Technology you can count on

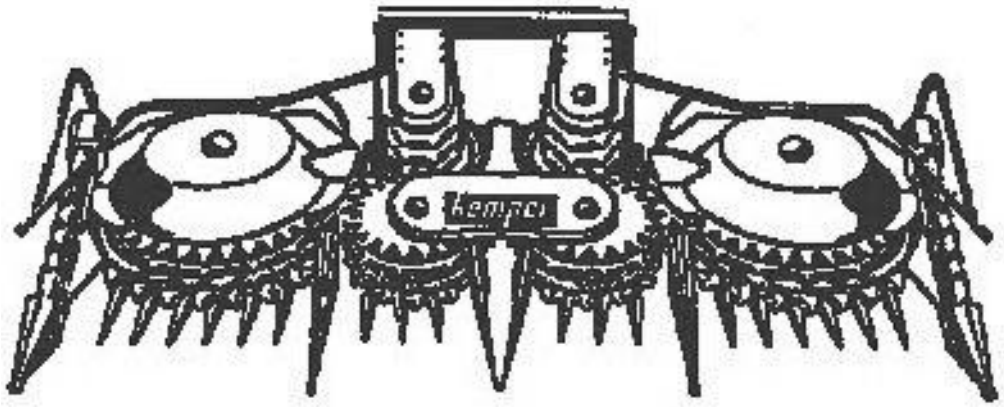
Operator's manual

Version B 0003
English

No.: 88943

CHAMPION ROTARY CROP HEADER

M 4500



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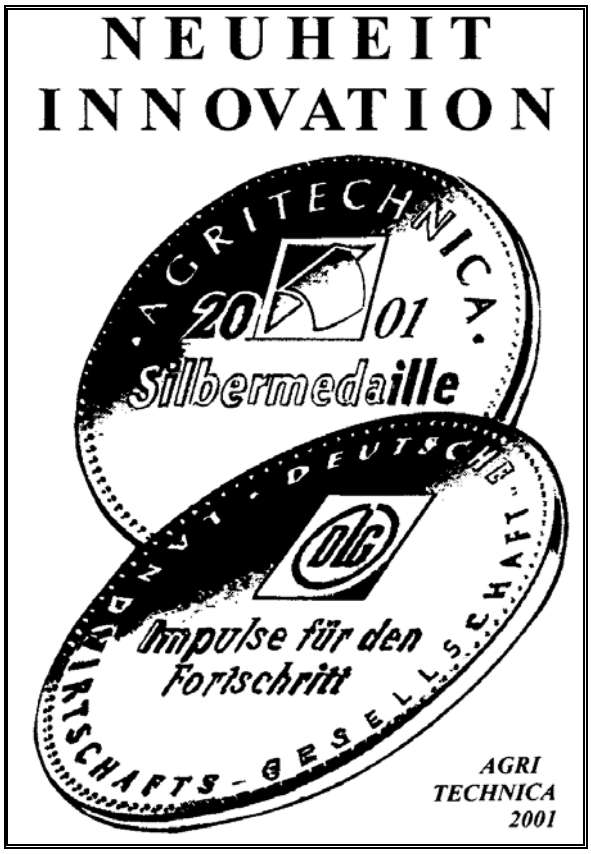

Design and model claims

The construction and function of our products are subject to technical continuous and further development, which means information and data pertaining to a delivery are not binding.

Telephone - National	Sales Management	+49 (0) 25 63 - 88 33
	Sales, Machinery	+49 (0) 25 63 - 88 34
	Shipping Status	+49 (0) 25 63 - 88 35
	Sales, Spare Parts	+49 (0) 25 63 - 88 36 / 88 37
	Customer Service	+49 (0) 25 63 - 88 26 / 88 32/ 88 84
Fax - National	Sales Management	+49 (0) 25 63 - 88 155
	Sales, Machinery	+49 (0) 25 63 - 88 98
	Sales, Spare Parts	+49 (0) 25 63 - 88 95
	Customer Service	+49 (0) 25 63 - 88 147
Telephone - International	Sales Management	+49 (0) 25 63 - 88 152
	Sales, Machinery	+49 (0) 25 63 - 88 22 / 88 25 / 88 28
Fax - International	Sales Management	+49 (0) 25 63 - 88 155
	Sales, Machinery	+49 (0) 25 63 - 88 44
	Sales, Spare Parts	+49 (0) 25 63 - 88 44
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Overview of important information

Following this checklist is NOT intended to be a release from reading the entire operator's manual!

1. Accident prevention

Read all instructions on page 3 of this manual.

2. Loading

For loading a fourth additional chain may be required - see page 6 and 7 and Fig. 7.

3. Channel size

Prior to attaching the header to the forage harvester adjust the channel size, see page 21 and Fig. 39

4. 20 RPM

Whatever the speed of the drive system on the different forage harvesters, it will only be of importance to reach 20 rpm on the gathering drums, read the applicable chapter „RPM of the drive system"

5. Control valve

When the control valve on the forage harvester is in neutral position both outlets should be open and unpressurized. See page 7 and Fig. 8.

6. Lights

When driving on public roads follow the lighting regulations on page 26 and 27.

7. Friction clutches

The complete drive unit is protected against overloading by two clutches. They are located directly below the outlet between the two feed drums. If the machine has been standing for a longer period a "simple check" should be made before starting operation, see page 30 and 31.

8. Attachment

For attaching, follow the instructions for the respective forage harvester.

9. Steering capability

To ensure sufficient steering capability of the forage harvester, balance weights must be attached to the steering axle. Do not exceed the permissible axle loads specified by the individual type approval.

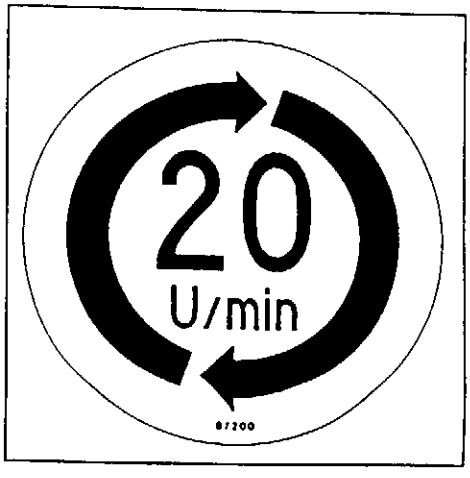
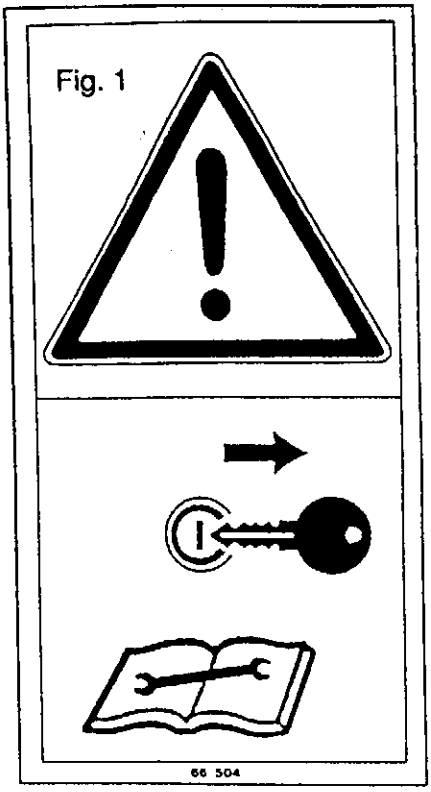


Fig. 1



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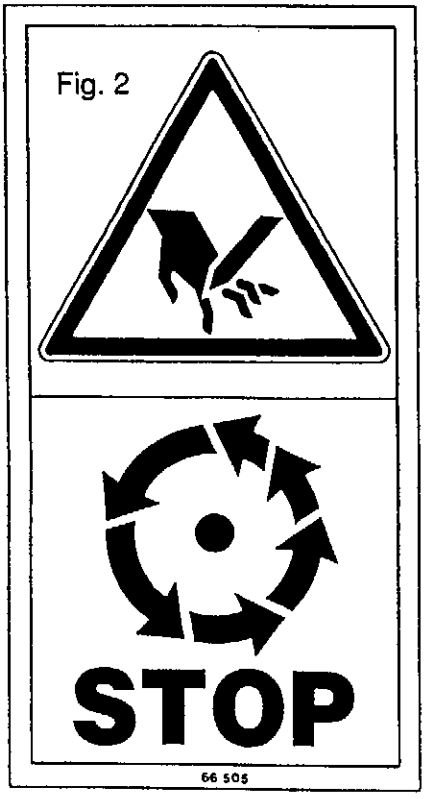
Before performing out main tenance or repair work, stop the engine and remove from the ignition key.

Fig. 2



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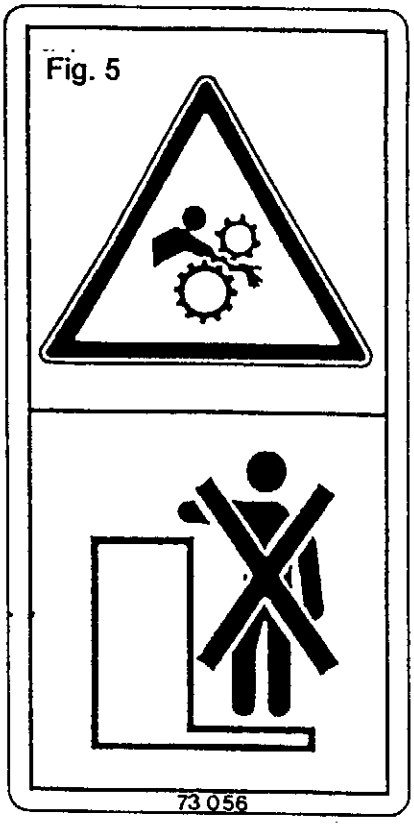
Keep clear of moving parts. Wait for all parts to come to a complete stop.

Fig. 5



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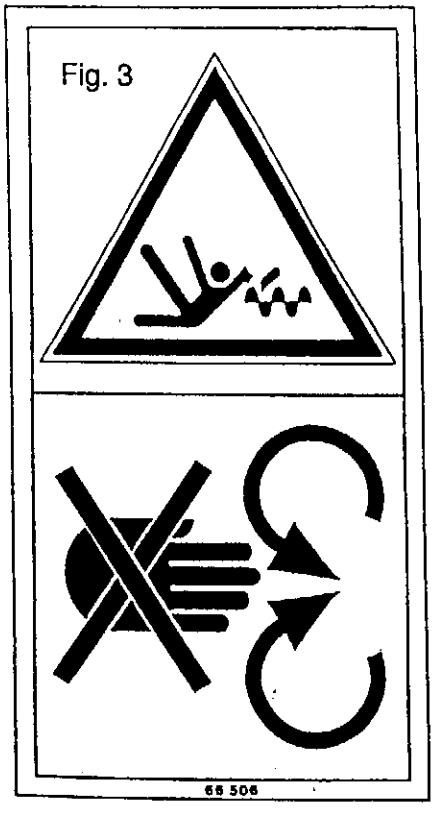
Do not climb onto the machine as long as engine is running.

Fig. 3



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Keep hands away from the rotating crop dividers.

Fig. 4

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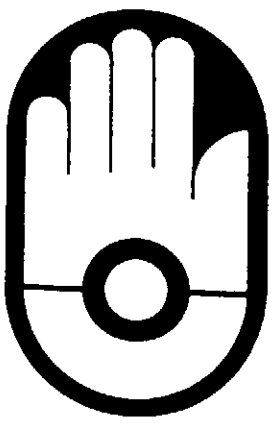
Keep clear of the area close to the raised outer drum units as long as the hydraulic system is under pressure.

Fig. 5A

When you do not understand something and need help, please call your dealer.

Accident Prevention Regulations



1. Stay clear of the feed-in area of the head.
2. Never attempt to feed the crop with hands or feet into the machine.
3. Always ensure that the PTO shafts are coupled correctly.
4. Keep the PTO shaft guard in good condition and secure the guard tube to prevent it rotating.
5. Never cut rings from PTO shaft guard cones.
6. It may be necessary to install front ballast weights to ensure adequate steering capabilities of the motor tractor. Maintain permissible axle loads. Observe information in individual type approval documentation.
7. Front attachments may only be uncoupled and set down on a level area.
8. Before performing any work under the machine, make sure machine is properly supported.
9. Before performing any work on the chopper, set the PTO shift lever to "off" and stop the tractor engine.
   Caution: The rotary cutters will continue to rotate after the gathering drums have stopped rotating!
   Before searching for foreign matter/blockage: switch off all drive systems, stop the engine and wait for all parts to come to a complete stop.
10. Ensure that all blades are fixed securely.
11. The hydraulic system operates under high pressure. Any porous, broken or damaged hoses must be replaced immediately. Otherwise, hoses and hydraulic lines must be replaced at the latest after 6 years. Maximum permissible oil pressure 190 bar.
    The system must be depressurized before disconnecting hydraulic lines. If injury is caused by escape of pressurized hydraulic oil, a doctor must be consulted immediately.
12. When travelling on public roads:
    - Before proceeding the following points: Wait till all cutting rotors have stopped rotating.
    - Observe all requirements relating to public traffic regulations mentioned in the complete individual type approval documentation.
    - The foldable guard with the guard cloths must be installed on the header.
    - The additional side lights and direction indicators must be connected.
    - Switch on the additional dipped beam headlights when travelling in the dark.
    - The retro-reflecting signs on the guard must be in good condition.
    - The header must be raised so that the front guard is approx. 300 mm above the roadway.
    - Please respect the maximum loads on the axles given by the manufacturer of the selfpropelled forager.
13. Observe all traffic and accident prevention regulations.
14. During the CE control also a noise check has been made: The max. allowed nois on the drivers ear is in accordance with the guidelines 86/188 EEC; Measurements according ISO 5131 with a closed cabin in connection with a John Deere SPF 6910 = 80,0 db (A).
15. Use only genuine Kemper spare parts.

4 Product Liability

Dear customer

You have made a good choice. We are pleased to congratulate you on you selection of a KEMPER machine. As your partner we offer quality and performance, together with reliable service.
In order to be able to evaluate the conditions of use of our agricultural machines, and to take these requirements into consideration in the development of new units, we ask you to provide some information.
This also allows us to inform you selectively of new developments.

Product Liability and Customer Information

Product liability instructs manufacturers and dealers to hand over the instruction manual with each machine and to give the customer practical instruction on operation, safety and maintenance.
A multiple form (A,B,C) similar to the one illustrated below is supplied with each Operator's Manual. Confirmation is required that the customer has taken possession of the machine and the Operator's Manual.
For this purpose, send the signed document A to Kemper. Document B is retained by the dealer who supplied the machine. Document C is retained by the customer. At the same time you will be assured that warranty is given.

EC Certificate of Conformity

This product has been submitted to the CE test and has obtained the CE approval mark in conformity with EC Directive 89/392/EEC.
(Communauté europeenne / European Community). An EC Certificate of Conformity is supplied with this manual. This certificate must be handed over to the final owner of the machine together with the Operator's Manual.

Handing over the Operator's Manual

Attention! Even if the machine is sold at a later date by the customer, the Operator's Manual must be handed over to the new owner.

This symbol will be found wherever safety advice is given in the manual.
Anyone operating this machine must be given all necessary safety instructions.

kemper Receipt C

[1] Type: / Machine No.:	[4] Delivery Date
[2] Customer Address:	[5] Address of authorized dealer/importer Company Stamp/Signature
[3] I purchased the machine described under (1) **With the delivery of the machine I received the Operator's Manual No. ...** Customer signature / Date Copy for customer	Company Stamp/Signature, if not identical with (5) [6] The machine was delivered to customer in conformance with specifications. Signature of Customer Service / Date

Maschinenfabrik KEMPER GmbH & Co. KG - Postfach 1352 - D-48694 Stadtlohn

Foreword

In addition to a comprehensive technical description, this manual contains general and specific information on the function and correct operation of the Champion crop header and gives recommendations concerning the elimination of malfunctions.
Our policy is one of continuous development and inprovement in accordance with the latest scientific and industrial knowledge. We therefore reserve the right to modify specifications.
The orientational indications "right" and "left" relate to the forward direction of travel of the machine.
Note the identification numbers of the machine on the page provided at the end of this Operator's Manual. This information will enable your dealer to quickly send the correct spare parts.

Range of use

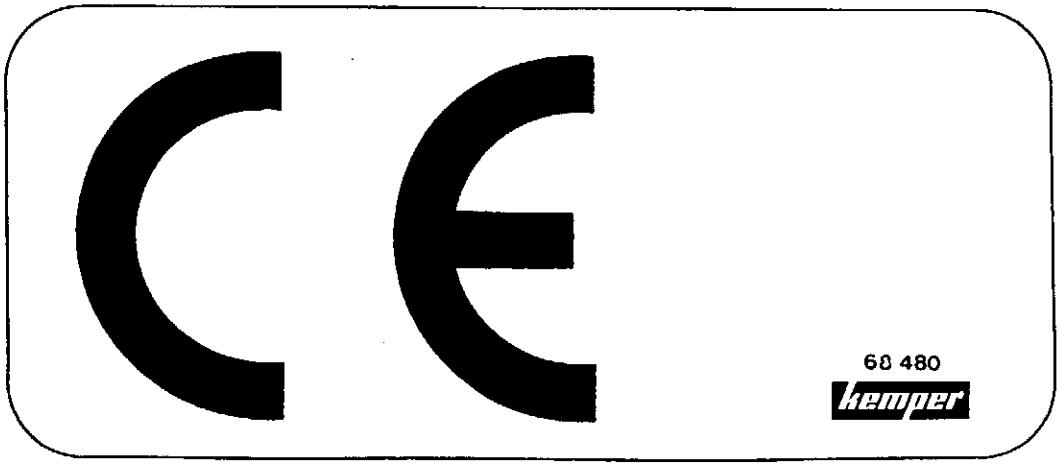
The Kemper Champion Rotary Crop Header with mounting frame for selfpropelled forage harvesters is suitable for the row-independent harvest of silage corn, whole crop silage, alfalfa, rape, field beans, millet, sunflower and other stalk-type plants. When the information into this manual is followed up.

The basic equipment of the Champion header comprises a mounting frame, gathering drums and fast rotating blade rotors. In conformity with the relevant machine safety regulations the machine may only be operated in accordance with the outlined specifications. Otherwise no liability will be assumed for resulting damage. Use in accordance with specifications includes observation of the operating and maintenance instructions and the exclusive use of genuine Kemper spare parts.

The Champion may only be operated, serviced and repaired by personnel who are familiar with operation or who have been instructed of the inherent dangers.

All relevant accident prevention, safety, occupational health and highway regulations must be complied with.
If unauthorized alterations are carried out to the machine the manufacturer bears no responsibility for resulting damage.

- The Champion header has been tested for accident prevention.
  The Champion header has been CE tested and marked.



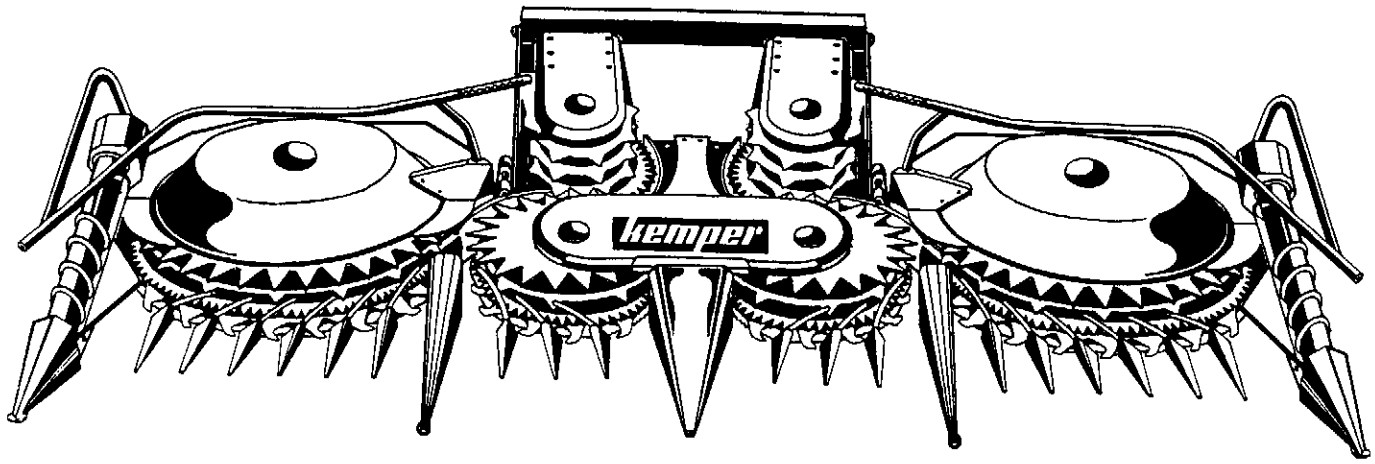


Fig.6

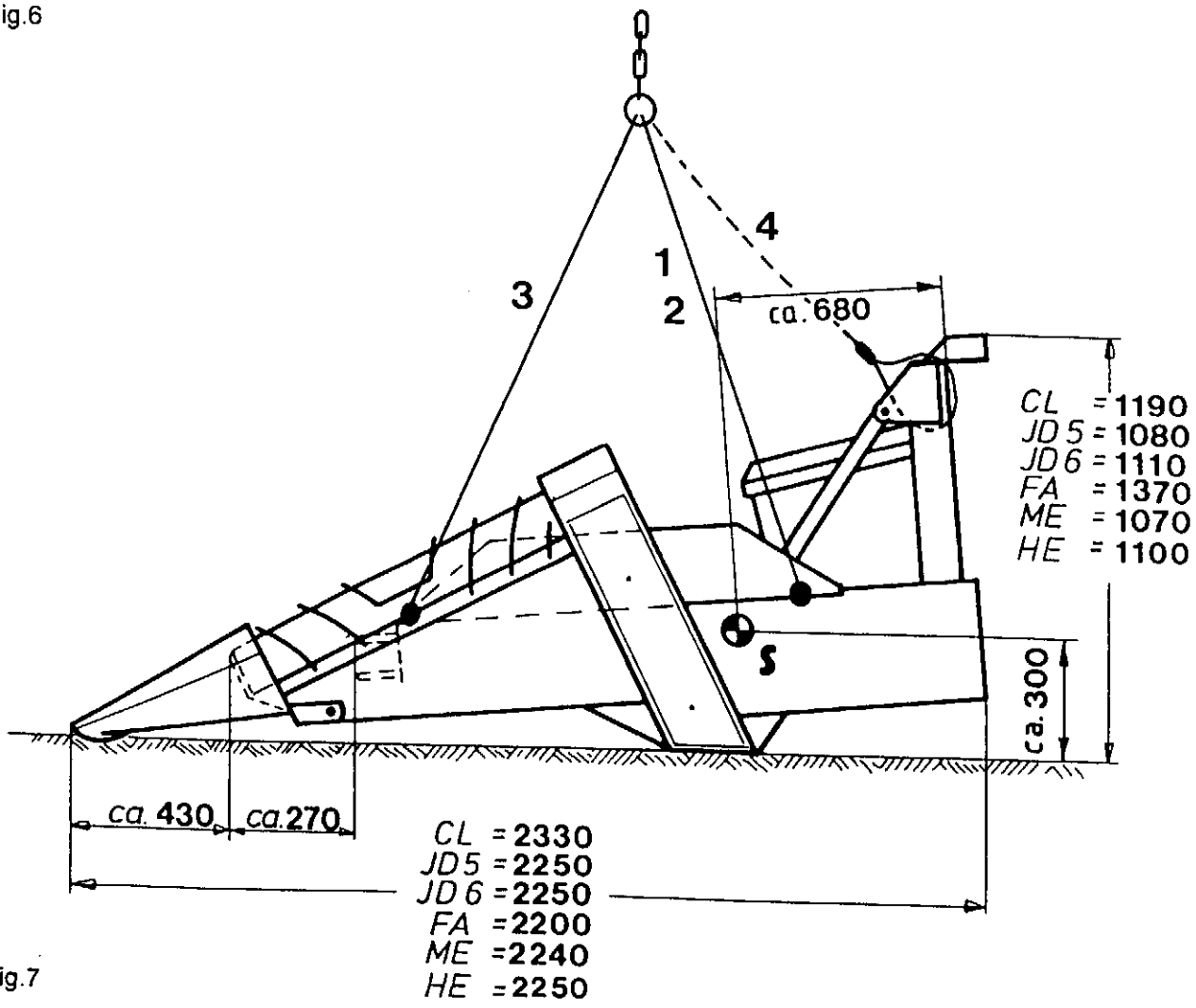


Fig.7

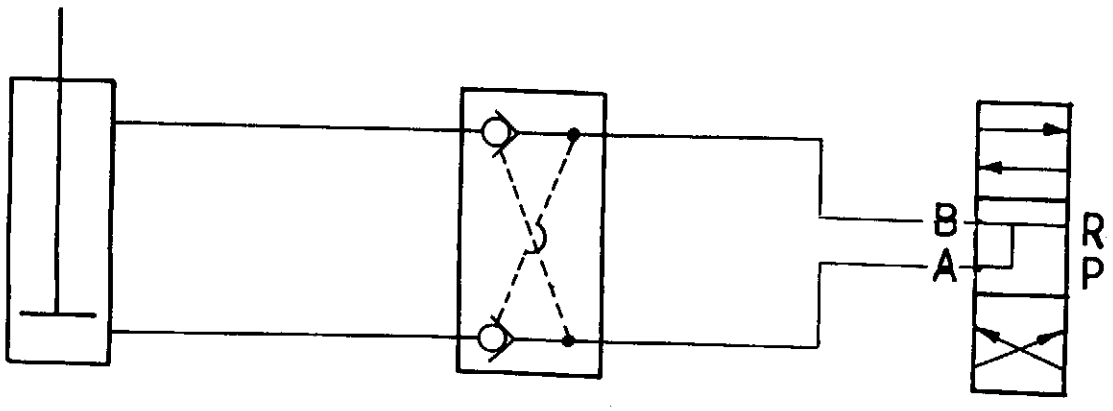


Fig.8

Technical data

Working speed	km/h:	up to	20
Length	m:		2.20
Overall width	m:		4.60
Height	m:		1.15
Working width	m:		4.55
Transport width	m:		2.47
Weight (basic equipment)	kg:	approx.	1.795

Standard equipment

Mounting facility

Header with integral mounting frame for attachment to a selfpropelled forage harvester. Depending on the mounting frame version, the header can be attached to the following selfpropelled forage harvesters:
Claas, John-Deere 5 + 6 series, Ford New Holland, Fiatagri, CASE and Mengele.
Height-adjustable supports.

Drive

Power is transmitted via the respective drive element of the harvester, enclosed bath gearbox and safety clutch.

Cutting system

Row-independent cutting system with fast rotating blades and freewheel mechanism in gearbox. The crop is cut over the entire working width (6.00 m) by enclosed rotary cutting blades with replaceable segments.

Feeding unit

Eight slow-speed gathering drums ensure that the crop is transferred uniformly to the chopping unit in a lengthwise flow direction. Two obliquely positioned feed drums "bundle up" the crop. Two mechanically driven crop dividers are provided for down crops. The crop lifters are moveable in vertical direction.

Road transport

The outer drum units can be folded in hydraulically reducing the transport width to 3.00 m. The foldable guard is equipped with side lights and direction indicators. When folded in, the outer drum units may partially cover the headlights of the forage harvester. It may be necessary to reposition the headlights, in accordance with traffic regulations.

Loading/ unloading the machine

When the M 6008 is loaded/unloaded with outer units folded up, the chain (or rope) lengths shown in Fig. 7 must be used. This prevents the machine from tipping over. Caution must be exercised when loading/unloading using this method. Use additional safety chains if necessary.

Equipment required on the forage harvester

1 socket for the side lights/direction indicators on the header.
1 double acting control valve for the folding drum units.
Minimum pressure 160 bar.

Control valve

Two double acting hydraulic cylinders fold the outer drum units in and out. The forage harvester should be equipped with a double acting control valve for the operation of these cylinders. When in neutral position, both outlets of the valve should be open and pressureless, see Fig. 8.
If this type of control valve should not be available, it must be ensured that both couplers are absolutely tight. Any leak would cause an overpressure in the delivery line which would cause the outer drum units to be raised slightly during field work. Damage to the machine would be unavoidable. If necessary, a shut-off cock must be installed to ensure that no pressure can be applied to the cylinders.

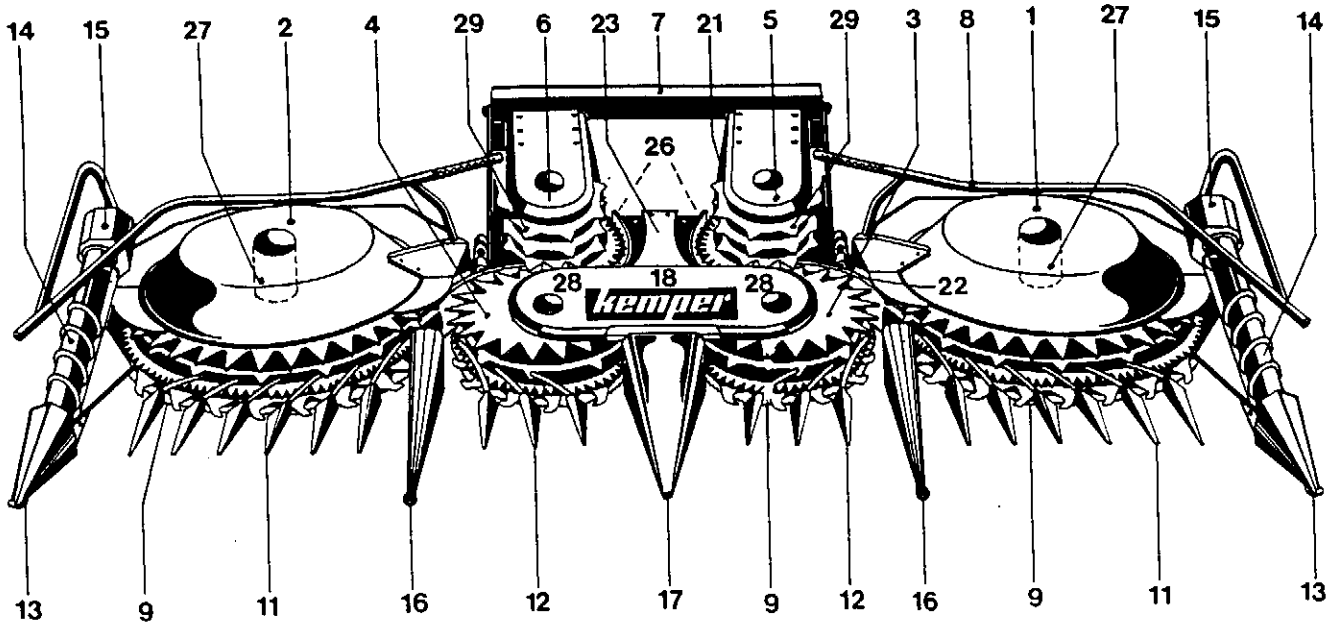


Fig.10

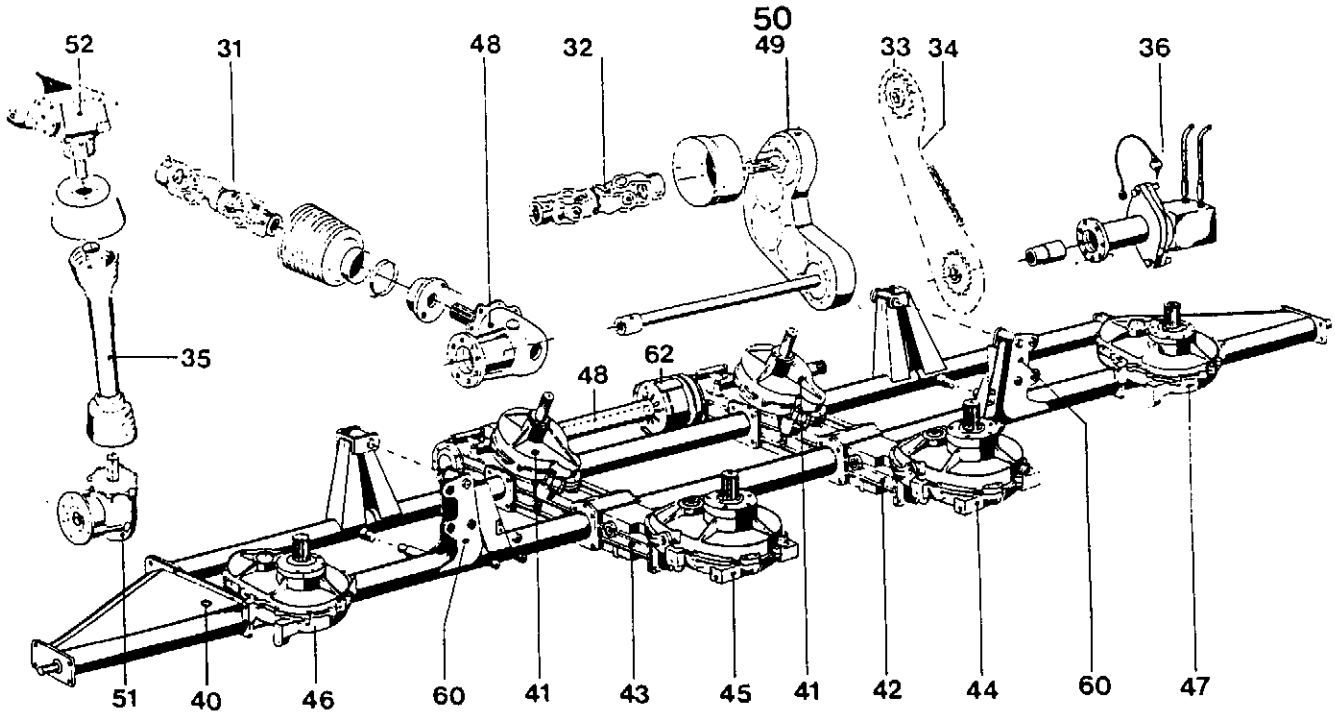


Fig.11

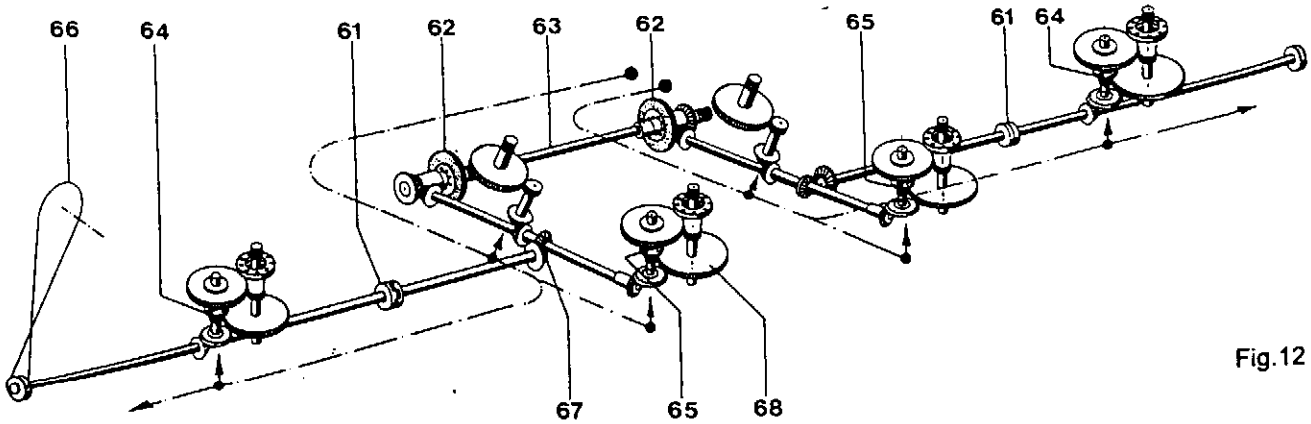


Fig.12

Designation of assembly groups

Rotary crop header	1	Large outer gathering drum, left -hand side	
	2	Large outer gathering drum, right-hand side	
	3	Small inner gathering drum, left-hand side	
	4	Small inner gathering drum, right-hand side	
	5	Left-hand feed drum	
	6	Right-hand feed drum	
	7	Mounting frame for different forage harvesters	
	8	Feed baar	
	9	Blade rotor (rotary cutting blade)	
	11	Small dividers (outside)	
	12	Small dividers (inside)	
	13	Outer stalk lifters	
	14	Rotary Divider	
	15	Rotating divider drive	
	16	Large dividers	
	17	Central divider	
	18	Central covering plate (for the small drums)	
	21	Cleaners of feed drums	
	22	Cleaners of gathering drums	
	23	Guide plate between feed drum	
Overload clutches	26	Friction clutch-	main drive
	27	Friction clutch-	large gathering drums
	28	Friction clutch-	small gathering drums
	29	Friction clutch-	feed drums
Main transmission	31	Main transmission	Claas
	32	Main transmission	John Deere 6-series
	33	Main transmission	John Deere 5-series
	34	Main transmission	Fiatagri - New Holland
	35	Main transmission	Mengele
	36	Main transmission	Hesston
Gearboxes	40	Basic frame and gearboxes	
	41	Spur gearbox	feed drums
	42	Angle drive	
	43	Angle drive	
	44	Spur gear angle drive	small gathering drum
	45	Spur gear angle drive	small gathering drum
	46	Spur gear angle drive	large gathering drum
	47	Spur gear angle drive	large gathering drum
	48	Angle drive	Claas - CASE - Deutz
	49	Spur gearbox	John Deere 6-series
	50	Spur gearbox	New-Holland FX
	51	Bottom spur gearbox	Mengele
	52	Top angle drive	Mengele
	60	Hinge	
	61	Claw-type clutch (hinges)	
	62	Friction clutch	
	63	Clutch shaft in the main drive	
Free wheel	64	Free wheel mechanism	large gathering drum
	65	Free wheel mechanism	small gathering drum
	66	V-belt	rotating crop divider
	67	Bevel gear drive	
	68	Spur gear dive	

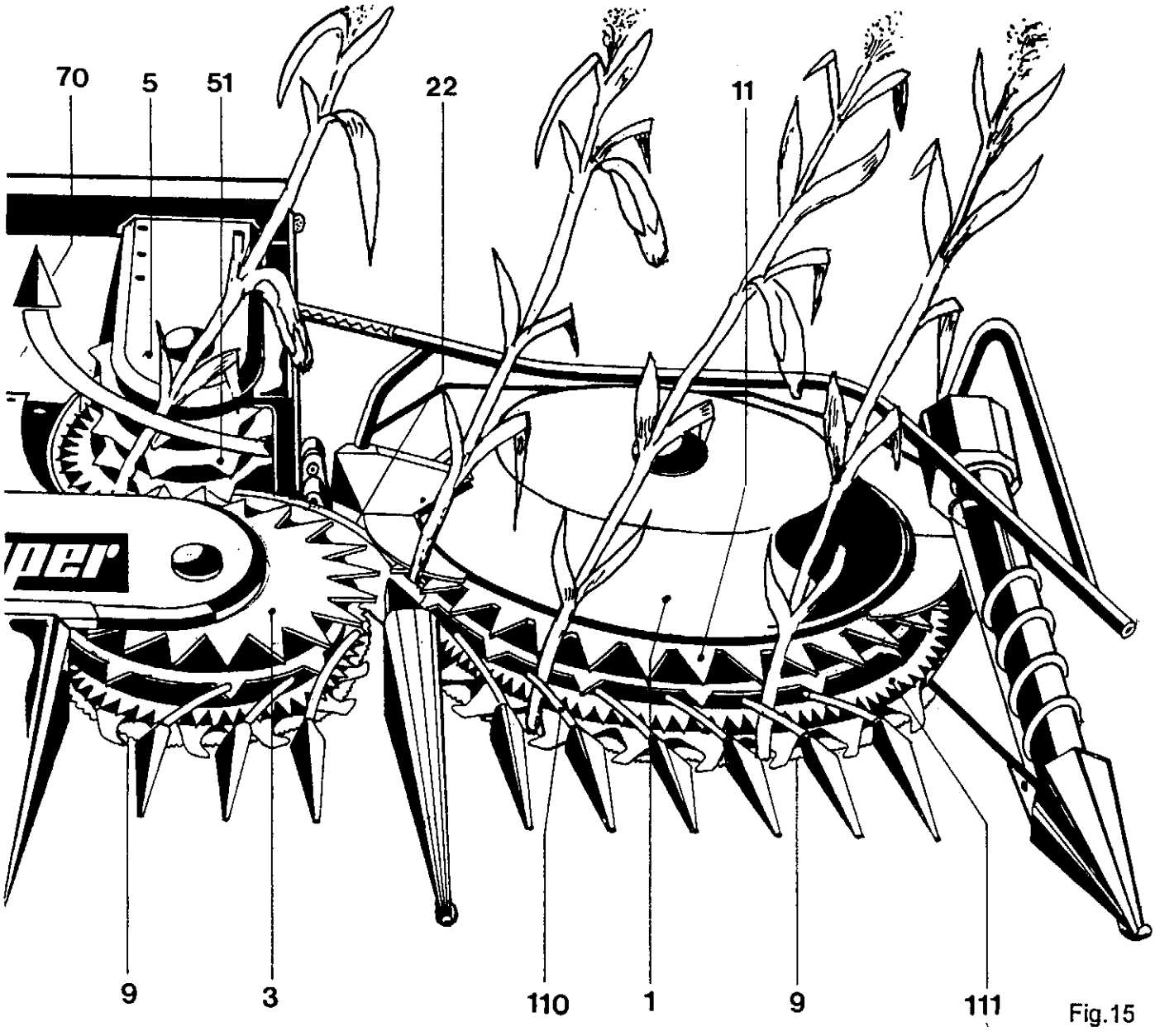


Fig.15

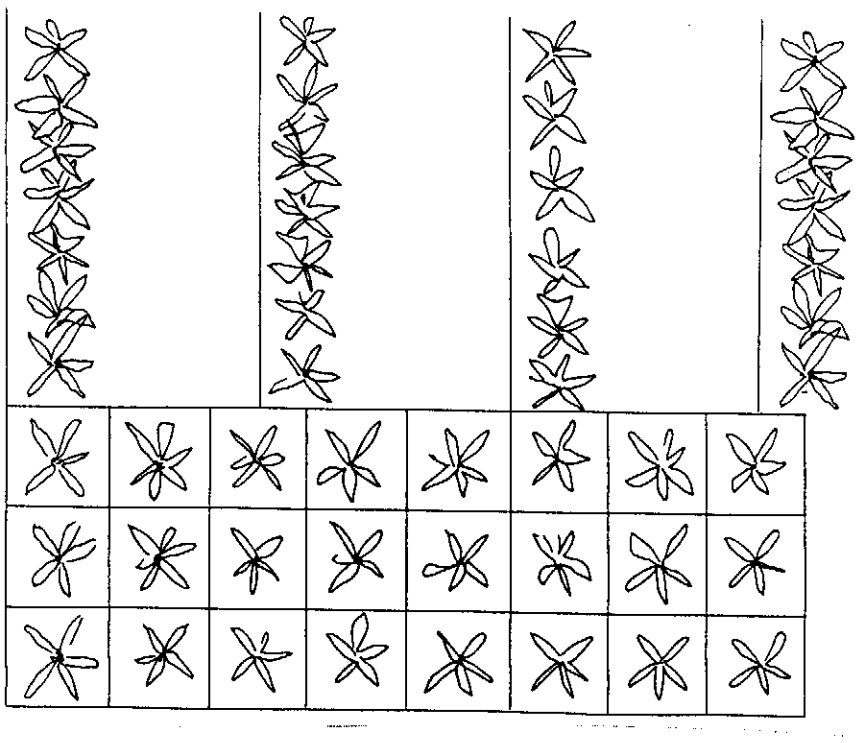


Fig.16

Method of operation Fig. 15

The patented cutting system allows the corn stalks to be cut in any direction - in a lengthwise, transverse or oblique sense to the rows. Every corn stalk must enter one of the cutting gaps. With free cutting, without ledger plate, the stalks are cut along the entire cutting width by the fast rotating blades 9. The slow rotating gathering drum 1 then conveys the stalk via the intake bars 110. The corn stalk is gripped pincer-like by the row of teeth 111. As a result of the rotation of the gathering drum, the crop is pushed against the feed teeth 11 and transferred along the guides and scrapers 22 to the feed drum 5. Here the teeth 51 sieze the stalks and transport them in a lengthwise direction 70 in a constant and compacted flow to the precompression and conveyor rollers of the forage harvester.

