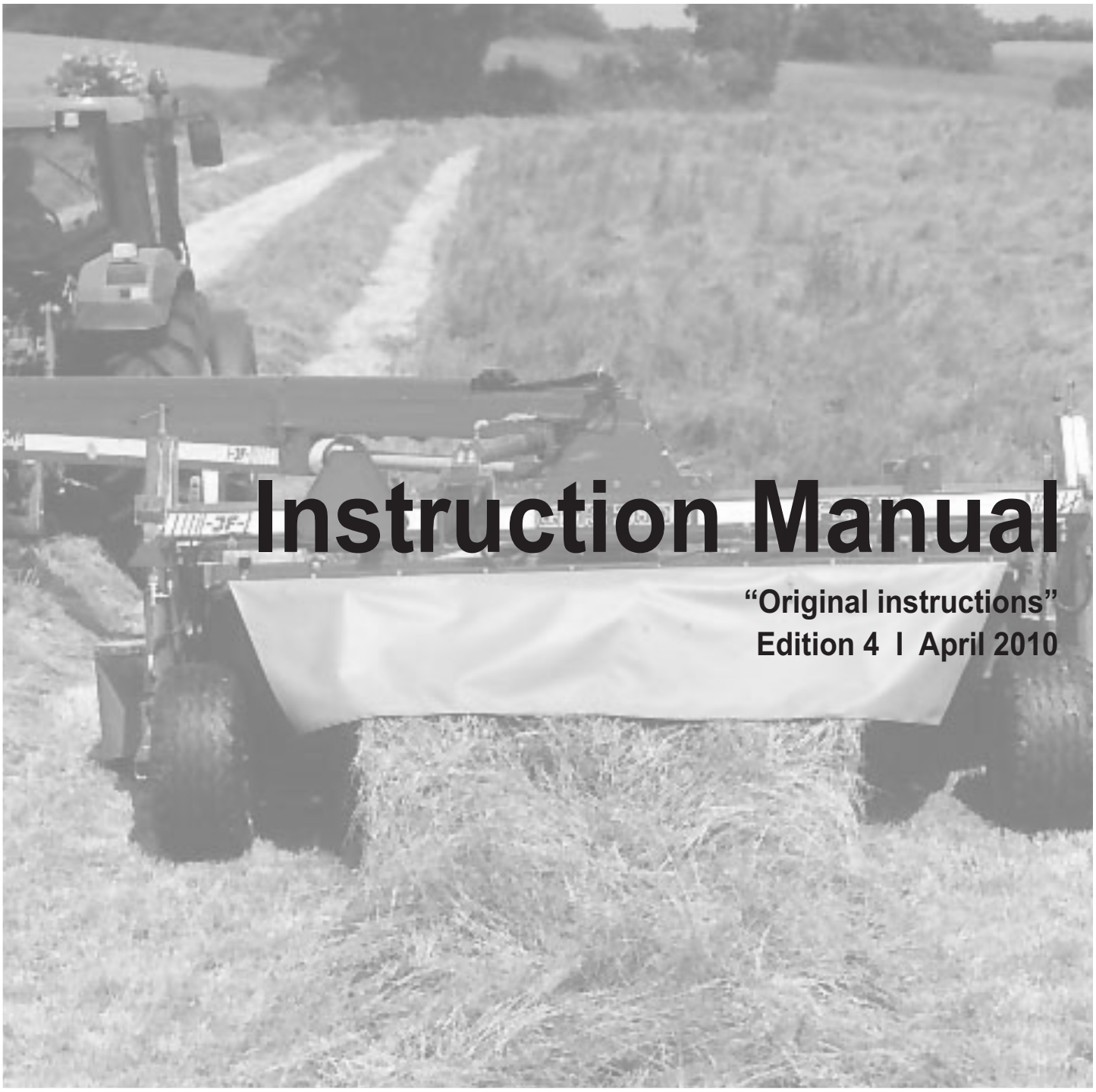
JF-STOLL

Disc Mower

GMS 2800 FL I GMS 3600 FL I GMS/GCS 3200 FL



Instruction Manual

“Original instructions”
Edition 4 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,

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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 :

GMS 2800/3600 FL
GMS/GCS 3200 FL

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.

CONTENTS

1. INTRODUCTION

INTENDED USE

The disc mowers of the type GMS 2800 FLEX, GMS/GCS 3200 FLEX and GMS 3600 FLEX are solely made for normal effort in agricultural work. They are only intended for cutting growing grass and straw crops on the ground and may only be mounted on tractors and run by the PTO drive shaft of tractors.

Any use beyond the above-mentioned does not make JF-Fabriken responsible for any possible secondary damages, the user bears that risk.

It is assumed that the work is performed under reasonable conditions, including that the fields have been cultivated normally and to a reasonable extent been cleaned of foreign bodies and the like.

Intended use also means that the information prescribed by JF-Fabriken in the instruction manual and the spare parts book is observed.

The disc mowers type GMS 2800 FLEX, GMS/GCS 3200 FLEX and GMS 3600 FLEX must only be used, maintained, and repaired by persons who after reading this instruction manual are confident with the machines in question and thereby informed about possible risks.

It is absolutely necessary to observe the following instructions to prevent injuries and damages. Also common technical safety rules and road safety rules **must** be observed.

If changes are made on the machine without permission from JF-Fabriken, JF-Fabriken cannot be held responsible for any injuries or damages.

SAFETY

Generally many damages occur 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 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 a 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 possible 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 manual instruction of how to protect himself and others against injuries.

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

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

GENERAL SAFETY INSTRUCTIONS

The following is a 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 of the tractor 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 cutting unit to the ground or engage the transport safety device when the machine is parked.

3. Remember to activate the transport safety device of the cutting unit and the stop valves of the hydraulic cylinders when transporting the machine.

4. Never work under a raised cutting unit, unless it has been secured by means of stop blocks or other mechanical securing device.

5. Always block the wheels before you work under the machine.

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

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

8. Never work before all guards have been mounted correctly.

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

10. Do not replace the guards or work with the machine if some of the guards are missing.

11. Always drive with the statutory lights and safety marking during transport on public road.

12. Limit the transport speed to max 30 km/h, unless the machine has been marked otherwise.

13. Never stay near the machine while it is working.

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

15. 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.

16. Before the cutting unit is raised or lowered it should be checked that nobody is near the machine - or touching it

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

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

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

20. Never stay between the tractor and the mower during engagement and disengagement.

CHOICE OF TRACTOR

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

Choose a tractor with a suitable power on the PTO shaft. If the power of the tractor is considerably larger than the normal demand of the machine make sure that the machine is secured against overload with a suitable clutch on the PTO drive shaft.

Considerable or long lasting overload can damage the machine and at worst result in parts being thrown out.

Choose a tractor with a suitable own weight and track width so that it can drive steadily with the machine. Also make sure that the lift arms of the tractor are intended to work with the weight in question.

Always choose a tractor with a closed cabin if you are going to work with a disc mower

CONNECTION AND DISCONNECTION

Always make sure that nobody is standing between the tractor and the machine during connection and disconnection. By an unintentional manoeuvre with the tractor persons might get jammed (see fig. 1-1)

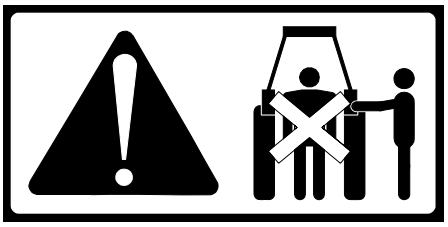


Fig. 1-1

Check that the machine is intended for the number and the direction of rotations of the tractor (see fig. 1-2). A wrongly chosen RPM for a considerable period can damage the machine and at worst lead to parts being thrown out.

Make sure that the PTO drive shaft has been mounted correctly. This means that the shear pin is in mesh and that the support chain has been fasted at both ends.

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

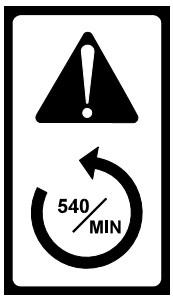


Fig. 1-2

Check that the hydraulic clutches are tight and that all hoses and fittings are undamaged before the hydraulic system is activated. When the engine of the tractor has stopped also make sure that there is *no* pressure in the hydraulic hoses by activating the hydraulic tractor 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 the hydraulic oil under pressure hits you consult a doctor immediately (see fig. 1-3).

Fig. 1-3

Check that the drawbar and the cutting unit can move freely before you activate the hydraulic cylinders. 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 working, check that blades and discs do not have any breaks or other damages. Damaged blades and discs must be replaced (see the section about maintenance).

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

TRANSPORT

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

It is important to block the hydraulic transport adjustment. Unintentional operation of the drawbar cylinder can cause the mower to move to the roadway of oncoming traffic, the cycle path or the foot path. Always check that the mechanical transport safety devices are engaged before transporting the machine.

The same might happen if there is air in the hydraulic cylinders or by a sudden loss of oil from the hydraulic hoses.

To remove possible air in the oil check all the hydraulic cylinders after the engagement to the tractor. Especially before driving on a public road.

WORKING

During the daily work it should be considered that loose stones and foreign bodies 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.

Worn and damaged canvas should of course be replaced.

On stony ground the stubble height is adjusted to maximum and the cutting angle must be as small as possible.

If the cutting unit or the conditioner stops unintentional you must stop the engine of the tractor, activate the parking brake and wait until all the revolving parts have stopped moving before you try to remove the foreign body.

Never allow anybody to stay near the mower during work and especially not children.

Gear down if the machine is working on steep slopes.

When working with a trailed mower keep a safe distance to the hillsides and the like. The earth can slide down and pull the mower and the tractor down. Also remember to adjust the speed to the 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.

Always make sure that the jack of the drawbar has been fastened correctly and locked when parking the machine.

LUBRICATION

When lubricating or maintaining the machine the cutting unit must be resting on the ground or the lifting cylinders must be blocked by means of the stop valves.

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

MAINTENANCE

It is important that the cutting unit is correctly relieved to ensure a perfect operation and to make sure that the cutter bar is not damaged.

Always make sure that the spare parts have been tightened to the correct torque.

When replacing parts in the hydraulic system make sure that the cutting unit is resting on the ground or that the lifting cylinders are blocked.

MACHINE SAFETY

JF-Fabriken has balanced all the revolving parts by means of a special machine with electronic sensors. If it appears that a part has an unbalance some small counter weights are fastened.

As the discs work with up to 3000 RPM even a minor unbalance will cause vibrations, which might lead to fatigue fractures.

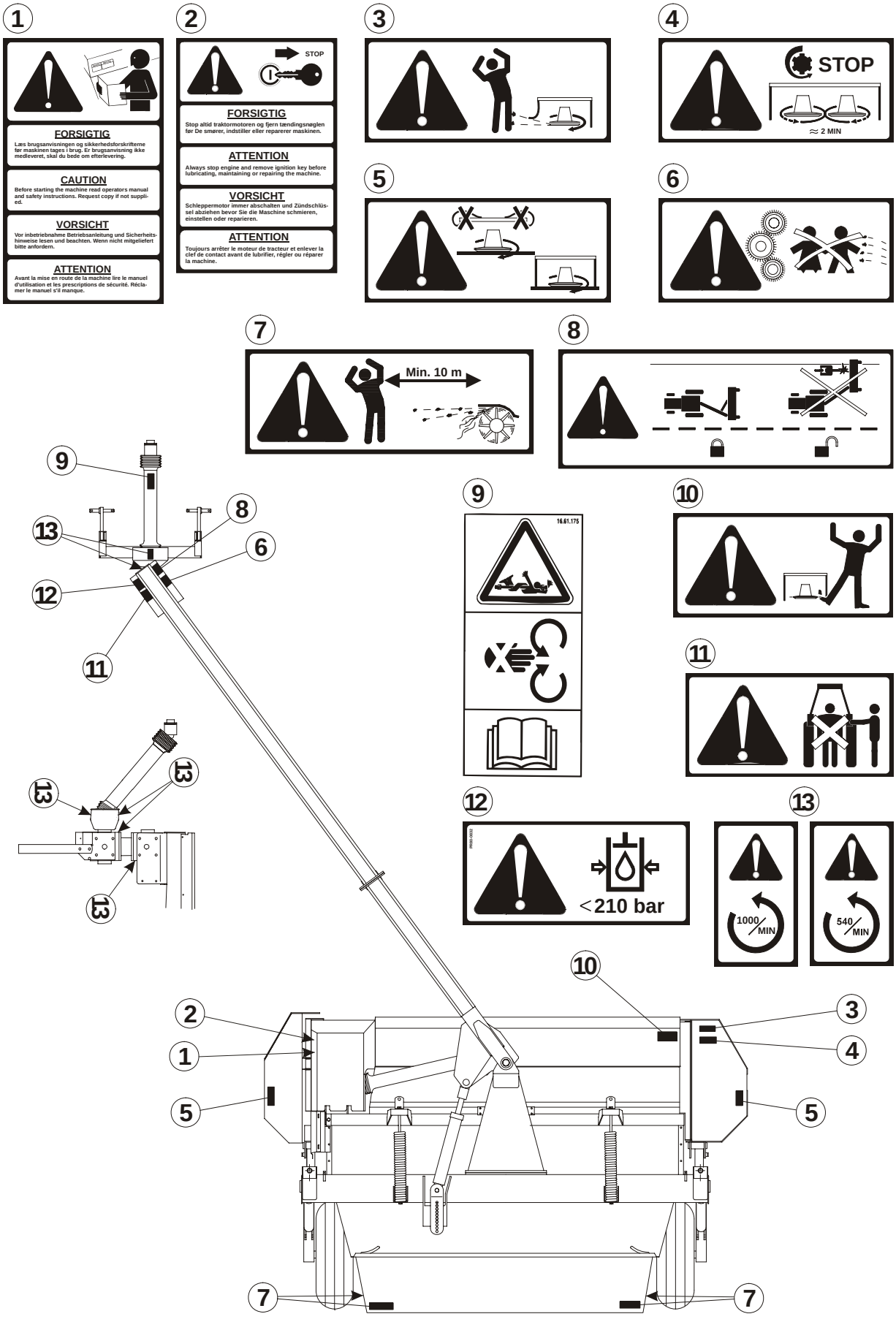
If the vibrations or the noise of the machine increases considerably during a period you should stop working immediately. Do not continue the work before the fault has been corrected.

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

During the season you should check daily that no blades, carries or bolts are missing. If any of these are missing you should mount the parts immediately.

At regular intervals clean the hats and flow intensifiers by removing earth and grass.

Also check and “air” the friction clutch at regular intervals to make sure that it does not rust.


1
FORSIGTIG
Læs brugsanvisningen og sikkerhedsforskrifterne før maskinen tages i brug. Er brugsanvisning ikke medleveret, skal du bede om efterlevering.
CAUTION
Before starting the machine read operators manual and safety instructions. Request copy if not supplied.
VORSICHT
Vor inbetriebnahme 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.
2
STOP
FORSIGTIG
Stop altid traktormotoren og fjern tændingsnøglen før De smører, indstiller eller reparerer maskinen.
ATTENTION
Always stop engine and remove ignition key before lubricating, maintaining or repairing the machine.
VORSICHT
Schleppermotor immer abschalten und Zündschlüssel abziehen bevor Sie die Maschine schmieren, einstellen oder reparieren.
ATTENTION
Toujours arrêter le moteur de tracteur et enlever la clef de contact avant de lubrifier, régler ou réparer la machine.
3
4
STOP
≈ 2 MIN
5
6
7
Min. 10 m
8
9
16.61.175
10
11
12
< 210 bar
13
1000 MIN
540 MIN

SAFETY DECALS

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

1 Read the manual instruction 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 damages.

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 before the work is completed.

3 Risk of stones being thrown.
Almost the same as decal no. 5. But even though all canvas and guards are in the right place there is still a risk of stones being thrown out. Nobody should therefore be allowed to stay near the machine during the operation.

4 Rotating blades.
After the tractor's PTO drive shaft has stopped the blades 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.

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

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

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

8 Remember the transport lock.
Always remember to activate the transport lock before transporting the machine on public road. Defects in the hydraulic system and unintentional manoeuvres can make the machine swivel into working position during transport and thereby cause serious machine damage and personal injury.

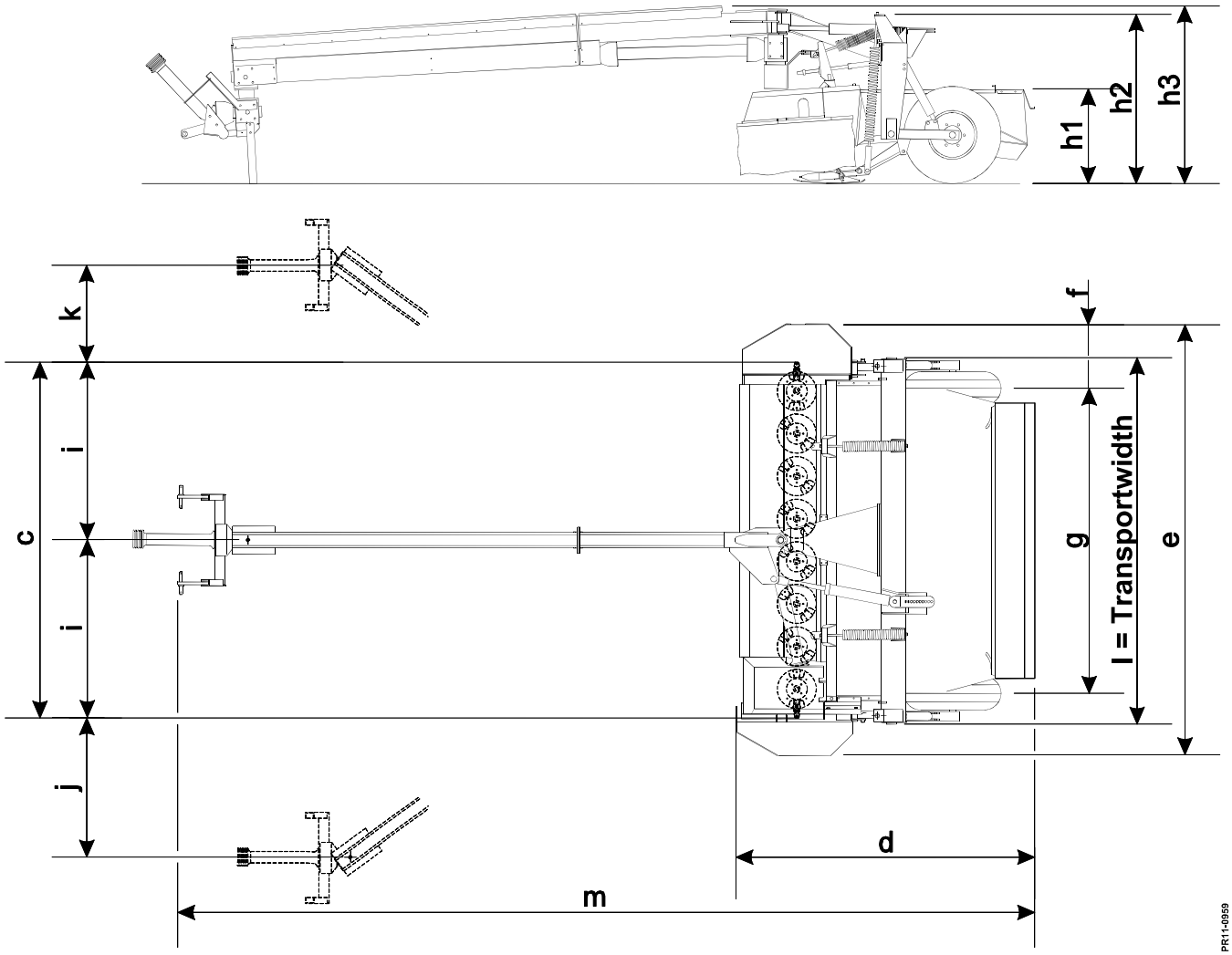
9 The PTO drive shaft.
This decal has the purpose to remind you of how dangerous the PTO drive shaft can be if it is not correctly mounted or protected.

10 Rotating blades.
Do not under any circumstances let anybody get near or stay near the machine during operation. The rotating blades of the machine can without difficulty cause serious injury on any part of the body hit by such a blade.

11 Risk of getting jammed during the connection.
Never let anybody stay near the machine and the tractor during connection to the tractor. An unintentional manoeuvre can result in unauthorised persons getting jammed.

12 Maximum 210 bar.
Make sure that all hydraulics is not exposed to more pressure than 210 bar, as there could be a risk of explosive damages of parts. Hereby you expose yourself and other persons to the danger of getting hit by metal parts with high speed or oil under high pressure.

13 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.



	GMS 2800 Flex	GMS/GCS 3200 Flex	GMS 3600 Flex
c	2800 mm	3150 mm	3550 mm
d	2600 mm	2600 mm	2300 mm
e	3500 mm	3800 mm	4200 mm
f	550 mm	550 mm	550 mm
g	2350 mm	2650 mm	3100 mm
h1	900 mm	900 mm	1000 mm
h2	1400 mm	1400 mm	1500 mm
h3	1500 mm	1500 mm	1500 mm
i	1400 mm	1600 mm	1775 mm
j *) max.	2300 mm	2300 mm	2300 mm
k *) max.	2100 mm	2100 mm	2100 mm
l	2900 mm	3200 mm	3600 mm
m	7200 mm	7200 mm	7000 mm

All measures are in mm and stated with the approximate value.

Max recommended deflection to the right and to the left, "**k**" and "**j**":

k -max = 2100 mm, (this adjustment of the shift cylinder means that **j** = 1450 mm).
j - max = 2300 mm, (this adjustment of the shift cylinder means that **k** = 1300 mm).
An adjustment to a deflection bigger than the max value will make the machine unstable.

