FCT 1460

Precision Chop Forage Harvester

Directions for use

"Original instructions"

GB

FOREWORD

DEAR CUSTOMER!

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

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

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

However, this first introduction doesn't replace a more thorough knowledge of the different tasks, functions and correct technical use of the machine.

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

This instruction manual is made so that the information is mentioned in the order you will need it, i.e. from the necessary operation conditions to use and maintenance. There are illustrations to support the instructions.

"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 at the time of publication.

Kongskilde Industries A/S reserves the right to make changes or improvements in the design or construction of any part without incurring the obligations to install such improvements on any unit previously delivered.

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1. INTRODUCTION

INTENDED USE

The precision chop forage harvester **FCT 1460 is solely constructed and manufactured for the usual work in agriculture, i.e.:** Usual work in fields where you want to cut/gather and chop green crops such as maize, grass or whole crop which are to be used for silage production intended for coarse fodder for cattle.

The machine should only be connected to a tractor which corresponds with the specifications of the product and is legal to use.

Any use beyond this is outside the intended use. Kongskilde Industries A/S is not responsible for any damage or injury resulting from such use; the user bears that risk.

It is assumed that the work is performed under reasonable conditions, i.e. that the fields are cultivated normally and to a reasonable extent kept clear of foreign matter and debris.

Intended use also means that the instructions given by Kongskilde Industries A/S in the instruction manual and the spare parts book are observed and that thorough agricultural knowledge and technically correct use is a matter of course.

The precision chop forage harvester FCT 1460 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 are a number of general and special safety instructions which **must** be observed altogether.

If any changes are made on the machine and its construction without permission from Kongskilde Industries A/S, Kongskilde Industries A/S cannot be held responsible for any damage or personal injury resulting from this.

PERFORMANCE

The precision chop forage harvester FCT 1460 has a very versatile use which, with the right equipment, makes it possible to chop grass and whole crops. At the same time FCT 1460 is capable of working alone or parallel with other machines.

FCT 1460 has a high capacity compared with other corresponding products as it uses the “DIRECT CUT” system. “DIRECT CUT” gives a minimum loss of power when cutting the material and thus ensures maximum utilisation of the accessible tractor power.

Capacity, however, is difficult to define and compare as, for a forage harvester, it will depend not just on which crop is being cut but also how the crop has been treated before it is picked up or cut by the machine and finally which cutting length adjustment the machine is working with.

If we take a forage harvester which, in fresh, not pre-dried grass, can work 100 tons per hour, it is possible to calculate the capacity at different per cents of dry matter depending on the pre-treatment before cutting, as shown in the following table.

	Dry matter	Capacity
Dry matter	100%	18 ton/h
Wet new grass	15%	120 ton/h
Not pre-dried grass	18%	100 ton/h
Pre-dried grass – no outflow of sap from clamp silo	25%	72 ton/h
Pre-dried grass – no outflow of sap from high tower silo	33%	55 ton/h
Very pre-dried grass	50%	36 ton/h
Straw, very dry	90%	20 ton/h

It will probably surprise most people that the capacity can vary between 20 and 120 ton/h, as a result of varying water content.

In practice you want to drive the forage harvester in the highest possible tractor gear without causing frequent blockage. However, the amount of grass in the field will always vary, for instance where the mower conditioner has had to turn, change forward speed or change direction of travel. Therefore it is often appropriate either to drive with a power reserve so that the machine will not block, or to continuously adapt the driving of the forage harvester to the conditions.

The pick-up unit and the feed rollers are both secured against overloading. The pick-up unit is secured by a friction clutch, the feed rollers by shear bolts in the drive shafts. Moreover the whole intake section is secured against blocking of the Pro Tec clutch which drives the harvest gearbox. The forage harvester also has a reverse function which makes it possible to remove a blockage without having to leave the tractor seat.

The intention is that the inexperienced user increases the forward speed gradually in the beginning until the pick-up is blocked; releases the blockage again by reversing and chooses a tractor gear at a suitable lower level to remove the risk of blockage.

However, it is not the intention that the clutch function of the feed rollers releases. If this happens, the clutch adjustment of the pick-up must be reduced. The same will apply if the main friction clutch between the tractor and the machine releases during normal working. If it is not the pick-up unit which is blocked, the adjustment of the machine is incorrect.

Unfortunately it has been seen that the torque adjustment of the friction clutch of the pick-up unit has been increased to the point where it is the friction clutch between the machine and the tractor which releases frequently. The main friction clutch is not intended to release frequently but only for starting shock or when foreign matter gets into the machine. The same applies to the shear bolt clutch for the feed intake rollers. The main clutch simply cannot absorb the heat which is generated during these long releases. The power transmitted at the main clutch will be at least 10 times higher than the power needed to drive the pick-up unit.
Only the pick-up unit can be seen from the tractor and therefore it should be released first when there is a blockage. The experienced user will be able to adapt the driving of the tractor to the amount of grass and thus work with less capacity reserve and, generally, have a greater output.

The cutting length of the forage harvester can be adjusted and adapted to the crop in question. The cutting length is usually reduced when cutting maize and whole crops to ensure greater damage of the grains. The shorter cutting length will of course require more power for which reason there will be a lower output when cutting maize and whole crop than when cutting grass, though it is difficult to compare.

The power requirements are also increased when the blades are worn and the shear-bar adjustment thereby changes. It is necessary to sharpen the blades and adjust the shear-bar during the season.

SAFETY

The safety of persons and machines is an integral part of Kongskilde's development work. However, damage can occur as a consequence of misuse and insufficient instruction. **We wish to ensure the safety of you and your workforce in the best possible way**, but this also requires an effort on your part.

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

As described above the machine is only intended for one purpose, namely:

Chopping grass and similar green crops for feeding purposes.

It is assumed that the work is performed under reasonable conditions, i.e. that the fields are cultivated normally and to a reasonable extent kept clear of foreign matter and debris.

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 manuals - this is a matter of your own safety!

You should **never** leave the machine to others before you have made sure that they have the necessary knowledge.

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 the operator 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. Always disengage the PTO drive shaft, activate the parking brake of the tractor, stop the tractor engine and remove the ignition key before you:

    - lubricate the machine,
    - clean the machine,
    - disassemble any part of the machine,
    - adjust the machine.

2. Always block the wheels before working under the machine.

3. Never start the tractor until all persons are at a safe distance away from the machine.

4. Make sure that all tools have been removed from the machine before starting the tractor.

5. Make sure that all guards have been mounted correctly and locked where appropriate.

6. During work never wear loose clothes or have your hair hang down as it may be pulled in by the moving parts of the machine.

7. 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 roads 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 and the direction of rotation of the tractor match 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 allow anybody to be on the machine during work 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.

18. Do not feed material into the cutting unit, using hands or feet, while it is working.

19. Do not try to remove material from the cutting unit while it is working.

20. If material must be removed from the forage harvester, the PTO shaft must be disconnected completely. Stop the engine and remove the ignition key.

LOCKING OF GUARDS

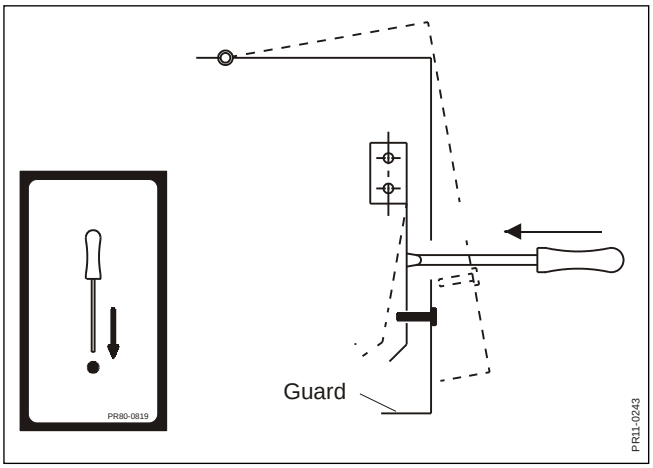


Fig. 1-1

All hinged guards on the machine are equipped with a lock. The lock ensures that the guard cannot be opened without tools. There are two different types of lock. Fig. 1-1 shows the locking principle and the corresponding transfer which indicates and illustrates the locks on the machine.

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.
Legal transport of the machine on public roads requires a tractor with sufficient mass and braking capacity.
Choose a tractor which has minimum 103 KW/140 HP at the power take-off but cannot deliver more than 200 KW/280 HP.
The machine is as standard constructed for 1000 RPM, and is delivered from the factory with 1 3/4" PTO drive shaft with 20 spline yoke. As an alternative 1 3/4'' yokes with 6 spline, 1 3/8” yokes with 6 spline and finally 1 3/8” yokes with 21 spline can be supplied for the PTO drive shaft of the machine

A suitable tractor will have a broad range of gears for driving speeds between 5 and 8 km/h.
The tractor hydraulic system should deliver at least 170 bar and the tractor’s pressure relief valve should not allow more than 210 bar.

The drawbar of the forage harvester is delivered with a drawing eye, for which reason the tractor should preferably have a clevis drawbar. The drawbar pin should be 30 mm diameter.

Always choose a tractor with a closed cab when working with a precision chopper.

CONNECTION AND DISCONNECTION

Always make sure that nobody is standing between the tractor and the machine during connection and disconnection. An unintentional manoeuvre with the tractor may cause serious injury (see Fig. 1-2). When disconnecting it is important that the ground is even and stable so that the machine does not move and injure persons or cause damage to other equipment.

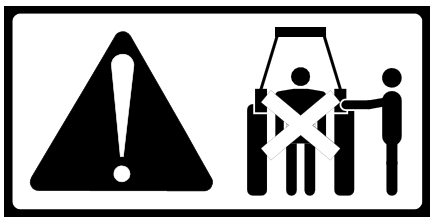


Fig. 1-2

The same precautions must be taken when connecting/disconnecting trailers by means of the hydraulic hitch at the rear of the forage harvester.

Check that the machine is intended for the number and the direction of rotation of the tractor PTO. A wrong number of rotations over a long period may damage the machine and at worst result in ejection of parts through the delivery chute.

Make sure that the PTO drive shaft has been mounted correctly, i.e. that the lock pin is in mesh and that the support chain has been fastened at both ends.

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

IMPORTANT: Before connecting the trailer with the hydraulic hitch, always:
- Disengage the PTO from the tractor.
- Wait until all moving parts have stopped.

Check that all hydraulic couplings are tight and that all hoses and fittings are undamaged before activating the hydraulic system.

Make sure that there is no pressure in the hydraulic hoses when these are disconnected from the tractor.

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

Fig. 1-3

ADJUSTMENT

IMPORTANT: Before adjusting the machine, always:
- Disengage the PTO from the tractor.
- Stop the tractor engine
- Wait until all moving parts have stopped.

It is important not to remove the guards until all revolving parts have stopped. This especially applies to the delivery chute above the chopping cylinder.

If the cutting parts in the blade cylinder must be adjusted or replaced, it is important to block the blade cylinder as the sharp blades can easily cause injury.

Before working, check that the feed rollers and the blade cylinder can move freely. Also check that the blades are intact and without cracks. Damaged blades must be replaced to prevent them from blocking or damaging the machine and to avoid metal parts being thrown out from the delivery chute.

Check periodically if blades and blade bolts are worn according to the guide in the instruction manual.

The first time you use the machine the blades and blade bolts may "bed in". For this reason you must check and tighten the blade bolts after the first working hour.

TRANSPORT

Limit the transport speed to maximum 30 km/h if the machine has not been marked with another maximum speed limit.
When the machine has been prepared for transport, the control unit must be turned off on the button at the side of the control box and the oil flow to the machine must be disengaged. This prevents faulty operation during transport.

DANGER: Never let anyone stand or sit on the machine, especially not when you are driving.

The machine has equipment for hydraulic conversion to transport position and the cylinder for this is fitted with a self locking valve. If there is air in the cylinder during transport there is a risk that the machine moves to the opposite lane, or towards the roadside where on coming vehicles may be present.

IMPORTANT: If the machine is equipped with auto hitch, the mechanical lock on the auto hitch must be activated when driving with a trailed wagon on public roads. This also applies if a self locking valve is fitted on the lifting cylinder of the auto hitch.

IMPORTANT: To ensure all the air has been expelled from the oil in the hydraulic cylinders; test all the functions after the hydraulic connections are connected to the tractor, especially before driving on the public road.

The attachments of the forage harvester (pick-up etc.) must be secured mechanically before transport.

The statutory lighting and traffic markings must be placed correctly, on the forage harvester as well as the trailer.
Reflectors and lighting must be cleaned regularly.

WORKING

Before you start working make sure that no persons are behind the forage harvester due to the danger of being hit by metal parts from damaged blades.

Also make sure that there are no persons in the trailer used for picking up. There is danger of suffocating in the flow of material or getting hit by metal parts.

If the feed rollers or the blade cylinder are blocked, disengage the clutches and stop the tractor engine immediately. Activate the parking brake and wait until the revolving parts have stopped before removing the material or the foreign matter.

WARNING: This cannot be said often enough: Never remove material blocked in the machine while the machine is running and never feed material into the pick-up with your hands or feet as there is a serious danger of getting caught and pulled into the harvester which would cause dismemberment or death.

Never allow anyone to stand near the forage harvester while it is working, especially not children who do not know the danger and do unforeseen things.

The chute is over 4 m high. Be aware of high-voltage lines and keep a safe distance away from these.

PARKING

Before parking the machine always lock the jack with the locking pin, otherwise the machine may tip over during parking. Also remember to block the wheels if there is a risk that the machine will move after parking

Remember to remove the hydraulic hoses and the control box before driving away with the tractor.

GREASING

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

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. Remove the ignition key and wait until all moving parts have stopped!

GRINDING

When grinding always follow this procedure:

- Stop the tractor engine and remove the ignition key.
- Activate the parking brake.
- Wait until all moving parts have stopped.

Unfortunately it is necessary to remove some of the guards to change the direction of rotation of the rotor when grinding the blades. As there are chain and belt transmissions your hands may be injured if the revolving parts have not stopped before the guards are removed.

Grinding is performed according to the following procedure:

1. Check if the grindstone is undamaged and if the device is able to move back and forth easily.

2. Lower the guard behind the grinding device to give access to the blade cylinder.

3. Adjust the stone and guard the grinding device again.

4. Remove the guard above the blade cylinder transmission and change the direction of rotation of the rotor.

5. Close the guard again and check that there are no persons near the machine.

6. Start the tractor again and keep the rpm at idle speed or a little above.

7. Perform the grinding carefully.

Always use safety glasses when grinding as small particles from the grindstone might hit you.
When grinding has finished, stop the tractor engine, remove the ignition key, change the direction of rotation and fasten all guards.

REMEMBER: Always grind with all guards closed.

MAINTENANCE

After approx. 2 days of operation, all bolts should be re-tightened. Always make sure that the used spare parts are tightened to the correct torque.

When replacing parts in the hydraulic system always make sure that the pick-up rests on the ground and/or the lifting cylinders are blocked.

Hydraulic hoses must be checked by an expert before use, and after that, a minimum of once a year. If necessary, they must be replaced. The working life of hydraulic hoses should not exceed 6 years, including maximum 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.

REPLACEMENT OF WEARING PARTS

Blades, blade bolts and shear-bar are made of high-alloyed, heat-treated materials. This heat treatment provides especially hard and ductile material which is able to withstand extreme stress. Damaged blades, blade bolts or shear-bars must be replaced by original JF spare parts only to ensure safe operation.

Blades and blade bolts must be checked every day during the season.
The special blade bolts must be tightened with a torque wrench to 40 kgm.

When the blades are worn out; max. 8 mm or approx. 12 mm above the straight piece, they must be replaced (see fig. 1-4).

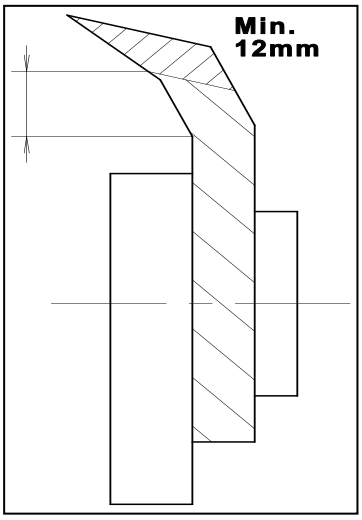
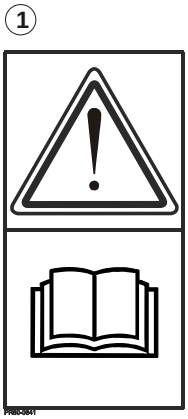
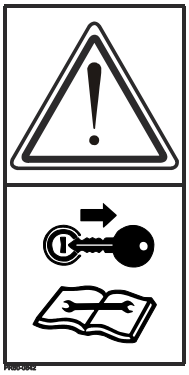
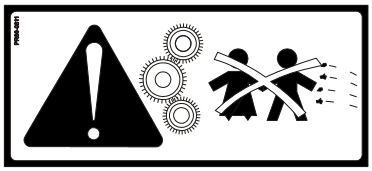


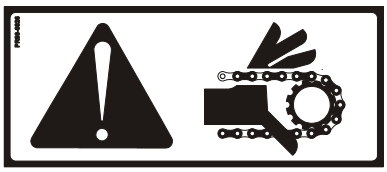
Fig. 1-4

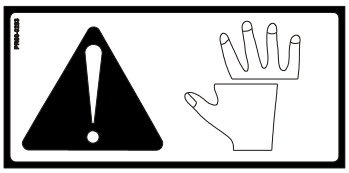
After replacement of blades, blade bolts and the like, check that no tools have been left in the machine.









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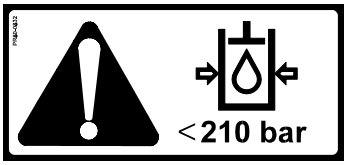
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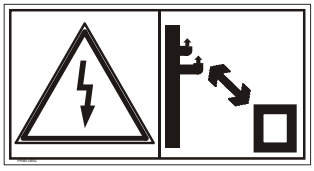

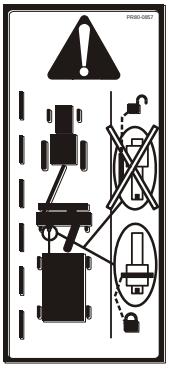


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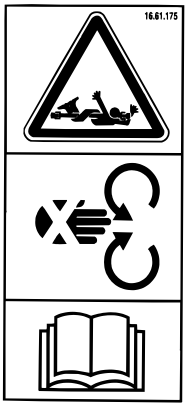
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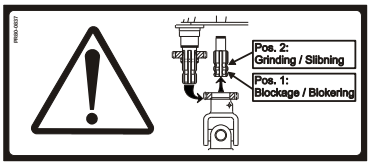
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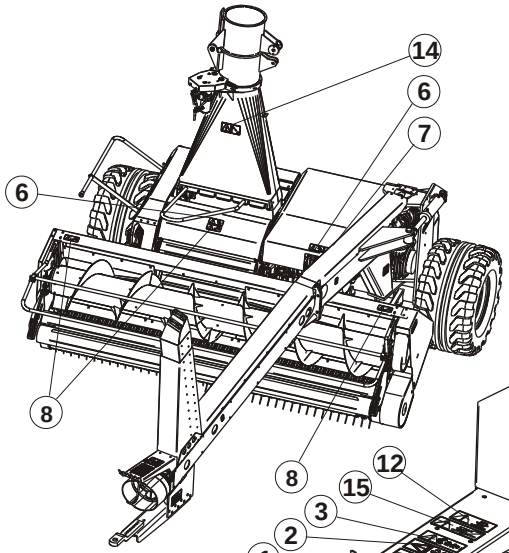
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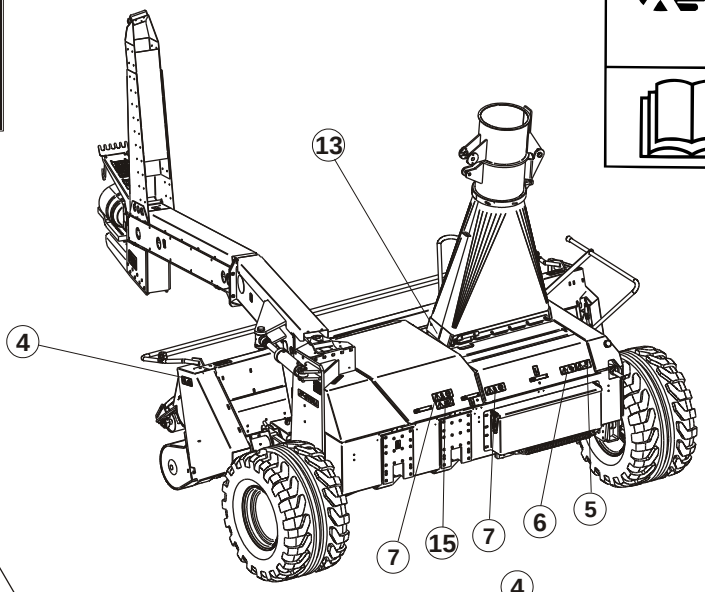
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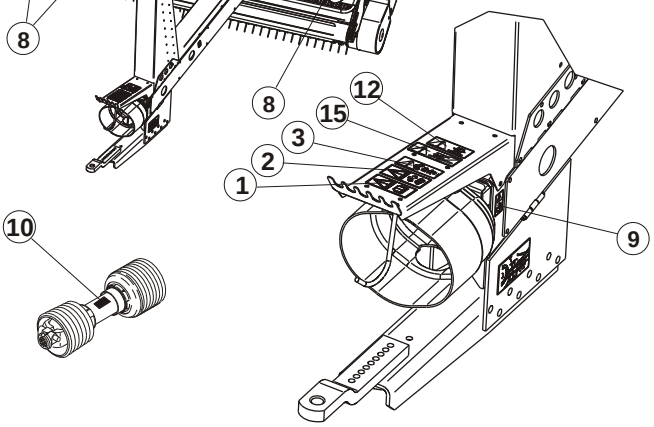
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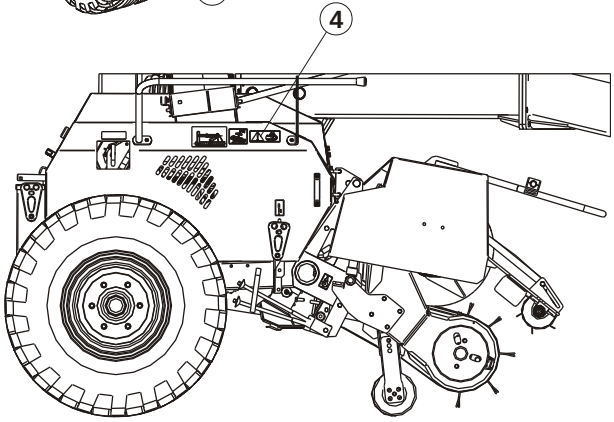
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SAFETY DECALS

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

1. **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.

2. **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.

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**
   One or more chain drives are placed under this guard. Make sure that the tractor engine has stopped before opening the guard.

5. **Risk of cutting.**
   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 can easily crush or cut off any part of the body that might get caught in the machine.

6. **Remember the guards when grinding.**
   Remember to close ALL guards before grinding.

7. **Rotating parts.**
   After the PTO drive shaft has stopped, the blades will have a momentum where they keep rotating for up to 2 minutes. Wait until the blades have come to a complete stop before removing guards for inspection or maintenance.

8. **Risk of getting pulled into the machine.**
   Do not stand near the attachments or the feed rollers while the machine is running. Make sure that the tractor engine has stopped first.

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.

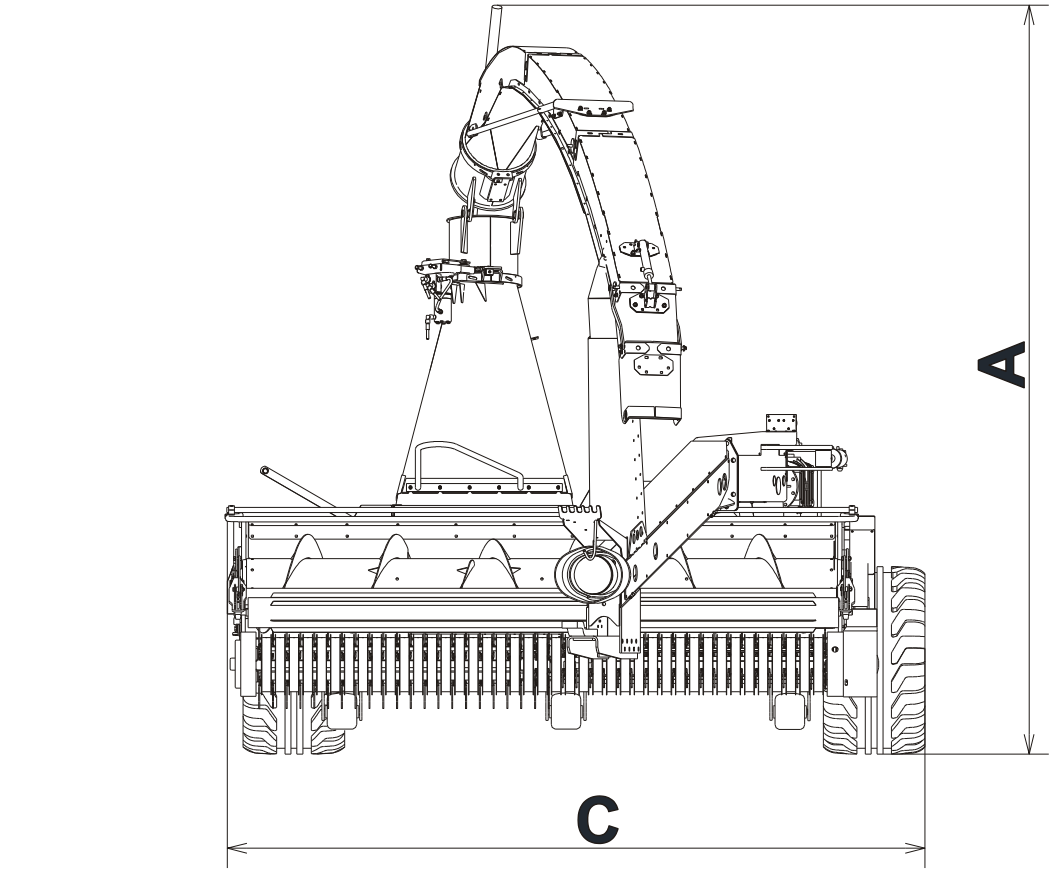
11. **Auto hitch.**
    Always block the hydraulic hitch with the supplied pin before driving with a trailed wagon on public roads.

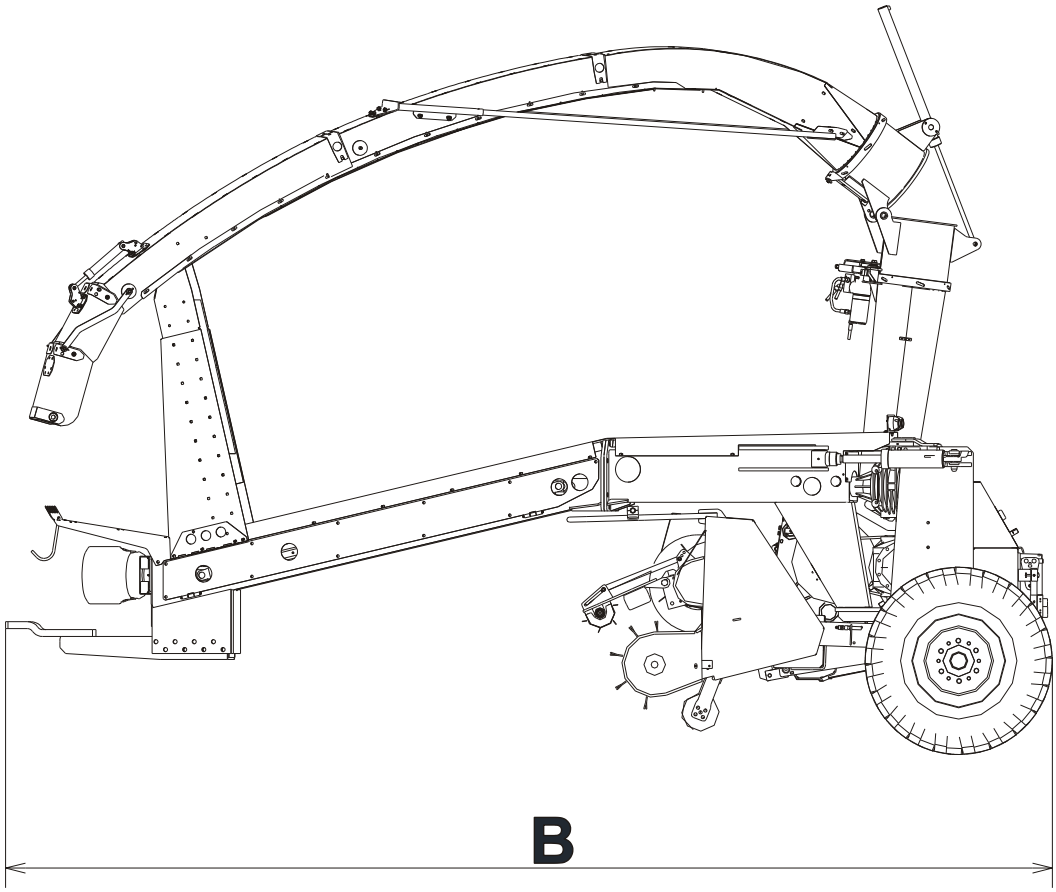
12. **Maximum 210 bar.**
    Make sure that all the hydraulic components are not exposed to more pressure than 210 bar, as there could be a risk of explosive damage of parts. Hereby you expose yourself and others to serious danger of getting hit by metal parts with high speed or oil under high pressure.

13. **PTO drive shaft for rotor.**
    There is an alternative pin for the PTO drive shaft for the rotor. It is used when the rotor is disconnected during reverse and when the rotor rotates in the opposite direction during grinding. Make sure that you place the PTO drive shaft correctly on the pin when performing these operations.

14. **High-voltage lines.**
    This decal has the purpose to remind you of the danger of getting too close to high-voltage lines.

15. **Hydraulic oil under pressure.**
    Warning against hydraulic oil under pressure.





PR11-1810

TECHNICAL DATA

TECHNICAL DATA	FCT 1460
Pick-up width	3.1 m
Power requirement	147-206 kW/200-280 HP
Blade rotor width	0.9 m
Rpm for rotor	1600 rpm
Number of blades, standard	40
HD blades	Standard
Grinding device	Grindstone with quick adjustment
Reverse grinding	Standard
Theoretical cutting length, standard (alternative)	12 and 16 mm (6 and 8 mm)
Reversible shear-bar, tungsten-coated	Standard
Number of feed rollers	4
Reverse of feed intake	Standard, hydraulic
Hydraulic functions	Pick-up lifting, drawbar, chute swivelling, deflector and reverse function
Turning angle for chute	280 degrees
Pick-up, pre-lubricated	Standard
Weight with pick-up	3800 kg
Length, max., B	5.31 m
Maximum width with pick-up, C	3.57 m
Transport height, A	3.8 m
Tyre dimension standard	500/50-17
Freewheeling clutch in PTO shaft	Standard
Friction clutch in PTO shaft	Standard, 3000 Nm
Steel wheels on pick-up	Standard
Rubber wheels on pick-up	Option (width, C: 3.75 m)
Hydraulic Auto-Hitch	Option
Hitch for trailer: drawbar load/ total weight	2000kg/ 15000kg

2. CONNECTION TO TRACTOR

THE HYDRAULIC SYSTEM

HYDRAULIC CONNECTION

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

CAUTION: It is important that the quick-release couplings are always carefully cleaned before mounting to avoid impurities contaminating the hydraulic system and damaging important valve functions. When the hydraulic hoses are not connected to the tractor they should be parked in the holder at the end of the drawbar.