Higher yields through narrow row spacing

Methods of cultivation

Alternative methods of corn cultivation are not only more and more discussed, but also already practised by institutions and farmers: higher yields are achieved by increasing the number of plants per surface unit. The new technique allows the existing seed drill to be used, but has only become possible with the introduction of the row-independent Champion cutting system.

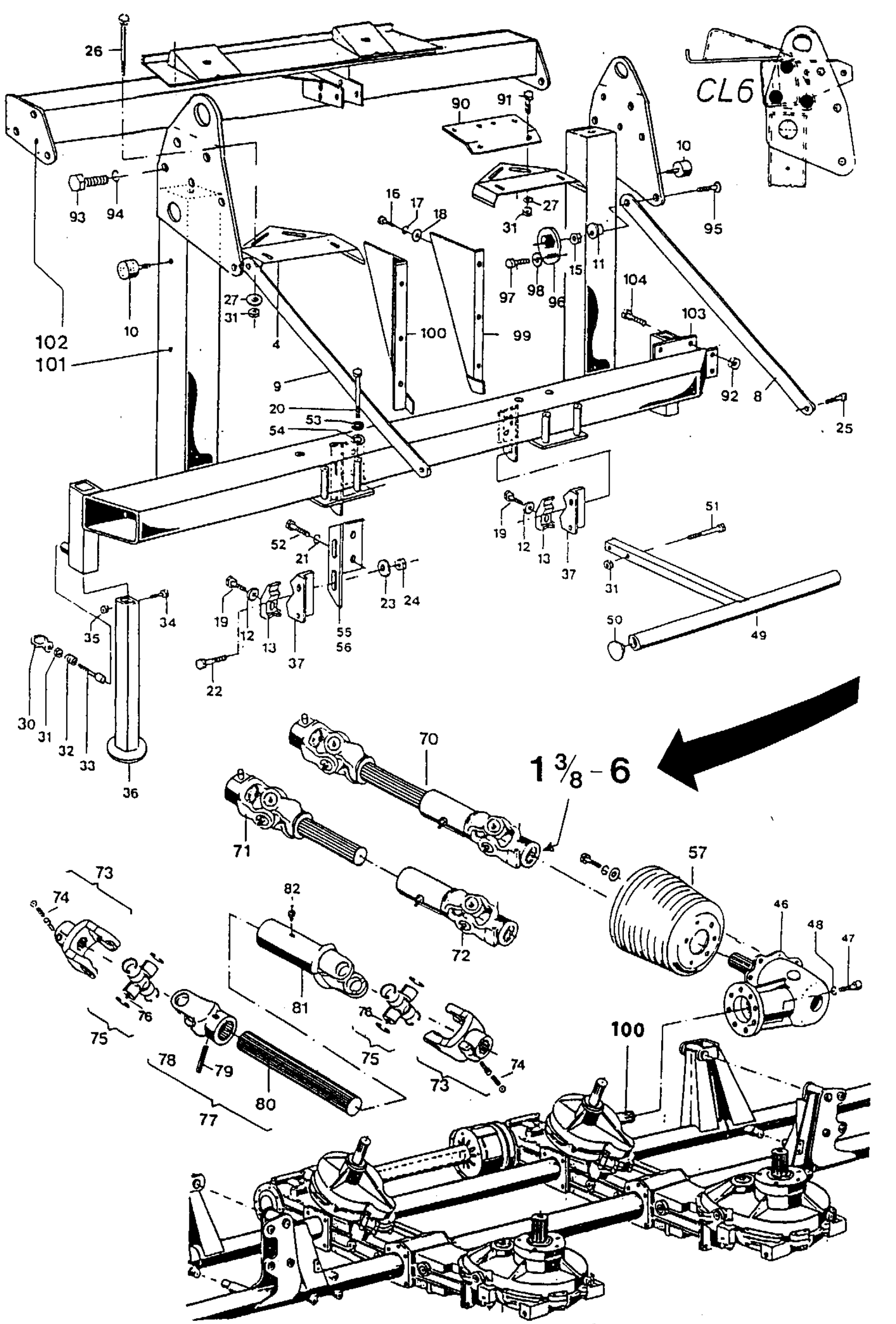
Ideal distribution of the plants in the field Fig. 16

Principle of the new method: no double rows, but usual row spacing of 75 cm is reduced to 30 cm. With equal seed density (10 plants/m^2) plant spacing within the row can be increased.

Higher yields

The new method gives the following advantages:

- The individual plants are more effectively placed.
- Faster shading of the soil as a result of the smaller row spacing.
- Reduction of erosion.
- Better utilization of the nitrogen contained in the soil.
- Yields increased by approx. 12 - 17 %.
- Higher quality.



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Attachment to CLAAS 6-series

M 4500 CL 6

The hitch points and the drive system of this header are designed to match the following CLAAS forage harvesters:

685 = 250 HP	690 = 300 HP	695 = 354 HP
685 SL= 250 HP	690 SL= 316 HP	695 SL = 354 HP
		695 MEGA = 354 HP

Main drive

Power is transmitted by a PTO shaft from the reverse gear places on the left-hand side of the JAGUAR.

1. speed

The drive shaft of the CLAAS gearbox turns at ~400 rpm under load.
This speed should be used for standard conditions an thickstemmed crops, e.g. corn, sunflower, beans or elephant grass.

2. speed

The drive shaft of the CLAAS gearbox turns ~495 rpm under load. This speed is required for harvesting whole crop silage. An accurate cut of thin-stemmed crops requires a higher rotating speed of the cutting blades.

Speed check

Whatever the speed ratio of the drive system of the forage harvester: for the practical use it will only be of importance that the drive shaft (100) turns at ~380 to 400 rpm under load (idling speed should be approx. 8% higher). This corresponds to a rotational speed of the large outher gathering drums from 19 to 20 rpm.

Spring tension of the precom-pression rollers

The performance of both the CHAMPION and the JAGUAR can only be utilized to the full if the precompression system of the forage harvester is under sufficient tension.

Note

**Due to its small diameter the knive drum 5 (fig. 23) has the tendency to push back the strem of forage (see the wedge-shaped area 3).
This problem can be eliminated by increasing as much as possible the spring pressure of the rear precompression roller 2. The forage caped will then be less thick and the wedge-shaped artea will be smaller.**

Table fig. 21

▼ = Thick stemmed crops (corn etc.)
▽ = Whole crop silage
▼ = Down crops

Fig.23

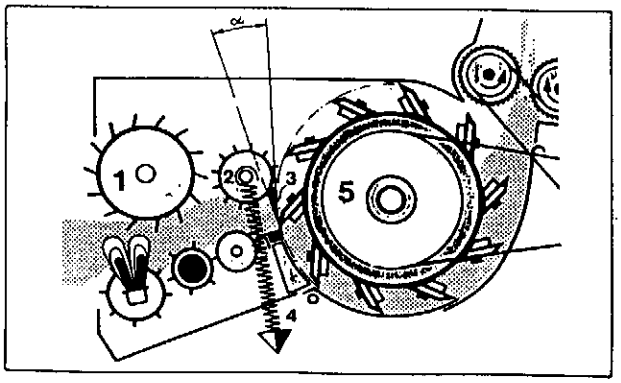
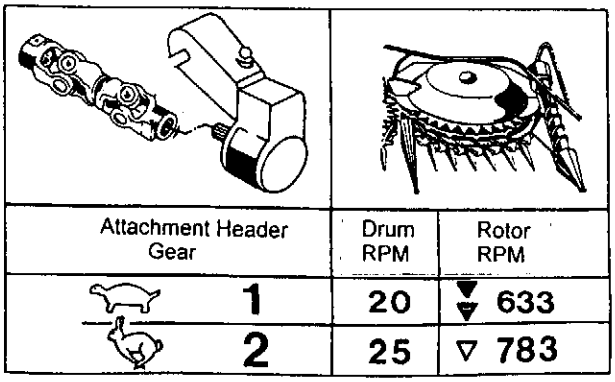
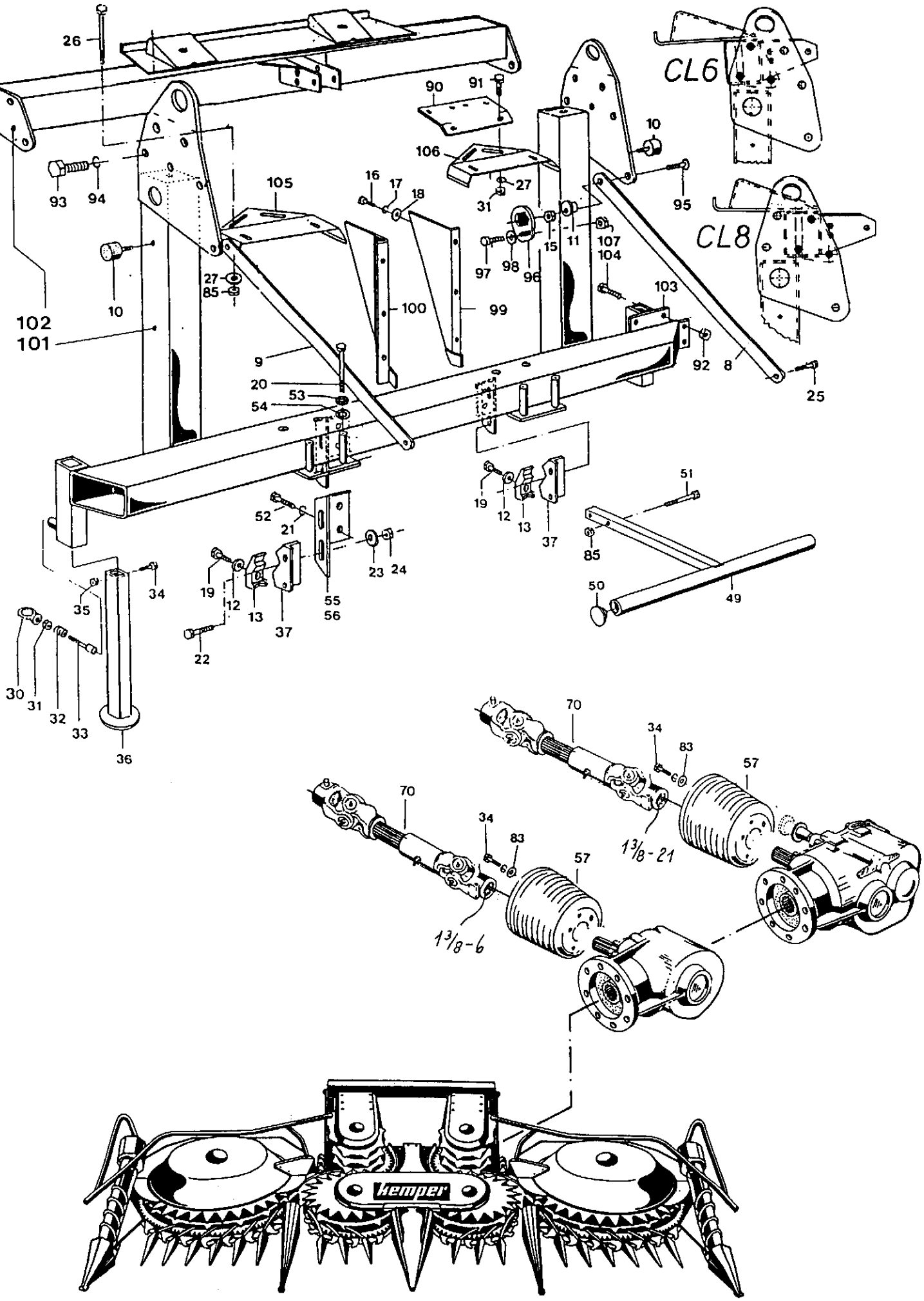


Fig.21



Attachment Header Gear	Drum RPM	Rotor RPM
1	20	▼ 633
2	25	▽ 783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Kemper

Attachment of header to the forage harvester CLAAS 8 series

M 4500 CL 8

As far as linkage and drive are concerned, this header is designed for the following CLAAS forage harvesters*:

820 = 310 HP 840 = 354 HP 860 = 410 HP and 880 = 481 HP
* Report available upon request (sample report of the TÜV, the German motor certifying agency)

Main Drive

The main drive is effected by a PTO shaft located on the left side of the Jaguar gearbox.

Checking rpm

Regardless of the drive speed ratio, it is important when cutting rough-stem crops under normal conditions that the drive shaft (100) turns at approximately 380-400 rpm under load (idling speed approx. 8% higher). This correlates to 19-20 rpm on the large outer gathering drums.

Channel width (fig. 39)

CLAAS CL 8 headers have an adjusted channel width of 735 mm.
The cover (4), the feed plate (5) and the scraper (6) may be rotated around the drum (7) to a channel width of 735 by unscrewing screws (2+3). When test-lifting, a check of the adjustment of the feed plates (5) must be made.

Trough (fig 39A)

The problem of winding the lower roller on a CLAAS forage harvester can be solved by installing a trough (see technical information 3198). We recommend installation, but cannot assume any responsibility for such since it involves parts from another manufacturer.

Cutting lengths

The indicated values concerning the choice of gear and the feed rate are only suggestions. Depending on the power of the motor, crop density, and the driving speed, it may be sensible to adjust the feed rate.

Trouble-shooting

- Trouble with the compression rollers is often the result of an improper choice of gear. Pay attention to the table on cutting lengths.
- In many cases, it is necessary to regulate the tension of the springs on CLAAS compression roller housing.

Fig,39

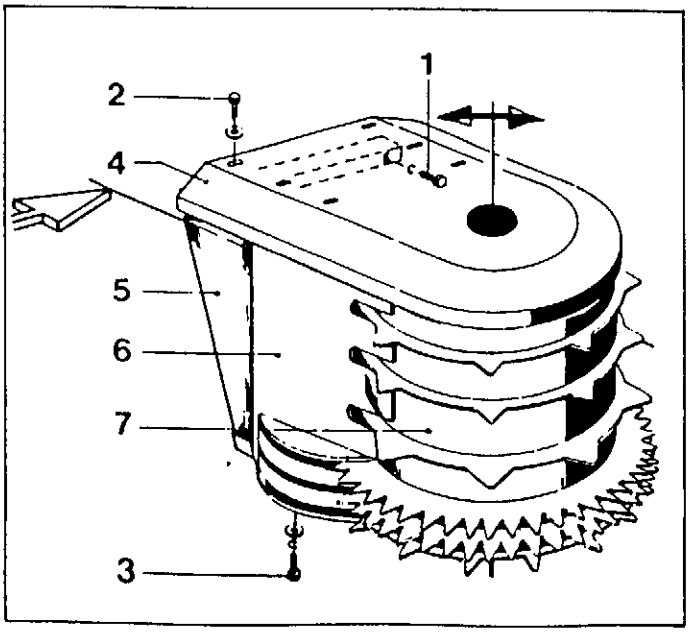
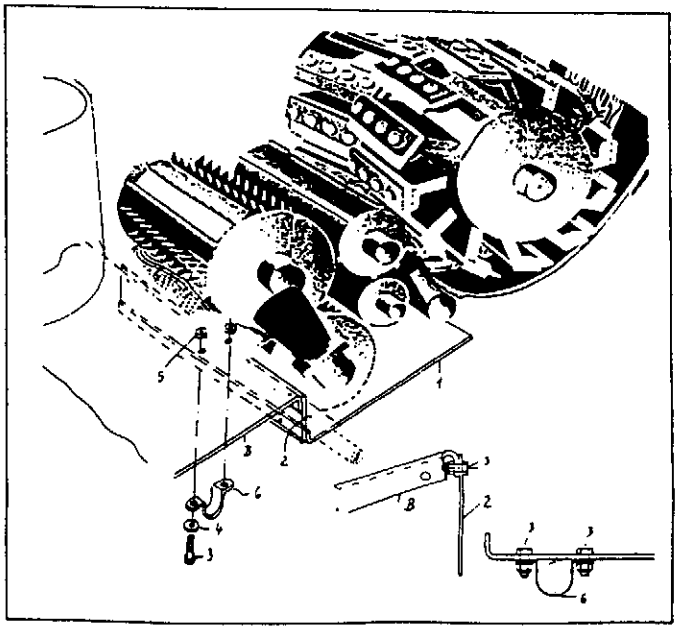
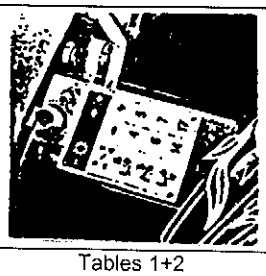
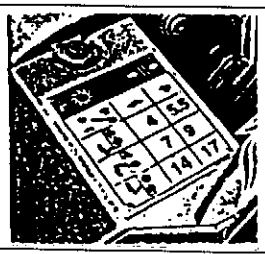


Fig. 39 A

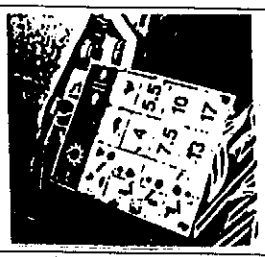




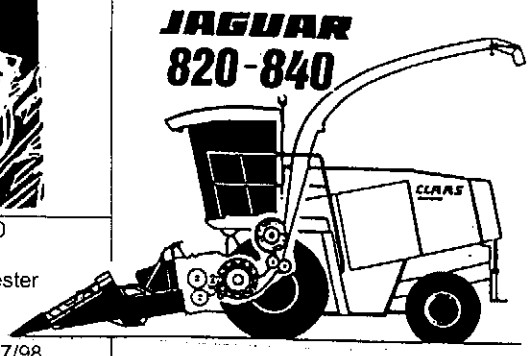
Tables 1+2
for
CLAAS forage harvester
820-840
built 1995-1996



Tables 3+4, 7+8
for
CLAAS forage harvester
820-840
built 1997-1998



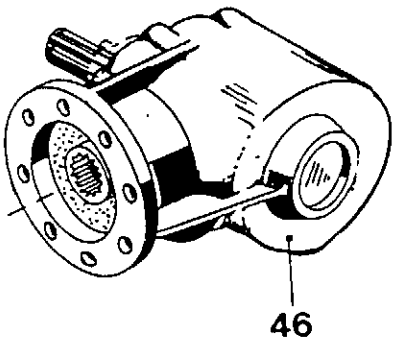
Tables 5+6, 9+10
for
CLAAS forage harvester
820-840
special edition
cutting length drive 97/98

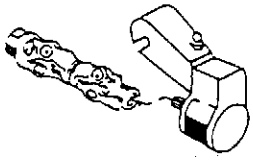


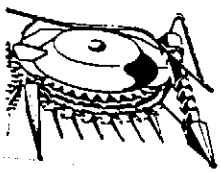
The forage harvester CLAAS 820-840 can, depending on the year of construction, be outfitted with various cutting length drives.

Choose the appropriate table:

A based on the construction year of the harvester
B based on the table for CLAAS cutting length drives







CLAAS			KEMPER						
	Gear	rpm	Gear	rpm	20 knives cutting length		Drum rpm	
	1	327	-	327	4		**17**	▽
	2	400	-	400	5	7	**20**	▼ ▽

Table 1

	Gear	rpm	Gear	rpm	20 knives cutting length		Drum rpm	
	1	327	-	327	4		**17**	▽
	2	400	-	400	5,5	9	**20**	▼ ▽

Table 3

	Gear	rpm	Gear	rpm	20 knives cutting length		Drum rpm	
	1	327	-	327	4		**17**	▽
	2	400	-	400	5,5	10	**20**	▼ ▽

Table 5

	Gear	rpm	Gear	rpm	24knives cutting length		Drum rpm	
	1	368	-	368	4		**18**	▽
	2	455	-	455	5,5	9	**23**	▼ ▽

Table 7

	Gear	rpm	Gear	rpm	24knives cutting length		Drum rpm	
	1	368	-	368	4		**18**	▽
	2	455	-	455	5,5	10	**23**	▼ ▽

Table 9

▼= rough-stemmed crop (corn, etc.)
▽= WPS (whole plant silage))
▽= lodged maize

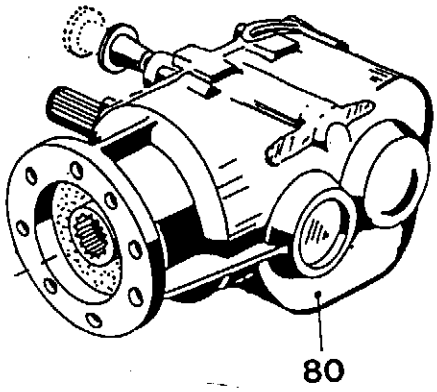


Table 2

	CLAAS Gear	CLAAS rpm	KEMPER Gear	KEMPER rpm	20 knives cutting length		Drum rpm	
	1	327	1	327	4		**17**	
	1	327	2	411	4	6	**20**	
	2	400	1	400	5		**20**	
	2	400	2	503		7	**25**	

Table 4

	Gear	rpm	Gear	rpm	20 knives cutting length		Drum rpm	
	1	327	1	327	4		**17**	
	1	327	2	411	4	7	**20**	
	2	400	1	400	5,5		**20**	
	2	400	2	503		9	**25**	

Table 6

	Gear	rpm	Gear	rpm	20 knives cutting length		Drum rpm	
	1	327	1	327	4		**17**	
	1	327	2	411	4	7,5	**20**	
	2	400	1	400	5,5		**20**	
	2	400	2	503		10	**25**	

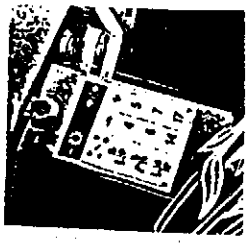
Table 8

	Gear	rpm	Gear	rpm	24 knives cutting length		Drum rpm	
	1	368	1	368	4		**18**	
	1	368	2	463	4	7	**23**	
	2	455	1	455	5,5		**23**	
	2	455	2	572		9	**28**	

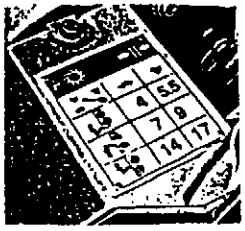
Table 10

	Gear	rpm	Gear	rpm	24 knives cutting length		Drum rpm	
	1	368	1	368	4		**18**	
	1	368	2	463	4	7,5	**23**	
	2	455	1	455	5,5		**23**	
	2	455	2	572		10	**28**	

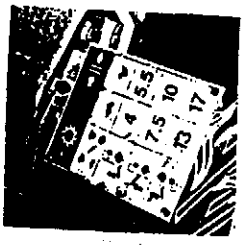
13E Attachment to the forage harvester



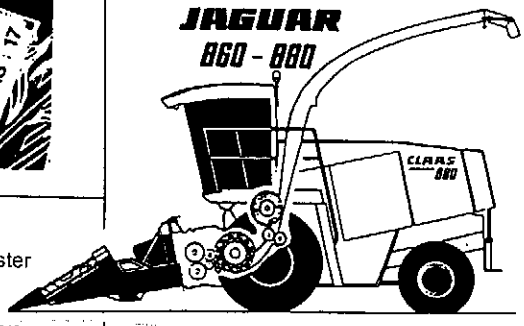
Tables 11+12
for
CLAAS forage harvester
86-880
built 1995-1996



Tables 13 - 14
for
CLAAS forage harvester
860-880
built 1997-1998



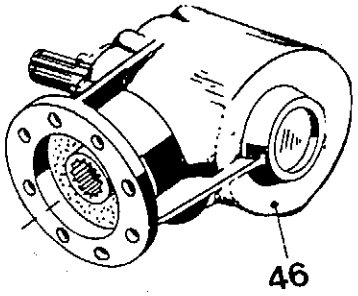
Tables 15 –16
For
CLAAS forage harvester
880-880
special edition
cutting length drive 97/98

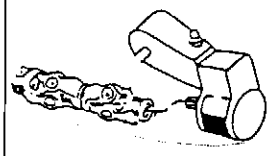


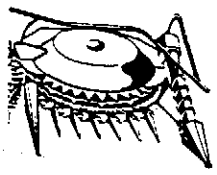
The forage harvester CLAAS 860-880 can, depending on the year of construction, be outfitted with various cutting length drives.

Choose the appropriate table:

A based on the construction year of the harvester
B based on the table for CLAAS cutting length drives







CLAAS			KEMPER					
	Gear	rpm	Gear	rpm	24 knives cutting length		Drum rpm	
	1	400	-	400	4	6	**20**	▼ ▽
	2	495	-	495	5	7	**25**	▽

Table 11

▼ = rough-stemmed crop (corn, etc.)
▽ = WPS (whole plant silage))
▽ = lodged maize

	Gear	rpm	Gear	rpm	24 knives cutting length		Drum rpm	
	1	400	-	400	4	7	**20**	▼ ▽
	2	495	-	495	5,5	9	**25**	▽

Table 13

	Gear	rpm	Gear	rpm	24 knives cutting length		Drum rpm	
	1	400	-	400	4	7,5	**20**	▼ ▽
	2	495	-	495	5,5	10	**25**	▽

Table 15

Angular drive (46) The standard header M 4500 CL 8 is equipped with an angular drive (46).

Gearbox (80) The use of a gearbox (80) is recommended so that all cutting lengths can be used optimally. It is also possible to retrofit to older headers. During installation, be sure that the PTO shaft to gearbox is equipped on both sides with a profile of 1 3/8-21 (67248).

A The use of a gearbox (80) is recommended so that all cutting lengths can be used optimally. It is also possible to retrofit to older headers. During installation, be sure that the PTO shaft to gearbox is equipped on both sides with a profile of 1 3/8-21 (67248).
B For WPS use and with short corn, we recommend an increased gathering drum rotation from approximately 25-28 rpm. Use the gear combination 2-1.
C With lodged maize, all gear combinations may be used in the gathering drum turning range of 17-22 rpm.

The use of all cutting lengths is optimised by the gearbox for short or long corn, light stock, lodged maize, as well as WPS.

WPS Generally, the faster gear 2 is used here. In order to optimise the cutting process, the speed of the cutting blades must be higher.

Checking drum rotation speed The most accurate method is to make a chalk mark on the large gathering drum and count the rotations per minute.

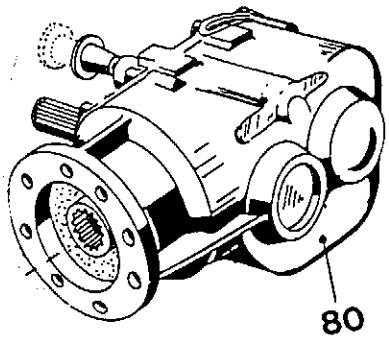


Table 12

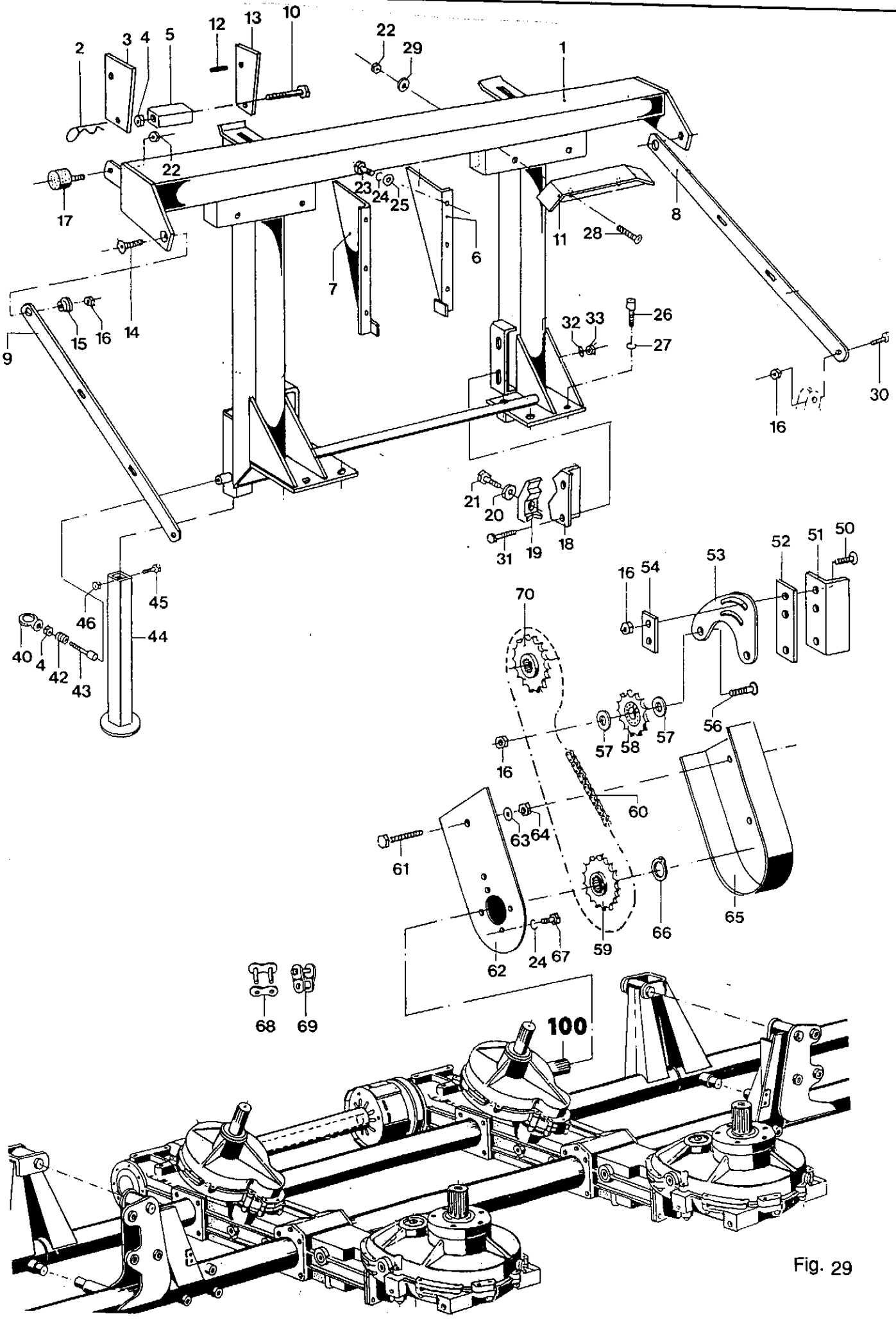
	CLAAS Gear	CLAAS rpm	KEMPER Gear	KEMPER rpm	24 knives cutting length		Drum rpm	
	1	400	1	400	4	6	**20**	▼▽
	1	400	2	317	4		**17**	▽
	2	495	1	495		7	**25**	▼△
	2	495	2	393	5		**20**	▼▽

Table 14

	Gear	rpm	Gear	rpm	24 knives cutting length		Drum rpm	
	1	400	1	400	4	7	**20**	▼▽
	1	400	2	317	4		**17**	△
	2	495	1	495		9	**25**	▼△
	2	495	2	393	5,5		**20**	▼▽

Table 16

	Gear	rpm	Gear	rpm	24 knives cutting length		Drum rpm	
	1	400	1	400	4	7,5	**20**	▼▽
	1	400	2	317	4		**17**	▽
	2	495	1	495		10	**25**	▼△
	2	495	2	393	5,5		**20**	▼▽


1
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57
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59
60
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65
66
67
68
69
70
100

Fig. 29

Attachment to John-Deere 5-series

M 4500 JD 5

The hitch points and the drive system of this header are designed to match the following John-Deere forage harvesters:

5720	= 214 HP	5820	= 282 HP
5730	= 214 HP	5830	= 282 HP

Main drive

Power is transmitted by the rear 1" spacket (70) of the feed and precompression roller drive of the JD forage harvester. Replace the tensioner in his area by bracket (53) and idler spocket (58) supplied with the header. When installing the 1" roller chain, make certain that the nuts of the connecting link are facing to the center of the forage harvester.

Speed of the drive system - corn

În standard conditions and thick-stemmed crops the drive shaft (100) of the header should turn at the speed from 380 to 400 rpm under load (idling speed should be approx. 6 to 8% higher). This corresponds to a rotational speed of the large outer gathering drums from 19 to 20 rpm.
The Champion M 4500 is equipped with a 19-tooth spocket (59). Since the spocket (70) truns at 383rpm, it is necessary to install a 19-tooth spocket (avaiable from John Deere part number AE 43033)

Speed of the drive system - whole crop silage

Depending on the kind of crop, the harvest of whole crop silage requires a higher rotational speed of the rotary cutters (thin stalks!). The necessary speed increase can be achieved by installing the 16-tooth spocket (John Deere part number AE 37412) which was replaced by the 19-tooth spocket. the drive shaft (100) will then turnat 455 rpm.

Attachment of the header

The top hitch points can be coupled in two positions (see fig. 25 and 26). Normally you should use the wide wedge shown in fig. 26.
Depending on the John-Deere forage harvester type and the tire size, it may be that with the standard attachment the front tips of the header do not reach close enough to the ground. If this is the case,it is advisable to install the square steel tubes shown in fig. 27 and to use the narrow wedges. The fornt part of the header will then become approximately 4 inches closer to the ground.

▼ = Thick stemmed crops (corn etc.)
▽ = Whole crop silage
▼ = Down crops

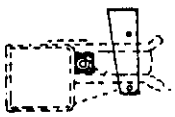


Fig. 25

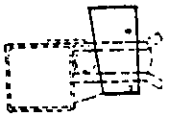


Fig. 26

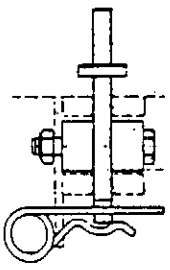
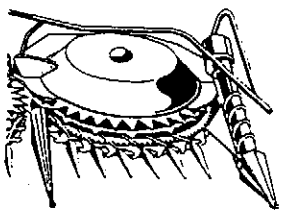


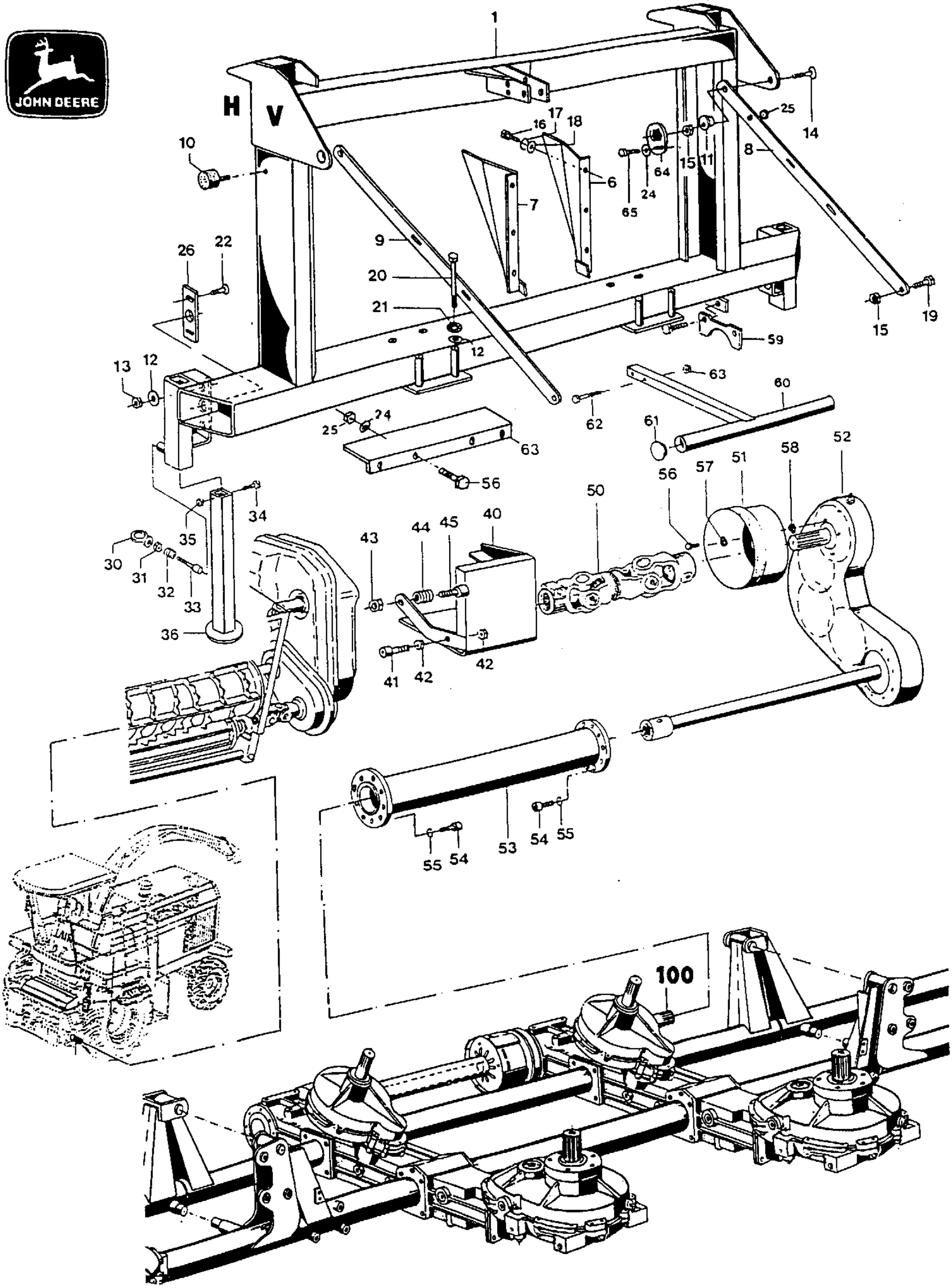
Fig. 27

Fig. 28



Chain drive

	item 70 Z 1	item 59 Z 2	Drum rpm	Rotor rpm
1	19	19	20	▼ 633
2	19	16	24	▽ 760


H
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43
44
45
50
51
52
53
54
55
56
57
58
59
60
61
62
63
64
65
100

Attachment of header to forage harvester John-Deere 6-series

M 4500 JD 6

The hitch points and the drive system of this header are designed to match the following John-Deere forage harvesters:
6610 = 280 HP* / 6810 = 405 HP* / 6650 = 280 HP* / 6850 = 440 HP*
6710 = 330 HP* / 6910 = 445 HP* / 6750 = 365 HP* / 6950 = 505 HP*
*= Expertise of the testing agency available on request.

Main drive

Power is transmitted by a PTO shaft from the shift and reversing gear unit on the left-hand side.

1st speed

In 1st speed the drive shaft of the JD gearbox turns at approx. 405 rpm under load. This 1st speed is suitable for normal conditions with thick-stemmed crops such as corn, sunflowers, beans or elephant grass.

2nd speed

In 2nd speed the drive shaft of the JD gearbox turns at approx. 530 rpm under load. This higher speed is required for harvesting whole crop silage because an accurate cut of thin-stemmed crops required a higher rotational speed of the cutting blades.

Speed check

Whatever the gearing, it is only important that the speed of drive shaft 100 is approx. 380 - 400 rpm under load when cutting thick-stemmed crops under normal conditions (idling speed approx. 8 % higher). This corresponds to a speed of 39 - 41 rpm at the gathering drums.

Attachment of the header

The top hitch points can be coupled in two positions, H and V, see Fig. 31 item 1. A slight inclination of the header can be achieved by using the front brackets V. When operating on soft ground it may be necessary to use the rear brackets H. Adjust the bottom slats 26 to match the hitch pin on the JD. The PTO shaft guard 40 must be installed on the reverse gearbox of the forage harvester.

Cutting lengths

The indicated values concerning the choice of gear and the feed rate are only suggestions. Depending on the power of the motor, crop density, and the driving speed, it may be sensible to adjust the feed rate.