TECHNICAL DATA

			GMS 2800 Flex	GMS/GCS 3200 Flex	GMS 3600 Flex
Conditioning system	GMS		PE-fingers in Y shape		
	GCS		-	Steel rollers with rubber profiles	-
Working width			2,8 m	3,2 m	3,6 m
Capacity at 10 km/h, effectively			2,8 Ha/h	3,2 Ha/h	3,6 Ha/h
Power requirements, min. on PTO			50 kW / 68 HP	60 kW / 82 HP	75 kW / 102 HP
Power take-out *)			1000 rpm		
Oil take-out			1 double-acting and 1 single-acting		
Drawbar			Swivel headstock / swing drawbar		
Number of discs			7	8	9
HD discs and blades			Standard		
Pendular suspended cutting unit			Standard		
Finger conditioner	Rotor width		2370 mm	2700 mm	3110 mm
	Fingers		120 PE-fingers	152 PE-fingers	160 PE-fingers
	Speeds		2 speeds		
	-for grass, standard		1000 rpm		
	-for clover and the like		670 rpm		
Roller conditioner	Roller width		-	2680 mm	-
	Diameter		-	225 mm	-
	Speeds		-	1000 mm	-
Swath width			800 – 2000 mm	900 – 2200 mm	1200-2500 mm
Transport width			2900 mm	3200 mm	3600 mm
Tyres			13 / 55 - 16		
Weight, approx.			1800 kg	2200 kg	2840 kg
Weight, transfered to tractor			480 kg	530 kg	600 kg
Noise level in the tractor cabin	Machine connected	Window closed	76,5 dB(A)		
		Window open	92 dB(A)		
	Machine disconnected	Window closed	76,5 dB(A)		
		Window open	78 dB(A)		

*) Can be changed from 1000 RPM to 540 RPM by turning the front gear. See page 21.

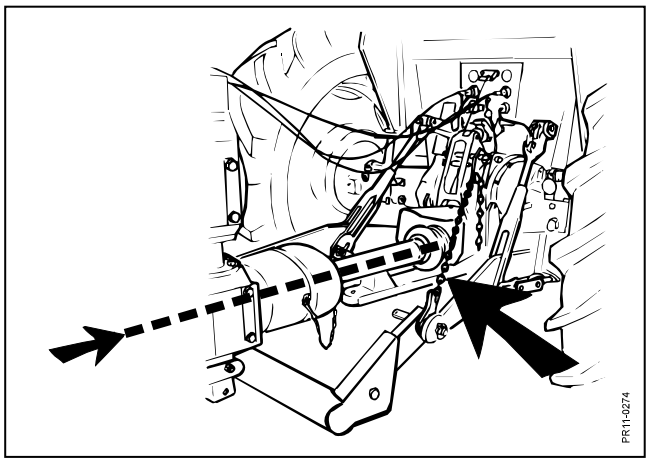


Fig. 2-1

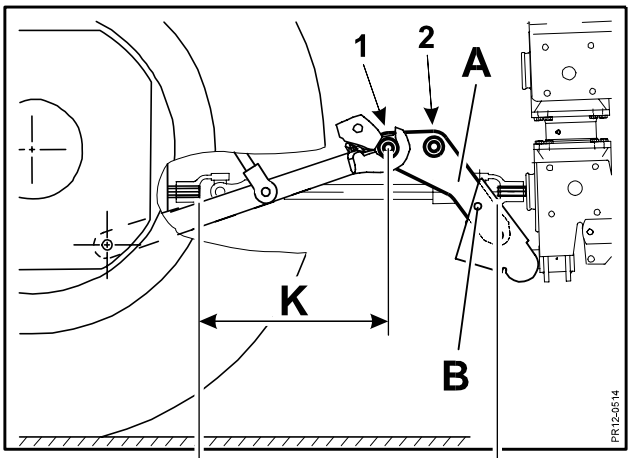


Fig. 2-2

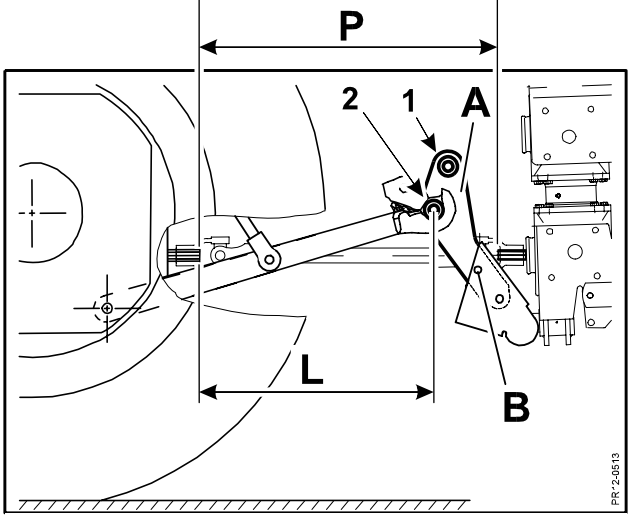


Fig. 2-3

2. CONNECTION AND TEST DRIVING

CONNECTION TO TRACTOR

MACHINE AND PTO DRIVE SHAFT

Fig. 2-1 The GMS/GCS machines are connected to the lower link of the tractor. The dowels are intended for category II. Bushings can be supplied for category III.
Adjust the lower links to the same height. Fasten the limiting chains to the lift dowels at the wanted category as shown on the figure. The lower lift arms of the tractor can now be connected to the machine and then **raised to a height where the input shaft of the power take-out (here called the PTO shaft) and the machine (here called the PIC shaft) are in line.** The lower links must be **locked** in this position to prevent a sideways travel so that **the PTO shaft and the PIC shaft are in line seen from above**. An even PTO drive shaft absolutely gives the longest life on axle universal joint and the other rotating parts of the machine.

Attach the upper end of the limiting chains at the top link fix point of the tractor. The limiting chains are not intended to carry the weight of the machine drawbar but to prevent unintentional lowering of the lower links, which will pull the PTO, shafts away from each other.

PTO DRIVE SHAFT FOR DRIVING WITH DIFFERENT TRACTORS

Fig. 2-2 The shock absorbers of the TOP SAFE system (extension links A Fig. 2-2 and 2-3), with two possibilities for placing of draw dowels, are now standard on the GMS/GCS machines.

IMPORTANT: Do not shorten your new PTO drive shaft before you are sure it is necessary. The PTO drive shaft is, from factory, adjusted to fit the distance **P**, from PTO dowel to PIC dowel, that is standard on most tractors. Still you have to be aware of:

Fig. 2-2 SHORT LOWER LINKS:
On tractors where the distance **K** between PTO dowel and the coupling eye of the lower links is **short**, the draw dowels are to be assembled at position **1.**

Fig. 2-3 LONG LOWER LINKS:
On tractors where the distance **L** between PTO dowel and the coupling eye of the lower links are **long**, placing of the draw dowels at position **2** would be preferable.

NB: By assembling at position 2 the right and left extension link should be reversed, and turned as shown on Fig. 2-3.
Always drive at position **2**, if possible.

The shock absorber of the TOP SAFE system can, if desired, be blocked with a bolt **B**.

IMPORTANT: The profile tube of the PTO drive shaft absolutely has to obey the overlap measurements as shown at Fig. 2-4.

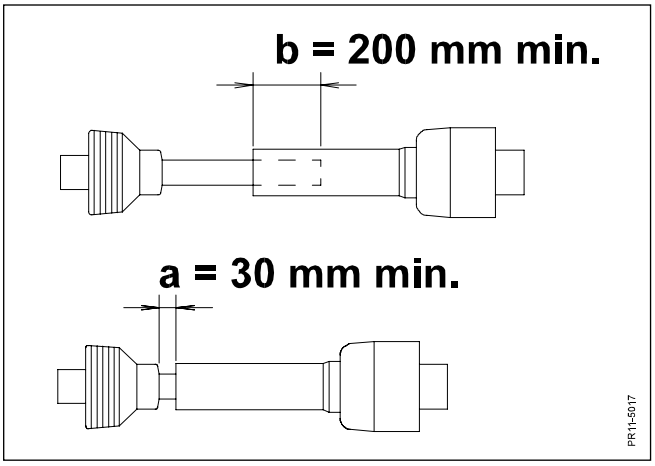


Fig. 2-4

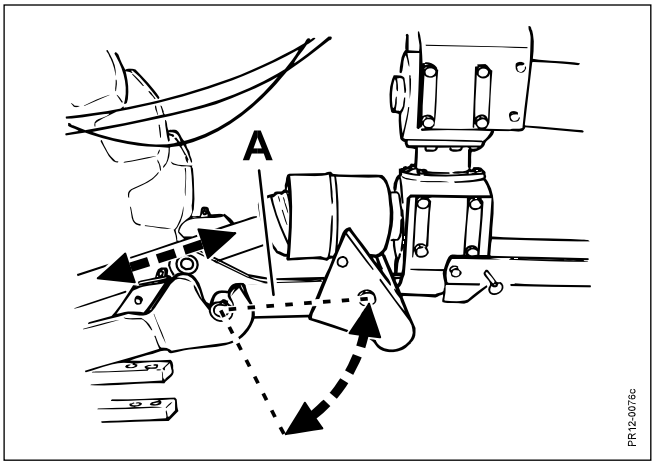


Fig. 2-5

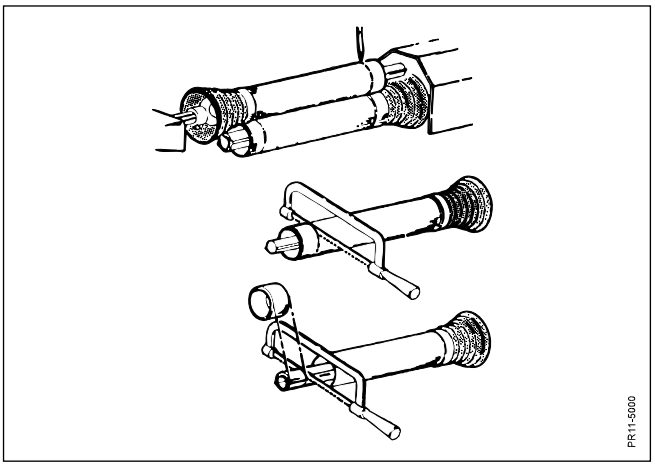


Fig. 2-6

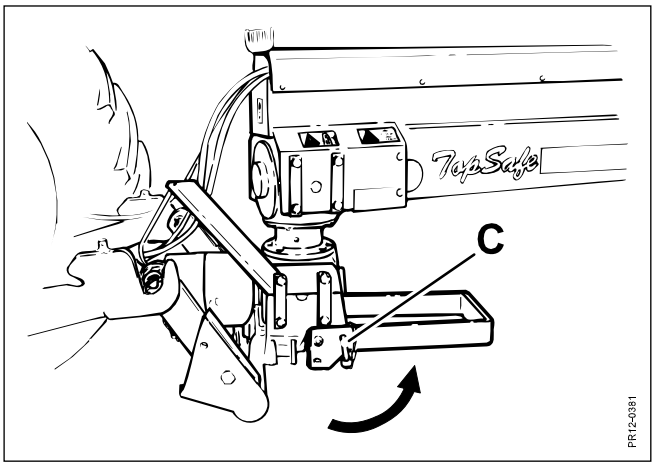


Fig. 2-7

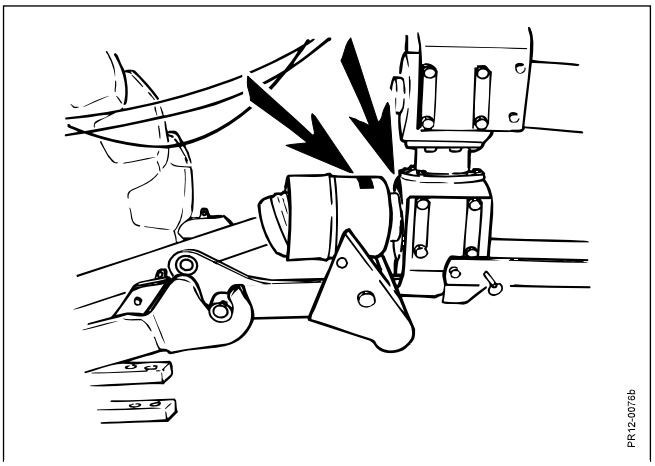


Fig. 2-8

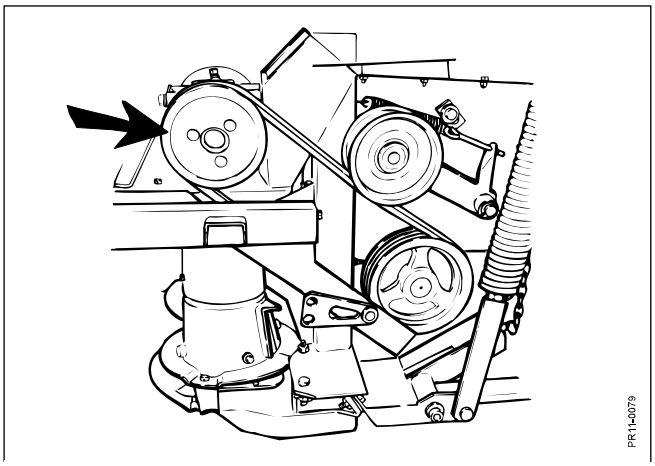


Fig. 2-9

BY POSSIBLE SHORTENING

Fig. 2-4 Adjust the PTO drive shaft so that it has:

Fig. 2-5

- **the biggest possible overlapping**
- **more than 200 mm overlapping in any position** (referring to situations where the safety drive (shock absorbers of the TOP SAFE system) will be released e.g. by collision against protruding stones, see Fig. 2-5).
- **a minimum distance to the block of 30 mm in any position.**

Fig. 2-6 Fasten the PTO drive shaft half parts to PTO and PIC respectively when these are at the same horizontal level and opposite each other (this by the shortest distance of this machine).
Keep the shaft ends parallel and mark the 30 mm (min).
Shorten all 4 tubes equally much. The profile tube ends must be rounded and any burrs must be removed carefully.

WARNING: Grease the tubes carefully before they are re-assembled, as they are exposed to big friction forces if the shock absorbing system is activated during the transmission of heavy load!

JACK

Fig. 2-7 The jack under the swivel gearbox is swivelled to the rear and locked with dowel and linch pin.

CONTROL OF CORRECT PTO SPEED

Fig. 2-8 The machine is marked so that the actual gearing is shown clearly on the front part of the swivel gearbox and the protection guard at the PIC shaft (see the decal on the machine on page 12 and 13, pos. 13). If, for some reason, this decal is missing the gearing should be re-checked.

Control, PTO 1000 RPM:

Fig. 2-9 1 rotation on the driving pulley for conditioner = **1 rotation** on the PIC shaft.

Control, PTO 540 RPM:

1 rotation on the driving pulley for conditioner = **½ rotation on** the PIC shaft.

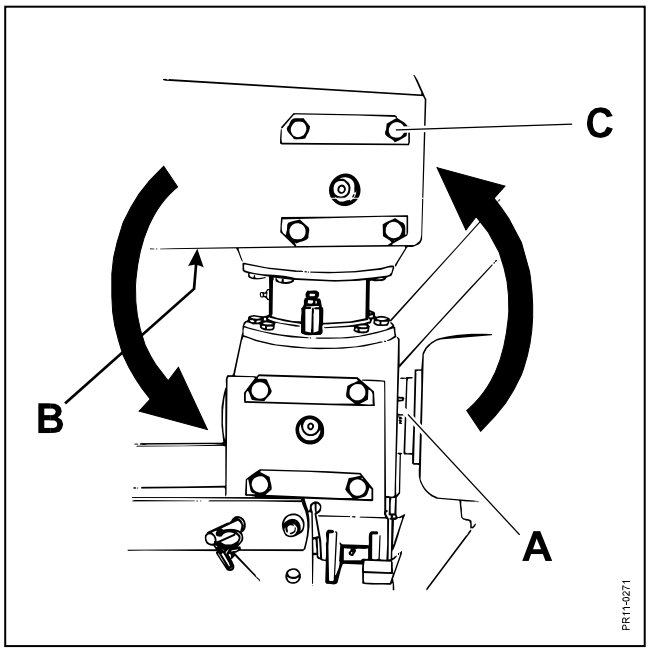


Fig. 2-10

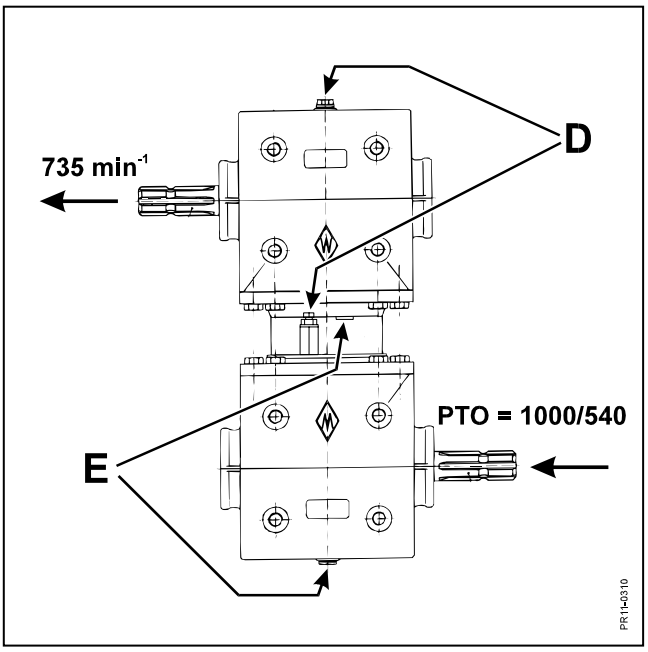


Fig. 2-11

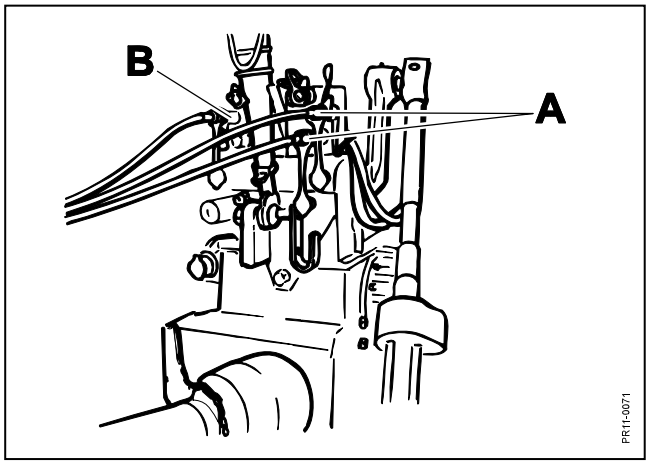


Fig. 2-12

PTO, 540 OR 1000 RPM

Fig. 2-10 From the factory the machine is mounted for **1000 RPM on the PTO.** This can be
Fig. 2-11 changed to 540 RPM by turning the front swivel gearbox which has a certain gear ratio that makes this possible.

Instructions:

1. Dismount the front PTO drive shaft and the protection guard. The protection guard is dismounted by loosening the clip **A**.

2. When dismounting the little guard at **B**, it is possible to dismount the PTO drive shaft on the output of the gearbox.

3. Loosen the gearbox by dismounting the 16 bolts, **C**. Use a crane or another type of lifting device as the gearbox weighs approximately 65 kg.

4. **Before the gearbox is turned and remounted the airing valves D must be turned.** Dismount the drain screws **E** and interchange them with the airing valves. If this is not done an unnecessary great loss of gear oil might occur, as the valves are not intended for being “upside down”.

CAUTION: **It is important to maintain a correct oil level. Too low as well as too high oil level will result in inconvenient heating of the gear.**

5. When re-mounting the front protection guard it is important to make sure that the decal with the correct number of RPM (540 RPM) is legible for a person standing in front of the machine.

FRICTION CLUTCH

See section **5. MAINTENANCE - friction clutch** before you start.

OVERRUN CLUTCH

The machine is equipped with overrun clutch on the PTO drive shaft **in front of** the rear swivel gearbox. If the PTO drive shaft is turned upside down this will have **no** influence on the effect of the overrun clutch.

HYDRAULIC CONNECTION

Fig. 2-12 The hydraulic hoses for the drawbar shift cylinder is connected to the double-acting oil take-out A and the wheel cylinders are connected in a single acting oil take-out B on the tractor. See the HYDRAULIC DIAGRAM page 77 in this instruction manual.

DANGER: The hydraulic components must not be exposed to a greater pressure than 210 bar as a higher pressure might cause parts to be damaged. Hereby the risk of personal damages occurs.

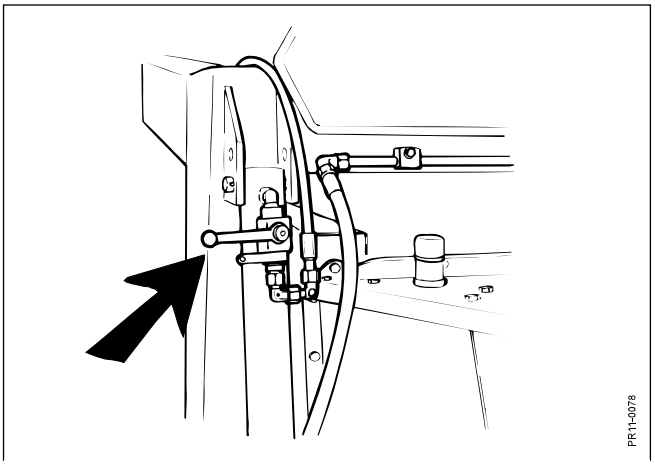


Fig. 2-13

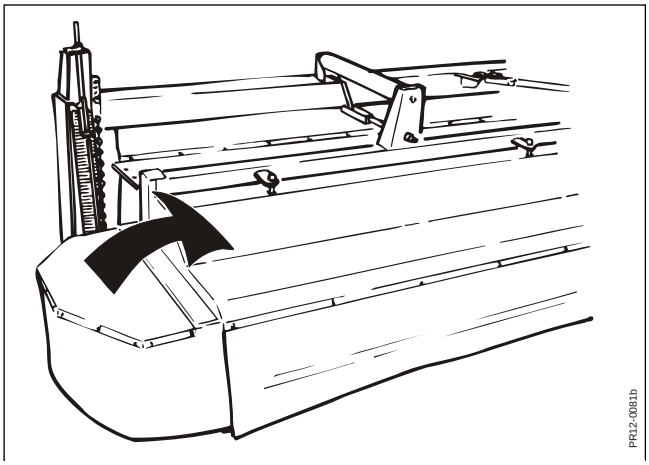


Fig. 2-14

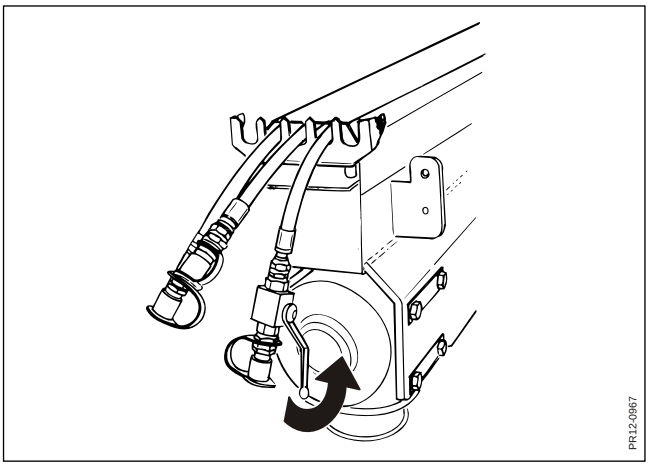


Fig. 2-15

TRANSPORT ON PUBLIC ROAD

The machine is only intended for suspension in the lower links of the tractor, as mentioned in the section **CONNECTION TO TRACTOR** page 17. The transport speed **ought not to be more than 30 km/h.**

Fig. 2-13 The single-acting oil take-out of the tractor performs the lifting and the lowering of the machine.