The machine is equipped with its own hydraulic system, which must be supplied with oil from the tractor.
The system is used for pick-up lifting, drawbar, chute swivelling, deflector, chute folding and reverse function. None of these functions use very much oil and are controlled in the best way when the oil flow is low. Adjust the oil flow from the tractor to 15-20l/min., or as low as possible.
Connect the hoses to a double-acting outlet on the tractor, or better: connect the pressure hose to the A-port on the hydraulic outlet and the return hose to a free flow return-port directly to rear-axle assembly. Hereby you ensure that the return pressure is sufficiently low. This is especially important if the oil flow from the tractor cannot be adjusted to a sufficiently low level.

IMPORTANT: The hydraulic outlet of the chosen A-port must be locked in pressure position to ensure continuous oil flow to the machine’s hydraulic system.

BYPASS VALVE

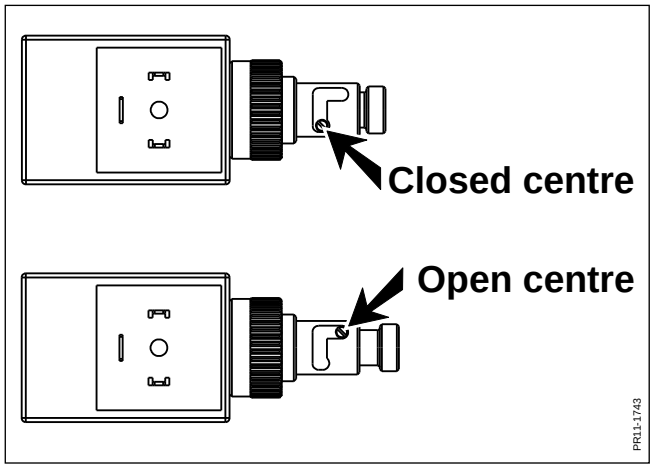


Fig. 2-1

Fig. 2-1 We distinguish between two types of tractor hydraulic systems: “open centre hydraulic” (also called “fixed pump”) and “closed centre hydraulic” (also called “variable pump”).

If the tractor is of the **“open centre”** type, the bypass valve must be **open** in order to allow passage of oil back to the tractor and should only be activated when a function on the machine is activated. If the valve is not open, this can be changed at the thumbscrew.

If the tractor is of the **“closed centre”** type, the bypass valve must be **closed** in order to allow the tractor to close the oil flow automatically when no functions are active. If the valve is not closed, this can be changed at the thumbscrew.

The bypass valve is placed at the left on the valve block.

None of the hydraulic functions use more than about 15 litres of oil per minute.
Therefore the oil flow from the tractor should be set to 15 litres of oil per minute, if possible. The bypass valve is preset to maximum 40 l/min. If this limit is exceeded, there will be a loss of pressure which may heat the oil and the valves.

CONNECTION OF ELECTRIC SYSTEM

Fig. 2-2

Fig. 2-2 The machine is equipped with full electronic operation of all the machine's hydraulic functions. The electronic operation consists of 2 units:

- A control unit mounted on the machine together with the hydraulic system. This unit activates the hydraulic valves.
- A control box for operation of the hydraulic functions. This can be placed on the right arm rest in the tractor cabin, allowing the driver easy access to it while driving in the field.

The control box is equipped with detachable fittings which can be fastened in the tractor cabin with screws, and it can subsequently be dismounted without tools.

The plug for the power supply is connected to a socket in the tractor cabin. This should supply 12 V and allow minimum 15 A. If the tractor does not have the same plug you should contact your dealer and get an adaptor.

IMPORTANT: When the machine is parked the control box should be placed in the chute support on the drawbar.

ELECTRO-HYDRAULIC CONTROL

The machine is operated from the control box which controls the electro-hydraulic functions.

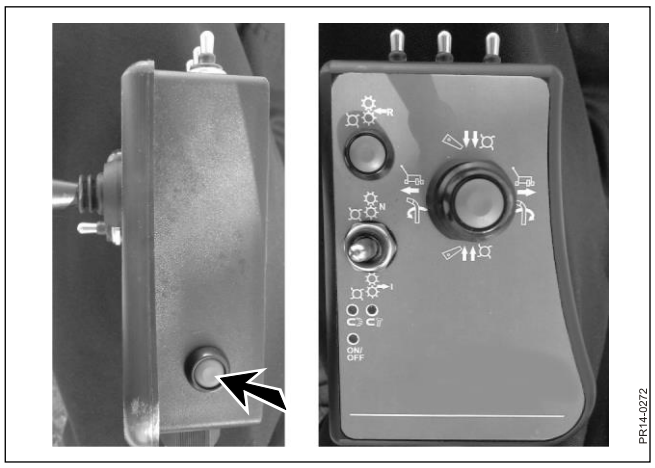


Fig. 2-3

Fig. 2-3 The control is turned on and off on the side of the control box.

IMPORTANT: Remember to turn off the control box if the tractor is stopped for some time. Although the machine is not in operation, several electric coils may be activated. These will drain the tractor's battery.

FUNCTIONS

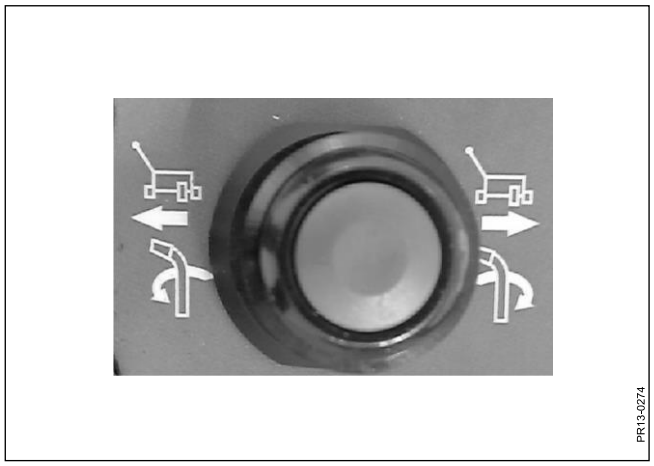


Fig. 2-4

Fig. 2-4 On the joystick:
Chute: Push to the left: The chute turns anti-clockwise. Push to the right: The chute turns clockwise.
Drawbar: While pushing the button: Push to the left: The machine moves behind the tractor. Push to the right: The machine moves out to the swath.

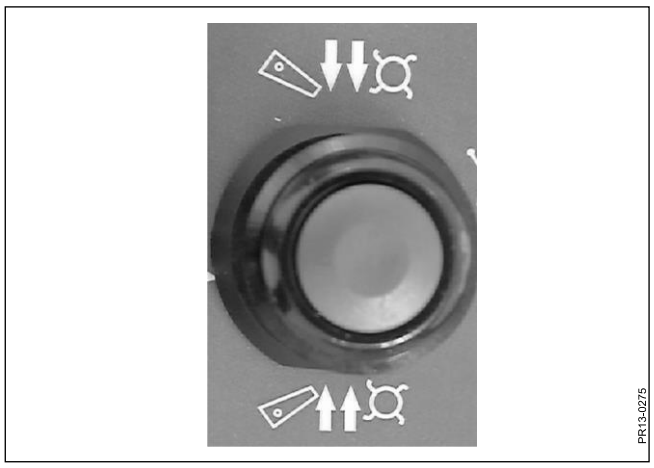


Fig. 2-5

Fig. 2-5 On the joystick:
Chute: Push forward: The deflector points downward. Push to the rear: The deflector points upward.
Pick-up: While pushing the button: Push forward: The pick-up is lowered. Push to the rear: The pick-up is raised.
It takes about 2 seconds to lower the pick-up completely so that the support wheels can follow the ground.

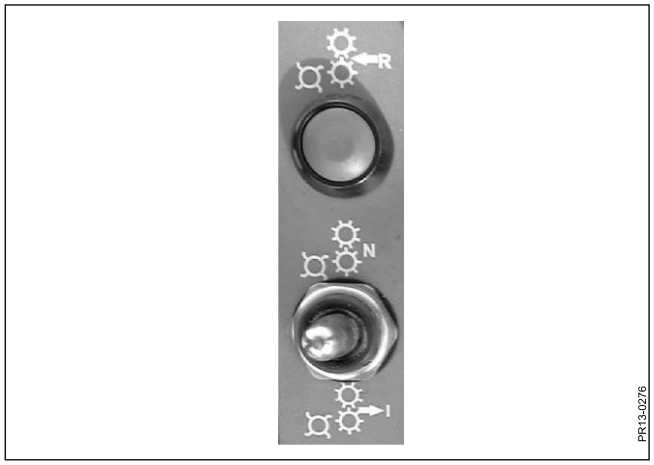


Fig. 2-6

Fig. 2-6 **Reverse function.** Applies to feed rollers and pick-up.
Feed in: Move the toggle switch to the rear.
Neutral: Move the toggle switch forward for about 2 seconds and then back to the middle position. Feed rollers and pick-up stay in neutral position.
Reverse: With the toggle switch in the middle position you reverse by holding down the push-button. Reversing will stop when letting go of the button.

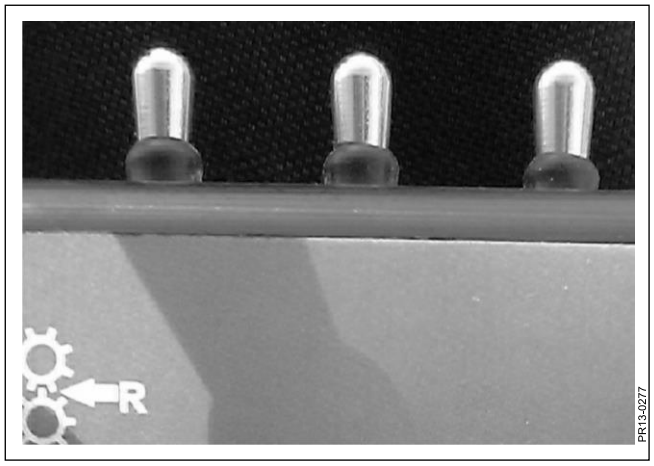


Fig. 2-7

Fig. 2-7 There are 3 toggle switches on top of the control box. One of them is used for folding of the chute; the other two are intended for optional equipment. The toggle switches automatically return to the neutral middle position after being activated.

Control light

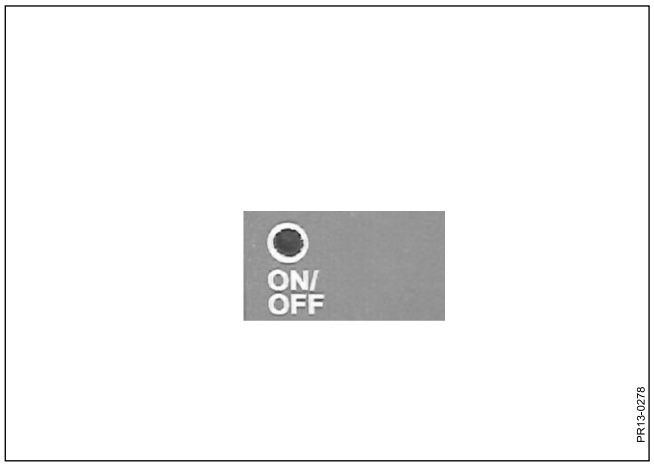


Fig. 2-8

Fig. 2-8 This light is on when the control unit is switched on.

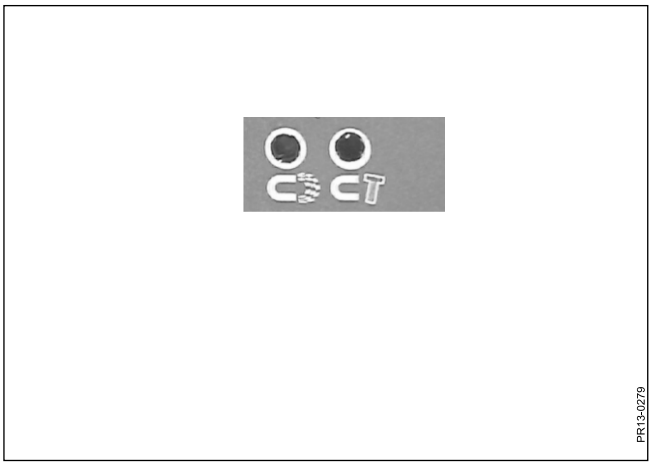


Fig. 2-9

Fig. 2-9 The left control light is on when the metal detector is active. It turns off when there is a metal stop or if the metal detector is turned off.

The right control light is on when there is a metal stop.

The metal detector turns on each time the control unit is switched on. If you wish to turn off the metal detector, this can be done by pushing the button on the MD control unit on the machine.

Hold the button for about 5 seconds. The left control light on the control box turns off.

See also the section: “MD-CONTROL”.

DRAWBAR AND PTO DRIVE SHAFT

The hitch eye of the drawbar is intended for a 30 mm hitch pin. The hitch pin must be secured. The drawbar load is 660kg.

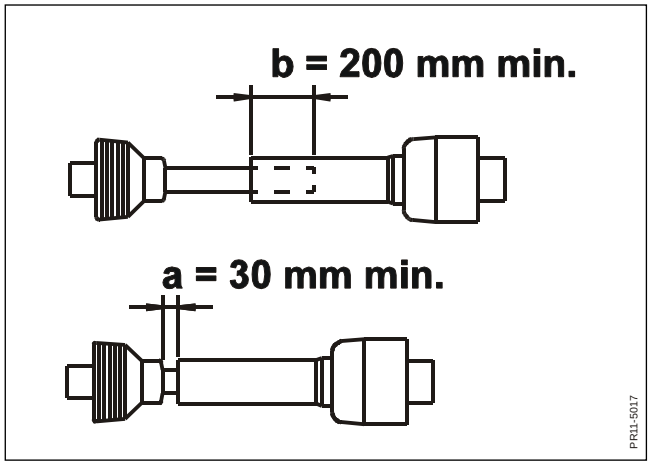


Fig. 2-10

Fig. 2-10 Adjust the length of the PTO shaft so that it:
- in working position has minimum 200 mm overlap, see measure **b**.
- is not compressed more than the prescribed 30 mm in order not to bottom the shaft, see measure **a**.

Adjustment of the length can take place by pulling out or pushing in the drawbar of the tractor.

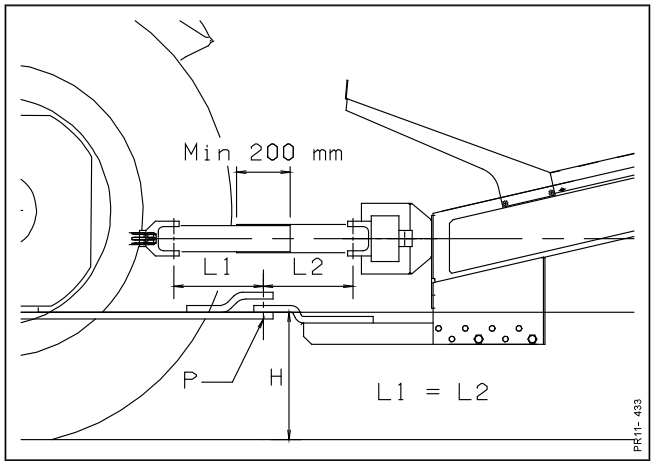


Fig. 2-11

Fig. 2-11 The height **H** of the hitch eye must be adjusted so that the PTO shaft is horizontal. The height can be changed by moving or turning the drawbar bracket.
To ensure longest possible life of the PTO shaft the following applies to standard PTO shaft without wide angle: The length **L1** must be equal to the length **L2**, i.e. the centre of rotation **P** for the drawbar must be as close as possible under the centre between the joints. The drawbar bracket on the chopper can be moved back and forth in steps of 25 mm.

IMPORTANT: The drawbar must always be mounted and fastened with 2 bolts.

SHORTENING OF THE PTO DRIVE SHAFT

It is necessary to be very careful when shortening the PTO drive shaft. If the PTO drive shaft is shortened too much, there is a risk that the profile tubes are drawn apart which may cause serious damage.
Especially on hilly ground when the machine and the tractor have variable angles in relation to each other. On the other hand, if the PTO drive shaft is not shortened enough there is a risk of squeezing during sharp turns, which may cause high frictional forces in the PTO drive shaft, which again will damage the axle joints.

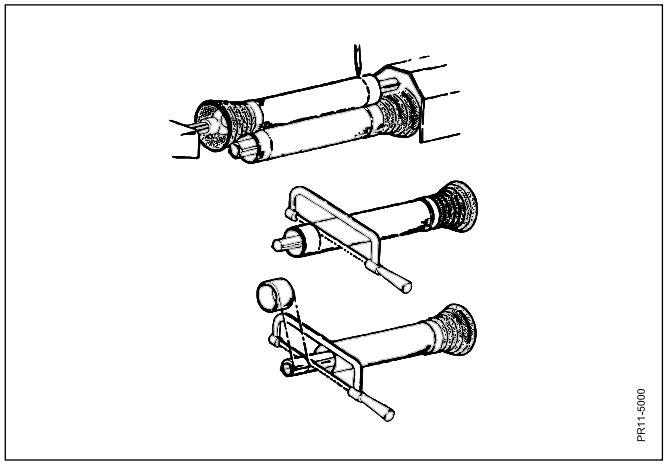


Fig. 2-12

Fig. 2-12 Fasten the halves of the shaft to PTO and PIC (fig. 2.10), respectively, when these are right opposite each other with the machine in working position. (The longest distance on this machine). Hold the shaft ends parallel to each other and mark the required shortening, minimum 200 mm overlapping. Shorten all 4 tubes equally.
The ends of the profile tubes must be rounded off and burrs must be removed carefully. It is very important that the tubes are smooth and clean before greasing. Grease the tubes carefully before reassembling.

WARNING: **Never turn so sharply that there are less than the prescribed 30 mm distance in order not to bottom the shaft. See measurement a in fig. 2-10.**
If the PTO drive shaft bottoms when turning sharply, there is a risk that the shaft and/or other transmission parts are damaged.

FRICTION CLUTCH

On the PTO drive shaft between the drawbar and the gearbox there is a friction clutch which ensures that the machine is not overloaded during operation.
Before starting a new machine, the clutch must be "aired". See section concerning the friction clutch in chapter 7 "MAINTENANCE".

3. MOUNTING OF EQUIPMENT

Mounting should take place in a workshop on even ground. The base machine must always be mounted correctly to the tractor according to section 2 "CONNECTION TO TRACTOR" before equipment and accessories are mounted.

HITCH FOR TRAILER

The machine can be supplied with combi-hitch or hydraulic hitch for connection of trailer. The maximum drawbar load is 2000 kg. Maximum total weight of trailed wagon: 15000kg.

COMBI-HITCH

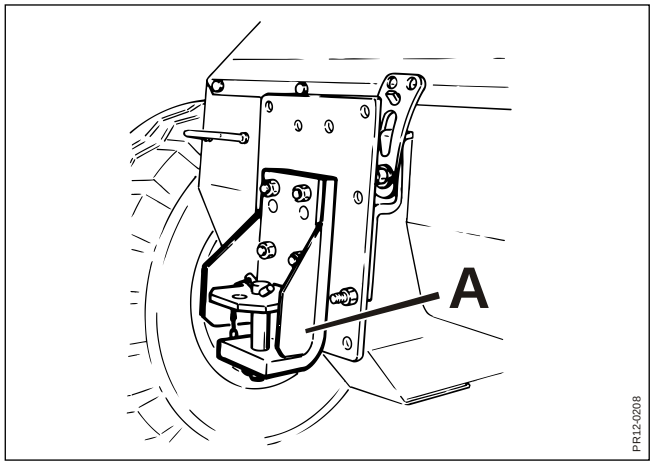


Fig. 3-1

Fig. 3-1 Combi-hitch **A** mounted in lowest position.

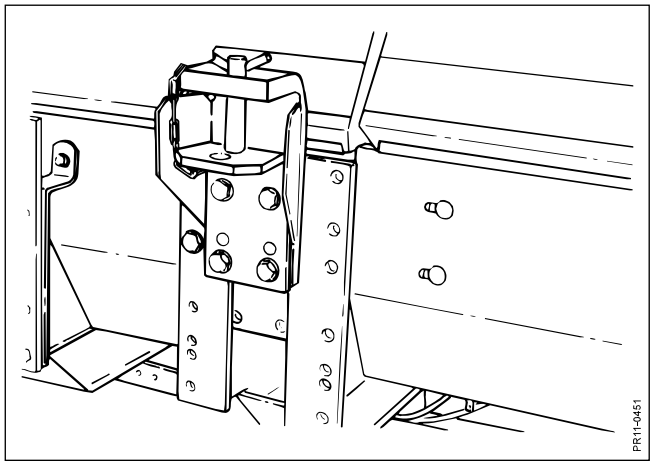


Fig. 3-2

Fig. 3-2 Combi-hitch mounted in uppermost position. This position is used for trailers with overrun brake, e.g. in Germany.

HYDRAULIC HITCH HOOK (AUTO-HITCH)

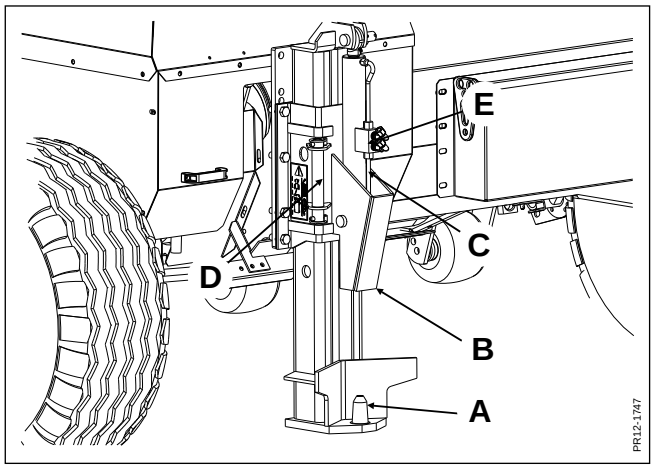


Fig. 3-3

Fig. 3-3 The hydraulic hitch **B** is equipped with a hitch hook **A** which is raised and lowered hydraulically by a double-acting cylinder **C**. The hoses from the cylinder **C** are connected to the valve chest on the forage harvester. Now the hydraulic hitch **B** can be operated with one of the 3 toggle switches at the front of the control box.

Fig. 3-3 For connection of the trailer the machine must be reversed to the drawbar of the trailer. The hitch hook **A** must be lowered and the hitch eye of the trailer is caught by the hitch hook. Lift the trailer with the hydraulic cylinder **C** until it reaches its bottom position. A hydraulic locking valve **E** which is mounted on the cylinder **C** ensures that the hitch hook **A** stays in the raised position. If the trailer is equipped with plugs for lighting and hoses for tipping and brakes these should be mounted subsequently.

IMPORTANT: When driving on public roads with a trailer connected to the hydraulic hitch B, the locking pin D MUST be removed from its holder and lead through the frame on the hydraulic hitch B so that the hitch hook A is locked mechanically, see fig. 3-4. This must be done in order to observe the traffic rules.

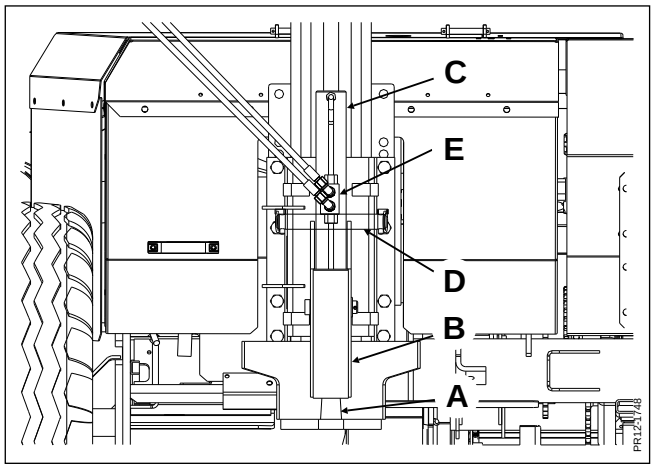


Fig. 3-4

Fig. 3-4 The trailer is disconnected as follows: If the locking pin **D** is placed so that it locks the hitch hook **A**, see figure 3-4, the locking pin **D** is removed and placed in the holder on the hydraulic hitch **B**. Then the hitch hook **A** is lowered by activating the cylinder **C.** When the hitch hook **A** has been lowered completely, the trailer is disconnected. Also remember to disconnect plugs for lighting and hoses for tipping and brakes, if these were mounted.

PICK-UP

Connection is preferably carried out on firm and even ground.
The base machine is connected to the tractor according to section 2 “CONNECTION TO TRACTOR”.

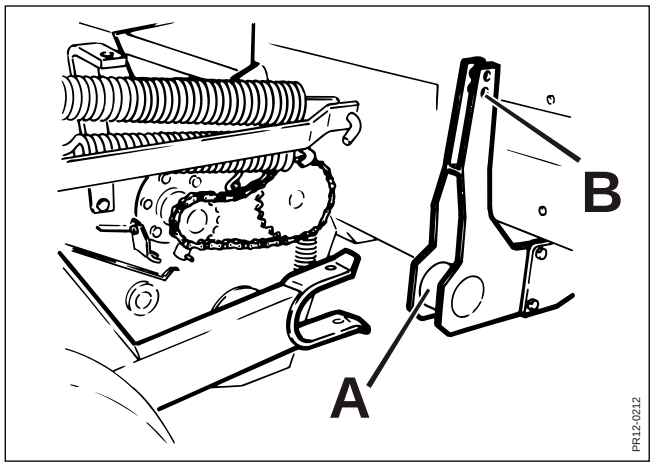


Fig. 3-5

Fig. 3-5 Wheel the pick-up on the rollers to the machine so that the catch **A** is engaged. Mount the 2 pins in order to fix the pick-up to the base machine.
Attach the relief device to the pick-up at **B**.

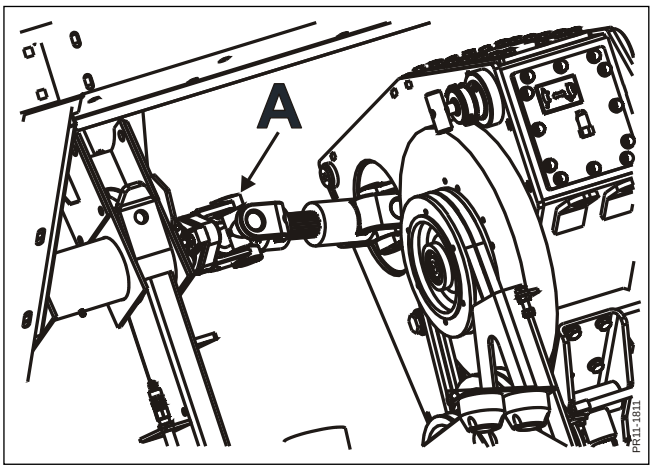


Fig. 3-6

Fig. 3-6 Mount the PTO drive shaft **A** for the pick-up.

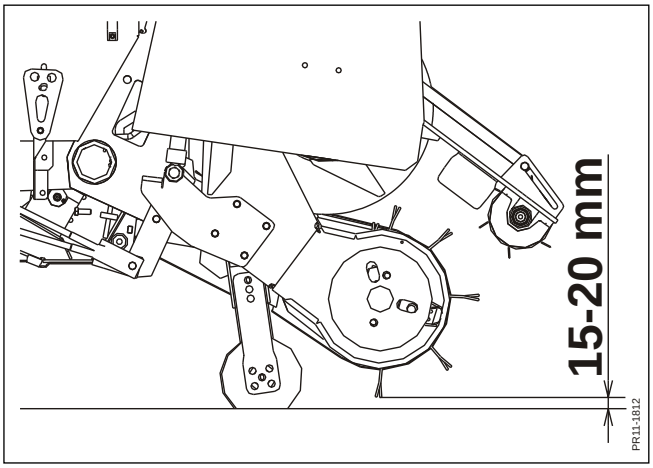


Fig. 3-7

Fig. 3-7 The height of the rollers under the pick-up can be adjusted. Adjust the height so that there is 15 – 20 mm distance between the point of the pick-up tines and the ground.

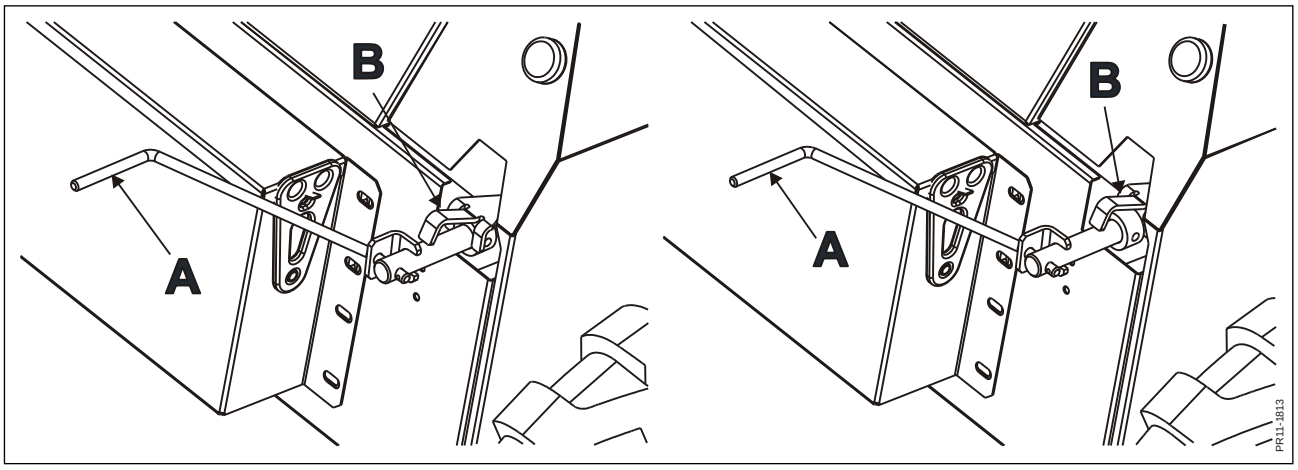


Fig. 3-8

Fig. 3-8 Tighten the relief springs with the spindle **A** until the ground pressure for the pick-up is maximum 30 kg. The spindle lock **B** is pulled out to release the spindle and pushed in to lock it. Lift up the lock to move it. Hold the spindle **A** in horizontal position so that the lock **B** can be engaged.

