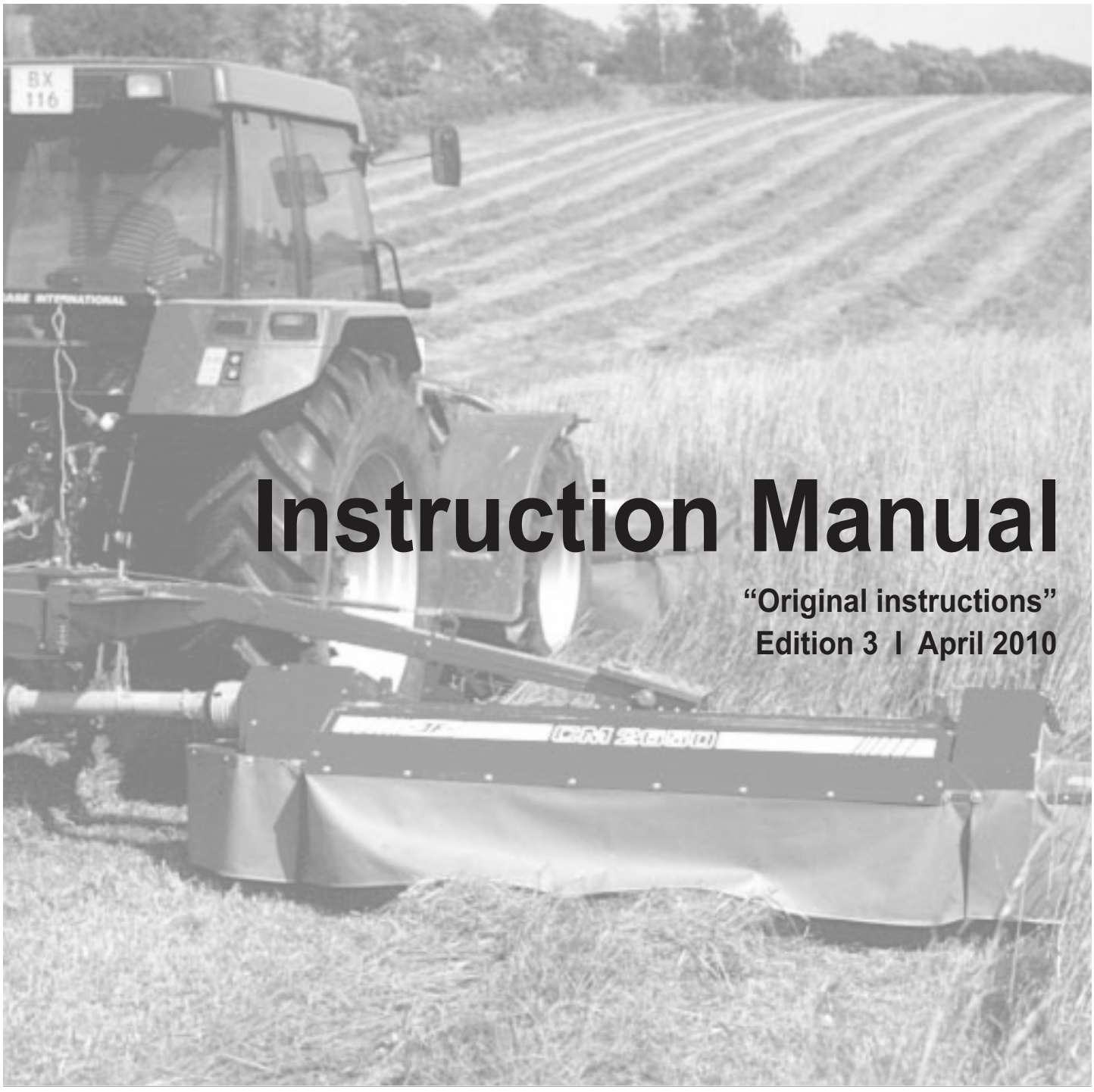
JF-STOLL

Disc Mover

CM 2650 I CM 2650 C



Instruction Manual

“Original instructions”
Edition 3 I April 2010

JF-STOLL

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

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

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

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

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

ES CEE Declaración de Conformidad
según la normativa de la 2006/42/EC

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

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

PL Deklaracja Zgodności CE
wedlug Dyrektywy Maszynowej 2006/42/EC

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

EN We,
DE Wir,
IT Noi,
NL Wij,
FR Nous,
ES Vi,
PT Me,
DA Vi,
PL Nosotros,
FI Nós,

JF-Fabriken - J. Freudendahl A/S
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Tel. +45-74125252

EN declare under our sole responsibility, that the product:
DE erklären in alleiniger Verantwortung, dass das Produkt:
IT Dichiara sotto la propria responsabilità che il prodotto:
NL verklaren als enig verantwoordelijken,dat het product:
FR déclarons sous notre seule responsabilité que le produit:
ES declaramos bajo resposibilidad propia que el producto:
PT declaramos com responsabilidade próqria que o produto:
DA erklærer på eget ansvar, at produktet:
PL deklarujemy z pełną odpowiedzialnością, iż produkt:
FI ilmoitamme yksin vastaavamme, että tuote:

EN Model:
DE Typ :
IT Tipo :
NL Type :
FR Modèle :
ES modelo :
PT Marca :
DA Typ :
PL Model :
FI Merkki :

CM 2650
CM 2650 C

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
2006/42/EC

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

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/EC

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/EC

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/EC

PT a que se refere esta declaração corresponde às exigencias fundamentais respectivas à segurança e à saúde de norma da
2006/42/EC

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

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

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

CE

Konstruktion (Design) + Produktion (Production)
Sønderborg, 15.12.2009 Jørn Freudendahl

FOREWORD

DEAR CUSTOMER!

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

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

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

However, this first introduction cannot replace a more thorough knowledge of the different tasks, functions and the technically correct 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. Besides this there are illustrations with text.

"Right" and "Left" is defined from a position behind the machine facing the direction of travel.

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

JF-Fabriken reserves the right to make changes or improvements in the design or construction of any part without incurring the obligations to install such changes on any unit previously delivered.

PREPARATION AFTER DISPATCH

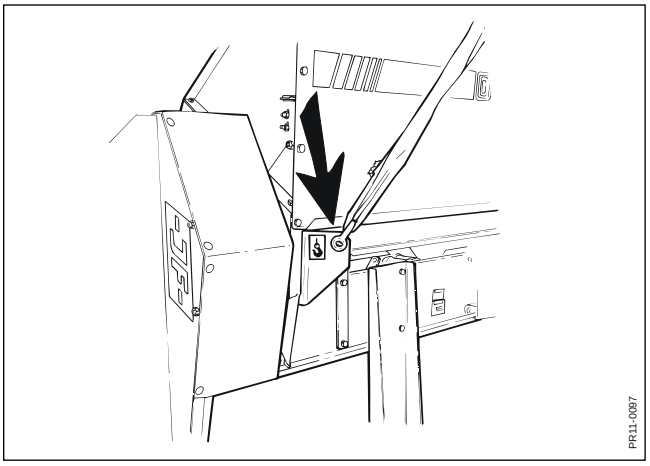

Fig. 0-1

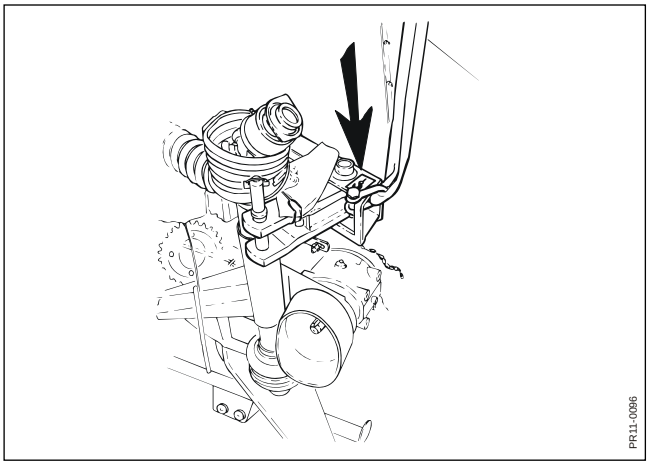

Fig. 0-2

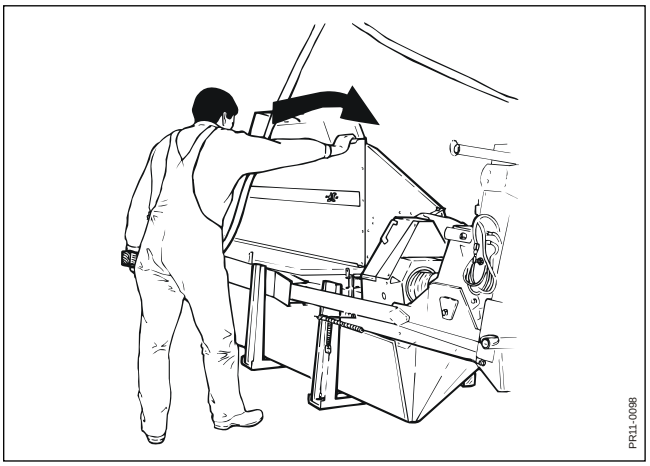

Fig. 0-3

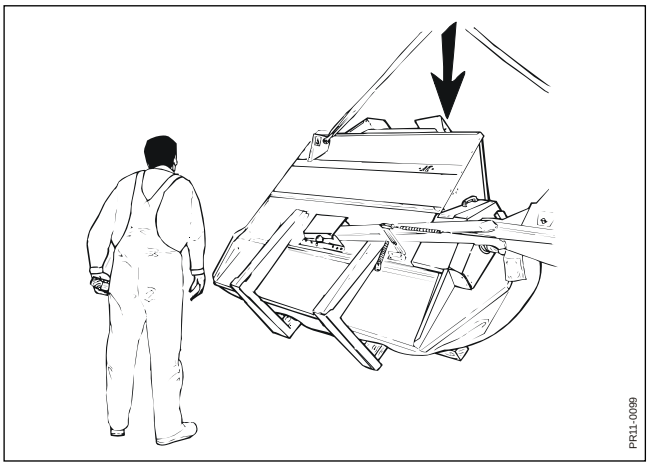

Fig. 0-4

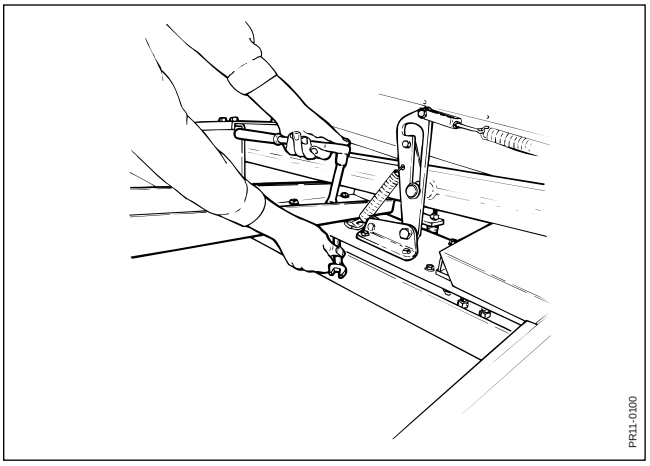

Fig. 0-5

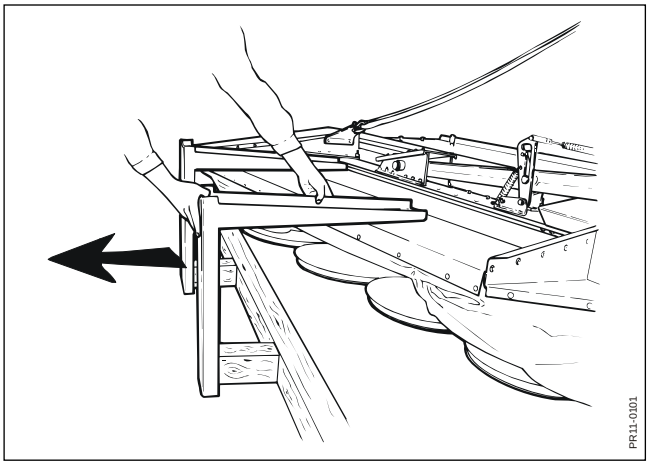

Fig. 0-6

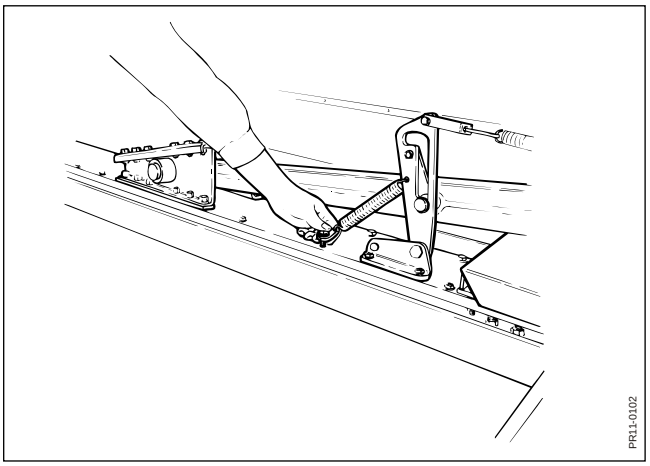

Fig. 0-7

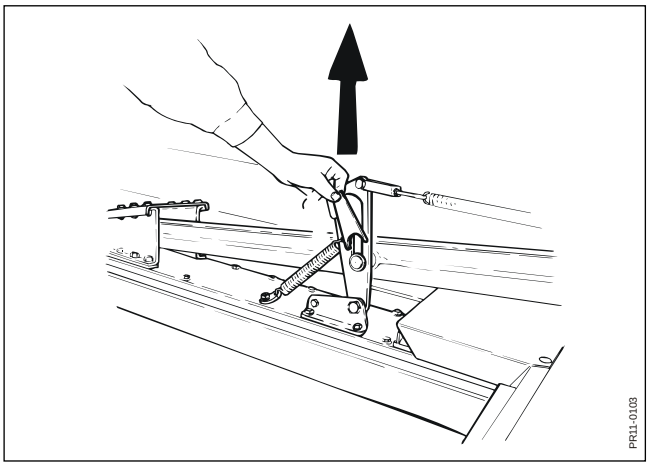

Fig. 0-8

1. INTRODUCTION

INTENDED USE

The drum mower **CM 2650** should only be used for the agricultural work which it is intended for, i.e.: Normal effort in fields or meadows where natural or planted grass or green crops are cut on the ground for animal feeding purposes. The material is laid in a swath, which allows subsequent picking up.

Of course, 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. JF-Fabriken A/S is not responsible for any damage resulting from such use, the user bears that risk.

The performance of the machine will depend on the material, i.e. the crop, the condition of the field, the ground, and finally the weather.

It is assumed that the work is performed under reasonable conditions, i.e. thorough agricultural knowledge and authorised operation.

Intended use, of course, implies that the prescriptions concerning adjustment, operation and maintenance in the instruction manual are observed.

The drum mower CM 2650 should only be operated, maintained or repaired by persons who are confident with the use of the product and are aware of the risks.

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

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

SAFETY

Generally much damage occurs in consequence of misuse and insufficient instruction. The safety of persons and machines is therefore an integrated part of JF-Fabriken's development work. **We wish to secure you and your family in the best possible way**, but this also demands an effort from your side.

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

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

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

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 secure that the operator follows the general safety instructions or the measures mentioned in the instruction manual to protect himself and others against injuries.

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

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

GENERAL SAFETY INSTRUCTIONS

Before use, the operator should make sure that the tractor and the machine observe the general work-related legislation and can comply with the Road Traffic Act.

The following is a short mentioning 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 and stop the tractor engine before you

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

2. Always lower the machine to the ground and use correct support or transport safety device when the machine is parked.

3. Always use the transport safety device of the machine during transport.

4. Never work under a raised machine unless the lift suspension of the machine is secured by means of a support chain or other mechanical securing.

5. Never start the tractor until all persons are safely away from the tractor and the machine.

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

7. Make sure that all guards have been mounted correctly.

8. During work never wear loose clothes, which can be pulled in by the movable parts of the machine.

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

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

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

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

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

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

15. Before raising or lowering the machine in the lift suspension of the tractor, check that no persons are near the machine or touching it.