The machine is lifted from the ground until the cylinders are fully stretched out.

When there is air in the system the machine cannot stay in lifted position. Any air in the cylinders is removed by pushing the pistons in and out a few times.

DANGER - ALWAYS REMEMBER:

TO LOCK THE SAFETY TAP positioned at the cylinder of the left wheel. The safety tap is locked in the shown position.

The shift cylinder is locked automatically by means of a double pilot operated check valve. With the double-acting oil take-out the machine is swivelled to a **central position behind** the tractor, see the **HYDRAULIC DIAGRAM**, page 79.

Fig. 2-14 Lift up the safety guards to reduce the transport width as much as possible.

DANGER - TRAFFIC MARKING:

The owner is always obliged to ensure that the machine is equipped with the correct lighting system and other traffic marking in accordance with the country's present laws in the area.

Fig. 2-15 When the machine has been put into transport position the oil in the cylinder for drawbar is disconnected with the ball valve at the oil take-out on the tractor.

IMPORTANT: It is important that this ball valve is disconnecting the oil in order to avoid unintentional movement of the machine by mistake.

CHECK BEFORE USE

Before you use your new disc mower you ought to:

1. Read this instruction manual carefully!

2. Check that the machine has been assembled correctly and is undamaged.

3. Check with the instruction manual of the machine and (possibly) the tractor that the PTO speed is correct. Too high PTO speed can be dangerous. Too low PTO speed will cause an unclean cut, blocking of the disc mower and a high torque on the drive shafts. Find the correct speed in the section **“CONTROL OF THE CORRECT PTO SPEED”** on page 19.

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

5. Make sure that the hydraulic hoses have been mounted in such a way that they are long enough for the movements of the cylinders.

6. Re-tighten the wheel bolts. After a few hours of operation with your new machine all the bolts must be tightened up. Especially fast revolving parts, parts at the drive device and at the suspension of the shift cylinder. See the torque specification in the section **"5. MAINTENANCE"**.
   Also re-tighten after servicing the machine.

7. Check the tyre pressure. See the section **"5. MAINTENANCE"**.

8. Check that the machine is greased sufficiently and check the oil level in the gearbox and the cutter bar. See the section **“4. LUBRICATION”.**

9. Air the friction clutch as described in the section **“5. MAINTENANCE"**.

From the factory the revolving parts of the machine have been tested and found correct. However, you should:

10. Start the machine with a low number of RPM. If there are no unusual scratching or knocking sounds the number of RPM may be increased. At the correct number of RPM any noticeable vibrations must be observed (check the guards for unusual vibrations).

    In case of doubt stop the tractor and the machine as described in the section about **"SAFETY"**.

Turn the revolving parts with manual power to check if the machine is turning independently.

Check the machine visually to find any possible errors (for instance burned paint or paint that has been scratched off). Then contact authorised assistance.

NB: Note that because of the smaller centrifugal force at a low number of RPM the blades can touch the protection plates on the cutter bar. This sound must disappear at the normal number RPM during work.

Also note that the cutter bar under the discs gets very warm. The colour of the cutter bar gets darker after some hours of operation.

Item 10. should be made with an open rear window and without hearing protector.

CAUTION: If the machine is tested for a long period, close the rear window or wear hearing protector!

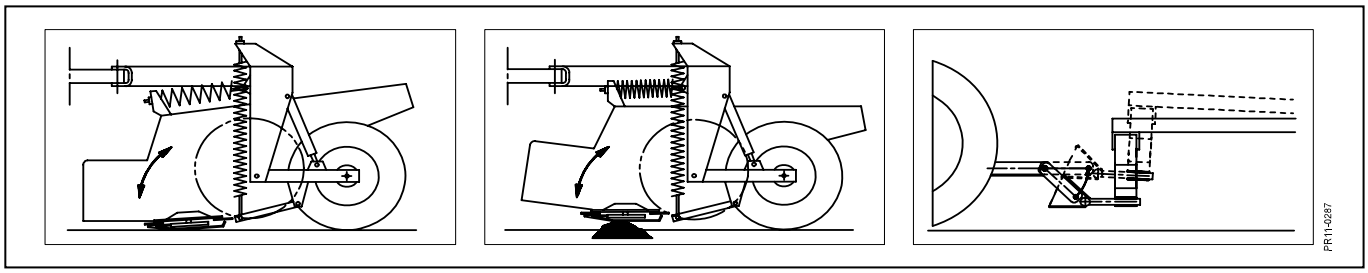


Fig. 3-1

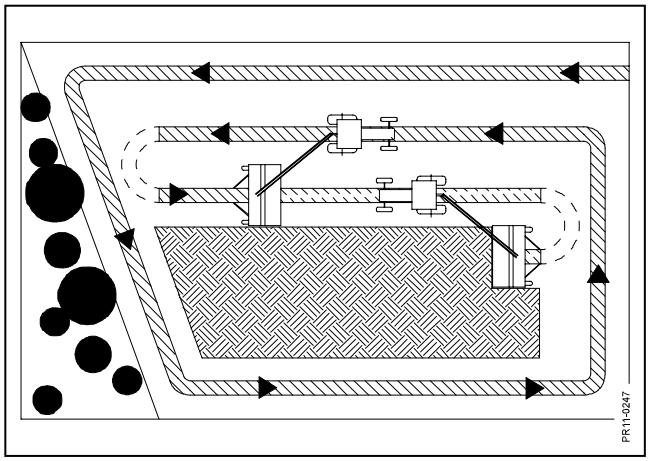


Fig. 3-2

3. ADJUSTING AND WORKING

STRUCTURE AND OPERATION

The cutter bar cuts and throws the crop against the conditioner fingers or the conditioner rollers (for **GCS**). These lift and throw the crop to the rear to the swath boards, which gather the crop in a 0.9 - 2.2 m wide swath.

The conditioning degree can be adjusted in 2 ways. The distance between the conditioner plate/rotor is adjustable and the rotor can work with two number of revolutions (for **GMS**). The roller pressure of **GCS** can be changed.

Fig. 3-1 The machine is equipped with the Top Safe safety system.
The machine frame (conditioner frame) with cutter bar is floating suspended in two strong springs for vertical movements and two horizontal springs which provides the cutter bar with an easy turnable movement when meeting stones or the like. Simultaneously the drawbar is extended and the machine is hereby lifted. This reduces the impact significantly.

The stubble height is continuously adjustable by adjusting the inclination of the cutter bar and the adjustable guide shoes (Fig. 3-10).

The machine can without problems manoeuvre round obstacles by means of the hydraulic shift cylinder.

WORKING IN THE FIELD

Fig. 3-2 The basic idea of the FLEX-series is that the crop can be placed in swaths from one side.

Place the machine in working position. Work a few rounds as to create a space to turn on at the end of the field. The FLEX-driving can now begin. The forwarding speed varies from 6 to 15 km/h depending on the crop and the working conditions.

Connect carefully and increase to the correct number of RPM (standard 1000 RPM), **before working in the crop.** When placing the swaths the single-acting hydraulic take-out of the tractor (for lifting/lowering the machine) must be in the **floating position.**

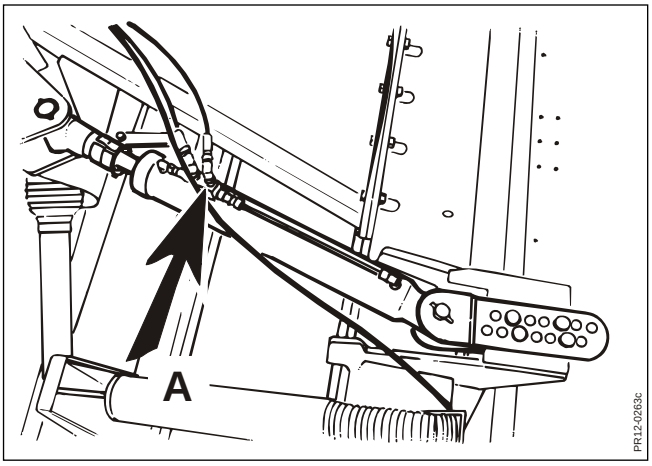


Fig. 3-3

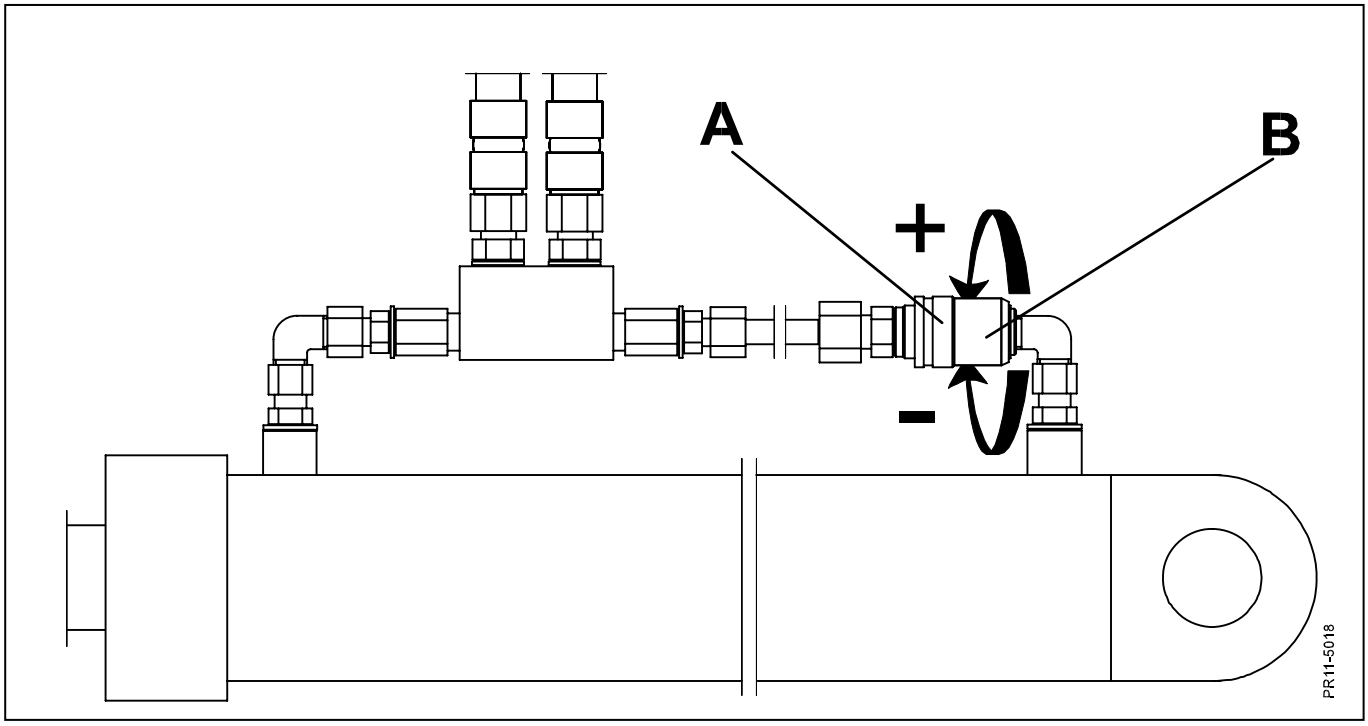


Fig. 3-4

THE SHIFT CYLINDER

AUTOMATIC LOCK

Fig. 3-3 The hydraulic cylinder for turning the drawbar is equipped with a double pilot operated check valve A, holding the cylinder and with this also the machine in a certain position.

The above ensures the tractor driver against unintentional or sudden movements of the machine because of for instance worn or otherwise leaking valves or clutches of the tractor or because of a loose hose.

WARNING: The hose couplings must be kept clean and the filter of the tractor should be maintained properly as in some cases impurities can prevent the valve in working correctly.

In case of any malfunction of the valve, see the section **"5. MAINTENANCE".**

THE SPEED OF THE SHIFT CYLINDER

Fig. 3-4 The swing speed can be adjusted so that the machine does not shift too quickly from one side to another. Adjustment is made with the adjustable throttle valve B, above the hydraulic cylinder.

On tractors with adjustment of the oil level this possibility can be used as a rough adjustment.

ADJUSTING THE MACHINE:

Loosen the counter nut **A** and adjust by turning the valve **B**.

+ = more speed

- = less speed.

The machine should be turned constantly and not swing to a position in front of the crop until just before the lowering (FLEX-driving takes some practice).

Note: Get familiar with the machine.
Use max throttling at first = lowest speed (slow motion).

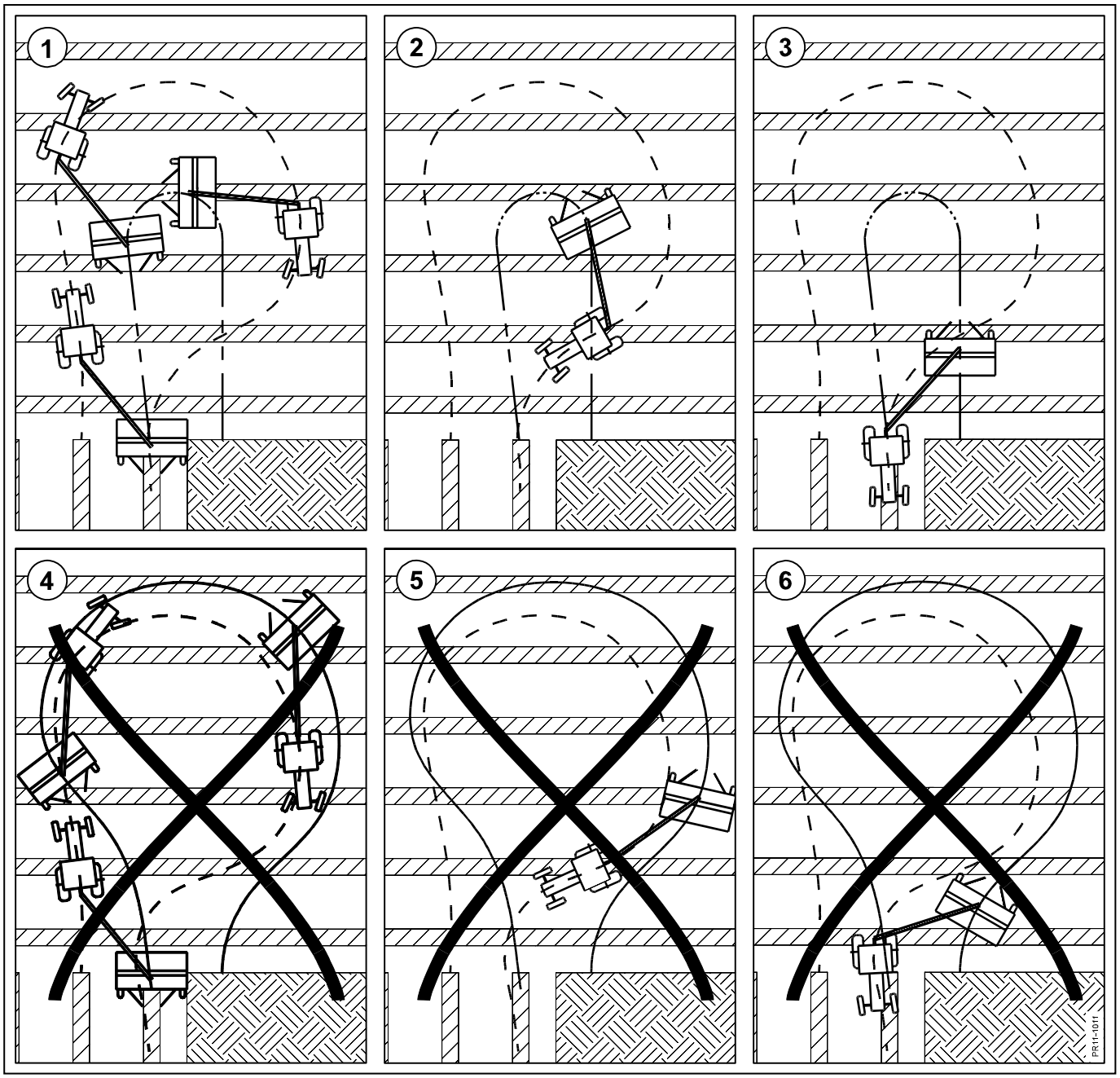


Fig. 3-5

TURNING AT THE END OF THE FIELD:

Fig. 3-5 Below section describes the best way of turning at the ends.

When driving away from the swath/material the machine is lifted and swung*) to **transport position** (the machine is placed centrally below the drawbar). Then continue the turn. Just before the machine is placed in the swath/material again it is swivelled the last bit into the new working position an lowered.

General instructions:
It is important that the disc mower performs as little a circle as possible when turning (Fig. ① - ③). This involves less space and a lower driving speed of the machine (Fig. ④ - ⑥).

*) Turning should be done continuously. Avoid sudden movements, for instance from the shift cylinder, sudden application of the brakes or sudden gear-changes (especially in case of a high driving speed).

The best way of turning is to adapt the throttling of the shift cylinder so that the machine **has only just been swung into the new working position just before it reaches the swath/material again.**

See the figures. ① -③ are recommended ④ **-**⑥ **are not recommended.**

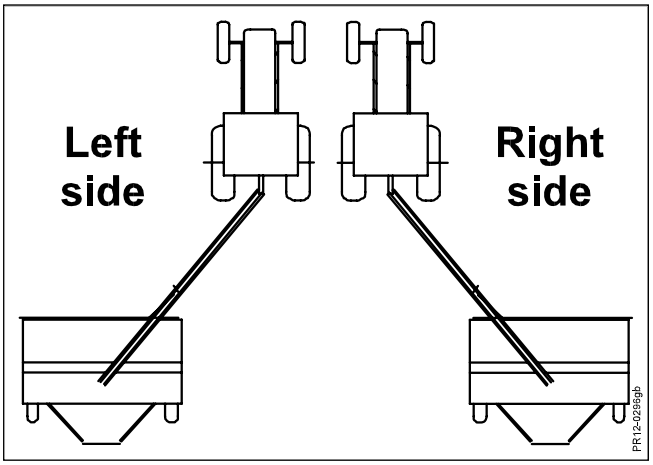


Fig. 3-6

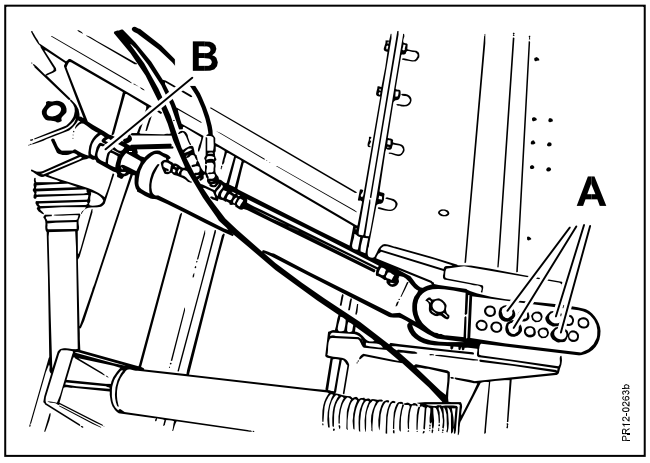


Fig. 3-8

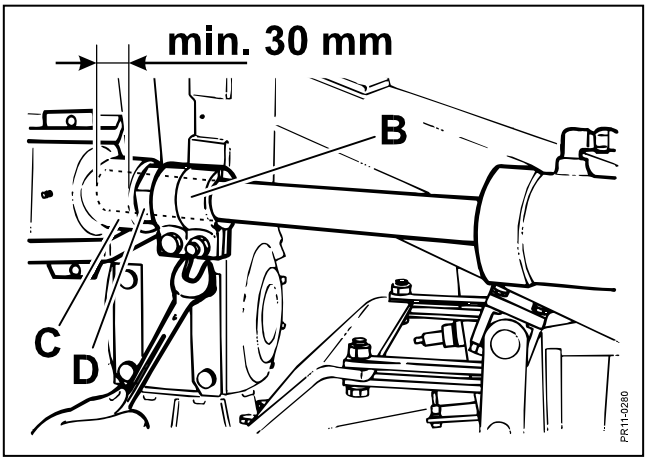


Fig. 3-9

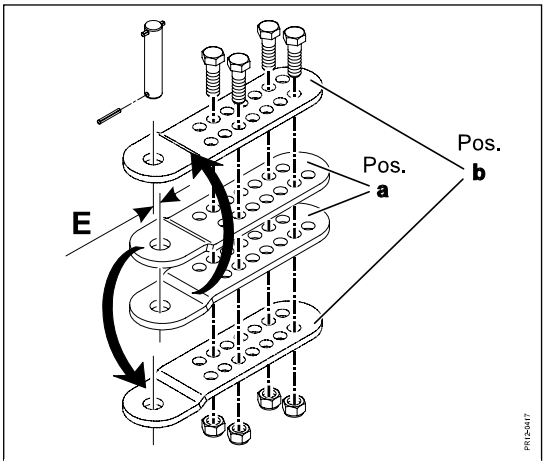


Fig. 3-10

ADJUSTMENT OF THE SWING OF THE DRAWBAR

From the factory the machine is mounted to drive symmetric (an equal displacement to the left and the right side).

