900	1,10
1000	1,00
1250	0,80
1500	0,70

DRIVING

When driving on hilly ground choose a tyre pressure which is 25 % bigger than the tyre pressures stated in the tyre pressure scheme in order to increase the stability of the manure spreader sideways to prevent the manure spreader from tipping over.
When the drawbar weight is big, it is advantageous to use front weights on the tractor, which results in a more even and steady driving with the manure spreader.

TURNING

As the trailer is equipped with a wide-angle PTO drive shaft it is not necessary to disengage the PTO drive shaft when turning. It is enough to stop the driving mechanism of the conveyor chain. Still you must ensure that the tractor tyres do not touch the drawbar arrangement of the manure spreader.

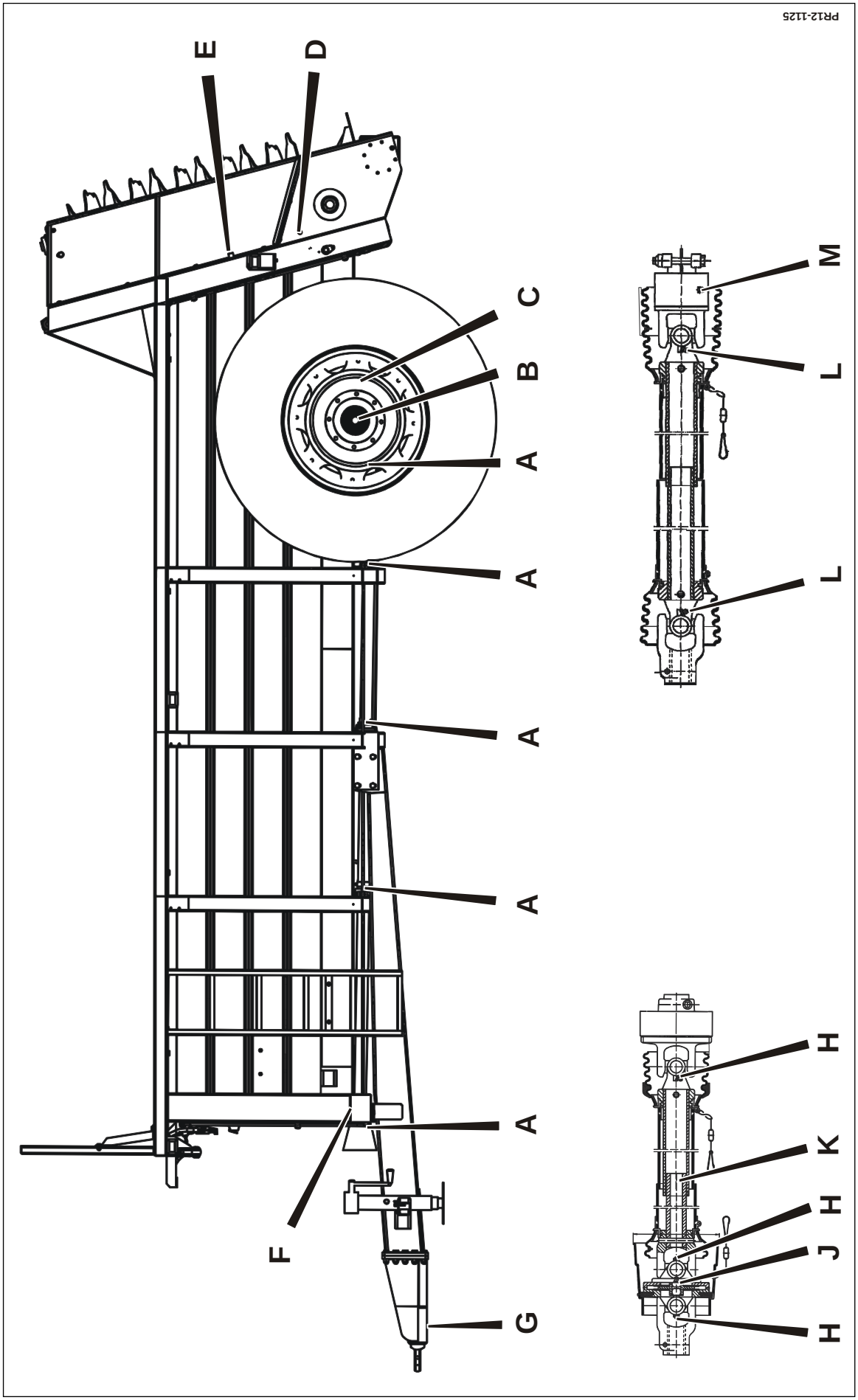

Fig. 6.1

6. GREASING

GREASE

Always ensure that the machine has been properly greased before it starts operating.