Table 30

▼ = Thick-stemmed crops (corn etc.).
▽ = Whole crop silage
⩛ = Down crops

Fig.30

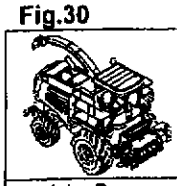
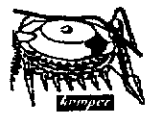
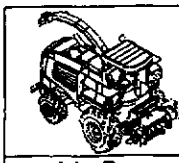
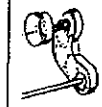
					
John Deere LOC		JD	Kemper	Kemper	
Gang	U/min	Schnittlängen	Getriebe	Trommel U/min.	
1	405		1 : 1	20	▼⩛
2	530		1 : 1	25	▼▽
Schnittlängen bei 56 Messer :			4,7 - 6,6 - 9,9 - 13,9		
Schnittlängen bei 46 Messer :			5,4 - 9,2 - 11,5 - 16,2		
Schnittlängen bei 40 Messer :			6,5 - 9,2 - 13,8 - 19,4		

Fig.30A

					
John Deere IVT		JD	Kemper	Kemper	
Gang	U/min	Schnittlängen	Getriebe	Trommel U/min.	
1	405	Stufenlos	1 : 1	20	▼⩛
2	530	Stufenlos	1 : 1	25	▼▽
Schnittlängen bei 56 Messer :			4 - 19	je 1 mm stufenlos	
Schnittlängen bei 46 Messer :			5 – 22		
Schnittlängen bei 40 Messer :			6- 26		

Profile connection

All new John Deere forage harvesters starting with the series 1. Nov. 96 are equipped with a strong profile on the outlet shaft (4) of the cutting length drive. Thus, there are two PTO shafts for driving the header M 4500:

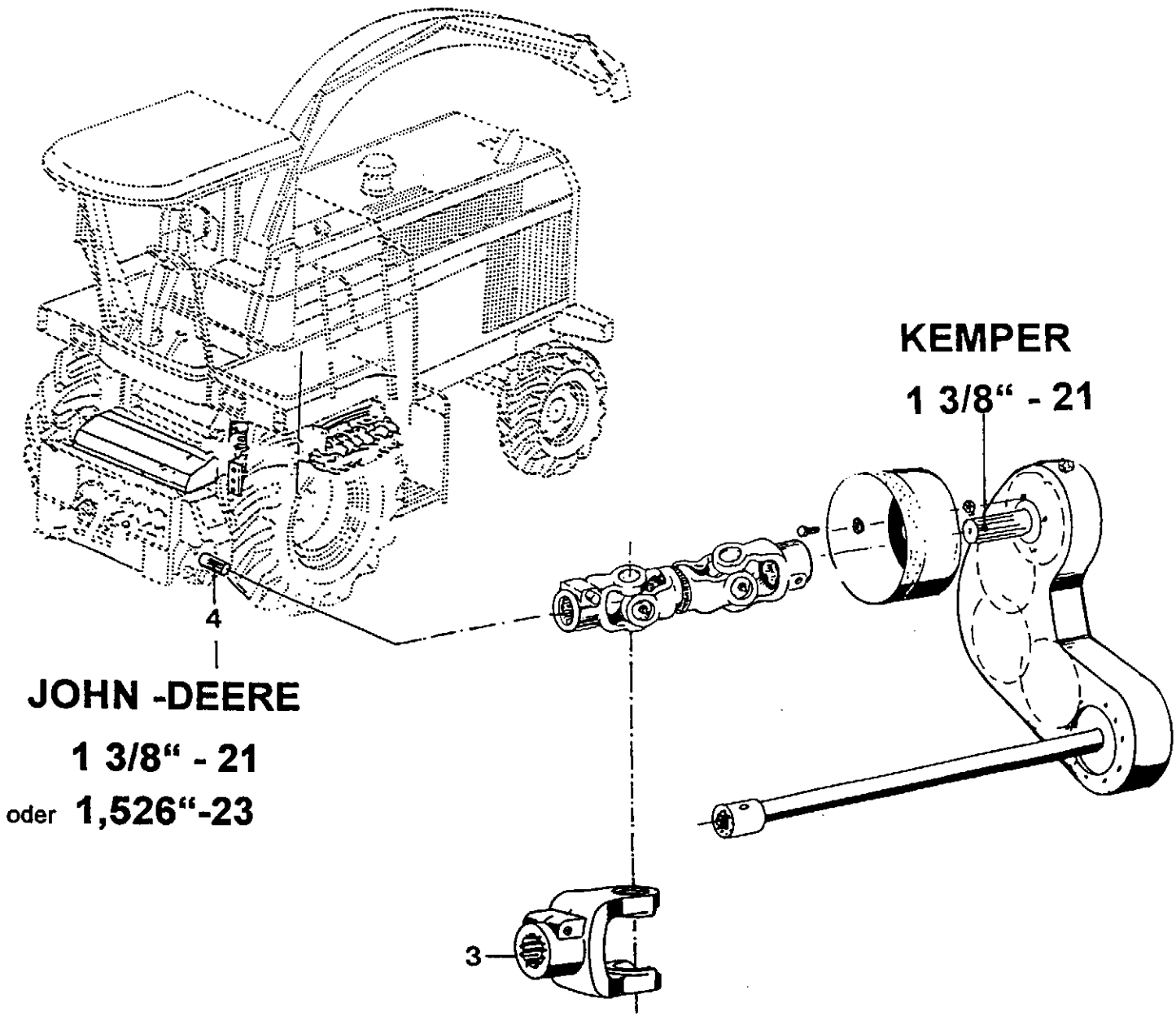
A	until Oct. 96 = 1 3/8"-21	= PTO shaft no. 64231
B	after Nov. 96 = 1.526"-23	= PTO shaft no. 72150

Z = 21, Z = 23

In the case of an exchange of harvesters with different profile connection (4), the following possibilities (header M 4500 has a profile connection of 1 3/8"-6):

A Replace complete PTO shaft (1) (64231 or 72150)

B Exchange slip-on fork (3) (35.79.101+) Z=21= no. 66527
(35.79.112+) Z=23 = no. 70076
JD=AZ50429



Channel width (fig. 39)

John Deere headers have an adjusted channel width of 660 mm. The cover (4), the feed plate (5) and the scraper (6) may be rotated around the conveyor drum (7) by unscrewing screws (2+3). When test-lifting, a check must be made of the adjustment of the feed plates (5) to the draw-in rollers.

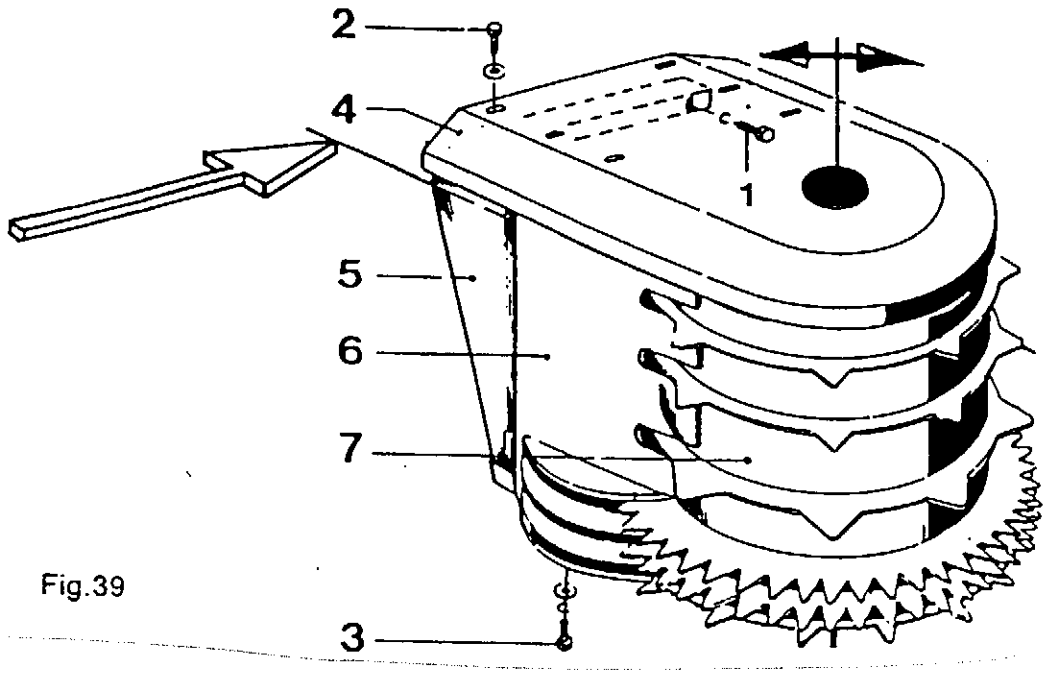


Fig.39

Vibration-free opening of header (fig. 30B)

In practical usage, it has been shown that it is only possible to achieve a vibration-free, hydraulic opening of the outer drum unit on the header when both throttles (item 23, no. E62155) have been removed from the pressure and reverse channels of the ¾" two-way valve AZ47055.

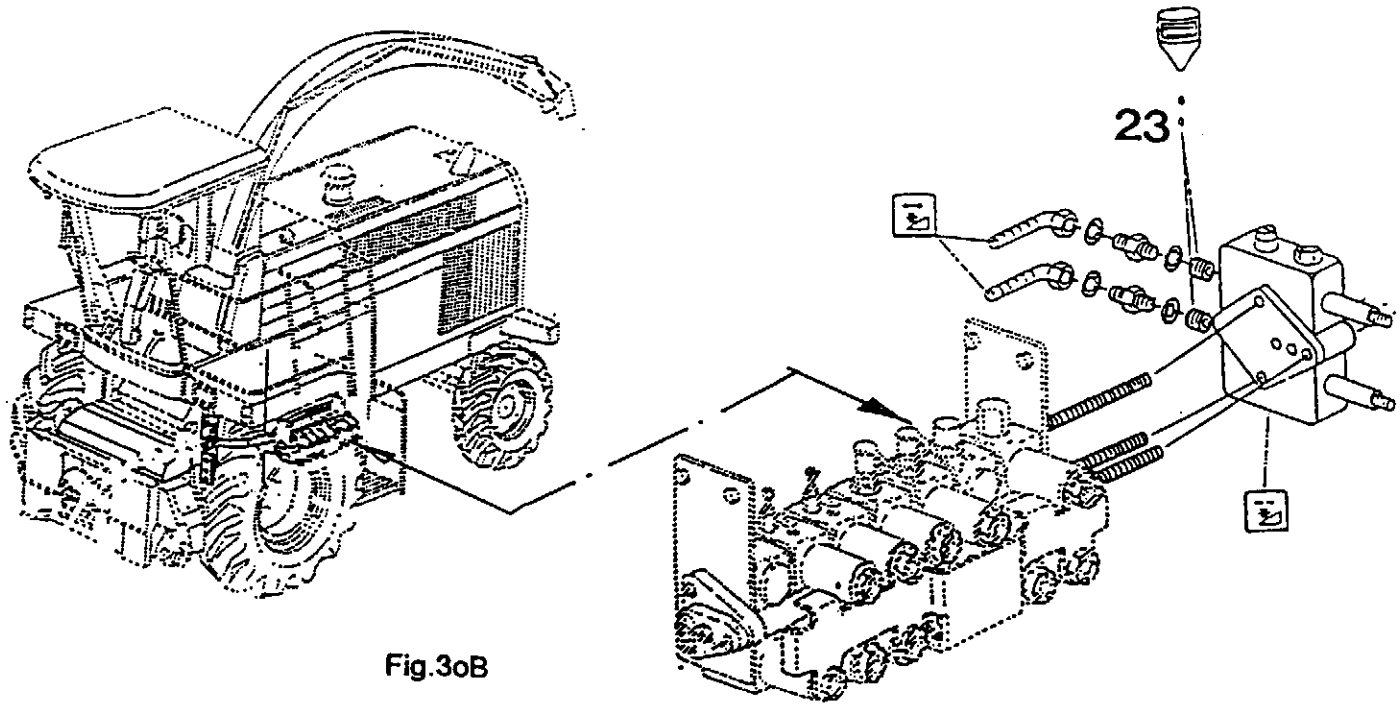
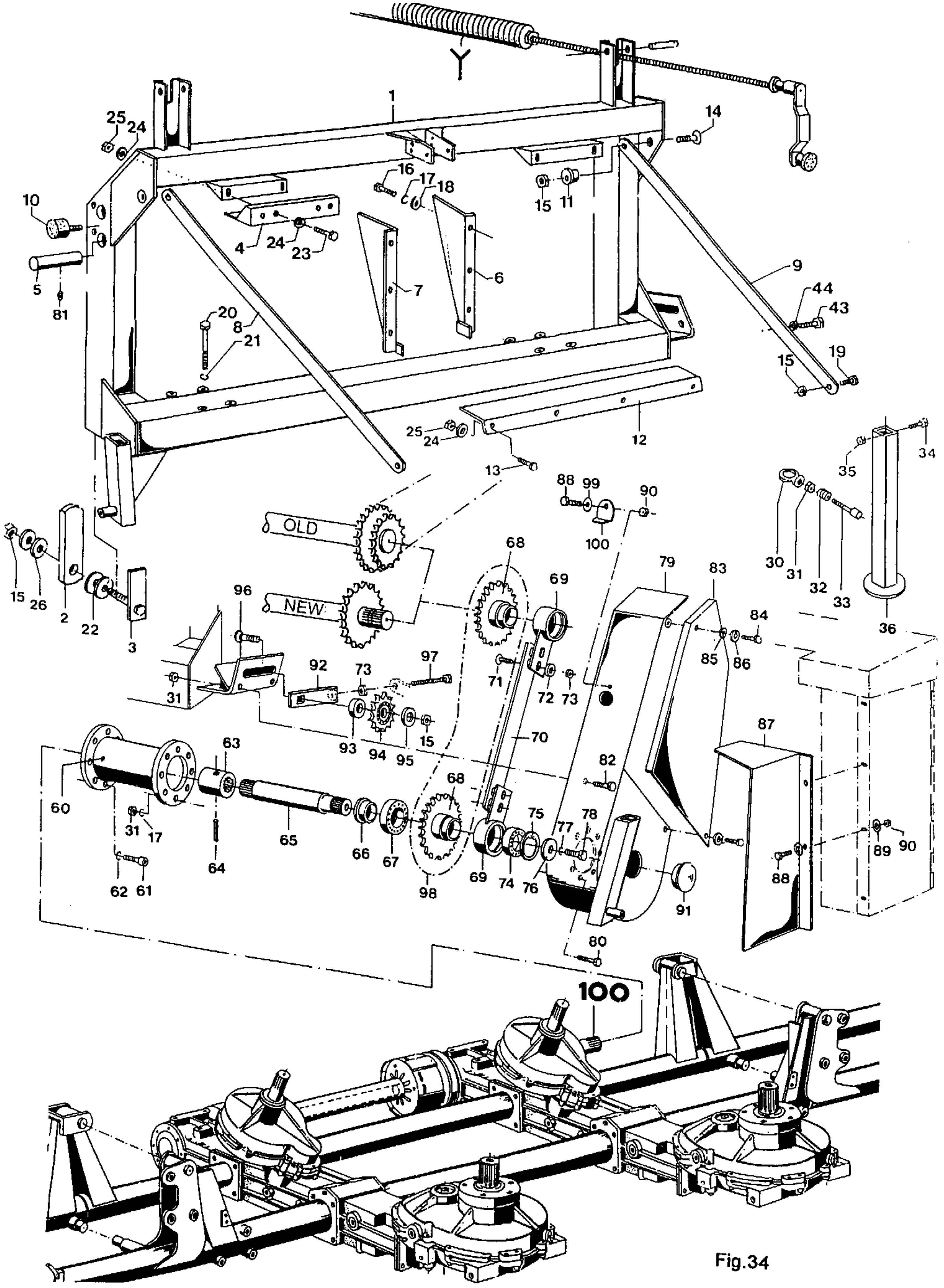


Fig.3oB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100
OLD
NEW

Fig.34

Attachment to FIATAGRI (New Holland)

M 4500 FA

The hitch points and the drive system of this header are designed to match the following FIATAGRI and New Holland forage harvesters:

Fiatagri	New-Holland
7820 = 300 HP	1900 = 280 HP
7825 = 340 HP	1905 = 300 HP
7835 = 360 HP	2100 = 320 HP
7840 = 400 HP	2200 = 340 HP
	2205 = 340 HP
	2305 = 360 HP
	2405 = 400 HP

Speed the drive system - corn

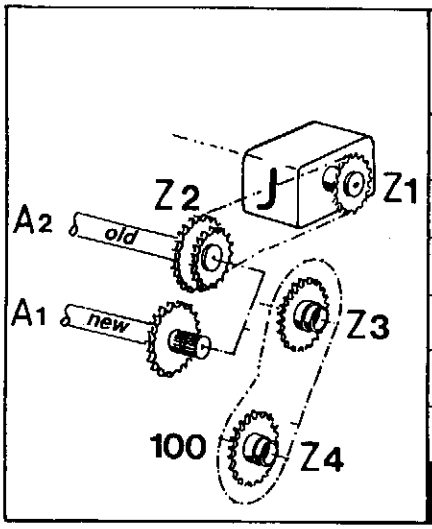
Since the NH and FA forage harvesters are equipped with different drive systems (see fig. 35 and 36), the PTO stub shaft (A) turns at different speeds. It is therefore advisable to measure the speed at "A". Whatever the speed ration of the drive system of the forage harvester: for the practical use it will only be of imporance that the bottom stub shaft (100) turns at approx. 400 rpm when harvesting thick-stemmed crops in standard conditions.
To check the speed of the gathering drums, mark one of the large drums with a chalk and count the revolutions.

Coupling point A1 Fig. 37

On the new NH types 1905 - 2205 and 2405 as well as on all FA types the coupling point A1 consistis of a simple sprocket with short 1 3/8" PTO stub shaft - 21 splines.
Attach the 20-tooth sprocket supplied with the unit to the stub shaft. The complete chain drive has to be installed as shown in fig. 37 & 38. The drive system has to be lubricated with oil once a day.

Coupling piont A2 Fig. 37

On the old NH types the coupling point A 2 consists of a double sprocket.
Place the chain onto the 18-tooth sprocket. The 20-tooth sprocket and the bearing support are not installed on types with double sprocket.



		NH old Version		NH + FA new Version	
		850	1100	850	1100
RPM	J	468	608	468	608
	Z1	20	15	18	14
	Z2	21	21	21	21
RPM	$A\frac{1}{2}$	446	434	401	405
	Z3	18	18	20	20
	Z4	20	20	20	20
RPM	100	401	391	401	405

Fig. 32

Note

The installation of different sprockets on the output shaft of the reverse gear-box involves a slight variation in the chopped lenght. This variation can be compensated by using the sprockets (R) (see fig. 35 & 36).

Speed of the drive system - whole crop silage

Depending on the kind of crop, the harvest of whole crop silage requires a higher rotational speed the cutting blades (thin stems!). We recommend to increase the number of teeth of the sprocket installed on the output shaft (J) by at least two teeth, but at most three teeth.

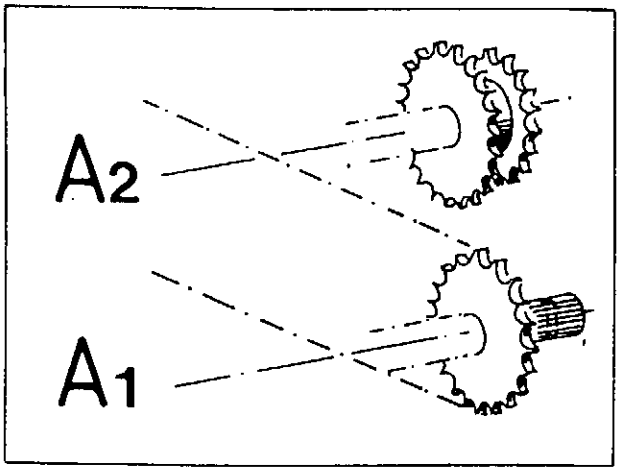


Fig.37

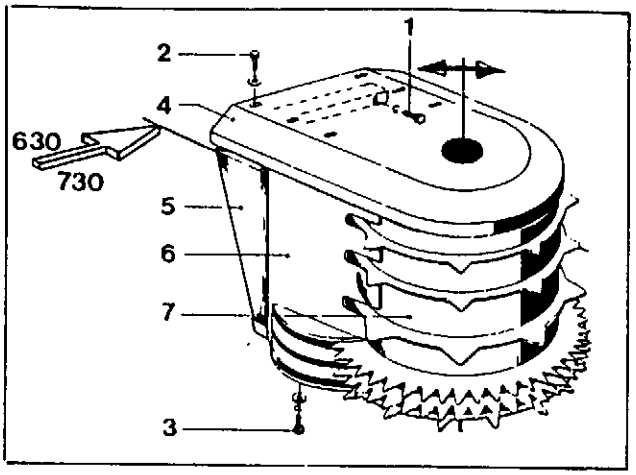


Fig.39

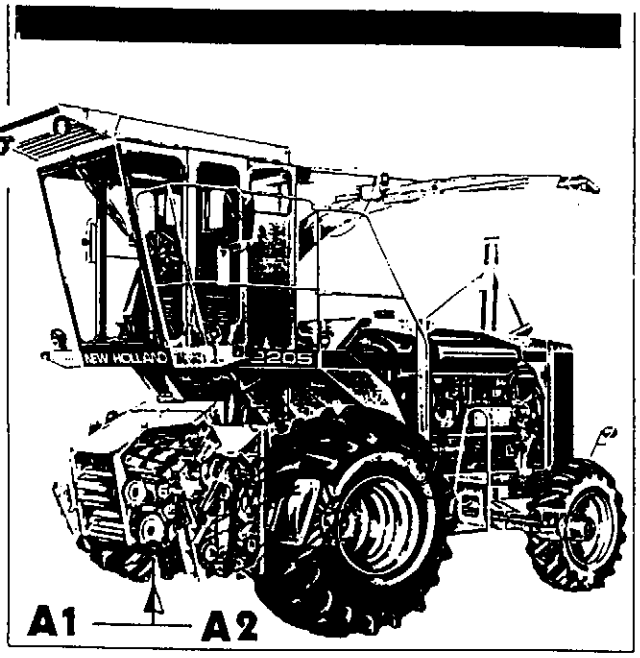


Fig.37 A

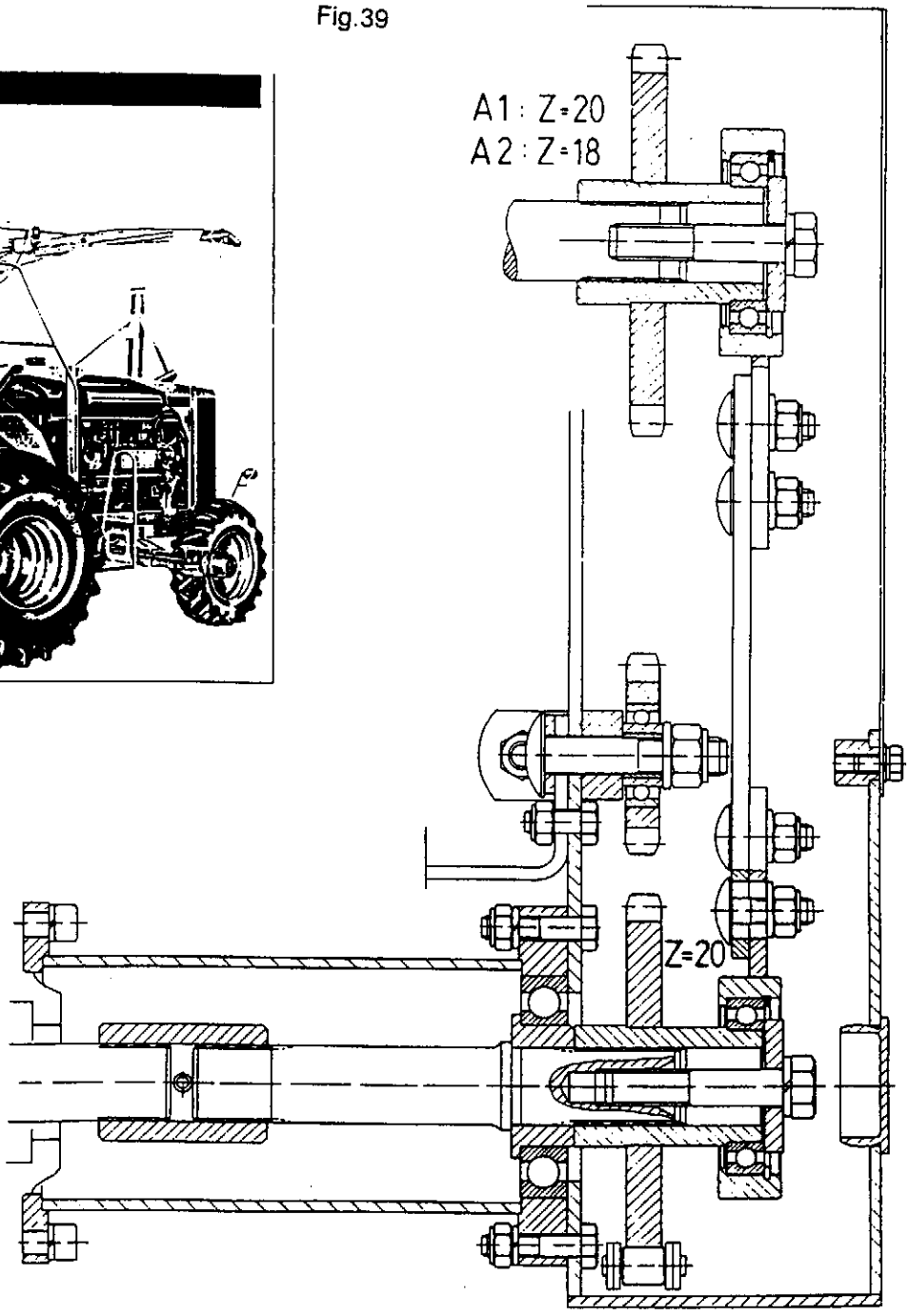


Fig.38

Channel width fig. 39

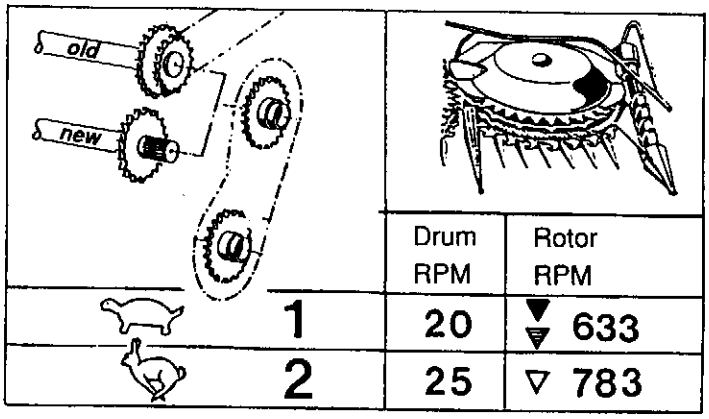
All front attachments of the NH and FA forage harvesters are adjusted to width of 730 mm. To match the Champion 4500 to this channel width, release the bolts 1,2 and 3. The entire assembly = cover 4, feed plate (5) and scraper (6), can then be turned around drum (7) until the desire width (630 mm) is available. Lift the unit to check the correct position of feed plates (5).

Flotation springs - fig. 38

Attach and secure the additional flotation springs (Y) to the U-sections of the top mounting frame. Adjust these springs and those of the forage harvester in such a way that the ground pressure of the skids is as low as possible. On the other hand there must still be available a sufficient lowering speed of the Champion 4500.

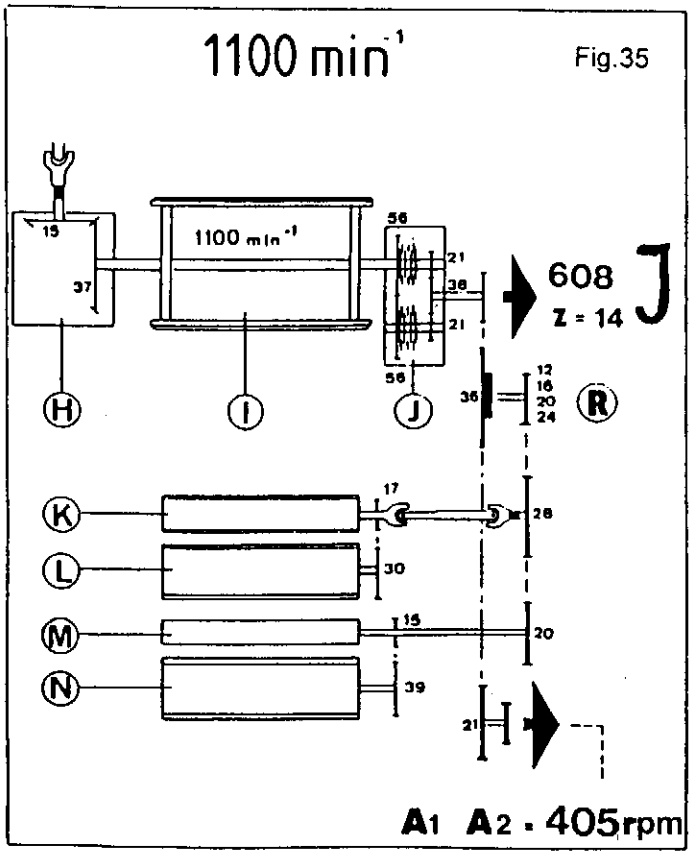
Table fig. 40

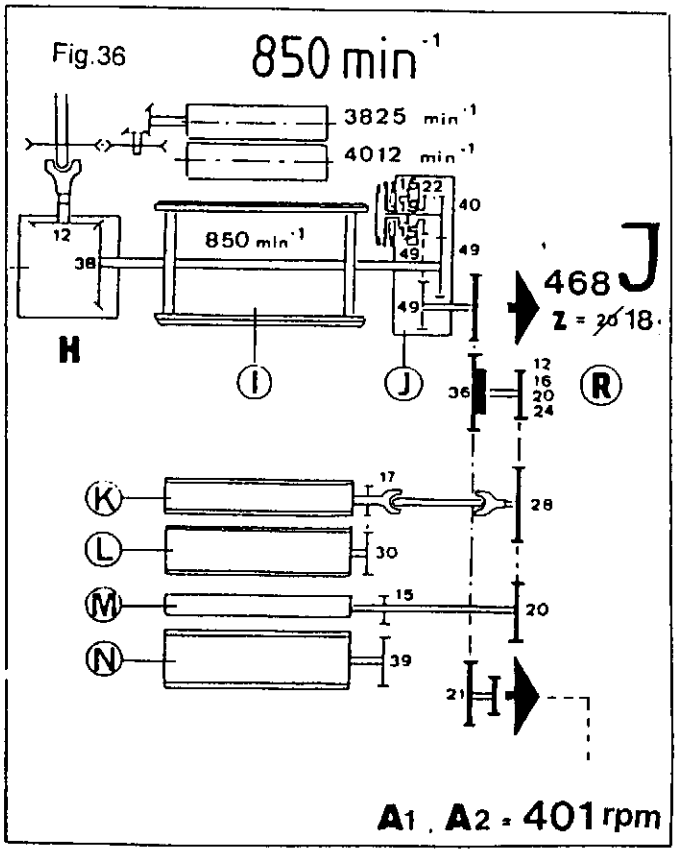
▼ = Thick stemmed crops (corn etc.)
▽ = Whole crop silage
⩛ = Down crops

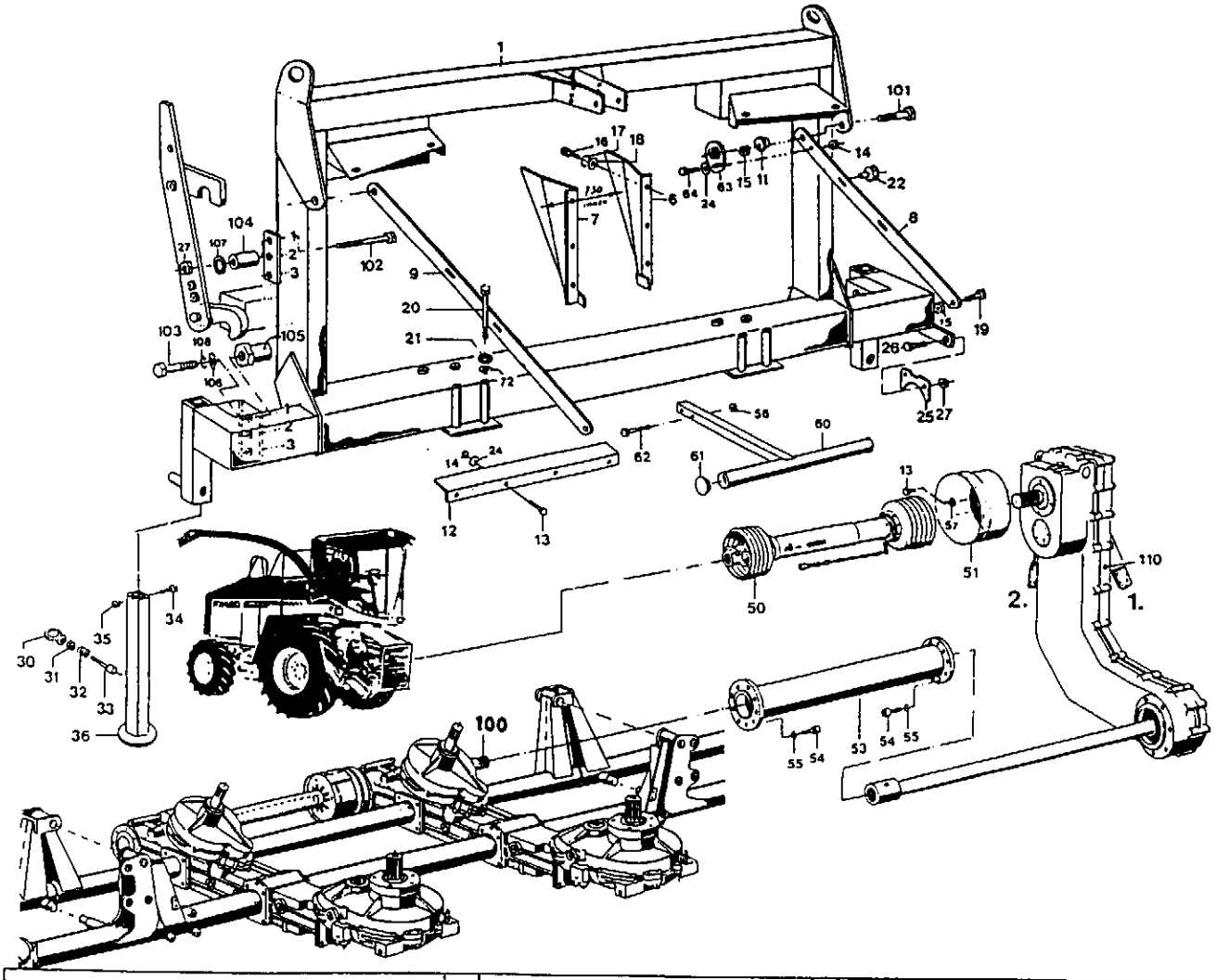


	Drum RPM	Rotor RPM
1	20	▼ ⩛ 633
2	25	▽ 783

Fig. 40







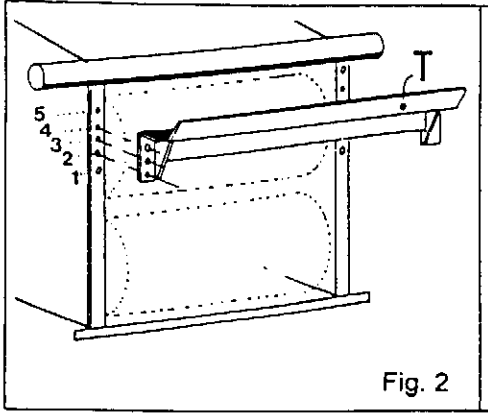


Fig. 2

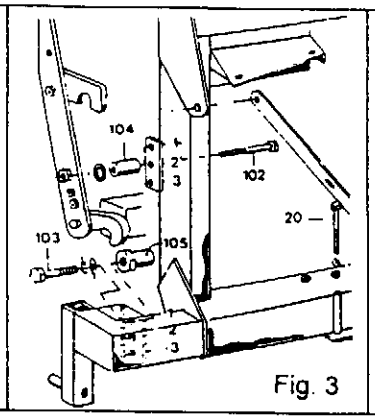


Fig. 3

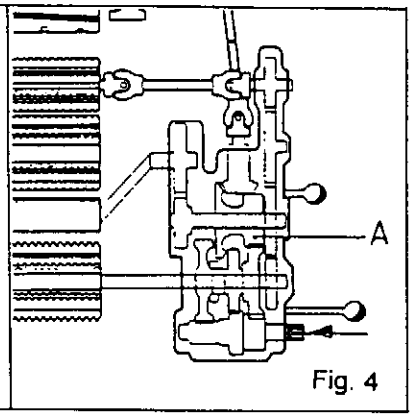
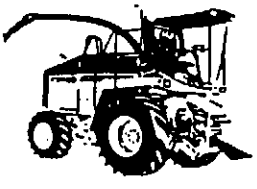
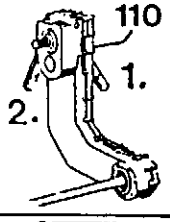


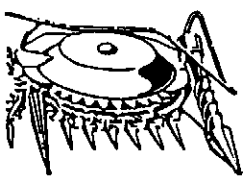
Fig. 4

Fig. 1



1





header speed	rpm	chutting length L1	L2	H1	H2	Hemper speed	drum rpm	
1	400	4	6	9		1 19:19	20	▼ ▽
WPS 1	400	4	6	9		2 20:17	24	▽

Attachment of header to the forage harvester NEW HOLLAND Type FX

M 4500 FX

New Holland	Fiatagri	NEW HOLLAND beg. 1999
FX 300 = 300 PS	9630 = 300 PS	FX 28 = 345 PS
FX 375 = 375 PS	9640 = 375 PS	FX 38 = 414 PS
FX 450 = 450 PS	9645 = 450 PS	FX 48 = 459 PS
		FX 58 = 526 PS

* Report available upon request (sample report of the TÜV, the German motor certifying agency)

Drive speed (corn)

The main drive is effected by a PTO shaft located on the left side of the FX gearbox.
Under normal operating conditions, the gearbox (110) on the header should be in first gear (1:1). Regardless of the drive speed ratio, it is important when cutting rough-stem crops under normal conditions that the bottom PTO stub shaft (100) (fig. 6) turns at approximately 400 rpm. This correlates to 20 rpm on the large gathering drums.
To check the rotation speed of the large gathering drum, make a chalk mark on the drum and count the rotations per minute.
Should extreme harvest conditions make it necessary to reduce the intake speed but this does not seem to be possible with the available harvester, contact your dealer and request technical information no. 3201-122.

Channel width

FX headers have an adjusted channel width of 730 mm. When test-lifting, a check of the adjustment of the feed plates (6+7) must be made. For necessary adjustments, see page 20 (fig. 39).

Attachment

The header is attached to the housing of the compression rollers. The compression roller housing is fitted with a mounting rail T (fig. 2). Practical use has shown that the middle hitch (i.e. mounting in the attachment holes 2, 3 and 4) provides the proper hitch point. For this height, two pins (104+105) (fig. 3) will need to be set for mounting.

Starting torque

Check the bolts (102+103) (item 20) regularly for proper fit.
Starting torque in Nm:
M 12 = 95 Nm M 16 = 235 Nm

Gearbox

To avoid damage, **never shift the gearbox under load**.

Cutting lengths

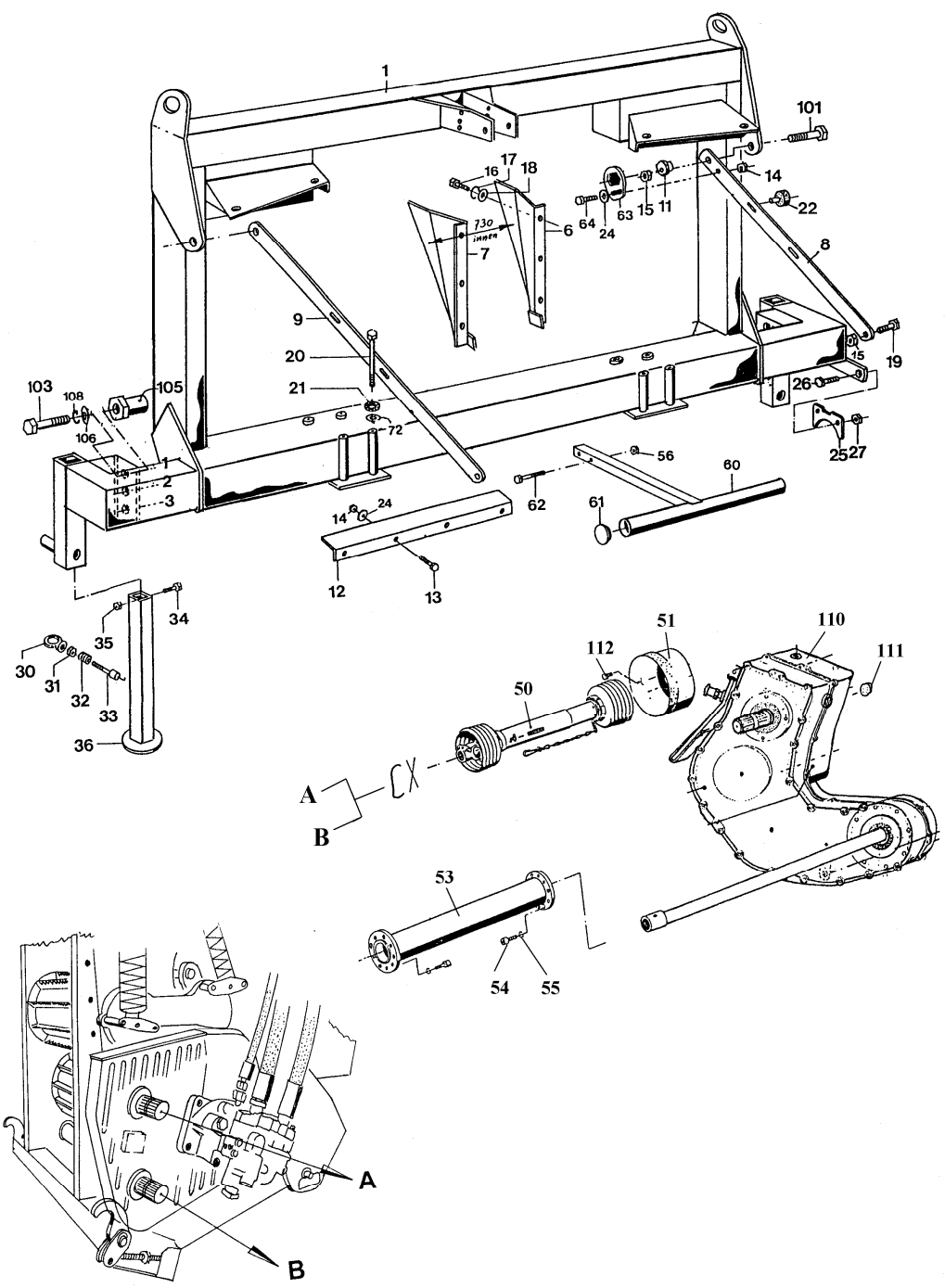
The indicated values concerning the choice of gear and the feed rate are only suggestions. Depending on the power of the motor, crop density, and the driving speed, it may be sensible to adjust the feed rate.