16. Do not stand near the guards of the cutting unit and do not lift the guard before all revolving parts have stopped moving.

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

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

19. Never stand between the tractor and the mower during connection and disconnection.

SPECIAL SAFETY INSTRUCTIONS

When working with mowers the following special measures should be observed.

1. Use a tractor with a cabin provided with safety glass. Furthermore it is advisable to protect the glass of the cabin with polycarbonate plates inside or with a close-meshed net outside. The cabin should be closed when working in the field.

2. Always keep away from the cutting unit when the blades or drums of the machine rotate.

3. When replacing blades it is important to observe the rules in the instruction manual to fulfil the safety requirements. Always use original spare parts.

4. Before use, check the revolving parts (blades, blade holders, rotor skirts and drums). If parts are damaged (bent or cracked), worn or missing, they should be replaced immediately.

5. Damaged, worn or missing blades should be replaced in sets in order not to create an unbalance in the machine.

6. Check canvases and guards regularly. Replace worn or damaged canvases.

7. Canvases and guards secure against ejection of stones and other foreign bodies. Before use canvases and guards must be placed correctly.

8. Lower the cutting unit to working position before starting the power transmission.

9. The field should be kept clear of stones and foreign bodies, if possible.

10. Even if the machine is adjusted and operated correctly, stones and foreign bodies in the field can be ejected from the cutting unit. Therefore no persons should stand near the cutting unit where the conditions are unknown. Be particularly careful when working along public roads or facilities (schools, parks etc.)

11. Though it is possible, never back with the cutting unit in working position. The correct movement for the cutting unit only works when driving forwards, and there is a risk of damage if driving backwards with the machine in working position.

12. Even though the power transmission has stopped, the revolving parts have a momentum. Therefore, always wait until the blades or drums have come to a complete stop before getting near the cutting unit.

13. If in doubt, always contact the nearest dealer.

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.

Choose a tractor with a suitable power on the PTO.
If the power of the tractor is considerably larger than the prescribed power, long-term overload should be avoided. This may damage the friction clutch in the PTO drive shaft which secures against overload.

Choose a tractor with a suitable own weight and track width so that it can drive steadily on the ground. Also make sure that the lift suspension of the tractor is intended to carry machines with the own weight in question. Pay special attention to the steering abilities of the wheels; if necessary, use front weights.

However, the tractor specifications are different within the individual tractor brands. Therefore, at worst, it can be necessary to adjust the weight distribution with a couple of weights in front of the tractor.

The machine is equipped with a gear box for either 1000 rpm or 540 rpm. **It is highly dangerous to run a machine at 1000 rpm if it is intended for 540 rpm.**

To apply the hydraulic function of the machine, it is necessary that the tractor has a double-acting hydraulic outlet.

Likewise, make sure that the hydraulic system of the tractor has a pressure of max 210 bar.

Finally, always choose a tractor with a closed cabin when working with a drum mower.

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 persons to be jammed. (see fig. 1-1)

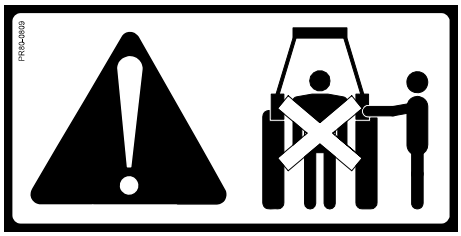

Fig. 1-1

Check that the machine is intended for the number and the direction of rotation of the tractor PTO (see fig.1-2). A wrongly chosen RPM is either highly dangerous or may lead to malfunction.

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

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

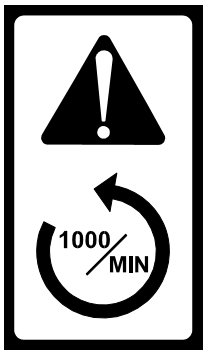

Fig. 1-2

Check that all hydraulic couplings are correctly mounted and fastened and that all hoses and fittings are undamaged before the hydraulic system is activated. When the tractor engine has stopped make sure that there is **no** pressure in the hydraulic hoses by activating the hydraulic tractor valves.

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

Fig. 1-3

Check that the cutting unit can move freely before you activate the hydraulic cylinder. Make sure that no persons are near the machine when starting, as there might be air in the hydraulic system, which might lead to sudden movements.

ADJUSTMENT

Never adjust the mower while the PTO drive shaft is engaged. Disengage the PTO drive shaft and stop the engine of the tractor before you adjust the machine. Do not lift the guard until all the revolving parts have stopped moving.

Before starting check that no blades are missing or defect and that they can be turned freely. Likewise, check that the blade holders are not loose or defect. Replace damaged blades and blade holders. (see section 5: MAINTENANCE)

Check periodically if blades and blade holders are worn according to the rules in the instruction manual. (see section 5: MAINTENANCE)

TRANSPORT

Never drive faster than the conditions allow, and max 30 km/h.

To remove possible air in the hydraulic system, check the hydraulic cylinder after connection to the tractor. Otherwise you risk that the cutting unit suddenly moves downward.

WORKING

During the daily work it should be considered that loose stones and foreign matter on the ground might get in contact with the revolving parts and get thrown out again at a very high speed.
Therefore, all guards must always be correctly mounted and intact when you are working with the machine.

Never allow anybody to stand near the mower during work, especially not children.

On stony ground adjust the stubble height to maximum, reduce the cutting angle as much as possible and limit the driving speed.

Through the suspension, the machine is secured against shocks in the direction of travel. However, there is **no** securing against shocks if backing with a lowered cutting unit and you **risk destroying the machine.**

If the cutting unit or the conditioner is blocked because of foreign matter, stop the power take-out of the tractor, activate the parking brake and wait until all revolving parts have stopped. Then try to remove the foreign matter.

Change into a lower tractor gear if working on hilly ground. When working with lift suspended machines keep a safety distance from steep slopes and similar condition of the ground, as the ground may slide down. Also adjust the speed of the tractor for sharp turns when driving on uplands.

PARKING

Never leave the tractor before the cutting unit is resting on the ground, the engine of the tractor has stopped, and the parking brake has been activated. This is the only way to perform a stable parking.
Make sure that the jack at the front of the machine is placed correctly and that the machine is resting on the jack when it is parked and disconnected from the tractor.

LUBRICATION

When lubricating or maintaining the machine, make sure that the cutting unit is resting on the ground or that the lift arms of the tractor are secured with a support chain.

Also check that the PTO has been disengaged, the tractor engine has stopped and the parking brake has been activated.

MAINTENANCE

Always make sure that applied spare parts are tightened to the correct torque and that parts on the machine are retightened regularly. (see section 5: MAINTENANCE)

Never apply other spare parts than those prescribed by the manufacturer.

Remember to relieve the oil pressure before working with the hydraulic system.

MACHINE SAFETY

All revolving parts are checked 100% and balanced by the factory by means of special machines with electronic sensors.

The rotors run at up to 2500 RPM, and even the slightest unbalance will cause abnormal vibrations which may lead to fatigue fractures.
If the vibrations or the noise of the machine increase gradually during a period you should stop working and check whether the revolving parts have been damaged. Do not continue the work until the fault has been corrected.

During the season check daily that no blades, carriers, PE-conditioners or bolts are missing. If any of these are missing, mount the parts immediately.

When blades are replaced all the blades on the rotor in question must be replaced in order not to create an unbalance.

Clean rotors and drums regularly of earth and grass and check that all parts are intact.

Check regularly that all parts at the mortise joints (various pins and ball heads) are intact and sufficiently lubricated.

1

CAUTION
Before starting the machine read operators manual and safety instructions. Request copy if not supplied.

VORSICHT
Vor intriebnahme Betriebsanleitung und Sicherheitshinweise lesen und beachten. Wenn nicht mitgeliefert bitte anfordern.

ATTENTION
Avant la mise en route de la machine lire le manuel d'utilisation et les prescriptions de sécurité. Réclamer le manuel s'il manque.

FORSIGTIG
Læs brugsanvisningen og sikkerhedsforskrifterne før maskinen tages i brug. Er brugsanvisning ikke medleveret, skal du bede om efterlevering.

2

STOP

FORSIGTIG
Stop altid traktormotoren og fjern tændingsnøglen før De smører, indstiller eller reparerer maskinen.

VORSICHT
Schleppermotor immer abschalten und Zündschlüssel abziehen bevor Sie Die Maschine schmieren, einstellen oder reparieren.

ATTENTION
Always stop engine and remove ignition key before lubricating, maintaining or repairing the machine.

ATTENTION
Toujours arrêter le moteur de tracteur et enlever la clef de contact avant de lubrifier, régler ou réparer la machine.

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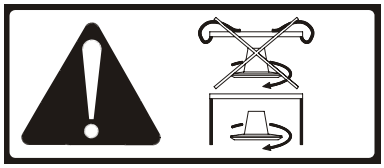

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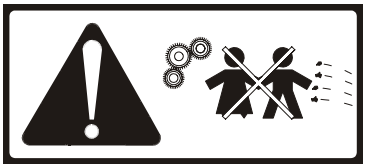

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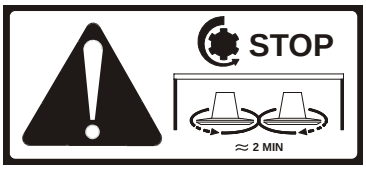

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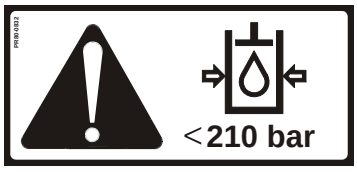

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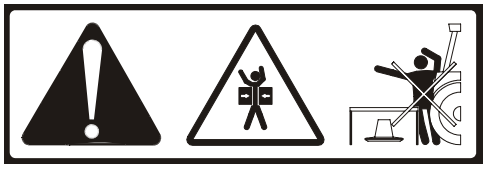
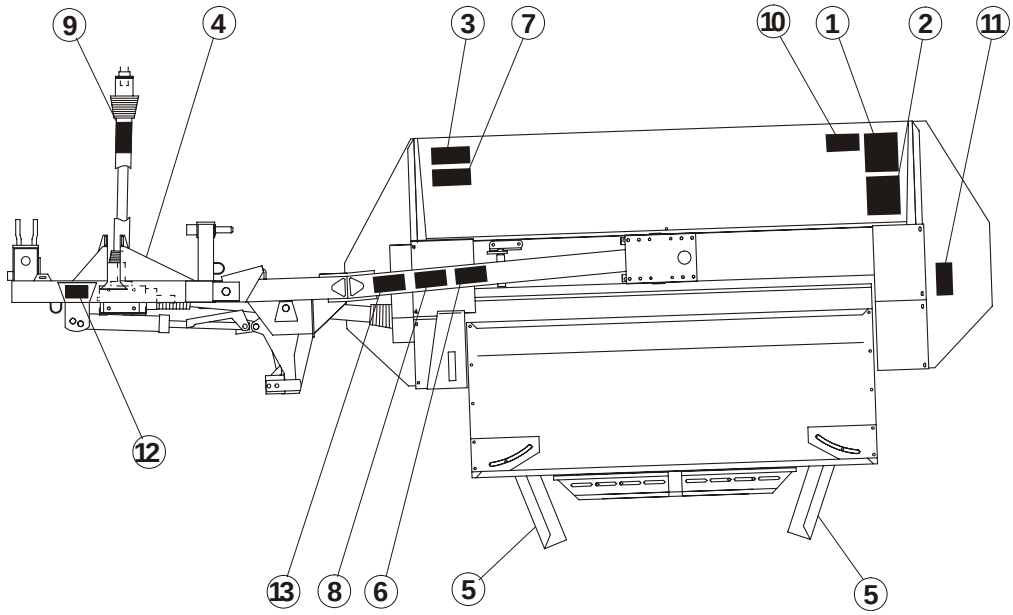




SAFETY DECALS

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

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

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

3 **Operation without canvas.**
Do not start the machine unless canvases and guards are intact and in their right place. The machine can throw out stones and other foreign matter during operation. The purpose of the canvases and the guards is to reduce such danger.

4 **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.

5 **Stones being thrown from the conditioner.**
The conditioner rotor runs with a high number of RPM and stones on the ground can be thrown up to 10 m backwards or sideways at a very high speed. Therefore, always make sure that nobody is standing near the machine when it is working.

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

7 **Rotating blades.**
Do not under any circumstances let anyone get near or stand near the machine during operation. The rotating blades of the machine can without difficulty cause serious injury to any part of the body if hit by such a blade.

8 **Risk of getting jammed during the connection.**
Never let anybody stand between the tractor and the machine during connection to the tractor. An unintentional manoeuvre may cause the person to get jammed.

9 **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.

10 Momentum**.**
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 you remove the canvas and the guards for inspection and maintenance.

11 **Risk of stones being thrown.**
Almost the same as decal 5. But even though all canvases and guards are in the right place, there is still a risk of stones etc. being thrown out. Nobody should therefore be allowed to stand near the machine during operation.

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 **Risk of getting jammed.**
Never let anyone stand between the machine and the tractor after the connection. Unintentional manoeuvres and misuse may cause serious personal injury.

TECHNICAL DATA

Type			**CM 2650**	**CM 2650 C**
Working width			2,65 m	
Effective capacity at 10 km/h			2,8 ha/h	
Power requirement, minimum on PTO			40 kW/54 HP	50 kW/68 HP
PTO speed			540 RPM	
Number of rotors			4	
Number of blades (easily replaceable)			12	
Stubble height adjustment			Yes	
Swath width			0,9 – 1,4 m	0,8 – 1,6 m
Weight			600 kg	705 kg
Ground pressure			30-40 kg	
Hydraulic transport adjustment			Extra	Standard
Oil take-out				1 double-acting
Conditioner speed (2 different)			-	723 or 883 RPM
Adjustable conditioner plate			-	Standard
Number of polyethylene fingers			-	120
Noise level in the tractor cabin	Machine connected	Window closed	76,5 dB (A)	
		Window open	86,6 dB (A)	
	Machine disconnected	Window closed	76,5 dB (A)	
		Window open	78,0 dB (A)	

We reserve the right to change the construction and specification details without notice.