TYPE OF GREASE: Universal grease of good quality

Fig. 6.1 Pay special attention to the **sliding PROFILE TUBES** of the PTO shafts**.** They must be able to slide back and forth when the torque is heavy. **If you neglect to grease the profile tubes sufficiently it will result in high axial forces** (seizing) **which will damage the profile tubes and in time also shafts.**
It is necessary to disassemble the profiles to ensure a satisfactory access when greasing.

Mark:	**Quantity:**	**Position:**	**Greasing interval:**
A	5	Flange bearings for transmission line	10 hours
B	2	Wheel bearings (10 g. extra in hub caps) - (See page 39)	each ½ year
C	4	Brake arms	40 hours
D	3	Rear shaft for conveyor chain	10 hours
E	2	Upper bearing for beater bars	10 hours
F	4	Front shaft for conveyor chain	10 hours
G	1	Turnable drawbar tongue	40 hours
H	3	Universal joint on front PTO drive shaft	40 hours
J	1	Double yoke	40 hours
K	1	Profile tube on front PTO drive shaft	10 hours
L	2	Universal joint on rear PTO drive shaft	40 hours
M	1	Free wheel on rear PTO drive shaft	40 hours

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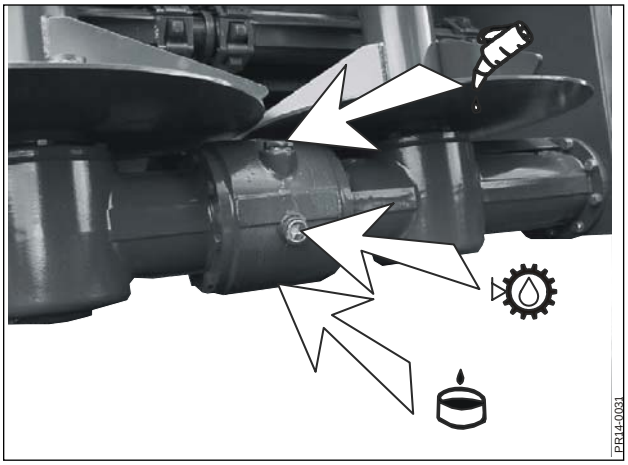

Fig. 6.2

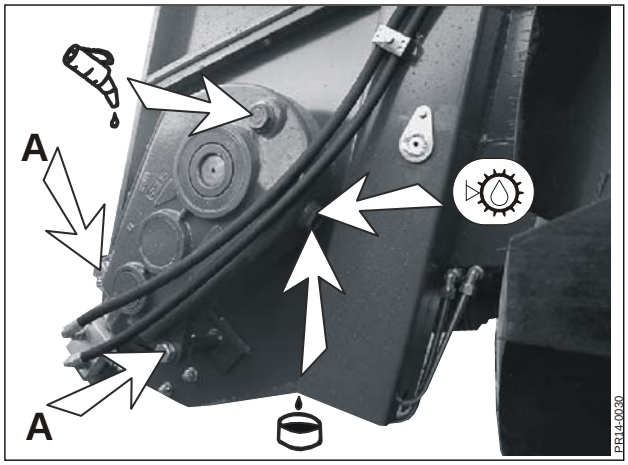

Fig. 6.3

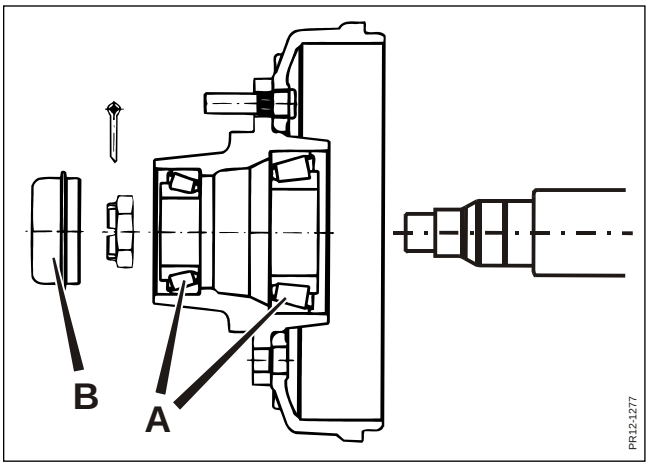

Fig. 6.4

OIL

OIL IN THE SPREADING UNIT GEARBOX

Fig. 6.2 **Oil content:** **8 litres.** Time of emptying: approx. approx. 2 hours at 20° C

Oil type: API GL4 or GL5 SAE 80W -90

Oil level: **The oil level must be checked every day during the season**.

Oil change: First oil change after 50 working hours and then after every 500 working hours or at least once a year.

OIL IN THE CONVEYOR CHAIN GEARBOX

Fig. 6.3 **Oil content:** **4.3 litres**

Oil type: API GL4 or GL5 SAE 80W -90

Oil level: **The oil level must be checked every day during the season**.