Table

▼ = rough-stemmed crop (corn, etc.)

▽ = WPS (whole plant silage)


= lodged maize


1
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INNER
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63
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7
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72
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19
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103
108
105
106
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27
56
60
62
61
14
24
12
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110
112
111
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A
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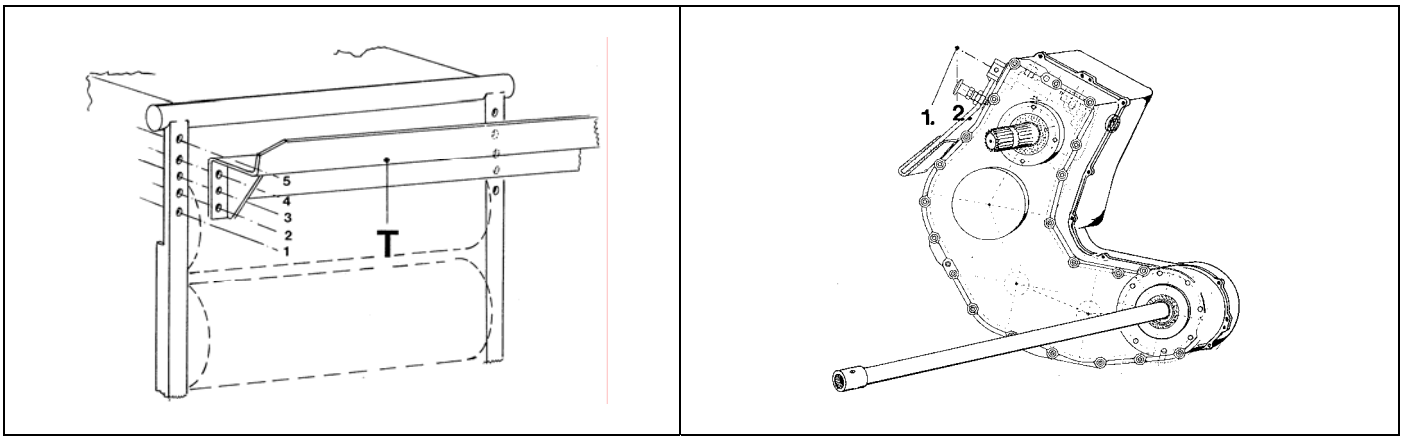
A
B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T
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Mowing attachment on the field choppers NEW HOLLAND type FX and Case IH type CHX

330 345 360 CX

In respect of the hitch points as well as the drive, this mowing attachment is designed for the following field choppers:

NEW - HOLLAND		CASE IH	
FX 30 =	386 PS*	CHX 320 =	386 PS*
FX 40 =	460 PS*	CHX 420 =	460 PS*
FX 50 =	515 PS*	CHX 520 =	515 PS*
FX 60 =	571 PS*	CHX 620 =	571 PS*

*An expert's report (TÜV report) can be requested

Field choppers FX CHX

The description in these instructions is based on the premise that the field chopper is equipped with the technology "infinite cutting length and hydrostatic drive".

Mowing attachment with manual transmission

This mowing attachment is equipped with a 2 gear manual transmission M2. The connection is via the cardan shaft 50 either on the shaft drive A or B

To avoid damage to the transmission **"do not switch when the machine is under load".**

Attaching the device

A The mowing attachment is attached to the pre-press roller housing. The mounting rail TO top, Figure 33, must be fixed in the middle hole pattern 2,3,4.

The lower fastening is effected via the HU clamp.

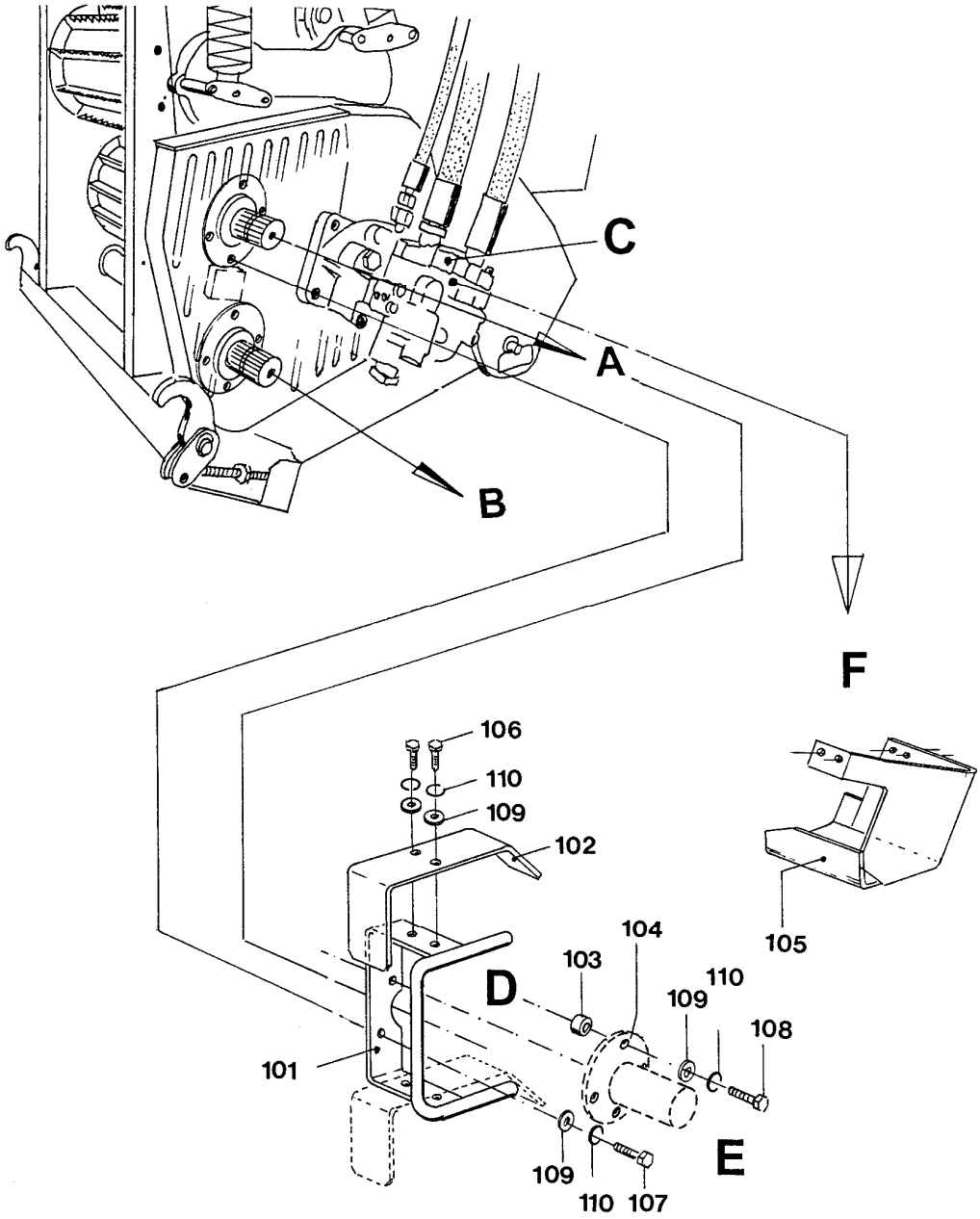
B The mount is aligned to the tire size 30.5 - 32. Depending on the type, smaller tires may not meet the allowed limit loads required in the TÜV expert's reports.

C When the mowing attachment is assembled or disassembled, the Champion stands on three supports. Two supports 36 are located in the lower area of the mount frame. The third front support is fixed on the upper crosstie of the mount frame to the left upon delivery of the device.
Before being first mounted, the mowing attachment is tipped on a level fixed surface. The mowing attachment must be raised and securely supported by means of a crane or another suitable aid.
Caution: observe the weight, work using three chains if necessary because of the overturning hazard.
After this, the front support 63 can be mounted underneath the middle crop separator.

D The mowing attachment is set on the supports 36 in the upper position before the field chopper. In this position, the channel width and the setting of the insertion plates 6+7 should be checked. For necessary adjustments, see the instructions for use, page 13D, Figure 39

F Slowly lift the mowing attachment, observe the insertion plates 6+7, support the mowing attachment, hoist and lock the rear supports and exchange the support 63 against the filler plug 64.

The machine must be securely supported whenever work is performed to its underside.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B
F
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D
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110
107
E

Safety "D" To adhere to the CE declaration of conformity, the two drive stubs A and B for the cardan shaft connection must be covered with a protection device "D". Depending on the use of shaft A or B, the cover plate (102) must be mounted above or below the clamp (101).

Safety "E" Depending on the use of shaft A or B, the shaft protection (104) must be mounted above or below.

Safety "F" The hydraulic motor with its electrical connection must be covered with a protection cover (105). The existing clamp must be removed.

Cutting lengths Depending on the cutting length selected, the cardan shaft (50) must be mounted on the drive stub "A" or "B" of the field chopper and gear "1" or "2" also selected on the Kemper manual transmission.

FX - CHX	Standing maize cylinder normal										
	Cutting lengths										
	4	**5**	**6**	**7**	**8**	**10**	**12**	**14**	**16**	**18**	**20**
Chopper A or B	B	A	A	A	A	B	B	A	A	A	A
Kemper manual transmission gear 1 or 2	2	1	1	2	2	2	2	1	1	1	1
Cylinder approx. U/min	20	20	23	21	24	23	28	26	29	33	37

FX - CHX	Downed maize cylinder slow											
	Cutting lengths											
	4	**5**	**6**	**7**	**8**	**8.5**	**10**	**12**	**14**	**16**	**18**	**20**
Chopper A or B	A	A	A	A	A	B	A	A	A	A	A	A
Kemper manual transmission gear 1 or 2	1	1	2	2	2	2	1	1	2	2	2	2
Cylinder approx. U/min	16	20	18	21	23	20	19	22	19	22	25	28

FX - CHX	Whole plant silage (WPS) cylinder fast											
	Cutting lengths											
	4	**5**	**6**	**7**	**8**	**8.5**						
Chopper A or B	B	B	B	A	A	B						
Kemper manual transmission gear 1 or 2	1	2	2	1	1	1						
Cylinder approx. U/min	27	25	30	28	24	27						

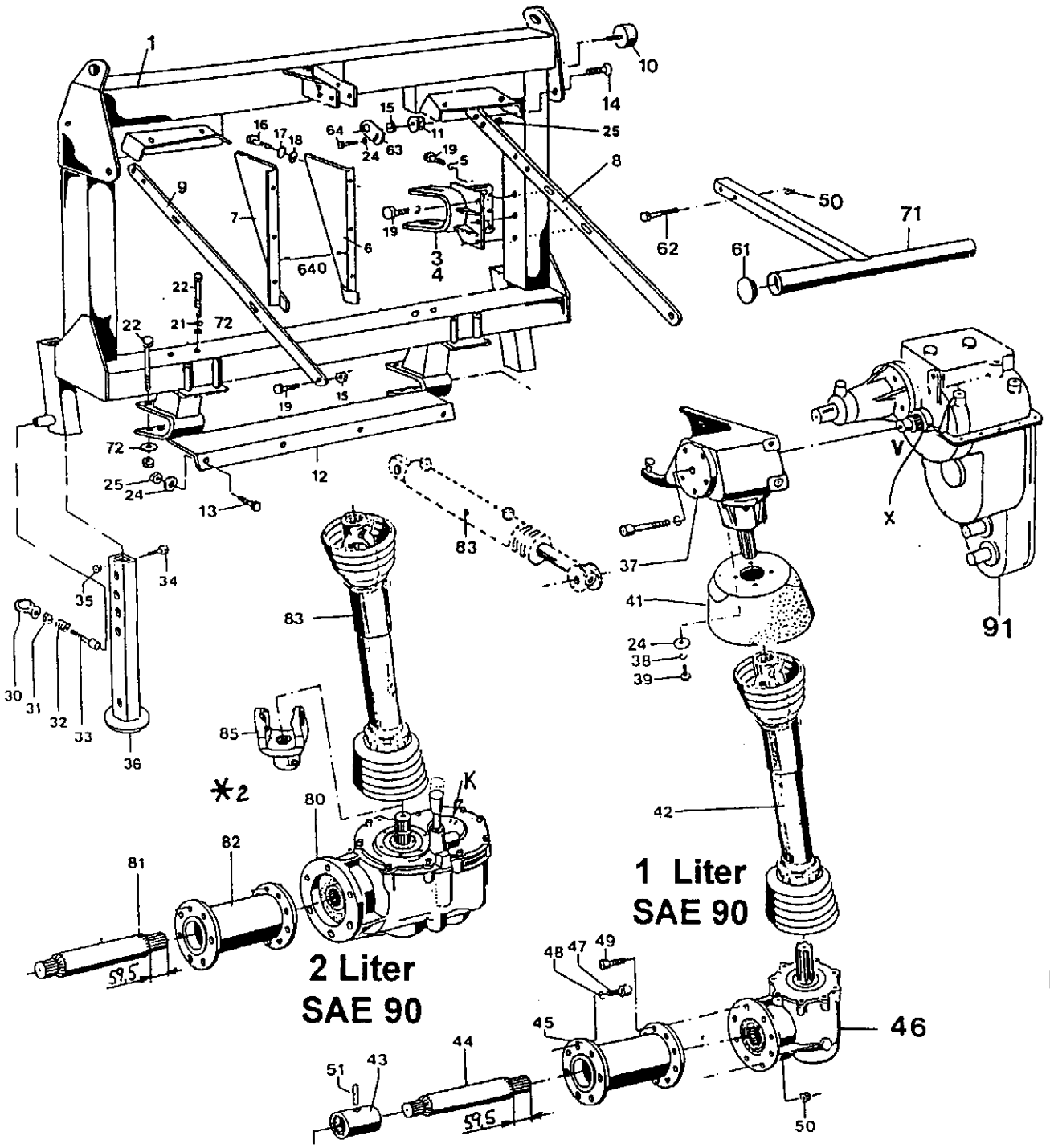


Fig. 41

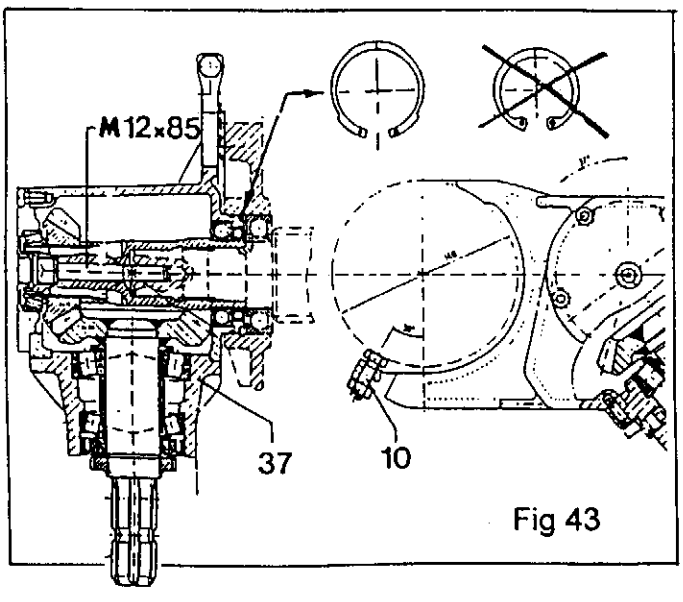


Fig 43

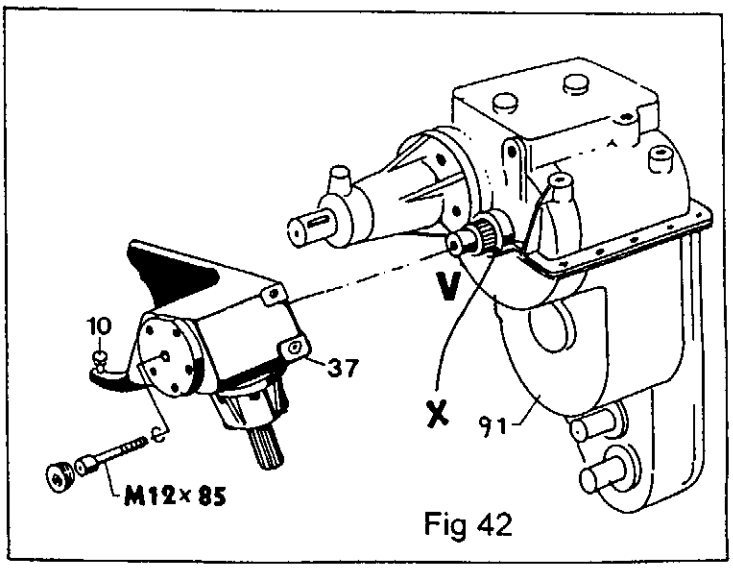


Fig 42

Attachment of header to the forage harvesters MENGELE - FERGUSON - CASE

M 4500 ME

The header is designed for the following harvesters*:

MENGELE

SF 5200 = 255 PS	SF 6000 = 330 PS	Mammut 5800 = 250 PS
SF 5500 = 280 PS	SF 6500 = 360 PS	Mammut 6300 = 320 PS
SF 5600 = 250 PS	SF 6600 = 354 PS	Mammut 6800 = 354 PS
	SF 7000 = 435 PS	Mammut 7300 = 410 PS
		Mammut 7800 = 480 PS

FERGUSON

MF 5130 = 320 PS MF 5150 = 410 PS MF 5170 = 480 PS

CASE

6900 = 374 PS 7400 = 422 PS 7800 = 480 PS

* Report available upon request (sample report of the TÜV, the German motor certifying agency)

Necessary equipment MENGELE

A The gearbox (91) must be fitted with an extended control shaft V. The shaft is necessary for the attachment of the angular drive (37). A conversion kit can be ordered from MENGELE which includes a longer shaft, a few spur wheels, a cluster gear, compression springs, as well as a replacement drive. Starting with 1995 models, the equipment is standard.

Installing drive

The angular drive (37) can be mounted only after the screws on gearbox (91) have been unscrewed and the drive has been lowered. Use a cheese head screw M12x85 to fasten the drive (37) to the junction shaft. Apply Locite to the screw. Secure drive (37) against rotation using bolt (94) and locknut.

SAE 90 oil

Drive (37) must be filled with 0.8 litre SAE 90 oil!

Note on drive (37)

Before installing drive (37), insure that a special circlip JV90x3 (inner diameter = 80.3mm) is fitted in front of bearing X on gearbox (1) (fig. 43). If a circlip JV90x3 (with noses) is installed, the connection area of the drive (37) would foul the noses of the circlip. The drive would then be distorted due to the M12x85 screw.

Recommendations

Implementing the following changes on the harvester will improve performance:

B Starting with 1997 models of the above listed Mammuts, MENGELE standard equipment includes a reinforced platform. For older machines, MENGELE will deliver a replacement platform. (Conversion kit 09-130276).

C Since 1997, MENGELE has added extension springs to improve compression on compression roller housing. (Conversion kit 09-133120).

D Since 1997, MENGELE also includes a pre-compression roller to increase safety in material handling. (Conversion kit 02-130680).

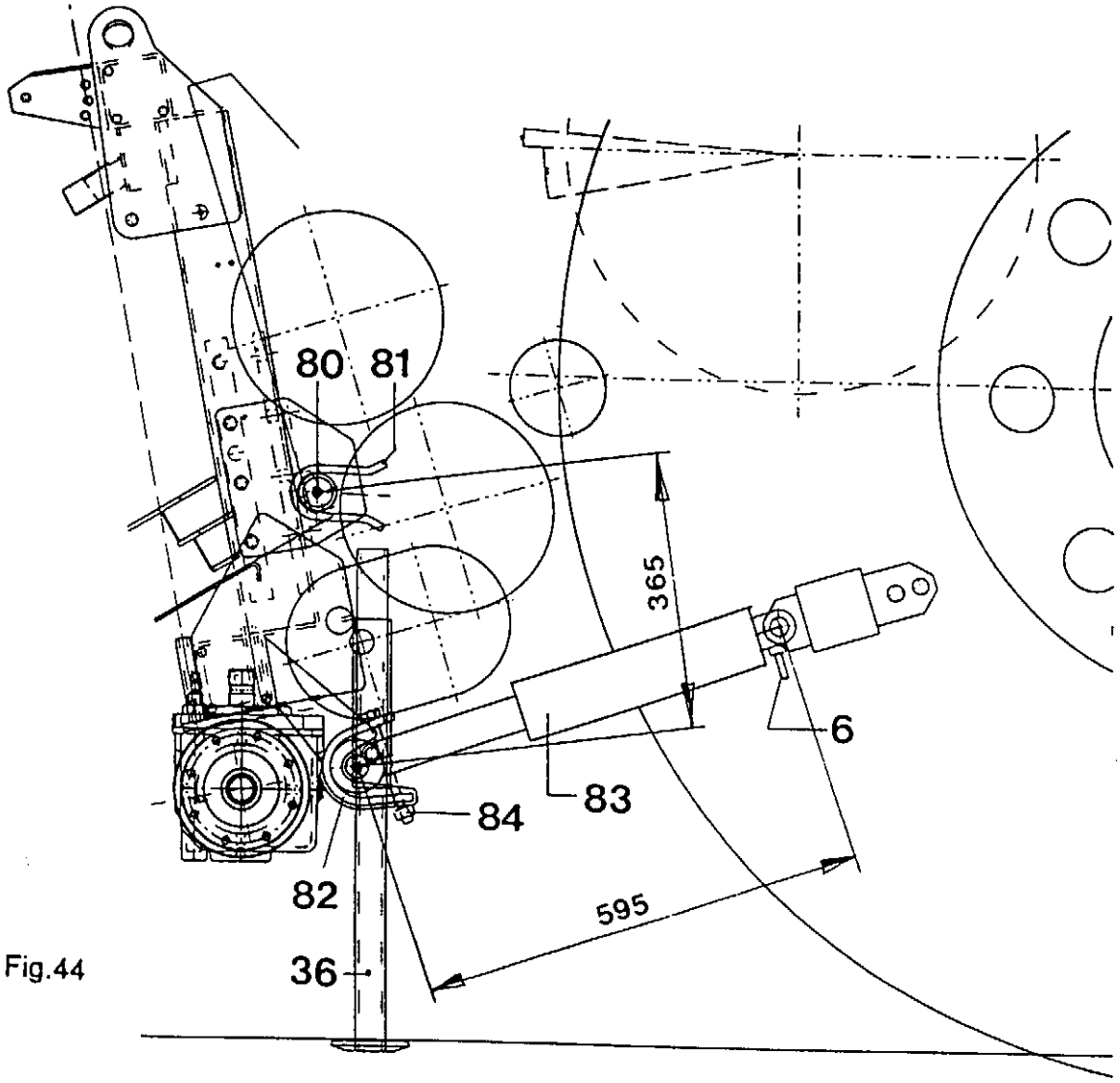
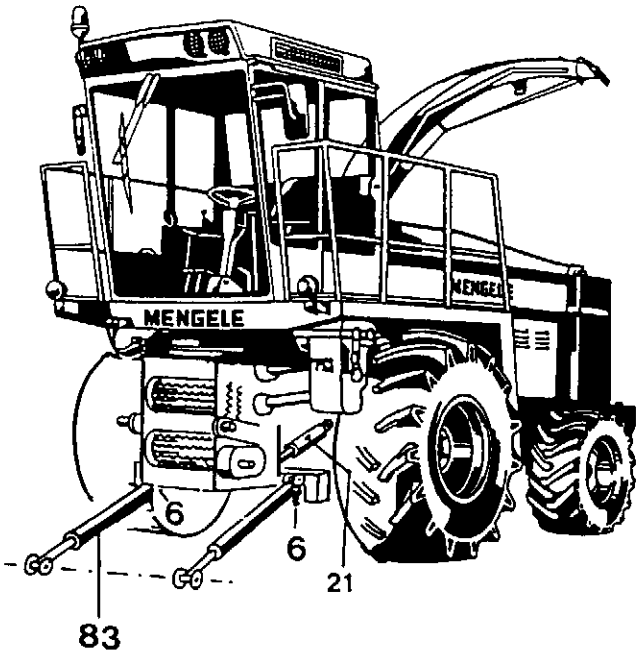


Fig.44



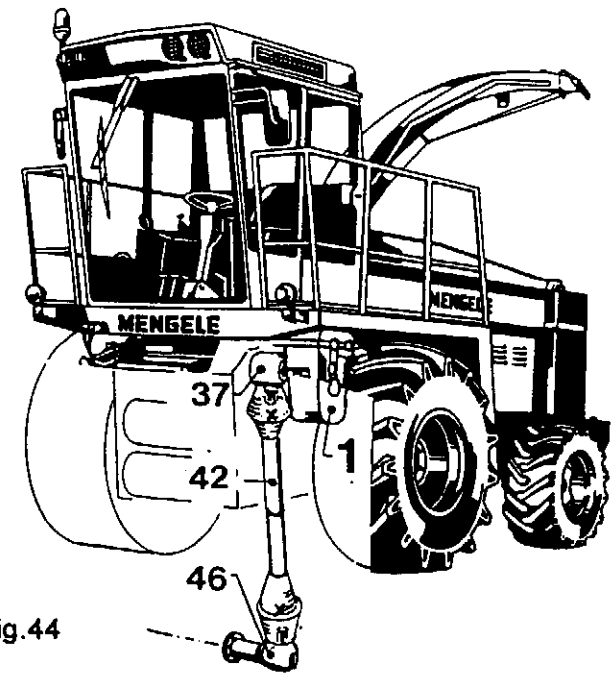


Fig.44

Prerequisites for lifting cylinder

E For the lower hitch, no longer are two support rods used.
Instead, both lifting cylinders are used (fig. 44).
This is advantageous when switching between corn and grass.

Note: The lifting cylinder must be shortened and then fitted with an extension adapter for use with grass.
(MENGELE conversion kit 09-133116 or 09-133513)

F The rear lifting cylinder (21) (fig. 44) for adjusting the height of the compression roller housing must be hung in the rear holes of the lifting bracket.

Tyre sizes

MENGELE Mammut harvesters are equipped with tyres in the following sizes:
30.5 - 32 + 24.5 - 32
28 - 26 + 23.5 - 26

Attachment

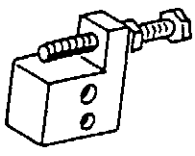
A The header is set on supports (36) in the upper position of the forage harvester. In this position, the channel width and adjustment of the feed plates (6+7) need to be checked. See Operator's Manual for necessary adjustments (p. 20, fig. 39).
B Both lifting cylinders (83) (fig. 44) are extended to 595. Using support screws (6) they are set to 365 and locked with a shut-off tap. Hereafter, both lifting cylinders (83) should again be run in hydraulically.
C The pin (80) on the compression roller housing is set to the height of the catch bracket (81) on the header, run in and secured with a key.
D The header is lightly lifted until the supports are free of load. Supports are taken up for transport and secured.
E Hereafter both lifting cylinders (83) can again be extended or, using a shut-off tap, locked.

Catch brackets

Each catch bracket (81) (fig. 44) is fastened with 6 bolts M 16x40, washers and spring lock washers. These bolts have to be pulled up to 210 Nm torque. Insert bolts with Locite 243 and regularly check them for proper fit, especially at the start of each field use.

Ground contact

Depending on the tyres of the forage harvester, it may happen that the header cannot be lowered sufficiently over the compression roller housing. The tilting angle is limited by pins located behind the housing. Remove these pins to obtain a better ground contact.



Rotational speed table 45 W with angular drive
MENGELE SF, Mammut 6300 – 7800 M 4500 ME

Blade rotor = 900 rpm

MENGELE		KEMPER						
Gear	rpm	Gear	rpm	cutting length			Drum rpm	
K	434	-	395	5	8	12,5	20	▼▼
L	571	-	519	6,5	10	16	26	▽

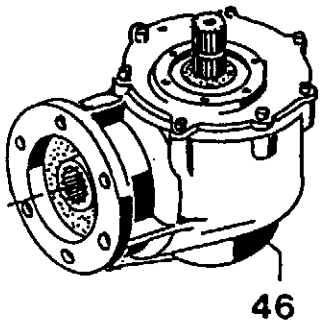


Table
Fig. 45 A – W

Rotational speed table 45 W with angular drive
MENGELE SF, Mammut 6300 – 78100 M 4500 ME

Blade rotor = 1000 rpm

MENGELE		KEMPER						
Gear	rpm	Gear	rpm	cutting length			Drum rpm	
K	472		429	5	8	12,5	21	▼▼
L	620		563	6,5	10	16	28	▽

Table
Fig. 45 B – W

Rotational speed table 45 A – S with gearbox
MENGELE SF, Mammut 6300 – 6800 M 4500 ME

Blade rotor = 900 rpm

MENGELE		KEMPER						
Gear	rpm	Gear	rpm	cutting length			Drum rpm	
K	434	1	395	5	8	12,5	20	▼▼
K	434	2	313	5	8	12,5	16	▼
L	571	1	519	6,5	10	16	26	▽
L	571	2	412	6,5	10	16	20	▼▼

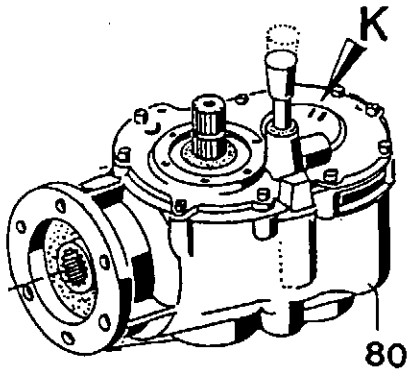


Table
Fig. 45 A – S

Rotational speed table 45 B - S with gearbox
MENGELE, Mammut 7300 – 7800 M 4500 ME
from '97 = Mammut 6300 – 6800

Blade rotor = 1000 rpm

MENGELE		KEMPER						
Gear	rpm	Gear	rpm	cutting length			Drum rpm	
K	472	1	429	5	8	12,5	21	▼▼
K	472	2	340	5	8	12,5	17	▼
L	620	1	563	6,5	10	16	28	▽
L	620	2	448	6,5	10	16	22	▼

Table
Fig. 45 B – S

Drive

MENGELE, CASE or FERGUSON forage harvesters have different drives. (434-571 rpm, 472-620 rpm). Header speed is dependent on the chosen gear on the harvester.

Gears K, L, R

K = short (slow) L = long (fast) R = reverse

Angular drive (46)

The standard header M 4500 ME is equipped with an angular drive (46). The main drive speed of the header is consequently reduced by approximately 10%. Using gear K, the optimal rotation speed for the gathering drum can be achieved (20-21 rpm) for forage lengths of 5, 8 and 12.5 (see Table 45 A-W and 45 B-W).

Gearbox (80)

So that all cutting lengths can be used optimally, it is recommended to use a gearbox (80. It is also possible to retrofit older header models (see technical information 3003). When installing, pay attention to the fitting position on the shaft (measures 59.5) (fig. 41, item 44).
About the advantages of using a gearbox, see Table 45 A-S and 45 B-S.

A Both standard cutting lengths 5-8-12.5 and 6.5-10-16 can be used in corn with an optimal gathering drum turning range of 20-22 rpm. Use gear combination K-1 or L-2.
B Using with WPS and with low corn, we recommend an increased gathering drum speed of approx. 25-28 rpm. Use the gear combination L-1.
C With lodged maize, all gear combinations may be used with a gathering drum rotation speed of 17-22 rpm.

For all cutting lengths, operations are optimised with the gearbox. This applies to short or long corn, light crops, lodged maize, as well as WPS.

WPS

Generally, the faster gear 2 is used here. In order to optimise the cutting process, the speed of the cutting blades must be higher.

Checking gathering drum rotation speed

The most accurate method is to make a chalk mark on the large gathering drum and count the rotations per minute.

Table

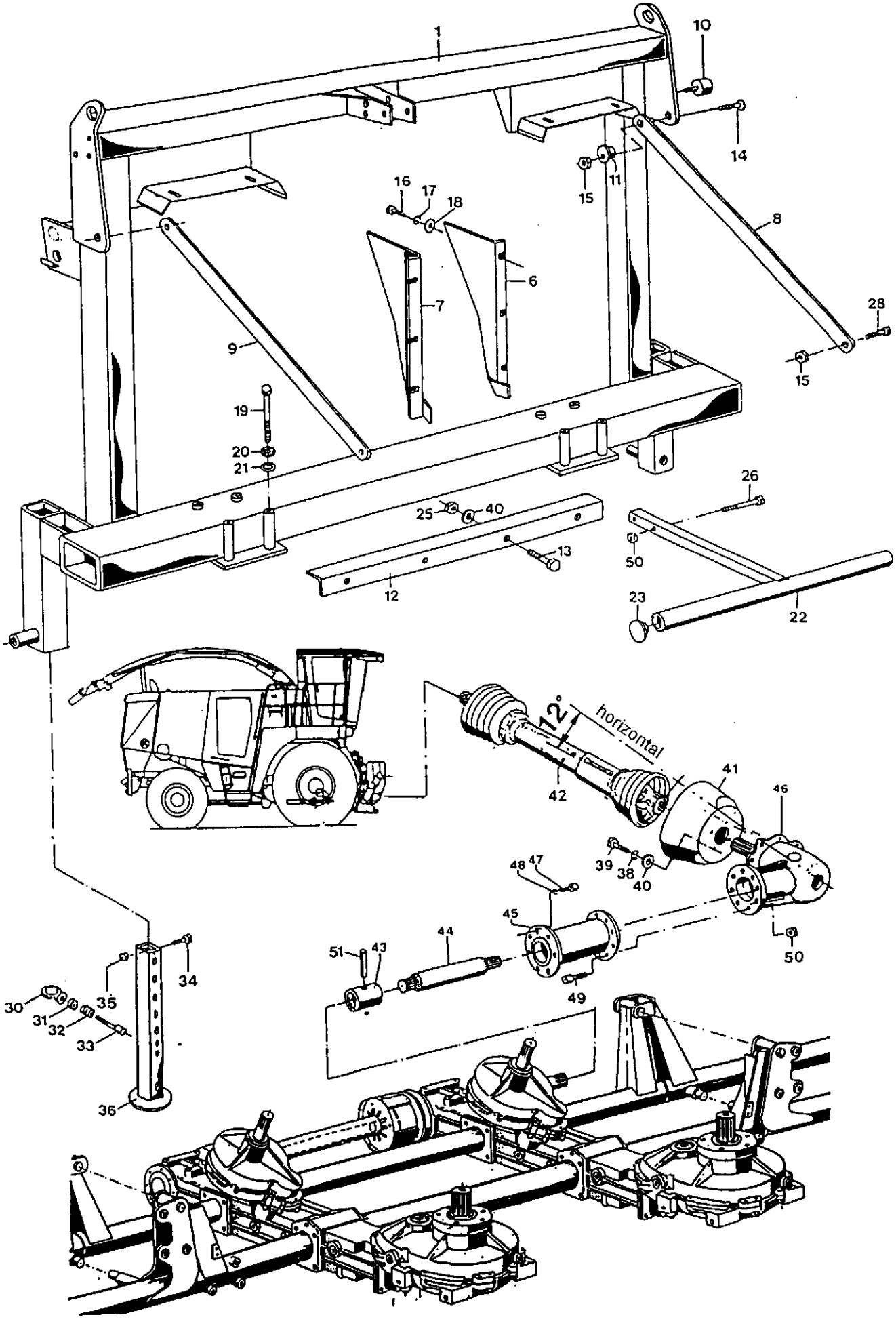
▼ = rough-stemmed crop (corn, etc.)

▽ = WPS (whole plant silage)

▽ = lodged maize

Cutting lengths

The indicated values concerning the choice of gear and the feed rate are only suggestions. Depending on the power of the motor, crop density, and the driving speed, it may be sensible to adjust the feed rate.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Attachment of header to the forage harvester CASE IH, type Mammut 8790

M 4500 CA

The header is designed for the following harvester, with respect to hitch points as well as drive:
MAMMUT = 8790 = 544 PS*
* Report available upon request (sample report of the TÜV, the German motor certifying agency)

CASE cutting lengths

The hydraulic feed roller drive on the CASE 8790 enables an infinitely variable cutting length adjustment.

Main Drive

The main drive is effected by a PTO shaft located on the left side of the gearbox with drive gears 1 = 430 rpm and 2 = 560 rpm.

Note on two-level forage length

1st gear, 430 rpm, corn
This gear is designed for normal operation in rough-stem crops such as corn, sunflowers, beans, etc.

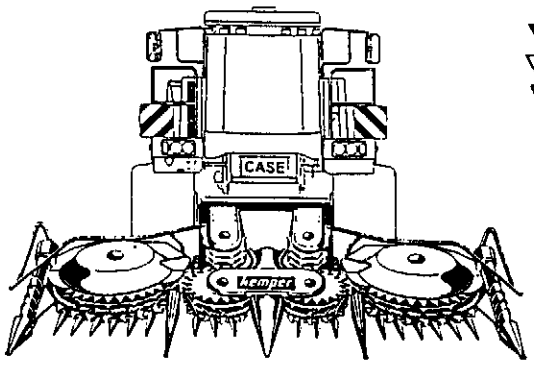
2nd gear, 560 rpm, WPS
The higher rotation speed is necessary for whole plant silage (WPS) because it is important to increase the cutting blade speed when harvesting thin-stemmed crops.

Attachment

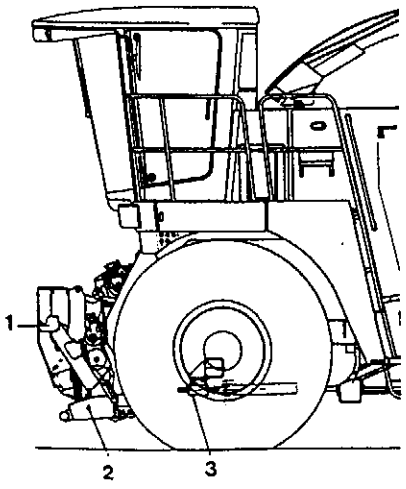
A The header is built onto the pendular framed lifting device and secured.

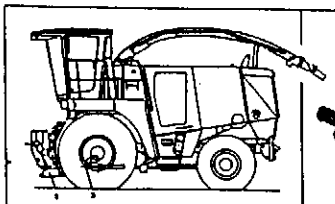
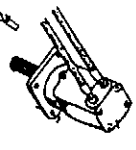
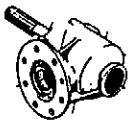
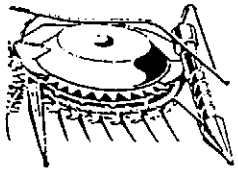
Cutting lengths

The indicated values concerning the choice of gear and the feed rate are only suggestions. Depending on the power of the motor, crop density, and the driving speed, it may be sensible to adjust the feed rate.



▼ = rough-stemmed crop (corn, etc.)
▽ = WPS (whole plant silage)
⩢ = lodged maize



 CASE		 CASE	 Kemper	 Kemper	
Gear	rpm	cutting lengths	angular drive	Drum rpm	
1	430	infinitely variable	1 : 1	20–22	▼ ⩢
2	560	infinitely variable	1 : 1	22–27	▽

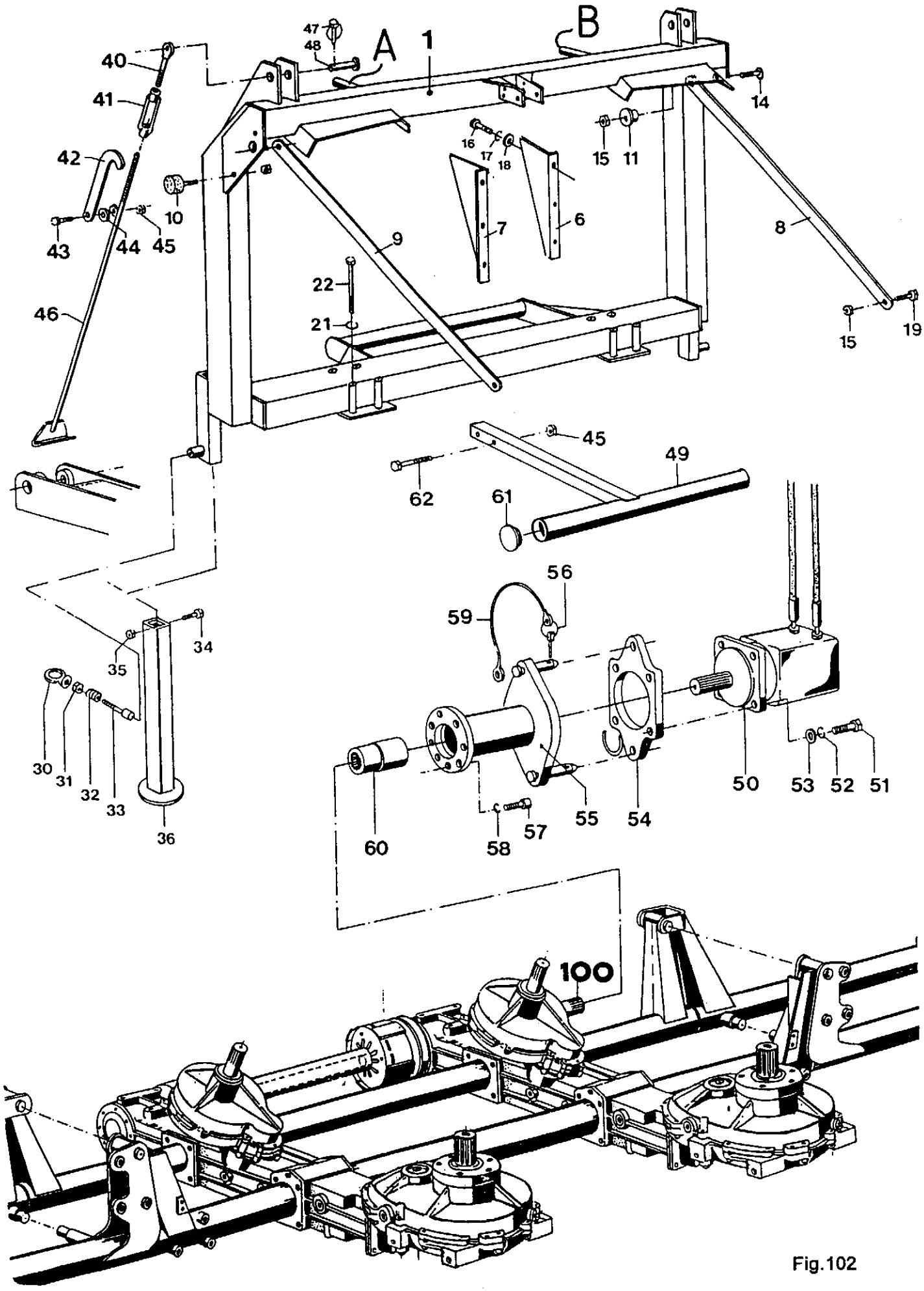

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Fig.102

Attachment to HESSTON

M 4500 HE

The hitch points and the drive system of this header are designed to match the following HESSTON forage harvesters:

7715 = 250 HP 7720 = 300 HP 7725 = 345 HP

Modification to the HESSTON forage harvester

Before attaching the Champion header M 4500 to selfpropelled HESSTON forage harvester, the following modifications must be performed on the forage harvester:
Shorten both slide rails on the precompression roller unit by 150 mm.
Weld an end plate onto the front side (see fig. 105).
Shorten both arms 20 of the lifting arms is required for other front attachments, we suggest to use bolt-on arm extensions as shown in fig. 106 and 107:
Cut of a 2" section (= 50 mm) from the lower part of the U-section as shown in fig. 107 and reinforce this area by installing a 0,5" (12 mm) thixck plate (21). The 0,6" (16 mm) plate (22) must foul the top and bottom part of the U-section.