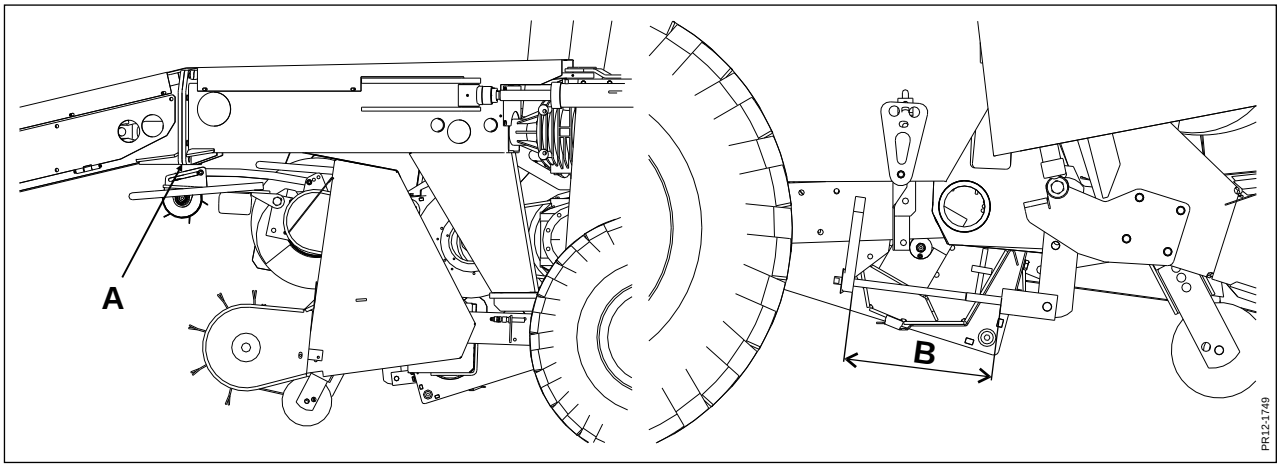


Fig. 3-9

Fig. 3-9 Adjust the stop, **B**, for lift of the pick-up so that you obtain maximum lifting height but also avoid the pick-up colliding with the drawbar at **A**.

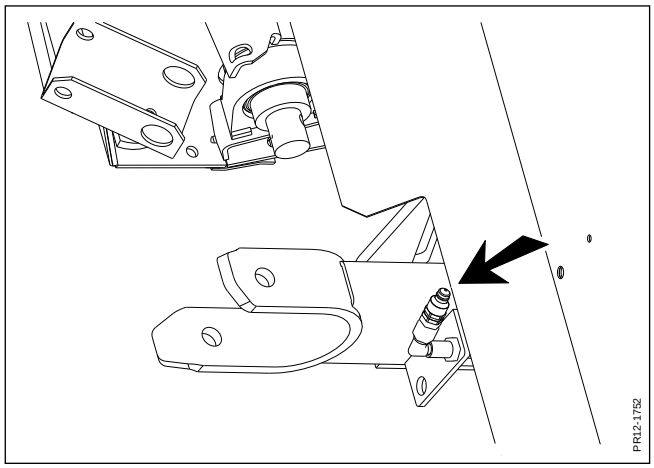


Fig. 3-10

Fig. 3-10 Connect the hydraulic hose for lift of auger and front roller to the quick-release coupling at the left-hand catch.

TRANSPORT CONVERSION

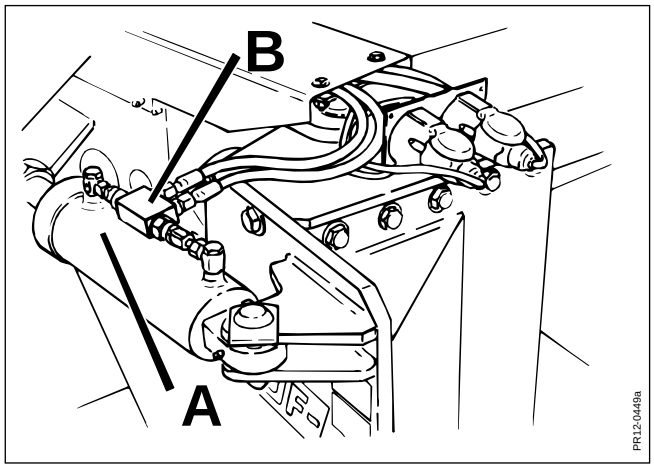


Fig. 3-11

Fig. 3-11 The drawbar is converted electro-hydraulically with the joystick on the control box. The hydraulic cylinder **A** is equipped with a safety lock valve **B** which ensures that the machine does not make any unintentional movements in case of leaking hoses.

FITTING CHUTES

There are 3 different chute options and 3 different positions of the bracket for chute turning, in order to accommodate most needs.

NB! Not all machines offer the option for 3 positions of the bracket for chute turning.

CHUTE TURNING

There are the following 3 positions for fitting the chute turning bracket, in order to optimise unloading to a selected side.

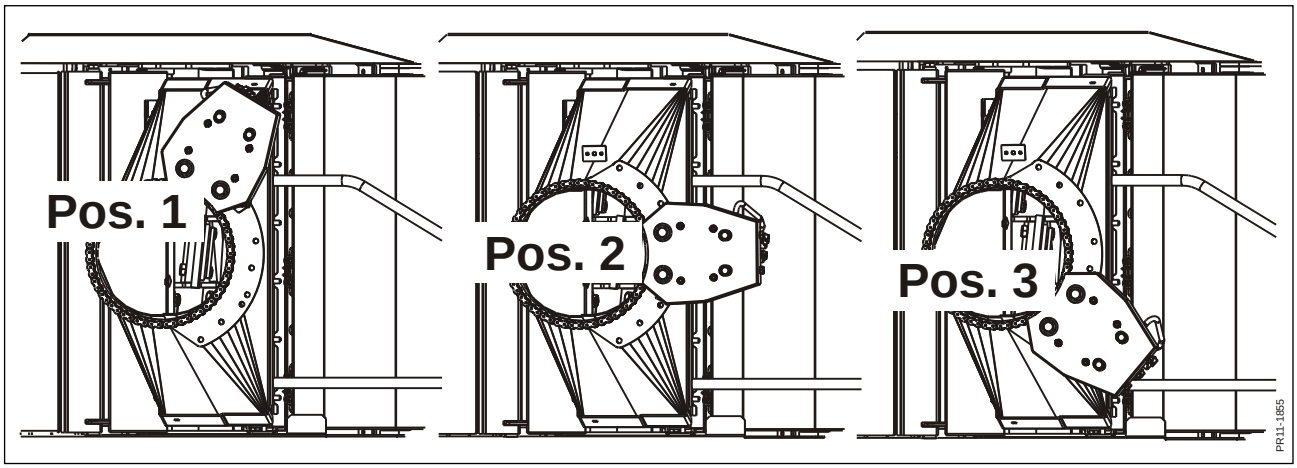


Fig. 3-12

Fig. 3-12 Pos. 1 for unloading to the right
Pos. 2 for unloading both sides. Cannot be used with the collapsible chute.
Pos. 3 for unloading to the left

When the chute is fitted, you must turn carefully from outer position to outer position in order to ensure that the hydraulic hoses are fitted correctly and are long enough.

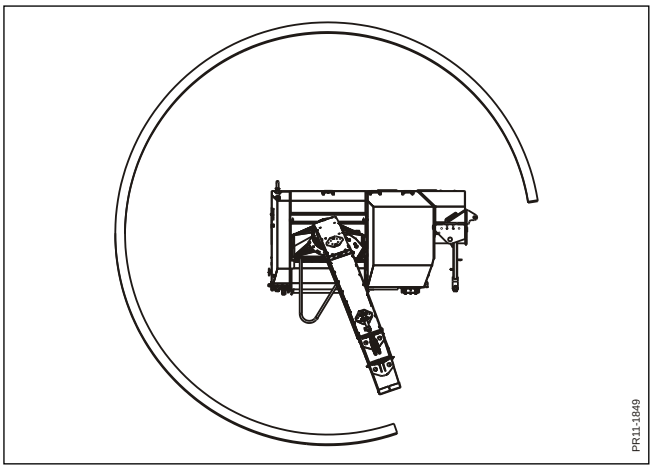


Fig. 3-13

Fig. 3-13 Position 1

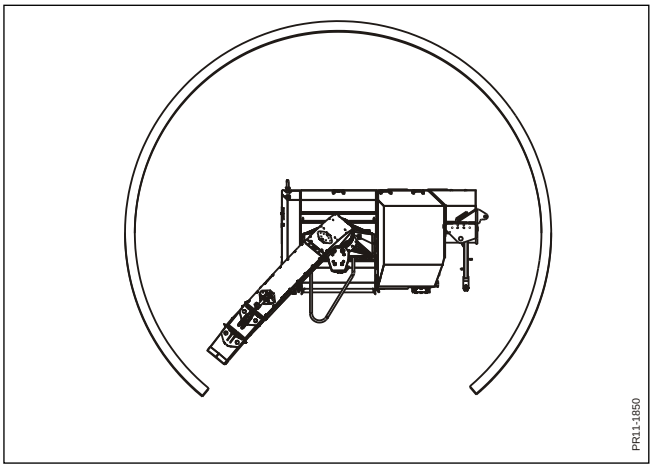


Fig. 3-14

Fig. 3-14 Position 2

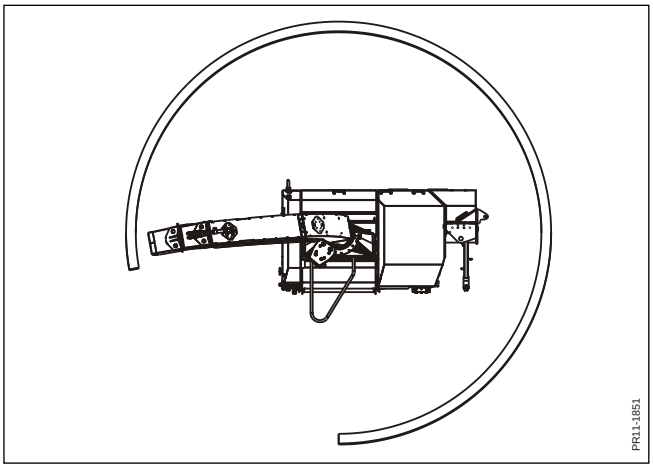


Fig. 3-15

Fig. 3-15 Position 3

NB! Not all machines offer the option for 3 positions of the bracket for chute turning. Only position 3 is offered for these machines.

STANDARD CHUTE

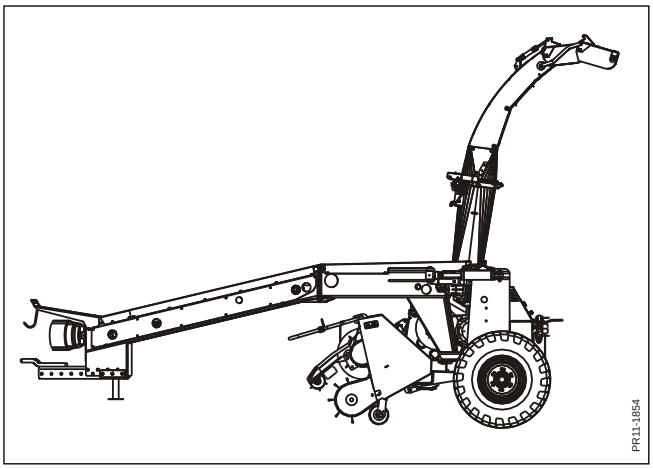


Fig. 3-16

Fig. 3-16 This is the standard chute that is supplied with the machine. It is approx. 3.8 metres high in the transport position.

COLLAPSIBLE CHUTE

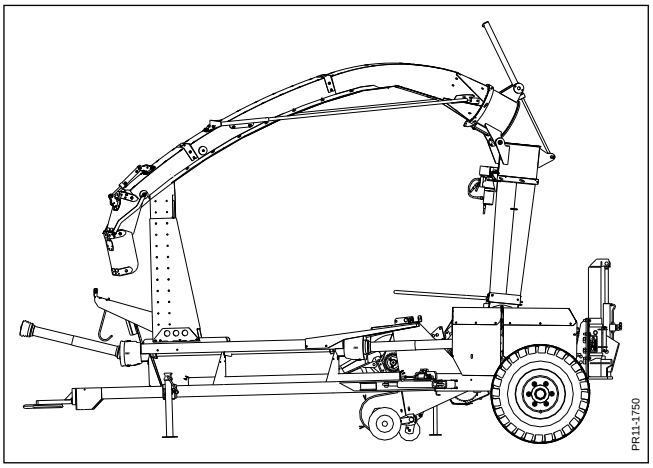


Fig. 3-17

Fig. 3-17 The machine can be fitted with a chute that permits loading of very high trailers. This chute is more than 4 m high and must be folded down during transport, so that it rests on a stand on the drawbar. This reduces the transport height to less than 4 metres.
The chute is collapsed by a hydraulic cylinder that is controlled from a toggle switch on the front of the control box in the driver's cab.
The chute is operated electro-hydraulically with the joystick and toggle switch on the control box. Move the drawbar into transport position, turn the chute into a position above the stand and fold it down until it rests on the stand.

DANGER: The chute is more than 4 m high. Be aware of high-voltage lines. Keep a safe distance away from high voltage lines.

WARNING: Make sure that persons keep a safe distance from the machine when moving the chute. The hydraulic functions must be operated from the tractor.

IMPORTANT: Be careful not to hit the tractor cab.
IMPORTANT: Do not move the drawbar while the chute is resting on the stand.
IMPORTANT: Do not turn the chute while it is resting on the stand.
IMPORTANT: The chute must always rest on the stand during transport. This is partly due to the Road Traffic Act and also because the chute/delivery chute may get damaged, for instance if you drive fast on uneven ground.

CHUTE FOR PARALLEL OPERATION

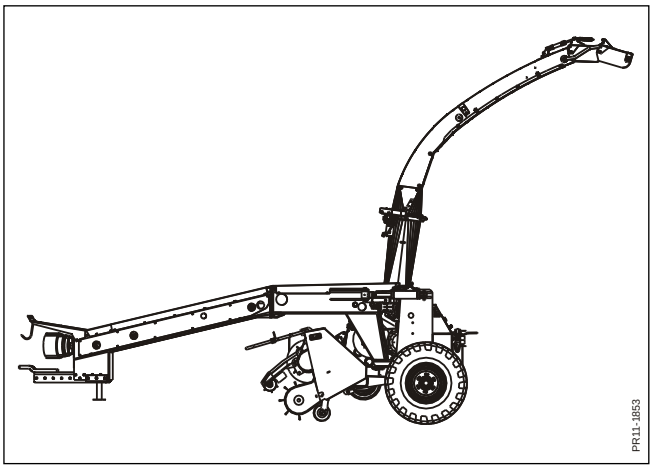


Fig. 3-18

Fig. 3-18 The machine can be fitted with a chute that has a transport height of 4.4 metres. This chute cannot be folded for transport.

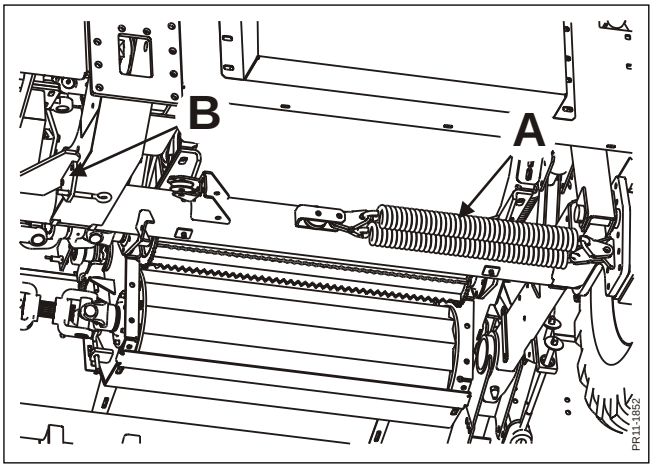


Fig. 3-19

Fig. 3-19 When this equipment is fitted, it is important that an extra spring **A** is fitted for chute relief, in order to compensate for the added weight of the chute. Bracket **B** must be moved to the indicated position so that the wire is not too short.

4. ADJUSTMENTS

PICK-UP

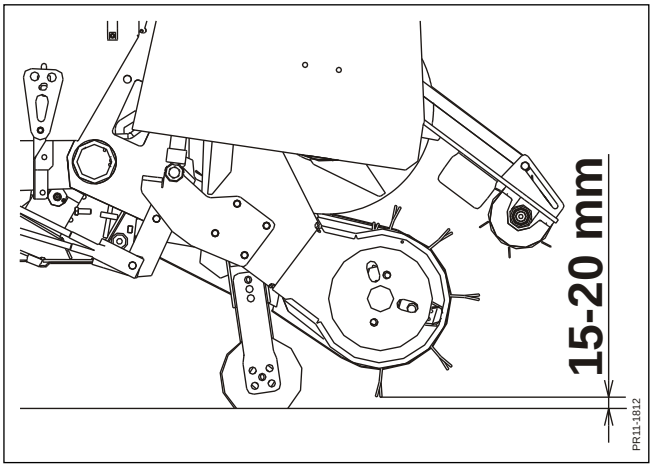


Fig. 4-1

Fig. 4-1 The pick-up is equipped with support rollers made of steel which are adjustable in height. You should keep the pick-up at such a height that the tines do not hit the ground and leave earth in the crop and can also pick up the grass without waste.

JF recommends a distance between the pick-up tines and the ground of 15 to 20 mm.

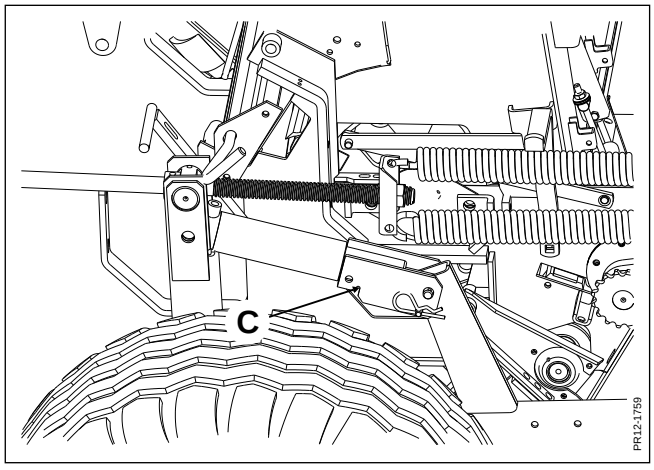


Fig. 4-2

Fig. 4-2 Before making any adjustment, the cylinder stop **C** must be engaged and secured with pin.

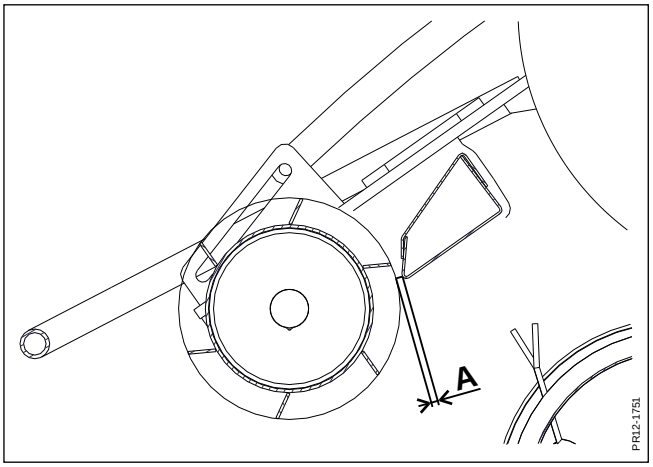


Fig. 4-3

Fig. 4-3 The distance **A** between the pick-up roller and the crossbar is adjusted so that they are as close as possible without colliding.

The auger on the pick-up is equipped with a slip clutch. The slip clutch of the auger is adjusted so that it releases before the other friction clutches in the machine.
The highest capacity is obtained by working at a forward speed where you drive without blockage in the auger. If there is a blockage around the auger you stop and force the crop out of the machine by using the reverse function. See also chapter 6 "WORKING IN THE FIELD".
A continuous and even flow through pick-up and auger is the best way to avoid blockages inside the machine, and thus avoid long operational stoppages.

The operator should always ensure spare friction discs for the slip clutch on the auger are in the tool box. If this clutch has often been in operation, the coating of the friction discs is worn and it cannot transfer sufficient transmission. It may therefore be necessary to replace the friction discs, but remember they have to be of the same number and quality.

CHANGE OF SPEED OF PICK-UP TINES

Extra sprockets and chains are supplied in order to be able to change the speed of the pick-up tines. This is an option that permits optimisation of material harvesting. The stated speeds are the tines' peripheral speed on the ground

Sprocket no.	Number of teeth Z	Speed
2064-720x	21	10 km/h
2065-897x	25	12 km/h
2065-994x	30	14 km/h

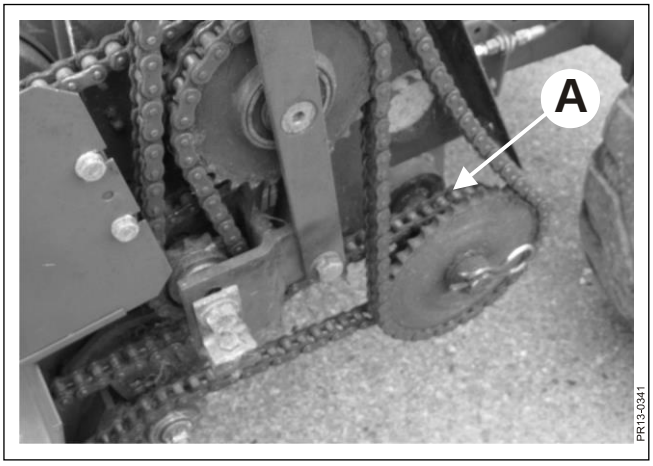


Fig. 4-3

Fig. 4-3 This is sprocket **A**, which is replaceable.

OPENING THE ROTOR HOUSING

Fig. 4-4

Fig. 4-4 The chute must be lowered in order to open the rotor housing. In order to make this easier, the chute is relieved by strong springs.

DANGER: First ensure that no other persons than the operator are in the vicinity.

WARNING: **The hydraulically collapsible chute** (accessory) is so heavy that the rotor housing cannot be opened manually for access to the chopping rotor. Instead, please use the procedure described in Fig. 4-10 – Fig. 4-14.

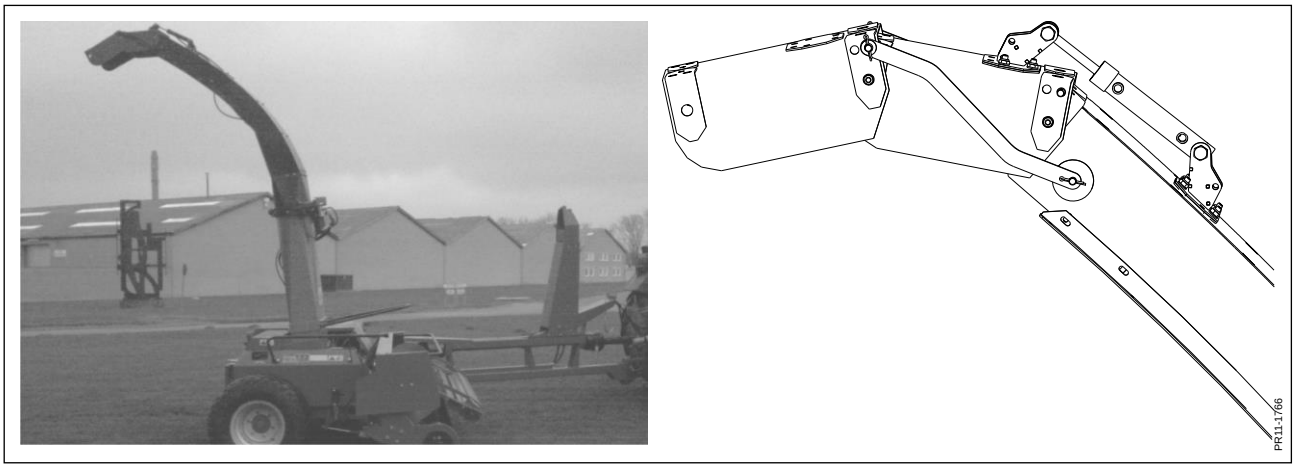


Fig. 4-5

Fig. 4-5 1) Turn the chute to the rear. Turn the deflectors to the middle of the working area.

Fig. 4-6

Fig. 4-6 2) Open the cover of the rotor housing and the left cover.

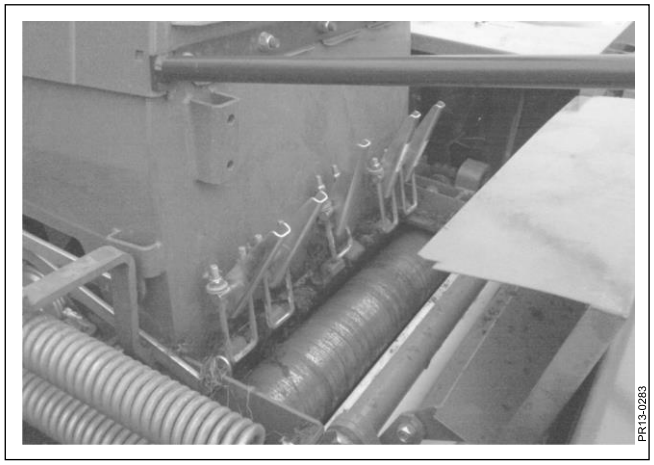


Fig. 4-7

Fig. 4-7 3) Open the clips on the front of the rotor housing.

Fig. 4-8

Fig**. 4-8** 4) Using the handle, turn the chute backwards and down, which will open the rotor housing.

5) The rotor housing is closed in the same way, although in the reverse order.

Fig. 4-9

Fig. 4-9 When the rotor housing is closed, it is a good idea to lift the chute the first part of the way.

COLLAPSIBLE CHUTE

WARNING: The chute is so heavy that the rotor housing cannot be opened manually when you want to get access to the chopping rotor. Use this procedure instead:

DANGER: First, make sure that no persons are near. The hydraulic functions must be operated from the tractor seat.

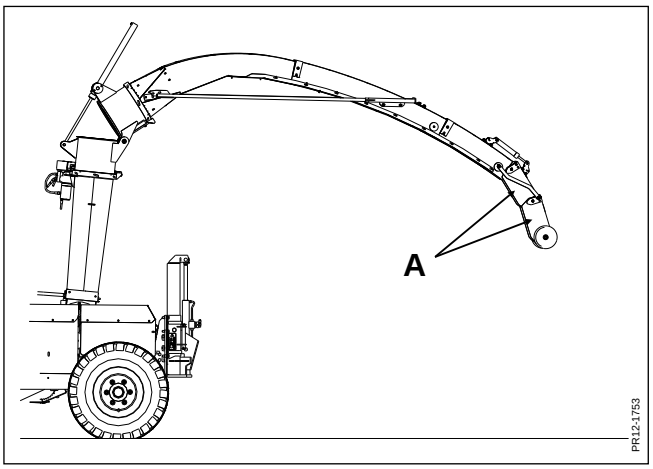


Fig. 4-10

Fig. 4-10 Turn the chute to the rear. Adjust the deflectors **A** to the middle of the working area.

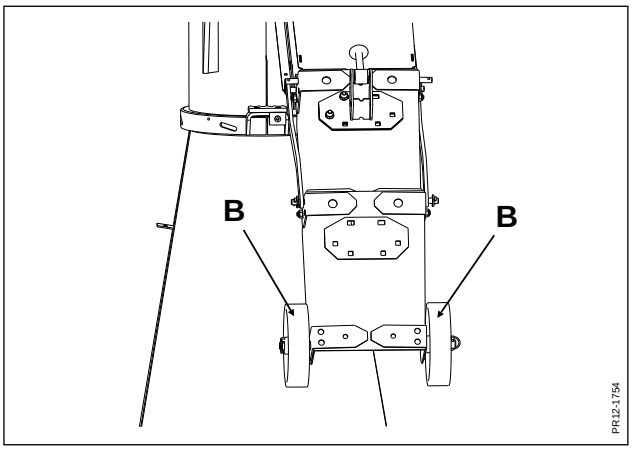


Fig. 4-11

Fig. 4-11 Fold down the chute to about 1.5 m above the ground and mount the wheels **B** with the pin and split pins.

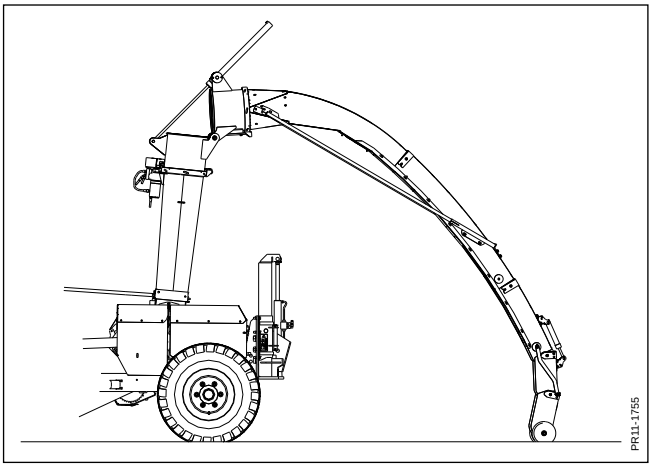


Fig. 4-12

Fig. 4-12 Fold down the chute until the wheels rest on the ground.

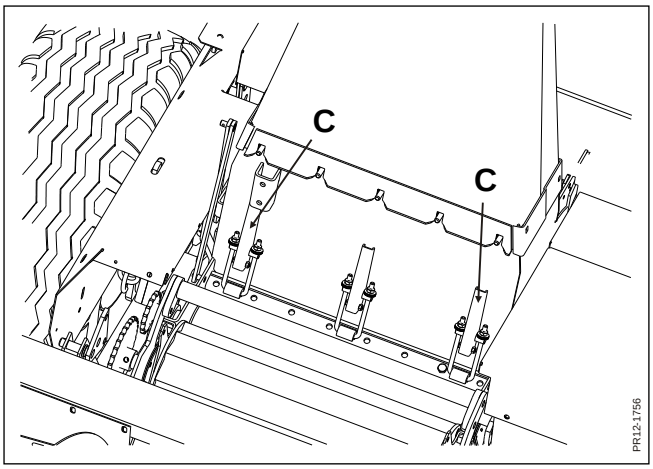


Fig. 4-13

Fig. 4-13 Now the lock clamps **C** at the front of the rotor housing can be opened safely.

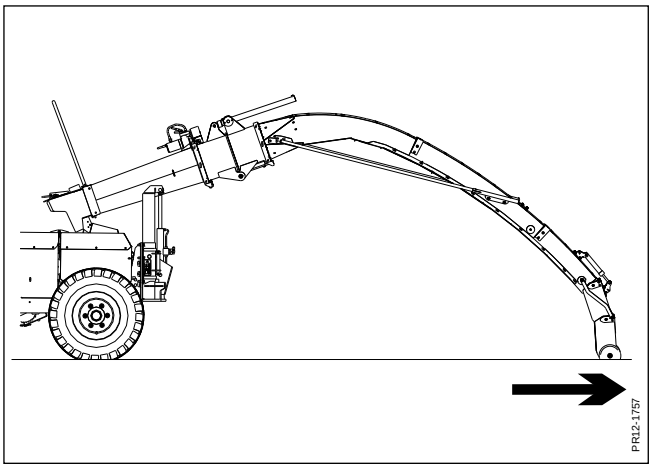


Fig. 4-14

Fig. 4-14 Move the chute cylinder in direction “Chute closed”, whereby the rotor housing is opened.