Oil change: First oil change after 50 working hours and then after every 500 working hours or at least once a year. The oil is emptied out by loosening the two screws **A** and turning the gear till the oil runs out of the hole.

WHEEL AXLE

LUBRICATION OF HUBS

Fig. 6.4 Disassemble hubs.
Clean the inside and the outside of the hubs carefully.
Clean and check both wheel bearings carefully.
Renew grease sealing.
Grease wheel bearings with a 10 mm layer of lithium base grease EPZ.
After mounting and adjustment of the clearance of the wheel bearings (see chapter 7: **MAINTENANCE**): Fill wheel cap ¾ with grease and mount.

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7. MAINTENANCE

IN GENERAL

Before long time of standstill, the machine should be cleaned and greased and be sprayed with rust-preventing oil, if necessary.

Be careful when cleaning with a high pressure cleaner. Never spray directly on bearings or electric parts and grease the grease spots of the machine carefully after cleaning.

WARNING: When repairing or maintaining the machine it is especially important to ensure correct personal safety. Therefore, always park the tractor (if mounted) and the machine according to the GENERAL SAFETY INSTRUCTIONS items 1-17 in the beginning of this instruction manual.

IMPORTANT: Screws and bolts on your new machine must be retightened after some hours of operation. This also applies if repairs have been made. Especially the bolts for the spreading platform must be retightened carefully.

Torque moment $\mathbf{M_A}$ (if nothing else has been stated)

A Ø	Class: **8.8** $\mathbf{M_A}$ [Nm]	Class: **10.9** $\mathbf{M_A}$ [Nm]	Class:1**2.9** $\mathbf{M_A}$ [Nm]
M 8	25	33	40
M 10	48	65	80
M 12	80	120	135
M 12x1.25	90	125	146
M 14	135	180	215
M 14x1.5	145	190	230
M 16	200	280	325
M 16x1.5	215	295	350
M 18	270	380	440
M 20	400	550	650
M 20x1.5	430	615	720
M 24	640	900	1100
M 24x1.5	690	960	1175
M 30	1300	1800	2300

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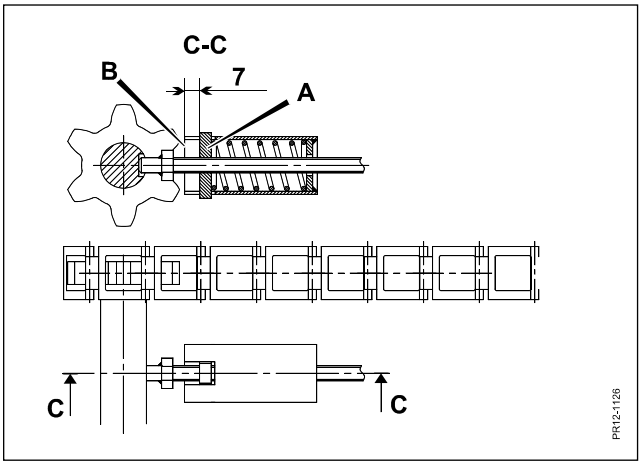