Oil motor drive

The output of the standard oil motor OMT 160 i not sufficient. to obtain the required output you can:

A: install a new OMT 250 oil motor (Danfoss P.N. 151 B 3008)

B: modify the OMT 160 motor so as to obtain the OMT 250 version. the modification can be performed by Danfoss (Offenbach/Main/Germany) or by one of their franchised dealers.

Attachment to a HESSTON forage harvester

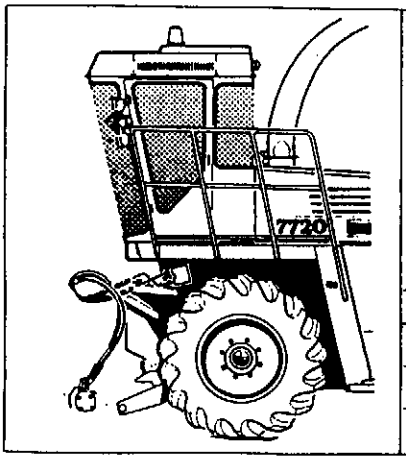
Approach the HESSTON forage harvester to the header supported by its prop stads. Install and secure the OMT 250 oil motor. Drive the forage harvester up to the header until the pins of the header fully engage into mounting brackets of the forage harvester (see fig. 103).
Using the top connecting rods approach the header to the forage harvester until the limit stops A and B foul the roller housing of the forage harvester without any play.

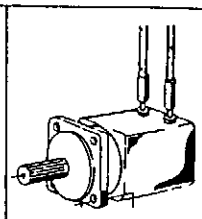
▼ = Thick stemmed crops (corn etc.)

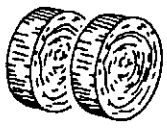
▽ = Whole crop silage

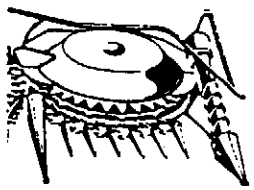
▼▽ = Down crops

Fig.116









rpm	cutting length	KEMPER rpm	
	-	-	-
~ 400	infinitely	20	▼▽
~ 500	infinitely	25	▽

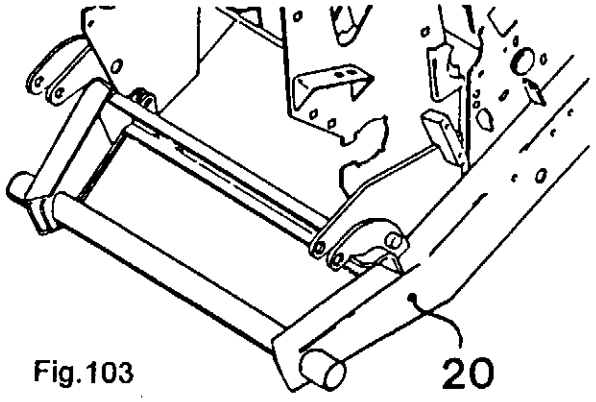


Fig.103

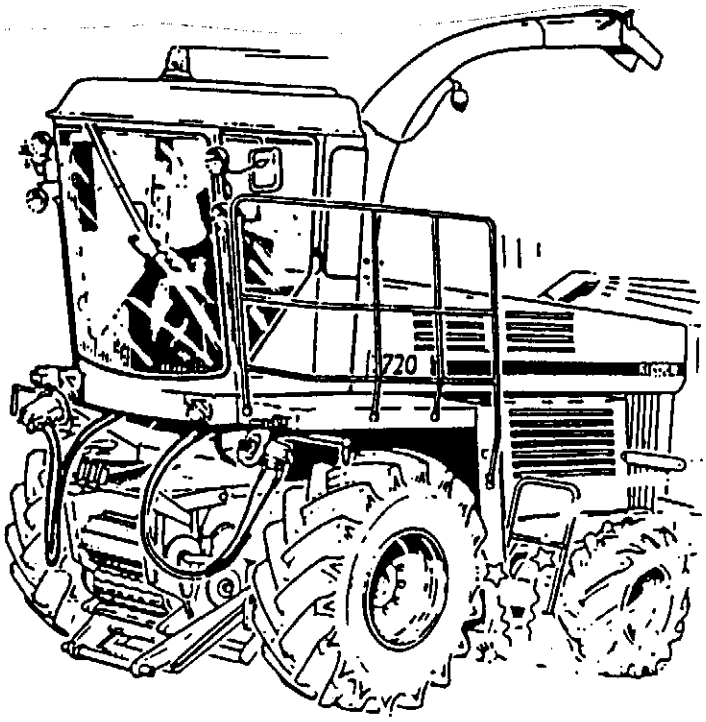


Fig.104

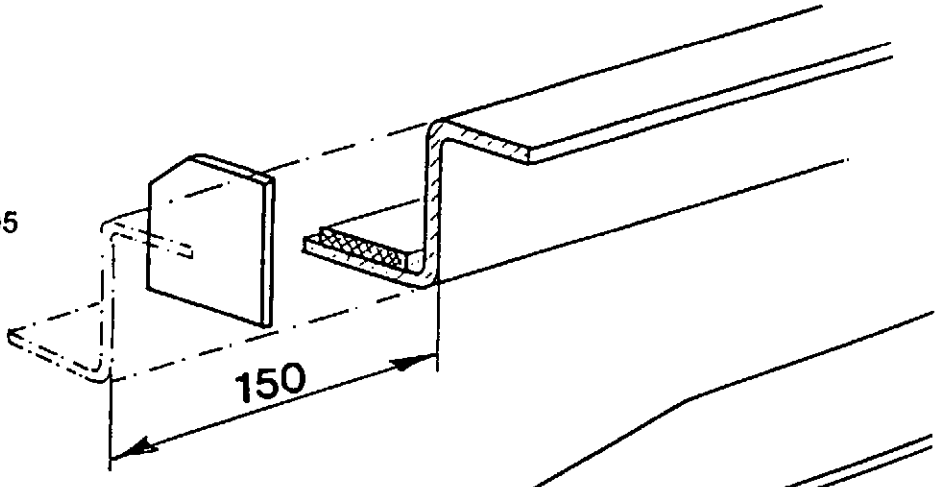


Fig.105

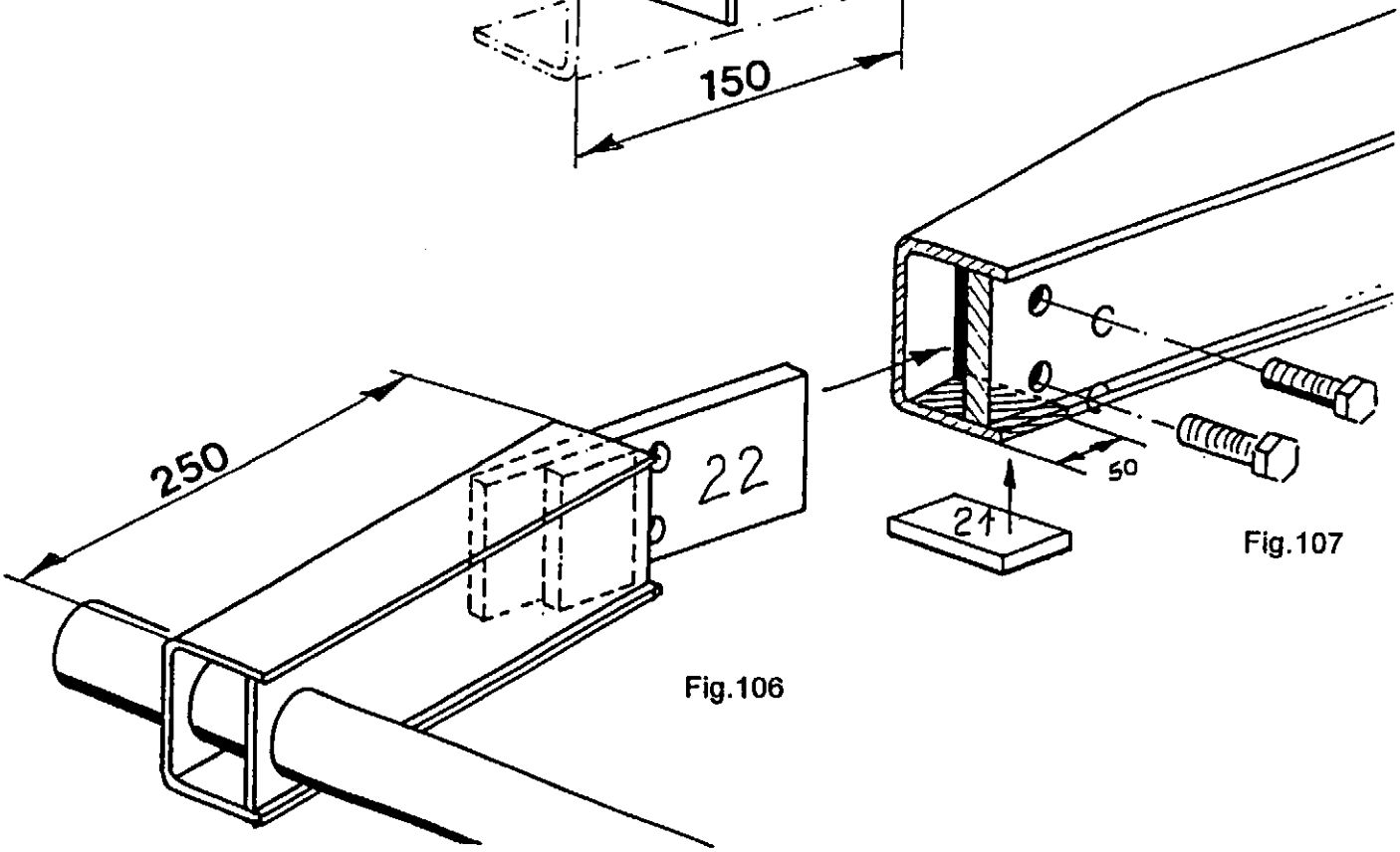


Fig.106

Fig.107

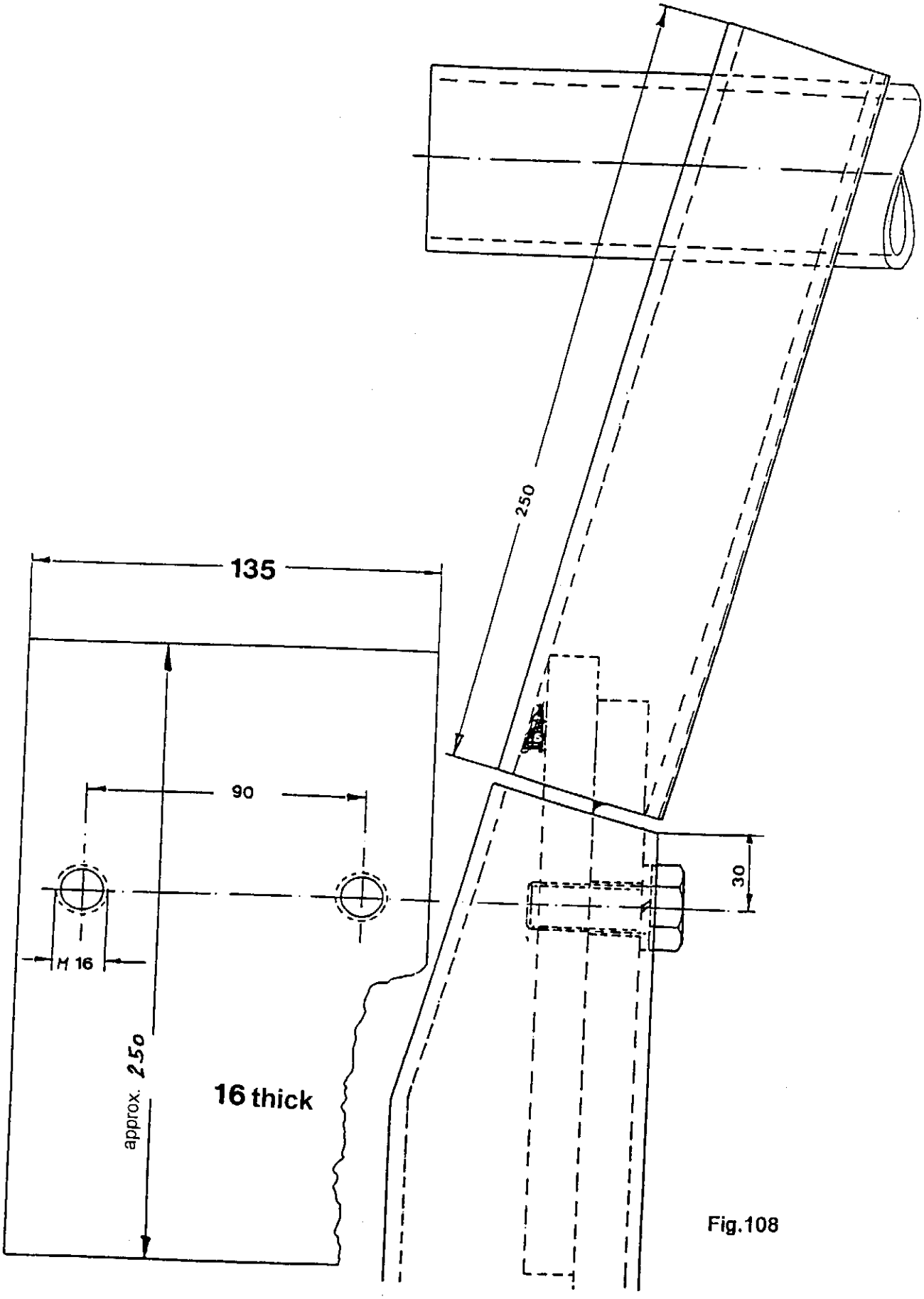
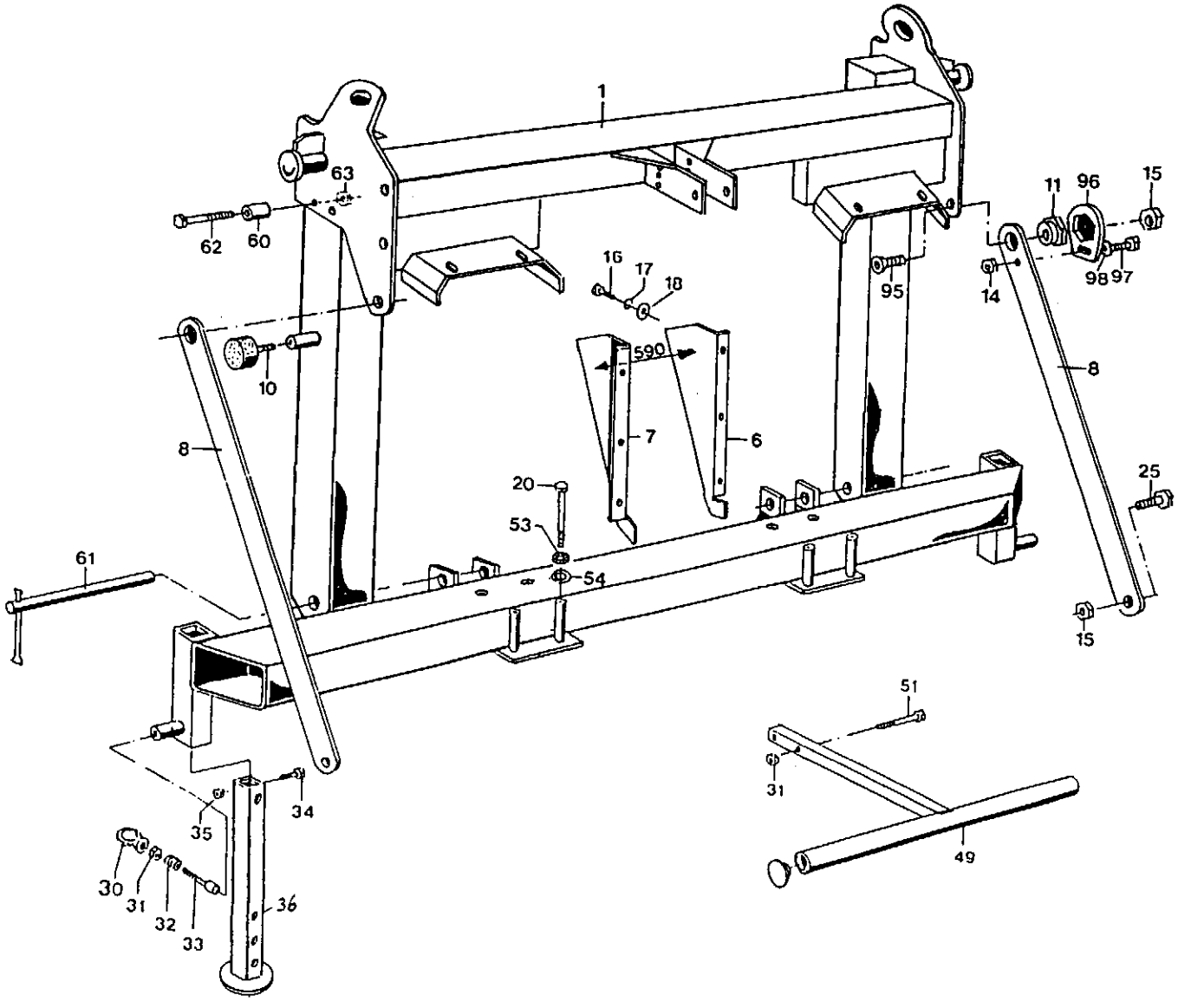


Fig.108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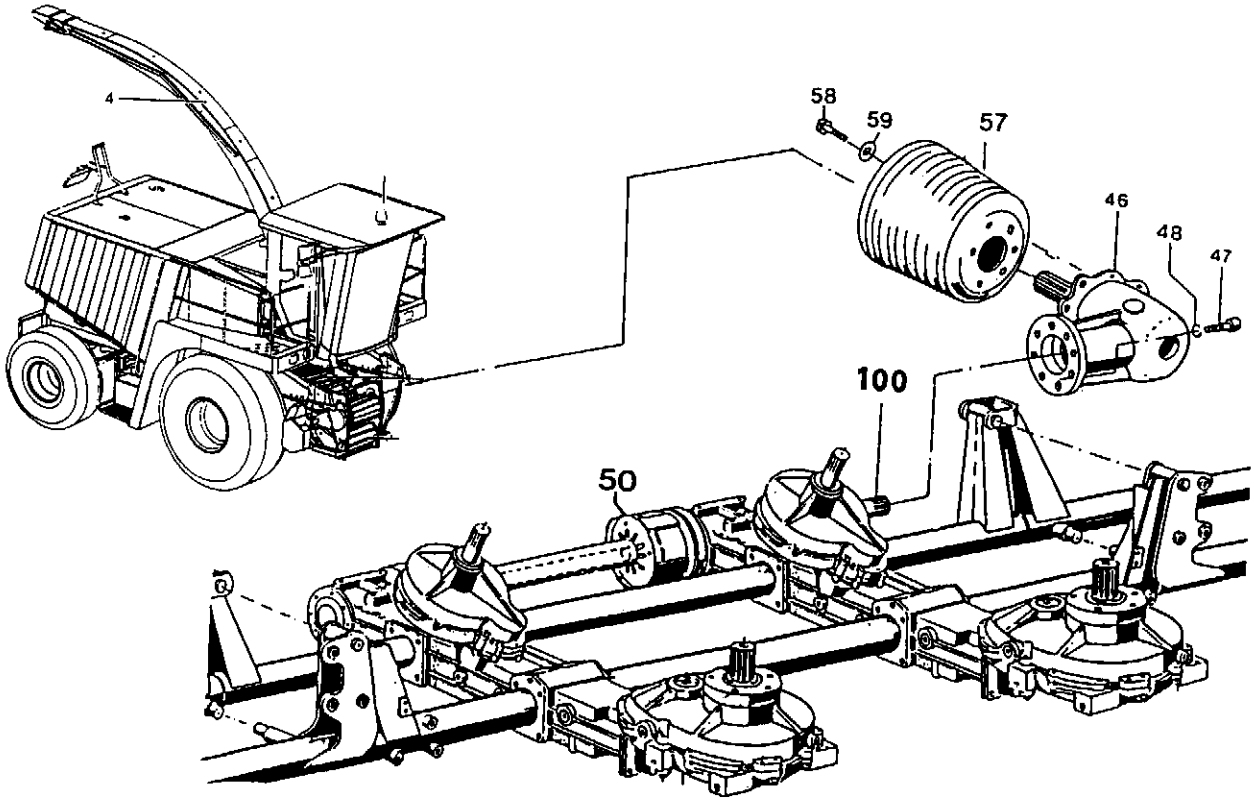
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Attachment of header to the forage harvester DEUTZ-FAHR "Giant 400"

M 4500 DF

The header is designed for the following DEUTZ-FAHR harvester, with respect to hitch points as well as drive:
Giant 400 = 408 PS*
* Report available upon request (sample report of the TÜV, the German motor certifying agency)

Channel width

DF headers have an adjusted channel width of 590 mm. When test-lifting, a check of the adjustment of the feed plates (6+7) must be made. For necessary adjustments, see page 21 (fig. 39).

Attachment

The header is attached to the housing of the compression rollers. It sits on supports and the Giant is pushed slowly into it. The upper catch arm is locked down with the insertion pins (item 61).

Oil motor drive

The drive is effected by a hydraulic motor and a PTO shaft to angular drive (item 46). The angular drive has a transmission ratio of 1 : 1. Motor speeds are adjustable between 320 rpm, 400 rpm and 500 rpm. During a test run, inspect the rotational direction of the hydraulic motor. The direction can be changed from the cab.

Drive speed (corn)

Regardless of the drive speed ratio, it is important when cutting rough-stem crops under normal conditions that the bottom PTO stub shaft (100) turns at approximately 400 rpm. This correlates to 20 rpm on the large gathering drums. To check the rotation speed of the large gathering drum, make a chalk mark on the drum and count the rotations per minute.

Drive speed (WPS)

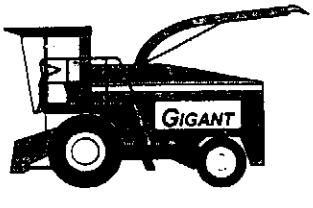
Depending on the nature of the crop during a WPS harvest, it may be necessary to increase the speed of the cutting blades, especially with thin-stemmed crops. We recommend a hydraulic motor speed of 500 rpm. This corresponds to a gathering drum rotation speed of 25 rpm.

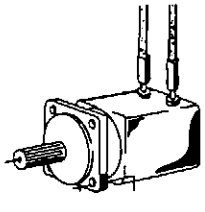
Starting torque

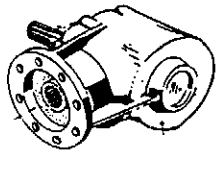
Check the bolts (62+95) (item 20) regularly for proper fit.
Starting torque in Nm:
M 12 = 95 Nm M 16 = 235 Nm M 20 = 475 Nm

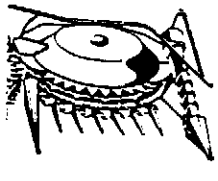
▼ = rough-stemmed crop (corn, etc.)
▽ = WPS (whole plant silage)
▼▽ = lodged maize

Fig.115









Gigant 400		Gigant 400	KEMPER	KEMPER	
Gear	rpm	cutting lengths	angular drive	Drum rpm	
1	320	-	-	-	-
2	400	Infinitely variable	1 : 1	20	▼▼▽
3	500	Infinitely variable	1 : 1	25	▽

Fig.46

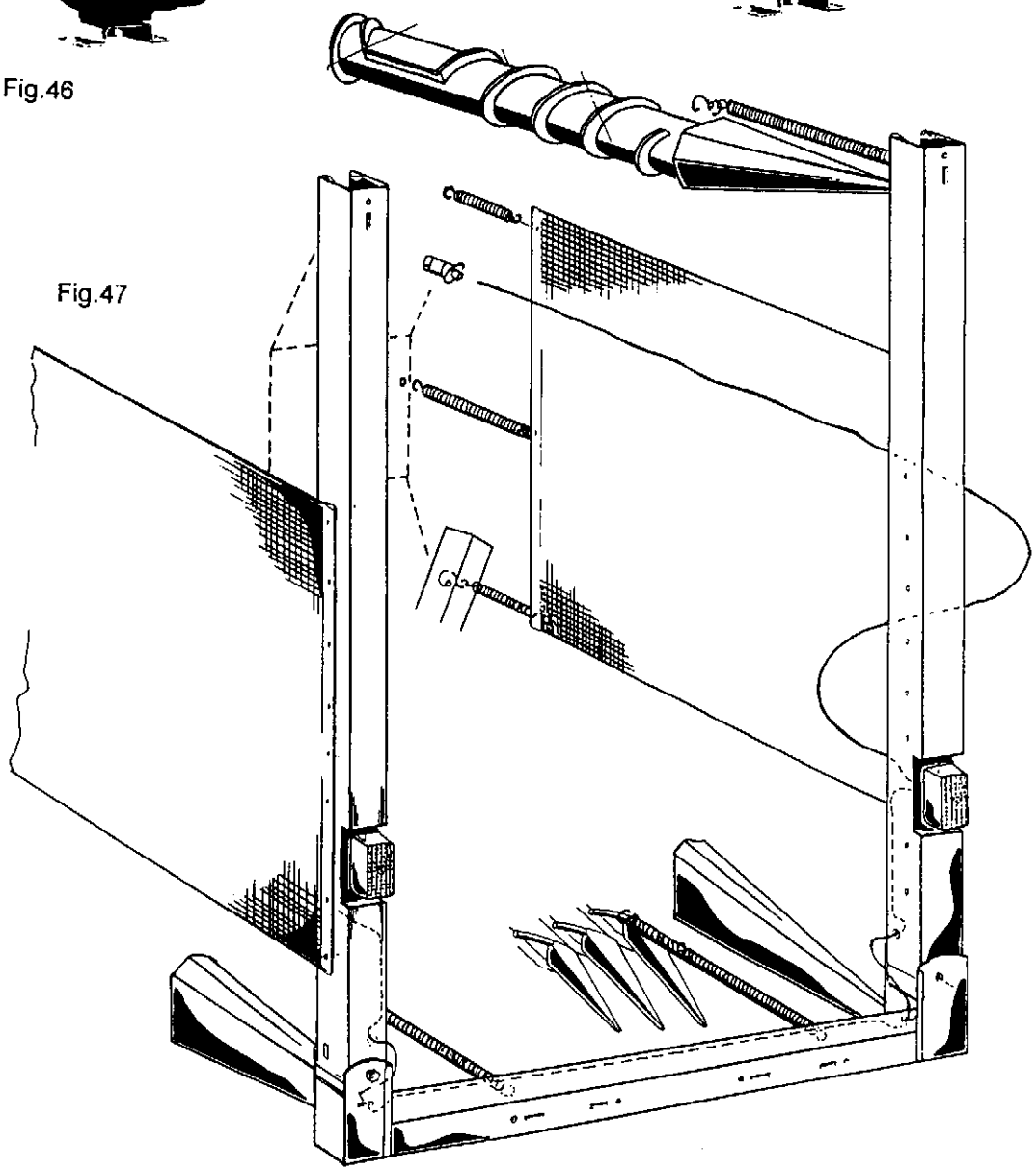


Fig.47

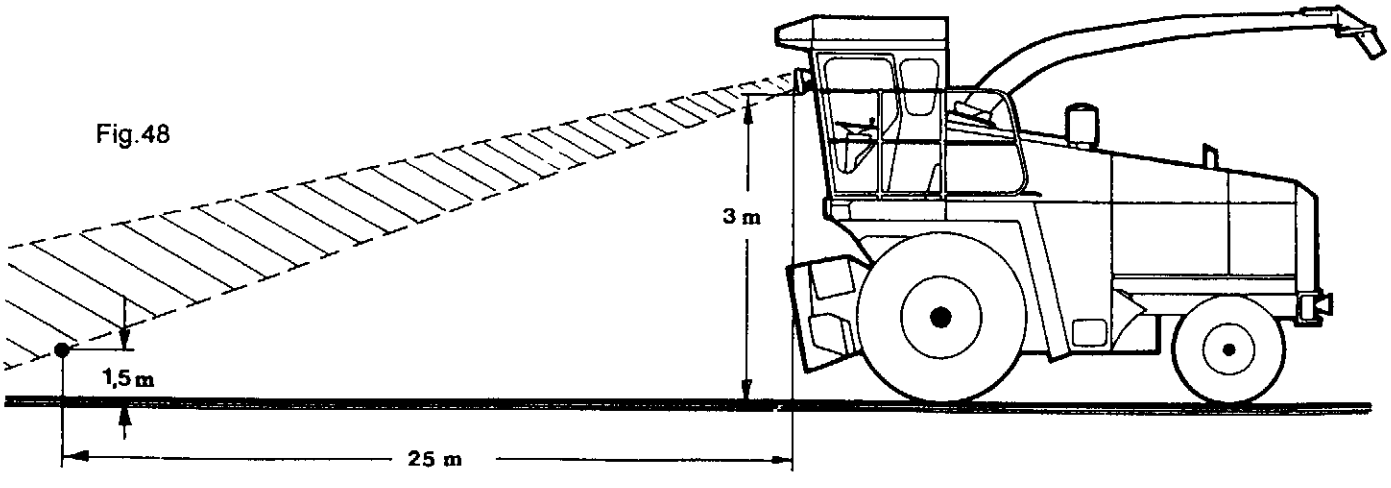


Fig.48

Transport on public roads

Steering capability

Ballast weights must be installed on the front axle of the carrier vehicle to ensure sufficient steering capability. Observe the permissible axle loads.

Divider PointsGuards Fig. 47

Before travelling on public roads, the divider points must be covered with the foldable guard. Also use the guard cloths to cover the skids, the rotary cutters and other sharp edges.

Sequence of installation

A Wait for the rotors to be at a complete stop before folding them up.
B Install the foldable guard at the centeer and the hook in the springs.
C Fold up lateral guards and secure using the springs.
D Use these guard cloths to cover skids, blades and sharp edges.

Ground clearance

Before any road transport, raise the header until the front guard is approx. 300 mm above the roadway.

Transport safety equipment

Before traveling on public roads, install the safety rope to secure the outer drum units against unintentional lowering.

Side lights and direction indicators

Since the raised gathering drums cover in most cases the side lights and direction indicators of the forage harvester, we have fitted an additional set of side lights/direction indicators to the guard. For power supply a 7-pole socket must be installed on the right-hand side of the forage harvester.

Headlights Fig. 46 Fig. 48

The illumination of the roadway is generally affected by the raised gathering drums. It is therefore necessary to install an additional set of headlights on the forage harvester (note: do not confuse the headlights with the work lights).
The Testing Agengies suggest:
"Additional type approved headlights (e.g. Hella type 1 AB 004231-001, type approval HR HC/R E1 02 24461 R20) fitted with two separate switches, for standard lighting without cutter or with standard cutter, and for standard lighting plus additional headlights for journeys with Kemper header.
The headlight supports should be attached on both sides of the vertical pillars on the cab. The distance between the bottom edge of the headlights and the roadway should be approx. 3000 mm."

Special authorization

Follow the regulations in force in your country.

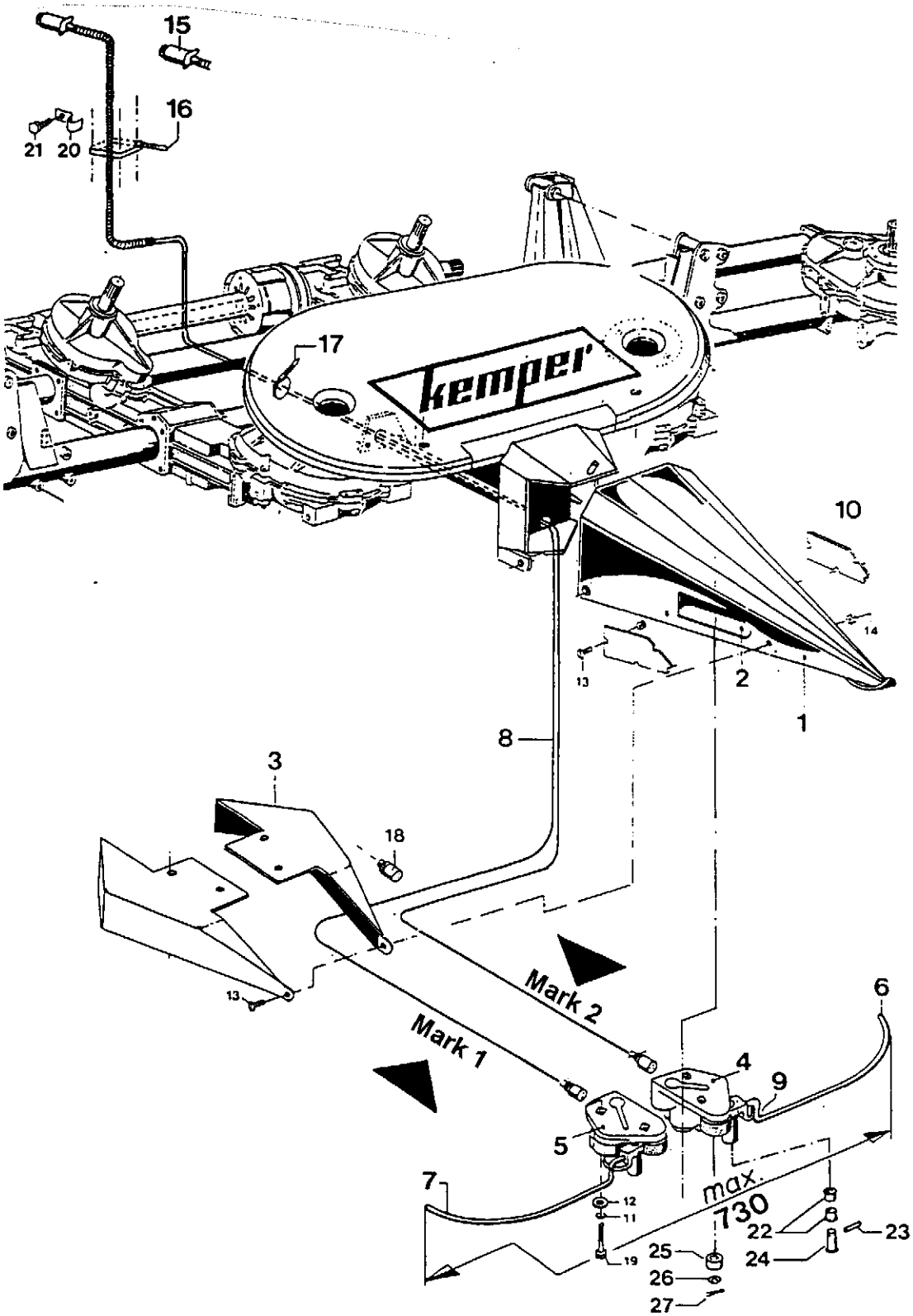
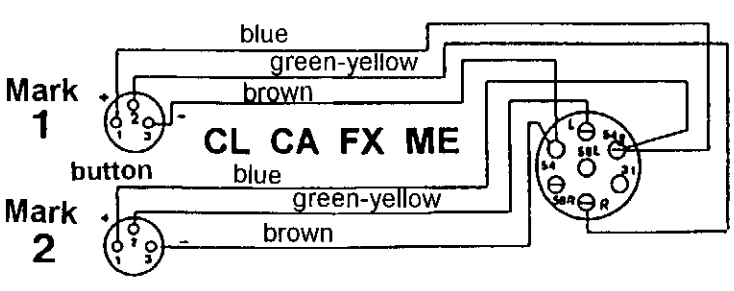


Fig.49

Fig.49A



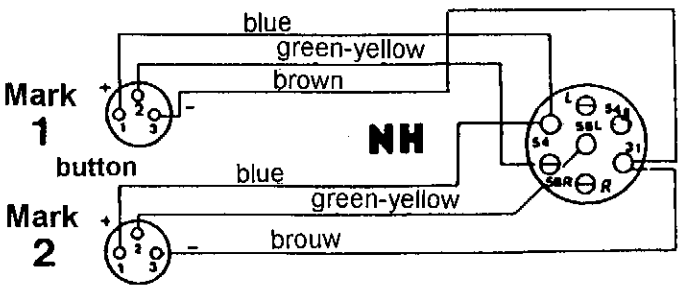


Fig.49C

Automatic steering mechanisam for the M 4500

Automatic steering mechanism

Steering a self-propelled forage harvester requires up to 90% of the operator's attention. The capacity of the machine can therefore only be utilized to the full if an automatic steering mechanism is provided.

Standard equipment of the basic machine

On the basic machine provision is made as standard for the installation of a feeler system:
The central divider point (1) is fitted with a cross strut for the attachment of the feelers. The two apertures (2) of the divider point are fitted with covers which can be unscrewed. The guide plates (3) & hadware are supplied as standard as loose accessory.

Specification of the „Autopilot" as optional equipment

Both sensing systems 4 and 5 have to be fitted to the central divider point 1. The feeler bars 6 and 7 are bent in such a way that they cover a range of 730 mm.
The measurement 730mm applies to a row spaching of 800 mm.
Important: There must be sufficient clearance between the bars and the plants. If the machine is to be used for other row spacings, the 730 mm measurement has to be adapted accordingly.
The extent of supply includes cable 8 which connects both sensing systems to the forage harvester, as well as the necessary hardware for installing the assembly.

After market supply

Retro-fitting the system to the 122 series machines (1994) is very simple.
Extent of supply: 2 feeler systems
1 cable with plug
+ securing parts
fitting instructions (=info 2608)
Order No. 67243
Please note that the type of cennection depends on the forage harvester type. Observe the wiring diagram.

Installation of a second feeler system

When installing a second had feeler system, observe the sensing range of the feelers (730 mm) and use the guide plates (3) supplied with the machine. The second hand feeler system should be of the CLAAS type.
Note: To obtain the sensing range of 730mm you sould only bend the feelers (6) and (7) in the area (9).