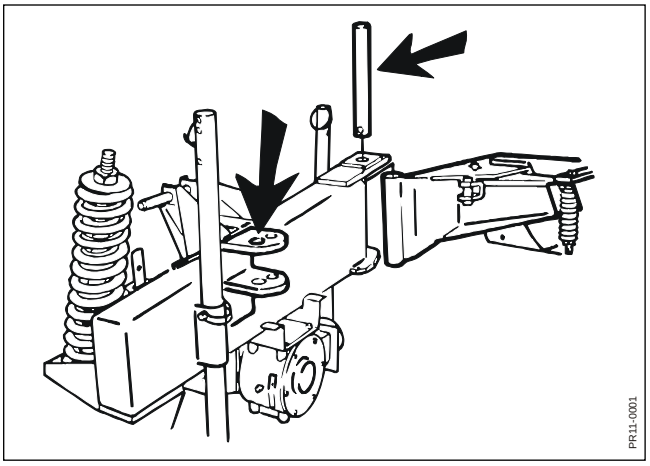
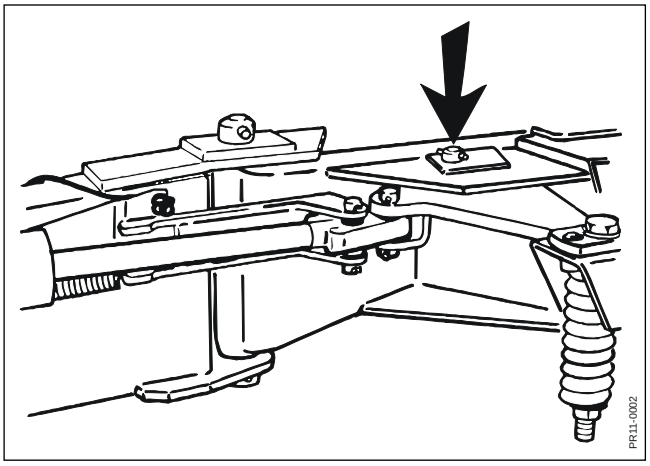


Fig. 2-1



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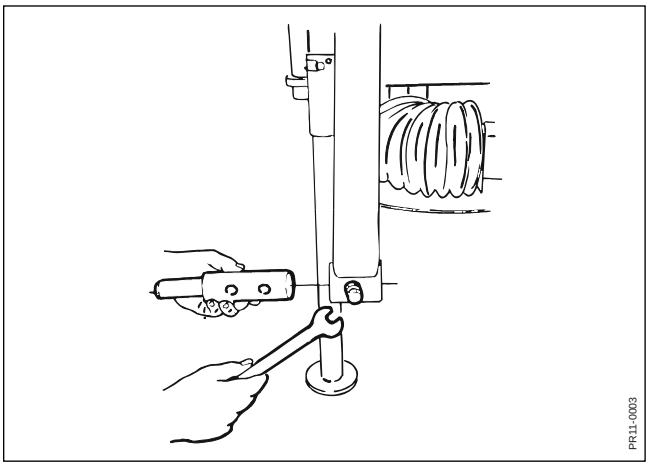

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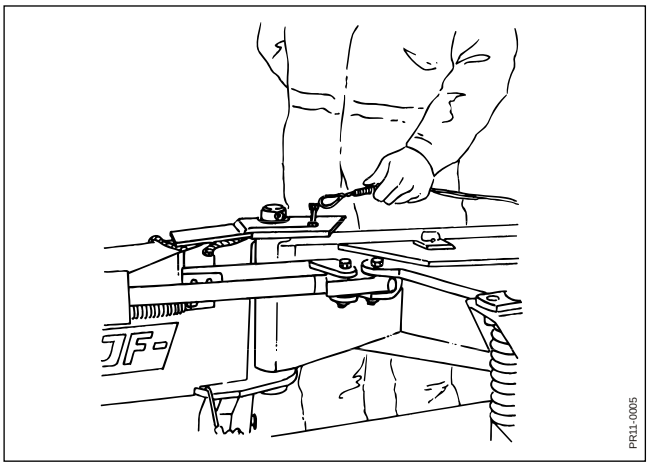

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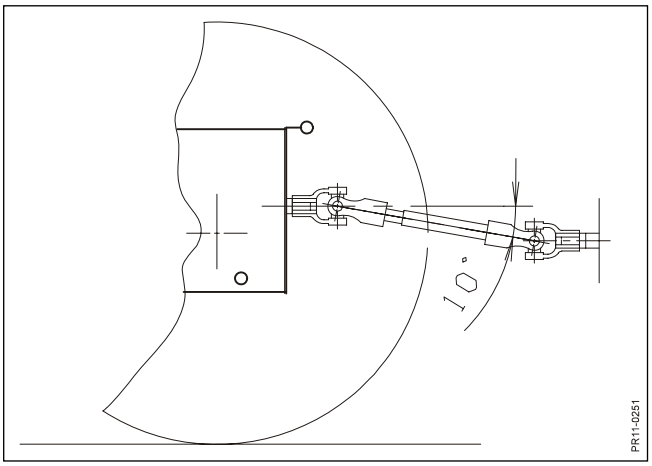

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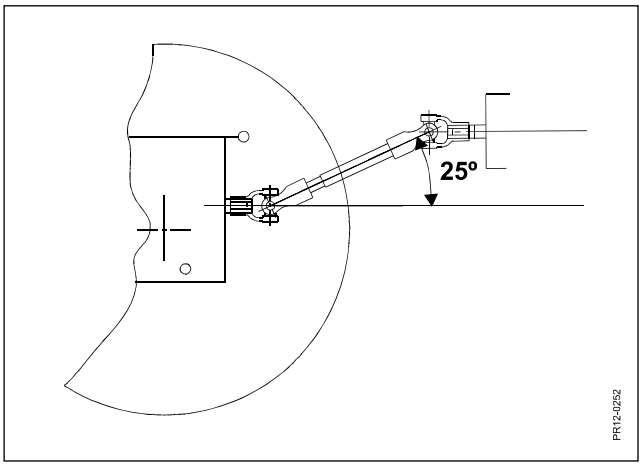


Fig. 2-6

2. CONNECTION AND TEST DRIVING

CONNECTION TO THE TRACTOR

IN GENERAL

The headstock is identical for several –JF- machine types and is designed for connection to the hydraulic lift arms of the tractor. During transport, the PTO drive shaft between the headstock and the machine can remain connected.

PREPARATION AFTER ASSEMBLING

Fig. 2-1: Mount the headstock to the machine with a pin which is locked with a special pin.

Fig. 2-2: Fasten a hydraulic cylinder or a mechanical conversion link with a pin and a cotter pin.

Fig. 2-3: The right hand lift arm can be adjusted sideways and thus be adjusted to the width of the tractor.

CONNECTION

Adjust the lift arms of the tractor to approx. 30 cm above the ground. Reverse and connect the lift arms by means of the pins.
Stabilise the lift arms sideways so that the machine is just full width cutting - too much to the right will overload the tractor and the PTO shaft unnecessarily.
Lift the machine, raise the two jacks.
Mount the top link as parallel to the lift arms as possible in the mounting hole on the tractor which provides the longest top link.

Fig. 2-4: Fasten the spring hook to the stop.

DEMANDS AND WISHES TO THE CONNECTION:

The length of the PTO shaft must be so that it has a proper overlapping and is not squeezed too much.

Fig. 2-5: The working angles of the PTO shaft are between –10º and +25º from
Fig. 2-6: horizontal.

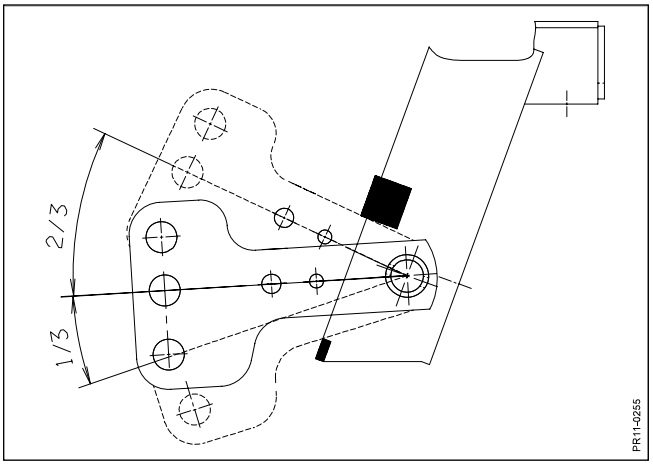
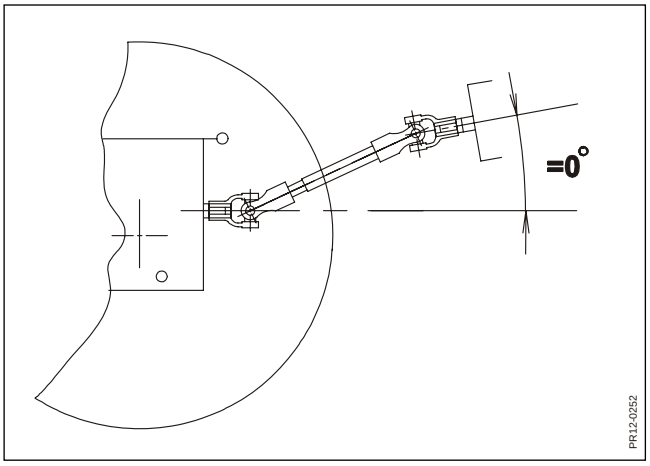


Fig. 2-7



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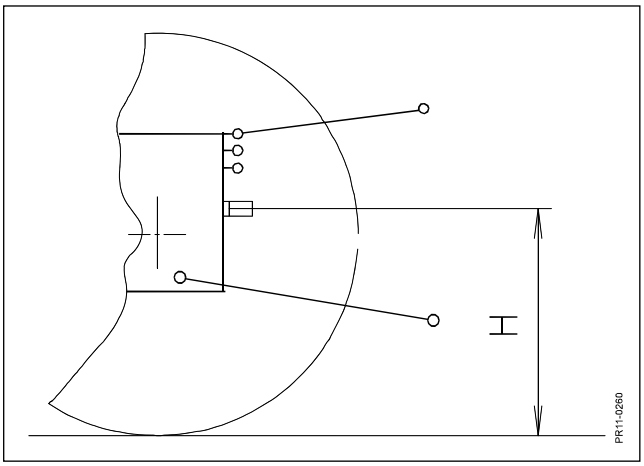

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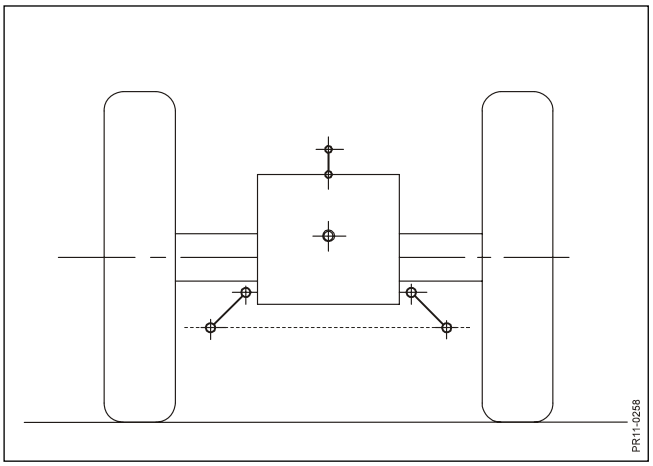

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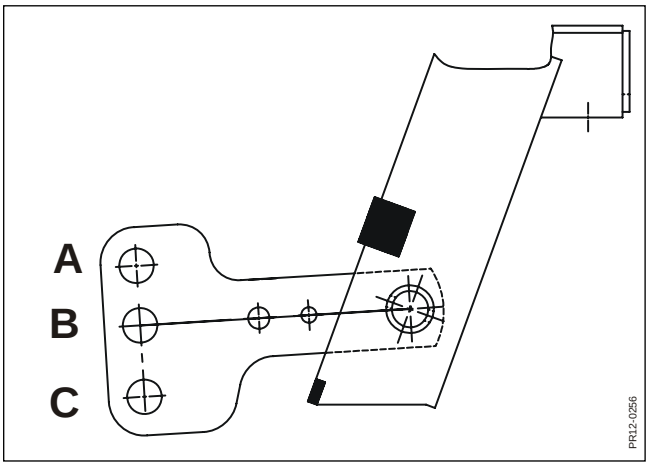


Fig. 2-11

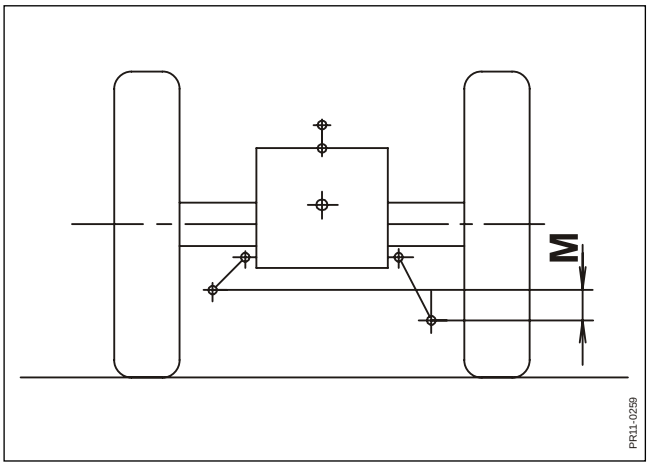


Fig. 2-12

Fig. 2-7: The ground following ability is 1/3 downward and 2/3 upward when the relief is for 30 - 40 kg ground pressure.

Fig. 2-8: The PTO of the tractor and the PIC (power in-take) of the machine must be parallel, i.e. the angle between them must be **as close to 0º as possible.**

WHAT TO DO:

Fig. 2-9: Measure the height **H** of the PTO shaft (power take-off) of the tractor above the ground.

Fig. 2-10: Adjust the lift arms of the tractor so that they are at the same level, unloaded.

Fig. 2-11: Choose hole in the lever arm at the left coupling point.

Height H of the PTO of the tractor	Connection hole for left lift arm
H < 650 mm	A = upper hole
650 < H < 800 mm	B = middle hole
H > 800 mm	C = bottom hole

Fig. 2-12: If the machine is not equipped with a lever arm with 3 holes at the left coupling point, adjust the lift arms. **Adjust the right lift arm in proportion to the left.**

Height H of the PTO of the tractor	Adjustment of the right lift arm in proportion to the left
H < 650 mm	50 mm upwards
650 < H < 800 mm	0 mm
H > 800 mm	50 mm downwards

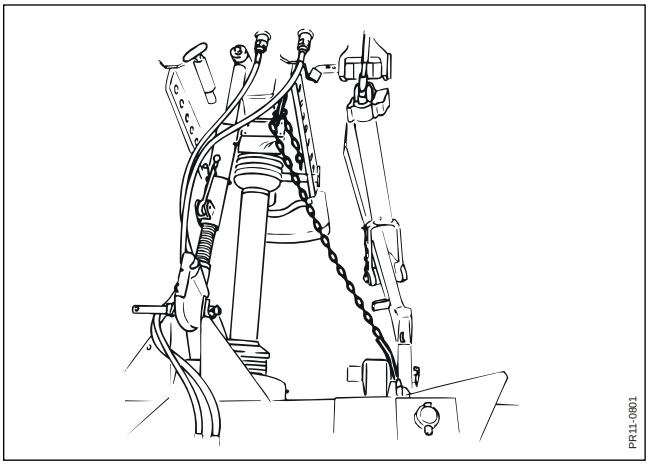


Fig. 2-13

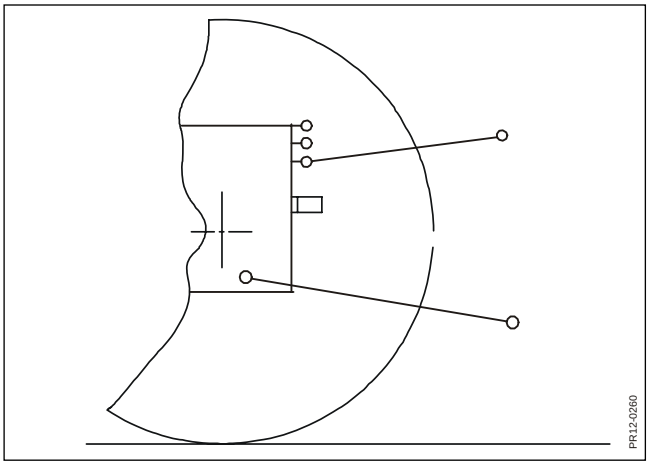
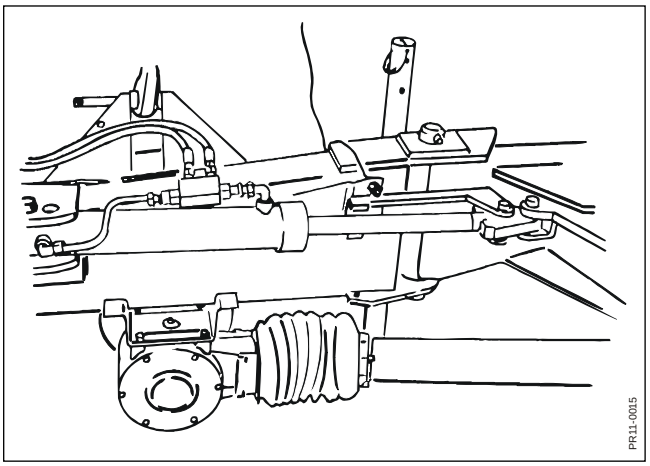


Fig. 2-14



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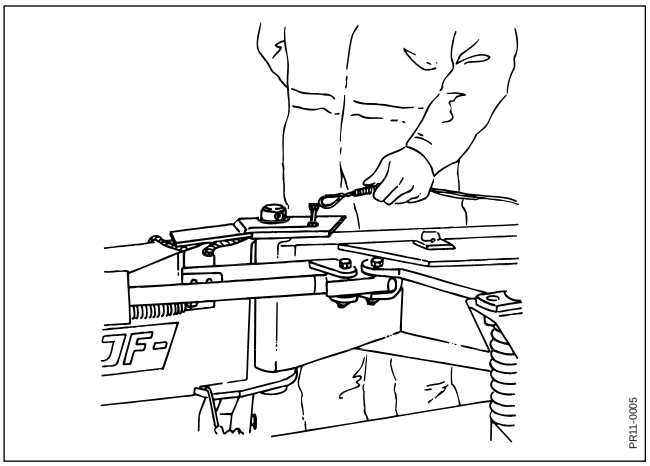