Fig. 7.1

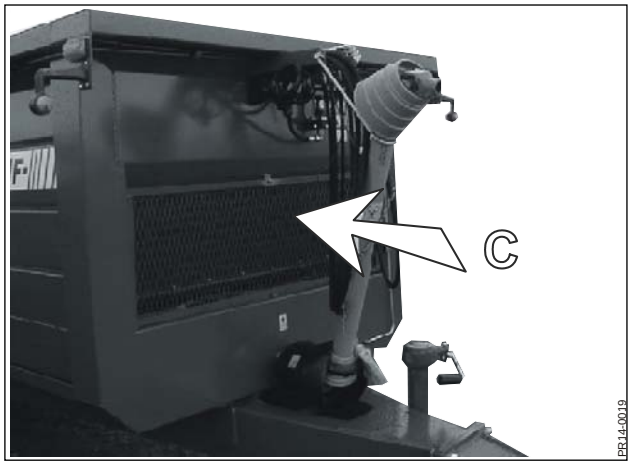

Fig. 7.2

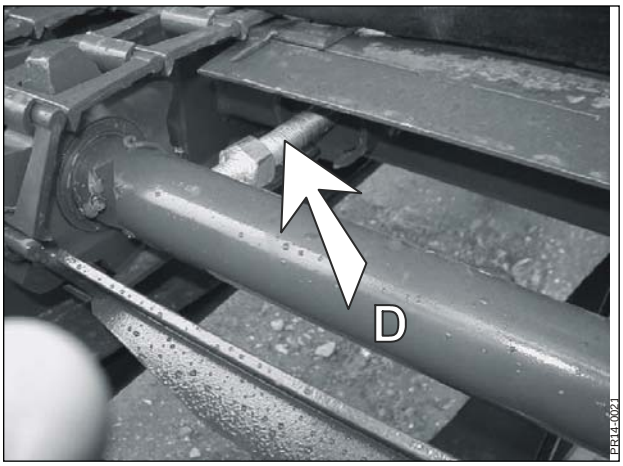

Fig. 7.3

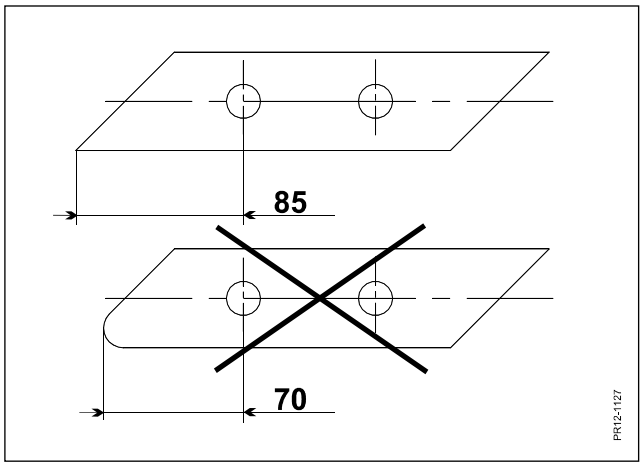

Fig. 7.4

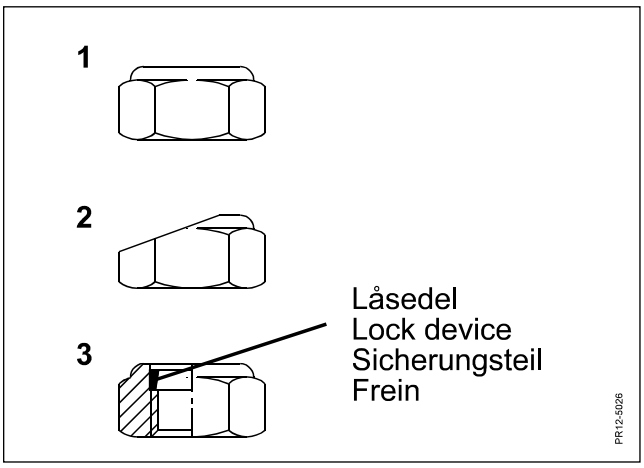

Fig. 7.5

CONVEYOR CHAIN

The conveyor chain is factory pre-set but due to paint and small burrs it might be necessary to tighten the conveyor chain after approx. 10 working hours.

IMPORTANT: The conveyor chain must always be tightened correctly, especially when reversing.

Fig. 7.1 The conveyor chain must be tightened when the threaded plate (A) is on level with the end of the bush (B).
The distance between the threaded plate and the end of the bush must be approx. 7 mm. See also Fig 7.3.
However, this distance must be approx. 12 mm, when the conveyor chain is new and unused.

Fig. 7.2 The tightening is made by:
Fig. 7.3
- removing the front grill (C) at the front of the trailer above the conveyor chain.
- tightening the threaded spindle (D).
- mounting the front grill again.

If the conveyor chains are worn unequally, it can be an advantage to exchange the chains.

When there is no more travel in the tightening arrangement you must remove 1 chain link/chain, i.e. 4 links in total.

VERTICAL BEATER BARS

IMPORTANT: Shredding drums that are full of twine can neither shred nor pulverise the dung satisfactorily. Therefore, it must be removed immediately.

IMPORTANT: Worn spreading blades do not have the necessary shredding effect and the power requirement will be increased substantially when the spreading blades are worn.
Therefore, they must be turned or replaced immediately when worn.

If the above-mentioned is not observed the power requirements will be higher than necessary resulting in the following: the automatic clutch will disengage too often, it will be difficult for the tractor to pull the manure spreader, and especially on hilly grounds, and the consumption of fuel will be unnecessarily high.

Fig. 7.4 The difference between a new and a worn spreading blade appears from Fig. 7.4, i.e. if the distance from the outer bolt to the tip/end of the spreading blade is reduced to approx. 70 mm, it must be turned immediately or replaced.

Fig. 7.5 Apart from checking the spreading blades to ensure that these are not loose, the bolts must also be checked for wear and possible damage. To avoid the risk of spreading blades being thrown out the bolts should be replaced if they are worn or damaged. The lock part of the nut must of course be intact and the nut must be used max. 5 times.