When closing the rotor housing, follow the same procedure in reverse order.

ROTOR AND ROLLER SECTION

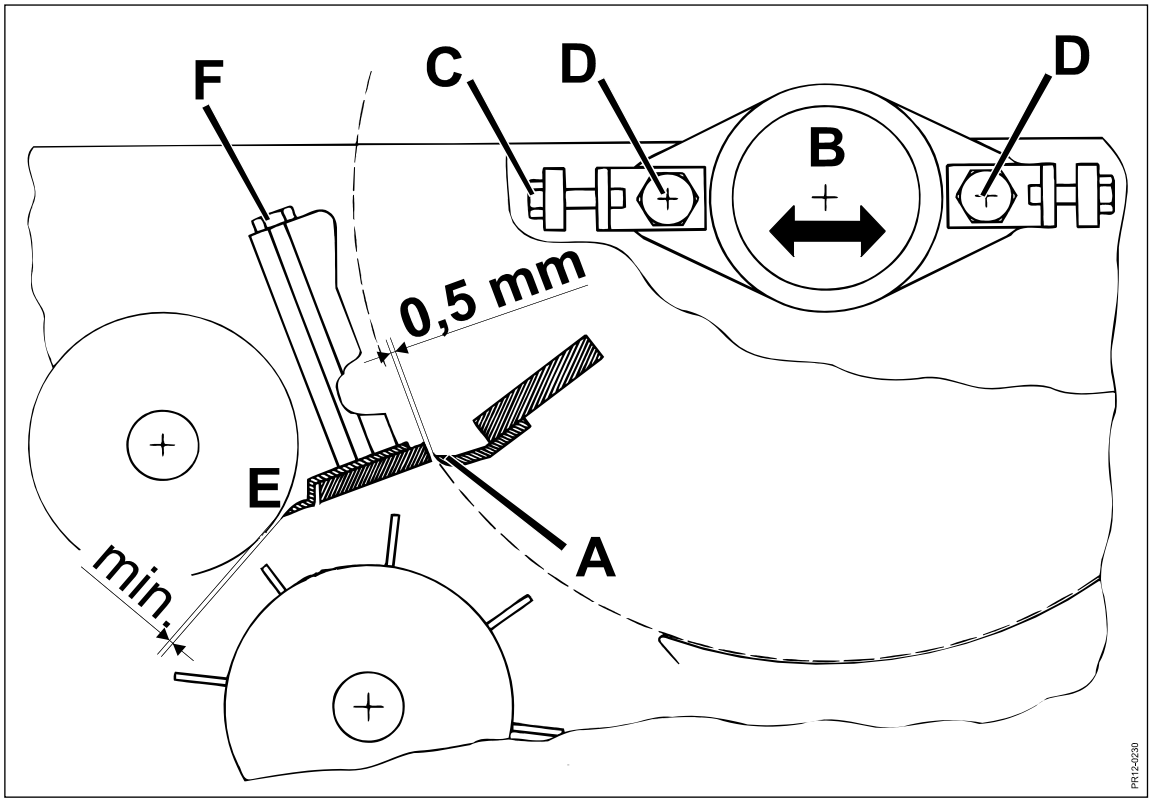


Fig. 4-15

Fig. 4-15 The distance **A** between the blades of the rotor and the shear-bar must be checked regularly with the delivered gauge (distance measuring device). You should aim at a distance of 0.5 mm. If it is necessary to adjust the distance, loosen the 2 bearing housings **B** and adjust with the screws **C**. When the distance has been checked, the bolts **D** of the bearing housings are tightened with a torque wrench to 40 kgm (400 Nm).

The machine is equipped with a scraper for the smooth roller **E**. The scraper is mounted together with the reversible shear-bar just mentioned.
The scraper is placed as close to the smooth roller **E** as possible without touching it. The distance between the scraper and the smooth roller should be between 0.2 and 0.5 mm. Tighten the bolts **F** with a torque wrench to 10-12 kgm (100-120 Nm). **Wrong adjustment of the scraper may result in overheating of the smooth roller and operational stoppage.**

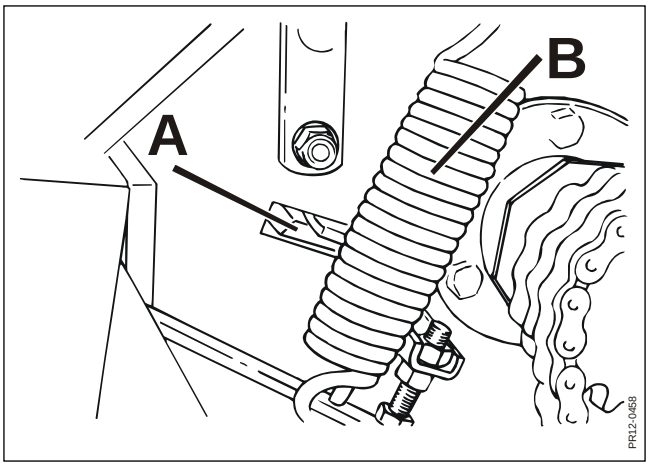


Fig. 4-16

Fig. 4-16 The scraper is dismounted by removing the screws **F** (on fig. 4-15), which also secure the shear-bar, after which scraper and shear-bar can be pulled out of the opening **A** in the rotor housing. The spring **B** for the serrated roller must be loosened or dismounted to get enough space. If the shear-bar has been worn, it can be reversed for a new sharp edge.

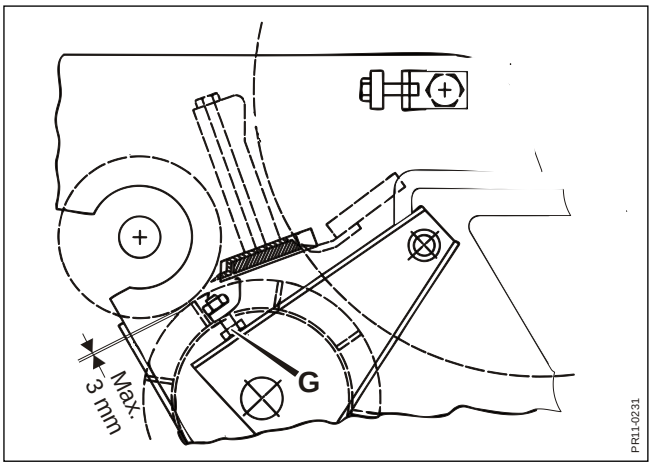


Fig. 4-17

Fig. 4-17 The distance between the smooth roller and the serrated roller should be maximum 3 mm. Adjustment is made with the bolts **G** at both sides of the rotor housing.

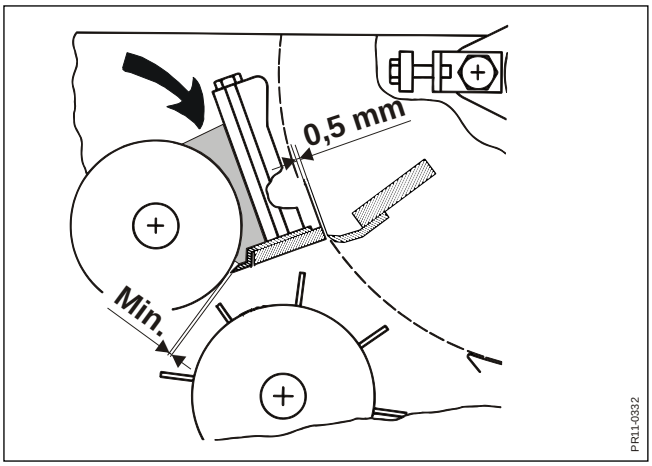


Fig. 4-18

Fig. 4-18 Under some conditions, crop substance (small particles) can accumulate in the shaded area and get so compact that this may result in an overloading of the transmission driving the rollers.
Check the area after every 8 hours of operation and remove possible crop residue. Check, and if necessary adjust, the distance between scraper and smooth roller. The checking frequency can be reduced when the operator knows the machine under all conditions.

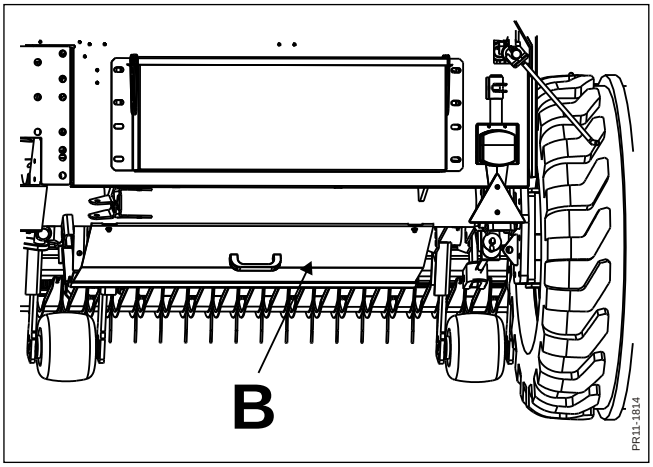


Fig. 4-19

Fig. 4-19 Under the roller section a bottom plate **B** can be mounted as option. This plate can be mounted when working in very dry and/or short crops to avoid waste under the rollers.

IMPORTANT: When working under normal conditions we recommend you to drive without this bottom plate as, otherwise, material can accumulate under the rollers causing reduced capacity and unnecessary overload of the transmission.

However, when driving in a crop where there is an excessive waste under the rollers, the bottom plate should be mounted. Waste material should be removed on a regular basis.

CUTTING LENGTHS

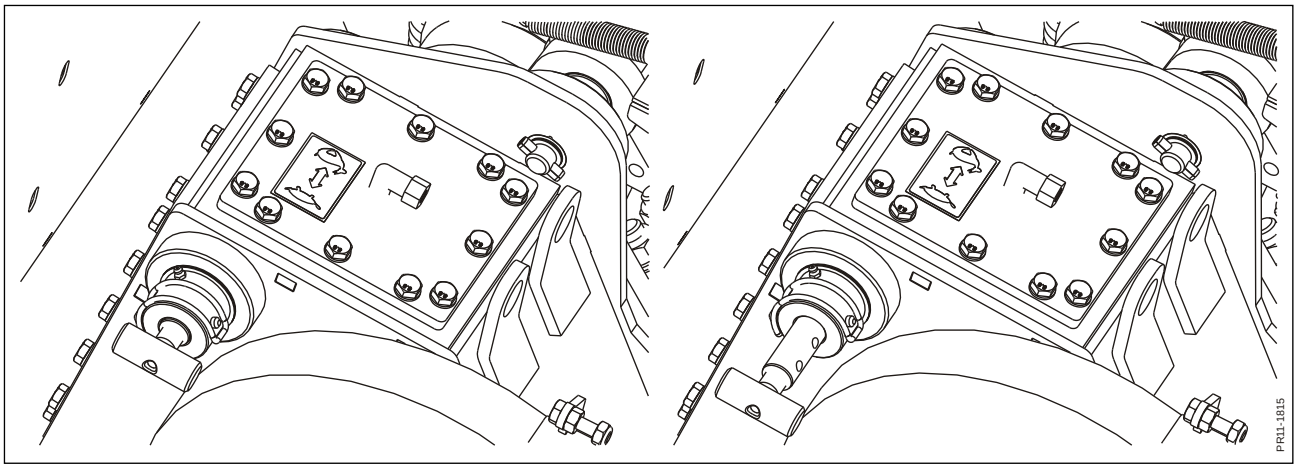


Fig. 4-20 Adjustment 1 Adjustment 2

Fig. 4-20 The chopping length is changed on the harvest gearbox which has 2 gears. This is done by removing the split pin and moving the handle to the wanted position. **Mount the split pin again**.

As standard the following chopping lengths can be achieved:

Adjustment	Theoretic chopping length
1	16 mm
2	12 mm

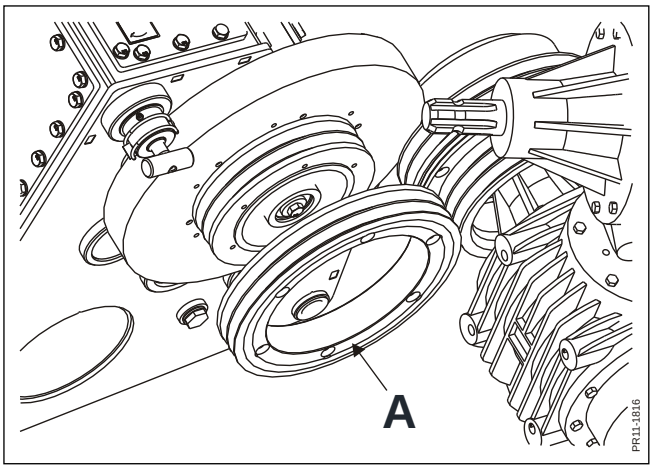


Fig. 4-21

Fig. 4-21 If you want an exceptionally short chopping length, the outermost pulley ring **A** must be moved from the swivel gearbox to the harvest gearbox. Hereby the following chopping lengths are obtained:

Adjustment	Theoretic chopping length
1	8 mm
2	6 mm

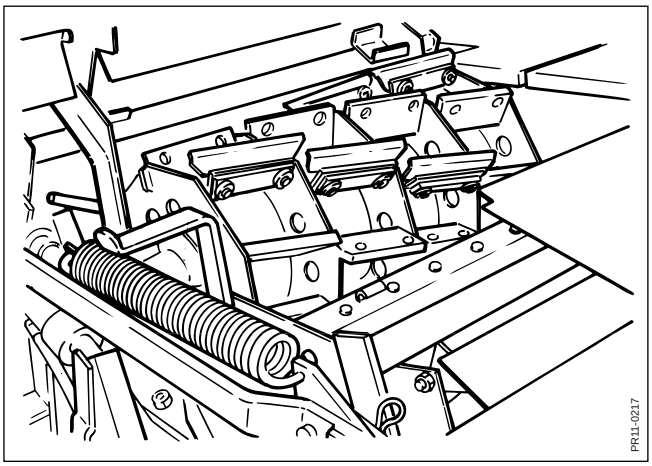


Fig. 4-22

Fig. 4-22 The cutting lengths can be doubled by removing every second row of blades in the rotor.

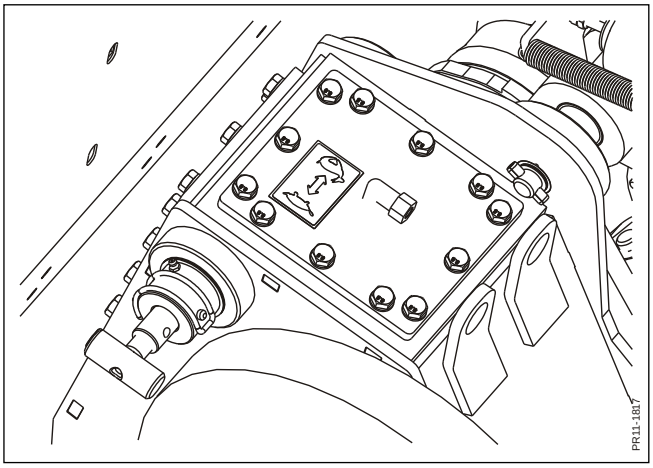


Fig. 4-23

Fig.4-23 In the position between adjustment 1 and adjustment 2 the gears of the harvest gearbox are not in mesh.

REPLACEMENT AND ADJUSTMENT OF BLADES

When replacing a single blade the blade must be placed at the same distance to the shear-bar as the existing blades. To ensure that the rotor is in balance it may be necessary also to replace the opposite blade as a used blade has a different weight compared to a new blade.
Even if there is no visible damage to the blade bolts, they should always be replaced together with the blades as they might have been overloaded.

CAUTION: **Check the distance between the blade and the shear-bar (0.5 mm) with the supplied gauge before the bolts are tightened.**

WARNING: **Only use original blade bolts when replacing. Tighten the blade bolts with a torque wrench to 40 kgm or with the supplied spanner using approx. 40 kg leverage.**

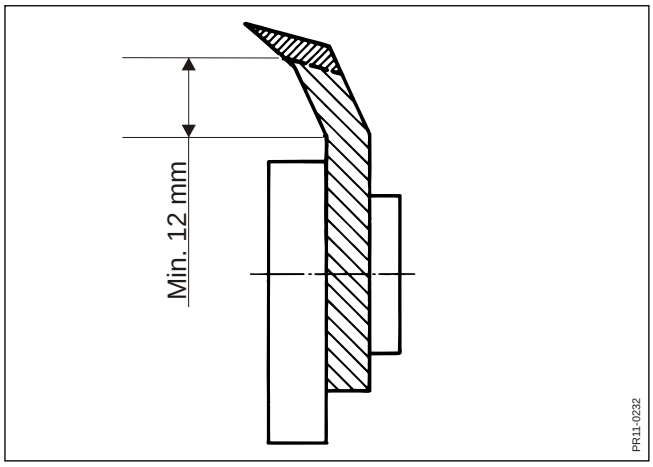


Fig. 4-24

Fig. 4-24 When the blades have been worn max. 8 mm or to the first bend, i.e. approx. 12 mm above the straight piece, they must be replaced.

DANGER: **When all blades on the rotor have been worn and the rotor adjusted towards the shear-bar, it MUST be adjusted back again before new blades are mounted. Otherwise there is a risk that the new blades collide with the shear-bar when the rotor is turned.**

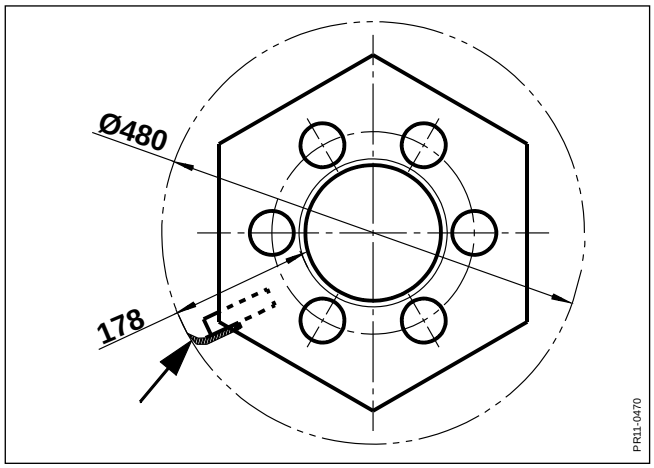


Fig. 4-25

Fig. 4-25 When mounting new blades they must be pulled out so that the outer diameter on the rotor is 480 mm (from rotor tube to blade point = 178mm).

GRINDING

Adjustment of the PTO drive shaft for the rotor to or from grinding position, respectively, may only take place **when the tractor and the machine have been stopped and the rotor has come to a complete standstill.** The rotor may only rotate when the grinding device is in grinding position.

Check before grinding:

- that the grindstone is undamaged.
- that the device slides easily back and forward.
- that the device is parallel with the rotor.

The grinding device is correctly adjusted from the factory and therefore there is normally no need for adjustment, but if it has been dismounted adjustment can be made at the oblong holes of the lateral guides. The bolts must be tightened firmly after the adjustment.

The stone is fed by turning the handle.

Normally you should grind the blades once a day – but avoid too much grinding since it will reduce the life of the blades.

CAUTION: **<u>Protect your eyes</u> – <u>always</u> use safety glasses when grinding. The guard above the grinding device <u>must</u> be closed while grinding.**

GRINDING OPERATION

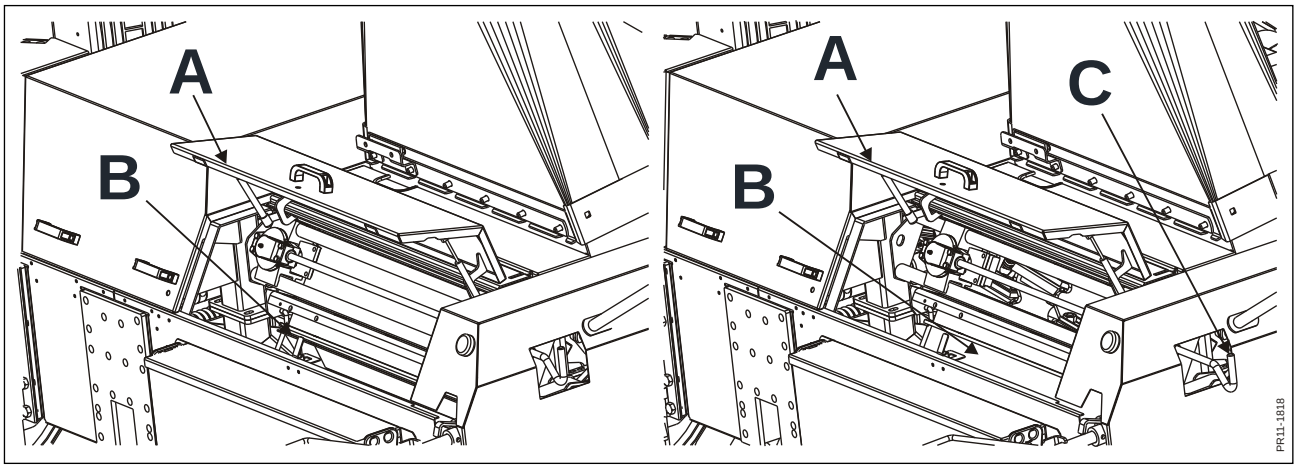


Fig. 4-26

Fig. 4-26

1. Open the guard **A** above the grinding device.

2. Lower the guard **B** between the grinding device and the rotor so that there is free space between the device and the rotor. Adjust the grindstone so that there is 2-3 mm clearance between the stone and the blades by turning the handle **C**.

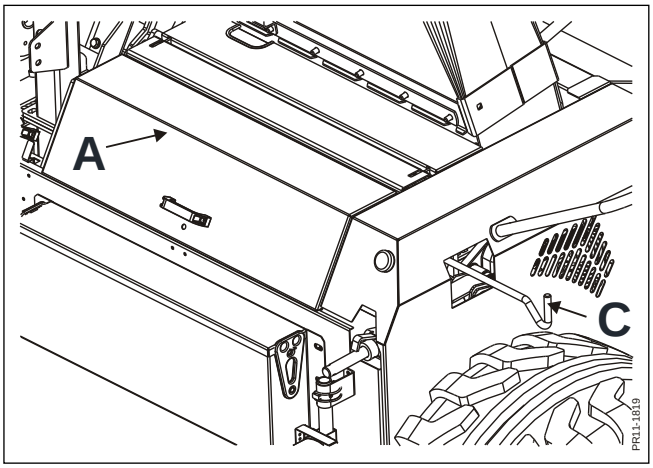


Fig. 4-27

Fig. 4-27 3. Close the guard **A**.

WARNING: REMEMBER, only grind with CLOSED guards.

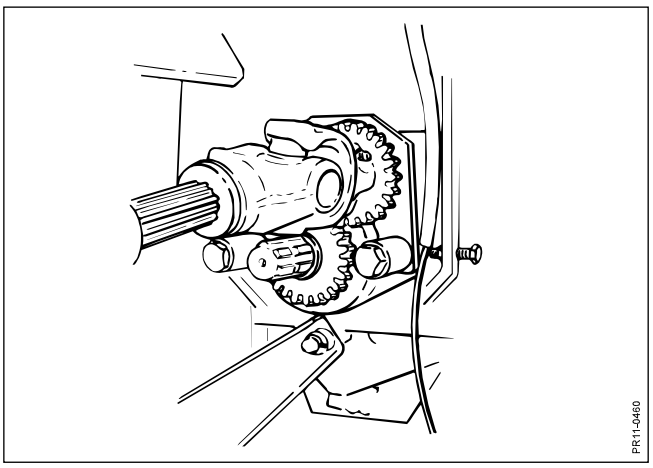


Fig. 4-28

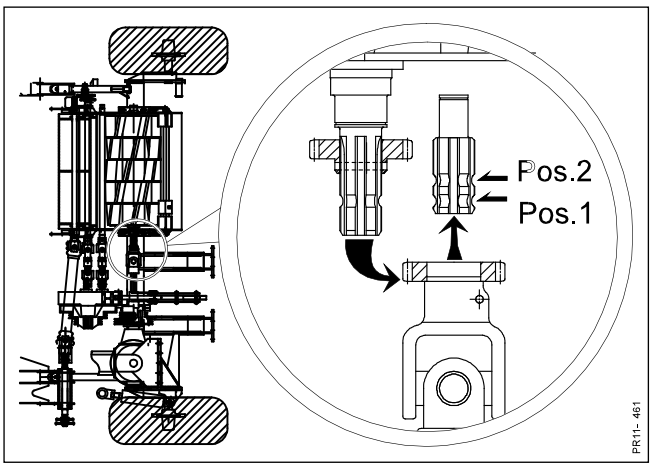


Fig. 4-29

Fig. 4-28 4. Mount the PTO drive shaft for the rotor on the free pin on the rotor housing.
Fig. 4-29 The PTO drive shaft must be fixed at pos. 2 whereby the gear wheels are engaged and the rotor will rotate in the opposite direction.

5. Close all guards.

6. Start the tractor and keep the rpm at a little above idle speed.

Fig. 4-27 7. Feed carefully by turning the handle **C** until the stone touches the blades. Move the stone in a sliding movement across the entire rotor and back again. Feed some more and repeat the movement across the whole width of the rotor so the blades in the whole width of the rotor are sharpened.

8. Push the handle in after grinding. Stop the tractor and when the rotor has come to a complete stop, the guard between the device and the rotor must be lifted back into its right position. The PTO drive shaft for the rotor must be moved back to the pin for normal direction of rotation of the rotor.

WARNING: REMEMBER, only grind with CLOSED guards.

For safety's sake check the distance between blades and shear-bars again with the gauge.
Check wear of the grindstone regularly. If the stone has been worn down to a thickness of 10 mm it must be replaced.

ROUGH GRINDING

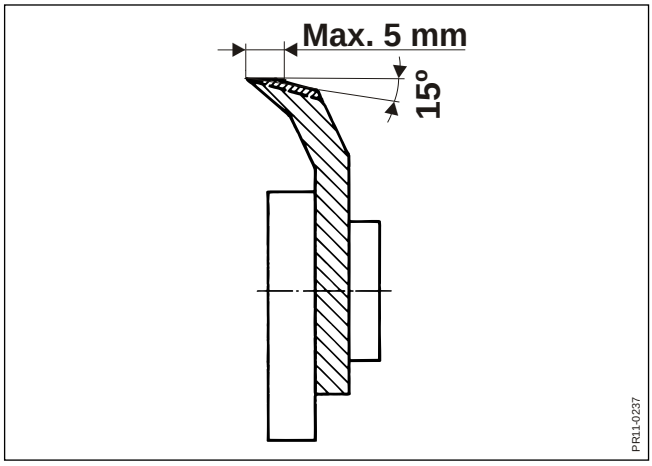


Fig. 4-30

Fig. 4-30 To avoid unnecessary power consumption and excessive wear of the grindstone when working with the harvester, it is necessary to make a rough grinding or adjustment of the blades when the cutting edge is 5 mm wide or more. Grind the rear edge to an angle of approx. 15°.

Rough grinding can be made by means of an angle grinder with the rotor and blades positioned in the machine.

CAUTION: **<u>Be careful</u> not to grind down the cutting edge (front edge) of the blades.**
Block the rotor with a firm object (a piece of wood or the like) during rough grinding to make sure that the rotor does not move during this operation.

REVERSE

The reverse function **can** be used at full rpm (1000 rpm on the PTO), but **we recommend you to reduce the rpm** to relieve the machine as much as possible and reduce the wear of the rubber disc.

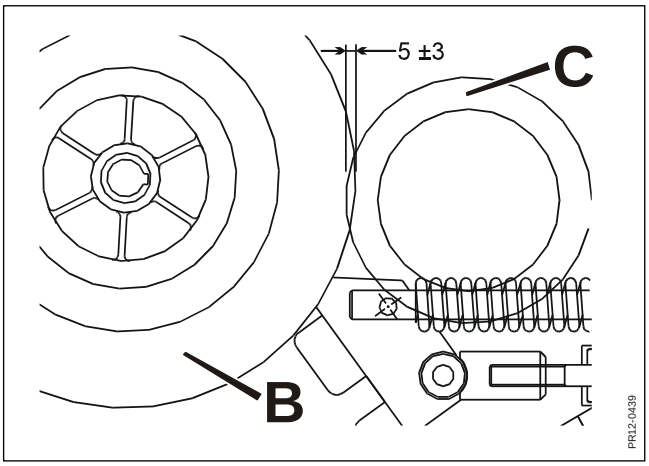


Fig. 4-31

Fig. 4-31 During reverse, the overlap between the steel friction disc **B** and the rubber disc **C** is 5+/-3mm. It is not necessary to make any adjustment in case of wear because the cylinder always has the constant pressure which is determined by the pressure relief valve.

CAUTION: **Only use the reverse function shortly each time to ensure correct functioning and long life of the rubber disc.**

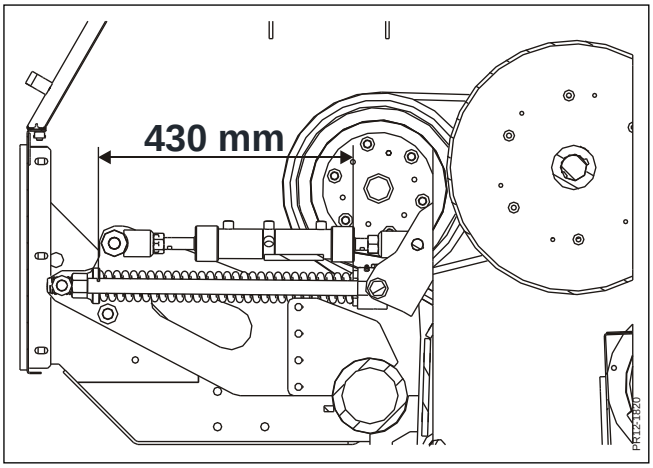


Fig. 4-32

Fig. 4-32 The tightening of the V-belt is determined by the spring which is tightened to the length **"A" =430mm**, when the reverse function is in "feed in".

WARNING: **The tightening of the spring should NOT be increased, in relation to the indicated lengths, as this may overload the transmission. The V-belt drive works as a belt clutch and slips if the feed intake is overloaded.**
With this clutch function the attentive operator can change into a lower gear when the belts slip and thereby avoid blockage in the feed intake section.

NEUTRAL POSITION

The neutral position is between the reverse function where the rubber disc and the friction disc are in mesh and normal working position where the belt drive is tightened by the spring and drives the feed intake.

In neutral position the belt drive for the feed intake section is slackened and it stands still. **This is not a position which should be considered as standstill of the machine, for instance because the blade rotor still rotates.** Moreover, an empty, smooth-running feed intake can still be driven by the slight friction from the slackened belts.