Please note: Follow the right connection to the forage harvester!
(Fig. 49A, 49B, 49C)

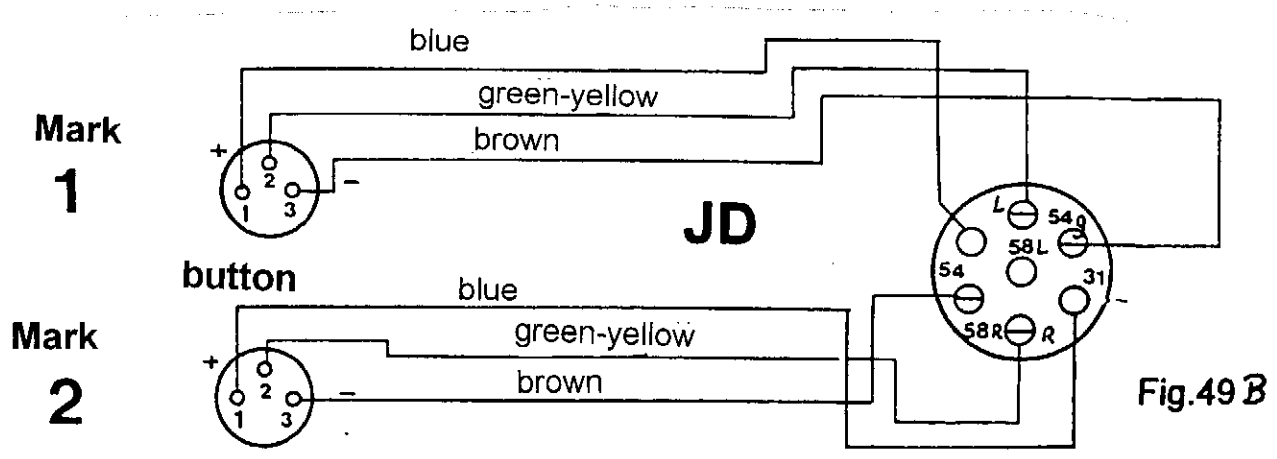


Fig.49 B

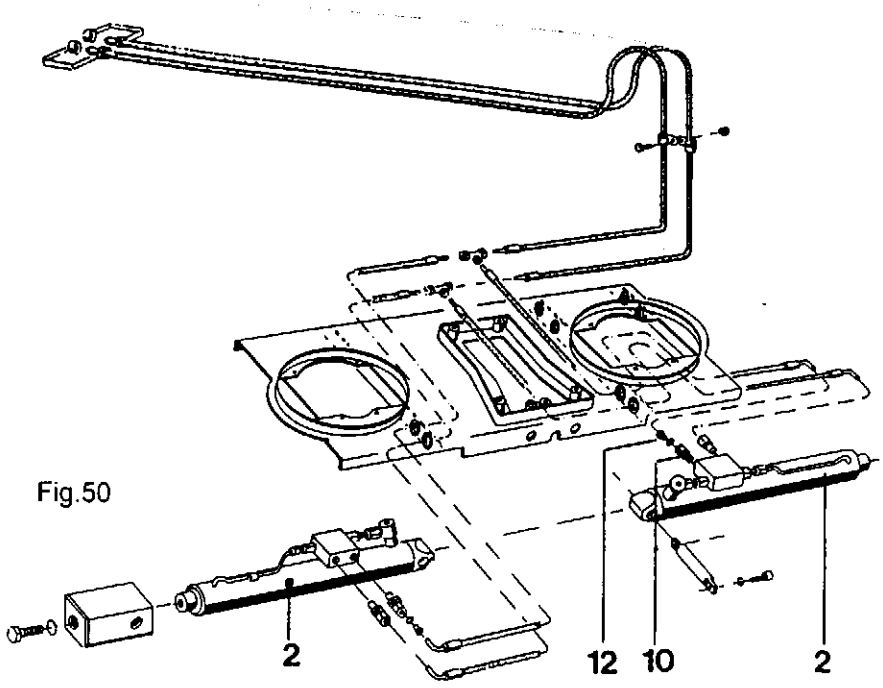


Fig.50

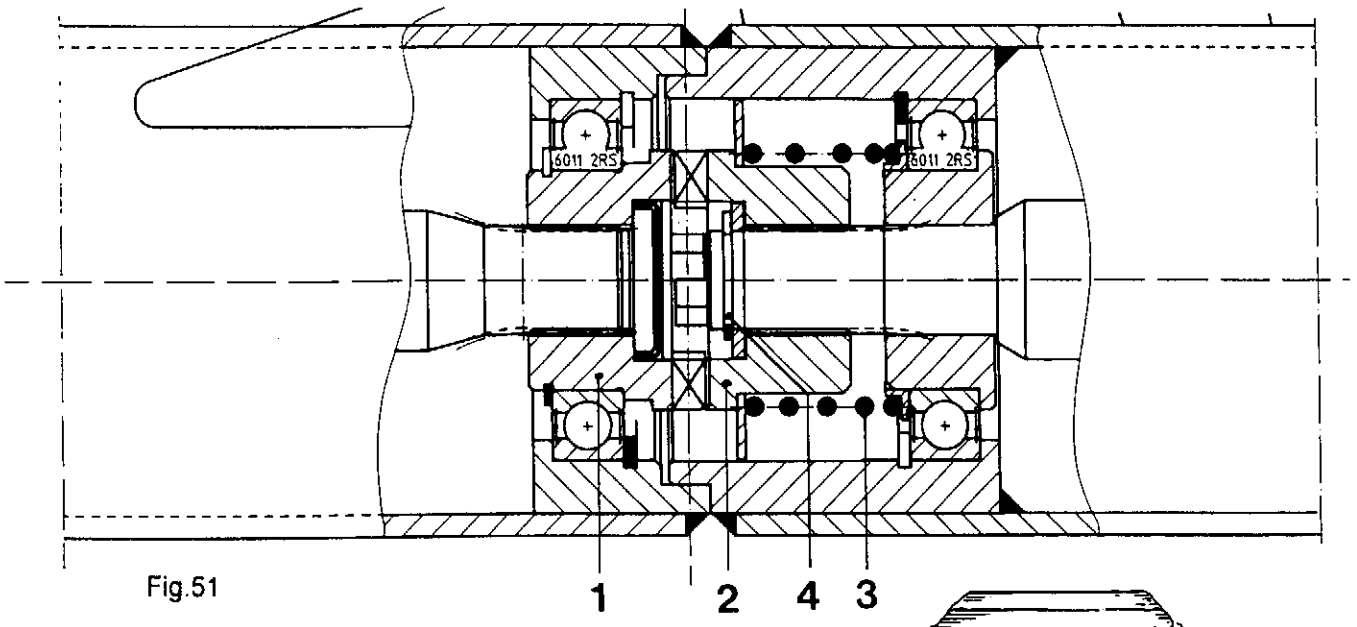


Fig.51

Fig.52

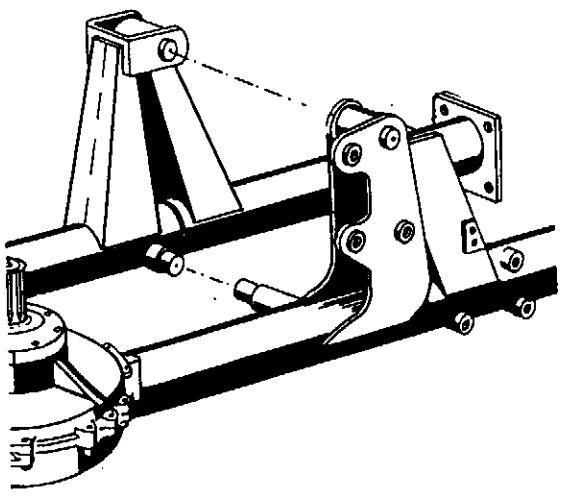
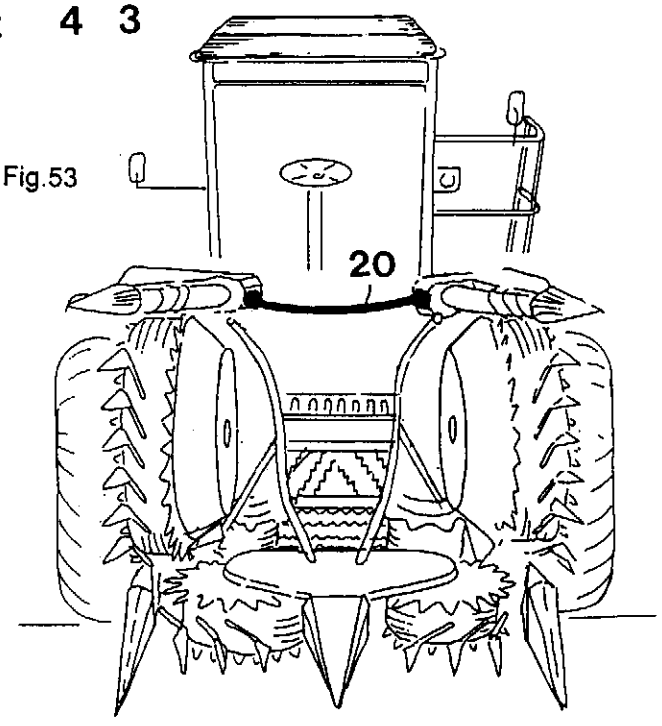
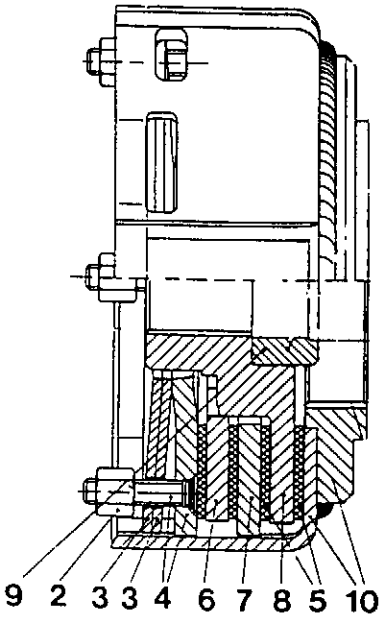


Fig.53





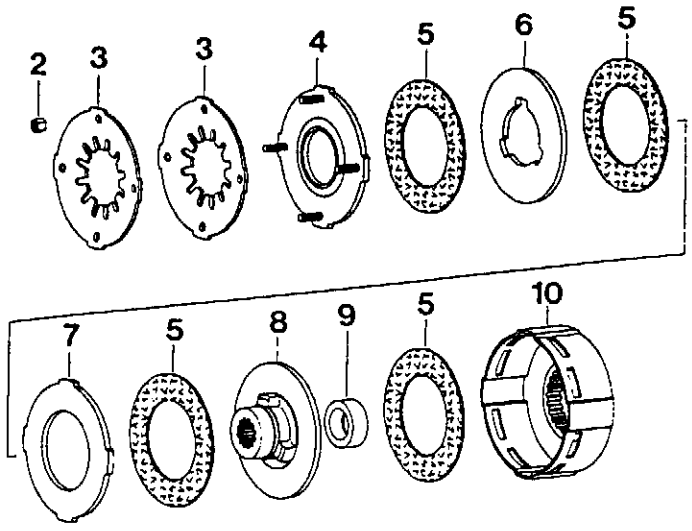


Fig.55

Fig.56

Pos.-Nr. / Item / Repère	Bestell-Nr. (kemper)		Stückzahl / Quantity / Quantité	Technische Angaben / Technical data / Données techniques	Benennung	Description	Désignation
1	66024	56.285.16	1	EK92/4-1 3/8" (21)-ZNP80x2(38); M= 700 Nm	Reibkupplung; drehsinnunabhängig	Friction clutch; independent of direction of rotation	Limiteur a friction; independant du sens de r- rotation
2	64093	60.51.09	4	M8	Sechskantmutter	Hexagon nut	Ecrou hexagonal
3	67184	66.16.01	2	152x63x2,6 2 = grün	Tellerfeder; grün 2x	Belleville spring; green 2x	Ressort Belleville; vert. 2x
4	59860	56.66.19	1		Druckscheibe	Thrust plate	Disque de pression
5	57911	56.73.08	4	91x150x3	Reibscheibe	Friction disk	Disque de friction
6	13503	56.67.01	1	151,5x68/85,2x7	Mitnahmescheibe	Drive plate	Disque d'entraînement
7	13504	56.66.02	1	160,7x90x7	Mitnahmescheibe	Drive plate	Disque d'entraînement
8	65893	56.64.226	1	K92/4-1 3/8" (21)	Nabe	Hub	Moyeu
9	65894	16.50.512	1	35,5x52,98x20	Ring	Ring	Bague
10	65895	56.65.122	1	EK92/4-ZNP80x2(38)	Kupplungsgehäuse	Clutch housing	Boitier

(D) **VOR INBETRIEBNAHME:**
Hinweise in der Betriebsanleitung zur Reibkupplung im Hauptantrieb beachten!

(F) **AVANT MISE EN SERVICE:**
Faites l'attention aux indications de mode d'emploi concernant l'embrayage à friction de l'entrainement central!

(GB) **BEFORE START-UP:**
Follow instructions of operator's manual concerning the friction clutch of main drive!

(NL) **VOOR HET IN BEDRIJF NEMEN:**
Aanwijzingen in het bedrijfsvoorschrift naar slipkoppeling in de hoofdaandrijving in acht houden!

(I) **PER LA MESSA IN FUNZIONE:**
Procedere come descritto nel manuale di istruzioni con particolare riguardo alle frizioni di sicurezza!

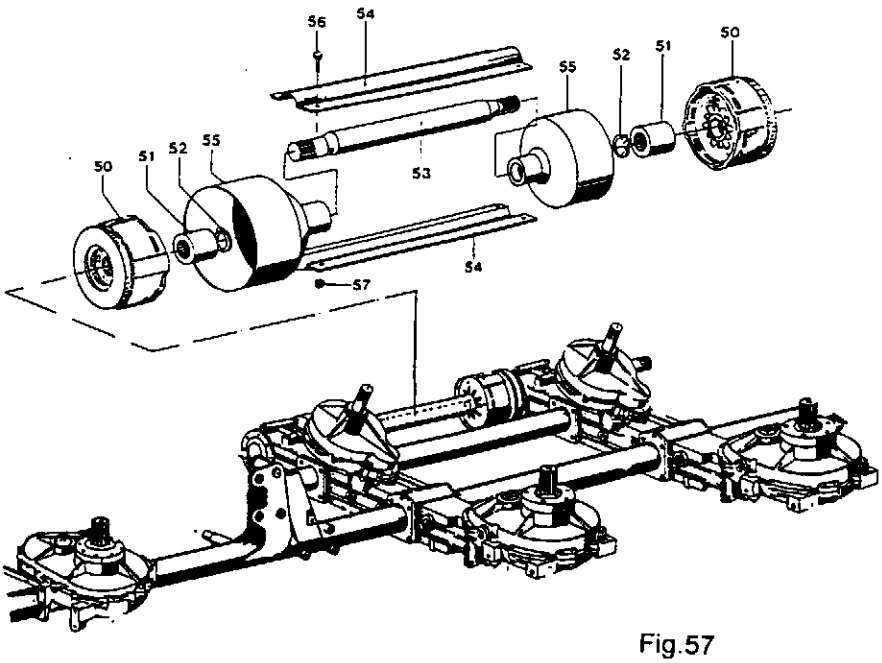


Fig.57

Main drive friction clutch

Protective function Fig. 55-58

The two friction clutches (50) of the main drive system (located under the mounting frame) protect the entire machine from excessive load. It is imperative to service the two friction clutches and to check their function regularly.

Torque

Set torque M = 800 Nm. In the two following chapters the servicing work required to maintain this torque is described. The friction clutch must be disengaged at regular intervals.
The warranty will be voided if these instructions are not observed!

Easy check

Easy check before initial use and after longer standstill periods:

- Remove guard tube (54).
- Tighten the nuts (12) to relieve the friction discs of load and turn the clutch.
- Unscrew the nuts (12) to the end of the thread.
- Attach the guard tube.

Detailed check "disengaging"

Detailed check at the start of the new season:

- Remove guard tube (54) - remove circlip (52) - move profiled bush (51) to the side - remove clutch shaft (53) - remove both friction clutches 50.
- Tighten the nuts (12) to relieve the friction discs (4) and the setting ring (2) of load
- Remove setting ring (2).
- Remove spring assembly, friction discs, driving discs and hub. Clean these components or replace them if necessary.
- The alignment of the setting ring (2) is important for maintaining torque M = 800 Nm, see fig. 56 (profile (9) on outside of setting ring (2) - profile (9) engages with recess (1) in housing (8).

New friction discs

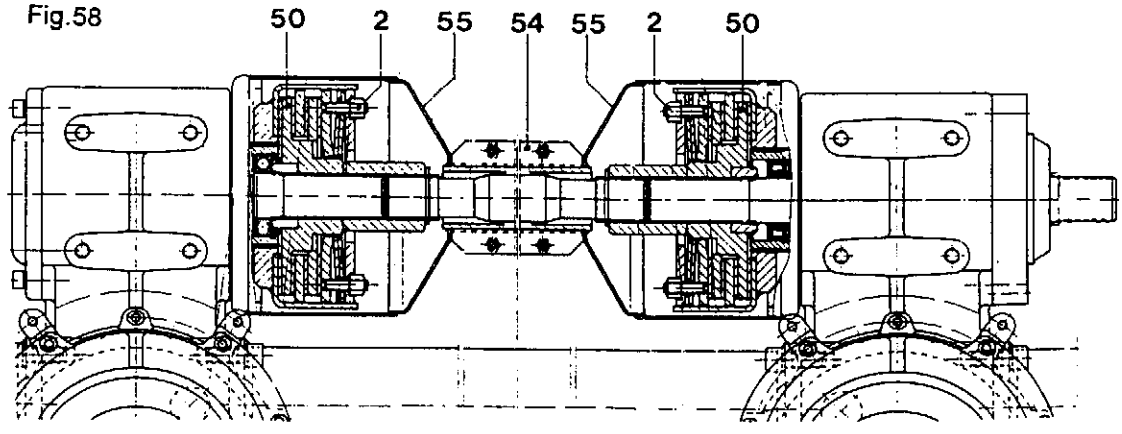
After new friction discs have been installed, the clutch will only attain full torque after a break-in period.

- Start the header carefully, avoid any unnecessary load on the clutch.
- The full capacity of the machine should only be utilized after the break-in period.

Note on installation:

The installation of the friction clutch can be simplified by tightening all nuts (12). The toothed section of the clutch housing and that of the flange hub can then be rotated.

Fig.58

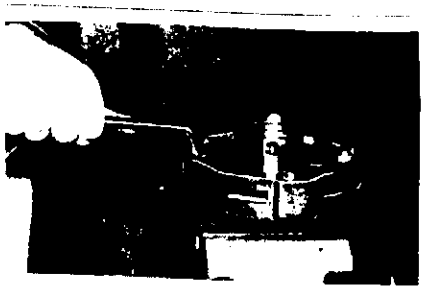


General inspection of the friction clutches:

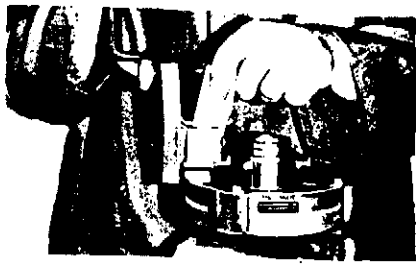
Before the start of every season.

Also see page 30 and 31

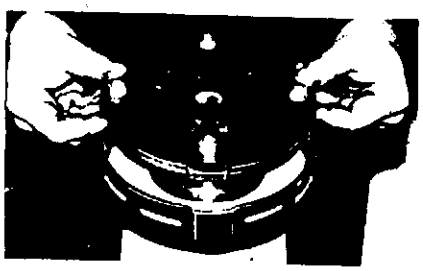
- Durch Anziehen der Sechskantmuttern Tellerfedern mit Druckscheibe verspannen.
- Tighten hexagon nuts to compress Belleville springs and thrust plate.
- Serrer les ressorts Belleville contre le disque de pressionau moyen des écrous hexagonaux.

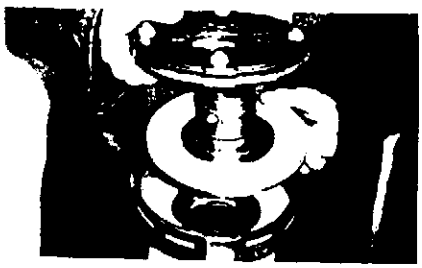


- Entlastete Stege mit Sonderwerkzeug SW-18 aufbiegen.
- Use Special tool SW-18 to bend up relieved lugs.
- Au moyen de l'outil spécial SW-18, redresser les crénaux dégages.

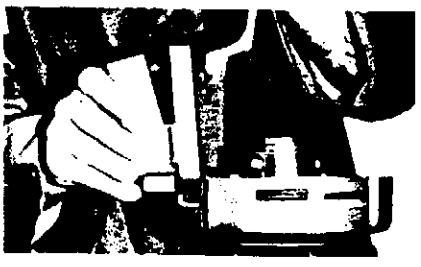


- Nabe und Reibscheiben in Kupplungsgehäuse legen. Druckscheibe, Tellerfedern zusammenlegen und mit Schraubenschlüssel vorspannen.
- Place hub and friction disks into clutch housing. Use a spanner to pestress thrust plate, Belleville springs after placing them together.
- Placer le moyeu et les disques de friction dans le boitier suivant l'ordre indique. Au moyeu d'une clé á vis, precontaindre le disque de pression, les ressorts Belleville mis ensemble.



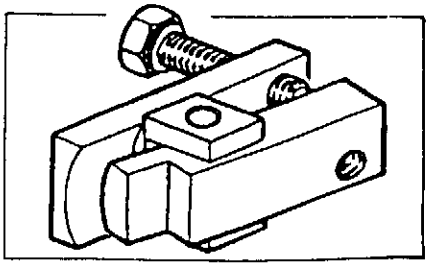


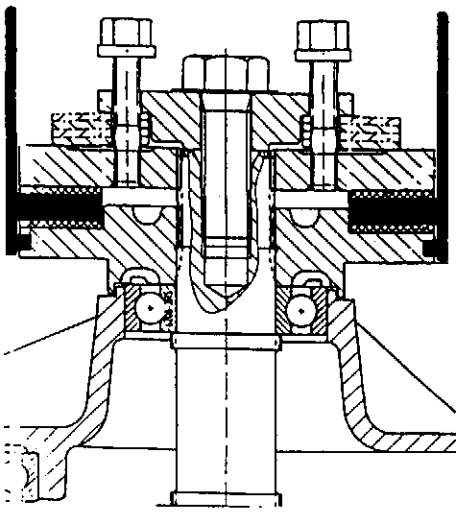
- Bei 2 Tellerfedern schmale Stege und bei 1 Tellerfeder breite Stege mit Sonderwerkzeug SW-18 nach innen biegen.
- Use special tool SW-18 to bend lugs inwards. (Narrow lugs for 2 Belleville springs, wide lugs for 1 Belleville spring).
- Repousser vers l'intérieur la paroi du boitier au moyen de l'outil Sw-18; au droit de la grande lumiére lorsque le montage comporte 2 ressorts Belleville, au droit de la petite lumiére lorsqu'il n'y a qu'un seul ressort Belleville.

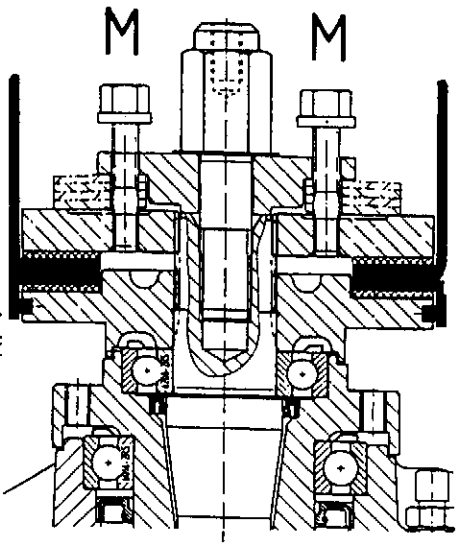


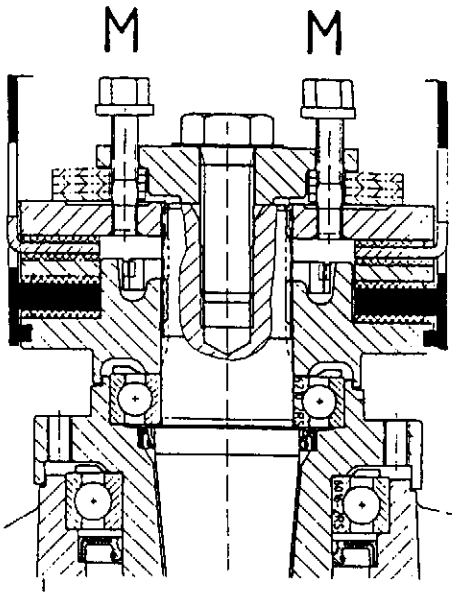
- Sechskantmuttern bis zum Gewindeauslauf zurückdrehen.
- Rewind hexagon nuts to end of threated section.
- Devisser les écrous hexagonaux en les ramenant a l'extrémité du filetage.

- SW 18 Fa. Walterscheid









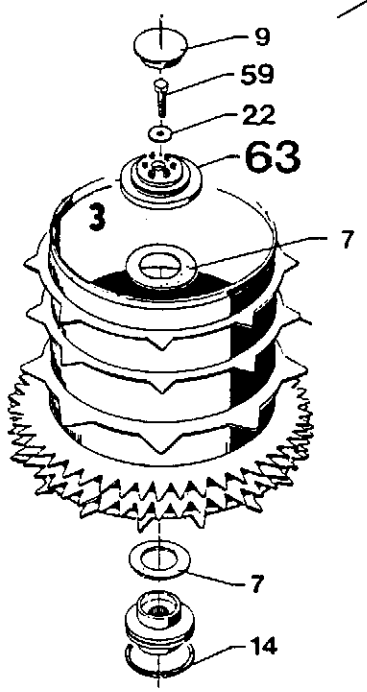


Fig.60

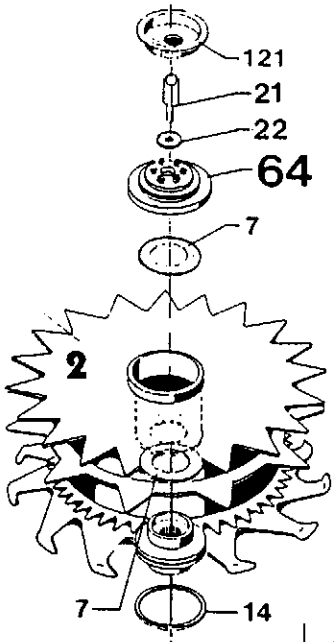
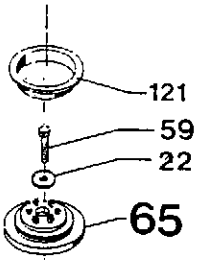


Fig.61



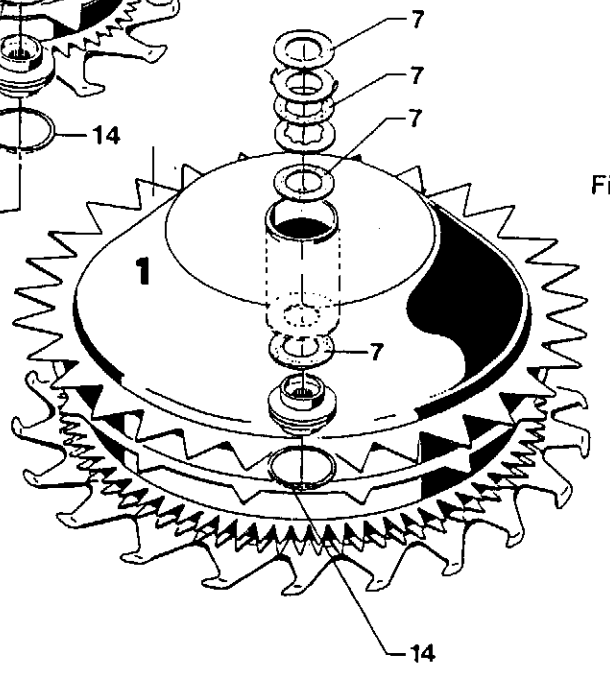


Fig.62

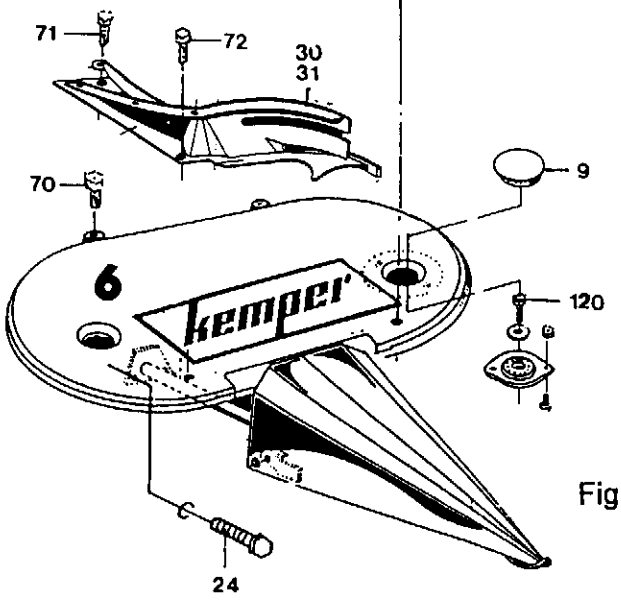


Fig.63

Friction clutch in the gathering and feed drum

All six drums (gathering and feed drums) are equipped with friction clutches which protect the drive elements from overload (too fast engagement of the drums, excessive crop density, blockages). Due to the different power requirements the drums are equipped with a different number of friction discs and belleville springs.

Friction disc, Belleville springs, spring assy

To ensure that the necessary torque is always available, carefully check the following details: number of the friction discs in the spring assemblies; number and thickness of the Belleville springs (see the white and red marks).

- **Spring assemblies**

Large gathering drum:	item 65 = No. 67181 = 2600 Nm, hole 45 Ø
Small gathering drum:	item 64 = No. 67182 = 1400 Nm, hole 35 Ø
Feed drum:	item 63 = No. 67183 = 1300 Nm, hole 35 Ø This spring assy is marked with „130“

- **Belleville springs per spring assy**

Large gathering drum:	item 11 = No. 12977 = 2x, mark: 3,2 red item 12 = No. 12978 = 2x, mark: 2,8 white
Small gathering drum:	item 11 = No. 12977 = 2x, mark: 3,2 red item 12 = No. 12978 = 2x, mark: 2,8 white
Feed drum:	item 11 = No. 12977 = 2x, mark: 3,2 red item 12 = No. 12978 = 2x, mark: 2,8 white

- **Friction discs**

Large gathering drum:	item 7 = No. 59046 = 4x
Small gathering drum:	item 7 = No. 59046 = 2x
Feed drum:	item 7 = No. 59046 = 2x

Simple check

The following steps have to be carried out after long periods of storage:

- Remove the plastic covers (9 and 121).
- Tighten all nuts (M) until the Belleville springs are relieved of load.
- Release the friction discs by turning the drums by hand.
- Loosen all nuts (M) and turn them up to the locking mechanism at the top en of the thread.

Detailed check

The following steps have to be carried out at the start of each season.

- Remove the plastic covers (9 and 121)
- Remove the gathering drums (1 and 2) and the feed drum (3).
- Remove the friction discs, the Belleville springs and the pressure discs. Clean these components or replace them if necessary.

Warranty will be voided if these instructions are not observed

Dismounting central covering plate

Remove cap 9. Dismount screws 24, 70 and 120. The central covering plate can be pulled out in forward direction. In case of dismounting the intake drum 2 the guides 30 and 31 should be dismounted.

Fig.71

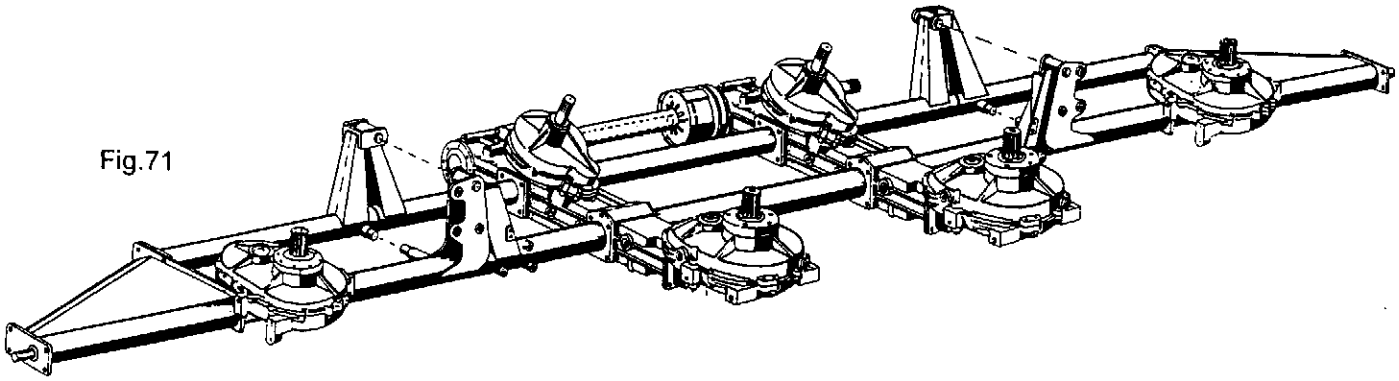


Fig.72

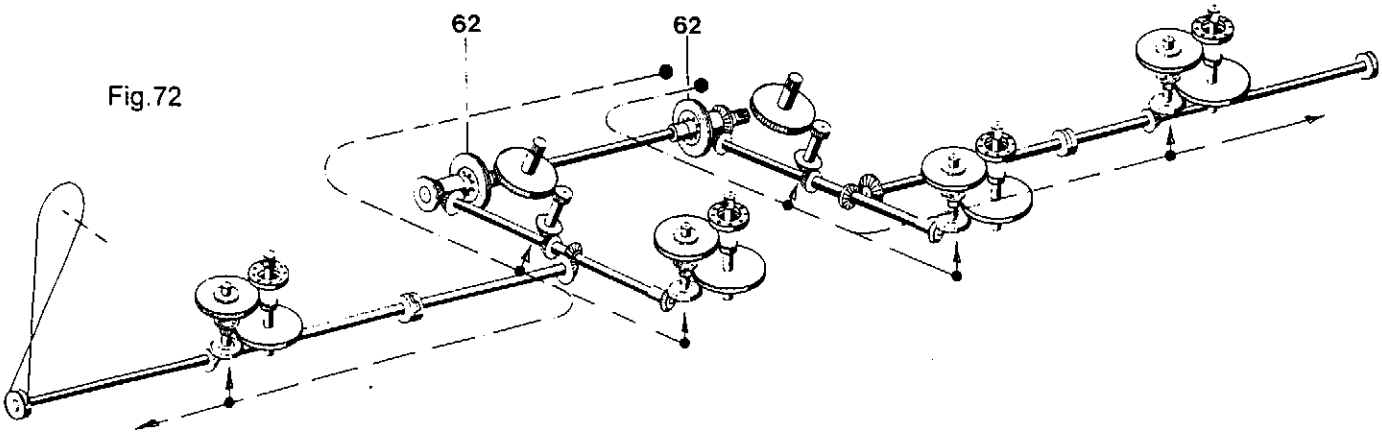
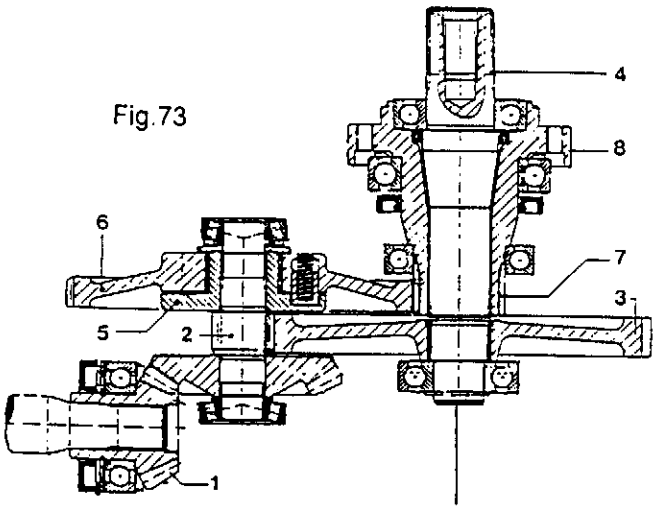


Fig.73



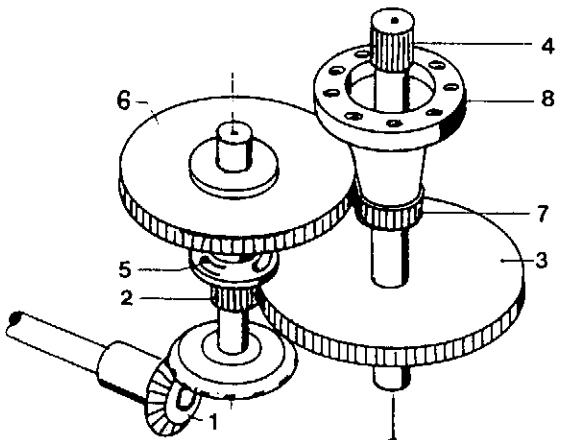
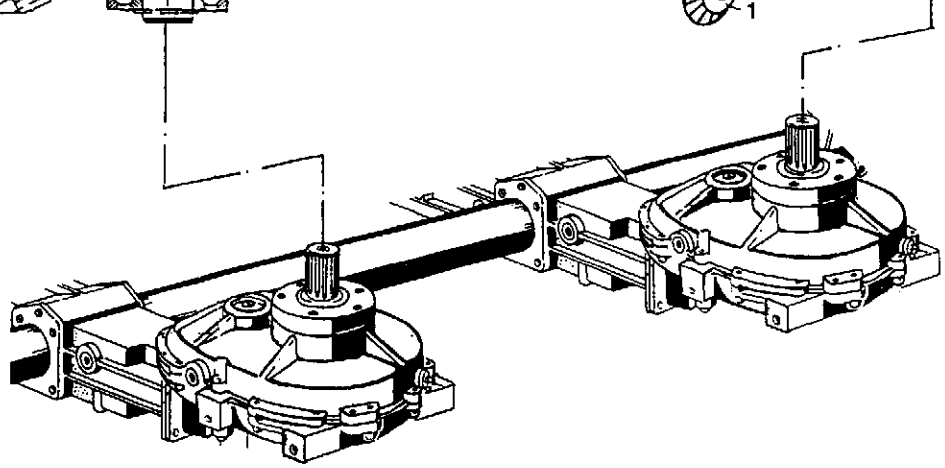


Fig.74



Drive system

Bottom drive

Service and maintenance are much more simplified by the drive system of the Champion M4500 („bottom drive"). All rotors and drums can be lifted away from the header.

Basic frame

All eight gearboxes are integrated into the basic frame (fig. 71). Every gearbox has its own oil supply system, so each of them can be unscrewd from the flange without any loss of oil. The gearboxes of the slow rotating feed drums are filled with semi-fluid lubricant.

Drive system

Figure 72 shows the drive system of the Champion M4500. Both sides are separately protected by an overload clutch (62).

Free wheel mechanism

All four spur gear angle drives (gathering drums & rotary cutter) have the same operating principle (fig. 73). The only difference lies in the sense of rotation and in the speed rotation to compensate for the different size of the gathering drums.

Power transmission fig. 74

The slow rotating gathering drums are driven by bevel gear drive (1), spur gear (2), spur gear (3) and shaft (4). The fast rotating rotary cutters are driven by bevel gear drive (1), free wheel mechanism (5), spur gear (6), spur gear (7) and flange (8).

Feed bar

Feed bar (2) pushes the stems to the front to ensure a more regular intake of the crop into the Champion M4500. It is height adjustable to match different crop conditions.

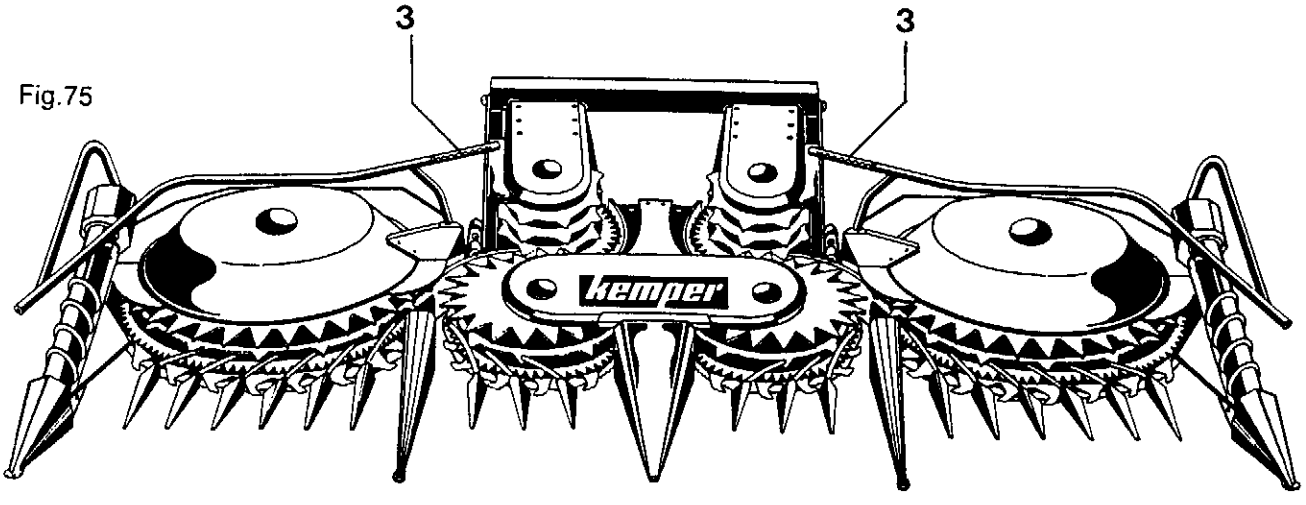
- Only lift the feed bars to such an extent that they cannot strike against each other in the transport position.

Divided feed bars

The tube ends (3) of the feed bars are resilient to ensure sufficient mobility in the transport position.

- NEVER use the tube ends (3) as a handle!