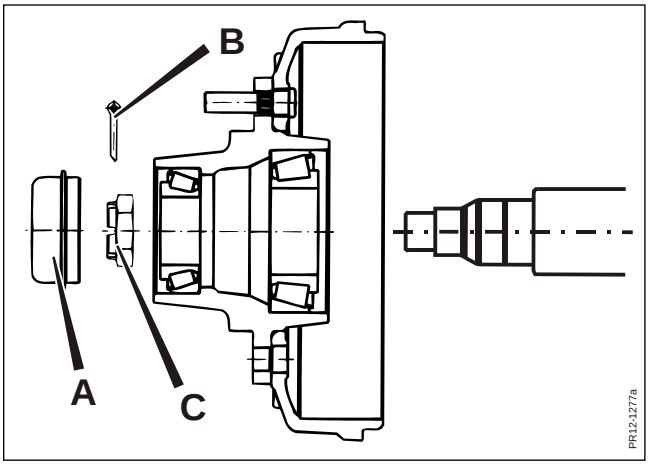

Fig. 7.6

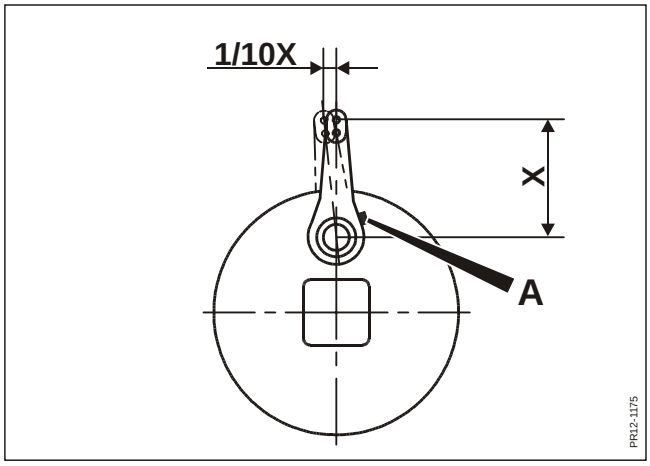

Fig. 7.7

WHEEL AXLE

TYRES

The tyre pressure must be checked regularly.

Dimension of tyres and type: 620/75 R34 (LI 170, A8): 3.2 bar

Dimension of tyres and type: 18.4 R34 (LI 157, A8): 3.2 bar

IMPORTANT: IF A LOWER TYRE PRESSURE IS USED THAN RECOMMENDED THE LIFE OF THE TYRES WILL BE VERY MUCH REDUCED! This especially applies in connection with quick transport on roads.

FIXING OF WHEELS

The wheels are fastened by means of a torque wrench. The opposed wheel-fixing bolts are tightened (cross tightened) with the correct torque moment, which is 450 Nm.

The wheel-fixing bolts must be tightened approx. every 500 km.
After wheel change it is necessary to tighten after 50 hours drive.

CHECK OF PLAY IN WHEEL BEARING

To make this check it is necessary to elevate the axle from the ground, until the wheel can rotate - without hindrance. To adjust the wheel play, dismount the hub cap, remove the split pin, and tighten the hub nut, until a noticeable resistance is felt. Then turn the hub nut back, until the first hole for split pin fits. Insert split pin and bend. Fill the hub cap ¾ with new grease, and mount.

ADJUSTMENT OF BRAKE

<u>The travel of the brake cylinder:</u>

Fig. 7.6 If the brake arm is moved forward in the driving direction, the movement must be 1/10 of the length of the brake arm, i.e. if the brake arm is 180 mm, the travel must be 18-21 mm.

If the travel is too big, adjust it by turning the screw A, until the distance is correct.

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HYDRAULICS

All hydraulic parts should be checked for possible leakage from time to time. It may be necessary to re-tighten screws and fittings in order to repair possible leakage.

HOSES

The Danish Working Environment Service recommends replacing hoses every 5-6 years, even if they do not look damaged or worn.

CLEANING

We have the following cleaning instructions from our supplier of paint.

- Having received the manure spreader the paint must still have a hardening period of 2-3 weeks before the adhesion and wear properties are as intended. In this period, do not use high pressure cleaner and do not grease the surface of the machine with oil.
- After the hardening period the following should be observed:

Cleaning with high pressure cleaner		
Pressure	Maximum	150 bar
Temperature	Maximum	50-60^{o} C
Minimum distance	50 to 100 cm	

After the hardening period you must of course remove manure from the manure spreader, as manure is a very aggressive material, which is able to damage any paint, if not removed.

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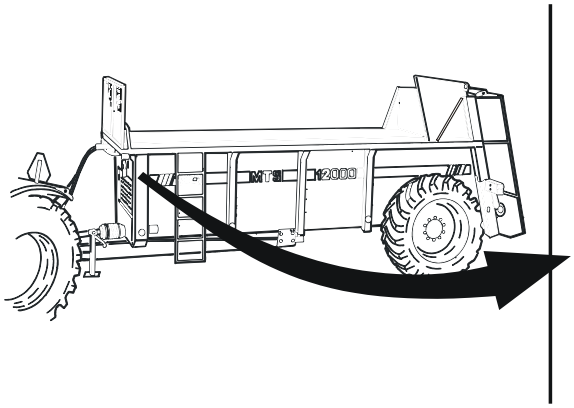
8. VARIOUS

SPARE PARTS ORDER

When ordering spare parts please state machine type and serial number. This information is printed on the machine plate. We request you to write this information on the first page in the spare parts book supplied with the machine as soon as possible so that you have the information at hand when ordering spare parts.