WARNING: **Do not approach the machine when the feed intake is in neutral position and the rotor is rotating. Neutral position does not guarantee that the feed intake will not start.**

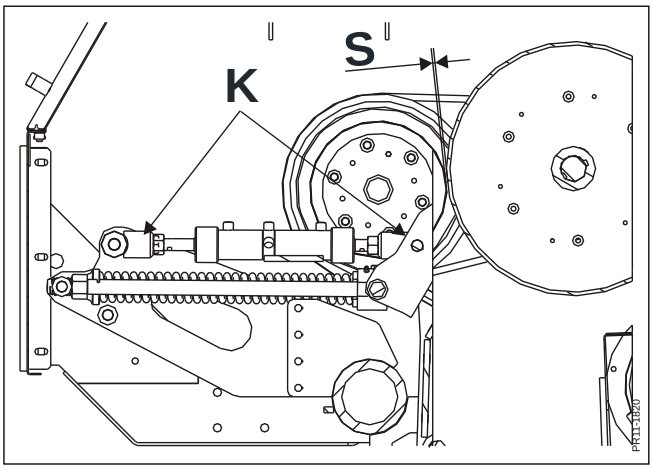


Fig. 4-33

Fig. 4-33 In neutral position, with a new rubber disc, the distance between the rubber disc and the steel friction disc should be approx. **S**= 0-1 mm. Adjustment of the neutral position is made at the end pieces **K** of the cylinder. It is not necessary to adjust in case of wear of the rubber disc.
The cylinder is without pressure when the reverse is in “feed in".

5. METAL DETECTOR (MD)

FCT 1460 is equipped with a metal detector. The purpose of the metal detector is to protect the machine against damage by possible metal in the crop and to ensure that no metal gets in the chopped material as it may cause diseases for the animals which are going to eat it.

The machine is equipped with a system which can detect (register) ferrous metal (metal containing iron) in the feed intake section and immediately stops pick-up, auger and feed intake if metal in the crop enters the front rollers.

MAGNET TUB (METAL SENSOR)

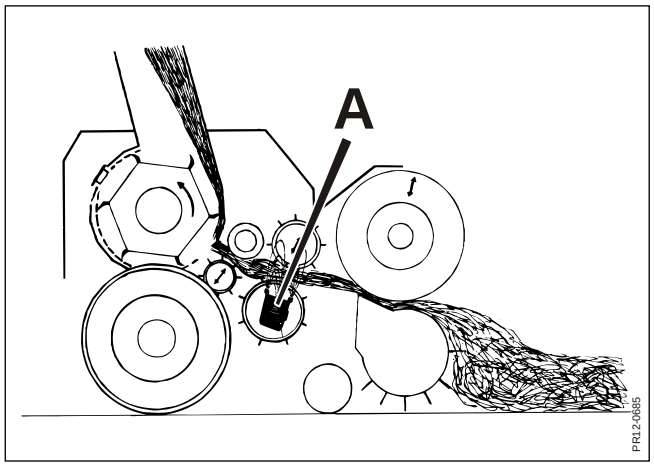


Fig. 5-1

Fig. 5-1 The machine is equipped with a magnet tub **A** (a sensor) which is mounted in the lower front feed roller. The function of the magnet tub is to detect ferrous metal (metal containing iron).

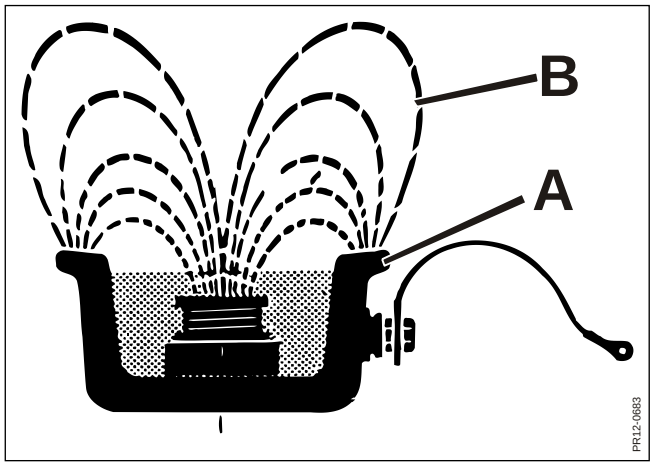


Fig. 5-2

Fig. 5-2 The magnet tub **A** has an upward magnetic field **B**. This magnetic field covers the whole opening between the 2 front rollers.

The accuracy that the detector registers the metal is approx. 95 %. However, there are several factors which influence the accuracy of the sensor: They are:

- The size of the metal object.
- The shape of the metal object.
- The position of the metal in the feed intake section.
- The cutting length and thus the feed intake speed.
- The distance between the pawl and the ratchet wheel in the stop system.

REGISTRATION OF METAL

When a ferrous metal piece passes the magnet tub a voltage is induced which is immediately registered by the microprocessor in the control unit which releases a programmed stop sequence.

STOP OF THE FEED INTAKE SECTION

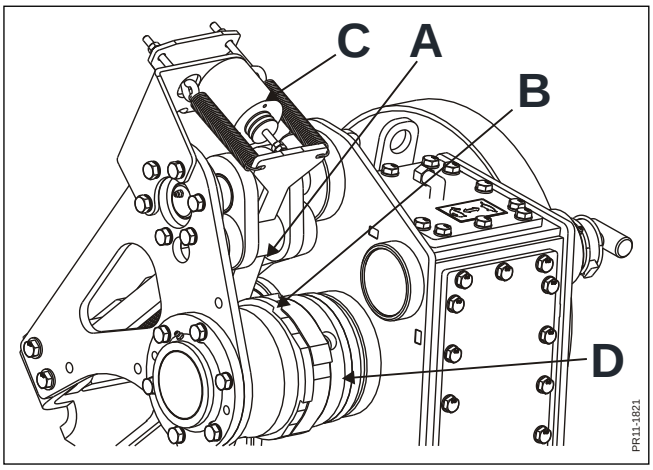


Fig. 5-3

Fig. 5-3 When the metal has been detected, a signal will be sent so that the voltage on the magnet coil **C** is disconnected. Hereby the pawl **A** is activated and is engaged with the ratchet wheel **B** which blocks the feed intake and releases the clutch **D**. At the same time the reverse function goes to neutral position.

Since the feed intake is blocked faster than the reverse function goes to neutral, the clutch **D** is released briefly. It slips until the reverse has disengaged the belt transmission.
The reverse slackens the V-belts and the drive of the feed intake is deactivated.
This means that the feed intake automatically goes into neutral in case of metal detection, even though the switch on the control box is in feed intake position.
Of course, the system can only work if there is constant oil flow to the machine and the control unit is turned on.

This neutral position is necessary at any disengagement as the friction clutch would otherwise be damaged and would have to be replaced.

WARNING: **Do not approach the machine when the feed intake is in neutral position and the rotor is rotating. Neutral position does not guarantee that the feed intake will not start.**

RESETTING OF THE METAL DETECTOR

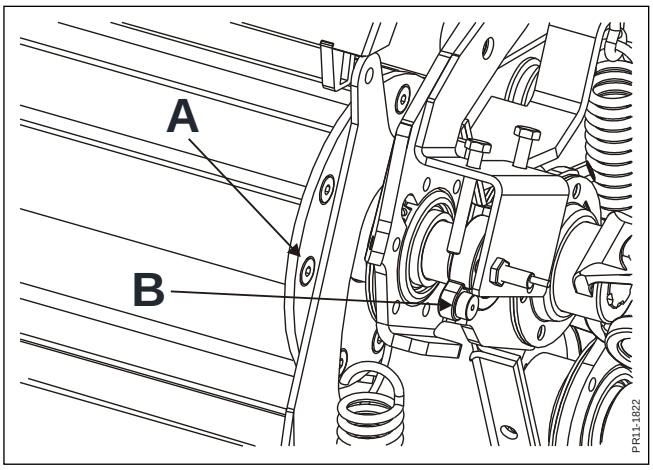


Fig. 5-4

Fig. 5-4 To secure against faulty operation after a metal detection and to ensure that possible metal has been removed before restarting, the electronics does not allow normal feed intake function until the feed intake has reversed.
During reverse the feed roller **A** drives a magnet switch **B** around. Hereby a signal is sent to the microprocessor that you have reversed and the stop system with the pawl will reset.

Note: You must reverse for minimum 2 seconds before the control unit registers and allows feed intake.

CAUTION: When the machine has reversed after a metal detection, stop the tractor and check the area in front of the feed roller for possible metal pieces and remove these.
If nothing is found there is a risk that the metal enters the feed intake again together with the crop when restarting the machine. Pay special attention when restarting the machine after metal detection.

MD-CONTROL

Fig. 5-5

Fig. 5-5 The control unit **A** which is placed under the left rear guard contains the necessary controls for the metal detector. It receives a signal from the magnet tub and in case of detection of ferrous metal it gives a signal to the coil to block the feed intake and to the reverse function to go into neutral position. Furthermore it verifies, by means of the magnet switch, whether the feed intake has reversed. When starting the machine, the metal detector is active, and you need to reverse the feed intake before you can work normally. See chapter 6 "STARTING IN THE FIELD".
The metal detector turns on each time the control unit is switched on.

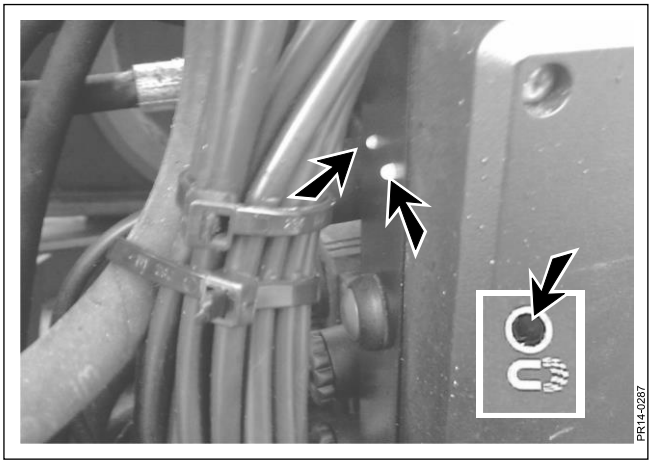


Fig. 5-6

Fig. 5-6 When the control unit is switched on and the metal detector is on, the two control lights on the MD control unit and the light on the control box are on.

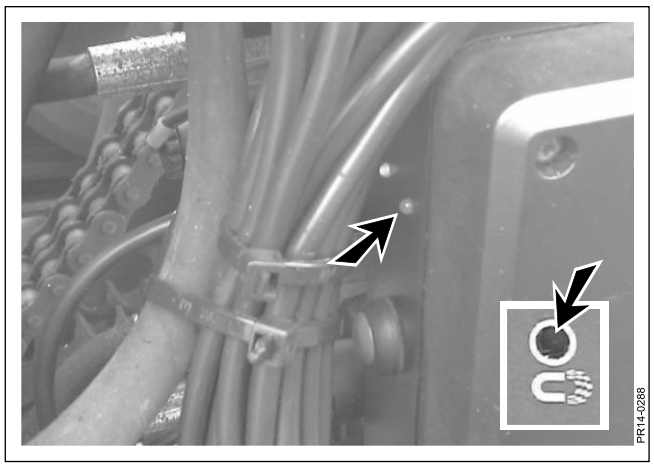


Fig. 5-7

Fig. 5-7 The metal detector is turned on and off by pushing the button on the MD control unit. It is turned **off** by holding the button for about 5 seconds. Thereby the yellow control light on the MD control unit and the light on the control box are turned off. One single push on the button turns on the metal detector again.
Although the metal detector has been turned off, it is always turned on when the machine starts, when the control unit has been turned off on the control box or when the power supply has been interrupted. This ensures that you don't work without metal detector unless you intend to. If you work without metal detector you risk that metal enters the machine, causing damage and contamination of the crop.

WARNING: Do not approach the machine when the feed intake is in neutral position and the rotor is rotating. Neutral position does not guarantee that the feed intake will not start.

The MD control unit controls the reverse system in the following situations:

- When the system is turned on: The reverse moves to neutral position and cannot move to feed intake until the machine has reversed for 2 seconds.

- When metal is registered:
(If turned on) The reverse moves to neutral position and cannot move to feed intake until the machine has reversed for 2 seconds.

ADJUSTMENTS

RATCHET STOP

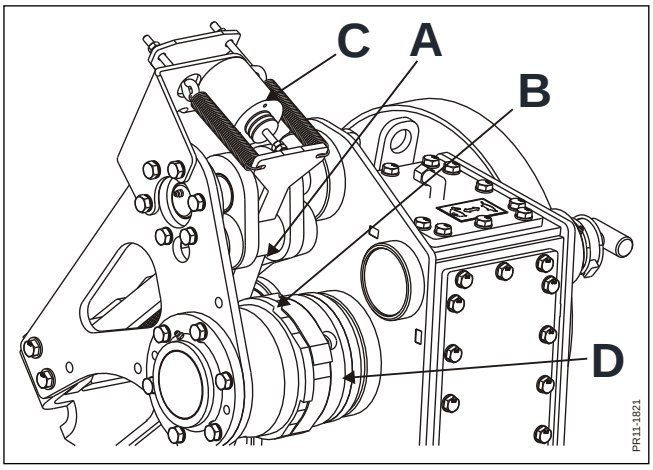


Fig. 5-8

Fig. 5-8 The stop system of the metal detector is integrated in the transmission for the feed intake system. The system consists of a pawl **A** and a ratchet wheel **B** and is activated by a coil **C**. The system is activated when metal is registered in the feed intake section and the coil gets a signal from the electronics which brings the pawl **A** in mesh with the ratchet wheel **B** and the feed intake section is blocked.

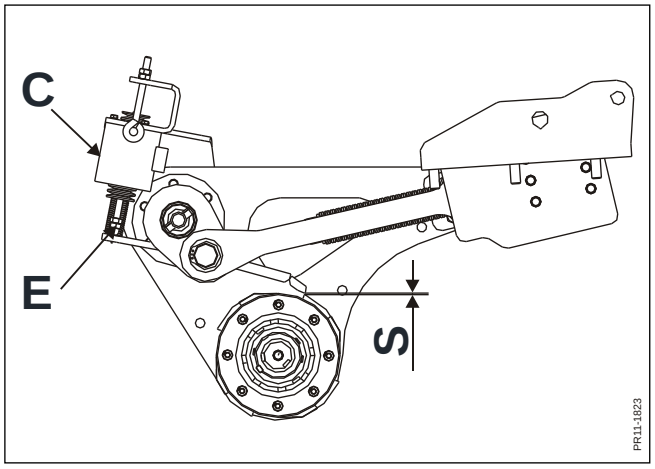


Fig. 5-9

Fig. 5-9

WARNING: **The distance between the pawl and the wheel MUST be S= 1-2 mm as the distance determines the reaction time of the system in case of metal detection.**
Too large distance may mean that a metal object can reach the blade rotor before the feed intake stops and cause serious damage to the harvester.

The distance between pawl and wheel has been adjusted correctly from the factory. If it becomes necessary to readjust, it is done by means of the adjusting screw **E** above the coil **C**.

SPRING ASSEMBLY

A spring assembly in the stop system determines how fast the feed intake will stop in case of metal detection.
The spring assembly should NOT be modified since this would result in risk of metal in the chopping rotor or shocks damaging the transmission.

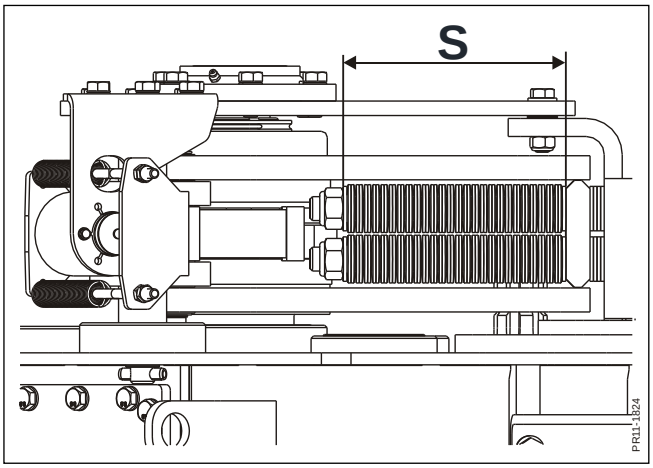


Fig. 5-10

Fig. 5-10 From the factory the spring assembly is set to S= 175mm.

FAULT FINDING FOR MD

In chapter 12 in this book "MISCELLANEOUS" is a table for fault finding on the MD system. The table contains the most known faults, possible cause and remedies.

6. WORKING IN THE FIELD

GENERAL CONDITIONS

Adjust the machine to the maximum cutting length acceptable for the crop in question. This will reduce the stress in the feed intake section and the transmission and increase the possibility of working with the machine continuously without blockages. Be aware that adjustment for short cutting length increases the power consumption and also the wear of blades.
Always work with sharp blades and correctly adjusted shear-bar.

Under difficult conditions we recommend you to bring spare friction discs for the slip clutch on the auger since these are worn each time the clutch is activated. After some time the power which can be transmitted is reduced so much that the capacity of the machine is lowered and the friction discs must be replaced. When replacing discs remember that they must be of the same number and quality so that the required torque can be transmitted and to secure maximum life.

SWATHING BEFORE CHOPPING

If it is possible to influence the swathing made before chopping it is important to emphasise that regular and even swaths are optimal for the subsequent chopping and will spare the tractor driver a lot of trouble.

The machine is equipped with a wide pick-up and if you want to use the capacity of the machine through double swathing, it is desirable to place 2 swaths beside each other within the width of the pick-up instead of raking. Raked swaths are often irregular and the crop tangled which may cause blockages in the auger and/or feed intake section.
Therefore, double swaths are optimal for a regular flow of crop through the machine.

TRANSPORT POSITION

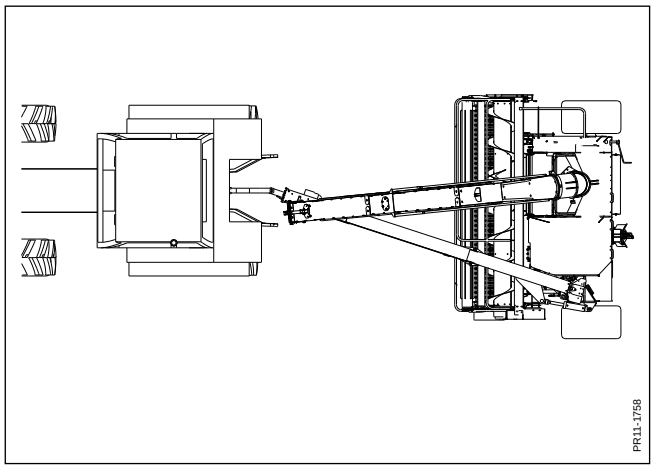


Fig. 6-1

Fig. 6-1 In transport position the machine must be placed straight behind the tractor. The chute must be folded down to rest on the stand on the drawbar.

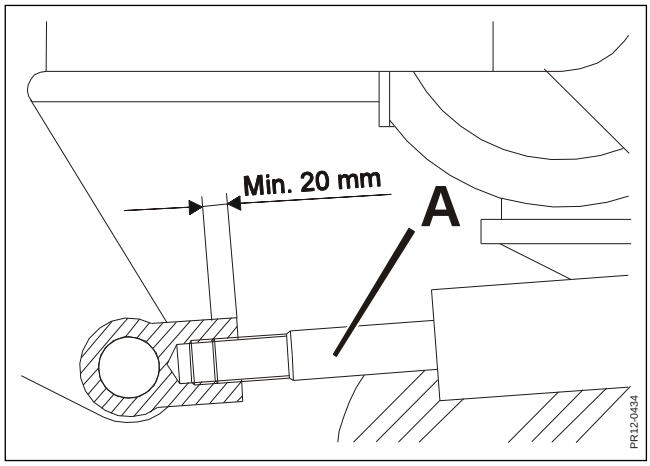


Fig. 6-2

Fig. 6-2 The cylinder **A** for the drawbar can be adjusted in length in order to change the position of the machine behind the tractor.

CAUTION: There must be minimum 20 mm thread in mesh between the piston rod and the threaded piece.

STARTING IN THE FIELD

STARTING

Turn on the control system (the button at the side of the control box) and turn on the oil flow to the machine. Fold up the chute and turn it to the required position.
Now move the machine into working position.

Reset and check the metal detector:

Lights on the control box:

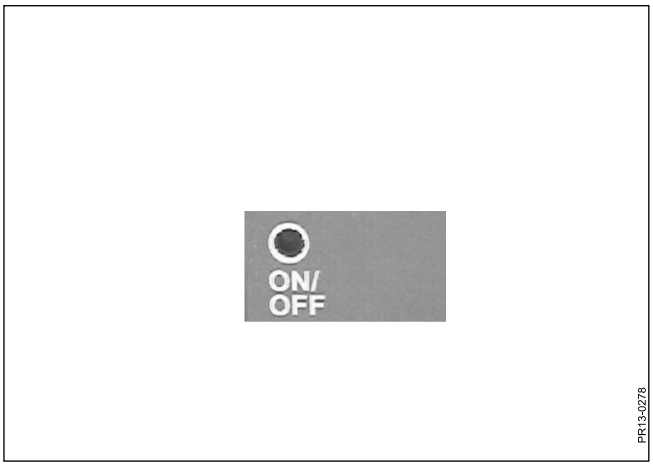


Fig. 6-3

Fig. 6-3 The green light indicates that the control system is on.

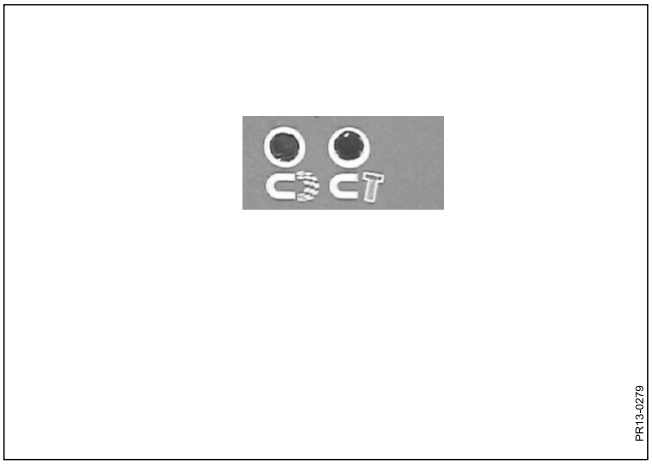


Fig. 6-4

Fig. 6-4 The green, left-hand, light indicates that the machine is working with normal feed intake and that the metal detector is activated.

The red, right-hand, light indicates that the machine is in "metal stop", i.e. the electronics has registered metal and the system has reacted (the pawl blocks the ratchet wheel and the reverse system moves to neutral position).

When the control system is turned on, it is in the “metal stop” state. Therefore the green light **(Fig. 6-3)** and the red, right-hand, light **(Fig. 6-4)** are on, and the reverse system is in neutral position. The control system cannot be set to ”feed intake” until it has registered that you have reversed.
Therefore: Connect the power take-off (only the chopping rotor rotates) and move the feed intake to reverse until the red light turns off after about 2 seconds (the control system has registered that you have reversed).
Set the control system to feed intake. The green, left-hand, light **(Fig. 6-4)** now indicates that the metal detector is activated.

Checking the metal detector:

Disconnect the power take-off again and turn off the engine, but do NOT turn off the control unit. Test the functioning of the detector by moving a large ferrous metal piece across the lower front feed roller.

WARNING: Do not approach the machine when the feed intake is in neutral position and the rotor is rotating. Neutral position does not guarantee that the feed intake will not start. Do not approach the machine until the blade rotor has come to a complete stop.

Fig. 6-4 When the metal detector has registered metal, the reverse system moves to neutral position and the red light on the control box is on again.
The detector has now been checked. Reset the detector as described above.

WORKING

Gradually increase to the correct number of rpm. This is 1000 rpm on the PTO during working, therefore start with approx. 1050-1100 rpm unloaded.
Drive slowly into the crop and increase the forward speed as long as the tractor can keep the required number of revolutions of approx. 1000 rpm.

An inexperienced operator should always work with a capacity reserve in the machine to avoid problems with the flow through the machine.

IMPORTANT: Always make sure the tractor can keep the correct number of revolutions of 1000 rpm on the PTO. This ensures a regular load of the machine and you avoid torque increases (in case of reduced rpm) which wears the safety clutches and the transmission.

To obtain optimal pick-up function it is important that:

- The crop enters the machine regularly and that you, if possible, drive in the opposite direction of the mower conditioner.
- The forward speed is adjusted to the amount of crop and is not so high that blockage is frequent.
- You drive as straight as possible into the crop and are aware of this when turning in the field.

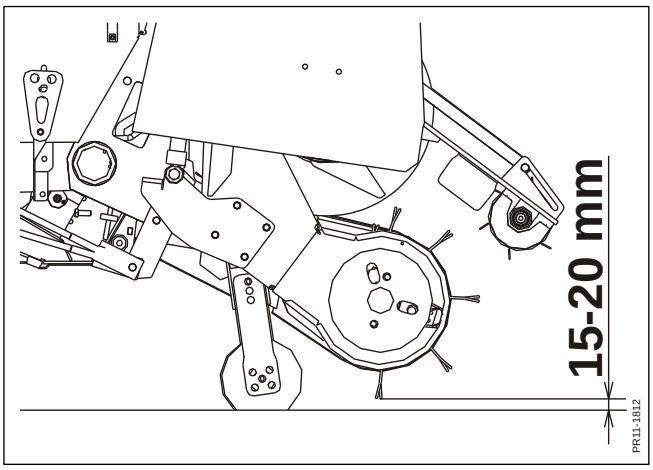


Fig. 6-5

Fig. 6-5 The pick-up is fitted with support rollers of steel which are adjustable in height. From the factory the wheels have been adjusted so that there is 15-20 mm space between the tines and an even and firm ground.
Check regularly that the pick-up tines do not reach further down than necessary to be able to pick up the swath efficiently. If the tines hit the ground too hard they are quickly worn and the drive of the pick-up may be overloaded.

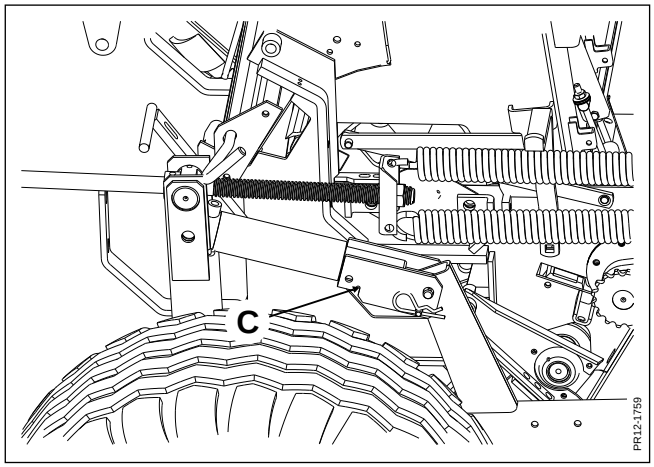


Fig. 6-6

Fig. 6-6 Before making any adjustment, the cylinder stop **C** must be engaged and secured with pin.

Lift the pick-up completely during transport and when turning. When driving through soft areas in the field, the pick-up can be lifted partly to avoid picking up earth etc. The position of the pick-up is locked, both in the lifted and in the partly lifted position. Only when the pick-up is completely lowered, can the support rollers follow the ground. It takes about 2 seconds to lower the pick-up completely with the joystick activated.

BLOCKAGE IN THE MACHINE

Auger and feed intake section:
In case of blockage in the auger or feed intake section, immediately move the feed intake to neutral position and reduce the number of revolutions.
Hereby the auger and the feed intake stop immediately, and you can obtain an overview of the situation.

DANGER: Do not approach the machine when the feed intake is in neutral position and the rotor is rotating. Neutral position does NOT guarantee that the feed intake will not start.

Now move the reverse system to reverse position at a low number of rpm (the push-button on the control box). Hereby the auger is lifted and the feed intake runs “backwards” whereby the material in the machine is reversed out. We recommend reversing slowly with the machine while the material is pushed out. This creates room for the grass which is reversed out and leaves it as a regular “swath”.
After reversing, increase to normal number of rpm. Set the auger and feed intake section to normal feed in (toggle switch on the control box). It is important to have a normal number of rpm, otherwise the chute or the rotor might be clogged up.

The rotor

In case of blockage in the rotor, immediately change to neutral position and turn off the power transmission. Hereby the auger and the feed intake stop immediately, and you can obtain an overview of the situation.

To enable the feed rollers to pull the material out of the rotor, it must be disconnected during reverse. The procedure is as follows:

1) Go to the machine when the power take-off has been disconnected and the engine has stopped.

DANGER: **Do not approach the machine until the rotating parts have come to a complete stop and be aware that neutral position does not guarantee that the feed intake will not start.**

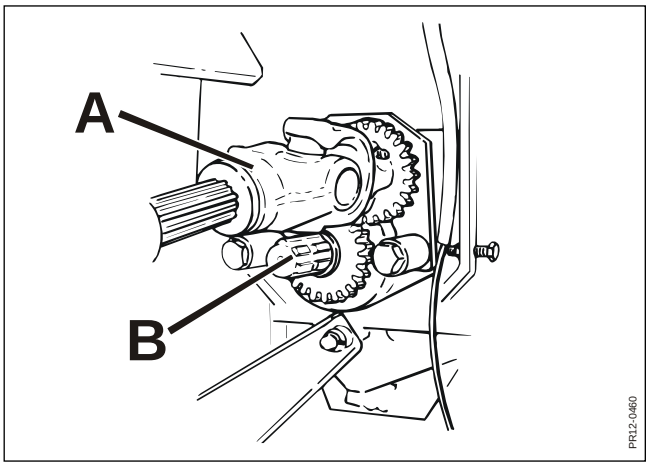


Fig. 6-7

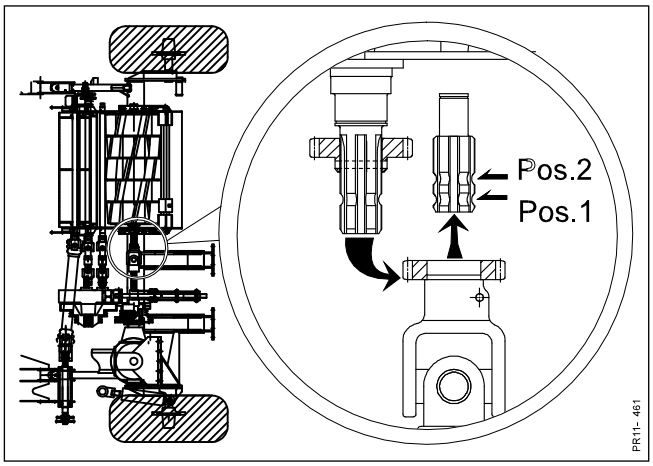


Fig. 6-8

Fig. 6-7 2) Move the PTO shaft **A** for the rotor to the alternative pin in **pos. 1**, where the
Fig. 6-8 gear wheels are not in mesh. Thereby the rotor is not driven.

WARNING: **It is important that the PTO shaft is NOT moved to pos. 2, where the rotor rotates in the opposite direction. This position is only used for grinding.**

3) Connect the power take-off again at low number of rpm, move the reverse function to reverse position and reverse the material out of the machine.

Fig. 6-7 4) After reversing disconnect the power take-off again, and when the rotor has come to a complete stop, move the PTO shaft **A** for the rotor back to the pin **B** for driving the rotor.

5) With the reverse function in neutral **it is now normally possible** to ”blow” the chopped grass, which is in the rotor housing, out of the chute, unless this is also blocked. In order to ”blow the rotor housing empty” it is necessary to increase the number of revolutions to maximum.