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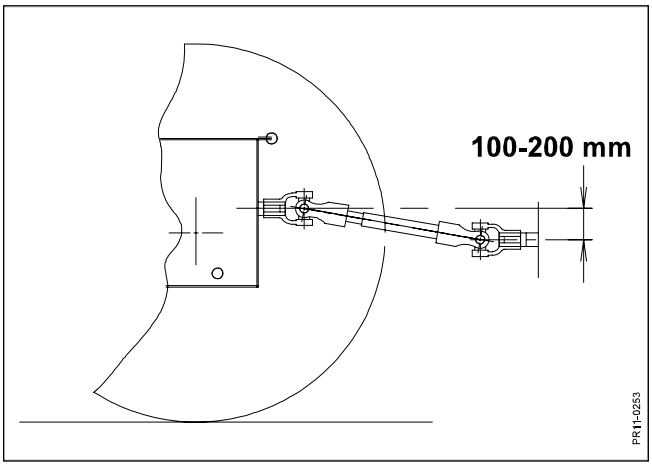


Fig. 2-17

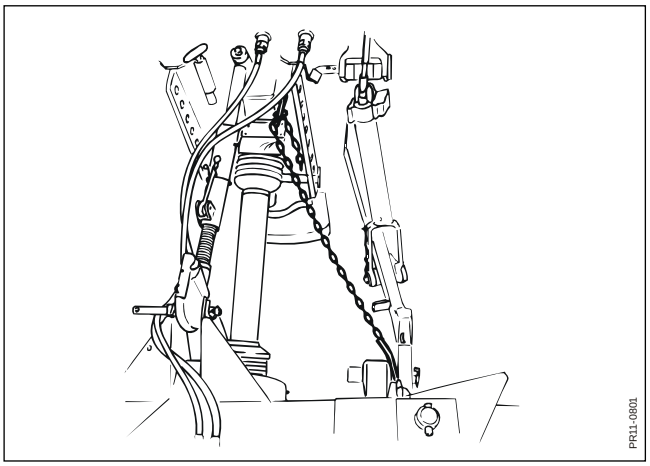


Fig. 2-18

Fig. 2-13: Connect the lift arms of the tractor to the coupling points of the machine. At the same time, mount the bottom stop chain on the right lift pin and its chainlock at the top link fix point.

Fig. 2-14: Mount the top link. Try low position on the tractor side first with a view to subsequent connection and disconnection.

Fig. 2-15: Connect the swivel cylinder to the double-acting hydraulic outlet of the tractor.

Fig. 2-16: Raise the machine and place it in working position. Mount the spring hook for the stop.

Fig. 2-17: Fix the working position of the bevel gear. The PIC (Power Intake Connection) must be 100 - 120 mm lower that the PTO of the tractor (= approx. 10º).

Fig. 2-18: Mount the support chain so that the bottom stop = the working position of the bevel gear.

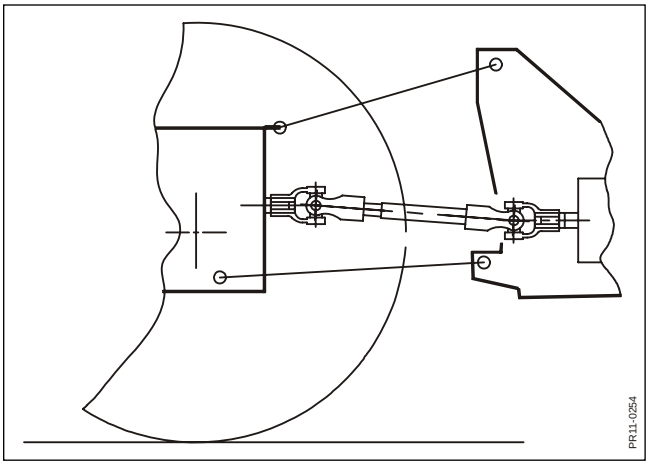


Fig. 2-19

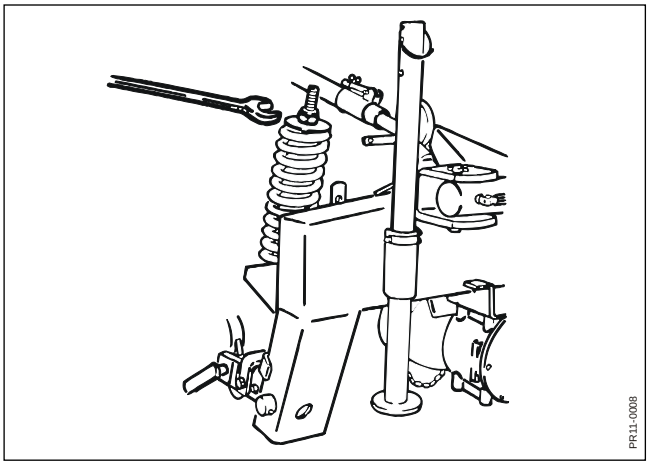


Fig. 2-20

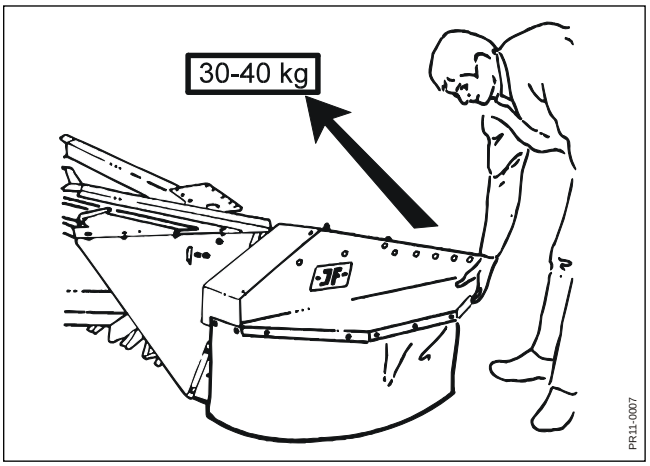
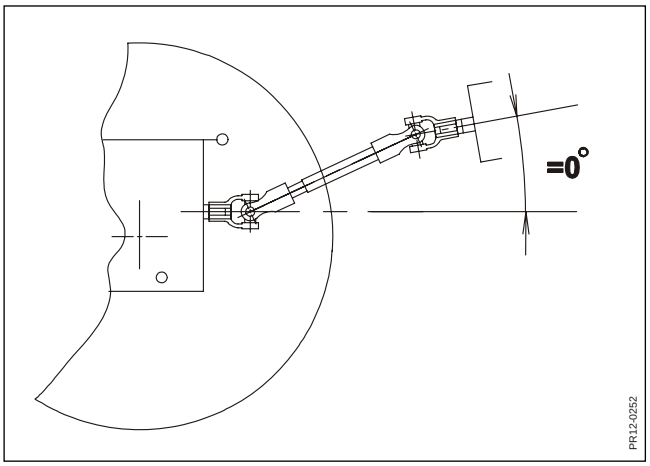


Fig. 2-21



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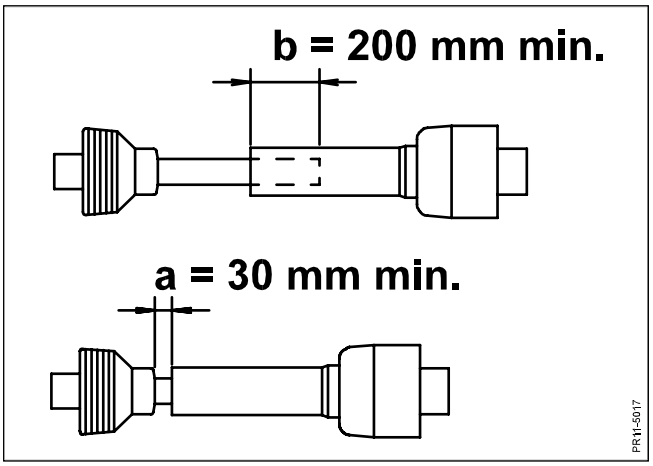


Fig. 2-23

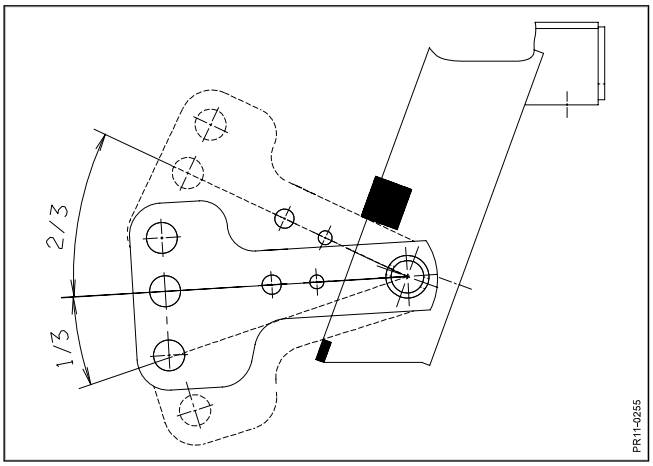


Fig. 2-24

Fig. 2-19: Lower the machine into working position and adjust the length of the top link so that the headstock is in vertical position.

Fig. 2-20: Adjust the relief spring to the wanted relief. It must be possible to lift the extreme end
Fig. 2-21: of the machine with a power of 30 – 40 kg.

Adjust the lift arms of the tractor to stop when the machine has been lifted sufficiently from the ground, because of the maximum upward angle of the PTO shaft.

Fig. 2-22: If, in raised position, the machine has a forward inclination of more than 5°, mount the top link higher on the tractor and repeat Fig 2-17.

Fig. 2-23: Adjust the length of the PTO shaft so that it:

- In working position has minimum 200 mm overlapping.
- In no position is compressed more than the prescribed 30 mm in order not to bottom the shaft.
- In the outmost position has minimum 100 mm overlapping.

Fig. 2-24: Check that the lever arm can move approx. 1/3 downward and approx. 2/3 upward when the cutting unit rests on the ground and the suspension is in working position to make sure that the machine has sufficient ground following ability. Adjustment is made by raising or lowering the right lift arm in proportion to the left

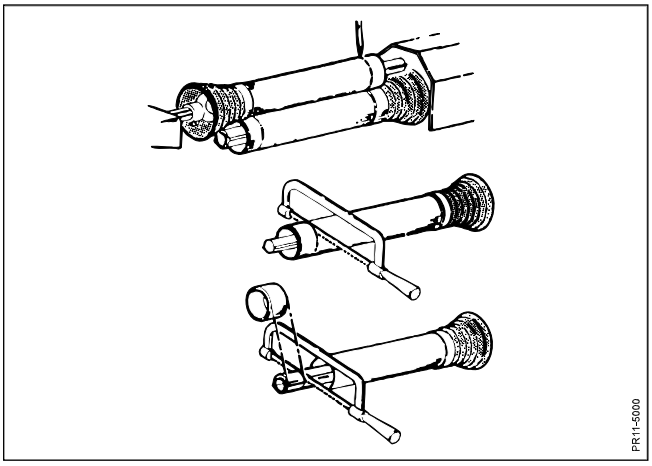


Fig. 2-25

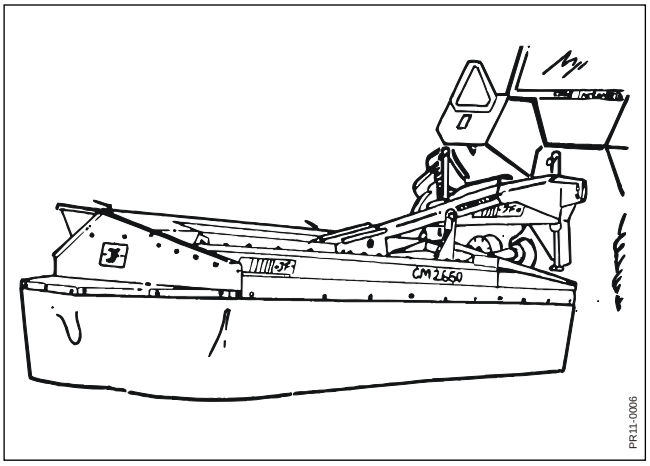


Fig. 2-26

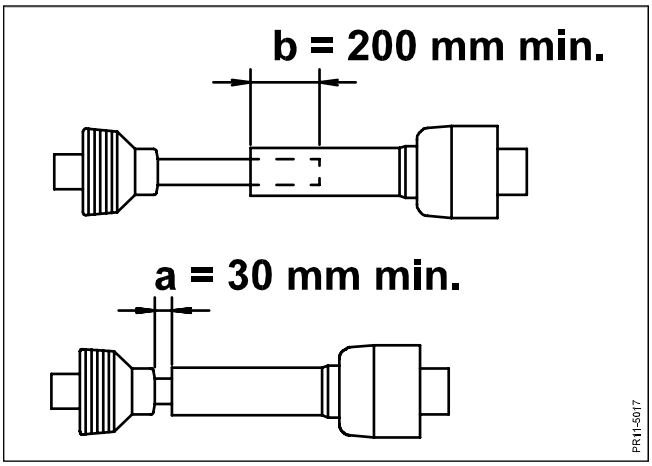


Fig. 2-27

Fig. 2-25: Mount the PTO shaft with the freewheeling towards the machine side. Check that the tubes do not touch each other (squeeze or bottom). If necessary, shorten all 4 tubes (see section on ADJUSTMENT OF THE PTO DRIVE SHAFT).

PARKING OF THE MACHINE

Fig. 2-26: Disconnect the machine in transport position. Release the spring hook for the stop, lower the lift arms and disconnect the top link.
Raise the lift arms and lower the jacks, lower the lift arms and release them from the machine.

THE PTO DRIVE SHAFT

If the machine is connected to a tractor with hydraulic or pneumatic control of the PTO, the PTO drive shaft must be replaced by a PTO drive shaft with friction clutch and freewheeling.

ADJUSTMENT OF THE PTO DRIVE SHAFT

Dimensions and movements of the lift arms of the individual tractor brands are not standardised. Therefore, the distance from the power take-out (PTO) of the tractor to the input shaft (PIC) on the centre gearbox may vary according to the tractor.
It may therefore be necessary to shorten the PTO shaft before using it on the machine to ensure correct operating ability.

IMPORTANT: Do not shorten your new PTO shaft until you are certain that it is necessary. From the factory the shaft is adjusted to the distance from the PTO to the PIC which is standard on most tractor brands.

<u>If it is necessary to shorten the shaft on your machine, the following applies:</u>

Fig. 2-27: Adjust the length of the PTO shaft so that it:

- **has as much overlapping as possible**
- **in no position has less overlapping than 200 mm.** (As the distance from the PTO to the PIC varies when the machine moves up and down within the normal working area, make sure that the overlapping is sufficient in both extreme positions).
- **is not compressed more than the prescribed 30 mm in order not to bottom the shaft.**

IMPORTANT: The specified values for overlapping on the tubes of the PTO shaft must be observed as shown on fig. 2-27.

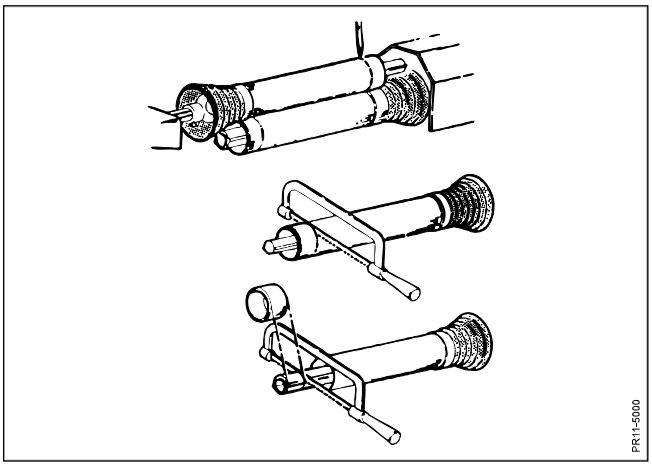


Fig. 2-28

Fig. 2-28: Shortening procedure:

1) Separate the PTO shafts in two halves and mount these on the PTO and the PIC, respectively, when these are at the same horizontal level. This corresponds with the shortest possible length of the shaft on this machine and usually corresponds with the working position when the machine rests on even ground.
2) Hold the ends of the shafts parallel side by side and mark the 30 mm (minimum) on the tubes. See also fig. 2-28.
   Check the overlap, 200mm.
3) Shorten all 4 tubes equally.
4) Round off the ends of the profile tubes and remove burrs carefully with a file until the tubes are smooth. It is important **to deburr the inside of the outer tube and the outside of the inner tube.** Thereby the surface of the profile tubes is secured against damage by sharp edges and impurities.
5) Clean the ends of the profile tubes of dirt and loose burrs.