When FLEX-driving the most comfortable driving is obtained if the machine is displaced equally much to the right and the left side. In this way the tractor driver does not have to correct the position of the tractor or the displacement of the shift cylinder at every swath.

The swing of a FLEX machine should be adjusted so that the tractor is driving in a central position in relation to the swath.

If you wish to work with a further distance to the unharvested grass please see the section about: Max advisable swing to the right and to the left, page 14.

ADJUSTMENT PROCEDURE:

The easiest adjustment is performed in the field.

Adjustment can be made from one arbitrary position to another arbitrary position as follows:

Fig. 3-6 1) The machine is swung to the **left side** of the tractor (Fig. 3-6).

Fig. 3-8 2) Make a rough adjustment at the flanges with the boltholes **A** (Fig. 3-8).

Fig. 3-10 A vernier adjustment is done by interchanging the upper and the lower splice of the shift cylinder, which means that you change from pos. a to pos. b, or the other way round (from b to a). This will halve the adjustment distance E from intervals of 30 mm to intervals of 15 mm., Which again means a doubling of the adjustment possibilities.

Fig. 3-6 3) The machine is now displaced to the **right side** of the tractor (Fig. 3-6).

Fig. 3-8 4) Make a rough adjustment with the baffle rings **B** Fig. 3-8 and 3-9 (extra loose
Fig. 3-9 rings can be ordered. The baffle rings can if necessary be shortened with a saw).
The vernier adjustment to the right as well as to the left can, if necessary, be obtained by means of the threaded rod **C** (it is necessary to loosen the baffle rings **B**, and the counter nut **D**, to turn the piston rod). **Note that there must be a minimum of 30 mm thread in the mesh!**

NB: The vernier adjustment on the threaded rod has no influence on the displacement at the right side of the tractor as long as there is at least 2 pcs 30 mm baffle rings on the piston rod.

It is recommended to seek as large a distance between the bolts **A**.
The counter nut **D must be tightened properly.**

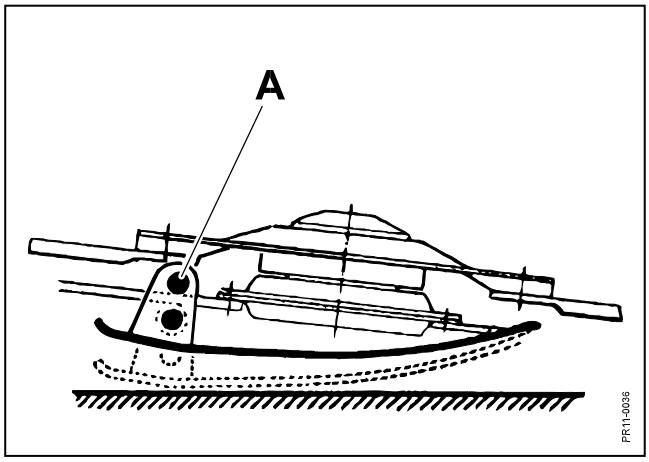


Fig. 3-11

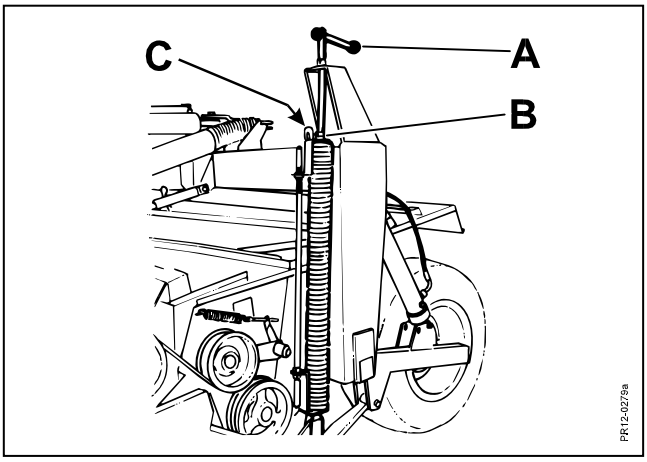


Fig. 3-12

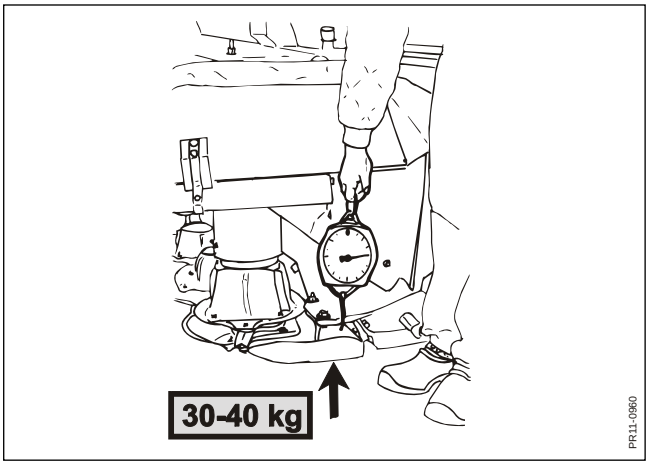


Fig. 3-13

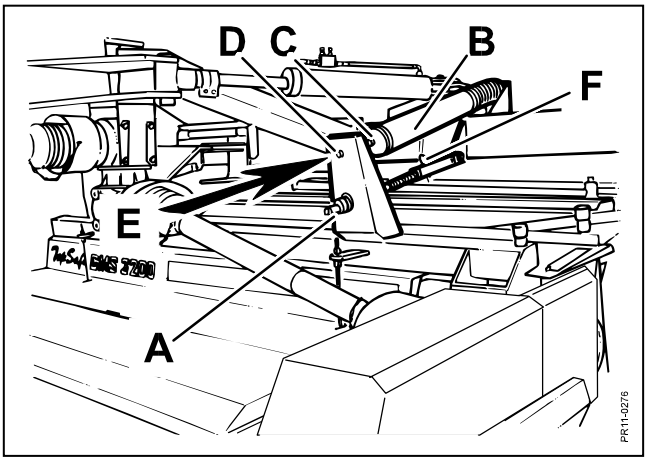


Fig. 3-14

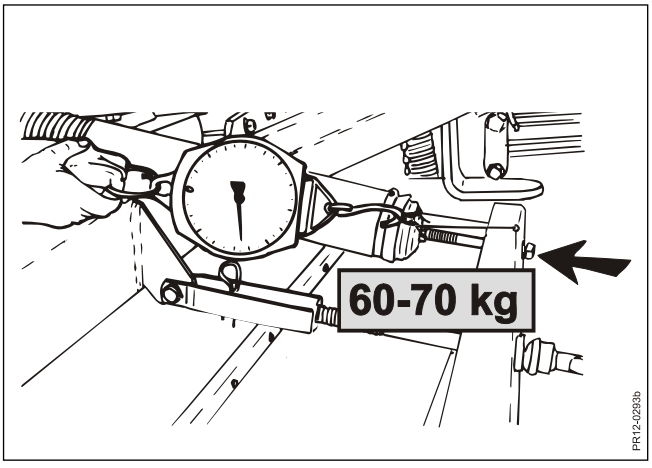


Fig. 3-15

STUBBLE HEIGHT AND RELIEF OF THE CUTTER BAR

Unload the cutter bar in the right order:

1) The machine is swivelled to a **central position behind** the tractor (transport position).

The machine must be mounted correctly in the lower links of the tractor, see the section about **Connection**. The **cutter bar must be lowered to rest on an even surface.**

Fig. 3-11 2) Adjust **the stubble height** by means of the guide shoes and by adjusting the inclination of the cutter bar.

Theoretical cutting height:
The upper hole 55 mm => corresponding to a stubble height of 110 mm.
The lower hole 30 mm => corresponding to a stubble height of 60 mm.
(Usually the stubble height is 2 x theoretical cutting height).

Fig. 3-14 The vernier adjustment is made by adjusting the inclination of the cutter bar on the spindle at **A**. A spring cotter **F** maintains the adjustment. **The length of the spindle must be the same in both the left and the right side! This is important to ensure that the cutting unit does not heel resulting in an unsatisfactory function.**

Fig. 3-12 3) The height relief springs are adjusted with the handle **A**, until the cutter bar **has** a suitable ground pressure.

Fig. 3-13 In principle the spring adjustments can be adjusted in such a way that the cutter bar is floating. First you can for instance tighten the springs adjusting the lift power of the cutter bar to **30-40 kg on each side** (where the spring weight is
Fig. 3-12 used as a help). A counter nut **B** secures the adjustment.

Note: It is seldom that the height relief springs are to be tightened equally much.

Fig. 3-14 4) The **Top Safe** springs **B** are adjusted until the cutting platform can be moved in the direction of **E**, with a **suitable pressure**.
The counted nut **C** is loosened and the adjustment is made by means of **D**.

Fig. 3-15 Start with **approx. 60-70 kg** on each side.

NB! These **TOP SAFE** springs have not been adjusted from the factory because of the transport and after adjustment it should be checked, **that the springs have the same torque in the right and the left side.** This can either be done by weight or by comparing the lengths of the springs **B** (fig. 3-14).

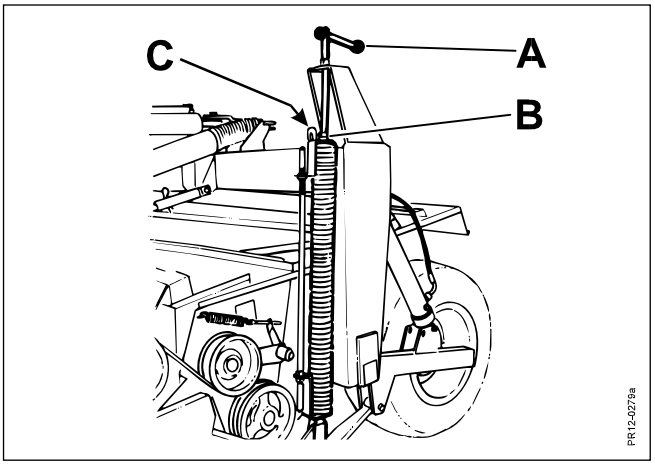


Fig. 3-12

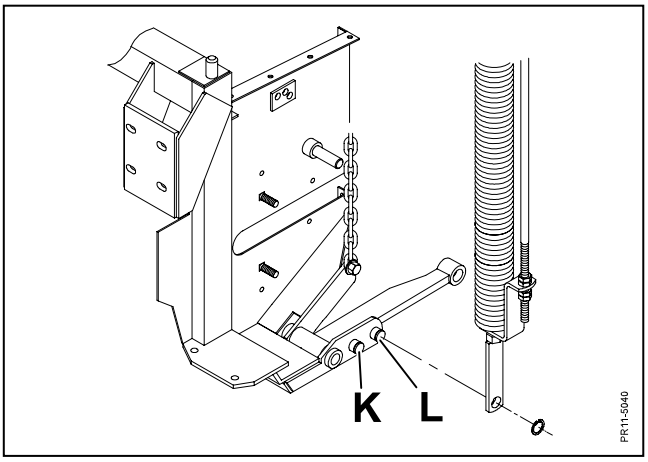


Fig. 3-16

Fig. 3-12 5) **The safety chains C**, are adjusted with approx. **1½** chain link's clearance downwards.

The safety chains ensure that the cutter bar has a stable suspension during transport and when working in the headland and they also ensure a maximum bottom position/depth.

6) **Any modification** of the stubble height demands a re-adjustment of the relief (Fig. 3-5).

7) **Working in the field** - ensure less possible load on the cutter bar. If the stubble is wavy the springs have been tightened too much.

The extension of the adjustment is only intended as a guide and must be adapted to the individual need and situation.

Note: **At intervals is must be checked that the machine is working with the correct relief. Earth and grass on the cutter bar and in the swath boards can change the relief considerably!**

To small relief can cause **great wear** on the guide shoes and **damage the grass roots.** There is also an increased risk that the machine will **"pick-up stones"**, which means an increased risk of damage to material and persons.

Fig. 3-16 If the cutting platform has a marked tendency to tip over the problem can be solved in two ways:

A) By loosening the horizontal top springs a little (Fig. 3-14), page 34, and tightening the vertical height relief springs a little (Fig. 3-12).

B) Or by displacing the fix point of the vertical height relief springs on the lower part of the cutter bar from **K** to **L**. Thereby the centre of gravity of the cutting platform is moved forward resulting in greater ground seeking qualities.

And vice versa, if the cutting platform seems to be too ground seeking A) or B) is performed in the opposite direction.

From the factory the **GCS** models are mounted at **K**, and the **GMS** models at **L**. This is the optimum adjustment in most cases.

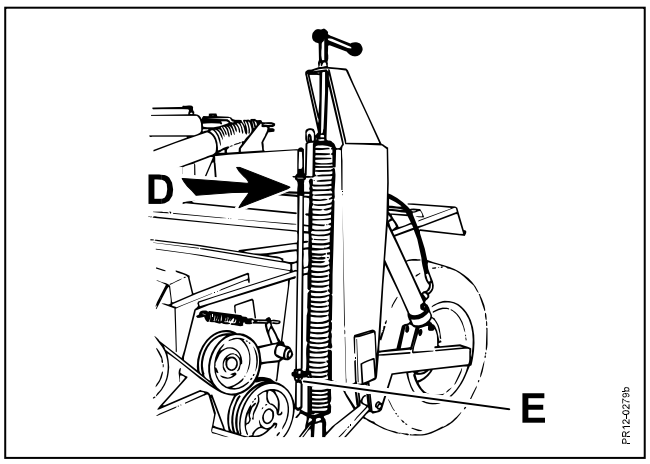


Fig. 3-17

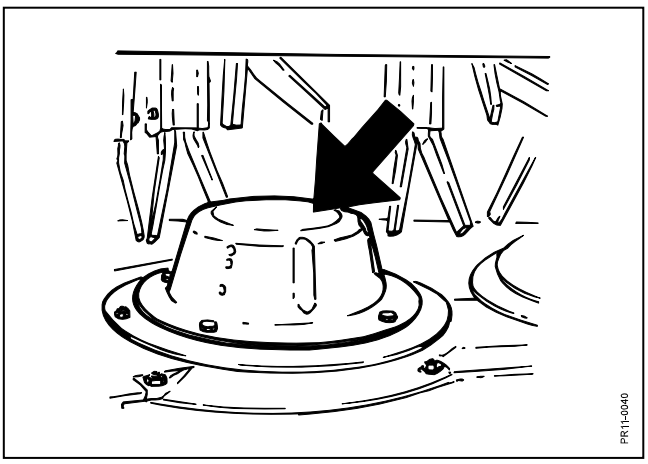


Fig. 3-18

NB! THE CONNECTION BETWEEN CUTTER BAR AND RELIEF SPRING

It is essential to pay attention to the important connection between the following elements:

- **a)** The distance from the PIC shaft to the ground and the inclination of the cutter bar
- **b)** The tension of the Top Safe springs and of the height relief springs.

If one thing is changed under **a**, the other things under **b** must be checked/adjusted to obtain optimum working conditions.

WARNING: Remember! After the adjustment it must be checked that all the counter nuts have been tightened and any tools must be removed from the machine.

SPRING INDICATOR

The machine must be connected to the tractor as described on page 17. The stubble height and the relief must be performed as described on page 35.

Fig. 3-17 The rod is placed in such a height that the indicator is positioned **straight in front of the** marking D on the rod. Nut and counter nut E are tightened so that the rod “is loose” on the bracket.

The spring indicator will then **show** how large the actual relief is compared to the original adjustment.

This is useful information when working with an (alternative) smaller/larger tractor. The tractor driver does not have to perform the fundamental adjustment of the stubble height nor relief from one tractor to another.
The relief is then adapted by adjusting the height of the lower links until the indicators show the right relief. In return the tractor driver must accept a displacement of the angle of the PTO drive shaft.
A larger angle of the PTO drive shaft will reduce the life and can not be recommended on a long view.

FLOW CAPS

Fig. 3-18 The discs are equipped with low flow caps to enable them to lift the crop away from the blades. This reduces the risk of stripes and re-cutting.

If the power requirement seems too high the flow caps can be dismounted. The crop and the driving technique decide the need of flow caps.

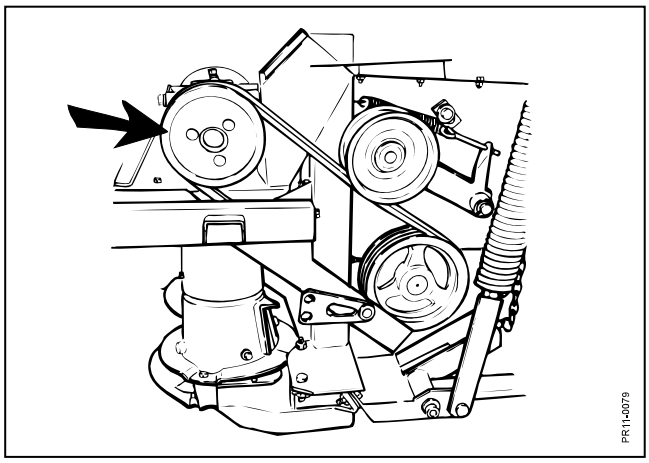


Fig. 3-19

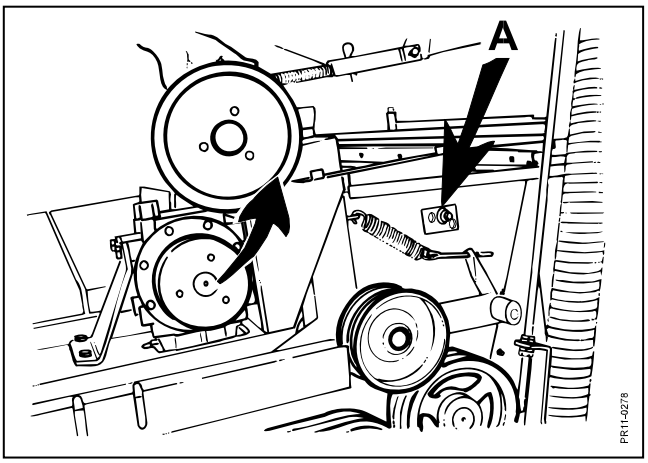


Fig. 3-20

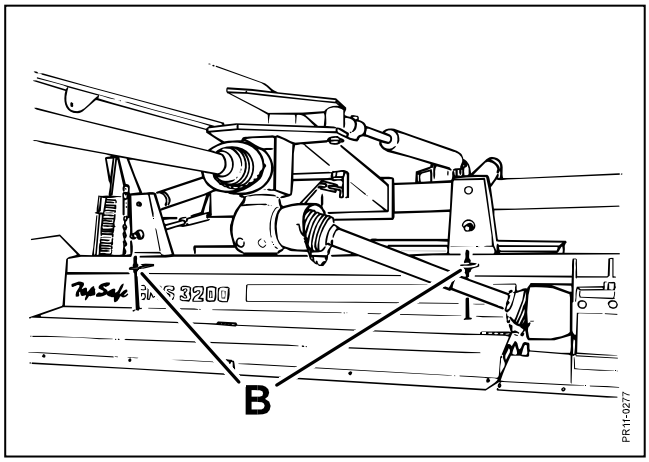


Fig. 3-21

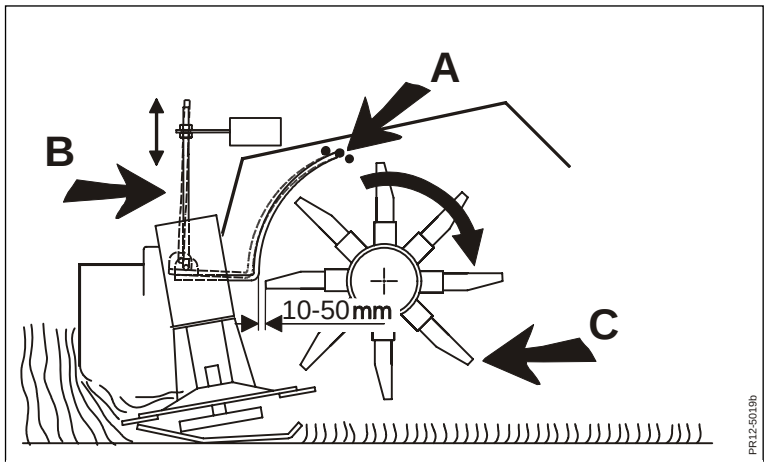


Fig. 3-22

THE CONDITIONER (GMS)

The conditioner rotor has 2 speeds: **670 - 1000 o/min.**

Fig. 3-19 From the factory the gearbox is equipped with a pulley for a conditioner speed of **1000 RPM .**

Fig. 3-20 When changing to **670 o/min**. the outer big pulley on the gear is removed. The big pulley is mounted on top of the small one). The 3 supplied belts must be used.

Generally: **High speed - stronger conditioning**
Low speed - weaker conditioning

Fig. 3-21 The conditioning can also be varied by changing the distance between the
Fig. 3-22 conditioner plate and the rotor. Adjustment is made by moving the conditioner plate in the holes at **A** (right and left side are adjusted equally much) and adjustment of the screws at **B** (right and left side are adjusted equally much).
3600 FLEX: The adjustment is made continuously by means of a handle at the spindle in the right side.

Generally: **Small distance - strong conditioning**
Large distance - weaker conditioning

The adjustment should be adapted to the forwarding speed and the state of the crop. As a basic adjustment it is recommendable to start up with a small distance up front (15-20 mm) and a larger distance at the rear.

OPTIMUM CONDITIONING can be obtained with the following positions:

You have a:		Succulent, green crop		or	Strawy, more ripe crop	
You want to drive		above 10 km/h	under 10 km/h		above 10 km/h	under 10 km/h
The following adjustment of **GMS** is recommended:						
Conditioner rotor speed	high				X	X
	low	X	X			
Distance between conditioner plate and rotor	big		X			
	medium	X				X
	small				X	

Finally the PE-fingers at **C** can be turned around for a more aggressive attack on the crop.