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DISPOSAL

When the machine is worn-out it must be disposed of in a proper way. Observe the following:

The machine must **not** be placed somewhere outside; - it must be emptied of oil (gearboxes and hydraulic system). These oils must be handed over to a destruction company.

Disassemble the machine and separate the individual parts, e.g. tyres, hydraulic hoses, hydraulic valves etc. Hand over the usable parts to an authorised recycling centre. The large scrapping parts are handed over to an authorised breaker's yard.

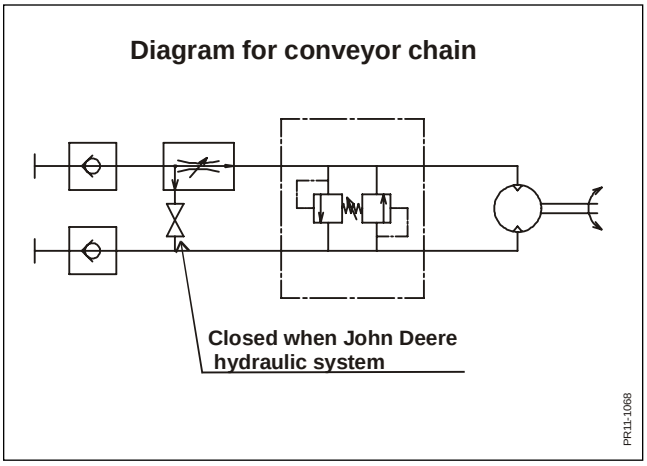

Fig. 8.1

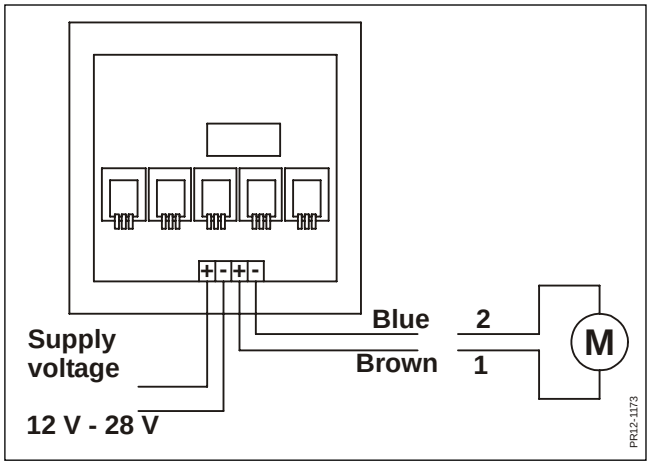

Fig. 8.3

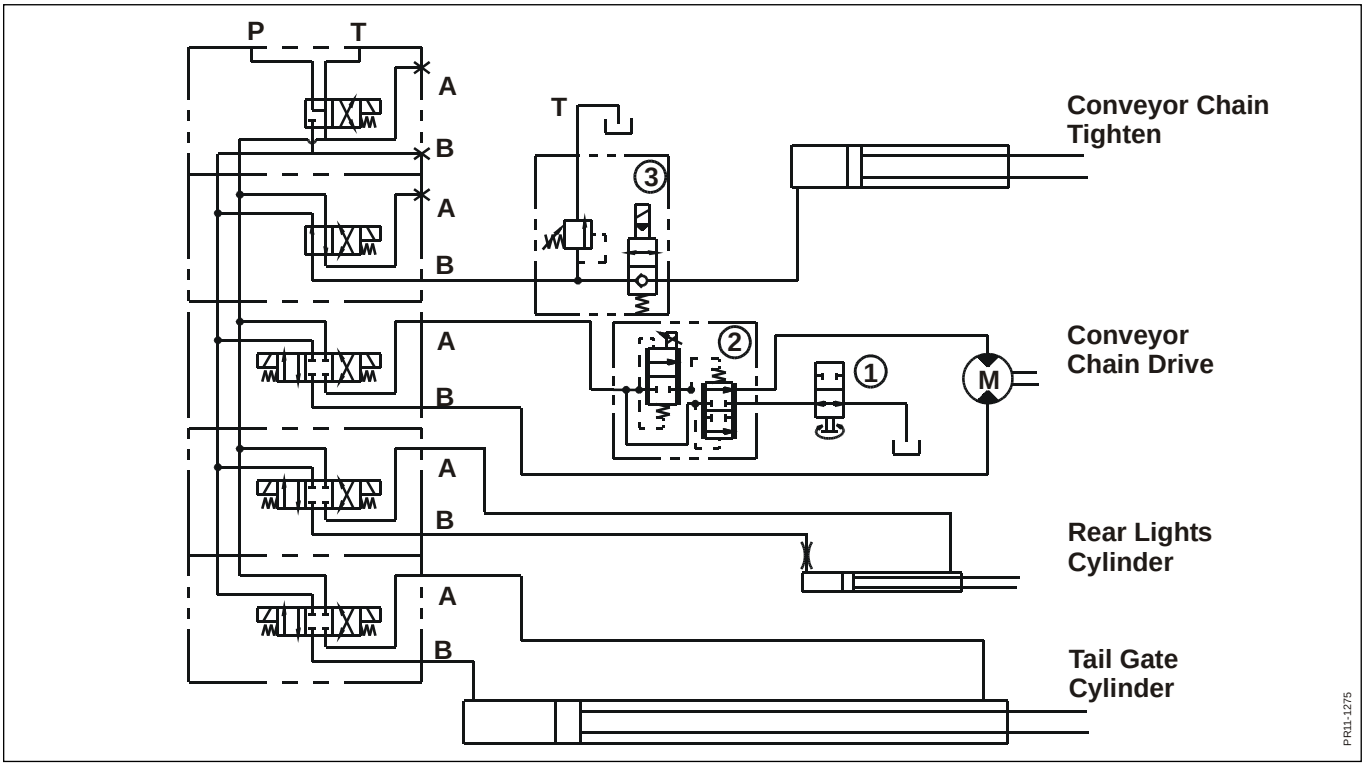

Fig. 8.2

INTERRUPTIONS

PROBLEM	POSSIBLE CAUSE	REMEDY	SEE PAGE
The automatic clutch disengages.	Worn spreading blades. The spreading blades are tangled in twine or other material. Too high speed of conveyor chain. Foreign object is stuck in the spreading unit.	Turn or replace the spreading blades. Remove the material. Reduce the speed. Reverse the conveyor chain and remove the foreign object.	45 45 31 45
The conveyor chain ”hesitates”.	Conveyor chain is not tight enough.	Tighten up the conveyor chain.	45
The conveyor chain parts when reversing.	Conveyor chain is not tight enough.	Tighten up the conveyor chain.	45

HYDRAULIC DIAGRAM

Fig. 8.1 Hydraulic diagram (standard)

Fig. 8.2 Hydraulic diagram (JF-Link)

1) Manually operated ball valve
2) Flow regulating valve
3) Overflow valve (40 bar)

WIRING DIAGRAM FOR ADJUSTMENT OF CONVEYOR CHAIN

Fig. 8.3 Electric diagram

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FOR OWN NOTES

WARRANTY

JF-Fabriken - J. Freudendahl A/S, 6400 Sønderborg, Denmark, hereafter called **"JF"**, grants warranty to any buyer of new JF machines from authorized JF-dealers.