Fig.75



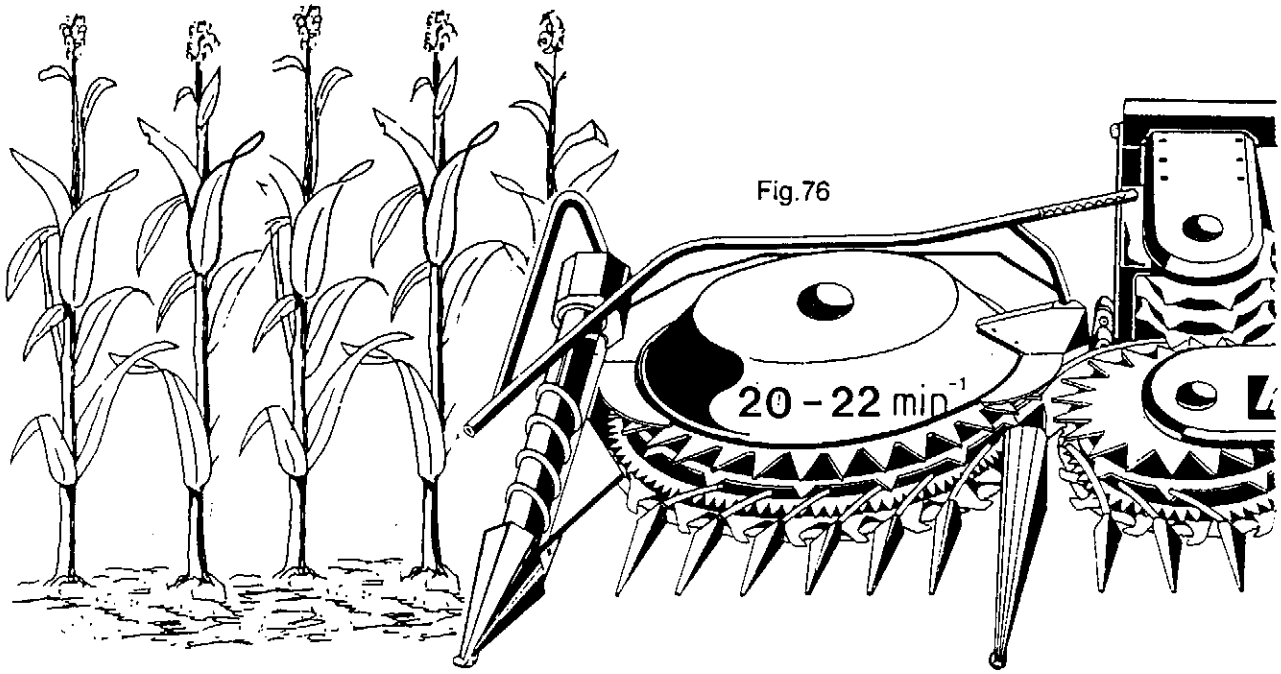


Fig.76

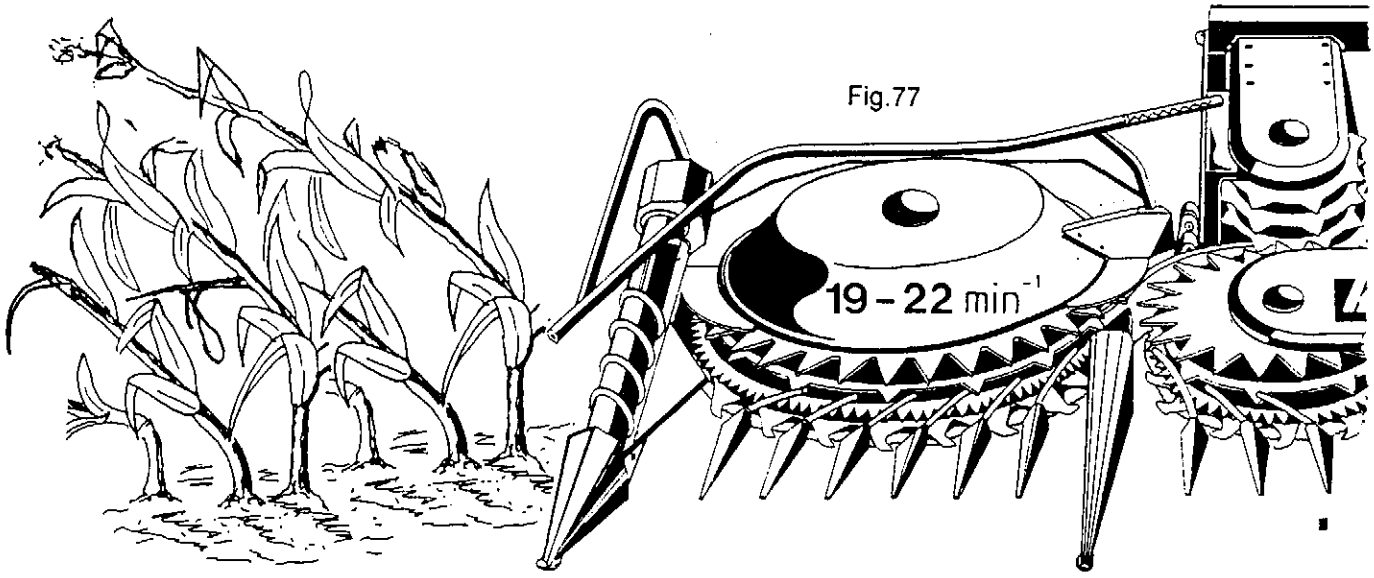


Fig.77

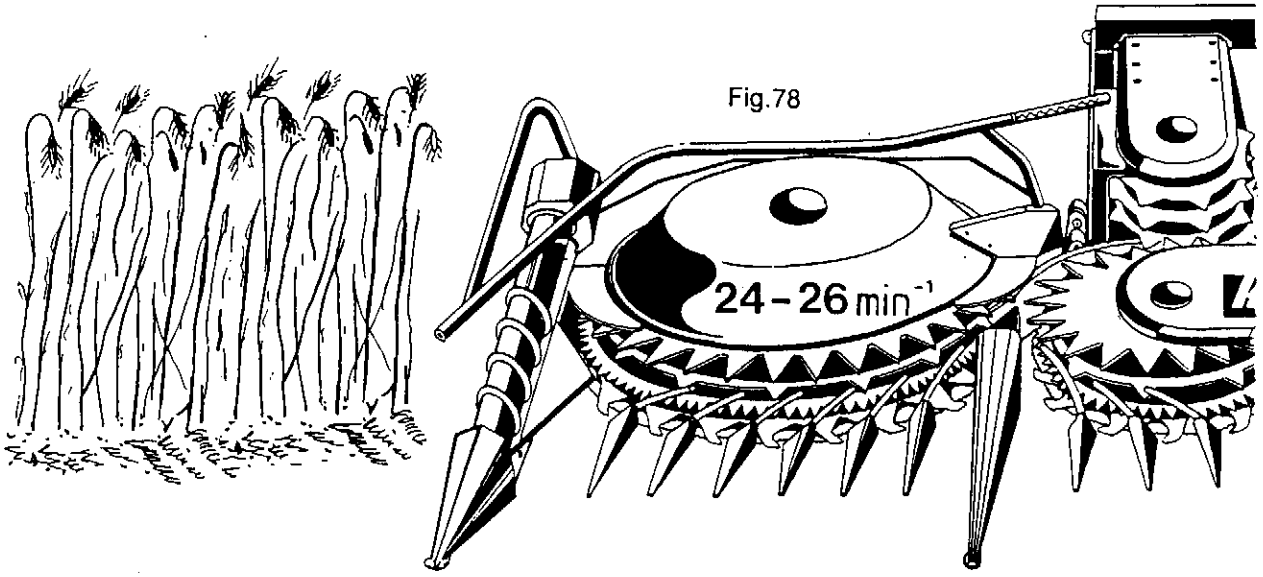


Fig.78

Start up - headland turns - changing the forage wagon – reversing

The Champion header may only be operated, serviced and repaired by personnel who are familiar with this work and have been instructed of the inherent dangers!
At this point we can only give some general recommendations. Together with your own experience, observing the following instructions will certainly help to avoid serious problems.

- **You should be familiar with the machine before you start!**

Start-up

Starting the forage header, engaging the chopping unit and the header as well as reversing the header should always take place with the engine running at idling speed. Reversing causes the gathering drums to rotate in the opposite direction. The cutting rotors stop. Switching the gathering drums to forward movement should also take place at idling speed. This will prevent any unnecessary slipping of the clutches.

- **Always start and engage at idling speed to save the overload clutches!**

Driving into the crop

When the chopping unit and the cutting blades have come up to speed, drive at a sufficient speed into the crop to obtain from the beginning a compact stream of fodder. This is particularly important in difficult crop conditions or when handling short-stemmed corn.

- **Always drive at sufficient speed into the crop!**

Direction of travel

The row-independent harvesting system allows selection of any direction of travel. In difficult conditions (e.g. down crops) there is always one direction which provides best results. This must be determined by trial and error.

- **Use the free choice of the travel direction!**

Travel speed

The travel speed is determined by the kind and density of the crop and the engine power available. The shorter the crop and the lower the crop density, the faster you should drive to ensure satisfactory operation of the feed elements.

- **Travel speed depends on the kind and density of the crop and the power of the harvester.**

Headland turns

To protect the header drive, maintain the rotational speed when negotiating headlands, and drive directly back into the crop.

- **Maintain rotational speed when turning at headlands!**

Changing the forage wagon

Considering the short feeding distance of the Champion header, it is not advisable to actuate the instantaneous stop of the forage harvester when changing the forage wagon. Stopping and restarting the unit would cause loss of time and expose the drive system to unnecessary load.

- **When changing the forage wagon, allow all drive units to continue to operate!**

Clearing blockage

To clear blockage in the channels caused by weed-infested crops or long and sticky husks, stop the harvester and operate in reverse for a short period. Repeat this process if necessary. This technique has been proven with experience.

- **It is important that the quick reversal process not allow the cutting blades to stop!**

Should you find it necessary to use your hands to remove any material, be sure to switch off the harvester motor and turn the PTO shaft shift lever to OFF.
Even though the gathering drum may have stopped rotating, the cutting blades may still be rotating. Wait for the blades to come to a complete stop!

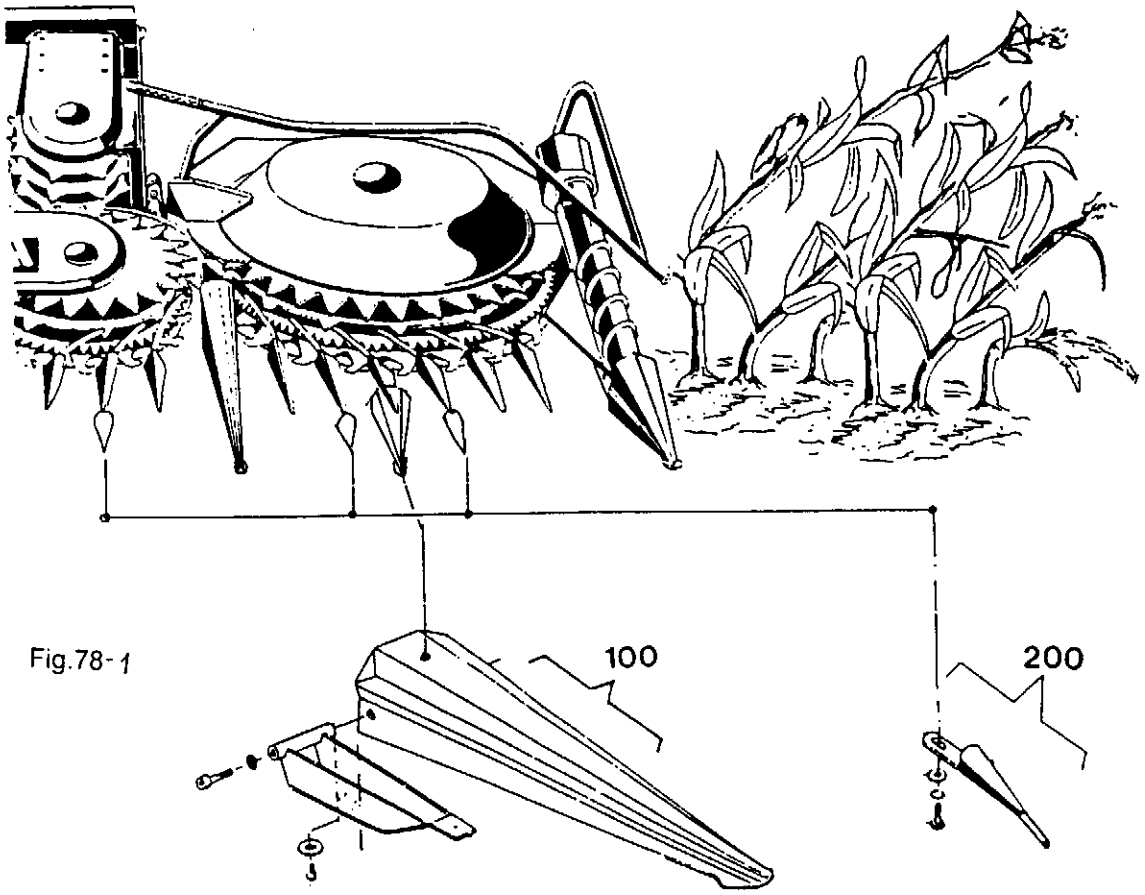
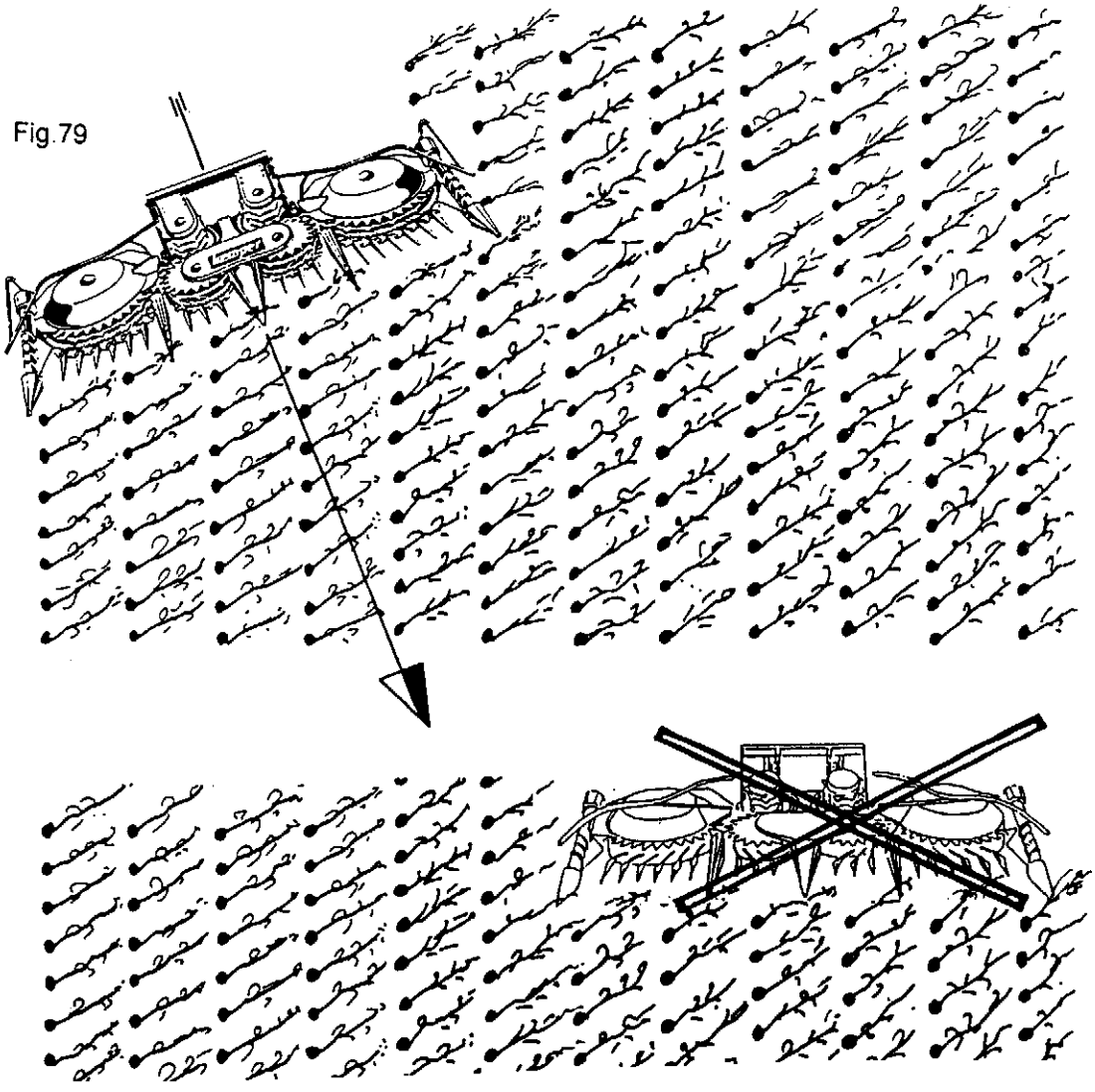


Fig.78-1

Fig.79



Working in down crops

Down crops

Down crops vary widely, because the effects of nature differ greatly. Despite the successful cultivation of new varieties and the use of new growing methods, it will never be possible to overcome the problem of down crops. We have therefore equipped the header, as standard features, with all technical solutions which allow contractors to offer a machine which can deal with any situation. One of the most important advantages is the row-independent harvesting technique which allows the down crop to be approached from the optimal direction.
Standard header equipment includes two rotating crop dividers for down crops as well as divider points which are movable in height. The teeth of the gathering drums positively disentangle the stalks of the crops before they are raised by the rotating crop dividers and divider points and fed to the chopping unit of the forage harvester.
Despite the standard universal equipment, some recommendations:

- The practical experience of the driver is the key to a successful harvest of down crops.
- When starting the operation drive once around the field. This will help to find the best direction of travel.
- In most cases best results are achieved when operating transversely to the rows, see Fig. 79.
- At the start you should observe attentively the effect of the machine on the crop.
- In order to obtain from the beginning of the process a compact stream of forage, you should drive fast into the crop and reduce as much as possible the rotational speed of the gathering drums.
- To clear a blockage stop and reverse briefly. Repeat this procedure if necessary
- Prolonged reversing is disadvantageous.
- Stalk lifters item 100 adjustable, 2 items = serial equipment
- Stalk lifters item 200 fixed, 6 items = Order no. B 353 (69196)

Never push the crop with hands or feet!

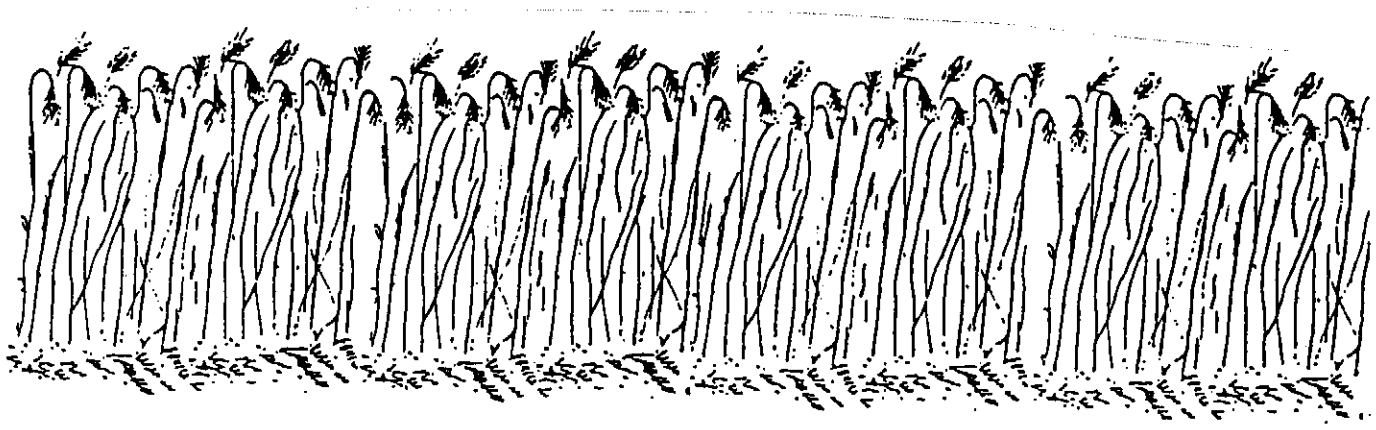
Short-stemmed corn

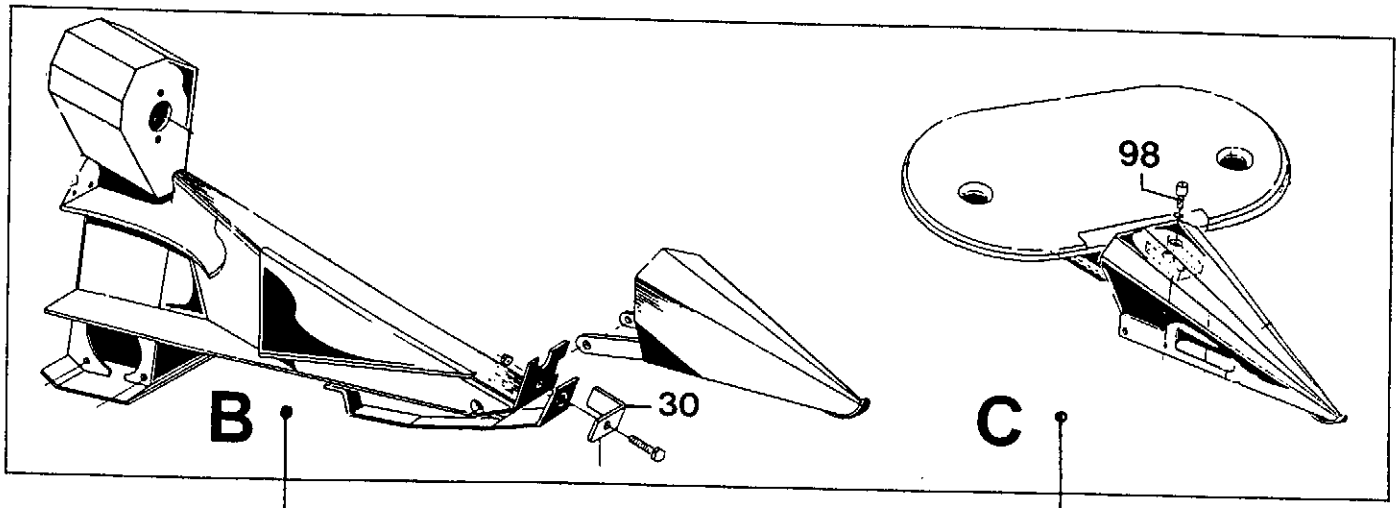
When harvesting short-stemmed corn you should select a high travel speed in order to obtain a continuous flow of material. Lower the feed bar to ensure that the corn stalks are pushed forward before they reach the precompression rollers.

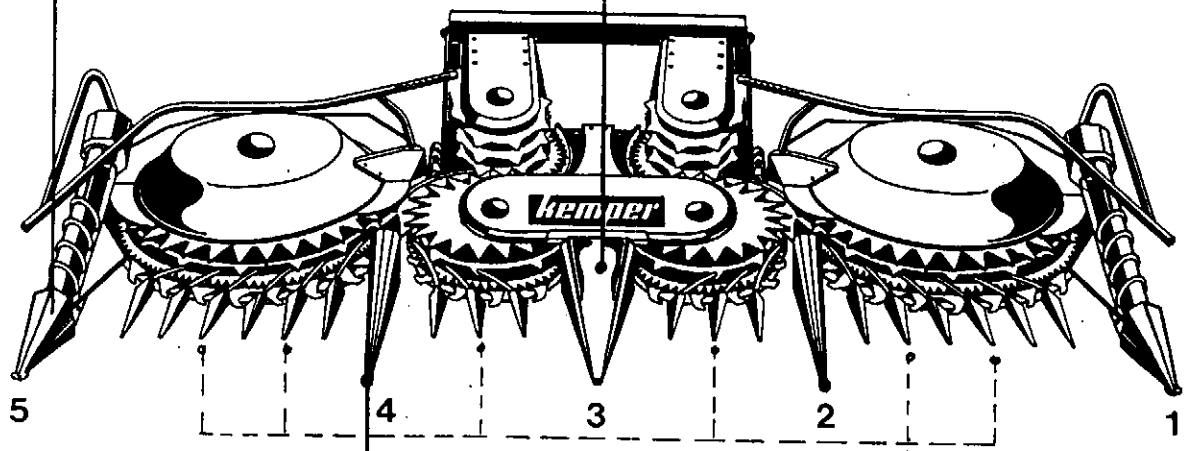
- Increase forward speed and lower the feed bar.

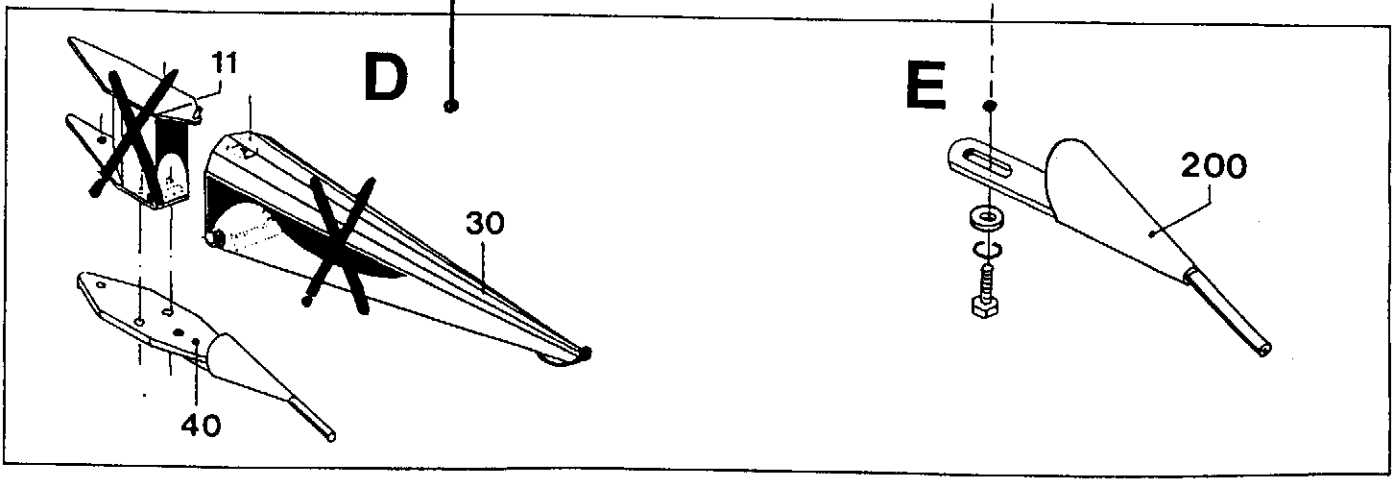
Renewable resources - (elephant grass)

The Champion rotary crop header is at present the only production machine which allows elephant grass to be harvested and chopped in a single operation. The unique lengthwise feed mechanism and compact stream of forage ensures the homogeneous structure of the chopped material which is required for further processing of the crop.




B
30
C
98


kemper
5
4
3
2
1
A


D
11
30
40
E
200

WPS

Originally, the Champion header was constructed for harvesting thick-stemmed crops. Under favorable conditions (e.g. dry standing crops) and by following the instructions on this page, the header can produce very favorable results with whole crop silage. Depending on the cutting height, however, some specific compromises may need to be accepted due to the design and construction principle of the cutting system.

Converting the M 4500

A All dividing points (1-5) must be raised to improve combing (not for lodged crops).

B Both outer dividing points (1+5) must be raised by assembling an angle Bracket.

C The middle point (3) can be set at a minimum height using an M12x20 cheese head screw (98).

D In the leaf lifter area (2+4), the pillow block (11) and dividing point (30) must be exchanged for a different dividing point (40).

E Additionally, with lodged goods, 6 fixed stalk lifters (200) can be installed. Order no. 69196. (see page 38, fig. 78-1, item 200).

Settings

1. Pre-seasonal general inspection of clutches (see pages 31-33).
2. All scrapers inside the guides must lay as close as possible to the gathering drums.
3. Sharp cutting blades and properly placed cleaners are absolutely necessary as dull blades and swung out cleaners damage the drives and destroy the clutches. We recommend the use of new cutting blades.
4. To achieve an optimal cutting process, the speed for the cutting blades must be higher for WPS than it is for corn. Engage the faster gear. With certain harvesters, drive speed can be optimised by using a gearbox.
5. Check the connection between the centre table and both rear guides.

General notes

- Down wet crops cannot be optimally harvested.
- Standing dry crops should be at least knee high.
- When operating in very difficult conditions (lodged and weed-infested wet material, sandy soil), the operator should have some experience as regards to the choice of the forward speed and the direction of travel.

Operating instructions

- Select a high forward speed to obtain an immediate flow of material.
- Starting and engaging the header at idling speed saves the clutches.
- Drive at a consistent speed through the crop.
- Take advantage of the flexibility in direction of travel.
- Maintain rpm when turning.
- Travel speed depends on the corresponding crop density, kind of plant, and power of the harvester.
- When changing the forage wagon, do not disengage any drives.
- Clean after each use. Clay and crop deposits harden overnight and cause malfunction.

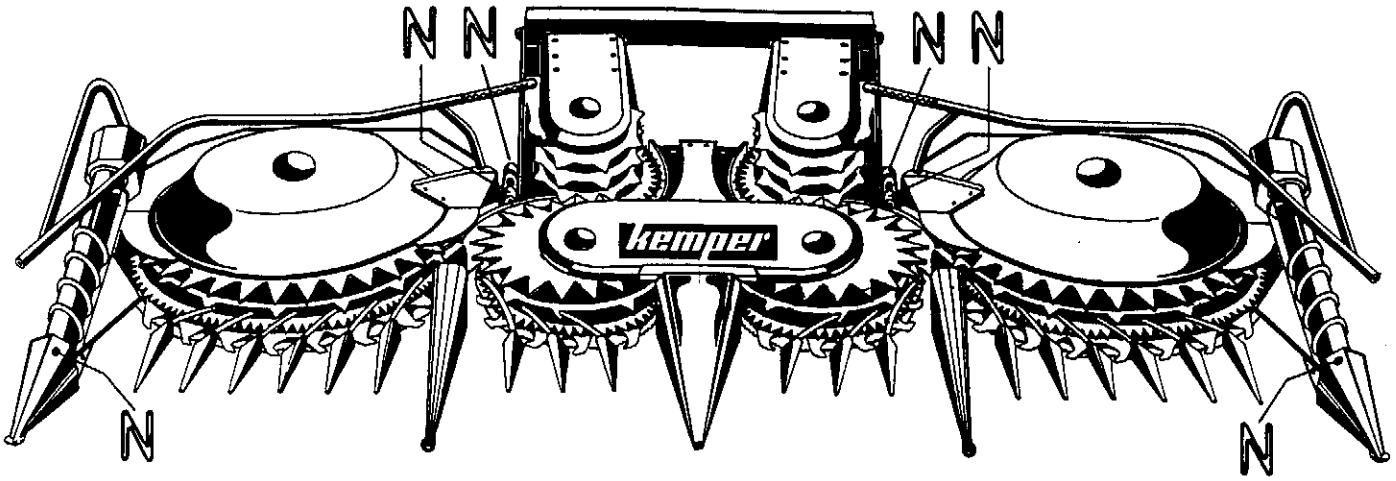


Fig.80

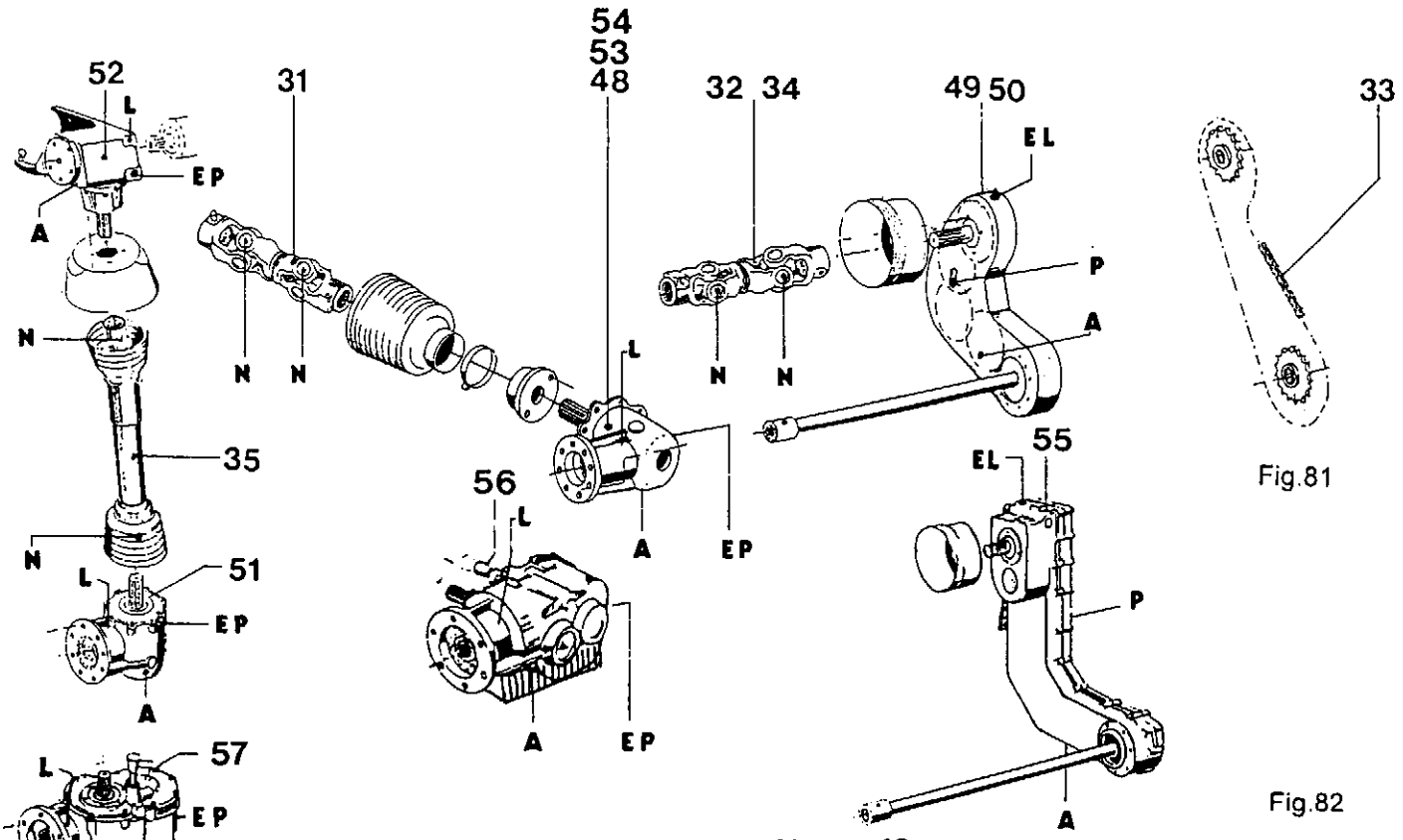
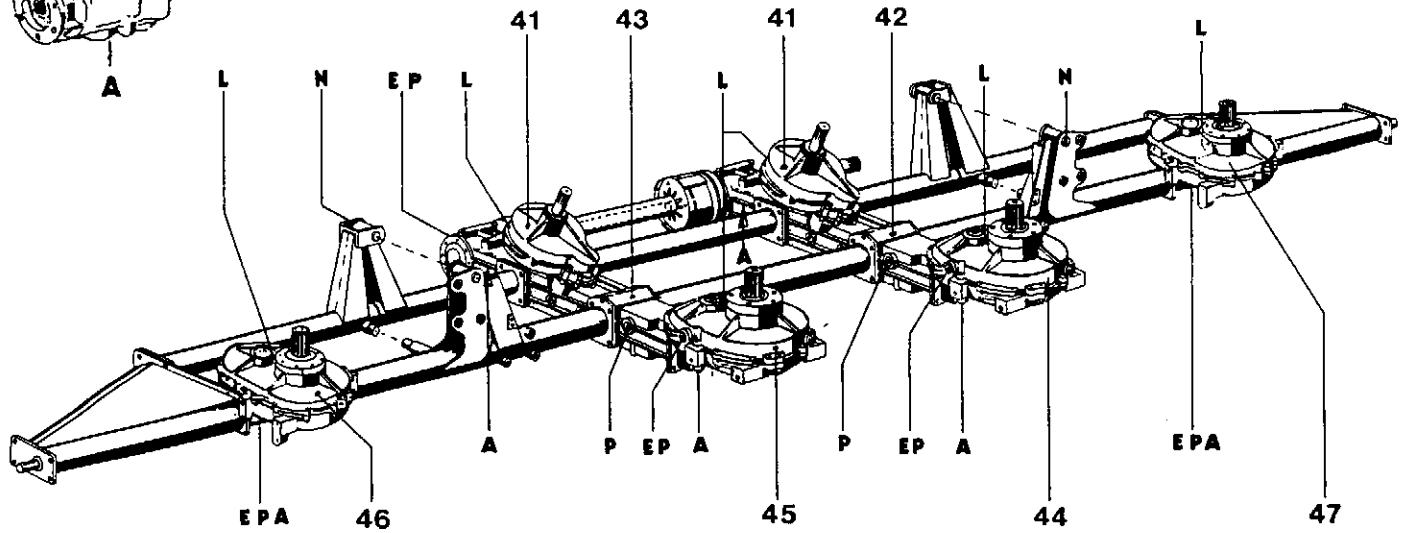


Fig.81

Fig.82



Lubrication chart

Lubrication points

The basic machine has six greasezerks (N).

Basic machine fig. 80

- Grease ervery day= 2 grease zerks on the bottom bearing of the rotating crop dividers for down corn
- Grease every week= 4 grease nipples of the hinges of the outer drum units.

Drive system

- oil every day = item 33 the chain drive of the John Deere forgare harvester (5 series) and of the New Holland / Fiatagri series. We recommend the use of a non ageing oil with good adhesive properties
- Grease every day= the PTO drive shaft

Grease lubricated gearboxes

- Item 41 = Spur gearbox. Both super gearboxes are constant-lubricated with semi-fluid lubricant GRESANAT X00. Comparative grease see table

Oil lubricated gearboxes fig. 81 an 82

• Item 42 =	Angle drive		3,5 litres
• Item 43 =	Angle drive		3,5 litres
• Item 44 =	Spur gear angle drive		3,0 Litre
• Item 45 =	Spur gear angle drive		3,0 litres
• Item 46 =	Spur gear angle drive		3,5 litres
• Item 47 =	Spur gear angle drive		3,5 litres
• Item 48 =	Anlge drive CLAAS	CL 8	0,9 litres
• Item 49 =	Spur gear angle drive	JD6	1,8 litres
• Item 51 =	Bottom angel drive Mengele	ME	1,0 litres
• Item 52 =	Top angle drive Mengele	ME	0,8 litres
• Item 53 =	Angle drive CASE 8790	CA	0,9 litres
• Item 54 =	Angle drive Deutz Fahr	DF	0,9 litres
• Item 55 =	Gearbox New Holland	FX	4,0 litres
• Item 56 =	Gearbox CLAAS	CL8	4,5 litres
• Item 57 =	Gearboc Mengele	ME	2,0 litres

- The gearboxes 42 + 44 and 43 + 45 have their own oil supply system (each of them can be removed without any loss of oil).

Oil specification

- SAE 90gear lube

Oil change interval

- Every 500 operating hours

Oil level check

- Check the oil level with the gearbox in a horinzontal position. The oil must reach up to the bottom edge of the oil level plug hole (P).
- Fold up the outer drum units to check the oil level of gearboxes 46 and 47

Inspections intervals

- Check gearboxes daily for leaks (visual check)

A-E-L-N-P

A = Oil drain plug
E = Oil filler plug
L = Breather
N = Grease zerk
P = Oil level plug

Comparative Grease

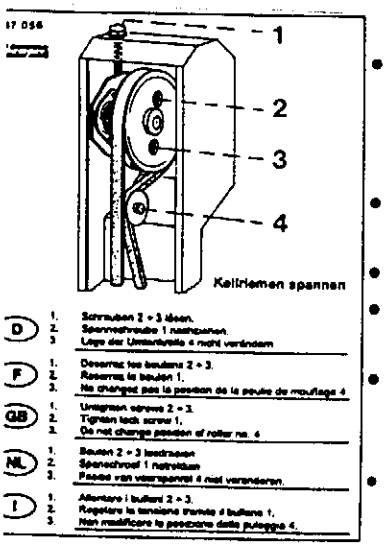
Supplier	Description	
Westfalen	Gresanat	X 00
Aral	Aralub	FDP 00
Shell	Special Geargrease H	
Esso	Geargrease	
BP	Energrease	HT 00 EP
Texaco	Starfak	E 900
Antar	Geargrease	EPEXELF00

Maintenance and inspection

Maintenance at the beginning of the season

- The most important step at the beginning of every season is the "detailed check" of the friction clutches in the main drive system: remove dismantle, and clean or replace all components of both clutches. See the section "Main drive friction clutch".
- Before restarting operation we recommend checking the star ratchets K43 in the gathering drums. For lubricating the star ratchet (1 x / year) we recommend a lithium-saponified grease **"GLEITMO 805 and 810"** produced by Gleitmolybdän, and which is particularly suitable for combating frictional corrosion.
- Run the machine and check all bearings for overheating and excessive play.

Daily Maintenance



- Always check the cleaners under the rotary cutters (two per rotor). Blunt or incorrectly positioned rotors cause plugging and unnecessarily burden the drive and clutches.
- After the first few days of operation as well as following the replacement of a blade or cleaner, all bolts must be retightened. Check all cutting blades. Very dull blades must be replaced, as they leave extremely long stubble and overburden the drive.
- Husk and stalk residues must be removed daily from the gathering drums, cutting blades, and scrapers.
- Visually inspect gearboxes daily for leaks.
- Tension on V-belts must be regularly checked, starting after the first 15 hours of use.
- Lubricate the header daily in accordance with the greasing chart. Essentially this means lubricating both front bearings of the rotating crop divider as well as the PTO shaft for certain harvester types.
- Loose bolts on the cutting blades and cleaners will quickly cause damage (e.g. worn out borings). With a raised drum unit on the side, a quick check is effortless.

Weekly maintenance

- Check tightness of all bolts regularly. Tightening torque in Nm:

Thread	Property class 8.8	Property class 10.9	Securing bolt with toothing
M 6	11	17	
M 8	28	40	42
M 10	55	80	85
M 12	95	140	130
M 16	235	350	

- Check the entire cutting area for foreign objects. These cause damage to the rotary cutters, the cleaners of the gathering drums and the dividers.
- Clean the clutches on the hinges.

- Clear and preserve header. Also clean the 8 free spaces 21 above the drum star ratchet K 43.
- The oil in the gearboxes should be drained every 500 operating hours. Lubricate the header in accordance with the greasing chart.
- Check all components for wear and order all necessary spare parts in time

Information concerning the set of springs

1. Install the set of springs F under tension (nuts M must be at the bottom).
2. Secure the assembly using the threaded pin M 20 and cup spring T. Tightening torque = 375 Nm.
3. Turn the six nuts M up to the limit stop at the threat end and make sure that the nuts can not move to the bottom inadvertently. Tighten or release the nuts by turns using each time the same torque.