6) Move the reverse function back to normal feed intake, and the work can be resumed.

AFTER WORK

When you have finished working with the machine, always place the reverse system in neutral position. Hereby the belts on the V-belt drive are slackened.

VARIOUS

If you use ensiling agents, the safety instructions of these must be observed.
It is very important to protect the eyes.

WORKING POSITIONS

The position of the drawbar is adjusted continuously with the hydraulic cylinder. To avoid an obstacle etc. in the field you can easily adjust the position of the drawbar during working since the drawbar is above the pick-up.

With the wide pick-up on the machine it is possible to work with the chopper in several positions in relation to the tractor:

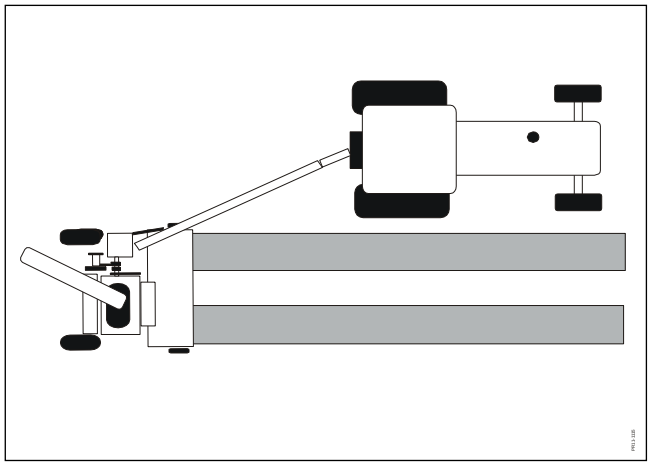


Fig. 6-9

Fig. 6-9 1) The chopper picks up grass beside the tractor, working offset. The machine can pick up wide single swaths and double swaths, which are very suitable for the chopper. A good driving technique is to load into a trailer on the offside of the forage harvester.

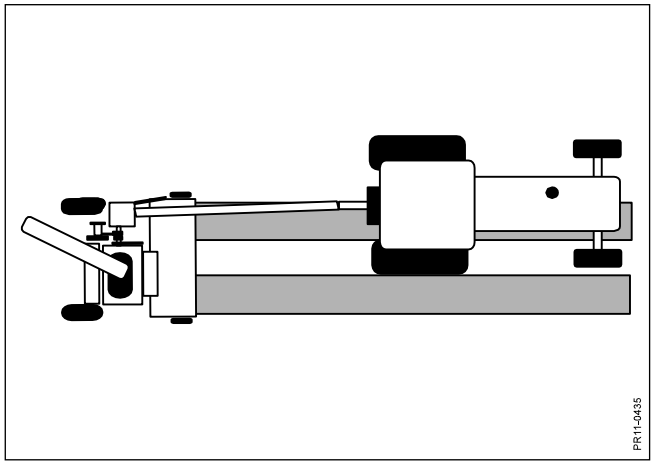


Fig. 6-10

Fig. 6-10 2) The chopper now works semi-offset as the tractor drives with one set of wheels between the swaths. This technique results in a straight drive line and is suitable for unloading to both sides. The parallel driving tractor can get closer to the chopper and it is easier to control the loading of the trailer.

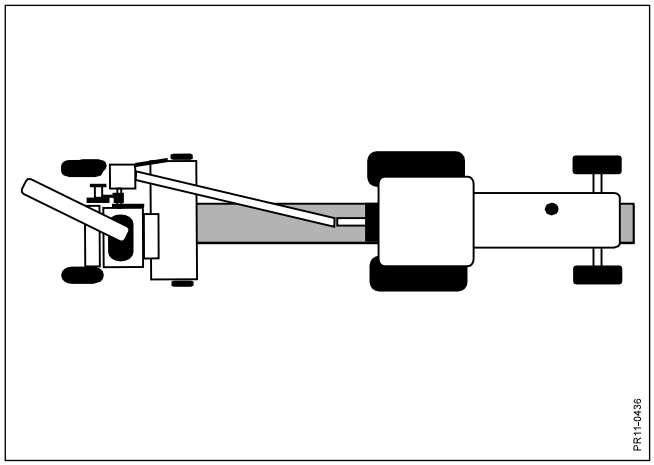


Fig. 6-11

Fig. 6-11 3) Here the chopper works in-line as the tractor drives over the swath. This technique is of course very suitable for picking up single swaths as you avoid driving on the crop. The technique is still suitable for side loading to both sides and brings the tractors close to each other.

CAUTION: **The PTO shaft should work with a deviation of maximum 20°. For sharp turns to the right it is therefore recommended that the drawbar is moved to transport position or a position corresponding to working in-line (see Fig. 6-11.)**

7. MAINTENANCE

IN GENERAL

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 1-20 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 blades on the rotor must be retightened carefully.

Torque measurement $\mathbf{M_A}$ for bolts on the machine (if nothing else stated in this instruction manual).

A Ø	Class: **8.8** $\mathbf{M}_A$ [Nm]	Class: **10.9** M_A [Nm]	Class:12.9 $\mathbf{M}_A$ [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 24	640	900	1100
M 24x1,5	690	960	1175
M 30	1300	1800	2300

GUARDS

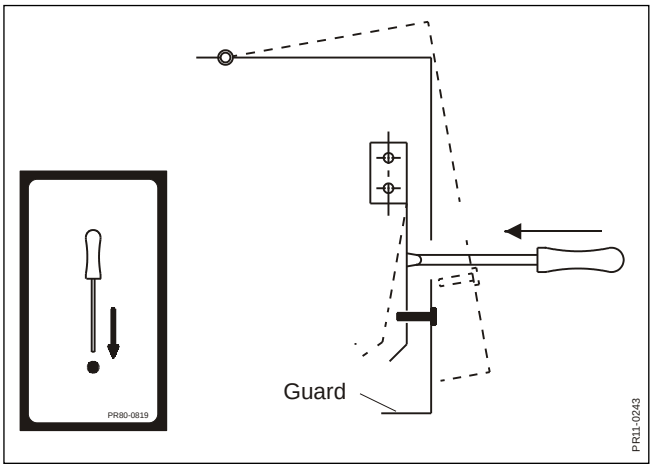


Fig. 7-1

Fig. 7-1 When maintaining the machine you often need to open or remove guards. For safety reasons all guards have been equipped with a lock. The lock ensures that the guard cannot be opened without tools. There are two different types of lock. The figure shows the locking principle and the corresponding transfer which indicates and illustrates the locks on the machine.

REPLACEMENT OF BLADES

See description for replacement of blades in the rotor and the subsequent adjustment in the section REPLACEMENT AND ADJUSTMENT OF BLADES in chapter 4 "ADJUSTMENTS".

TYRE PRESSURE

FCT 1460 is as standard equipped with wide low profile tyres which provide a good carrying capacity and thus a low ground pressure.
The below table indicates the recommended tyre pressure. The machine is delivered from the factory with these pressures.

FCT 1460	Tyre dimension	Tyre pressure [bar]
Wheels on machine	500/50-17	2.2
Rubber wheels for pick-up (option)	3.50-6/ 4	3.0

A reduced tyre pressure for the machine can be used in extreme cases when driving in areas where extra large carrying capacity is required (meadows, sandy areas or the like)

CAUTION: Check the tyre pressure regularly and make sure that the wheel-fixing bolts are tightened correctly.

FRICTION CLUTCH

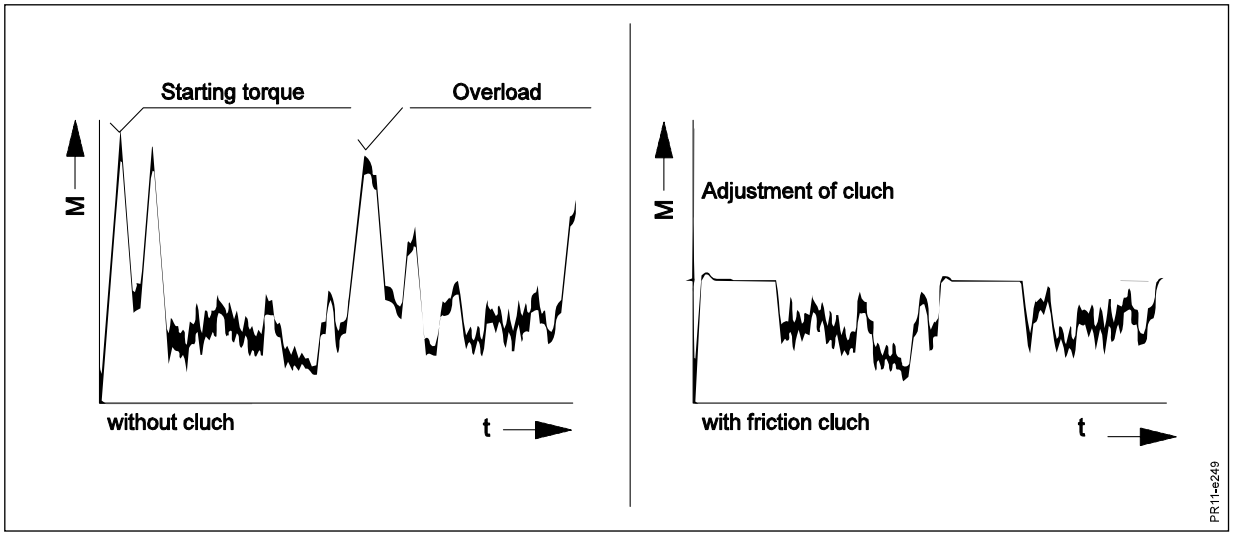


Fig. 7-2

Fig. 7-2 In order to ensure a long life for your tractor and machine, the machine is delivered with a **friction clutch** on the front PTO drive shaft. The figure illustrates how the clutch protects the transmission against high torque peaks and at the same time is capable of transmitting the torque while it is briefly in function (slips).

In order to ensure that the clutch works as intended it must be “aired” at regular intervals **as dirt and moisture may cause the clutch to get** “**stuck”.**

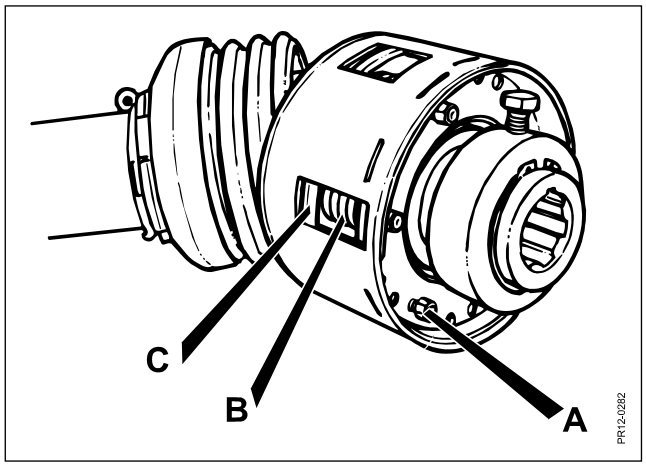


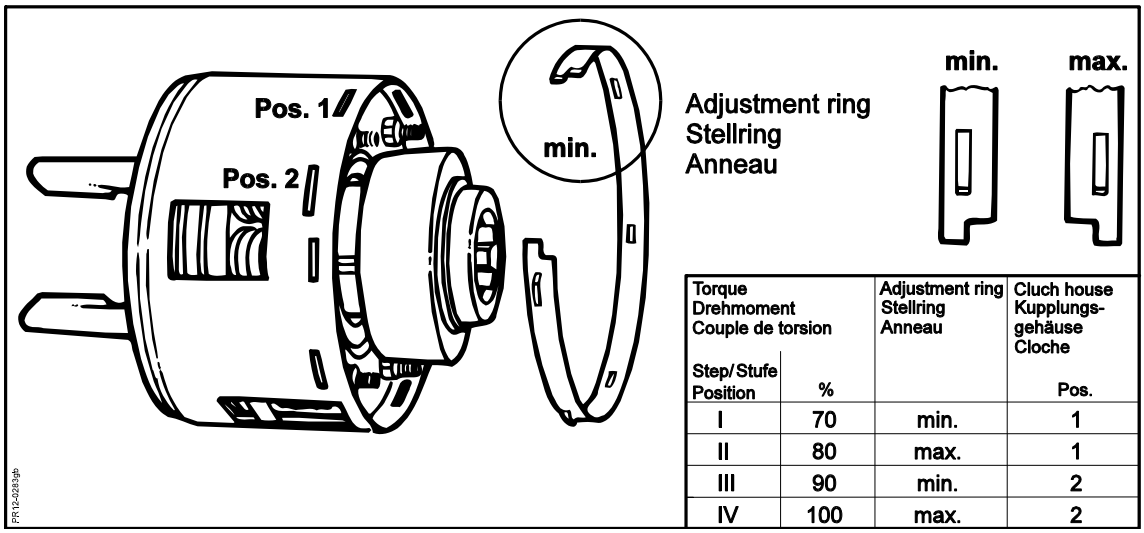
Fig. 7-3

Fig. 7-3 Before the start of a new machine and after a long period of standstill, e.g. winter storage, **the clutch is "aired" in the following way:**

1) The six nuts **A** on the flange are tightened. Hereby the springs **B** are compressed so that they do not press on the clutch plates **C** and the clutch can rotate freely.

2) **Let the clutch rotate for 30 seconds**. This removes dirt and possible rust on the plates.

3) **The nuts A are loosened again** until they are at level with the threads of the bolts, and the springs **B** can press on the clutch plates **C**.



Torque Drehmoment Couple de torsion		Adjustment ring Stellring Anneau	Cluch house Kupplungs-gehäuse Cloche
Step/ Stufe Position	%		Pos.
I	70	min.	1
II	80	max.	1
III	90	min.	2
IV	100	max.	2

Fig. 7-4

Fig. 7-4 The torque in the friction clutch is adjustable. However, you should not change the factory-set adjustment until you have contacted the dealer or the factory's Service Department.
The friction clutch has 4 different torque adjustments. The adjustment can be changed by turning the adjustment ring **D** and by choosing between 2 different positions in the clutch housing.

1. The adjustment ring has a **minimum** and a **maximum** position.

2. The clutch housing has two different sets of slots **E** in the height into which the adjustment ring **D** can be mounted, **pos. 1** and **pos. 2**.

TORQUE ADJUSTMENT GUIDE

PTO	Torque	Adjustment
1000	2700 Nm	Step I
1000	**3000 Nm**	**Step II**
1000	3300 Nm	Step III
1000	3600 Nm	Step lV

From the factory the clutch is delivered with adjustment II, corresponding to 3000 Nm and should not be adjusted higher!

Adjustment of the torque can **only** be made when the nuts **A** (on Fig. 7-3) are tightened. After the adjustment the nuts are loosened again to the end of the bolt.

WARNING: **If the clutch is overloaded by slipping for some time, it will get heated and thus be worn quickly.**
Overheating will damage the friction plates. If the clutch is blocked or partly put out of function in other ways, the factory guarantee will be discontinued.

FUSES

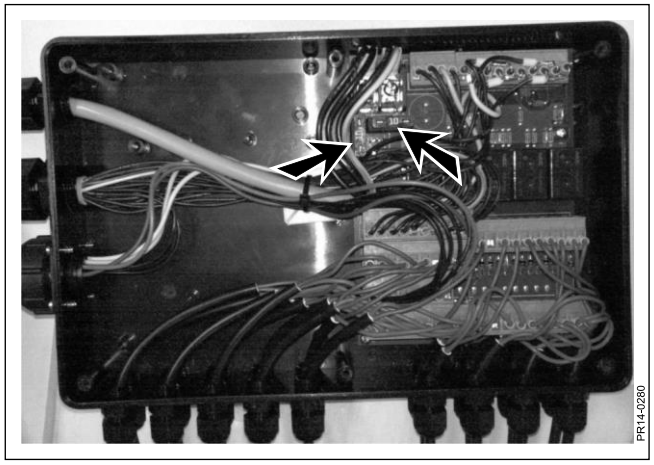


Fig. 7-5

Fig. 7-5 There are two 10A fuses in the control system on the machine. Only replace the fuses by fuses with the same power value. Servicing, except replacement of fuses, must always be performed by an authorised JF dealer / service technician.

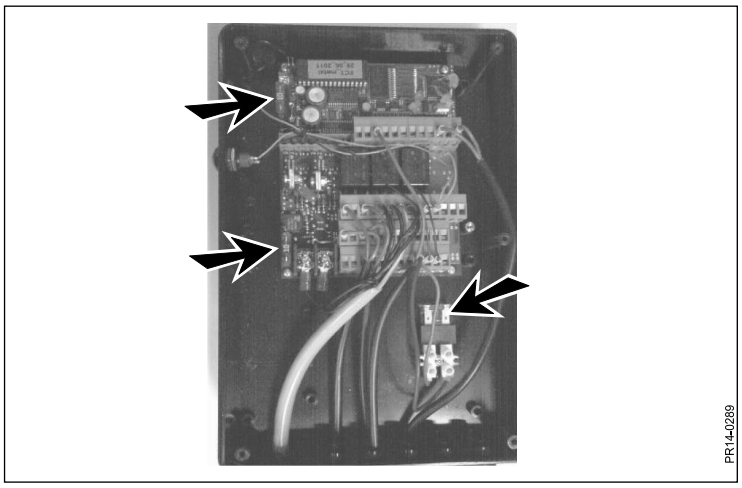


Fig. 7-6

Fig. 7-6 There are two 10A fuses and one 5A fuse in the MD control unit. Only replace the fuses by fuses with the same power value. Servicing, except replacement of fuses, must always be performed by an authorised JF dealer / service technician.

WARNING: Never mount fuses with a higher power value. The control system may be damaged. If fuses blow there is an error in the electric system.

VARIOUS

ROLLERS

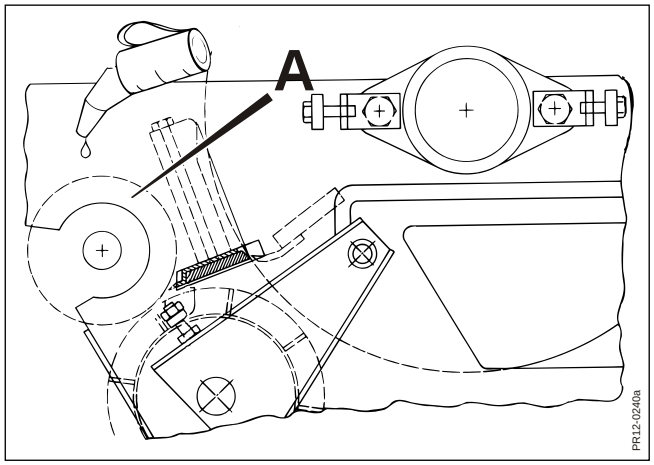


Fig. 7-7

Fig. 7-7 The upper rear feed roller, the smooth roller **A**, should be secured against formation of rust on the surface. If the machine is not in use in a period of more than one day, the whole surface should be lubricated with a thin coat of oil.

CHAIN TIGHTENER FOR PICK-UP AUGER

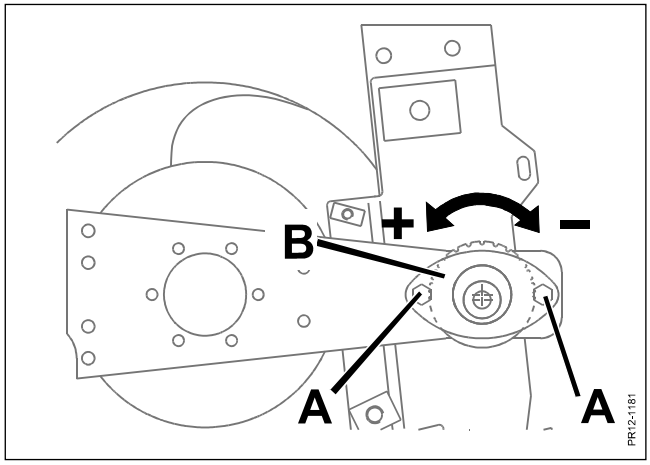
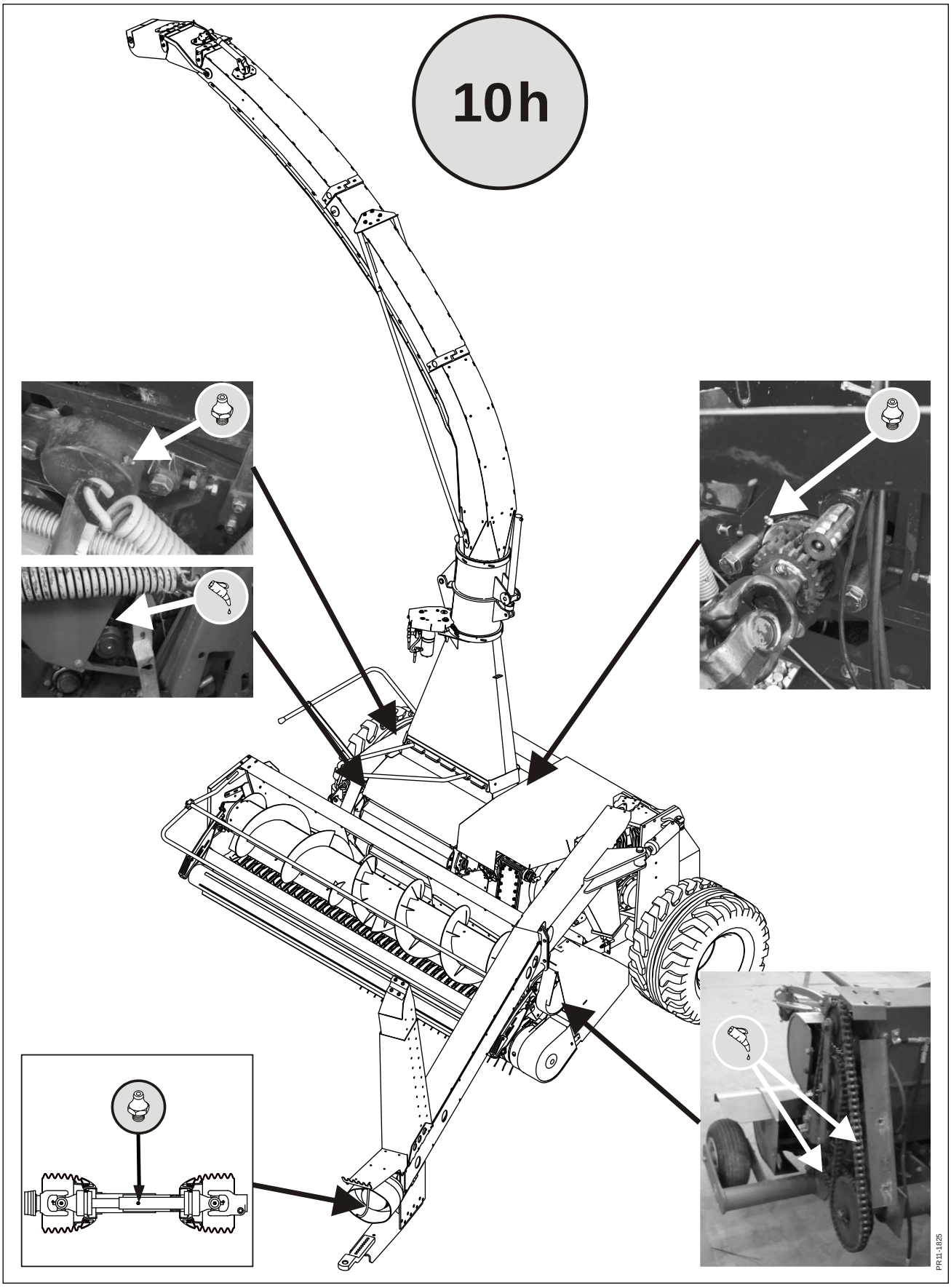


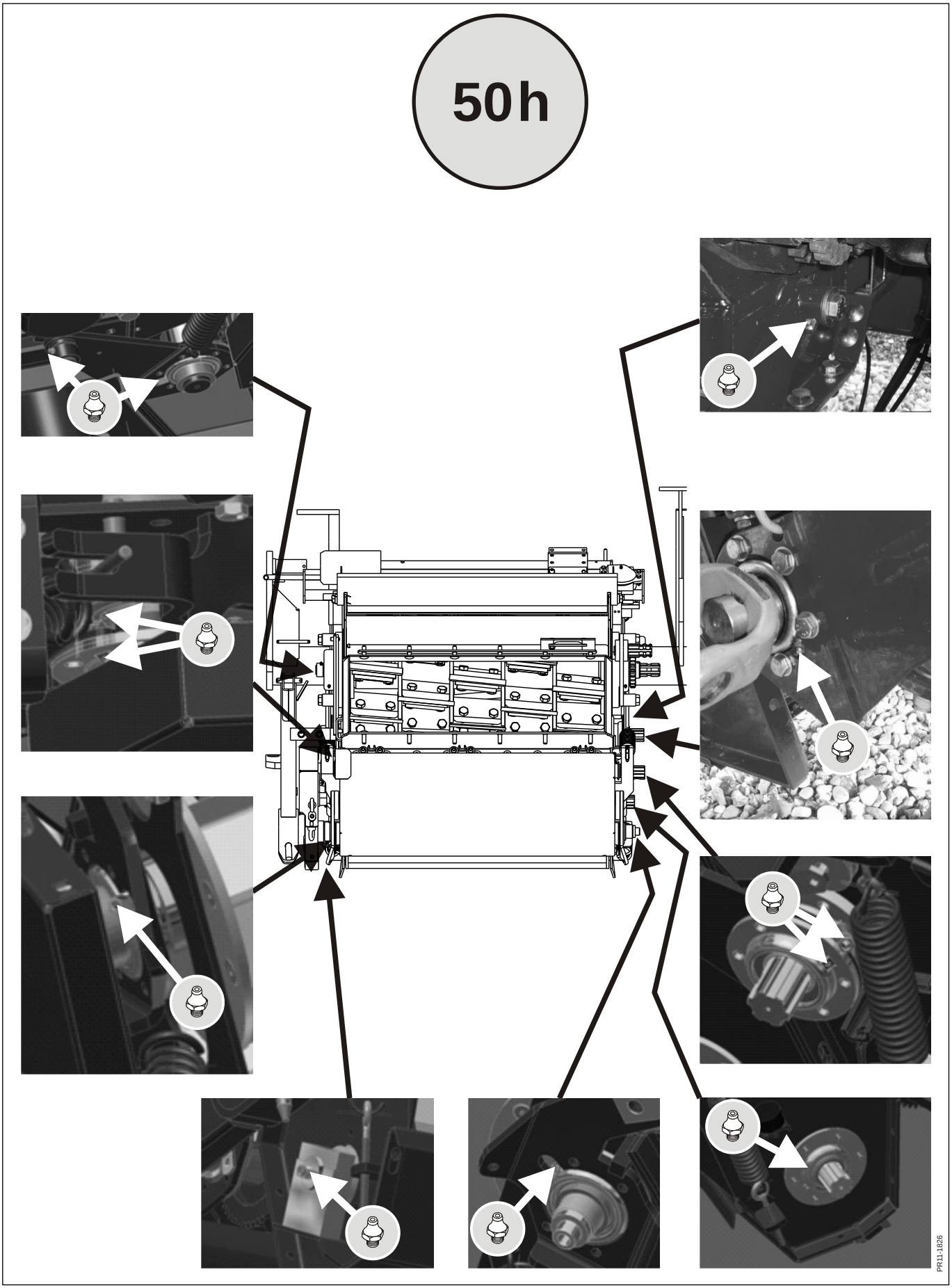
Fig. 7-8

Fig. 7-8 Two bolts **A** are loosened after which the eccentric **B** can be turned with a screwdriver or the like. It is turned in **+** direction for tightening and in **–** direction for loosening.