The warranty covers remedy of material and production faults. This warranty is valid within a year after date of sale to end-user.

- The warranty is invalidated in the following cases:

1. **The machine has been used for other purposes than those described in the instruction manual.**
2. **Improper use.**
3. **Damage caused by external sources, e.g. lightning or falling objects.**
4. **Insufficient maintenance.**
5. **Transport damage.**
6. **The construction of the machine has been modified without JF's written permission.**
7. **Unskilled repair of the machine.**
8. **Unoriginal spare parts have been used.**

JF cannot be held responsible for loss of income or legal claim as a result of faults either of the owner or of a third party. Nor is JF responsible for wages beyond current agreements in connection with replacement of warranty parts.

JF is not responsible for the following costs:

1. **Normal maintenance such as expenses for oil, grease and minor adjustments.**
2. **Transport of machine to and from workshop.**
3. **The dealer's travelling expenses or freight charges to and from the user.**

Warranty is not granted on wearing parts unless it can clearly be proved that JF has committed a fault.

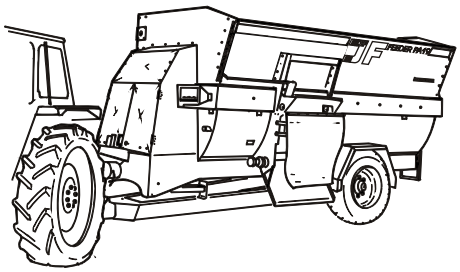
The following is regarded as wearing parts:

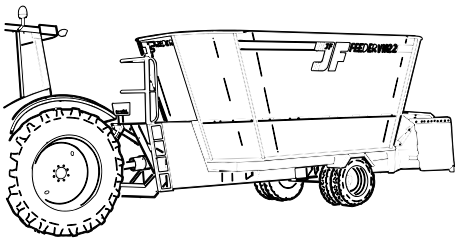
Protective canvases, blades, blade suspensions, shearbars, guide shoes, stone protections, discs, rotor skirts, conditioner parts, tyres, tubes, brakes shoes, chain tightener parts, guards, hydraulic hoses, conveyors, wheel-fixing bolts and nuts, snap rings, sockets, PTO drive shafts, clutches, gaskets, seals, tooth belts, V-belts, chains, sprocket wheels, carriers, conveyor chain slats, rake and pick-up times, rubber seals, rubber paddles, shares, wearing plates and lining for spreading platform, shredding blades incl. bolts and nuts, beaterbars and vanes for farmyard manure spreaders.