WARNING: Lubricate the profile tubes carefully before reassembling. If the shaft has insufficient lubrication it may lead to high frictional forces during work which may cause the transmission to be overloaded.

Check that the PTO has sufficient overlapping in all positions by raising and lowering the machine by means of the hydraulic.

Finally, check that the number of rotation of the PTO of the tractor is the 540 RPM or 1000 RPM which the machine is intended for and that the direction of rotation is correct.
A too high number of rotations of the PTO can be highly dangerous. A too low number of rotations, however, may cause insufficient cutting and an unnecessarily high torque load on the transmission.

SECURING AGAINST OVERLOAD

IMPORTANT: The tractor driver can secure the transmission against overload!

<u>When using the machine, the following should be considered</u>:

1) Always start the machine with the engine running at low speed. This especially applies to tractors with electro-hydraulic connection of the PTO shaft.

2) When starting, the cutting unit must be lowered to the ground and the machine must be in working position.

3) A sudden increase in the number of RPM of the machine, e.g. when driving into the field or after turning in the field should also happen with the machine close to working position.

4) Listen to the RPM of the tractor when working in the field. If the RPM falls slowly or is suddenly reduced it can be a sign of overload of the transmission due to too high speed or foreign bodies in the cutting unit.

WARNING: If the PTO is connected in transport position it will break.

FREEWHEELING

The PTO drive shaft is equipped with an overrun clutch or a combined friction/overrun clutch. The shaft must be mounted with the clutch towards the machine side.

TEST DRIVING

CHECK BEFORE TEST DRIVING

Before test driving, the following should be checked:

1. That the hydraulic components are correctly connected and tightened.
2. That the PTO shaft of the tractor has the correct number of RPM.
3. That the bevel gear has the correct oil level. See section 4; LUBRICATION.
4. That all lubricating points have been greased. See section 4; LUBRICATION.
5. That all blades on the rotors are intact and correctly mounted.
6. That connection of the PTO shaft of the tractor is made with the cutting unit lowered to the ground and the machine in working position.
7. That connection of the PTO shaft of the tractor is made with a low number of RPM on the engine.
8. That the PTO shaft between the PTO of the tractor and the PIC of the centre gearbox is not squeezed, or bottomed, when the lift arms of the tractor are raised and lowered carefully.
9. That the safety guards of the PTO shafts do not rotate with the shafts, that the support chains are fastened correctly.
10. That the protection (guards and canvases) on the machine are complete, intact and correctly mounted.
11. That all tools have been removed from the machine.
12. That nobody stands near the machine during operation.
13. That all retaining springs under the canvases have been folded down.

THE ACTUAL TEST DRIVE

When all guards are in place, a test drive can be made. Remember to fold down the retaining springs below the canvas.
Connect the PTO shaft carefully and let the engine run at a low number of RPM for some minutes.
If there is no unintended noise or unusual vibrations, the speed can gradually be increased to normal number of RPM (PTO = either 540 RPM or 1000 RPM).
Apart from the tractor driver nobody should stand near the machine.
Do not activate the hydraulic cylinders if persons are near the machine.

NB: All machines have been tested for vibrations before they leave the factory. This is an essential part of the company's quality assurance.

It is, however, necessary to check regularly whether the machine has unnatural vibrations, especially during test driving.

WARNING: When rotors and blades rotate with up to 2500 RPM, even slightly damaged rotating parts (blades, rotor skirts and drums) can cause vibrations which in the long run may lead to secondary damage in the form of cracks or fractures.

Even though the machine has been secured against vibration damage, there will always be a certain risk, though limited.

During the season check daily if blades, rotor skirts and drums are damaged and replace the parts, if necessary.

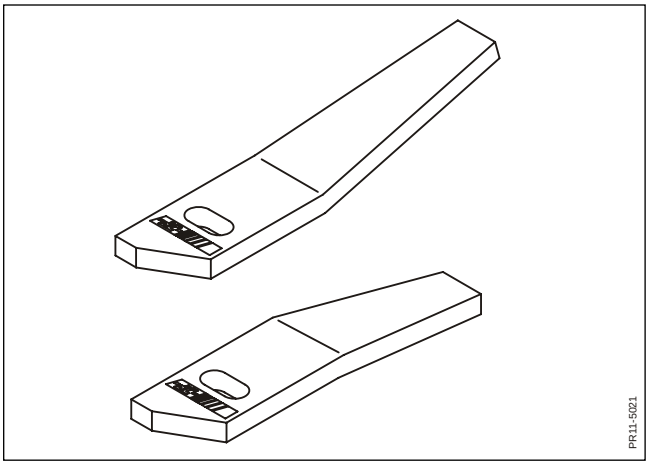


Fig. 3-1

3. ADJUSTMENTS AND DRIVING

CONSTRUCTION AND FUNCTION

CM 2650 is a drum mower which is connected to the tractor and lays a gathered swath beside the wheels of the driving tractor.

THE MOST IMPORTANT ELEMENTS OF THE MACHINE

BLADES

Each rotor on the machine has a set of blades. These blades are made of 4 mm hardened high-strength steel.

REMEMBER: Before working, check:

- that all blades are there and correctly mounted.
- that no blades are bent or cracked.
- that all blades can turn freely around the blade bolt.

ROTOR SKIRTS

The rotor skirts turn towards each other in pairs to ensure the shortest way of the material through the machine and thus optimise the flow of material.
This construction ensures that the cutting is not blocked by the material and that the cut grass does not remain on the ground with the risk of being recut.

NB: It is not possible to change the direction of rotation of the individual rotors.

CONDITIONER ROTOR

The main purpose of this rotor is to condition, lift and transport the material to the rear so that a gathered swath can be laid by means of the swath guards.

Fig. 3-1: The rotor is equipped with PE-fingers which have several important advantages:

- various tests have shown that the fingers have an incredibly high wear resistance.
- the fingers have sufficient rigidity to create an efficient conditioning between the conditioner plate and the rotor.
- the fingers are flexible and can bend and thus avoid possible foreign matter in the conditioner rotor.
- if a finger should break off the rotor, you avoid metal in the swath which could cause serious secondary damage.

At the same time, the fingers are constructed so that the grass falls in the correct angle which results in optimal preconditions for gathering a regular swath behind the machine.

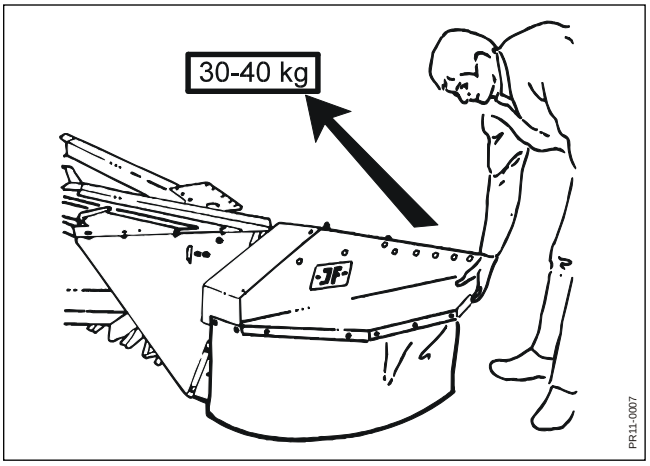


Fig. 3-2

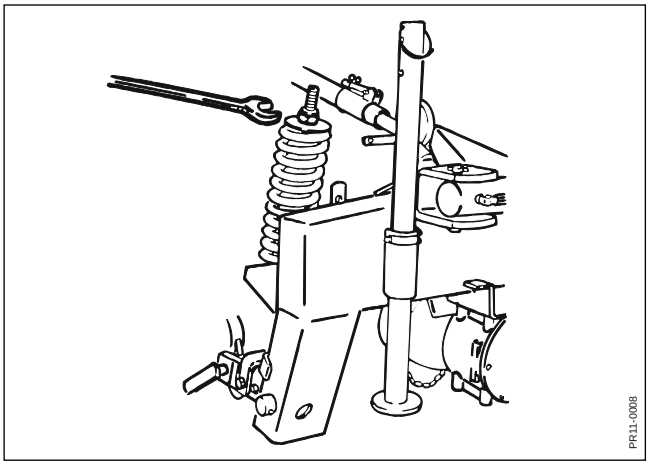


Fig. 3-3

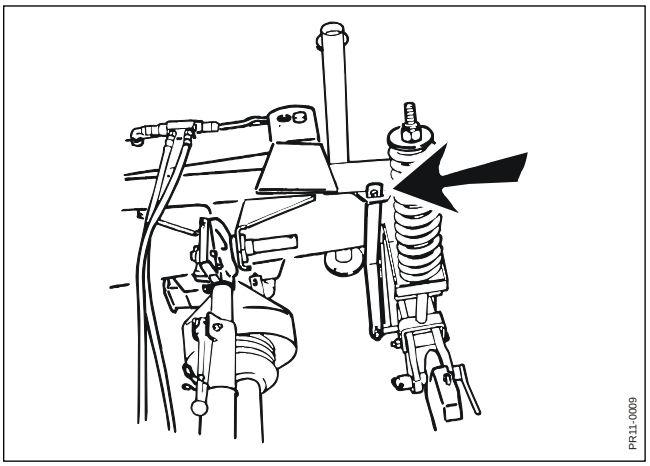


Fig. 3-4

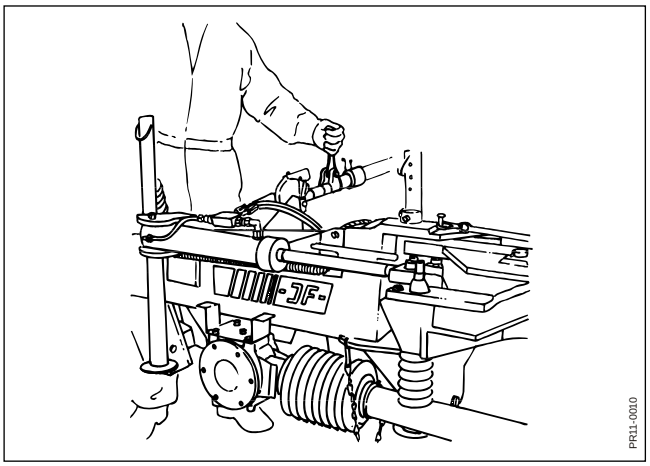


Fig. 3-5

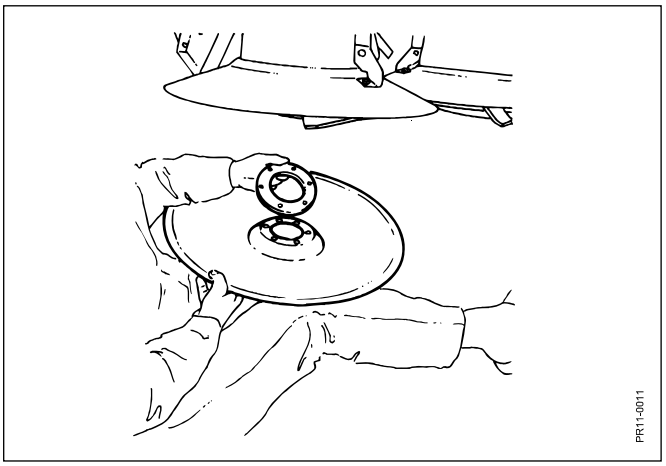


Fig. 3-6

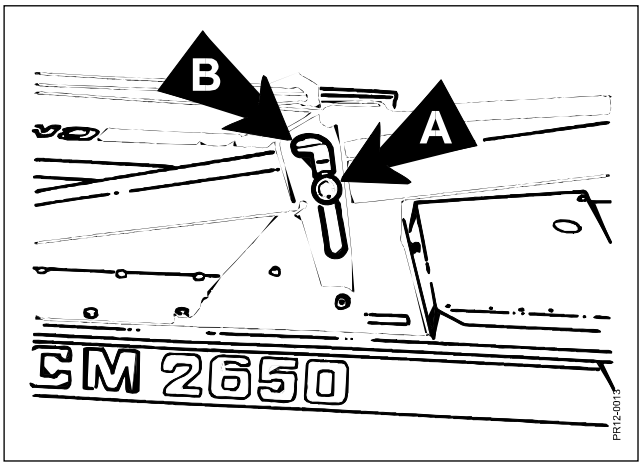


Fig. 3-7

ADJUSTMENTS

On **CM 2650** there are several elements which must be adjusted correctly to ensure optimal performance.

GROUND PRESSURE

Fig. 3-2: The ground pressure of the machine must be 30 - 40 kg in the right side.

Fig. 3-3: Adjust the ground pressure by tightening or loosening the pressure springs after having adjusted a suitable ground clearance (see section 2; CONNECTION AND TEST DRIVING) on the lift arms of the tractor. Adjust the stop of the lift arms so that it can easily be restored. If the lift arms are not good, use support chain 4220-8001 (auxiliary equipment).

Fig. 3-4: Check by keeping an eye on the measuring rod – the hole in proportion to the slot.

CUTTING HEIGHT

Fig. 3-5: The cutting height can be adjusted with the length of the top link. A short top link gives a low cutting height.
N.B. Avoid backward inclination as the machine will then recut.

Fig. 3-6: A higher cut is obtained by mounting the supplied spacers at the guide shoe (the tool packet).

TRANSPORT LOCK

CM 2650 is equipped with a stop which blocks the movement of the machine in the hinge point when the machine is in transport position.

Fig. 3-7: Correct function is obtained by adjusting the eye bolt so that position **A** (free) is obtained in working position and position **B** (blocked) is obtained in transport position.