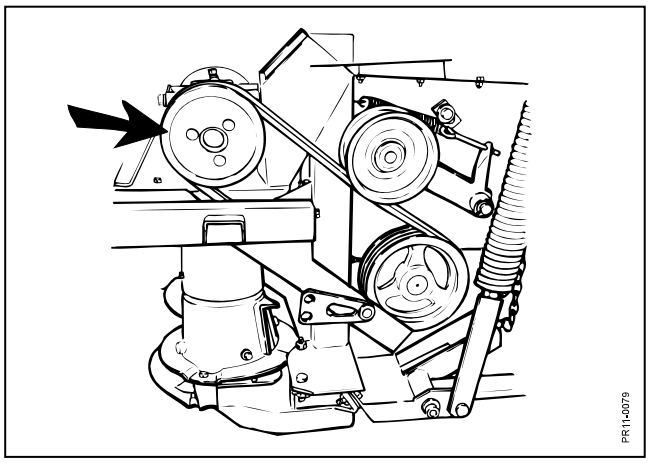


Fig. 3-23

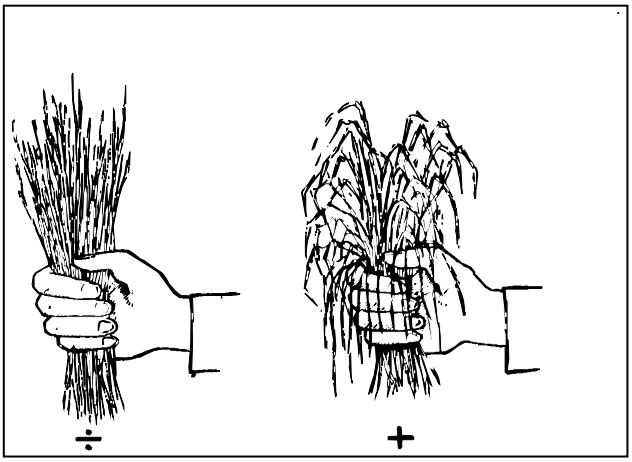


Fig. 3-24

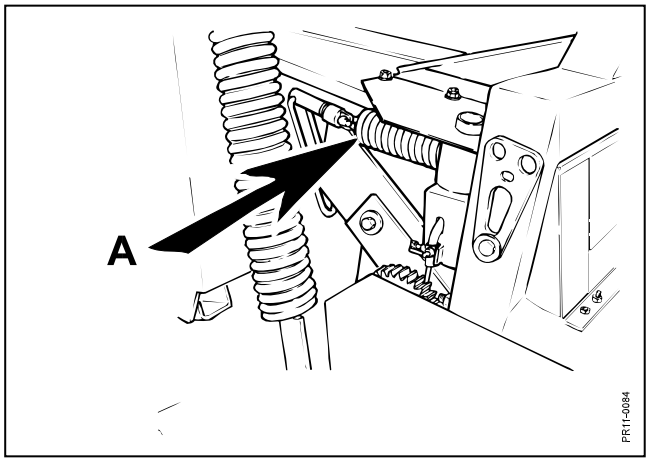


Fig. 3-25

THE CONDITIONER (GCS)

Fig. 3-23 From the factory the gearbox is equipped with a pulley for a conditioner speed of **1000 RPM**. This is the standard speed on the **GCS** machines.

CONDITIONING

The conditioning should not be stronger than is required for obtaining a quick drying. The correct degree of conditioning may be difficult to judge, especially in grass crops. The straws must be broken, but not crushed. Crushed leaves and stems give unnecessary waist.

Too strong conditioning can be seen by the stems having a dark green colour and giving off liquid.

The reason may be:
- that the rollers are too close
- that the roller pressure is too high and
- that the driving speed is possibly too low

Fig. 3-24 Too light conditioning is characterised by the straws keeping upright, when a bunch is held in the hand.

The reason may be:
- that the roller distance is too big
- that the roller pressure is too low
- that the driving speed is possibly too high

It may be difficult to decide if the conditioning is suitable, but do not be tempted to exaggerate the conditioning. Normally it is sufficient, even if it cannot immediately be seen on the grass.

ROLLER PRESSURE

Fig. 3-25 In order to ensure a suitable roller pressure, both by large and small quantities of grass, the upper roller is spring-loaded and the springs also give the rollers the possibility of receding when a foreign body gets between the rollers.

The roller pressure is adjusted on both sides of the machine at the springs **A**.

The following lines of direction can be given:

- In grass crops **the springs** are tightened.

- In clover, Lucerne and other leafy crops the springs are **loosened**

Attention: The springs must be equally adjusted in both sides.

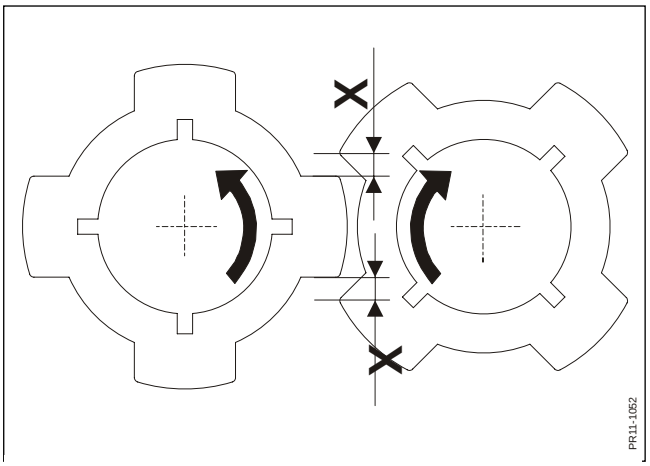


Fig. 3-26

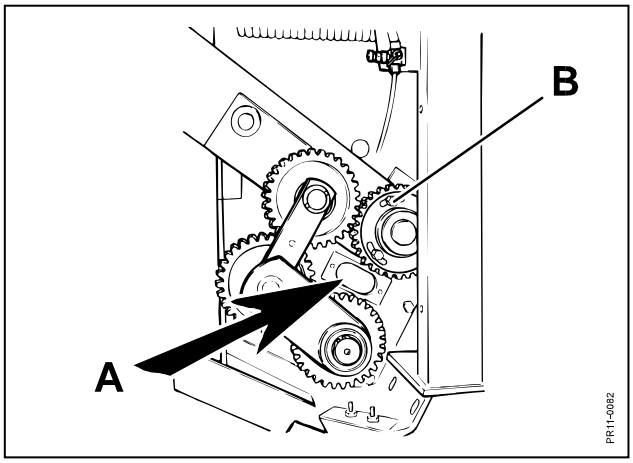


Fig. 3-27

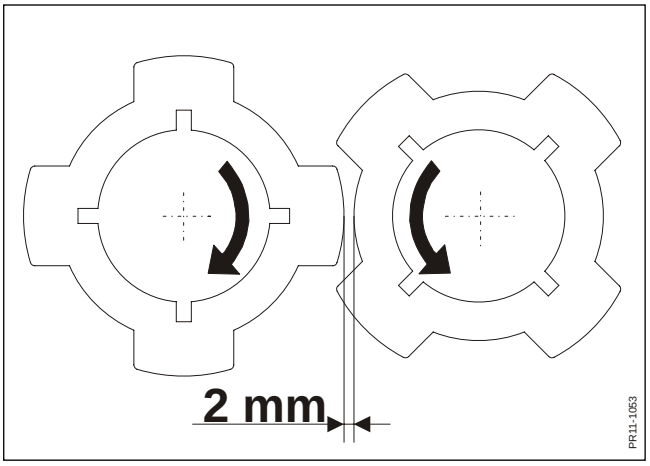


Fig. 3-28

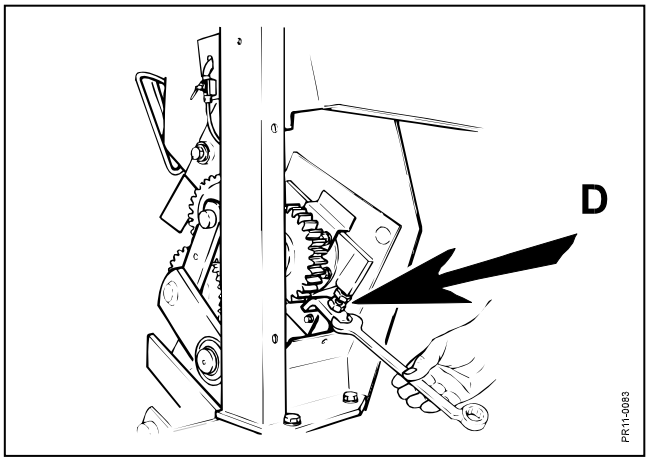


Fig. 3-29

SYNCHRONIZATION OF THE ROLLERS

Fig. 3-26 The rollers **must never** touch each other, this will give a poor result and many vibrations in the machine.

The rollers must always be correctly synchronised, i.e. be in time with each other, so that the roller profiles on one roller go precisely into the roller profiles on the other roller. the rollers are correctly synchronized when the distance **X** is approximately the same in both sides.

Fig. 3-27 The synchronisation can be checked through the peephole **A** between the rollers. For readjustment the 4 bolts **B** are loosened, and the roller is turned into the correct position. The bolts are tightened with 200 Nm (20 kgm).

DISTANCE BETWEEN ROLLERS

Fig. 3-28 The distance between the rollers must be min. 2 mm.

The distance is checked with a finger nail, it should just be possible to stick it between the rubber profiles where the dimension 2 mm is indicated in the figure.

Fig. 3-29 Adjustment of the distance, if required, is made at the screw **D** that is provided with a counter nut that must be retightened well after adjustment. The adjustment is made on both sides of the machine.

If there are jarring sounds or vibrations it may be due to the rollers being too close or the synchronisation being incorrect.

IMPORTANT: Check these adjustments frequently.

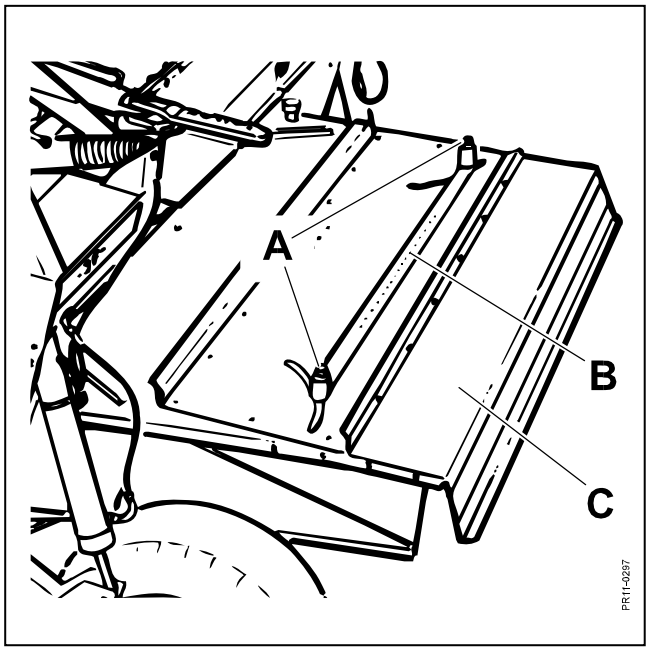


Fig. 3-33

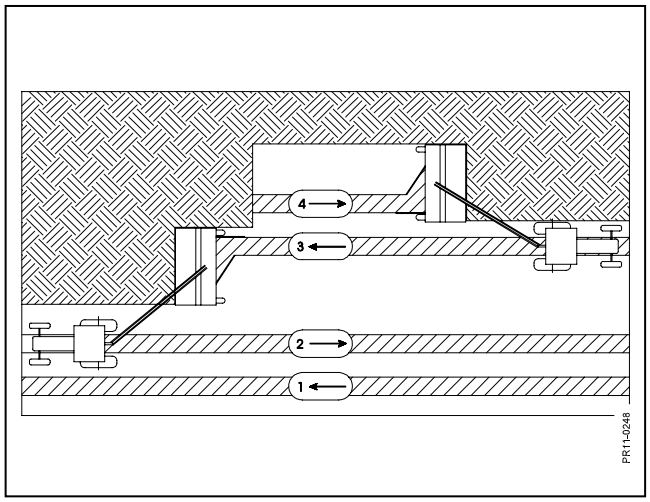


Fig. 3-34

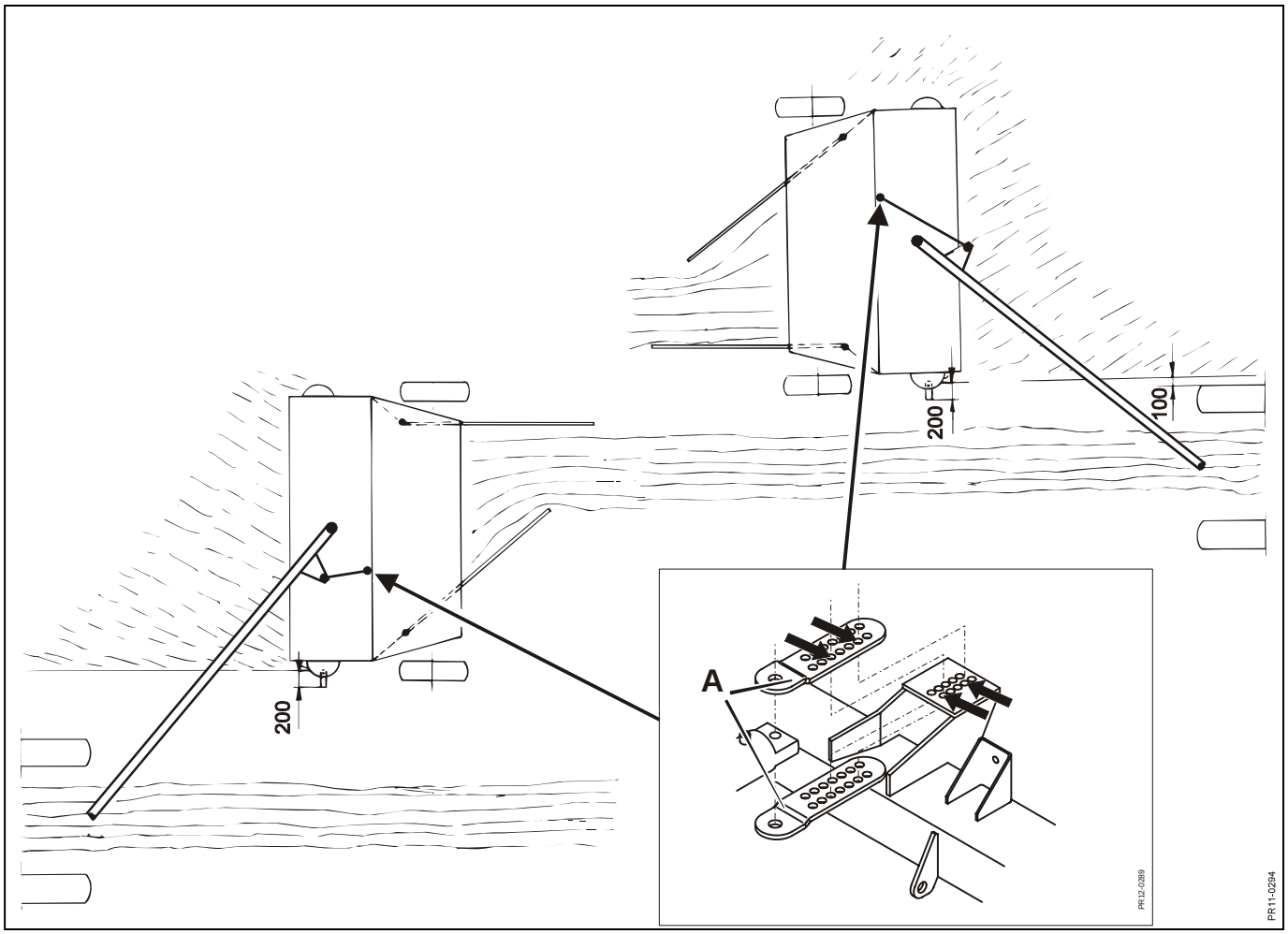


Fig. 3-35

ADJUSTMENT OF SWATH BOARDS

Adjust the swath boards so that they fit to the width of the following pick-up. **The swath should be as even and wide as possible.**

Fig. 3-33 Adjustment is made by loosening the nut at A and adjusting the swath width with the slide bar at **B**.

Then the swath can be placed dislocated from the middle if required. See the section below about asymmetric placing of swath.

IMPORTANT: Be aware when adjusting the swath guards on GMS 3600 FLEX, so that the canvas at the rear will not be squeezed and damaged.

ASYMMETRIC SWATHING (ADDITIONAL EQUIPMENT - ONLY GMS)

Fig. 3-34 If the pick-up width of the following chopper allows it would be a great advantage to put two swaths together. A double swath will be up to 3.3 m with GMS 3600, approx. 3,0 m on GMS 3200 and about 2.6 m wide with GMS 2800. The width of the double swath depends on the crop, the adjustments of the machine, and the driving technique.

Double swathing is possible by extending both swath boards with a lightweight board that can be bought as additional equipment.

RE-ADJUSTMENT TO ASYMMETRIC SWATHING

The delivery guard **C** Fig. 3-33 is dismounted or tipped up.

Fig. 3-35 The swath guards is adjusted so that the swath is pressed as much as possible to the right. This has the effect that by turns the tractor, which normally drives straight above the swath when FLEX-driving, will drive alternately close to/away from the unharvested crop. See illustration on Fig. 3-34.
Asymmetric swathing requires re-adjustment of the machine's displacement to the right and left:

Big displacement to the right and small displacement to the left.

When readjusting from symmetric displacement to asymmetric displacement you normally only adjust on the rear flange pieces **A.** Hereby the stroke of the tongue shift cylinder is maintained and it is still possible to drive above the previous swath.

The flange pieces **A** are normally moved one hole backward on the main frame as compared to the shown basic adjustment.

It will be best to make the exact adjustment in the field.

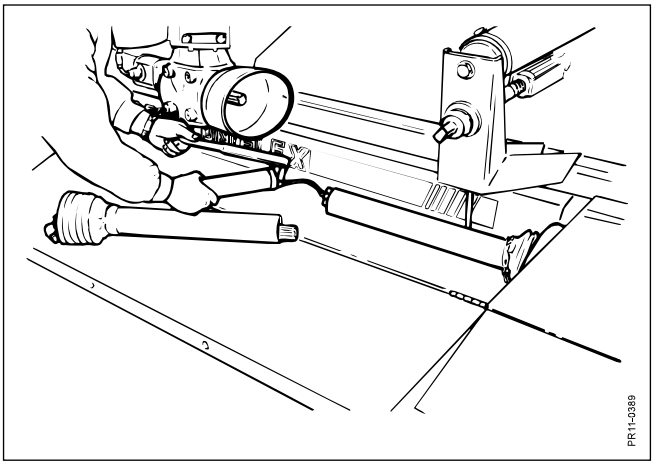


Fig. 4-1

4. GREASING

GREASE

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

Go through the greasing chart.

TYPE OF GREASE: Universal grease of good quality.

Rotating mechanical connections are greased with grease or oil as required, and wheel hubs are refilled with grease once per season.

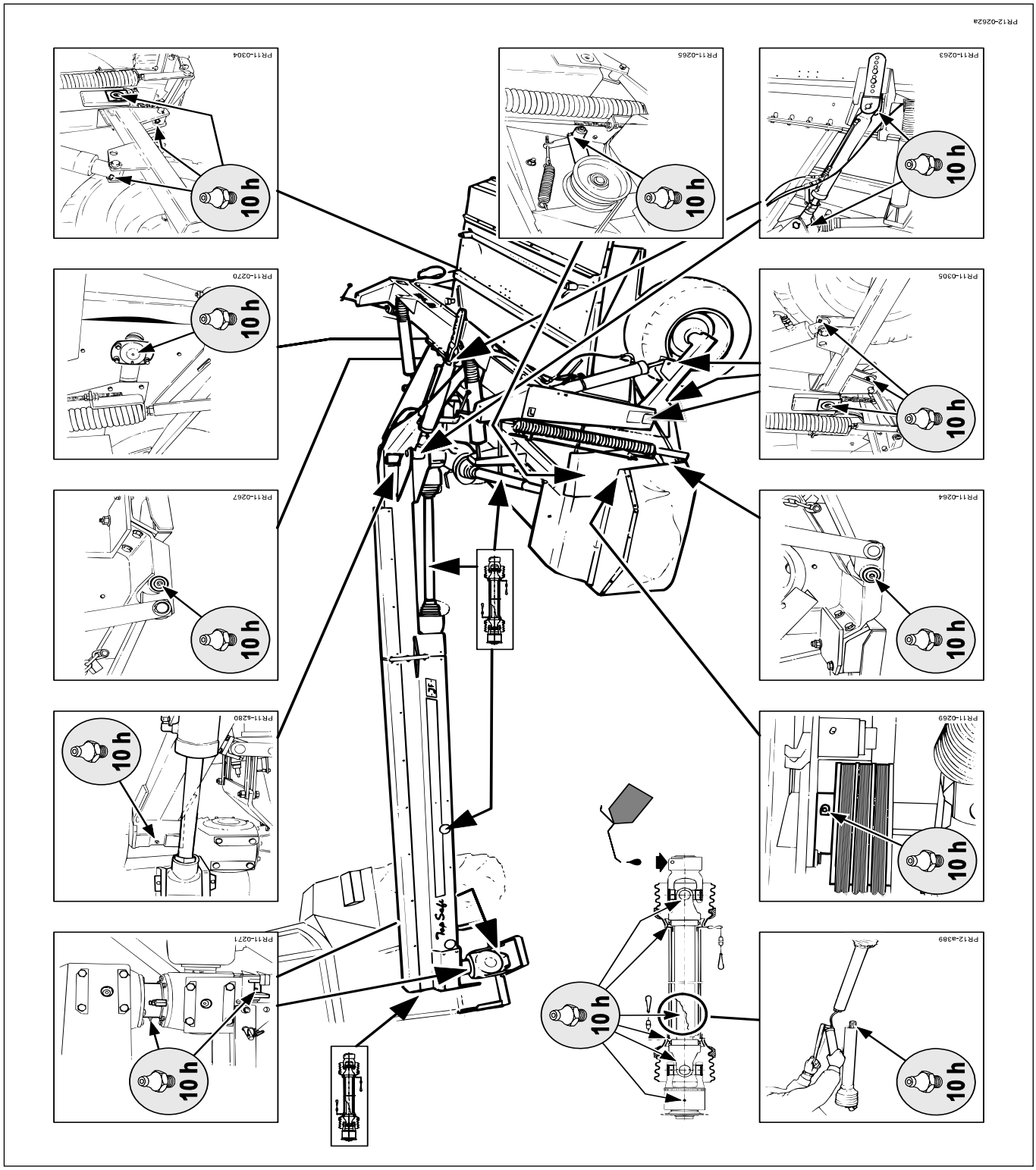
WARNING - REMEMBER:

PTO-DRIVE SHAFTS ARE GREASED EVERY 10TH OPERATING HOUR

Pay special attention to the **sliding PROFILE TUBES**. They must be able to slide back and forth even when the torque is heavy**. If you neglect to grease the profile tubes sufficiently, it will result in high axial forces, which will damage the profile tubes, and in time also connecting shafts and gearboxes.**

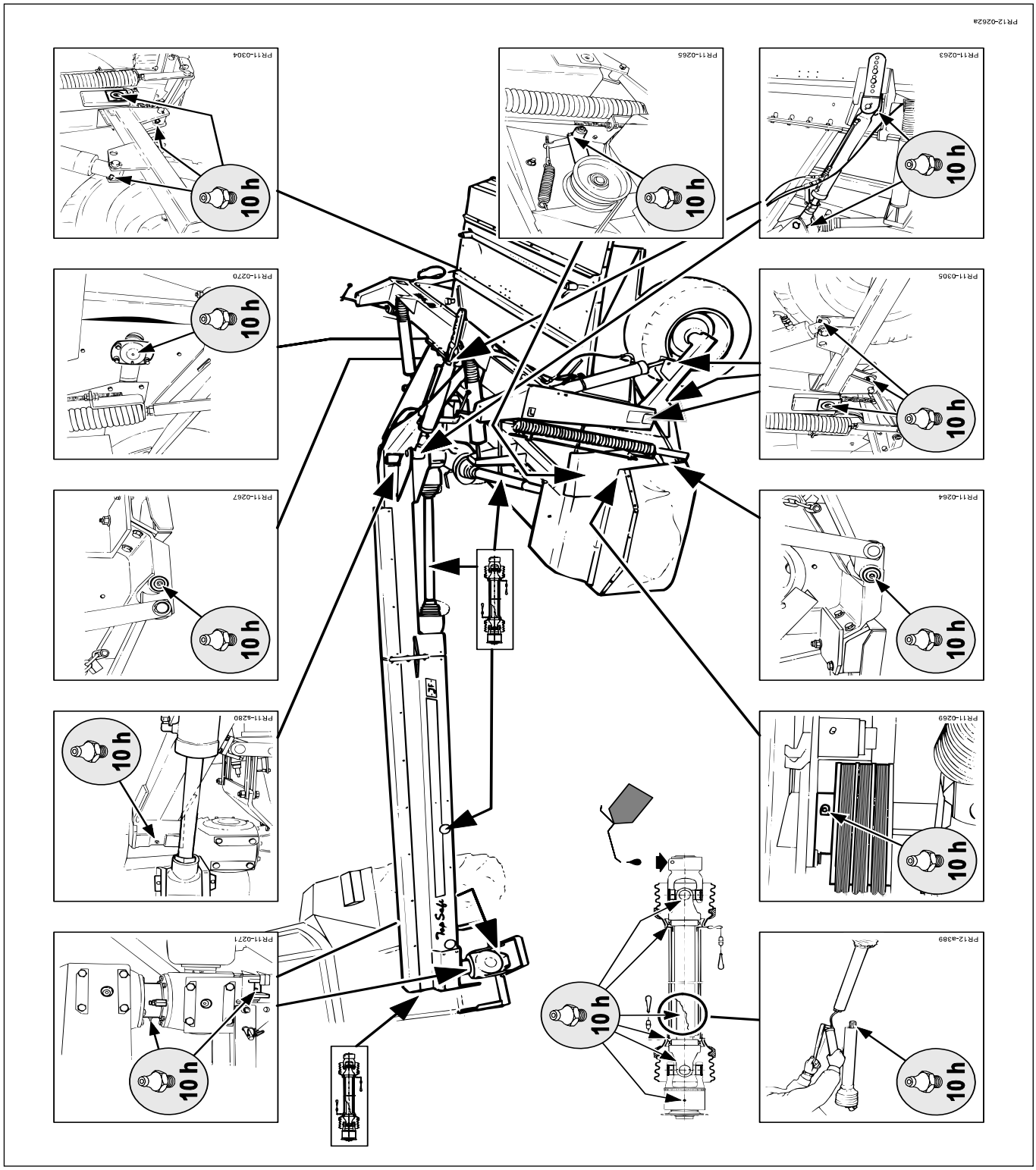
Fig. 4-1 This especially goes for the main PTO drive shaft and the traversing PTO drive shaft that operates the right angular gearbox above the cutter bar.

Greasing chart for disc mowers <u>GMS 2800, 3200 and GMS 3600 FLEX</u>
Below grease spots **must** be greased according to the operating time intervals indicated.



Greasing chart for cutter bar type <u>GCS 3200 FLEX</u>

Below grease spots **must** be greased according to the operating time intervals indicated.



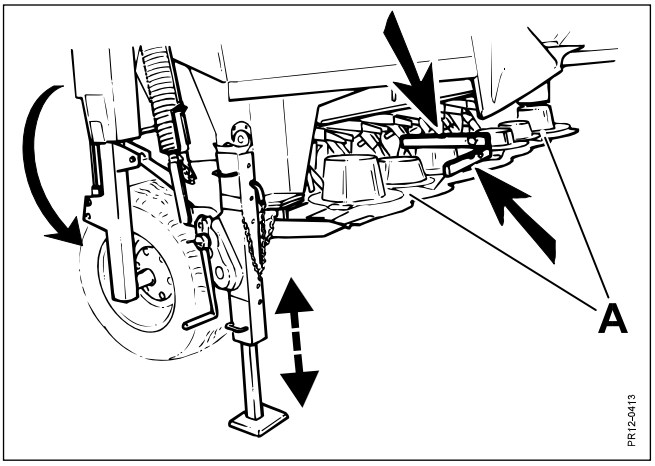


Fig. 4-2

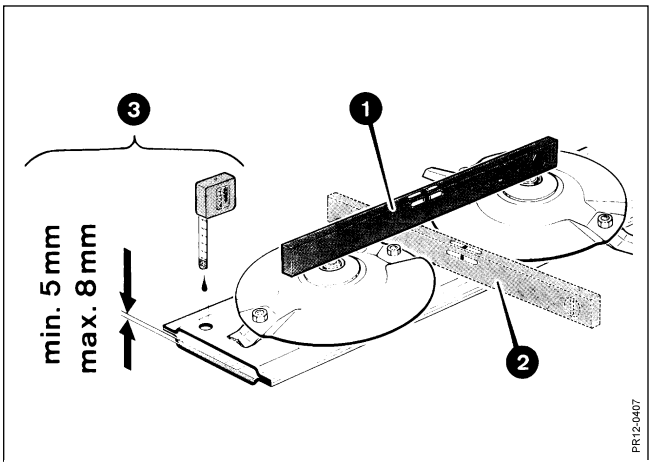


Fig. 4-3

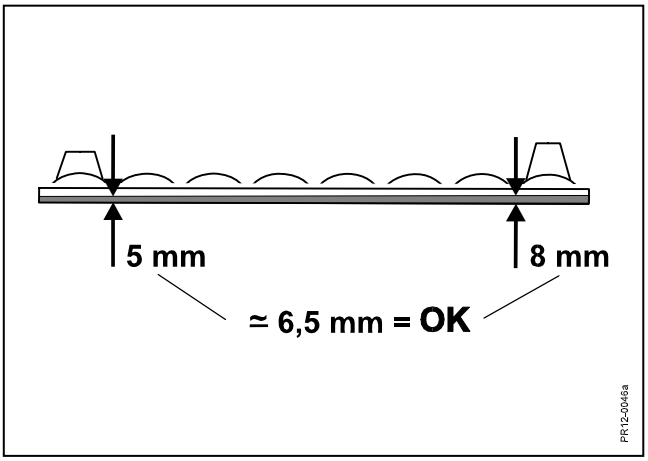


Fig. 4-4

OIL IN THE CUTTER BAR

Oil content: 

GMS 2800 FLEX **2.00 l**

GMS/GCS 3200 FLEX **2.25 l**

GMS 3600 FLEX **2.50 l**

2 Filling plugs are placed on top of the cutter bar:

2800 FLEX - between 1st and 2nd disc in **the righthand side,** and between 2nd and 3rd disc in **the left-hand side**.

3200 FLEX - between 1st and 2nd disc in the right **and** left-hand side.

3600 FLEX - between 1st and 2nd disc in **the righthand side** and between 2nd and 3rd disc in **the left-hand side**.

Oil type: **Only quality: API GL4 SAE 80W**

(In certain countries you cannot get API GL4 3AE 80W. In these cases API GL4 or GL5 SAE 80W-90 oil can be used as an acceptable alternative. Never use a straight EP 90 oil in the cutter bar.

Fig. 4-2 The oil level must be checked every day during the harvesting season.

Fig. 4-3 In order to facilitate the daily oil check we can recommend to have a permanent "oil measuring place". This means that the check for **"horizontal cutter bar"**, as shown on Fig. 4-2 and 4-3 only has to be made once.

Horizontal cutter bar:

Longitudinal direction: The machine is lifted to max. ground clearance. Hereby the construction of the machine ensures that the cutter bar will tilt backwards to almost horizontal position. Fine adjustment can be made with the tractor's lower links, or by ground adaptation.

Cross direction: Fine adjustment can be made with e.g. a lifting jack, as shown.

Fig. 4-4 Oil level: 

6 - 7 mm. (Average value)

This oil level must be an average of the measuring from both filling holes (marked by **A** on Fig. 4-2).
Wait 3 minutes (cold oil: wait 15 minutes) and then check the level.

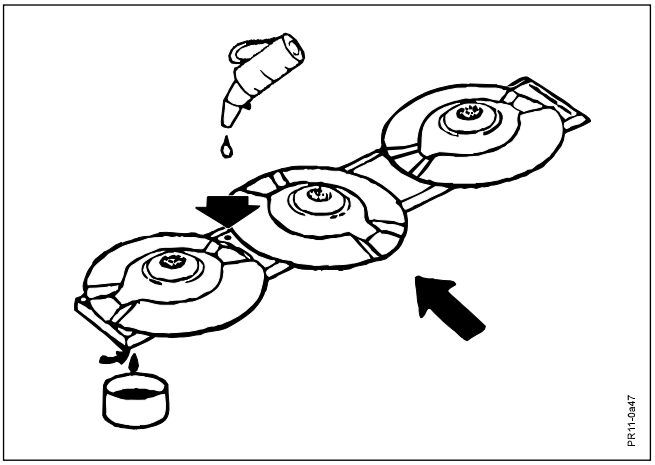


Fig. 4-5

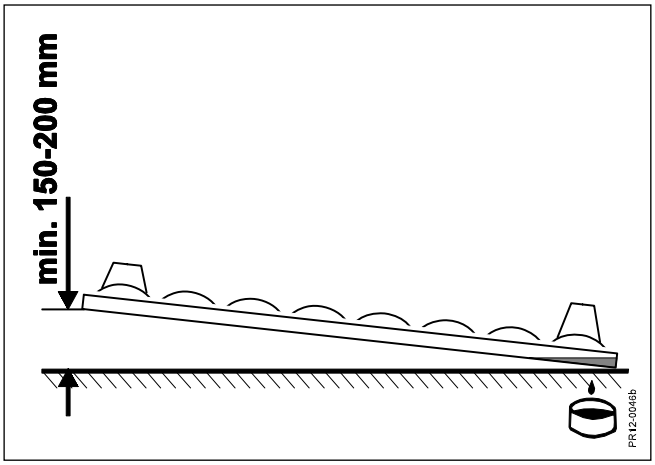


Fig. 4-6

Fig. 4-5 **Oil shift:** 

First oil shift after 10 working hours and then after every 200 hours of working or at least once a year.

The oil is drained off at the plug in the bottom in the left-hand side.

Please note: The **left** guide shoe is dismounted in order to reach the drain plug.

Fig. 4-6 For oil shift the cutter bar is raised at least 150-200 mm in the right hand side to ensure optimum emptying.

The drain plug is fitted with a magnet and should be cleaned at every oil shift.

REMEMBER: **Never** fill with more oil than described.
Too much oil as well as too little oil in the cutter bar causes unintended heating, which will in time damage the bearings.

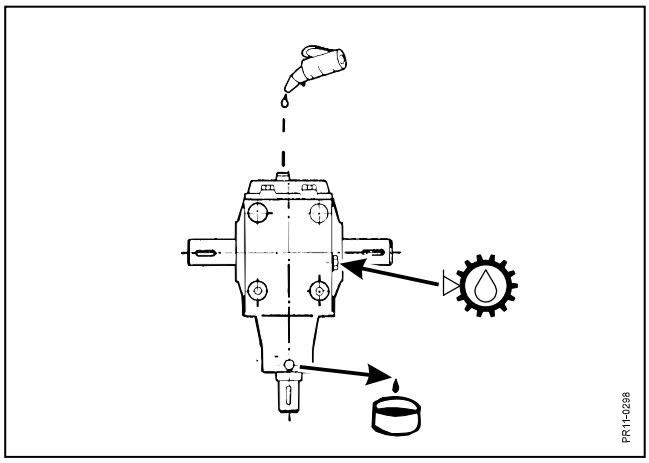


Fig. 4-7

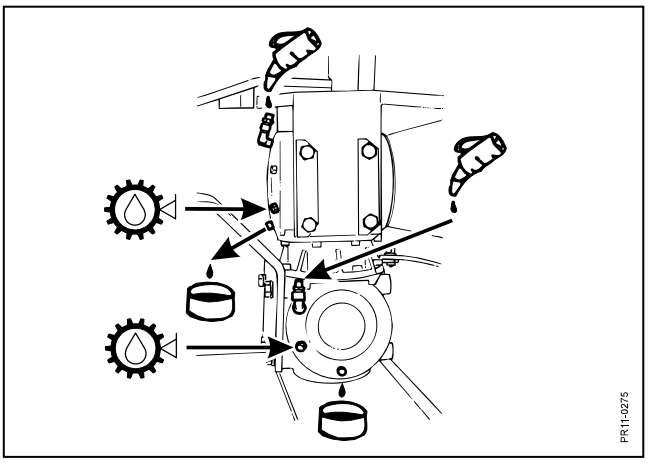


Fig. 4-8

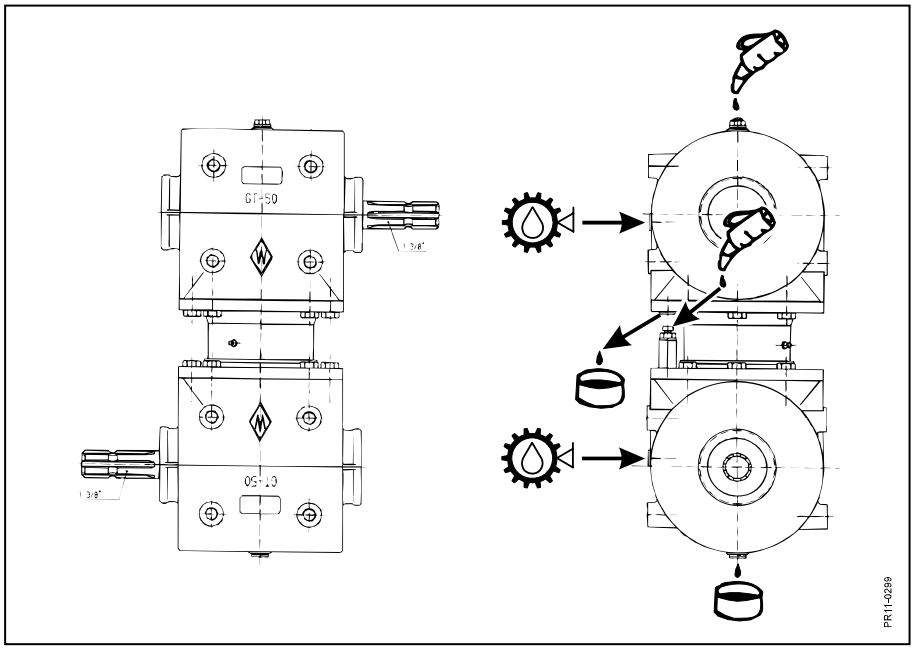


Fig. 4-9

OIL IN THE BEVEL GEARBOX ABOVE THE CUTTER BAR

Fig. 4-7

Oil content: 1,5 l

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

Oil level: **The oil level must be checked daily in the harvesting season.**

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

SWIVEL GEARBOX ABOVE CUTTER BAR

Fig. 4-8

Oil content: 0,6 l in the upper part
0,9 l in the lower part

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

Oil level: **The oil level must be checked daily in the harvesting season.**

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

SWIVEL GEARBOX AT TRACTOR

Fig. 4-9

Oil content: **2,0** l in the upper part
2,0 l in the lower part

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

Oil level: **The oil level must be checked daily in the harvesting season**.

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

5. MAINTENANCE

IN GENERAL

WARNING: **For repair or maintenance of 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 1-20 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 repair has been made.**

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

A Ø	Class: **8.8** $\mathbf{M}_A$ [Nm]	Class: **10.9** $\mathbf{M}_A$ [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

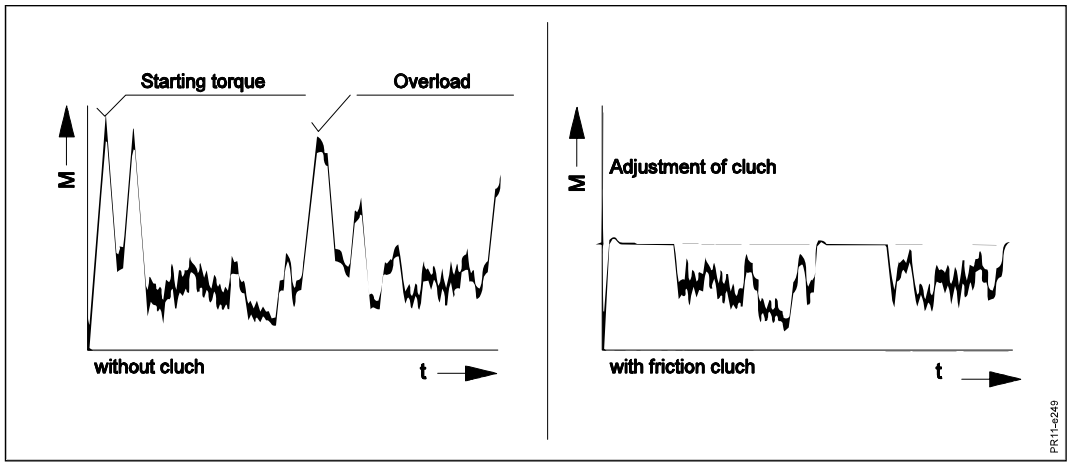


Fig. 5-1

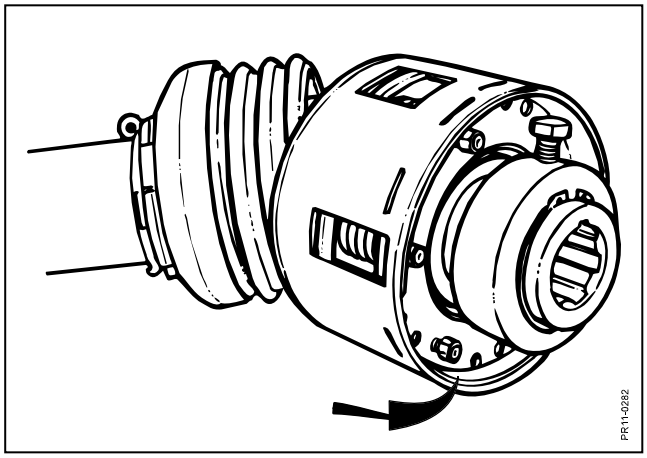
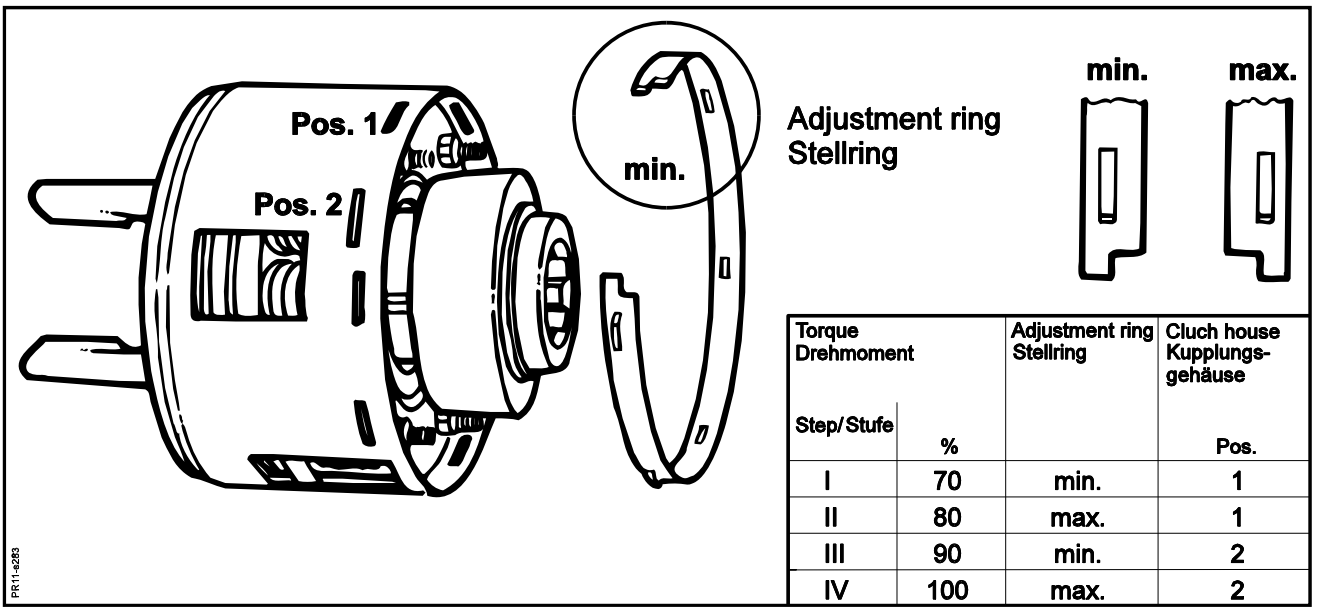


Fig. 5-2



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

Fig. 5-3

FRICTION CLUTCH

Fig. 5-1 **In order to ensure a long life for your tractor and machine** the machine is delivered with **friction clutch** on the front PTO drive shaft. On the figure is shown how the friction clutch protects the transmission against high torque peaks and at the same time being capable of transmitting the nominal torque while it 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. 5-2 Before the upstart of a new machine and after a long period of standstill, e.g. winter storage **the clutch is "aired" in the following way:**

The six nuts on the flange are tightened. Hereby the springs are compressed so that they do not press on the clutch plates and the clutch can rotate freely. **Have the clutch rotate for half a minute** to remove dirt and possible rust on the plates. The nuts are **loosened** again until they are at level with the threads of the bolts, and the springs can press on the clutch plates.