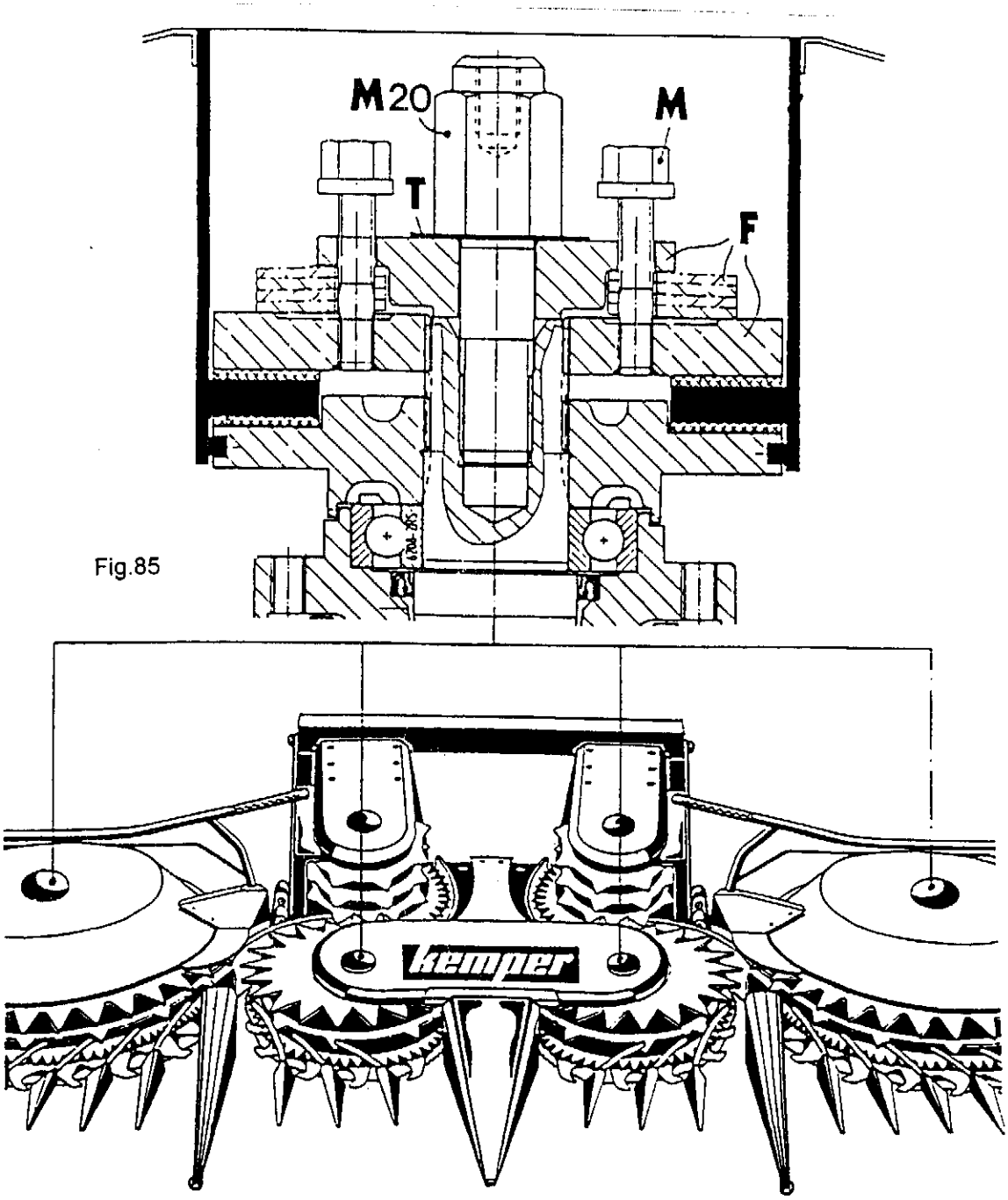


Fig.85

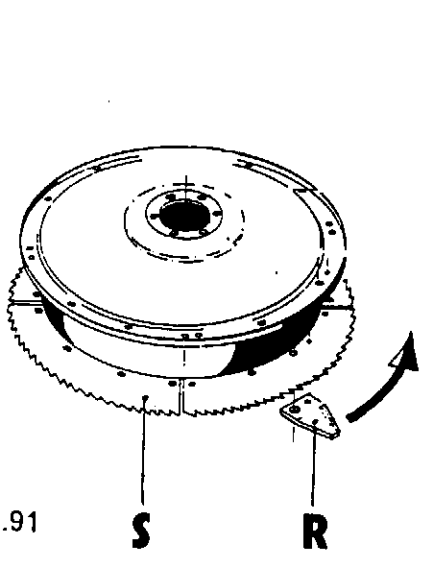


Fig.91

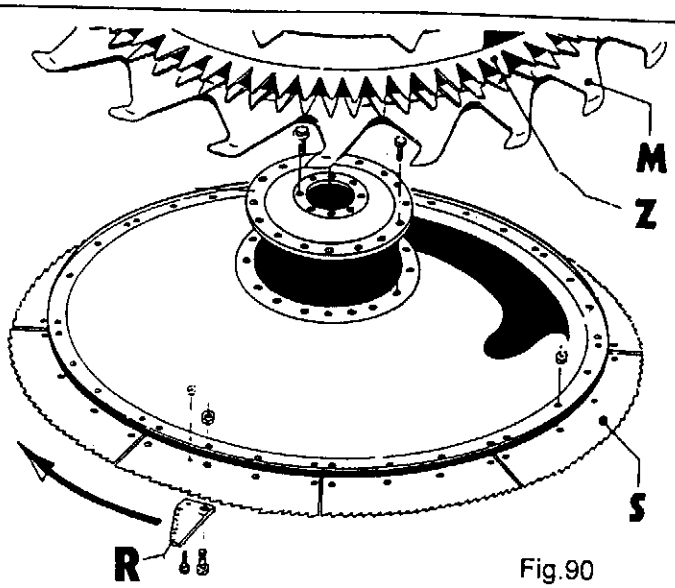


Fig.90

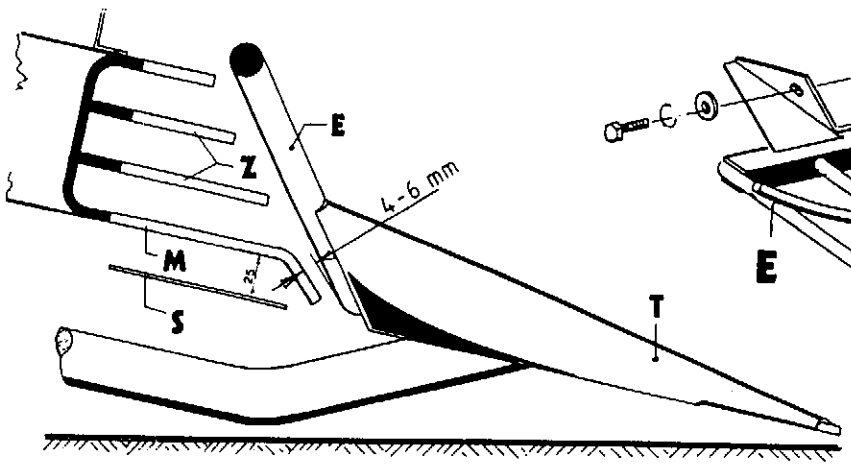


Fig.93

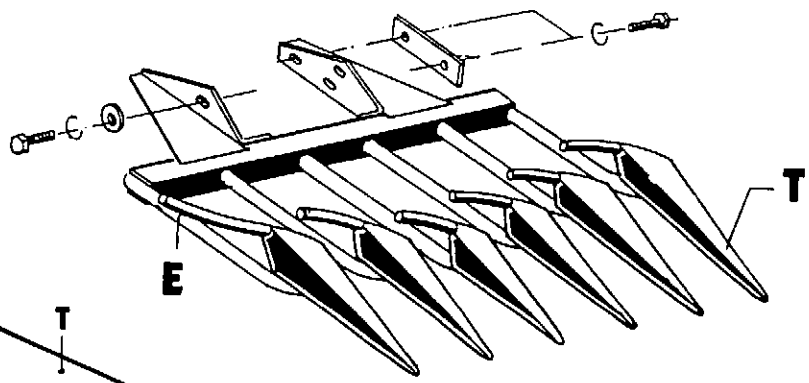


Fig.92

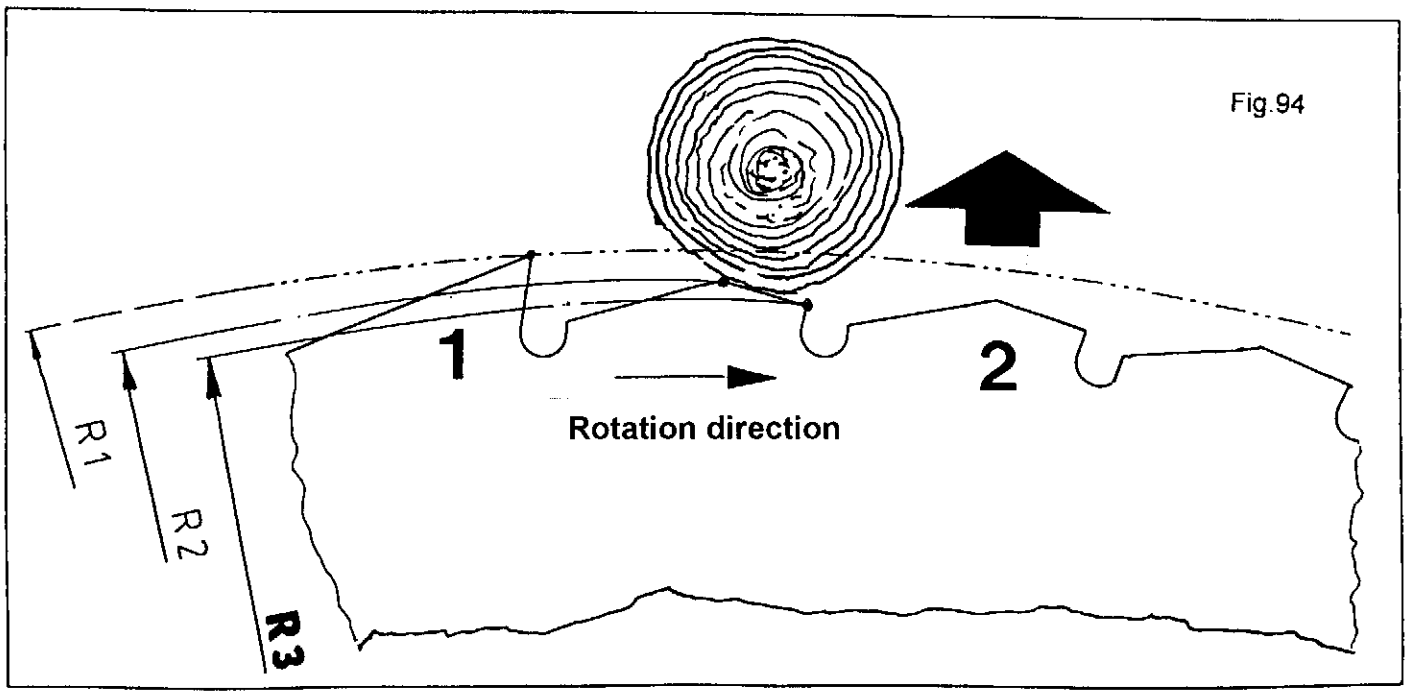


Fig.94

Maintenance of the feed and cutting devices

Feed and cutting area

The feed and cutting area includes the following components:

Small dividers	T	- Feed bars	E
Feed teeth	M	- Row of teeth	Z
Rotary cutters	S	- Rotor	R

Correct function of these components is very important for feeding, gathering, cutting and transporting the crop. Problems in the cutting area can be easily eliminated if the following recommendations are observed.

Small dividers Fig. 93

- The clearance between the rear part of the small dividers (T) and the feed teeth (M) should be as small as possible (from 4 to 6 mm). This will ensure more reliable gathering of lodged crops.

Feed teeth

- For the same reason, any feed tooth (M) deformed by a foreign object should be straightened immediately.

Feed bars

- The feed bars E have the important task of pushing the crop between the closely spaced row of teeth.
- After longer use, the feed bars E (18 ∅) can become worn. This wear must be compensated by adjusting or replacing the parts.

Saw cutters

- The cutting points should be fitted pointing in the direction of rotation.
- The normal saw cutters are 2,5 mm thick with 4 holes
  Saw cutters in cleanerarea are 3,5mm thick with 5 holes
- The saw cutters continue to rotate after the header has been switched off. Rotation is easily seen due to different blade colours and heard due to clicking from the freewheel mechanisms.

Attention! **Do not touch moving parts. Wait for the saw cutters to come to a complete standstill.**

Cleaners

Intact cleaners clear weeds and husks from the cutting area. They are secured to the rotary cutter by a securing bolt M 10 x 25 and a shear bolt M 8 x 25. Due to their property class (8.8) both bolts are special bolts.

- Blunt or deformed cleaners cause plugging. You should therefore check the cleaners once a day.
- Make certain that the tungsten carbide coating of the cleaners SR is facing forwards (when viewed in the direction of rotation).

Rotary cutter wear

The use area of the cutting blades is limited. Fig. 94 shows
Tine 1 = at time of delivery = 1 : 1
Tine 2 = condition after much use
Teeth which have been completely worn out can begin to push the harvested material forward. The cutting process then becomes more and more strenuous to the disadvantage of the drives and clutches. Reconditioning is time-consuming and helps only for a short period of time.

Changing the saw blades

Upon the installation of the lined saw blades, it must be ensured that always one green knife and then a yellow one is mounte. Observe the sense of rotation, i.e. clockwise or anti-clockwise. The lining must show upwards.
The installation sequence ensures safety. During the rotation of the rotor, an optical effect is generated which signalises that the rotor is operating.

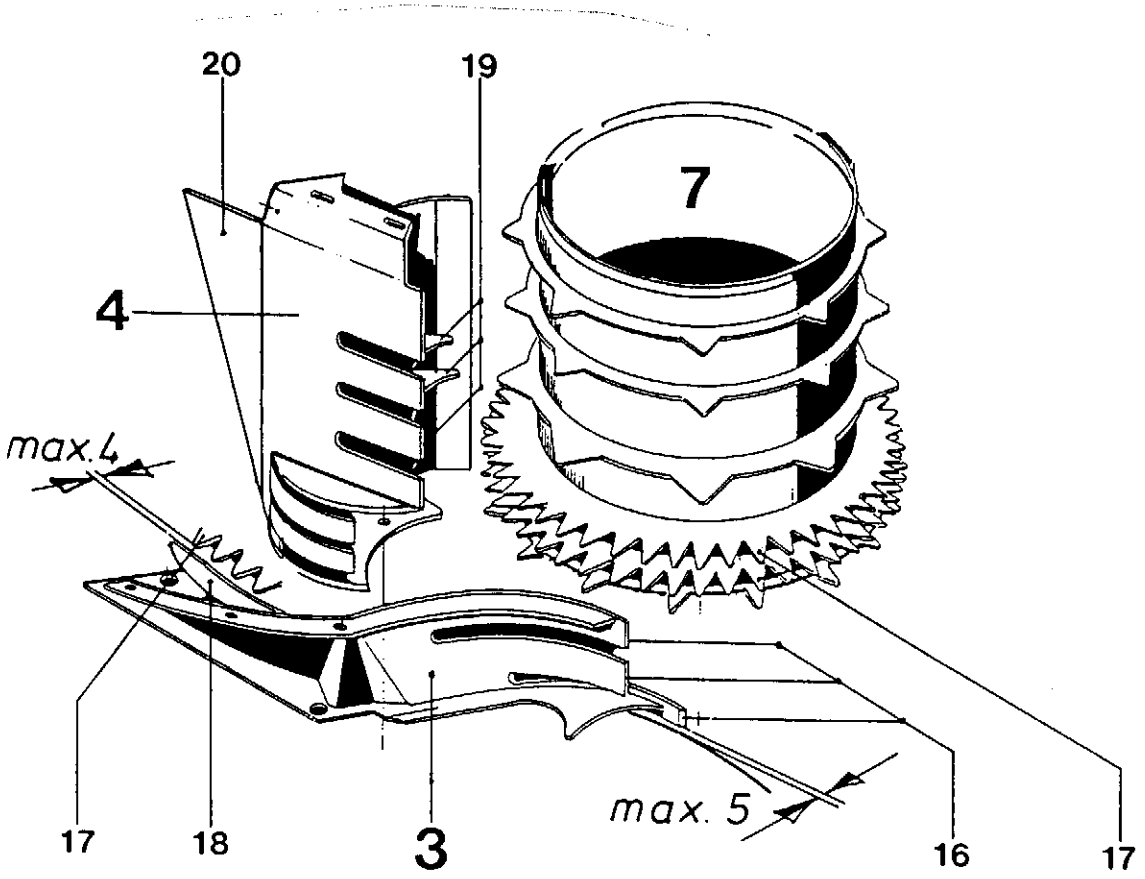


Fig.95

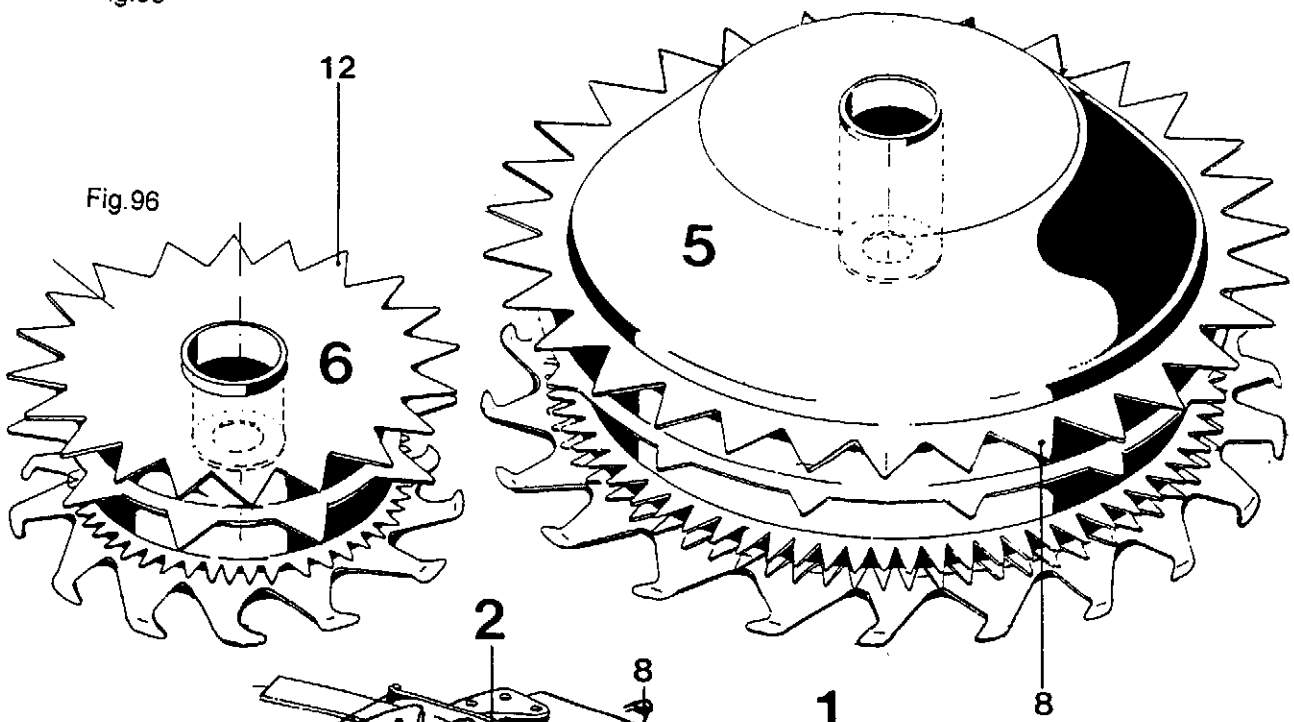


Fig.96

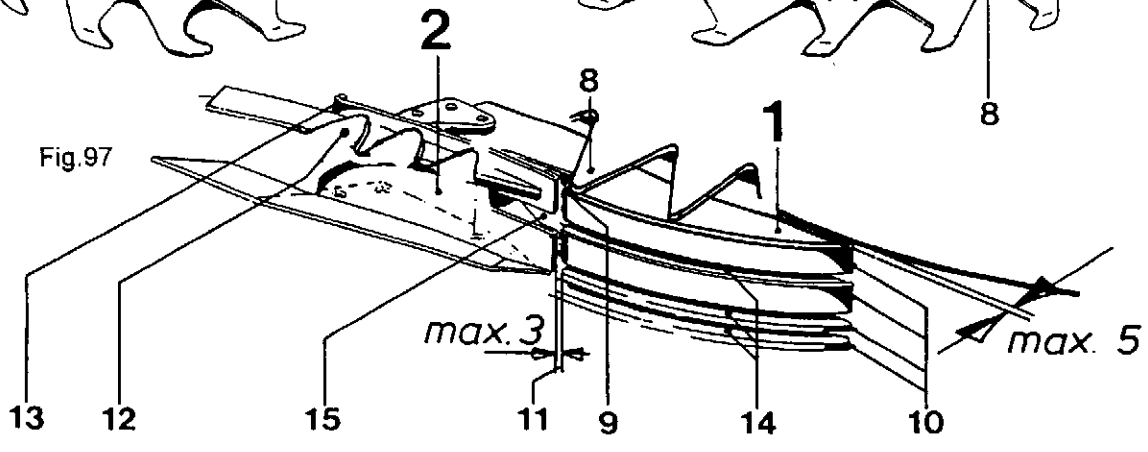


Fig.97

Checking the "crop guide track"

Scrapers and guides

All scrapers and guides in the "crop guide track" must be monitored specially and checked when a problem arises. Such problems can be caused, for example, by foreign objects in the track. They can also arise after installation work has been carried out in this area. If you see that the crop is not fed regularly into the machine, you must check the complete scraper and guide track. The following are the most important points:

Scraper 1 Fig. 97

Basic adjustment will be correct when all teeth of the gathering drum 5 are even with the edge 9 of the scraper 1.
The ends 10 of the scraper should be positioned as close as possible to the wall of the gathering drum 5 (maximum distance = 5 mm). The teeth of the gathering drum 5 should run at constant height through the guide slots 14.

Guides 2 Fig. 97

With guide 2 the distance 11 to scraper 1 is important. The distance must not exceed 3 mm and should be flush or set back by no more than 2 mm.
The teeth 12 of the gathering drum 6 must never touch the guide plate 10.
There should be no difference in height between guide slot 14 and slot 15.

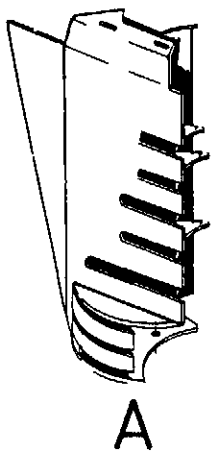
Guide 3 Fig. 95

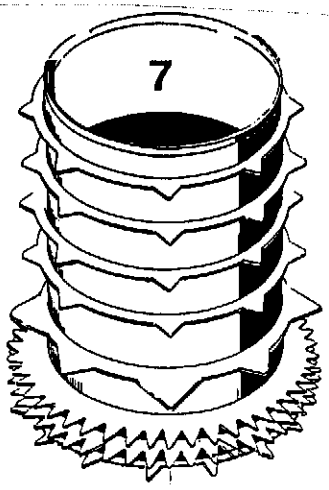
Here too, two points should be noted. The ends 16 of the scraper should be as close as possible to the wall of gathering drum 6.
Maximum distance = 5 mm.
Maximum distance between lower feed teeth 17 and guide plate is 4 mm.

Scraper 4 Fig. 95

Scraper 4 can be turned together with feed plate 20 around feed drum 7 to suit the actual channel width of the forage harvester. The ends 19 of the scraper should be as close as possible to the wall of the gathering drum 7 (maximum distance = 5 mm).

Fig.99





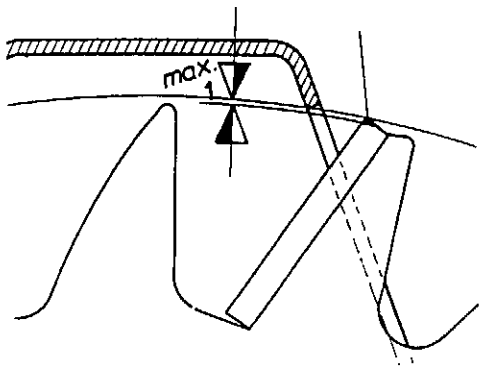
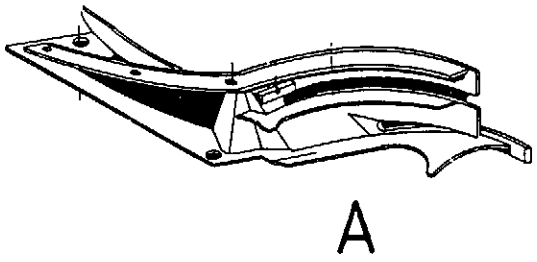
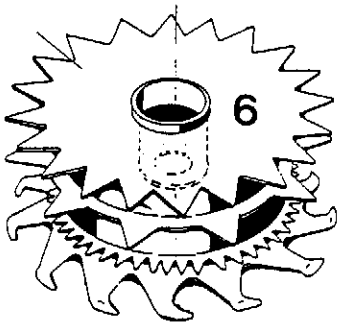


Fig.100





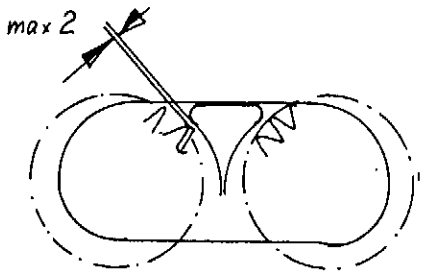
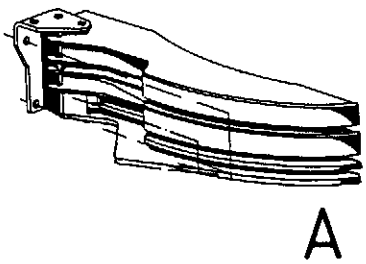
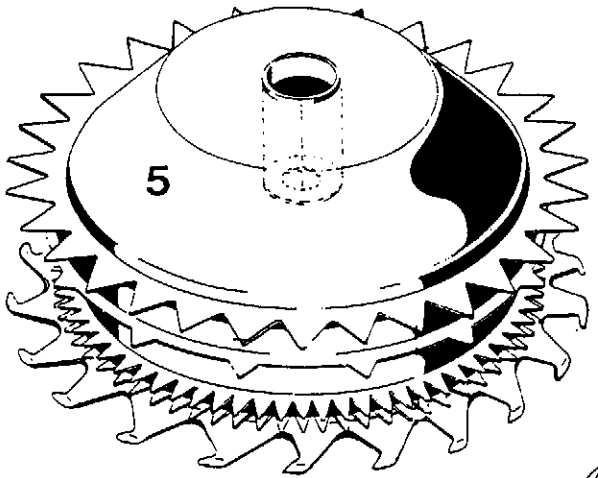
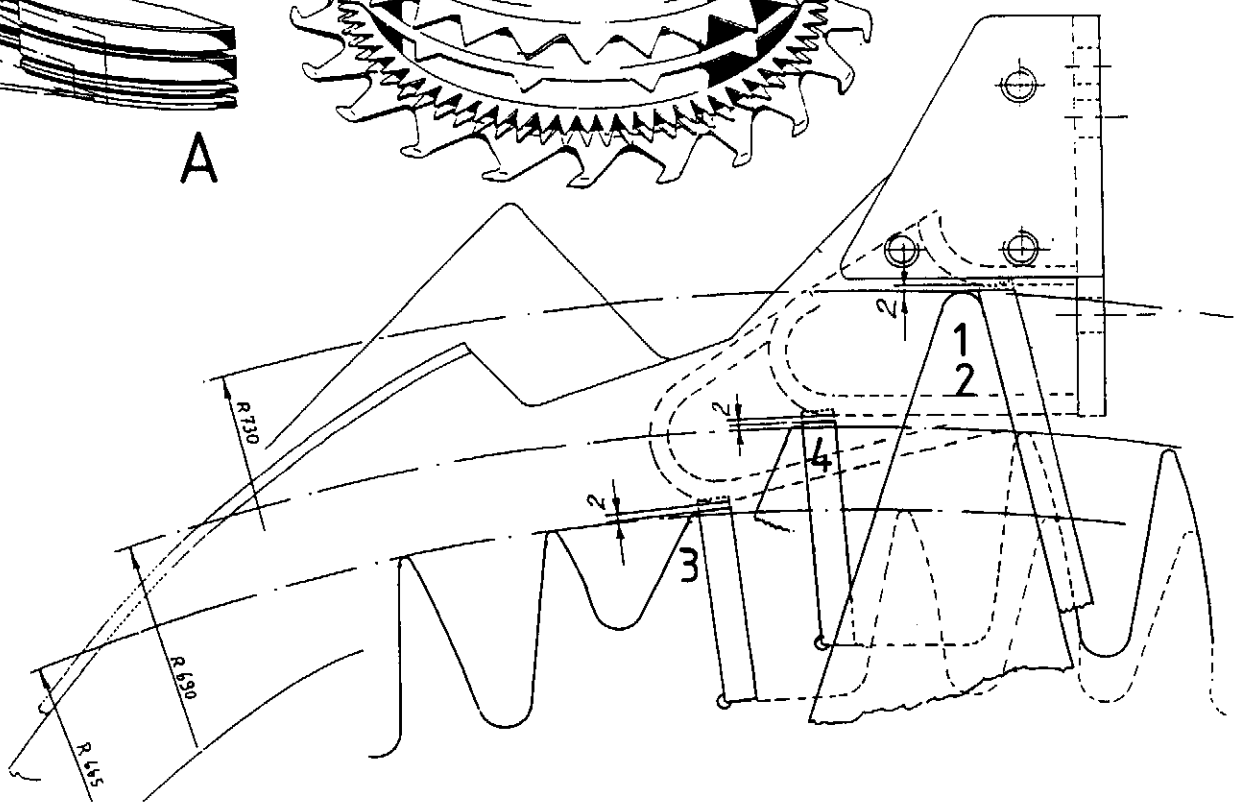


Fig.101







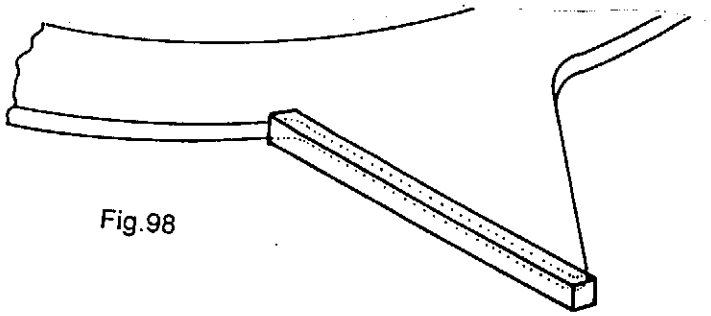


Fig.98

Cleaners fg. 98

The cleaners fitted to the tines of the gathering and feed drums constantly clear husk residues from the scrapers.

Distance

Maximum distance between cleaner and scraper edges: 1-2 mm

Feed drum fig. 99

The feed drum is fitted with two cleaners which are located in the area of the closely spaced bottom tines rows.

Small gathering drum fig. 100

The small gathering drum is equipped with three cleaners:
The two bottom cleaners pass through the scraper A and the top cleaner passes along the scrapers located under the central covering plate.

Large gathering drum fig. 101

All four tine rows are fitted with each one

Check

The cleaners are made from high-strenght special steel. Since they are constantly subject to wear they should be checked periodically. Accumulations of husk residues inside the scrapers A show that the cleaners are defective or not adjusted correctly.
Any wear of the cleaner points can be compensated by build-up welding (steel electrodes).

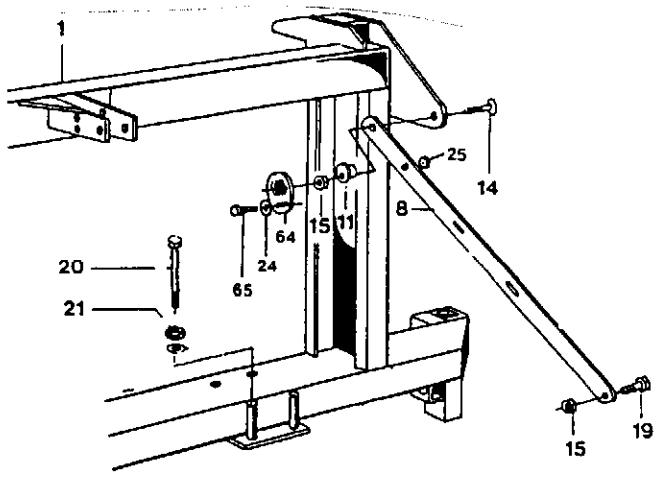


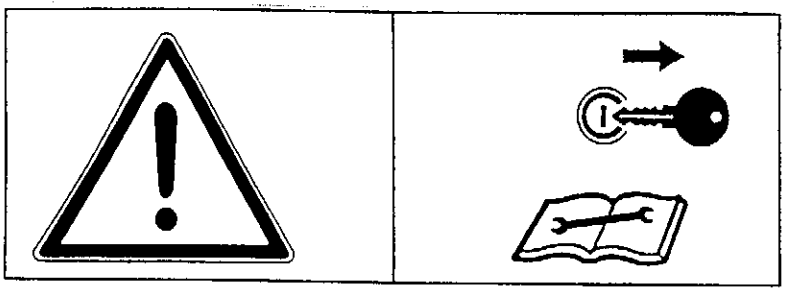
Fig.102

Mounting frame fig. 102

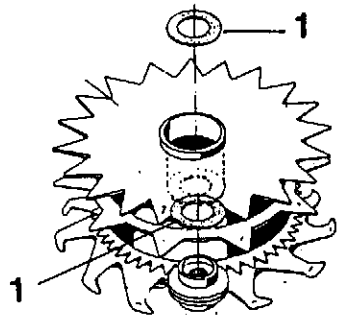
After the first 10 operating hours and then periodically check sturts 8 and screws 20 for proper seat.
When fitting mounting frame 1 thighten screws 20 first. Then secure the struts 8 with the top and bottom bolts and adjust the eccentric 11 so that the mounting frame is carried without tension. Finally tighten nut 15 and secure with lock tab 64.

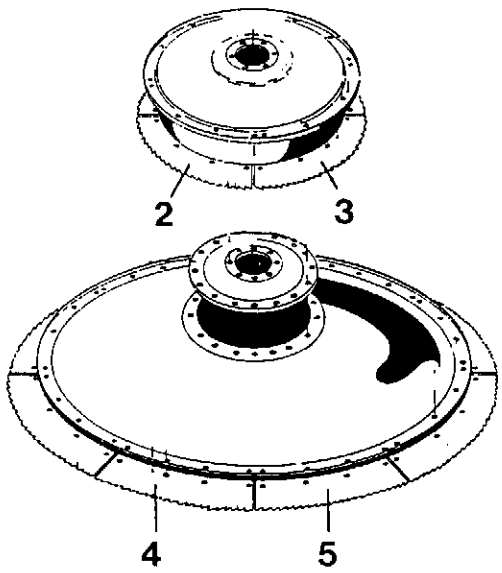
When problems arise

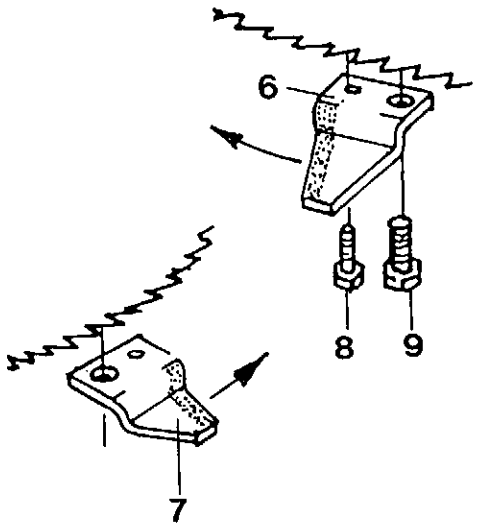
Prior to maintenance and repair work stop engine and remove ignition key.
Do not touch any moving machine parts. Wait until machine comes to a complete stop.

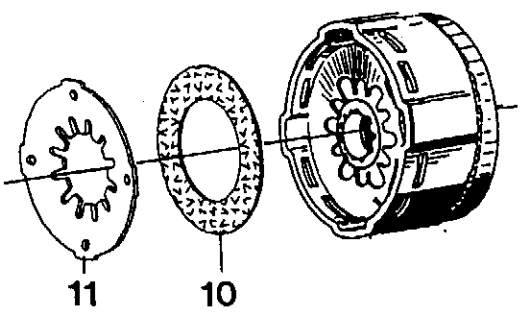


Problem	Possible cause	Remedy
Power required increases	Dull blades	Replace the blades
	Defective cleaners	Install new cleaners
Rotary cutters not rotating smoothly	Accumulation of leaves under the rotary cutters	Clean the area of the rotary cutters daily
	Dirt accumulation in the area of the rotary cutters	
	Defective cleaners	Install new cleaners
Header vibrates	Imbalance caused by differing blades	Replace blades in pairs
	Cleaners has been sheared off	Replace cleaners
	Imbalance caused by dirt inside the rotary cutter	Clean the rotary cutter
	Excessive vertical play of the blade	Align - install new blades if necessary
Accumulation of husks in the area of the scrapers	Scrapers not correctly positioned	See chapter "Maintenance and inspection of scrapers"
Corn stems are pushed to the front before they are cut - long uneven stubble	Accumulation of leaves on the small dividers	Clean the dividers
	One of the cleaners has broken	Replace both cleaners
	Dull blades	Install new blades
Overheating of the gearboxes	Too much oil in the gearbox	Check oil level
Gathering or feed drums stop (rotary cutters still rotating)	Accumulation of crop in the feed channel Clutch slips	Reverse the feed unit for a short moment. Repeat this step if necessary.
	Screw on top of the friction clutch lose	tighten the srewcs on block, see page 43
	friction discs worn out or smudge	replace or clean friction discs
	Defective gearbox	Replace components
Gathering drums and rotary cutters stop rotating	Defective claw-type discs (shifter collar)	Replace defective components
The entire left-hand or right-hand side of the header stops rotating	Left-hand or right-hand friction clutch defective (overload clutch)	see "Main drive friction clutch"
Obstruction in the hydraulic system of the outer folding mowing units	Foreign body, e.g. grain of sand, has obstructed the restrictor	Clean the restrictor located in the union at the cylinder inlet.









Most important wearing parts

Fig. Nr.	E-Teil Nr. Spare part no N° de pièce	Benennung Descr. Déscr.	Stück / Masch. Num./Mach. Nb de pcs/ groupe
1	59046	Reibscheibe 100 x 160 x 3 Friction disc Disque á friction	16
2	66035	Sägemesser innen 3,5 mm Cutting blade inside Segment de scie intérieur	4
3	66036	Sägemesser innen 2,5 mm Cutting blade inside Segment de scie intérieur	4
4	66037	Sägemesser außen 3,5 mm Cutting blade outside Segment de scie extérieur	4
5	66038	Sägemesser innen 2,5 mm Cutting blade outside Segment de scie extérieur	12
6	67156	Räumer rechtsdrehsinn Cleaner right-turning Débourreur à droite	4
7	67157	Räumer linksdrehsinn Cleaner left-turning Débourreur à gauche	4
8	57518	Schraube 8 x 25 - Sonder Screw Vis	8
9	63392	Schraube 10 x 25 - Sonder Screw Vis	8
10	57911	Reibscheibe 91 x 150 x 3 Friction disc Disque de friction	8
11	67184	Tellerfeder 152 x 63 x 2,6 (2xgrün) Belleville spring Ressort Belleville	4

Gamme de fabrication et de vente

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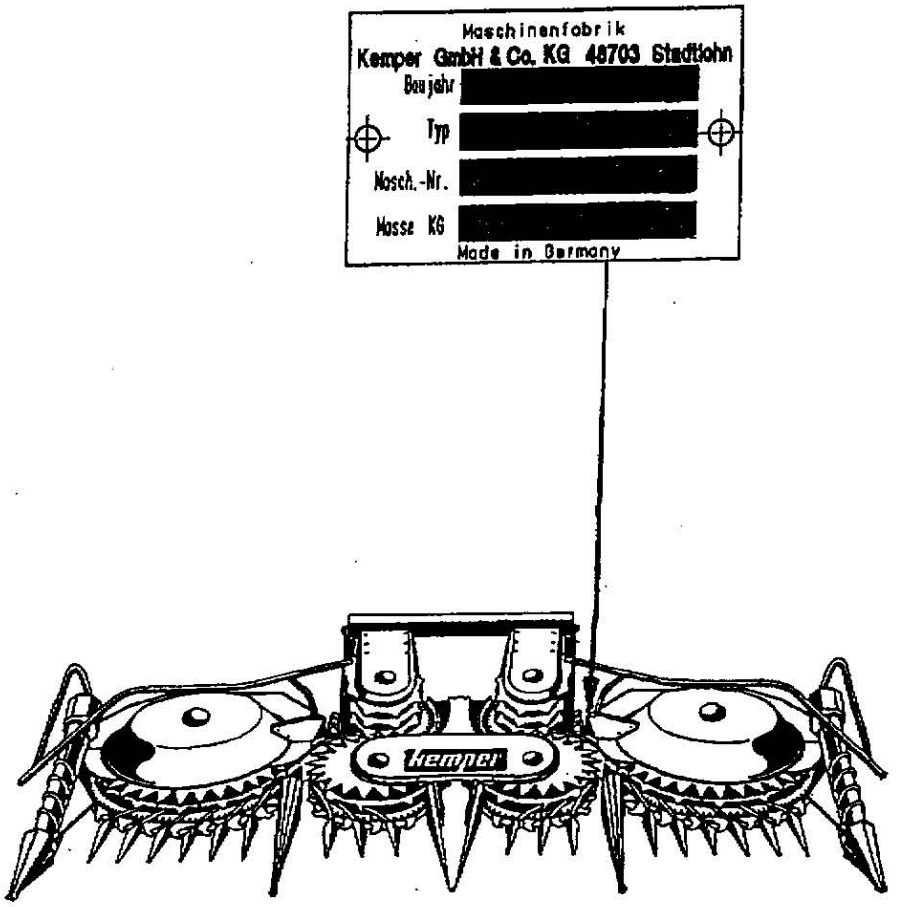

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