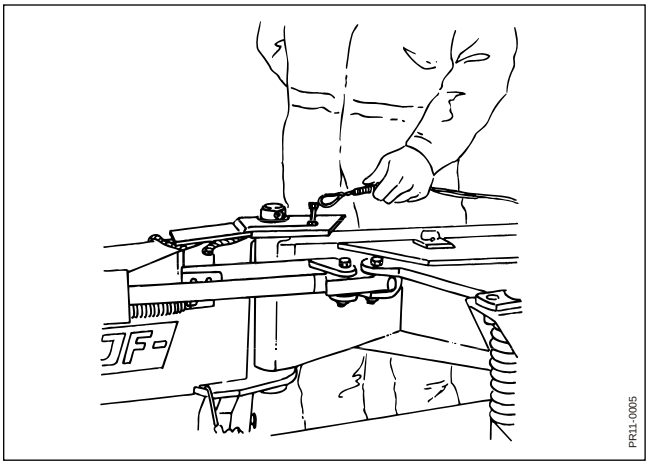


Fig. 3-8

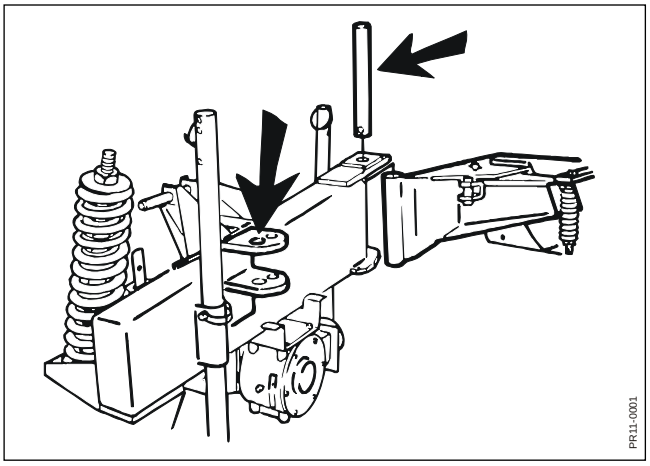


Fig. 3-9

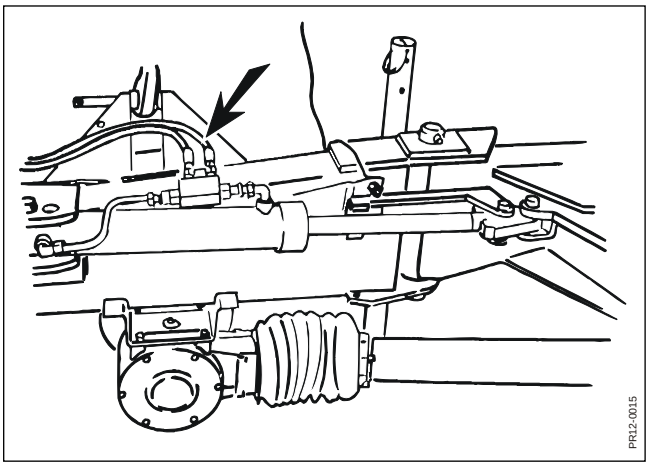


Fig. 3-10

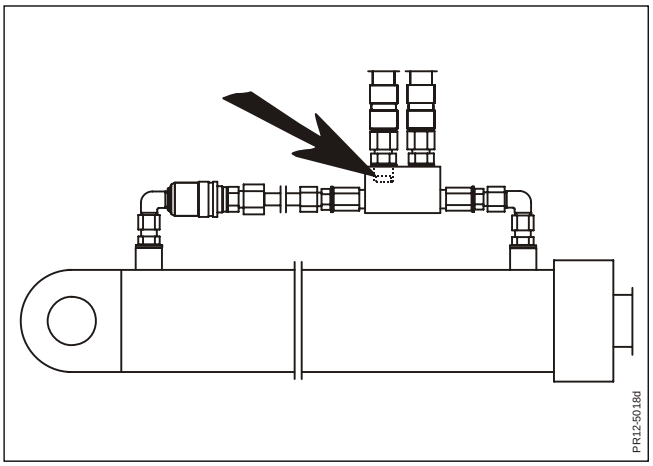
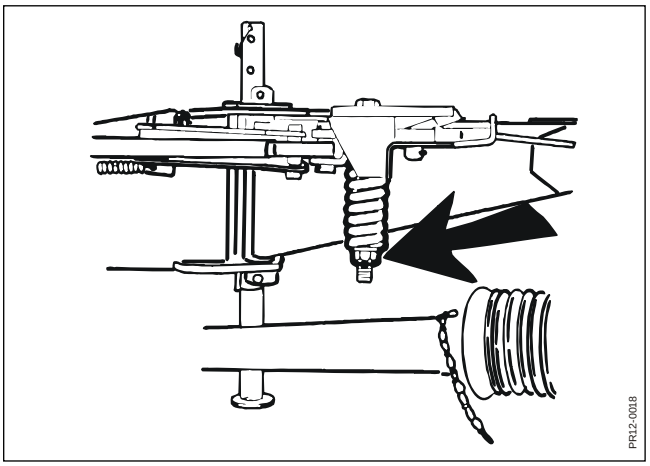


Fig. 3-11



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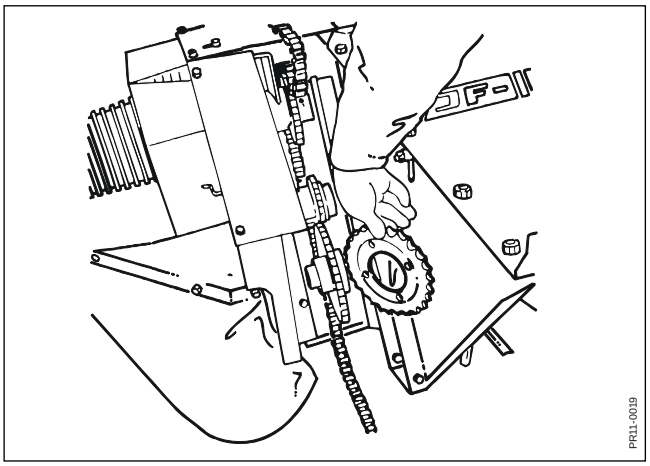


Fig. 3-13

Fig. 3-8: The stop is put out of action (when disconnecting) by loosening the spring hook.

CONVERSION UNIT

Fig. 3-9: The headstock is supplied with hydraulic conversion. Mount the conversion unit on CM 2650 in the left hole.

WARNING: Close the ball valve before transport. This prevents unintended activation during transport.

Fig. 3-10: Connect the hydraulic adjustment to the hydraulic outlet of the tractor.

Fig. 3-11: To prevent accidents, a throttle gauge has been mounted in order to reduce the speed of movements. Adjust the hydraulics of the tractor to minimum oil level.

The movements of the hydraulic cylinder are limited by means of a spring-actuated stop. This stop ensures that the machine is not unawares swivelled into transport position with a rotating PTO shaft.

IMPORTANT: Do not release the stop by means of the cord until you have stopped the machine completely. Otherwise the PTO may break.

Fig. 3-12: The safety release allows the machine to move backwards when for instance driving against firm objects.
If the safety release has been released it is easy to drive the mahcine into mesh again by reversing the tractor.
Tighten the spring approx. 5 mm (3 turns). Do not tighten the spring so much that the release is blocked.

FINGER CONDITIONER

The degree of conditioning is adjusted by changing the rotor speed and the distance between the conditioner plate and the conditioner rotor.
A hard conditioning is obtained through high speed (little sprocket wheel at the conditioner rotor, 27 teeth) and short distance between the conditioner plate and the rotor.
A careful conditioning is obtained through low speed (large sprocket wheel at the conditioner rotor, 33 teeth) and long distance between the conditioner plate and the rotor.

The conditioner on the machine can, as standard, run at two speeds:

- High = 883 rpm, for ripe, grassy crops.
- Low = 723 rpm, for green, leafy crops which are easy to condition.

For whole crops, a 16 teeth sprocket wheel can be delivered as auxiliary equipment and replace the driving gear whereby the speed is reduced to 503 RPM.

Fig. 3-13: If you wish to increase the rotor speed, replace the 33 teeth sprocket wheel on the rotor shaft by a 27 teeth sprocket wheel from the supplied spare parts package.
After replacing the sprocket wheel, adjust the chain length.

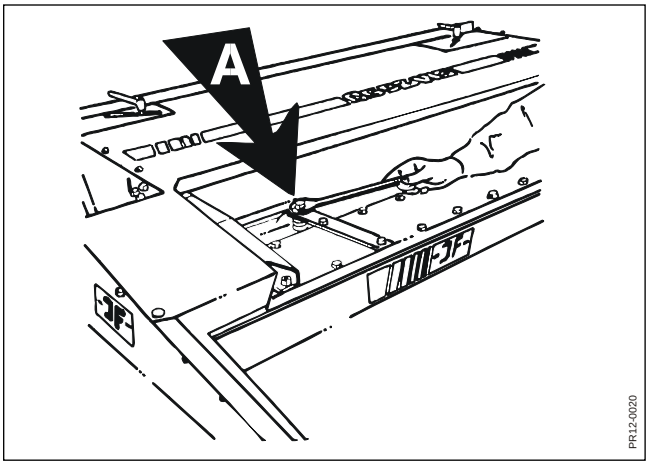


Fig. 3-14

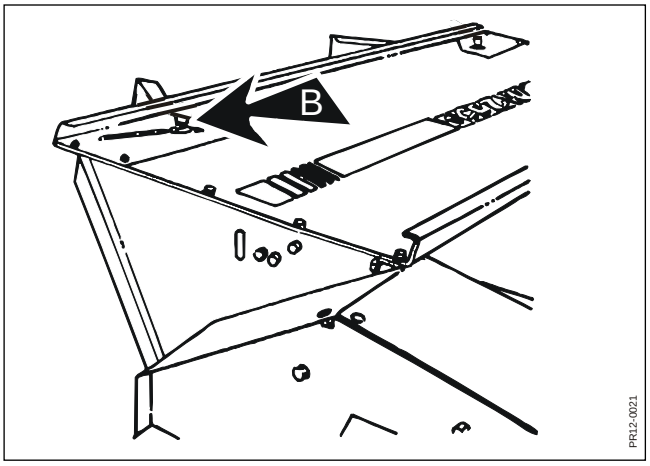


Fig. 3-15

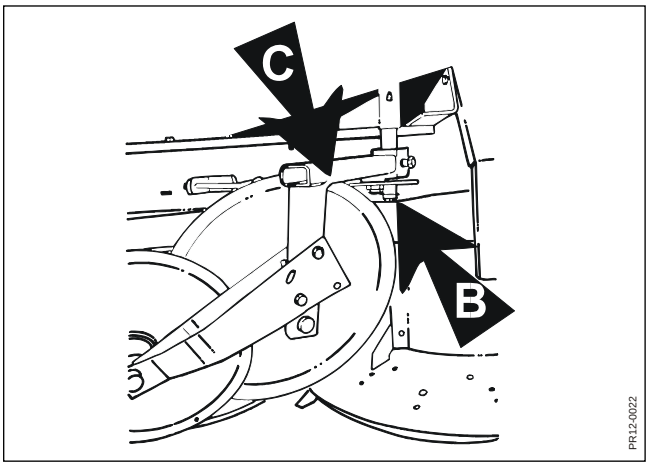


Fig. 3-16

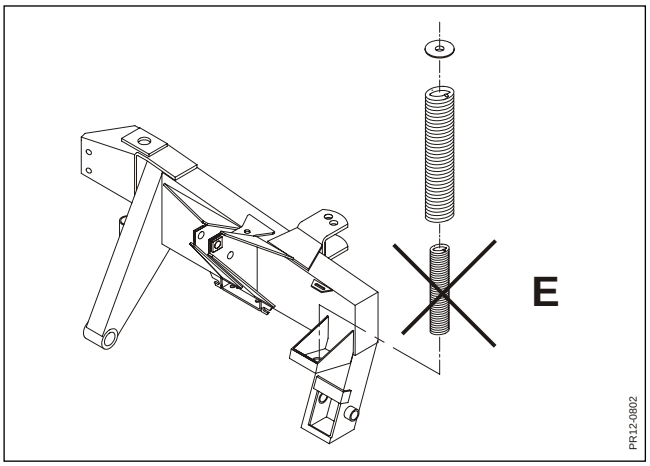


Fig. 3-17

CONDITIONER PLATE

Fig. 3-14: Adjust the plate with 2 nuts **A**.
For leafy crops, a low degree of conditioning is obtained by adjusting a long distance between the conditioner plate and the rotor.
The machine is equipped with a simple and easily operated system for adjustment of the degree of conditioning. This degree of conditioning is changed by regulating the distance between the conditioner plate and the conditioner fingers on the rotor.

Fig. 3-15: Adjust the swath width at the nuts **B**. Use the wrench tool supplied for replacement of blades.

The golden rule is: The shorter the distance, the stronger the conditioning of the crop.

The adjustment of the system depends on several conditions. The optimal conditioning can be obtained with the following adjustment of the conditioner plate:

You have a:	Succulent green crop			or	Strawy, more ripe crop	
You want to drive:	above 8 km/h	below 8 km/h			above 8 km/h	below 8 km/h
The following adjustment of the machine is recommended:						

Conditioner rotor speed	High				X	X
	Low	X	X			
Distance between conditioner plate and rotor	Long		X			
	Medium	X				X
	Short				X	

From the factory the machine is adjusted for a medium degree of conditioning.
This adjustment provides a satisfactory performance under normal conditions.

SWATH ROLLERS

Fig. 3-16: Adjust the swath rollers so that the crop is placed in a suitable swath in such a way that the tractor wheels do not drive in the material.
Adjustment is made by loosening the screw **B** and turning the arm **C**.
The swath roller set for mounting after delivery has order No. 4320-1201.

Fig. 3-17: When driving without conditioner, a better ground adaptation can be obtained by dismounting the inner spring **E**.

DRIVING WITH THE MACHINE

STARTING

When arriving at the field you want to work in, the following procedure must be followed:

1) Lower the cutting unit to the ground without driving into the crop.
2) Connect the PTO of the tractor with the engine at idle speed.
3) Increase the number of rotations gradually until the wanted 540 rpm or 1000 rpm on the PTO is obtained.
4) Drive forwards and lead the cutting unit into the crop.

NB: It is normal that the revolving parts (rotors and blades) will be noisy when starting due to the high number of rotations of the rotors (2500 RPM).
The noise will decrease when the machine works in the crop.

WORKING IN THE FIELD

There are several important conditions to be aware of when mowing with the machine.

Theoretically, it is possible to work with a speed of 15 km/h. However, always adjust the driving speed to the conditions, i.e. the amount of crop and the conditions of the ground.

The tractor driver should constantly be in full control of the tractor and be able to avoid unevenness on the ground and foreign matter in front of the tractor and the machine.

Reduce the driving speed if:

- the ground is uneven or hilly
- the crop is lying down
- the crop is unusually high and thick

Increase the driving speed if:

- the crop is low and thin
- the crop contains for instance peas etc.

As mentioned earlier, it is important that you pay special attention when working on hilly ground. Reduce the driving speed and be aware of the movement of the machine on the ground.
On hilly ground there is a greater risk that the machine hits a bank of earth or foreign matter and you, as a tractor driver, should minimise the risk of damage to the equipment.

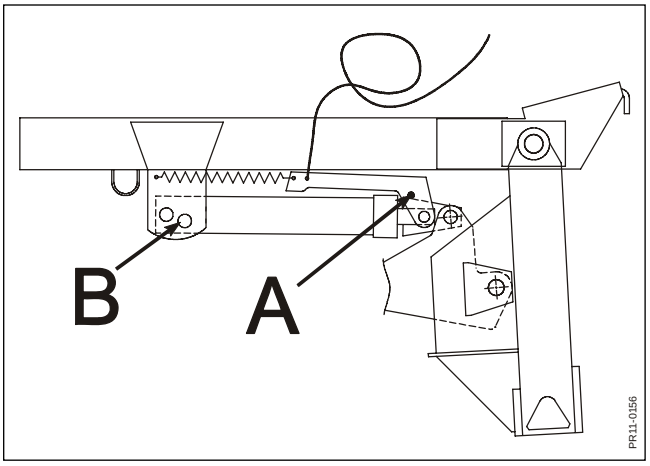


Fig. 3-18

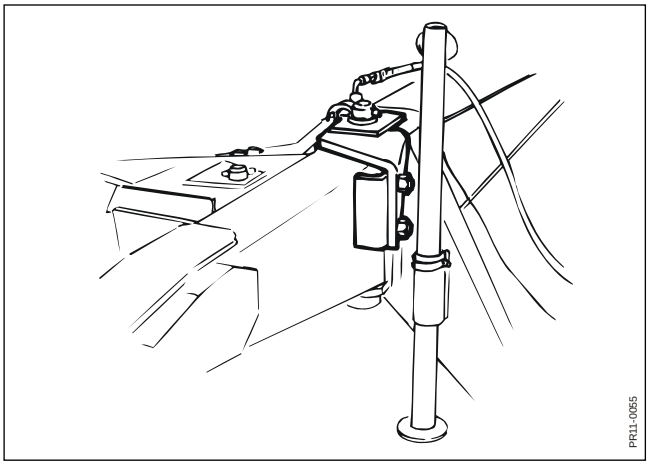


Fig. 3-19

REMEMBER: As long as the stubble remains uniform and the machine moves evenly and smoothly across the ground, the driving speed is at the correct level.

DANGER: When driving along field boundaries and steep slopes, always be careful and never drive too fast, partly because of foreign matter on the boundary and partly because of often varying ground conditions along steep slopes and boundaries.

During mowing make sure to keep a constant number of rotations on the PTO shaft (540 / 1000 rpm) to ensure that the cutting parts work optimally.

DRIVING WITH THE MACHINE IN OBLIQUE POSITION (DOUBLE SWATHING)

Only drive the machine in oblique position with a wide angle PTO drive shaft between the two gearboxes. With a normal PTO drive shaft, the angle deviation will cause huge vibrations in the transmission parts with danger of fatigue fractures in the transmission.