Fig. 5-3 The torque in the friction clutch has 4 different torque adjustments, which should be adapted as required. This is done by turning the adjustment ring and by choosing 2 different positions in the clutch housing.

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

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

GUIDING TORQUE ADJUSTMENTS

PTO	Moment	Adjustment
540	1500 Nm	Step lV
1000	1200 Nm	Step II

The adjustment can only be made when the six nuts are tightened. After the adjustment has been made the nuts are loosened again to the end of the bolt.

WARNING: **If the clutch is overloaded it will slip and get heated, and hence be worn quickly. Overheating will damage the friction plates. If the clutch is blocked or put out of function in other ways the factory guarantee will be discontinued.**

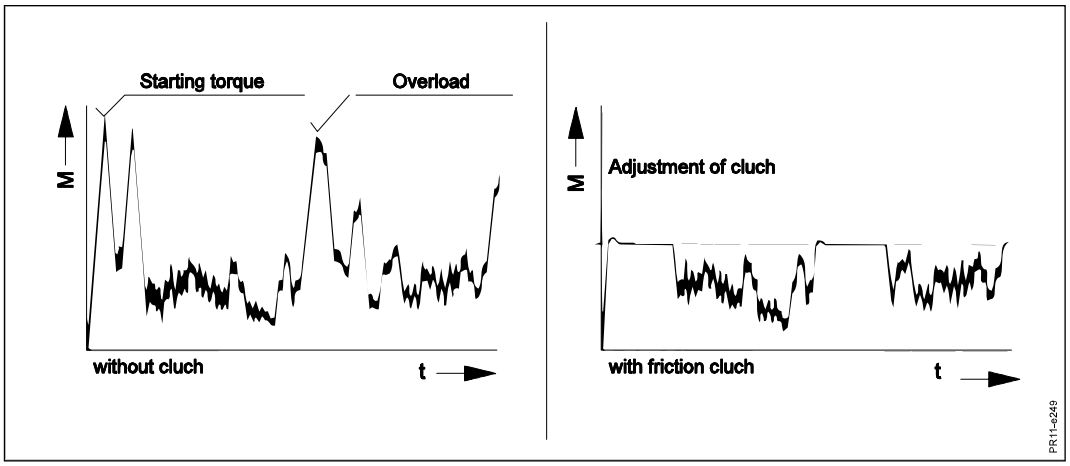


Fig. 5-1

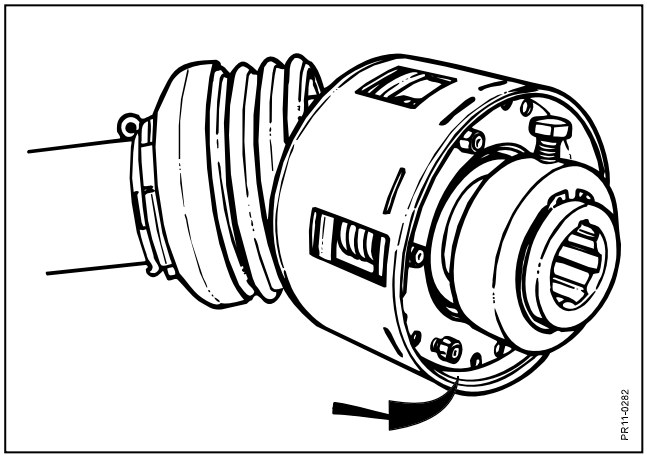
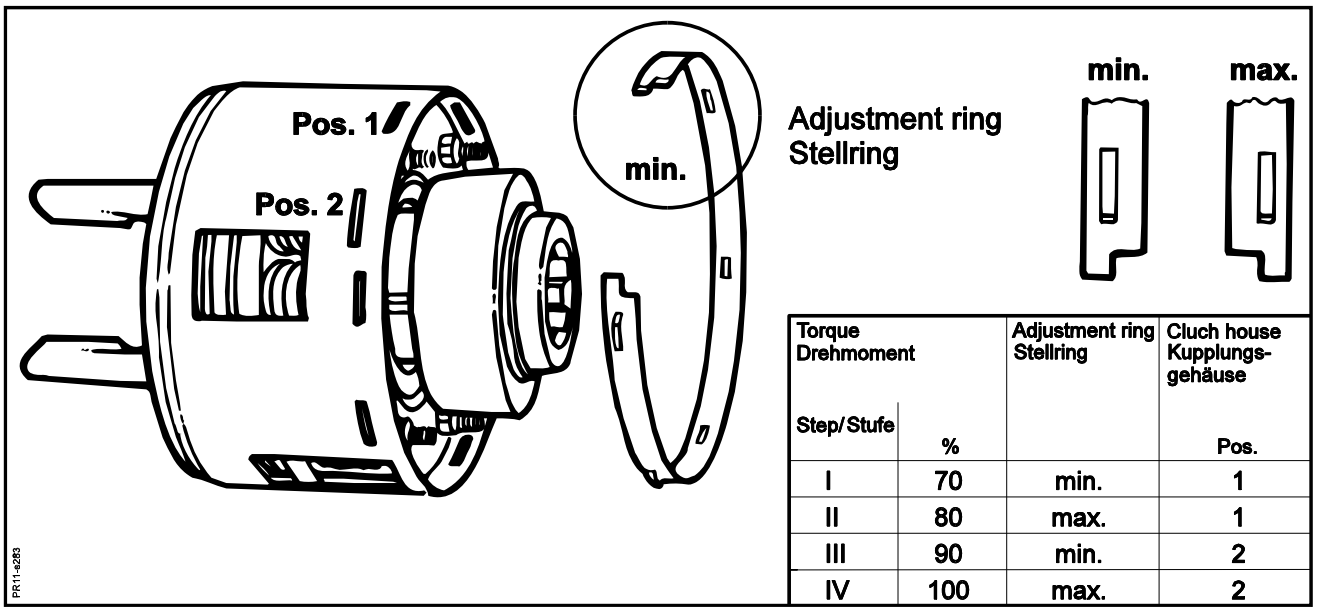


Fig. 5-2



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

Fig. 5-3

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. 3000 RPM, and one broken knife 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 will cause fatigue fractures and serious damage.

Fig. 5-4 To avoid damaging vibrations the bar must be tightened very well. 110 Nm (11 Kpm). Bolts at bar ends are checked regularly.

Fig. 5-5 Bolts at stone protections and shear bar must be checked at regular intervals.

Fig. 5-6 The two flow intensifiers in the sides are filled with blocks of foam to avoid unbalance. It is important that the foam blocks remain undamaged so that the flow intensifiers are not filled with dust and dirt.

Fig. 5-7 Low flow caps should be straightened or replaced by new ones if they are deformed. They should be checked for dust and earth 2 or 3 times per season.

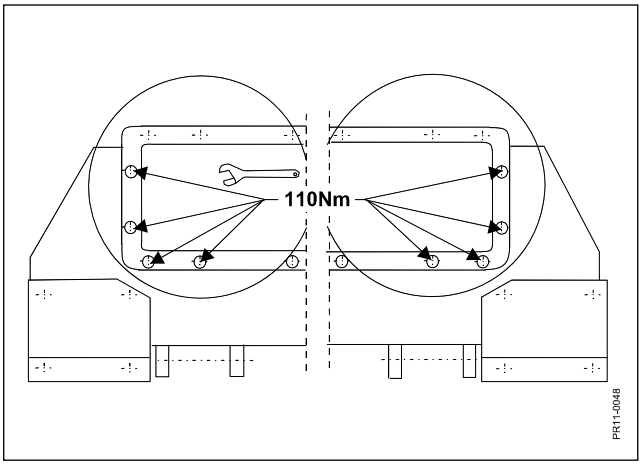


Fig. 5-4

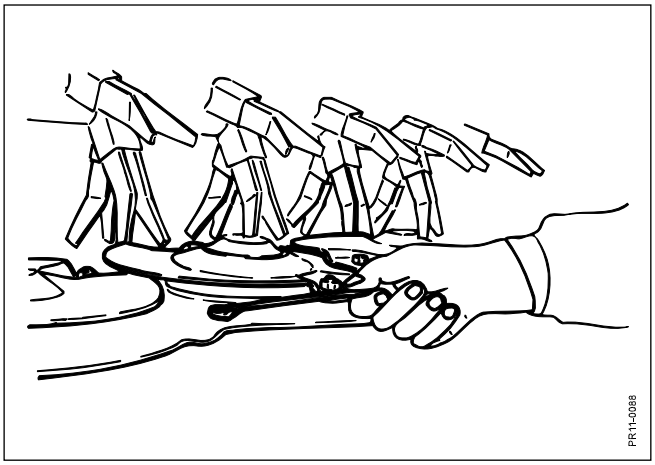


Fig. 5-5

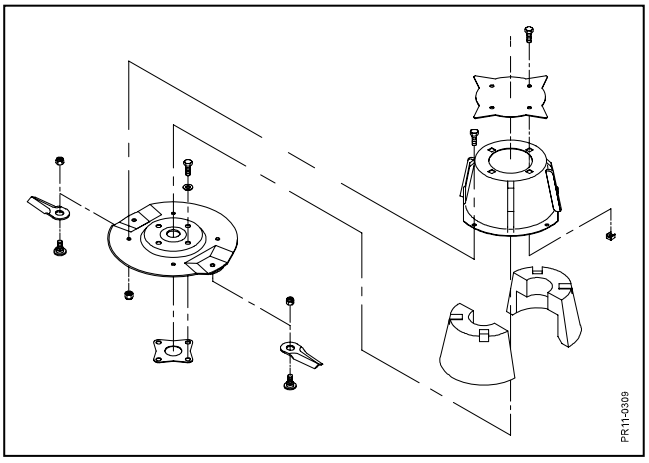


Fig. 5-6

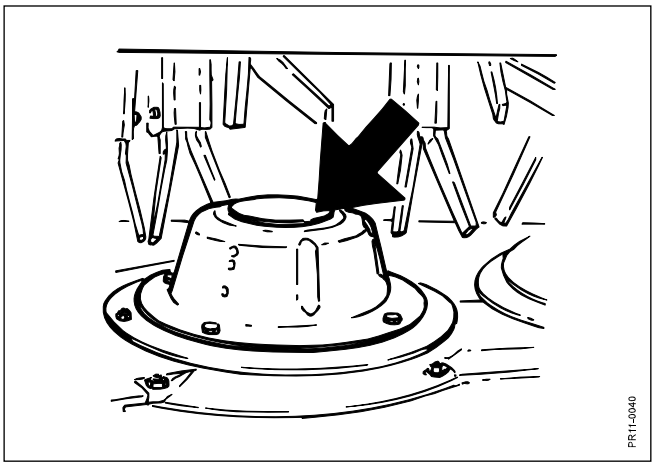


Fig. 5-7

CUTTER BAR - DISCS AND BLADES

Discs, blade bolts and blades are made from hardened, high-alloyed steel. This heat treatment results in a specially hard and ductile material, which can handle an extreme stress. If a blade or a disc is damaged no attempt must be done to weld the parts together as the generation of heat weakens the parts.

Damaged blades, discs, blade bolts or nuts **must be replaced by original -JF-spare parts to obtain a safe operation.**

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

CAUTION: Always lower the cutting unit to the ground before replacing blades, blade bolts, discs or the like.

Fig. 5-8 In order to make the maintenance of blades and discs much easier the front guard can be tipped up. The guard **A** is hooked on the hoop **B**, which is mounted on the centre gearbox.

CAUTION: **The cutting unit must not be lifted off the ground when the front guard is tipped up, as there is the risk of deforming the guard.**

Fig. 5-8a **Blades must be replaced if:**

- the width of the blade is less than 33 mm measured 10 mm from the edge
- the metal thickness around the blade hole is less than 10 mm.

Bent blades must be replaced immediately.

Blade bolts and nuts must also be checked periodically, in particular the tension of the nuts. Always check these parts after a collision with foreign matter, replacement of blades and the first time the machine is operating.

Fig. 5-9 **Blade bolts must be replaced if:**

- they are deformed
- they have been worn one-sided
- their diameter is less than 15 mm.

Fig. 5-10 **The special nut must be replaced if:**

- it has been used more than 5 (five) times
- the height of the hexagon is less than half of the original
- the locking device is worn and loose.

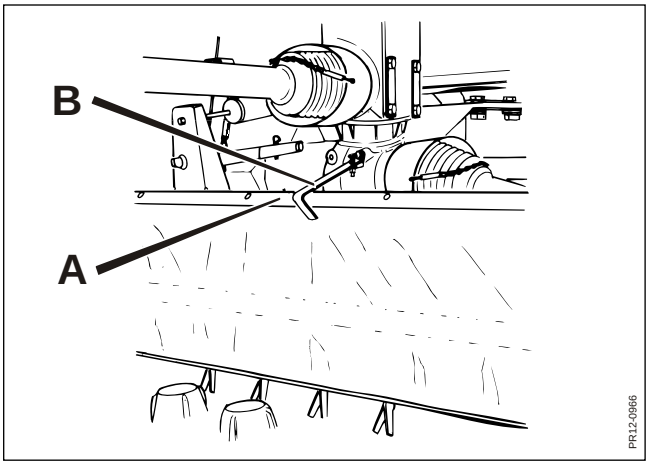


Fig. 5-8

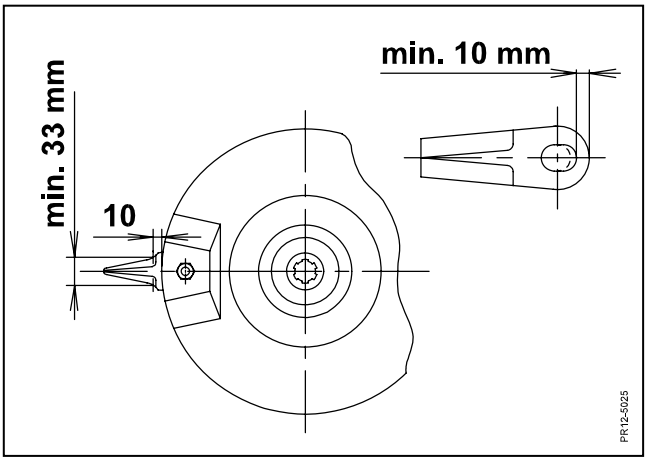


Fig. 5-8a

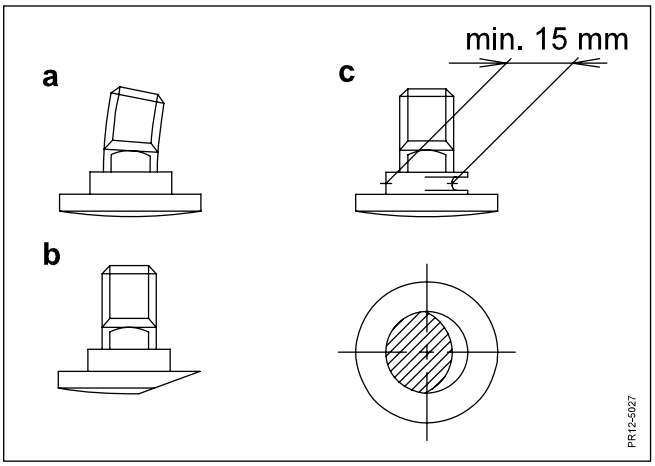


Fig. 5-9

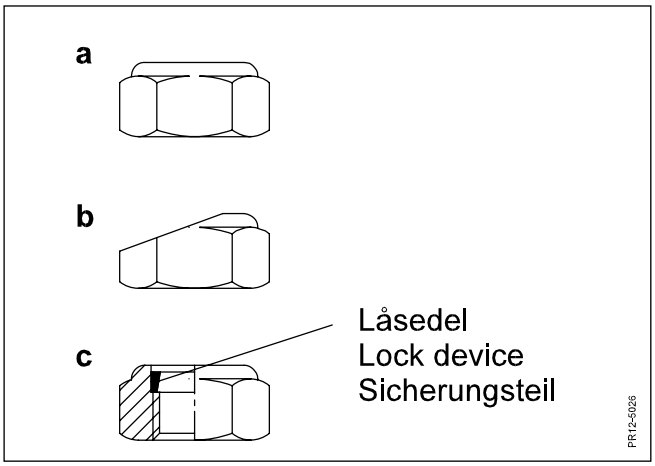


Fig. 5-10

Fig. 5-11 To obtain a satisfactory harvesting, **it is important that blades and the shear bar are intact and sharp.** Blades are replaced by dismounting the blade bolt and pulling it down and out of the disc. This is done easily when the blade is in the front position, so that the bolt can fall out through the hole in the stone protection. The old blade is removed and the new one is mounted with the blade bolt.
The blades can be used on both sides by moving the blades from one disc to another disc with opposite direction of rotation.

Fig. 5-12 If the discs have been dismounted they must be re-mounted **staggered 90^{o} in relation to each other.**

Fig. 5-13 **Make sure that the torque of the bolts is as shown.**

On discs fixed with 4 bolts the bolts must be tightened to 120 Nm (12 kpm).

On discs fixed with a central hub bolt the bolt must be tightened to 190 Nm (19 kpm).

The blade bolts must be tightened to 95 Nm (9.5 kpm).

The height of the disc can be adjusted by mounting a shim under the disc **B**. The need is caused by the replacement of discs or if the blades are not positioned at the same height.

WARNING: **After replacement of blades, blade bolts, discs and the like it should be checked that no tools have been left on the machine.**

Fig. 5-14 **WHEN REPAIRING:**
The GMS/GCS machines have a bar where the complete disc bearing housing can be dismounted.

Fig. 5-15 The PTO drive shaft for the cutter bar has been greased for life.

The PTO should run with minimum angular deviation.
The measure difference at **A** and **B** should max be 6 mm (+/- 3).
An alignment is made at the overhead gear by moving the gear in the oblong holes or by placing a filler at **C**. The screws **D** are locked with Loctite.

Fig. 5-16
1. The spring washers are placed, as shown, with the curved side upwards and downwards respectively.
2. The nut is tightened to 190 Nm.
3. The bolts maintaining the disc bearing housing for the bar is tightened to 85 Nm

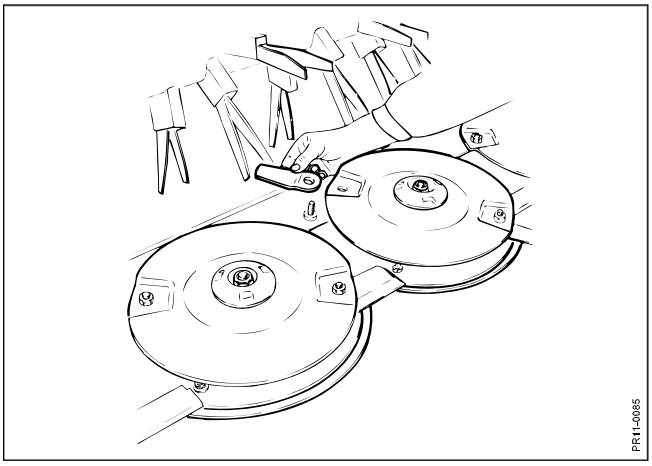


Fig. 5-11

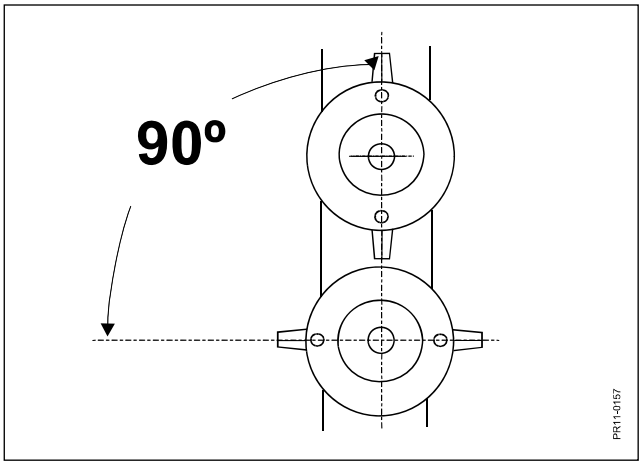


Fig. 5-12

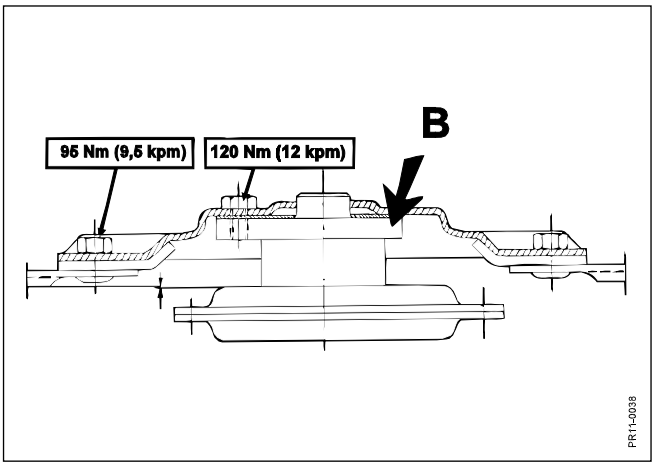


Fig. 5-13

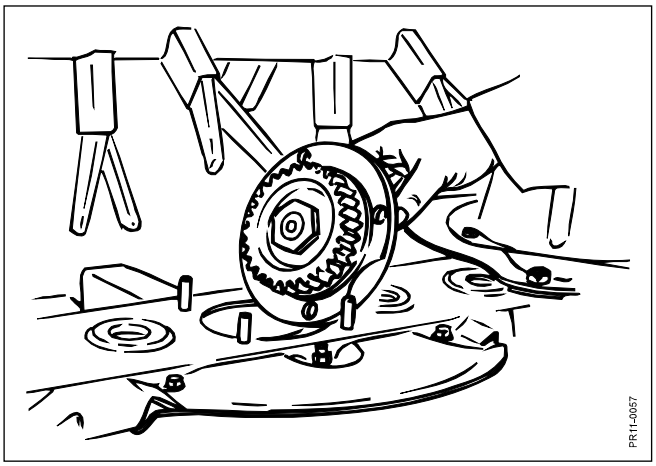


Fig. 5-14

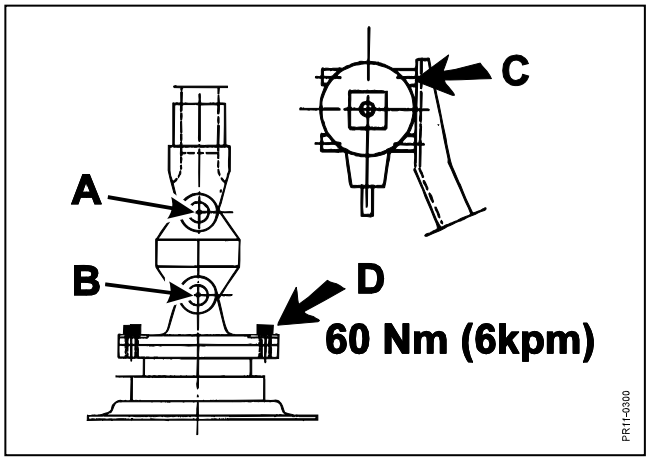


Fig. 5-15

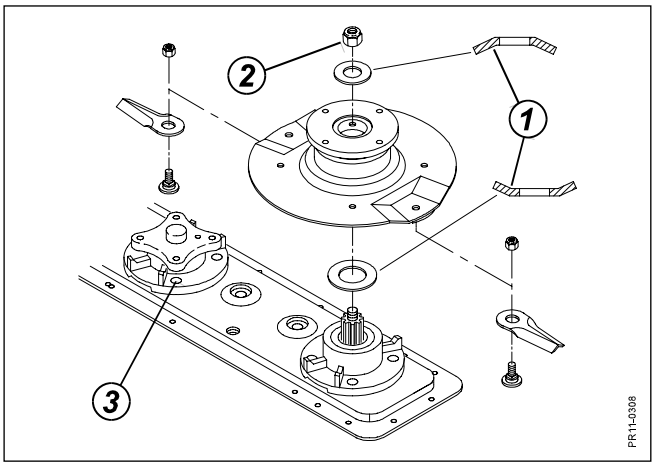


Fig. 5-16

THE CONDITIONER

Defect fingers are replaced to avoid waste of crop. Also the conditioner rotor will be out of balance resulting in among other things a reduction of the life of the bearings.