CAUTION: **It should always be possible to move the chain at least 20 mm up and down in the middle to make sure that it is not too tight.**

8. GREASING

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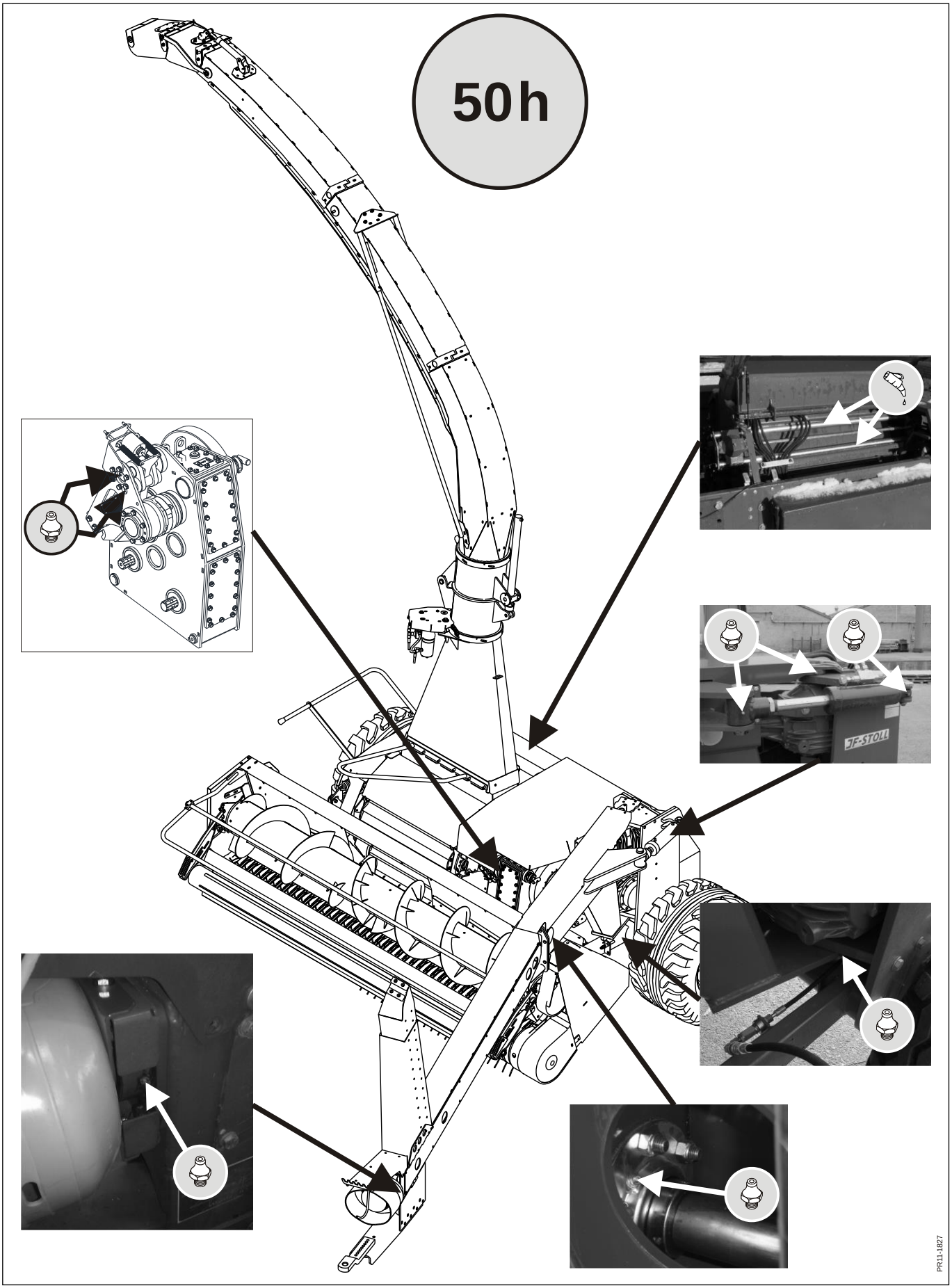
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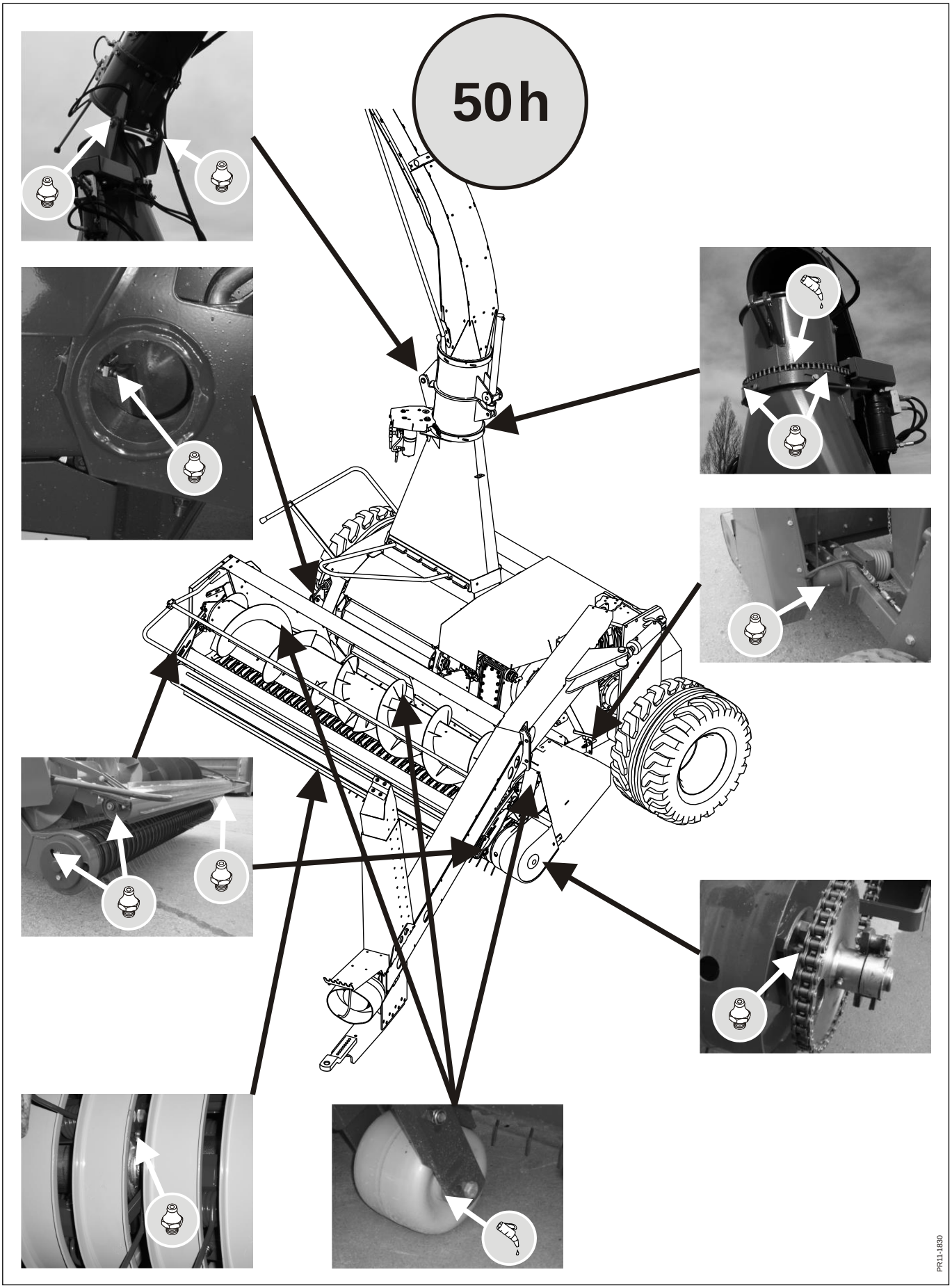
JF-STOLL
PR11-1827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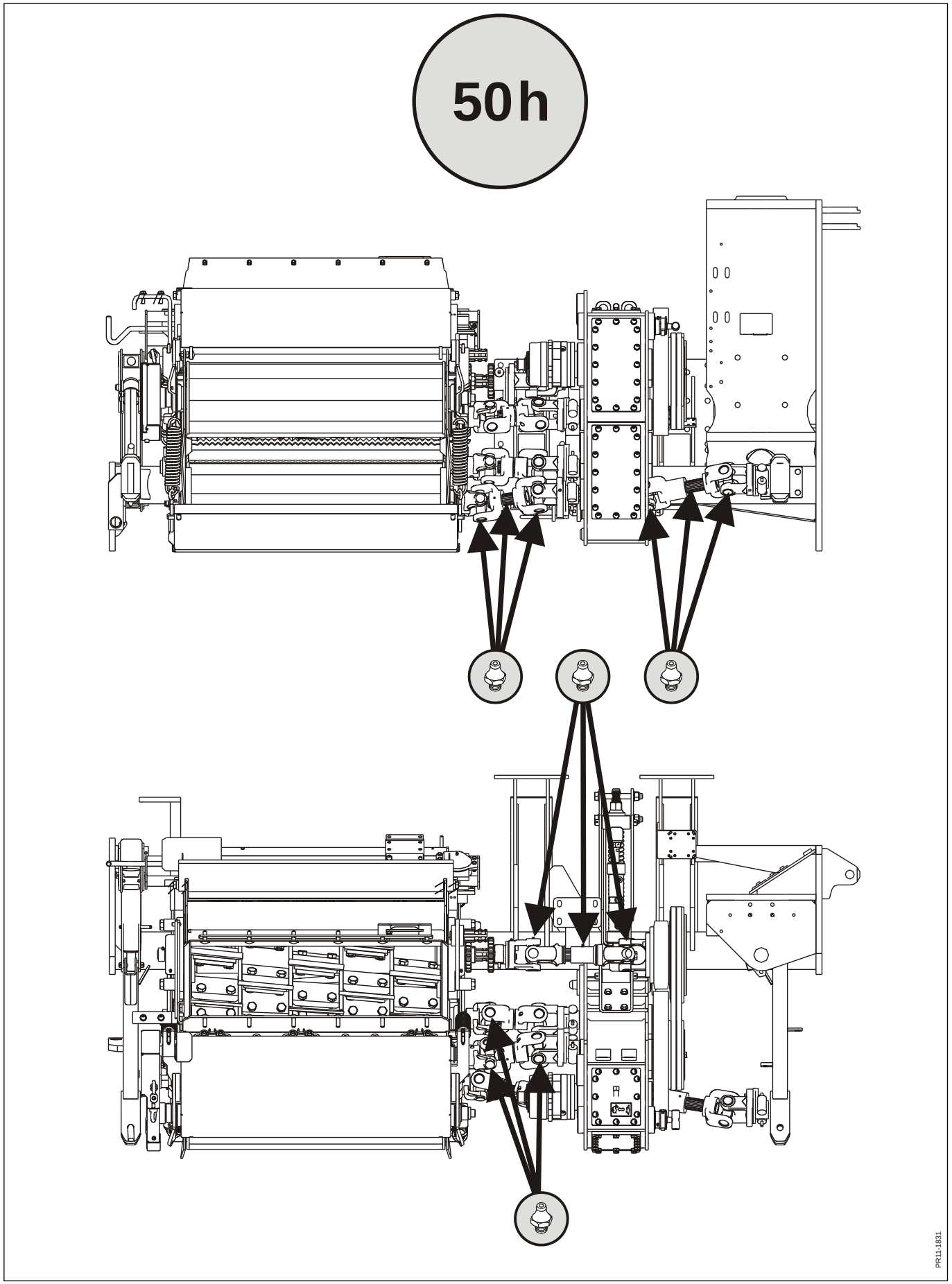
PR11-1830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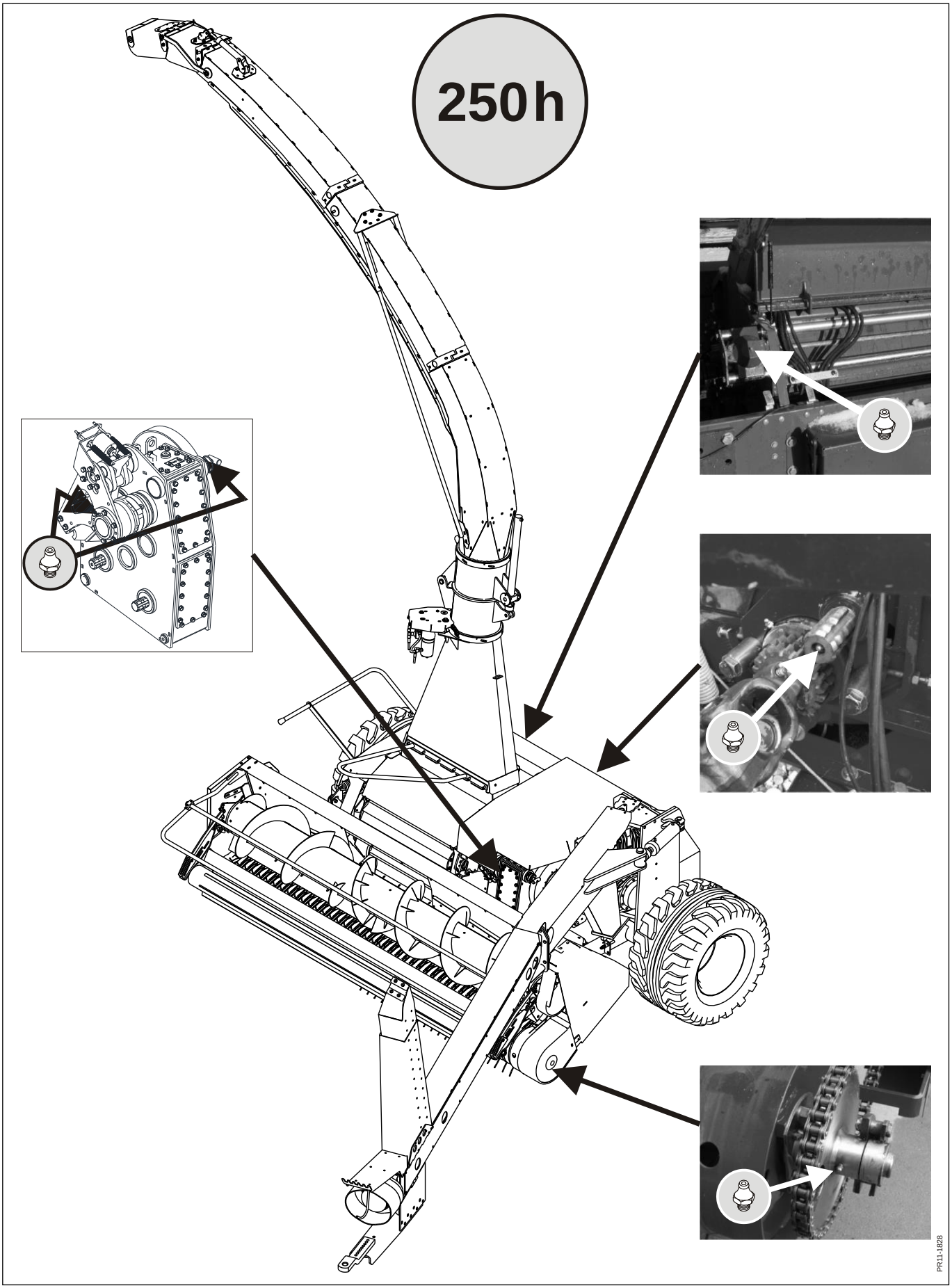
PR11-1831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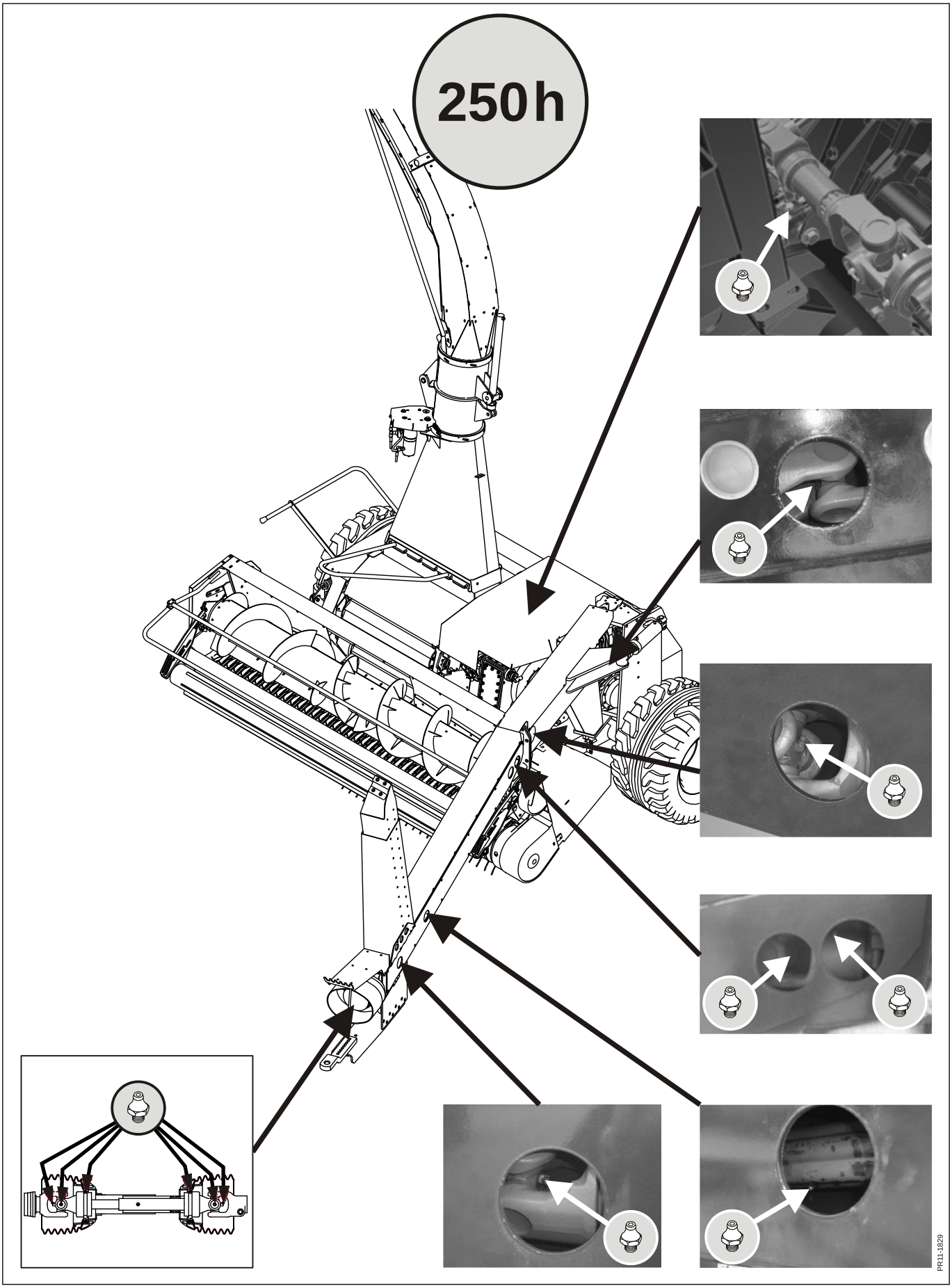
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OIL IN GEARBOXES

Swivel gearbox

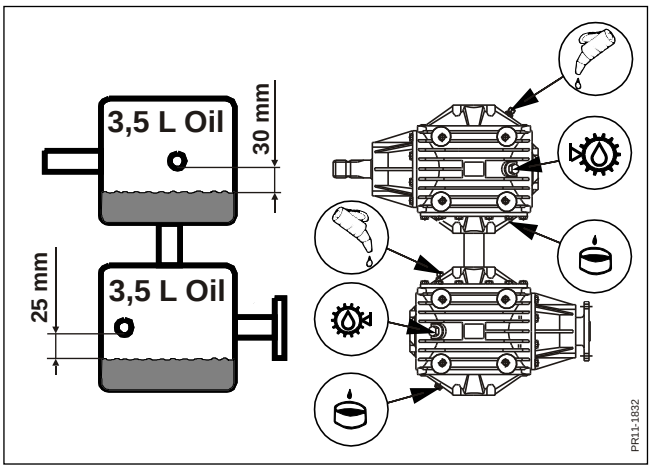


Fig. 8-1

Fig. 8-1

	Oil content	Quality
Swivel gearbox, upper part	3.5 l	85W-140
Swivel gearbox, lower part	3.5 l	85W140

IMPORTANT: The oil level must in the upper and lower part be 30 and 25 mm lower than the check plugs at the side of the swivel gearbox, as shown on the figure.

- **Oil change:** After the first 10 working hours and then annually.

Harvest gear

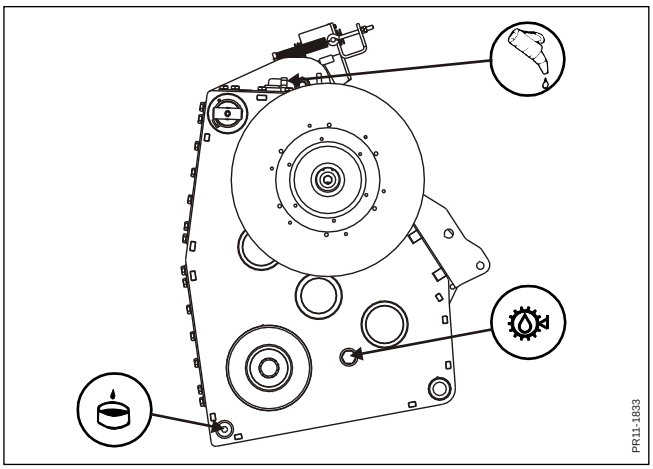


Fig. 8-2

Fig. 8-2

	Oil content	Quality
Harvest gear	10-11 l	80W-90

The oil level is checked through an inspection glass. The correct position of the gearbox during inspection and filling of oil is neutral position.

- **Oil change:** After the first 10 working hours and then annually.

9. STORAGE (WINTER STORAGE)

When the season is over, the preparation for winter storage should be made immediately after. First, clean the machine thoroughly. Dust and dirt absorb moisture and moisture increases the formation of rust.

CAUTION: **Be careful when cleaning with a high pressure cleaner. <u>Never</u> spray directly on the bearings and grease all grease points carefully after cleaning so that possible water is pressed out of the bearings.**

IMPORTANT: **Grease all grease points after cleaning the machine.**

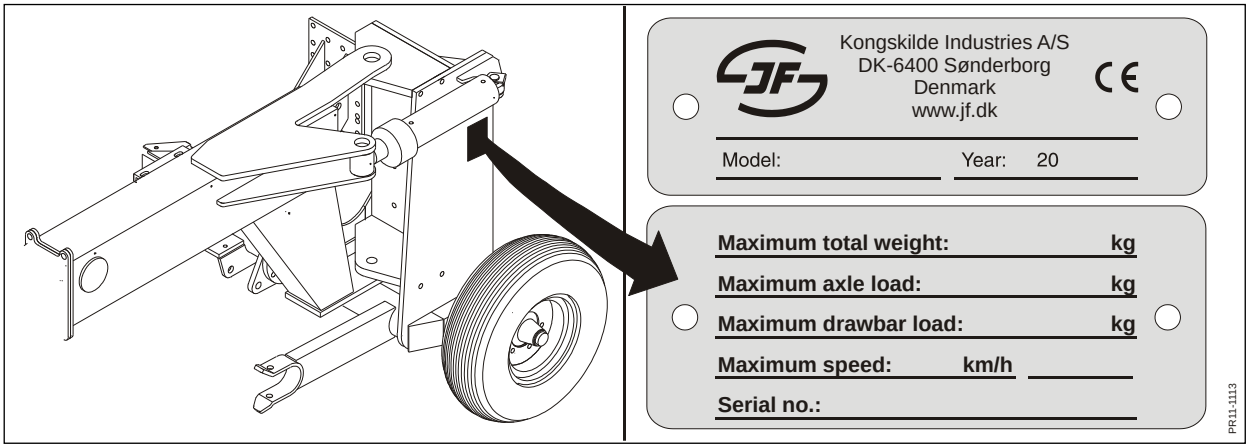
The following points are instructions how to prepare for winter storage.

- Check the machine for wear and other defects – note down the necessary parts you will need before the next season and order the spare parts.
- Dismount the PTO drive shafts, lubricate the profile tubes and keep them in a dry place.
- Spray the machine with a thin coat of rust-preventing oil. This is especially important on parts polished.
- Change the oil in the gearboxes.
- Store the machine in a ventilated building.
- Lay up the machine to unload the tyres.

10. SPARE PARTS ORDERING

When ordering spare parts, please state the exact 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.



11. MACHINE DISPOSAL

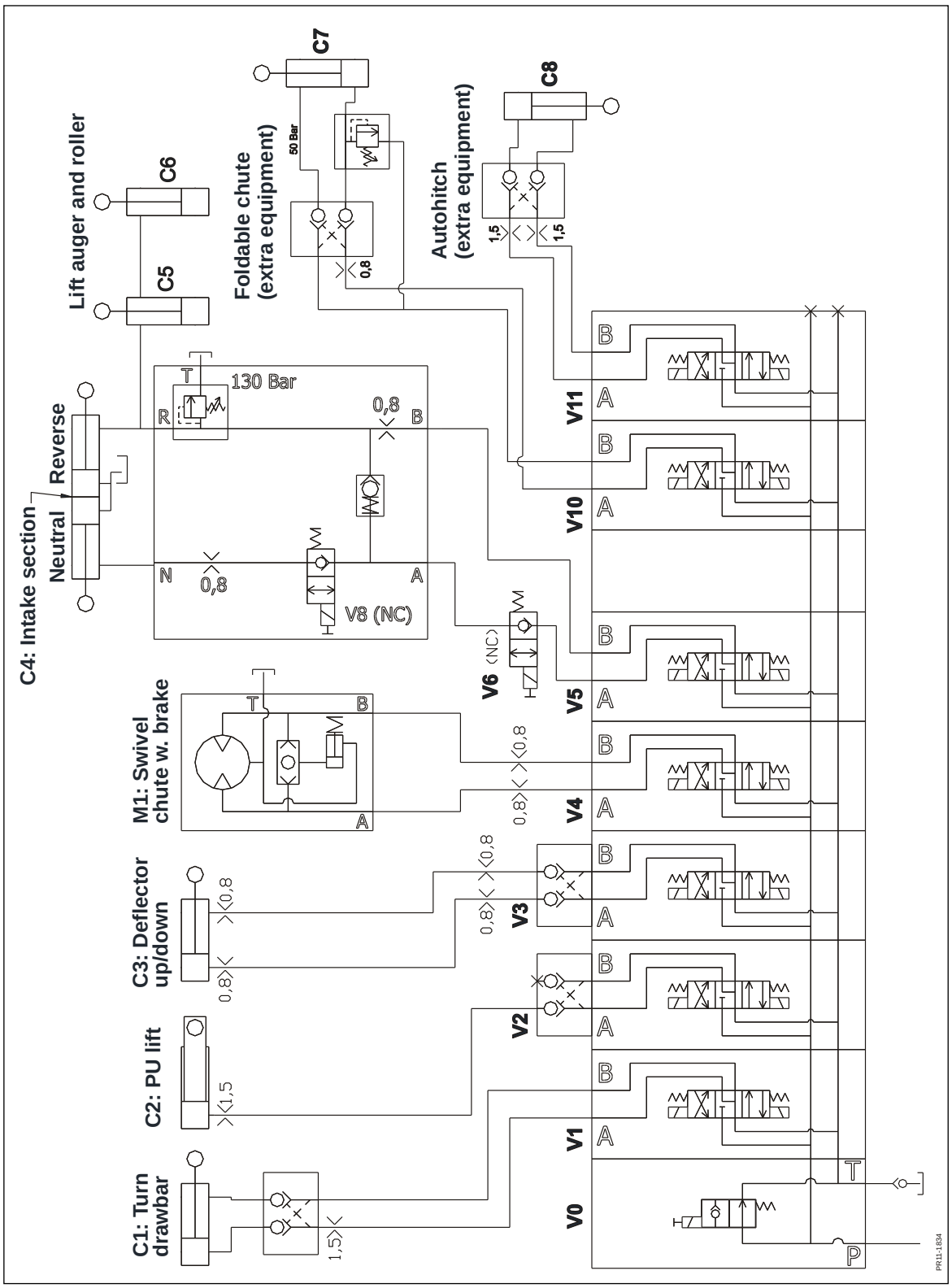
When the machine is worn-out it must be disposed of in a proper way.

Observe the following:

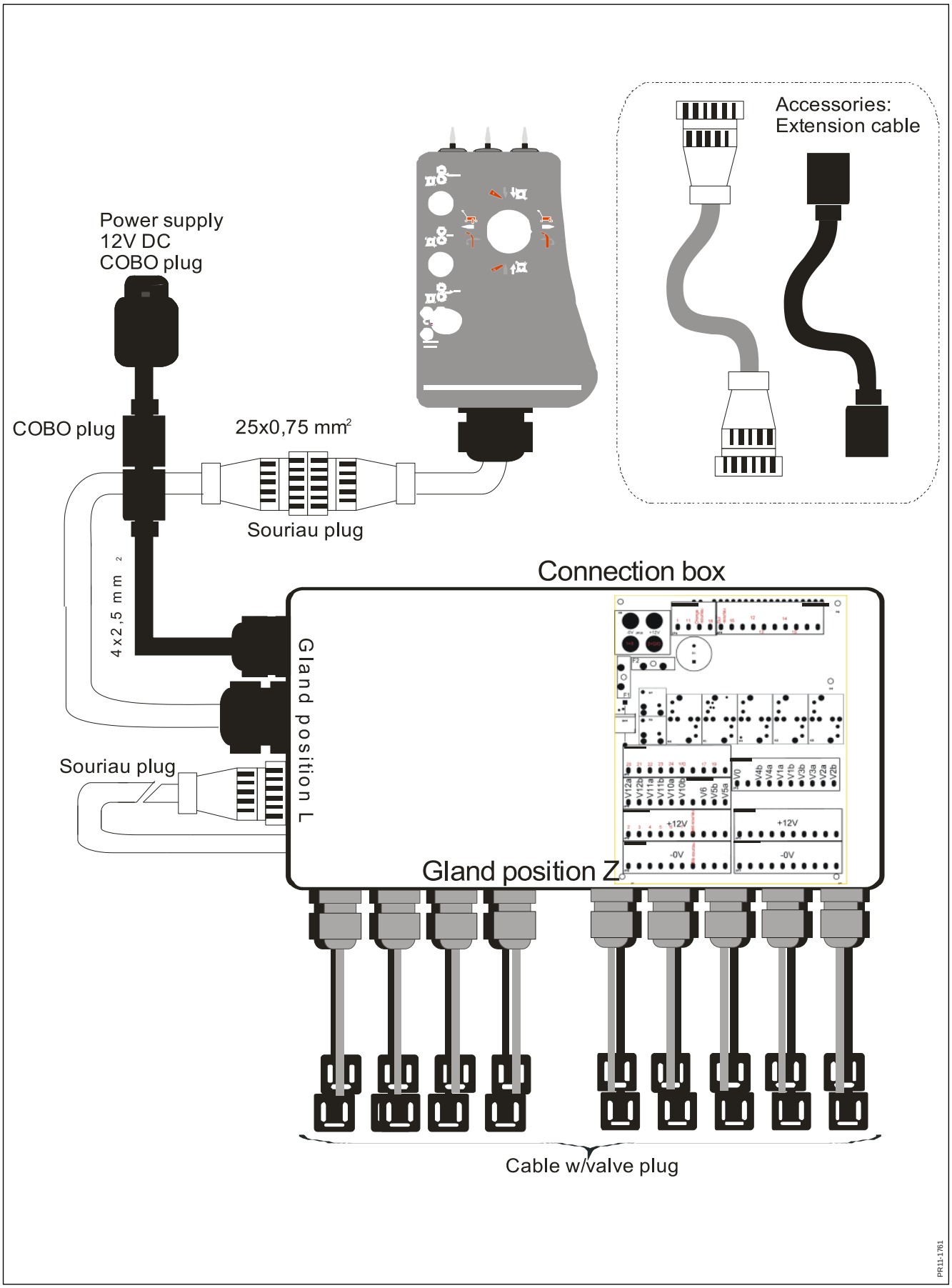
- The machine must **not** be placed somewhere outside.
- Gearboxes, cylinders and hoses must be emptied of oil. These oils must be handed over to a recycling company.
- Disassemble the machine and separate the individual parts, e.g. PTO drive shafts, tyres, hydraulic components etc.
- Hand over the usable parts to an authorised recycling centre. The large scrapping parts are handed over to an authorised breaker's yard.