When the wide angle PTO drive shaft has been mounted, it must be removed in transport position.

Therefore, the cord for operating the pawl must be removed when using a wide angle PTO drive shaft.

Fig. 3.18 Before turning, lock the stop with a pin A.
This pin is fastened to the PTO drive shaft with a chain and can only be mounted when the PTO drive shaft has been dismounted. Place the PTO drive shaft in the holder after dismounting. Only dismount the half of the PTO drive shaft towards the machine. Fasten the hydraulic cylinder in hole B intended for oblique driving.

Fig. 3.19 Adjust the deviation angle forward with fillers.

TURNING

When turning in the field, lift the cutting unit from the ground and lower the number of rotations.

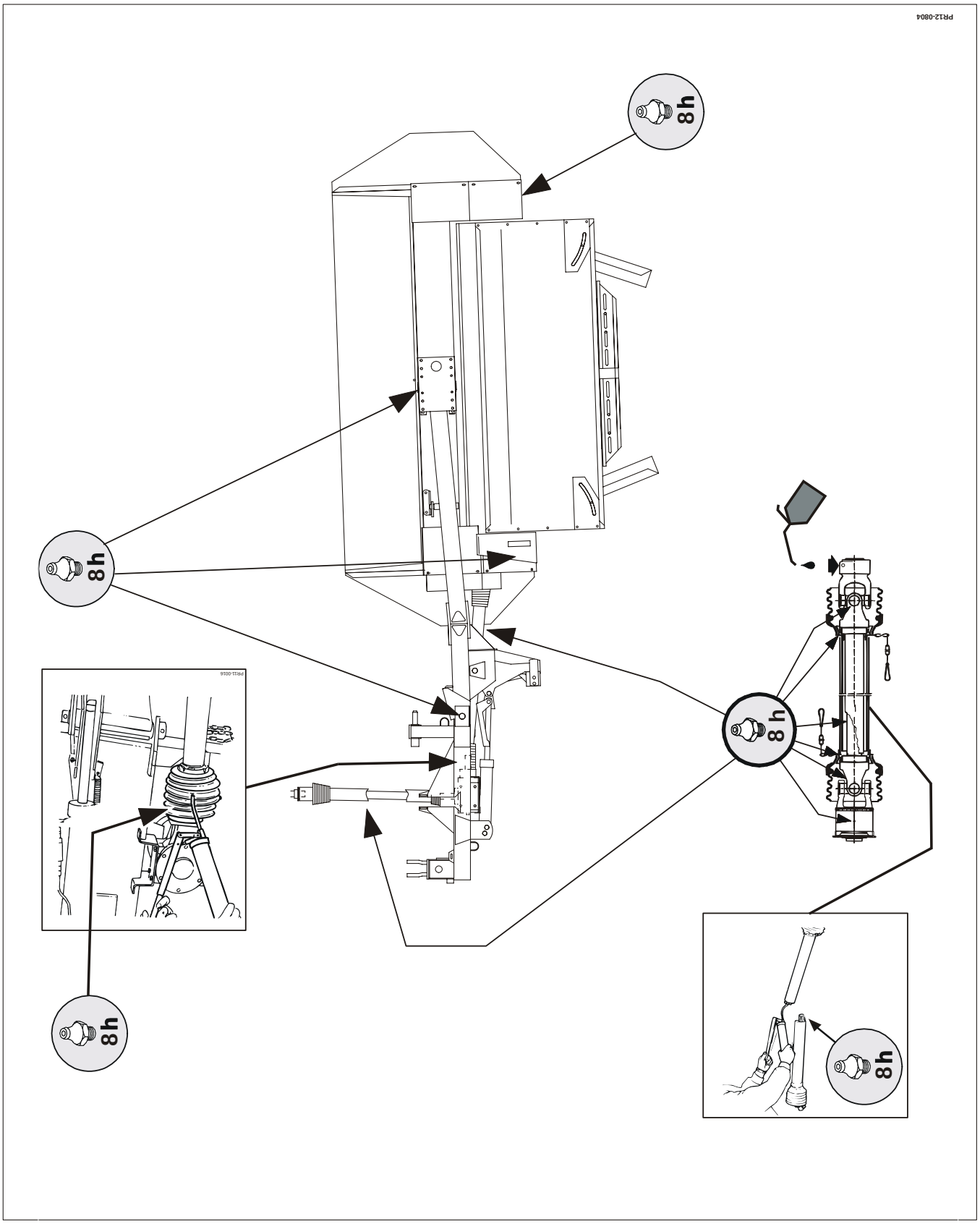
Lower the cutting unit to the ground before increasing the number of rotations again.

When turning on hilly ground or on steep slopes, turn with the machine towards the hill/slope, if possible, to ensure sufficient stability of the tractor.
Always reduce the driving speed when turning in the field.

IMPORTANT: Do not reverse with the machine in working position.

Lubrication chart for mower type: CM 2650

The indicated lubricating points **must** be lubricated according to the prescribed operation interval.



4. LUBRICATION

LUBRICATION WITH GREASE

Always make sure that the machine has been properly and sufficiently lubricated before working.

Go through the lubrication chart on the opposite page.

Type of grease: Universal grease of good quality.

The rotor gearbox is pre-lubricated with special grease type:

SHELL ALVANIA RO

Check and refill is unnecessary. When repairing **only** use this type of grease.

Rotating mechanical connections are lubricated with grease or oil as required.

IMPORTANT - REMEMBER: **Lubricate the PTO shaft after every 8 working hours.** Pay special attention to the **sliding profile tubes** of the PTO shaft.
They must be able to slide back and forth when the torque is heavy during working.

If you neglect to lubricate the profile tubes sufficiently, it will result in high frictional forces (seizing) **which will damage the profile tubes and in time also connecting shafts and gearboxes.**

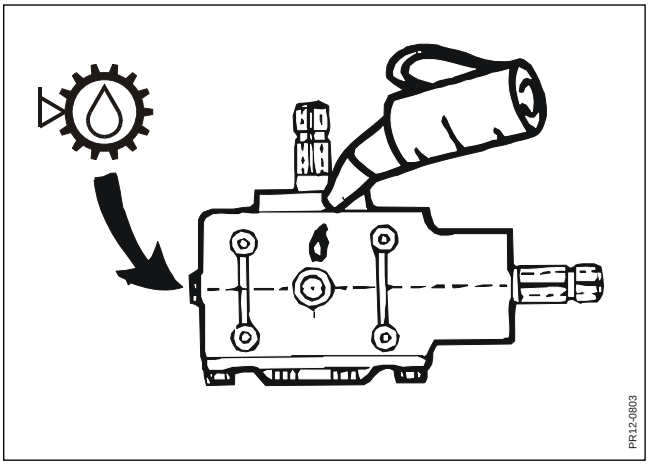


Fig. 4-1

MACHINE PARTS WITH OIL

BEVEL GEAR

Fig. 4-1: This angle gear drives the rotor gearbox and the chain drive for the conditioner rotor.

Correct oil content: **1,0 litres**

Correct oil type: API GL4 or GL5 SAE 80W - 90

Correct oil level:  Check the oil level after every 80 hours of operation at the level screw.

Oil change:  Make the first oil change after 50 hours of operation, and then after every 500 hours of operation or at least once every season.

CHAIN DRIVE

On the left side of the machine is the chain drive which drives the conditioner rotor.

This chain drive must be lubricated during operation and the chain should constantly be covered by an oil film to ensure long life of the chain and chain wheel. **Do not use grease or a very viscous lubricant which can hardly get through the rollers.**

Correct oil type: Oil with a viscosity of approx. SAE 30W.
E.g. chain saw oil, normal engine oil or very light gear oil.

5. 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 RULES items 1-19 in the beginning of this instruction manual.

TIGHTENING OF BOLTS

IMPORTANT: Screws, nuts and bolts on your new machine must be retightened after some hours of operation. The same applies if repairs have been made.

Correct torque moment M_A (if nothing else stated) for bolts on the machine.

Ma Ø	Class: **8.8** **M**A[Nm]	Class: **10.9** **M**A[Nm]	Class: **12.9** **M**A[Nm]
M 8	25	33	40
M 10	48	65	80
M 12	80	120	135
M 12x1,25	90	125	146
M 14	135	180	215
M 14x1,5	145	190	230
M 16	200	280	325
M 16x1,5	215	295	350
M 18	270	380	440
M 20	400	550	650
M 20x1,5	430	615	720
M 24	640	900	1100
M 24x1,5	690	960	1175
M 30	1300	1800	2300

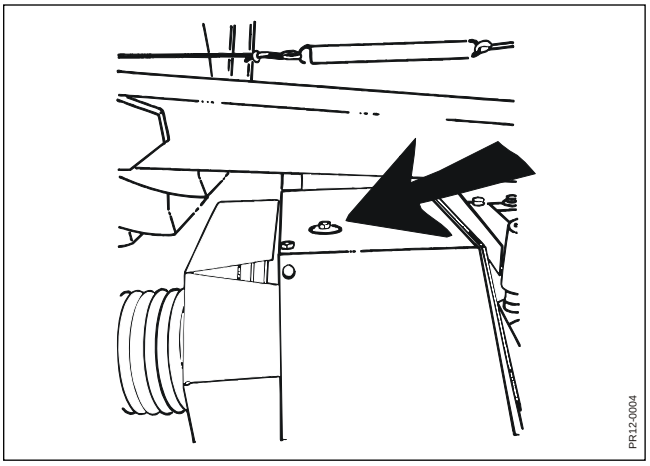


Fig. 5-1

CONTROL OF UNBALANCE

WARNING: **When driving in the field you must always pay attention if the machine starts vibrating more than usually or if it has jarring sounds.**
The discs rotate with approx. 2500 RPM, and one broken blade may cause serious injury to persons or material damage resulting from unbalance.
If working with a modern closed cabin the symptoms may be difficult to discover, and once in a while you have to get out and check if all blades and rotor fingers are intact.
In the long run unbalance may cause fatigue fractures and serious damage.

From the factory a test drive has been made on all machines, which are also checked for vibrations with special tools.

The first time you start the machine pay attention to vibrations and noise to have a standard of comparison later.

CONDITIONER

CONDITIONER FINGERS

To obtain the best possible result, replace broken and worn fingers with new ones. Note that some of the fingers must be shortened when mounted in order not to touch rotors or blades.
Furthermore, missing fingers or parts of fingers will cause the rotor to get out of balance which for instance will result in reduced life of the bearings.

BELT DRIVE

Fig. 5-1: Check that the belts are sufficiently tight.
If the nut is more that 1 – 2 mm above the guard edge, the belts must be retightened.

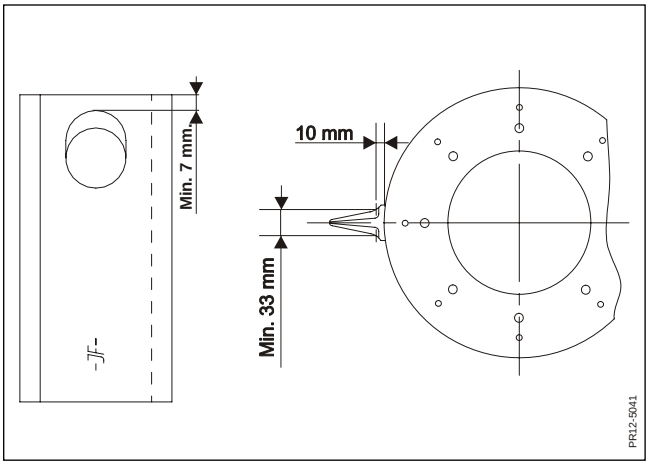


Fig. 5-2

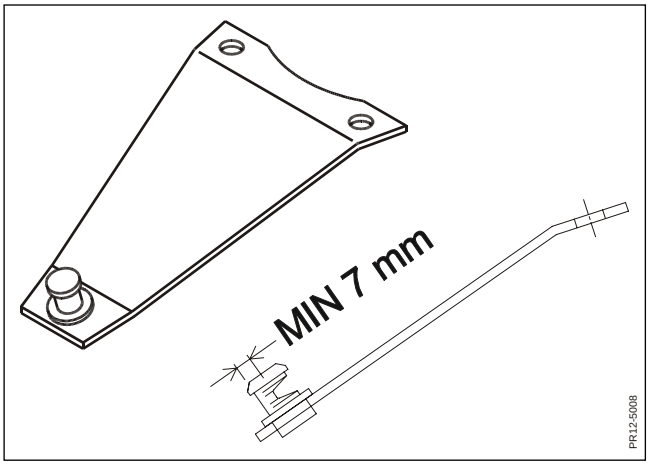


Fig. 5-3

ROTORS, DRUMS AND BLADES

Blades and blade holders are made from high-alloyed hardened materials. A special heat treatment results in an especially hard and ductile material which can handle extreme stress. If a blade or blade holder is damaged, do not attempt to weld the parts together again as the generation of heat will destroy the material properties and expose you and others to increased risk.

IMPORTANT: Damaged blades, blade holders and rotors **must be replaced by original -JF- spare parts to obtain safe operation.**

WARNING: **When replacing blades, all blades on the rotor in question must be replaced as not to create an unbalance.**

CAREFUL: **When replacing blades, blade holders, rotor skirts, drums etc., lower the cutting unit to the ground or lift the machine with the lift arms of the tractor and secure with support chains.**

BLADES

When replacing blades, blade holders etc., the cutting unit must be lowered to the ground by means of a stop block or other mechanical securing.

To obtain satisfactory cutting it is important that blades are intact and sharp. If the blades are not sharp the power requirement will increase unnecessarily and the cutting will be irregular resulting in slower regrowth of the grass.

The blades have two cutting edges and can thus be worn on two sides.

- Remove straight blades to the neighbouring rotor.
- Turn twisted blades.

Fig. 5-2: Replace blades if:

1) they are bent or cracked,
2) the blade width is less than 33 mm measured 10 mm from the edge of the rotor skirt.
3) the metal thickness around the blade hole is less than 7 mm.

Blade holders must also be checked regularly. Especially after collision with foreign matter or, after replacement of blades and the first time you use the machine.

BLADE HOLDERS

Fig. 5-3: Replace blade holders if:

1) They are deformed
2) The diameter of the blade pin is less than 7 mm.

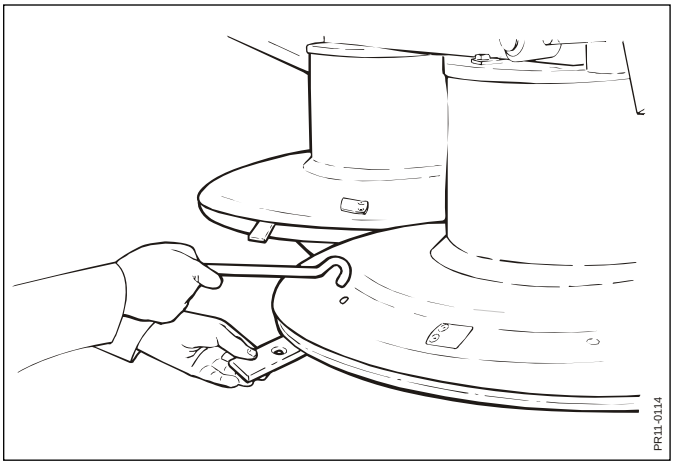


Fig. 5-4

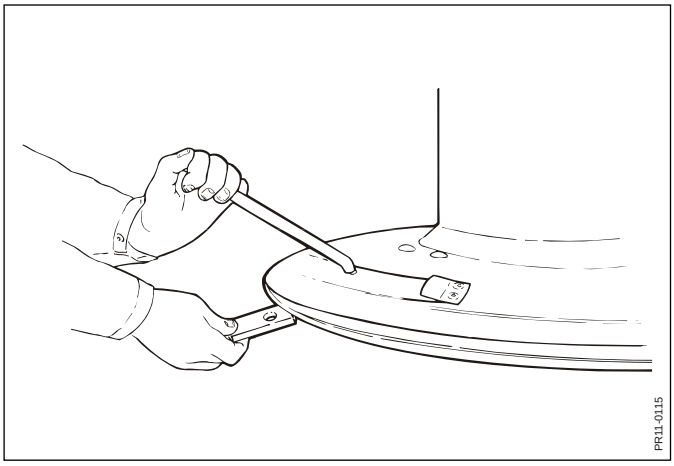


Fig. 5-5

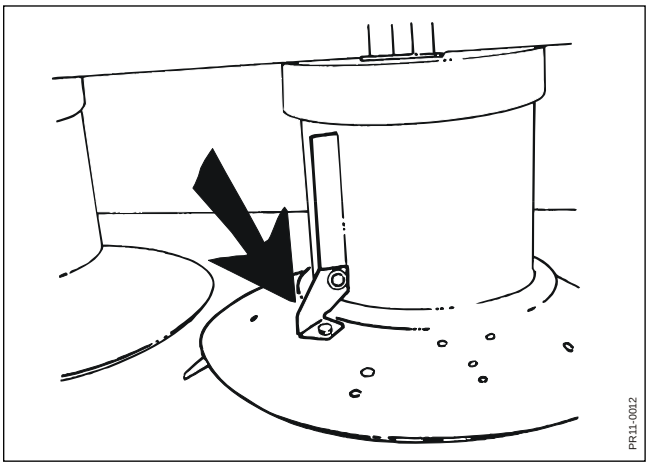


Fig. 5-6

REPLACEMENT OF BLADES

Fig. 5-4: Place the tool for replacement of blades in the hole on the rotor skirt and turn it
Fig. 5-5: halfway around. Release the blade by pulling towards yourself.
Remove the old blade and mount the new one by moving the tool away from you.