TIGHTENING OF V-BELTS

Fig. 5-17 The V-belts are tightened with the tension pulley **A**.
The tension pulley is tightened automatically by a spring **B**. The spring should be adjusted so that there is always at least 1-2 mm "air" between the loops. The adjustment is made by means of a nut at **C**.

DRIP-FEED LUBRICATION (ONLY GCS)

Fig. 5-18 The gearwheel drive of the rollers (at **D**) is lubricated by drip-feed lubrication. The oil reservoir **E** is filled with chain saw oil. Fill up after approx. every 20th working hour (0.5 litre). Make sure that no dirt enters the reservoir, choking up the oil feed.

Fig. 5-19 Turn on the oil when the machine is started by turning the tap at **F** on, so that it is approx. half open. **Remember to close again when the machine is stopped.**

Fig. 5-20 The drip interval must be 2-3 drip/min. This corresponds to a consumption of approx. 0.2 litres of oil during one working day (10 hours). Adjust the drip interval by turning the tap to approx. half-open. Please note that the oil temperature etc. may require a re-adjustment.

It should be checked occasionally that the oil tube is placed correctly at the middle of the roller chain.

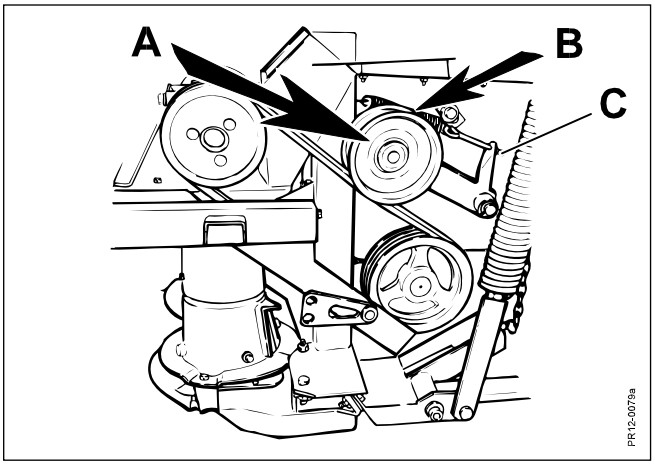


Fig. 5-17

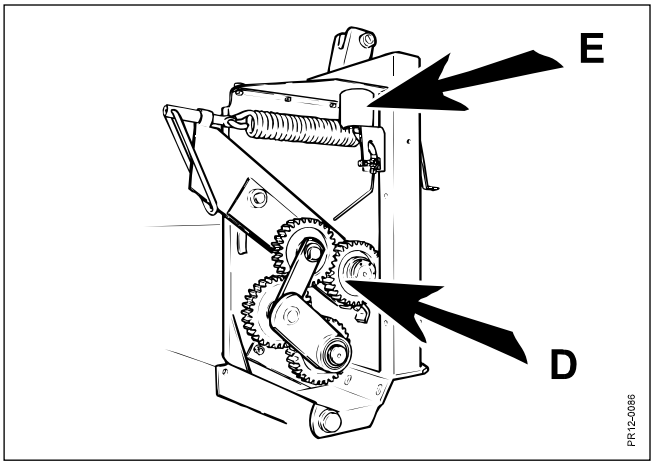


Fig. 5-18

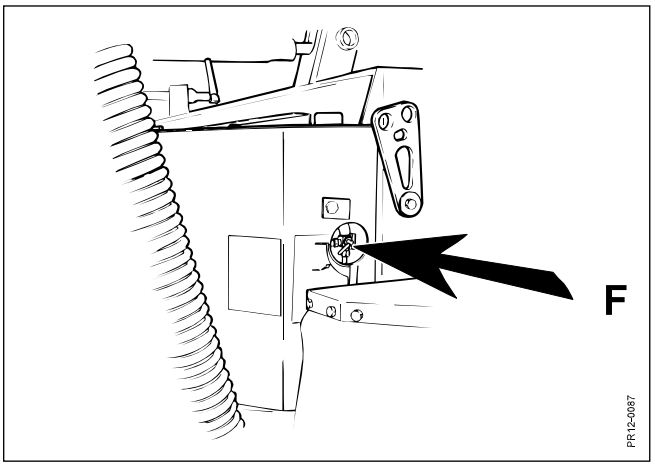


Fig. 5-19

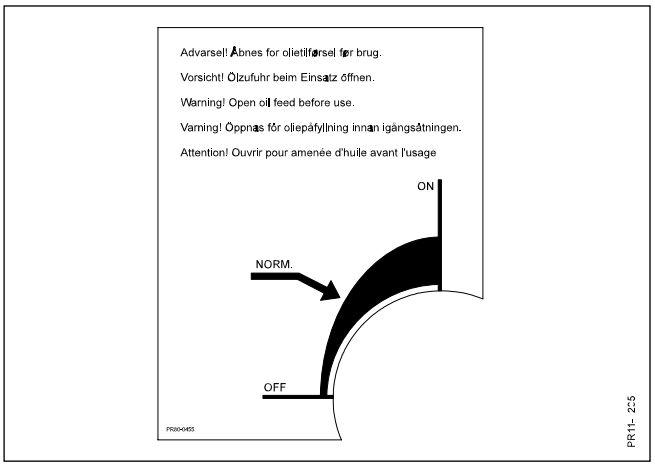


Fig. 5-20

TYRES

GMS 2800, GMS/GCS 3200 FLEX and GMS 3600 FLEX are equipped with **wide low profile tyres** providing a low ground pressure.

Please check the below scheme in order to find out which tyre pressure is valid for your disc mower.

	GMS 2800 FLEX	GMS/GCS 3200 FLEX	GMS 3600 FLEX
Tyre width	13 / 55 – 16	13 / 55 – 16	13 / 55 – 16
Recommended tyre pressure bar/PSI	3,6 / 52	3,6 / 52	3,6 / 52
Minimum tyre pressure bar/PSI *)	1,4 / 20	1,6 / 23	1,6 / 23

The minimum tyre pressure can in emergencies be used in areas where extra big carrying capacity is required from the machine (meadows, sandy areas etc.).

***) PLEASE BE AWARE THAT IF A TYRE PRESSURE IS USED THAT IS LOWER THAN RECOMMENDED THE LIFE OF THE TYRE WILL BE REDUCED REMARKABLY!**

At regular intervals check the tyre pressure and that the wheel bolts have been tightened properly.

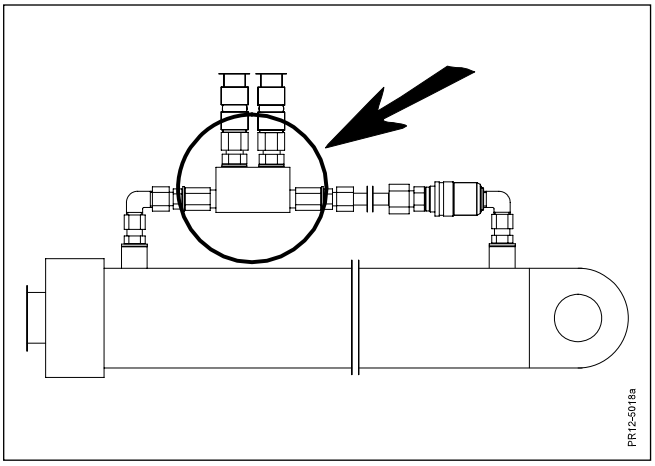


Fig. 5-22

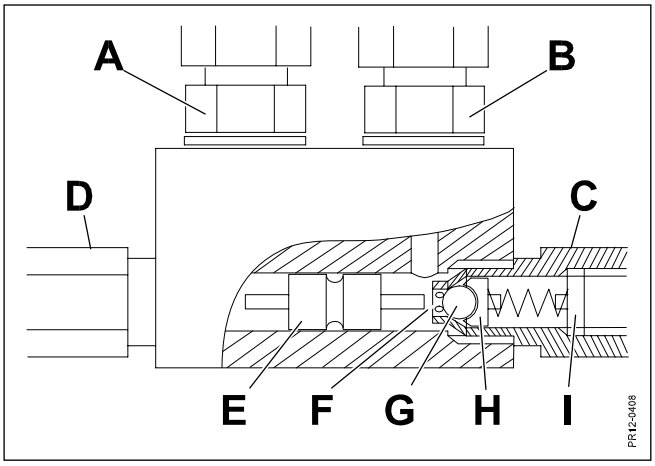


Fig. 5-23

PILOT OPERATED CHECK VALVE ON THE SHIFT CYLINDER

Fig. 5-22 Interruptions on the shift cylinder can occur if dirt from i.e. dirty quick-release couplings stick to an **pilot operated valve** placed on the shift cylinder.

The valve can easily be "opened", so that the sleeve valve can be dismounted. The valve body and the parts can then be cleaned with a clean cloth and possibly compressed air.

WARNING: Look out for leakage of hot oil!

CLEANING THE VALVE:

Fig. 5-23

1) The hose connection at **A** and **B** is dismounted

2) Dismount the two counter valves **C** and **D** from the valve body.

3) The sleeve valve **E** is dismounted and the parts are cleaned.

4) Check with a screwdriver or the like at **F**, that the ball **G** and the ball guide **H** can move freely and that the spring return is in order. It is an advantage to clean the parts with compressed air.

5) If the ball still can not move freely the flow screw **I** can be unscrewed through the counter valve **C**.

6) The parts can now be checked and cleaned.

7) The parts are assembled again in the opposite order with clean fingers and cloths.

8) Check the system.

Make sure that nobody is near the machine when it is working.

6. INTERRUPTIONS

PROBLEM	POSSIBLE CAUSE	REMEDY	SEE PAGE
Stubble uneven or bad cutting.	Wrong relief.	Relief springs must be re-checked.	35
	Number of RPM on the tractor PTO too low.	Check number of RPM (PTO 540 RPM / PTO 1000 RPM).	19
	Blades are dull or missing.	Turn the blades or replace them.	65
	Discs - stone protectors and flow caps deformed.	Replace deform parts.	63,65
*) Stripes in stubble.	The inclination of the cutter bar not ideal for the crop in question.	Reduce the inclination of the cutter bar.	35
	Guide shoe under cutter bar adjusted to high stubble.	Adjust the guide shoe to low stubble (there must be no stones in the field).	35
	Accumulation of material on the cutter bar.	Increase the driving speed.	39
		Mount flow caps on the discs.	
	Earth and grass in the space in front of the bar where the blades enter.	Mount special shear bar/replace worn shear bar. Mount only where the blades touch the bar.	63
Uneven flow through the machine.	Conditioner fingers worn or missing.	Replace worn/missing conditioner fingers.	40 "**C**" Fig. 3-22
		Turn fingers with the straight edge in the direction of rotation.	
	Distance between conditioner plate and rotor too big.	Adjust the conditioner plate reducing the distance at front to 10 - 15 mm.	41
		Increase the driving speed.	
Machine shaking/ uneven operation.	Blades damaged or missing.	Mount damaged/missing blades.	65
	Defect PTO drive shaft.	Check that the PTO drive shafts are in order.	63
	Defect bearings.	Check if bearings are loose or destroyed.	63
	Defect flow caps and flow intensifiers.	Replace flow caps and flow intensifiers.	63
	Earth and grass in flow caps, possibly missing foam blocks in flow intensifier.	Clean flow caps and mount missing foam blocks.	63
Machine swivels too fast.		Check adjustment of oil flow to shift cylinder (throttle valve).	29, 31

PROBLEM	POSSIBLE CAUSE	REMEDY	SEE PAGE
Power consumption seems too big.		Dismount flow caps from the discs.	39
Gear heats.	Wrong oil level.	Check oil level in gear (max. temperature, approx. 80^{o} C.).	57
Bar heats.	Wrong oil level.	Check oil level in bar (max. temperature, 90-100^{o} C.).	53

*) Especially in short, strong spring crops harvested under underfavourable conditions.

7. STORAGE (WINTER STORAGE)

When the season is over the machine should be made ready for winter storage right away. First clean the machine thoroughly. Dust and dirt absorb moistness and moistness increases rusting. **Be alert when cleaning with a high pressure cleaner. Never** clean directly on the bearings and lubricate all greasing spots carefully after having cleaned as to squeeze possibly water out of the bearings.

Below items are guiding instructions of how to perform other winter storage items.

The machine is checked for wear and defects - write down the 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.

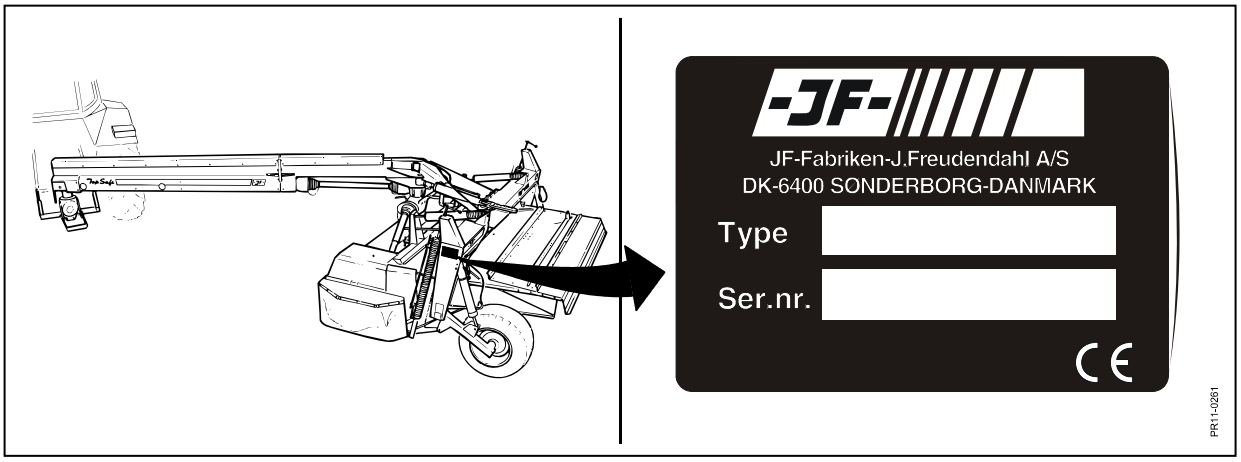
- Spray the machine with rust-preventing oil. This is especially important as regards all parts polished with use.

- Change the oil in the hydraulic system the cutter bar and the gearboxes.

- Place the machine in a ventilated engine house. Lay up the machine to unload the tyres.

8. SPARE PARTS ORDER

When ordering spare parts please state model, serial number and year of production. This information is printed on the machine plate. Soonest possible after delivery we request you to write these information on the first page of you spare parts book supplied with the machine so that you have the information at hand when ordering spare parts.



9. SCRAPPING THE MACHINE

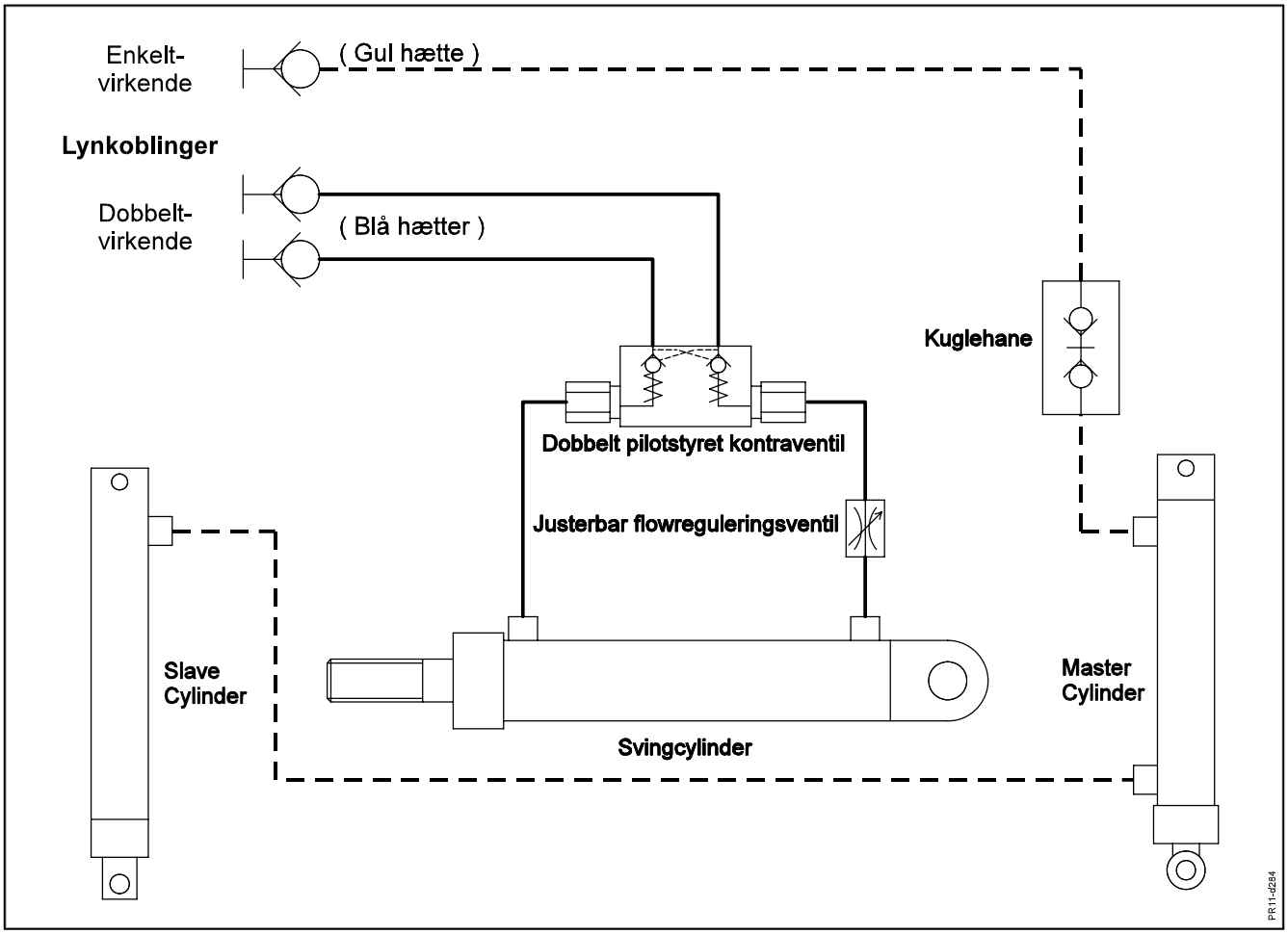
When the machine is worn-down it must be scrapped in a proper way. Observe the following:

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

- Disassemble the machine and separate the individual recycling parts, for instance tyres, hydraulic hoses, hydraulic valves etc.

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

10. HYDRAULIC DIAGRAM



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. JF is also not 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 traveling 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-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 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.**

Specialist in grassland machinery and complete diet mixers

When it comes to green feed techniques, JF-STOLL has gained a reputation as one of the world's leading suppliers and specialists. As a specialist manufacturer for over 50 years, we have gained a vast amount of experience from right around the world and, more importantly, unique regional requirements.

We also receive important inspiration in our development work through a close and continuous dialogue with customers, dealers and agricultural researchers.

No matter which type of JF-STOLL-machine you chose, you can be sure to obtain the best result to obtain a top result - in the shape of high performance and operational reliability, minimum maintenance, flexible working possibilities and optimal operating economy.

Dealer

JF-STOLL

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