12. MISCELLANEOUS

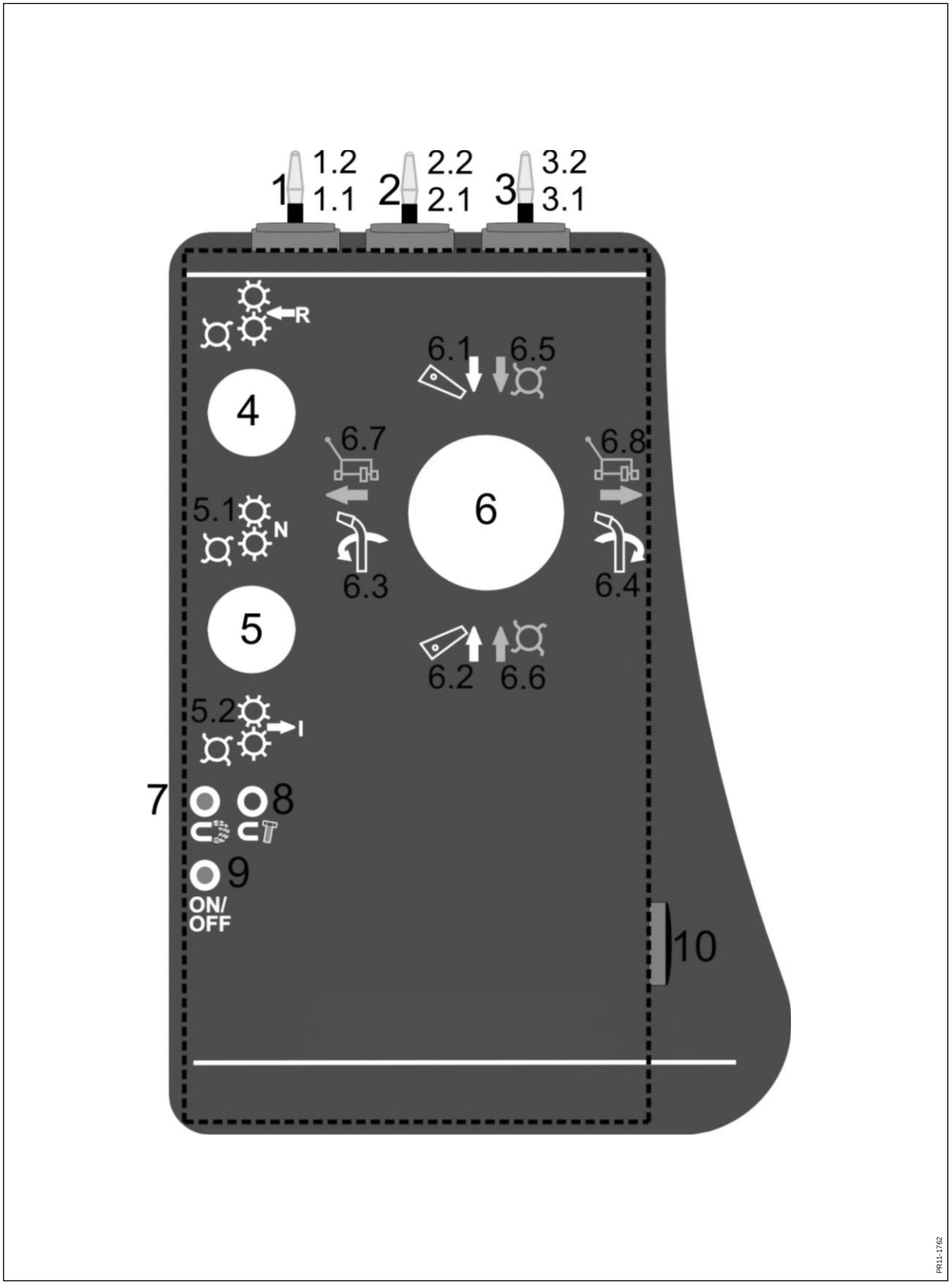
HYDRAULIC DIAGRAM FOR FCT 1460



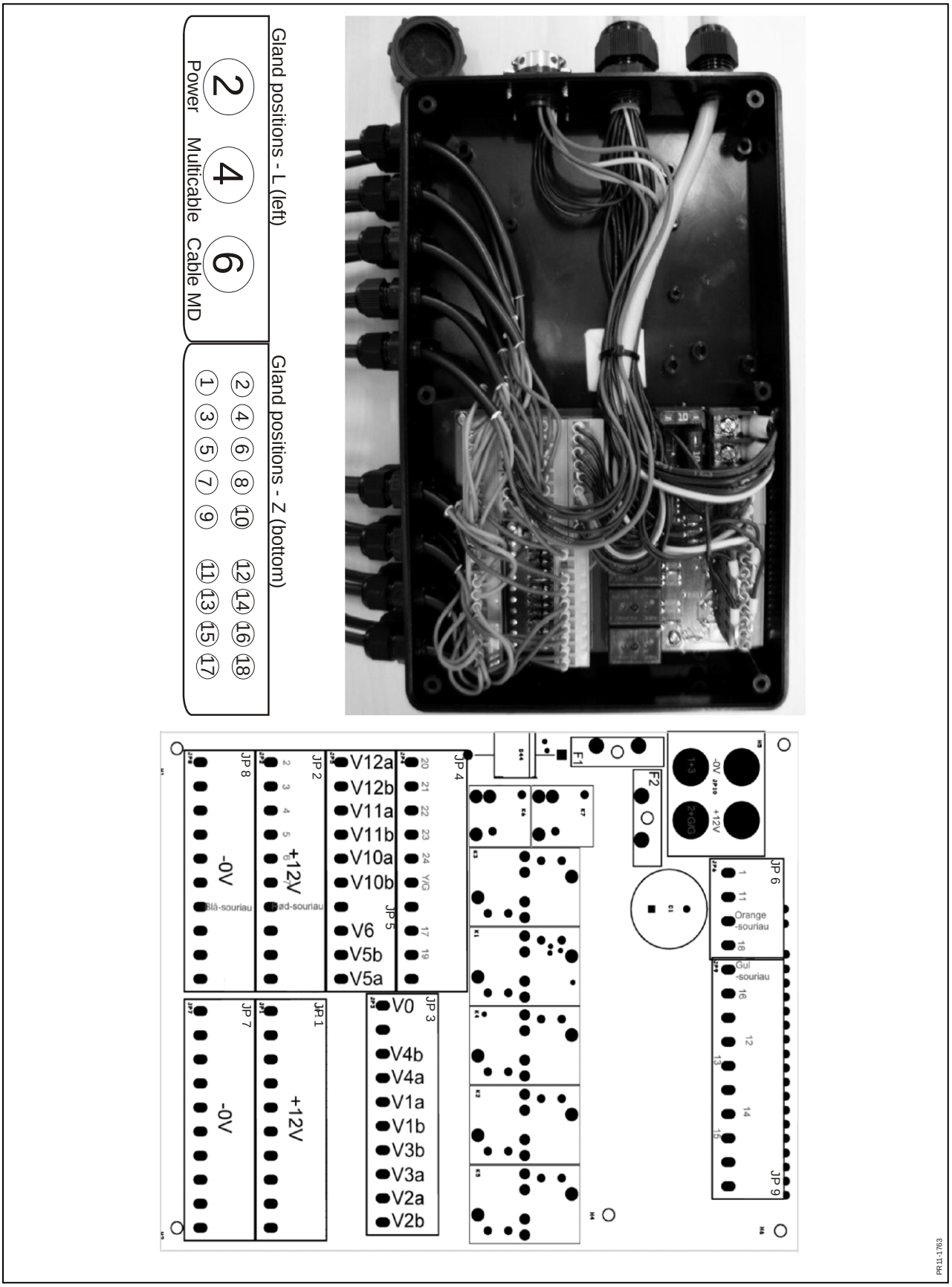
CONTROL SYSTEM



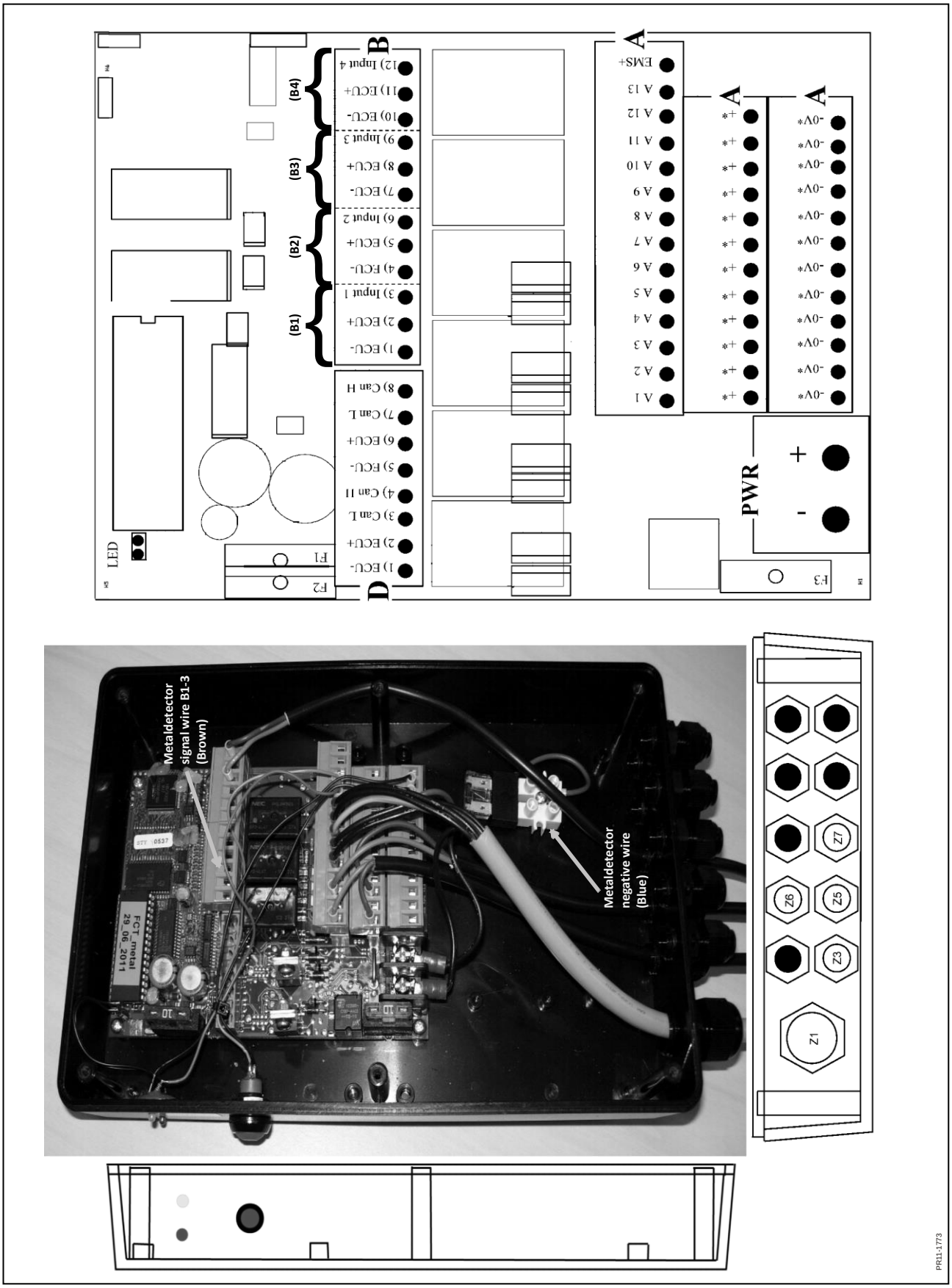
CONTROL BOX


1
1.2
1.1
2
2.2
2.1
3
3.2
3.1
R
6.1
6.5
4
6.7
6.8
5.1
N
6
6.3
6.4
5
6.2
6.6
5.2
I
7
8
9
ON/
OFF
10
PR11-1762

CONTROL UNIT ON THE MACHINE



MD-CONTROL UNIT



CONTROL UNIT ON MACHINE, WIRING SYSTEM

Function category	Functional description	Multi-cable wire n°	Souriau connection	Connection print PCB n° IN	Signal type				Connection print PCB n° OUT	Wire connections			Length (m)	Gland Position	Label	Comment	Prewired (Y/N)
					In-Dig	In-Ana	Out-D	Out-A		Signal terminal wire colour	Positive Terminal wire colour	Negative Terminal wire colour					
Joystick LED 9	Led Power ON - System Power indicator															Mounted on joystick PCB	
Internal power	0 volt power supply for Metal detector								JP8_7			Blue				Souriau plug - pin A	
Internal power	+12 volt power supply Metal detector (ON/OFF switch via main relay)								JP2_7			Red				Souriau plug - pin B	
MD input	V5a input from MD			JP6_3 Orange												Double function MD/Onboard - Souriau plug - pin C	
MD input	V0 input from MD			JP9_1 Yellow												Double function MD/Onboard - Souriau plug - pin D	
Joystick power	0 volt power supply	1	A						JP6_1								
Joystick power	+12 volt power supply (main relay)	2	B						JP2_1							Multiple cores to ensure power supply	
Joystick power	+12 volt power supply (main relay)	3	C						JP2_2								
Joystick power	+12 volt power supply (main relay)	4	D						JP2_3								
Joystick power	+12 volt power supply (main relay)	5	E						JP2_4								
Joystick power	+12 volt power supply (main relay)	6	F						JP2_5								
Joystick power	+12 volt power supply (main relay)	7	G						JP2_6								
Joystick Led 7	MD ON Green LED placed in Joystick Cabinet	8	H													Status LED from MD -Souriau plug - pin E Coverage for LED when delivered w/o MD	
Joystick Led 8	MD STOP Red LED placed in Joystick Cabinet	9	J													Status LED from MD -Souriau plug - pin E Coverage for LED when delivered w/o MD	
	Clutch Guard - Yellow LED placed in Joystick	10	K													Status LED from MD - Souriau plug - pin G	
Joystick sw 10	FCT Onboard ON/OFF (main relay)	11	L	JP6_2												Supply for JP1 & JP2	
Joystick 6.3 / (6.7)	Joystick Left V4B /(V1A)	12	M	JP9_4			2		JP3_3/(5)	Brown		Blue	1.0	Z11 / (Z18)	V4B /(V1A)	2x0,75mm² with valve connector	Y
Joystick 6.4 / (6.8)	Joystick Right V4A / (V1B)	13	N	JP9_5			2		JP3_4/(6)	Brown		Blue	1.0	Z12 / (Z17)	V4A / (V1B)	2x0,75mm² with valve connector	Y
Joystick 6.2 / (6.6)	Joystick Down V3B / (V2A)	14	P	JP9_7			2		JP3_7/(9)	Brown		Blue	1.0	Z13 / (Z16)	V3B / (V2A)	2x0,75mm² with valve connector	Y
Joystick 6.1 / (6.5)	Joystick Up V3A / (V2B)	15	R	JP9_8			2		JP3_8/(10)	Brown		Blue	1.0	Z14 / (Z15)	V3A / (V2B)	2x0,75mm² with valve connector	
Joystick top button	Joystick top button primary/(secondary) function	16	S	JP9_2													Y
Joystick sw 5.2	V6 Valve	17	T	JP4_8			1		JP5_8	Brown		Blue	1.0	Z9	V6	2x0,75mm² with valve connector	Y
Joystick sw 5.1	V5a Valve	18	U	JP6_4			1		JP5_10	Brown		Blue	1.0	Z8	V5a	2x0,75mm² with valve connector	Y
Joystick sw 4	V5b Valve	19	V	JP4_9			1		JP5_9	Brown		Blue	1.0	Z7	V5b	2x0,75mm² with valve connector	Y
Joystick sw 3.1	V12a Valve	20	W	JP4_1			1		JP5_1	Brown		Blue	1.0	Z2	V12a	2x0,75mm² with valve connector	Y
Joystick sw 3.2	V12b Valve	21	X	JP4_2			1		JP5_2	Brown		Blue	1.0	Z1	V12b	2x0,75mm² with valve connector	Y
Joystick sw 2.1	V11a Valve	22	Y	JP4_3			1		JP5_3	Brown		Blue	1.0	Z4	V11a	2x0,75mm² with valve connector	Y
Joystick sw 2.2	V11b Valve	23	Z	JP4_4			1		JP5_4	Brown		Blue	1.0	Z3	V11b	2x0,75mm² with valve connector	Y
Joystick sw 1.1	V10a Valve	24	a	JP4_5			1		JP5_5	Brown		Blue	1.0	Z6	V10a	2x0,75mm² with valve connector	Y
Joystick sw 1.2	V10b Valve	25	b	JP4_6			1		JP5_6	Brown		Blue	1.0	Z5	V10b	2x0,75mm² with valve connector	Y
Internal	V0 Valve - Master valve (ex. V6)						1		JP5_1	Brown		Blue	1.0	Z10	V0	2x0,75mm² with valve connector	Y
Power	Power cable												10.0	L2		4x2,5mm² with Cobo plug	Y
Connection	Multicable												10.0	L4		25x0,75mm² w/Souriau connection	Y
Fuse	Fuse 10 Amp for +12V			F1													
Fuse	Fuse 10 Amp for -0V			F2													

PR11-1764

MD-CONTROL UNIT - WIRING SYSTEM

				Signal type					Wire connections							
Category	Functional description	Souriau connection	In-Dig	In-Ana	Out-D	Out-A	Type comment	Terminal number	Signal terminal wire colour	Positive Terminal wire colour	Negative Terminal wire colour	Length (m)	Gland Position	Label	Comment	Prewired (Y/N)
Machine	SP1 - MD release					1	Operated as ON/OFF output	A1	Blue	Brown		4,0	Z3	SP1	2x0,75mm² with valve connector	Y
						1		A2								
Hydraulic	V8 hydraulic valve					1	Operated as ON/OFF output	A3	Blue	Brown		1,0	Z5	V8	2x0,75mm² with valve connector	Y
						1		A4								
Joystick	Green LED placed in Joystick Cabinet (7).	E			1			A5	5						7*1,5mm² w/Souriau plug - pin E	Y
Joystick	Red LED placed in Joystick Cabinet (8).	F			1			A6	6						7*1,5mm² w/Souriau plug - pin F	Y
Joystick	Yellow LED placed in Joystick Cabinet. (Clutch alarm)	G			1			A7	Yellow/Green			1,5	Z1		7*1,5mm² w/Souriau plug - pin G	Y
Hydraulic	V5a - Valve	C			1			A8	3						7*1,5mm² w/Souriau plug - pin C	Y
Hydraulic	V0 - Valve	D			1			A9	4						7*1,5mm² w/Souriau plug -pin D	Y
Jobcomputer box	Metaldetector function activated LED				1			A10							LED placed in Jobcomputer blackbox	Y
Jobcomputer box	De-activation of metaldetector-function		1					A11							Push switch placed in Jobcomputer blackbox	Y
Machine	Clutch sensor (S3)		1					A12	Black	Brown	Blue	5,0	Z9	S3	Inductiv Sensor	N
			1					A13/EM.S								
Machine	Metaldetector		1					B1-3	Brown		Blue (ext. fuse)	5,0	Z6	MD	2x0,75mm² with connectors + shield	N
Machine	Metaldetector/Rockdetector 2		1					B2-6								
Machine	Clutch sensor ref(S2)		1					B3-9	Black	Brown	Blue	5,0	Z8	S2	Inductiv Sensor	N
Machine	Reverse sensor (S1)		1					B4-12	Brown		Blue	5,0	Z7	S1	REED Sensor	Y
Power	Supply power Wire 1	A						Power -				1,5	Z1		7*1,5mm² w/Souriau plug - pin A	Y
Power	Supply power Wire 2	B						Power +							7*1,5mm² w/Souriau plug - pin B	Y
Power	0 volt power supply for monitor															
Power	+12 volt power supply for monitor															
COM	CAN Low							CAN Low								
COM	CAN High							CAN High								
Fuse	Fuse 10Amp for sensor input B1-4							F2								
Fuse	Fuse 10Amp for output A1-10							F3								

PR11-1774

DIAGRAMS:

The above figures show the hydraulic and electric diagrams for the machine. Here you can follow the wiring system between the components, for instance when maintaining or replacing cables and hydraulic hoses.

FAULT FINDING (MD)

In the below table the most known faults in the (metal detector) system are described. The table describes the possible cause and what you can do to correct it.

CAUTION: **If you are in doubt about how to handle a possible fault in the MD system, always contact a JF dealer or JF importer for professional instruction. Thus you avoid working with a defective system.**

Problem	Possible cause	Remedy
The electronics is not activated when turning on the control box with the switch on the side.	1) There is no power supply. 2) A fuse has blown in the control system. 3) Damage on one or more of the cables has caused short circuit.	1) Check and / or establish power supply from the tractor. 2) Replace the fuse(s). 3) Check wire connections and repair/correct if necessary.
No metal is registered when the MD system is checked with ferrous metal between the front rollers before starting or metal goes through the feed intake section without being detected.	1) Fault or defect on the magnet tub. 2) The wire connection to the magnet tub is defective. 3) The metal detector is turned off.	1) Return the magnet tub to Kongskilde for readjustment or replacement. 2) Correct/repair defect on the wire connection. 3) Turn on the metal detector.
Metal reaches the rotor although it is detected and the feed intake stops.	The distance between the pawl and the ratchet wheel is too long, and the wheel turns too much before the pawl is in mesh.	Adjust the distance between the pawl and the ratchet wheel with the adjusting screw above the coil. The distance must be approx 1 mm and max. 2 mm.

Problem	Possible cause	Remedy
The machine does not react to the control box.	1) The control system is not turned on. 2) There is no oil flow.	1) Turn on the control system. 2) Establish constant oil flow from the tractor.
It is not possible to adjust the reverse system to position for normal feed in after reversing.	There is a fault on the contact element at the nylon disc on the automatic clutch. The contact element must reset the electric system after reverse so that the machine can work again.	Replace the contact element on the automatic clutch.
Although normal feed intake position is established, the pawl is still in mesh.	Error in the wire for the coil.	Repair or replace the wire.
Metal is detected, but there is no metal in the feed intake section.	1) The adjustment of the magnetic field from the magnet tub has been changed. 2) There are loose metal parts/ swarf in the roller which disturb the magnetic field. 3) The voltage supply from the tractor is not sufficient. The MD system "regards" reduced voltage drop (under 8 V) as a disturbance, i.e. metal detection.	1) Dismount the magnet tub and send it to Kongskilde where it will be adjusted. 2) Clean the roller and the tub of loose metal parts/swarf. 3) Check if the voltage supply from the tractor is correct – 12 V.

WARRANTY

MD MACHINES

FCT 1460 is delivered with an electronic metal detector system (MD) which registers ferrous metal parts the moment they pass the sensor in the lower front feed roller.

During tests in the field with a range of common metal parts it has been possible to detect 95 % of the parts and stop the feed rollers before the blade rotor of the machine has been damaged seriously.

Though an MD cannot stop foreign matter such as: Stone, wood and tools made of chromium-nickel steel, it will provide a considerably higher safety against damage and operational stop, as most wearing parts from agricultural machinery which may be lost in the field, are made of ferrous metal. Furthermore there will be a higher security that there are no metal parts in the chopped crop for the herd.

The following special warranty rules apply to machines delivered with an MD from Kongskilde Industries A/S:

- The MD manufactured by Kongskilde Industries A/S is optional equipment which can only be delivered to some specific models from Kongskilde Industries A/S.

- The MD will register a ferrous metal part the moment it passes the front feed roller of the machine, and immediately after it will send an electrical signal to a control unit which will block the feed intake section by means of a signal to an electrically activated stop system before the metal part reaches the blade rotor. The MD can only register ferrous metal parts (metal parts containing iron). Tests have shown a registration guarantee of 95 %.

- All the components of the MD which have defects in material or manufacturing faults when delivered to the first buyer will be repaired or replaced free of charge for parts or labour costs if a warranty claim has been sent to one of Kongskilde Industries A/S's authorised dealers without undue delay. However, this does not apply if the fault does not occur until 12 months after delivery or if the general submission time for warranty claims is not observed.
  However, the warranty does not apply to damage caused by normal wear, accidents for which nobody is at fault, insufficient maintenance, inadequate storage or unintended use. General maintenance and replacement costs must still be paid by the buyer.

- The warranty will be invalidated if the construction or adjustment of the equipment is changed to an extent which has not been approved by Kongskilde Industries A/S.
- As the MD will not register all common ferrous metal parts, no warranty can be granted for damage caused by insufficient registration or blockage.

WARRANTY

Kongskilde Industries A/S, 6400 Sønderborg, Denmark, hereafter called **"Kongskilde"**, 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 Kongskilde's written permission.**
7. **Unskilled repair of the machine.**
8. **Non-original spare parts have been used.**

Kongskilde 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 Kongskilde responsible for wages beyond current agreements in connection with replacement of warranty parts.

Kongskilde is not responsible for the following costs:

1. **Normal maintenance such as costs for oil, grease and minor adjustments.**
2. **Transport of machine to and from dealer.**
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 Kongskilde has committed a fault.

The following is regarded as wearing parts:

Protective canvases, blades, blade suspensions, wearing bars, guide shoes, stone protections, discs, rotor skirts, crimper parts, tyres, tubes, brake shoes, chain tightening parts, guards, hydraulic hoses, conveyors, vertical auger and tub, wheel-fixing bolts and nuts, snap rings, sockets, PTO-shafts, clutches, gaskets and seals, tooth belts, V-belts, chains, sprocket wheels, carriers, conveyor chain slats, rake- and pick-up tines, rubber seals, rubber paddles, cutter blades, chute liner and lining for spreading platform, shredding blades incl. bolts and nuts, spreading rotors 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 pre-delivery check and has given instruction to the end user in the use of the machine.**
2. **The warranty cannot be transferred to others without Kongskilde's written permission.**
3. **The warranty can be nullified if repair is not undertaken immediately.**

EN EC-Declaration of Conformity
according to Directive 2006/42/EC

DE EG-Konformitätserklärung
entsprechend der EG-Richtlinie 2006/42/EG

IT Dichiarazione CE di Conformità
ai sensi della direttiva 2006/42/CE

NL EG-Verklaring van conformiteit
overeenstemming met Machinerichtlijn 2006/42/EG

FR Déclaration de conformité pour la CE
conforme à la directive de la 2006/42/CE

NO EF-samsvarserklæring
i henhold til 2006/42/EF

CZ ES prohlášení o shodě
podle 2006/42/ES

ES CE Declaración de Conformidad
según la normativa de la 2006/42/CE

PT Declaração de conformidade
conforme a norma da C.E.E. 2006/42/CE

DA EF-overensstemmelseserklæring
i henhold til EF-direktiv 2006/42/EF

PL Deklaracja Zgodności WE
wedlug Dyrektywy Maszynowej 2006/42/WE

FI EY : N Vaatimustenmukaisuusilmoitus
täyttää EY direktiivin 2006/42/EY

SV EG-försäkran om överensstämmelse
enligt 2006/42/EG

ET EÜ vastavusdeklaratsioon
vastavalt 2006/42/EÜ

Kongskilde Industries A/S
Linde Allé 7
DK 6400 Sønderborg
Dänemark / Denmark
Tel. +45-74125252

EN We declare under our sole responsibility, that the product:
DE Wir erklären in alleiniger Verantwortung, dass das Produkt:
IT Noi Dichiara sotto la propria responsabilità che il prodotto:
NL Wij verklaren als enig verantwoordelijken,dat het product:
FR Nous déclarons sous notre seule responsabilité que le produit:
NO Herved erklærer vi, at:
CZ Prohlašujeme tímto, že:
ES Vi declaramos bajo resposibilidad propia que el producto:
PT Me declaramos com responsabilidade próqria que o produto:
DA Vi erklærer på eget ansvar, at produktet:
PL Nosotros deklarujemy z pełną odpowiedzialnością, iż produkt:
FI Nós ilmoitamme yksin vastaavamme, että tuote:
SV Härmed förklarar vi att:
ET Käesolevaga kinnitame, et:

FCT 1460

EN to which this declaration relates corresponds to the relevant basic safety and health requirements of the Directive: 2006/42/EC

DE auf das sich diese Erklärung bezieht, den einschlägigen grundlegenden Sicherheits- und Gesundheitsanforderungen der EG-Richtlinie entspricht: 2006/42/EG

IT E' Conforme ai Requisiti Essenziali di Sicurezza a di tutela della Salute di cui alla Direttiva e sue successive modificazioni: 2006/42/CE

NL waarop deze verklaring betrekking heeft voldoet aan de van toepassing zijnde fundamentele eisen inzake veiligheid en gezondheid van de EG-machinerichtlijn no: 2006/42/EG

FR faisant l'objet de la déclaration est conforme aux prescriptions fondamentales en matière de sécurité et de santé stipulées dans la Directive de la: 2006/42/CE

NO er i overensstemmelse med alle relevante bestemmelser i Maskindirektivet 2006/42/EF.

CZ odpovidá všem příslušným ustanovením ES směrnice o strojích 2006/42/ES.

ES al cual se refiere la presente declaración corresponde a las exigencias básicas de la normativa de la y referentes a la seguridad y a la sanidad: 2006/42/CE

PT a que se refere esta declaração corresponde às exigencias fundamentais respectivas à segurança e à saúde de norma da C.E.E.: 2006/42/CE

DA som er omfattet af denne erklæring, overholder de relevante grundlæggende sikkerheds- og sundhedskrav i EF-direktiv: 2006/42/EF

PL dla którego się ta deklaracja odnosi, odpowiada właściwym podstawowym wymogom bezpieczeństwa i ochrony zdrowia Dyrektywy Maszynowej: 2006/42/WE

FI johon tämä ilmoitus liittyy, vastaa EY direktiivissä mainituja perusturvallisuus- ja terveysvaatimuksia (soveltuvin osin) sekä muita siihen kuuluvia EY direktiivejä: 2006/42/EY

SV överensstämmelse med alla hithörende bestämmelser i EG:s maskindirektiv 2006/42/EG

ET vastab kõigile EÜ masinadirektiivi 2006/42/EÜ asjakohastele sätetele.

CE

Konstruktion (Design)
Sønderborg, 01.03.2013
Brian Stamp

Konstruktion (Design)
Sønderborg, 01.03.2013
Klaus Springer

Produktion (Production)
Sønderborg, 01.03.2013
Bo Grubov

EN EC-Declaration of Conformity
according to Directive 2006/42/EC

BG ЕО-декларация за съответствие
съгласно директива 2006/42/ЕО,

RO Declarația de conformitate CE
în conformitate cu 2006/42/CE

SK ES prehlásenie o zhode
Podľa 2006/42/ES

SL ES-izjavo o skladnosti
na podlagi Direktive 2006/42/ES

HU EK-megfelelőségi nyilatkozatra
a 2006/42/EK

MT Dikjarazzjoni tal-Konformità tal-KE
skont 2006/42/KE

LT EB atitikties deklaracijos
pagal 2006/42/EB

TR AT Uygunluk Beyani
2006/42/AT göre

EL ΕΚ-Δήλωση συμμόρφωσης
σύμφωνα με την οδηγία 2006/42/ΕΚ,

LV EK atbilstības deklarācijas
sastādīšanai saskaņā ar Direktīvas 2006/42/EK

Kongskilde Industries A/S
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DK 6400 Sønderborg
Dänemark / Denmark
Tel. +45-74125252

EN We declare under our sole responsibility, that the product:
BG С настоящото декларираме, че:
RO Prin prezenta declarăm faptul că:
SK Prehlasujeme týmto, že:
SL Izjavljamo, da je
HU Kijelentjük, hogy a/az:
MT Għalhekk aħna niddikjaraw li l-
LT Šiuo mes deklaruojame, kad
TR Iş bu beyanla, aşağida tanımlı makinenin:
EL Με την παρούσα δηλώνουμε, ότι
LV Ar šo mēs apliecinām, ka:

FCT 1460

EN to which this declaration relates corresponds to the relevant basic safety and health requirements of the Directive: 2006/42/EC

BG съответства на всички релевантни разпоредби на директива: 2006/42/ЕО

RO este în conformitate cu toate dispozițiile relevante ale Directivei 2006/42/CE privind echipamentele tehnice

SK zodpovedá všetkým príslušným ustanoveniam ES smernice o strojoch 2006/42/ES

SL skladen z vsemi ustreznimi določbami Direktive o strojih 2006/42/ES

HU a 2006/42/EK gépekre vonatkozó irányelv valamennyi vonatkozó rendelkezésével megegyezik.

MT Jissodisfa d-dispożizzjonijiet kollha rilevanti tad-Direttiva: 2006/42/KE

LT atitinka visas atitinkamas EB Mašinų direktyvos 2006/42/EB nuostatas.

TR 2006/42/AT sayılı AT Makine direktifinin tüm ilgili hükümlerine uygun olduğunu teyit ederiz.

EL Συμφωνεί με όλους τους σχετικούς κανόνες της ΕΚ- οδηγίας μηχανημάτων 2006/42/ΕΚ.

LV atbilst visiem attiecīgajiem EK Mašīnu direktīvas 2006/42/EK noteikumiem.

CE

Konstruktion (Design)
Sønderborg, 01.03.2013
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