WARNING: **After replacing blades, blade holder etc., check that no tools have been left on the machine.**

CONDITION OF THE ROTOR SKIRTS

If the edges in front of the blades are deformed/worn, the blade holders can be removed to a new position. **All** blade holders must be removed.

CARRIERS/DRUMS

Fig. 5-6: Check that carriers on the drums are in place and intact. The drums can be deformed by stones and the like. If this results in unbalance, they must be replaced.
(Unbalance can be due to accumulation of dust, seeds and the like in the drums.)

6. MISCELLANEOUS

DRIVING TIPS AND FAULT-FINDING

Problem	Possible cause	Remedy
Uneven stubble or bad cutting	The cutting unit has too much relief	Check the basic adjustment of the machine and, if necessary, reduce the relief by loosening the springs
	The number of PTO of the tractor is too low	Check that the number of rotations of the tractor PTO is 540 rpm. Keep a constant number of RPM
	Worn blades	
Stripes in stubble	The cutting angle is too big, the grass does not get over the rotor skirt	Adjust the machine more horizontal by lengthening the top link
		Increase the driving speed, if possible
	Worn blades	Replace blades
Uneven flow through the machine	Conditioner fingers may be worn or missing	Replace worn fingers and mount new ones where these are missing
	The distance between the conditioner plate and the conditioner rotor is too long	Adjust the conditioner plate to shorter distance to the rotor Increase the driving speed
The machine vibrates/ uneven operation	Blades may be deformed, damaged or missing	Replace damaged blades and mount new ones where these are missing
	Defect PTO drive shaft	Check if the shaft is intact. Repair, if necessary
	Rotors or drums are deformed	Replace deformed parts
	Defect bearing in rotor gearbox or conditioner rotor	Check if bearings are loose or damaged. Replace, if necessary
	Earth and grass in drums and rotor skirts	Clean drums and rotor skirts
Gear heats	Wrong oil level	Check the oil level and refill/drain out oil, if necessary
		NB: Gear temperature max. 80 degrees

STORAGE

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

CAREFUL: Be careful when cleaning with a high pressure cleaner. Never spray directly on bearings, chain or chain drive.

IMPORTANT: Lubricate all lubricating 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 wearing parts needed before the next season and order the spare parts.

- Dismount, clean and lubricate the PTO shafts. Remember to grease the profile tubes. The PTO shaft must be kept in a dry place.

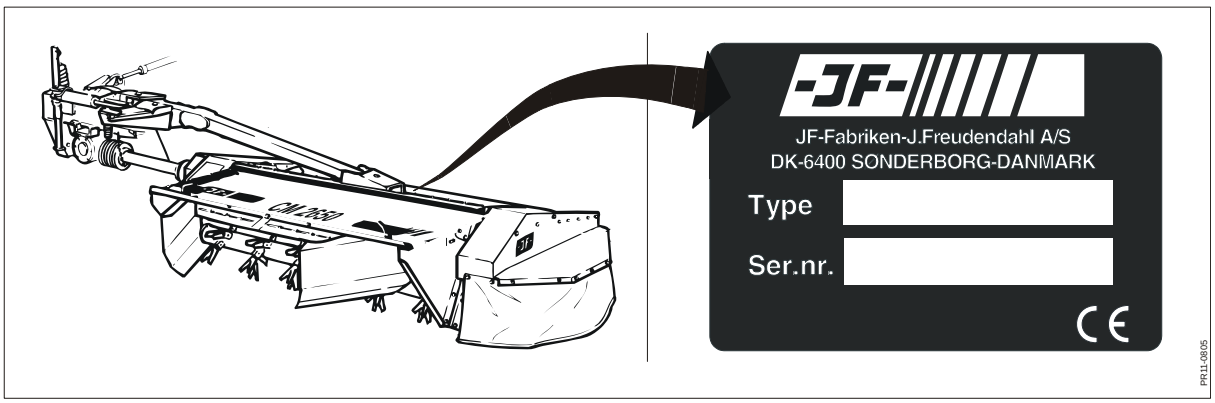
- Spray the machine with a thin coat of rust-preventing oil. This is especially important on the parts polished with use.

- Store the machine in a ventilated engine house.

SPARE PARTS ORDER

When ordering spare parts, please state machine type and serial number. This information is printed on the machine plate which is placed as shown on the figure below.

We request you to write this information on the first page in the spare parts catalogue supplied with the machine as soon as possible so that you have the information at hand when ordering spare parts.



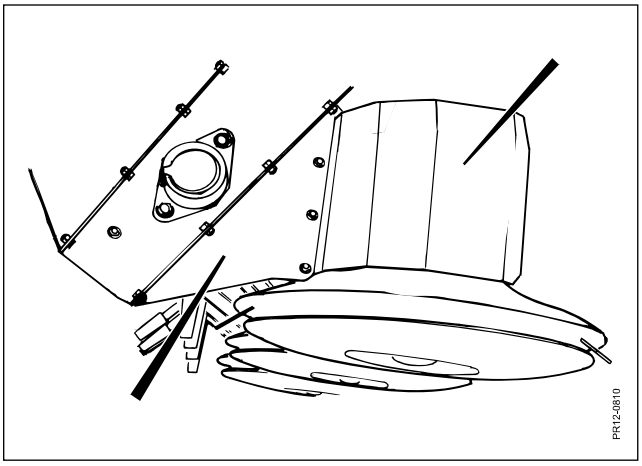


Fig. 6-1

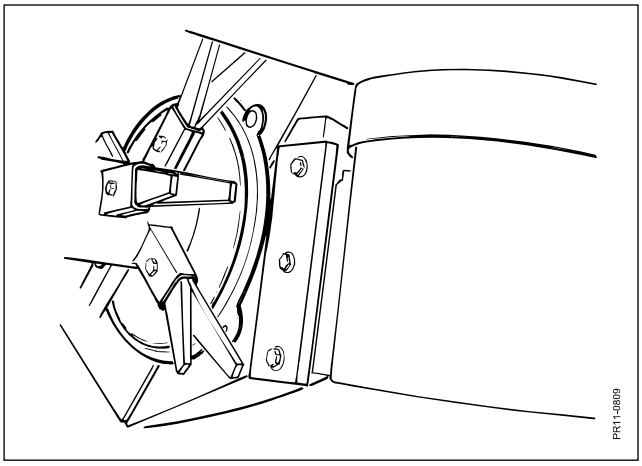


Fig. 6-2

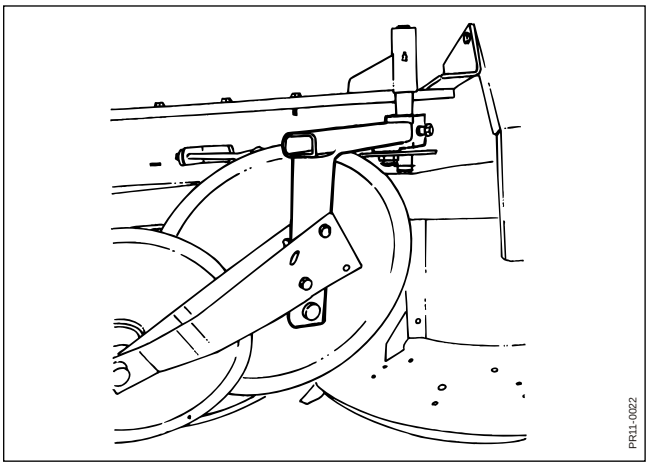


Fig. 6-3

AUXILIARY EQUIPMENT

Conc. order number: See spare parts list

WHOLE CROP EQUIPMENT

For driving in whole crop, a 16 teeth chain wheel can be mounted on the driving shaft, which reduces the number of rotations on the conditioner rotor.

SUPPORT CHAIN

To fasten and stabilise the depth stop of the lift arms, a special support chain can be supplied.

CROP DEFLECTORS

Fig. 6-1: For wet grass. Prevents ejection sideways. Remember to dismount carriers
Fig. 6-2: in the corners on the outmost rotors.

SWATH ROLLERS

Fig. 6-3: Mount swath roller set instead of the conditioner.

DOUBLE SWATHING

The headstock is constructed so that the machine can be placed in an oblique position forward and backward.

If this oblique angle is used, the machine must be equipped with a wide angle PTO drive shaft between the two gears to avoid vibrations in the transmission and thus expensive damage.

<u>REMEMBER:</u> This shaft must be removed before the machine is placed in transport position.

When the standard machine is equipped with this PTO shaft, the machine can put two swaths together, so that these can be picked up with a 3-metre pick-up.

To avoid driving in the swaths with the tractor wheels you have to drive with approx. 0.6 metre shorter cutting width every second time.

The above swath width can also be obtained when driving with a front mounted mower. In this case, drive with a constant oblique position backward.

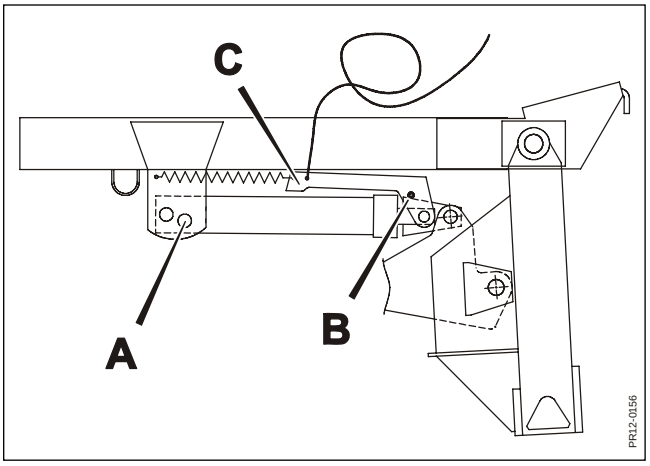


Fig. 6-4

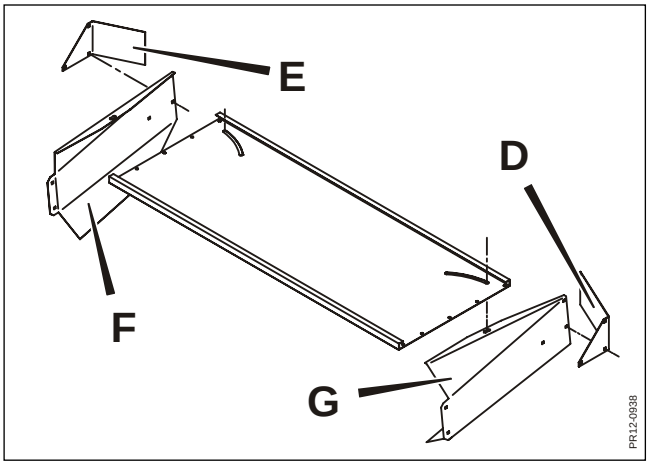


Fig. 6-5

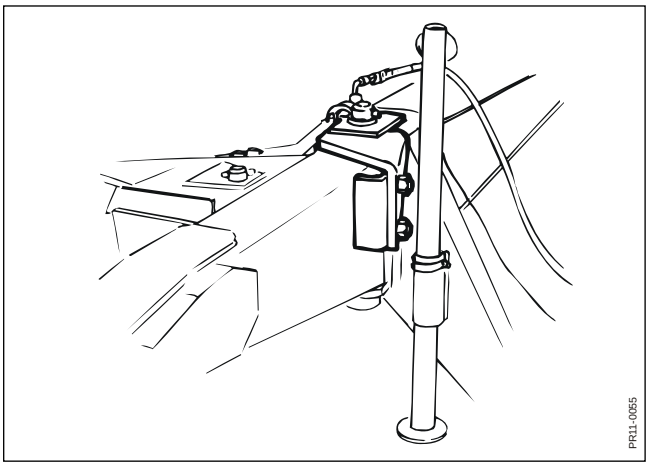


Fig. 6-6

MOUNTING

Fig. 6-4: Mount hydraulic cylinder for side adjustment in hole A.

Fig. 6-5: Dismount the stop guards D and E. Place swath boards F and G in the outmost position in the oblong holes.

WARNING: **When driving in oblique positions, the cord for operating the stop for cylinder must be removed.**

ADJUSTMENT OF OBLIQUE ANGLE

Fig. 6-4: The oblique angle backward is limited by a stop C for hydraulic cylinder. Always keep this stop in order and with a sharp edge on the stop surface.

Before conversion to transport, the half of the PTO shaft at the gearbox on the suspension must be dismounted.

Fig. 6-4: The pin for stop B is fastened to chain for PTO shaft. Therefore, the PTO shaft half must be dismounted before the stop for cylinder can be put out of action.

Fig. 6-6: Adjust the oblique angle forward by means of shims between the headstock and the stop.

Place the PTO shaft half in the holder on the boom during transport.

ADJUSTMENT OF THE SWATH WIDTH

The oblique angle forward influences the swath width.
The bigger the angle, the smaller the swath width.

The throwing length of the conditioner influences the swath width.
High speed = long throw = small swath width.
The throwing length is longest with the conditioner plate close to the conditioner rotor.

The number of rotations of the rotor is adjusted with the chain wheel on the rotor shaft. (See section 3: Adjustments and driving: Fig. 3-13).
Small chain wheel = high speed.

DRIVING IN THE FIELD

Only when a test drive is made in the field, can the above adjustment opportunities be used. The purpose is to obtain a good flow through the machine. With a little practice, the swaths can be laid as wished.
Double swathing is intended for driving in silage crops.
In long, old grass intended for hay, there may be waste as the long stems stick to the fingers. This also applies to alfalfa.

An increase of the distance between the conditioner plate and the conditioner rotor reduces this waste. If waste is not acceptable, the machine can be driven without oblique position as a normal mower.

The driving speed also influences the flow through the machine and the swathing.

First drive with the machine in oblique position forward, and then drive with the machine in oblique position backward.

REMEMBER: **Remove the PTO drive shaft between the two gears before conversion to transport.**

SCRAPPING

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

Observe the following:

- The machine must not be placed some where outside, and gear, cylinders and rotor gearbox must be emptied of oil and grease. These oils must be handed over to a destruction company.

- Disassemble the machine and separate the individual parts, e.g. PTO shafts, hydraulic hoses and components.

- Hand over the usable parts to an authorised recycling centre. The large scrapping parts are handed over to an authorised breaker's yard.

WARRANTY

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

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

- The warranty is invalidated in the following cases:

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

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

JF is not responsible for the following costs:

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

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

The following is regarded as wearing parts:
Protective canvases, blades, blade suspensions, shearbars, guide shoes, stone protections, crimper parts, tyres, tubes, PTO drive shafts, clutches, V-belts, chains, rake and pick-up tines and beater bars for farmyard manure spreaders.

In addition, the user must note the following:

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

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