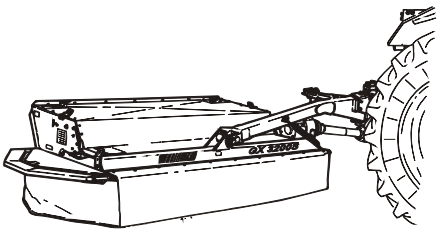
In addition, the user must note the following:

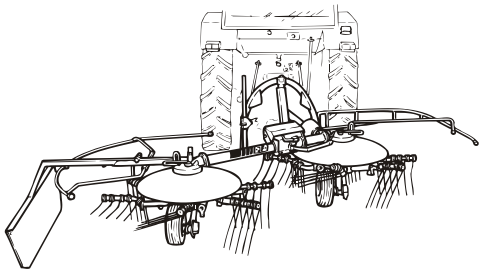
1. **The warranty is only valid if the dealer has undertaken a predelivery check and has given instruction to the end user in the use of the machine.**
2. **The warranty cannot be transferred to others without JF's written permission.**
3. **The warranty can be nullified if repair is not undertaken immediately.**

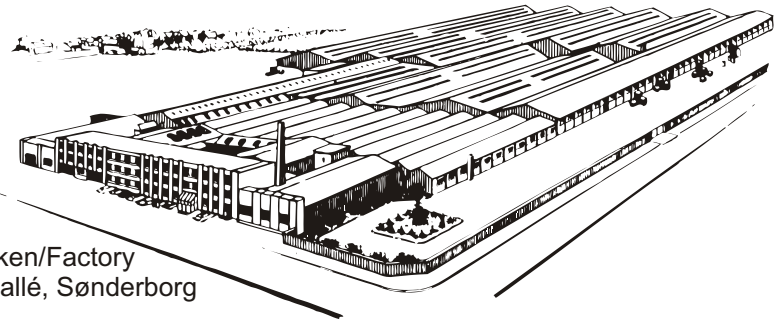
Et omfattende maskin program
Ein Lieferprogramm mit Zukunft
Progress In Farm Machinery
Une gamme de machines étendu
Progreso en Maquinaria Agrícola



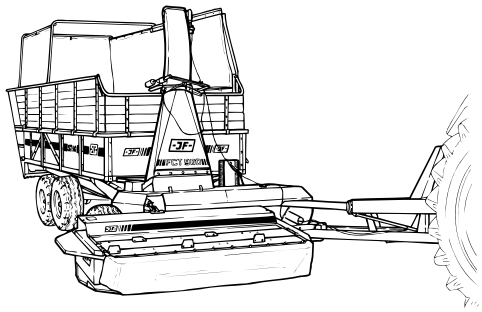




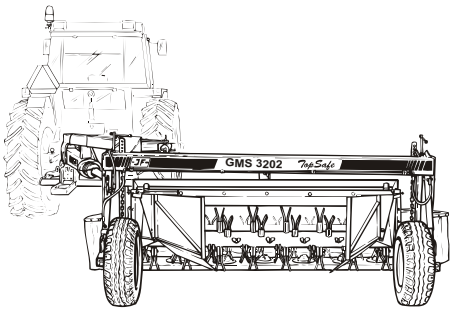


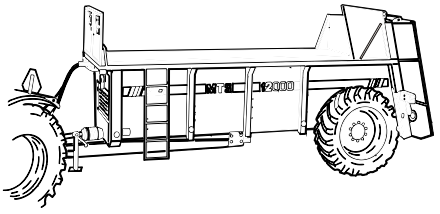


Fabriken/Factory
Lindeallé, Sønderborg



Fabriken/Factory
Ulkebøl, Sønderborg





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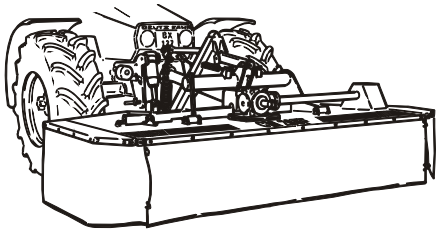

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JF-Fabriken - J. Freudendahl A/S
DK-6400 Sønderborg - DANMARK
Tel: (+45) 74 12 52 52
Fax: (+45) 74 42 58 08
Fax: (+45) 74 42 55 41
www.jf.dk
(A company in the JF Group)