



# **SAMPO ROSENLEW**



# **C10 C12**

## **Combine Harvester Instruction Book**

**Sampo Rosenlew Ltd  
P.O.Box 50  
FIN-28101 PORI**

**0 815 619 04/2018  
Englanti**



## **THIS BOOK**

The purpose of this book is to enable the Operator to familiarize himself with the combine. It is of utmost importance that the Operator becomes familiar with the structures, adjustments and maintenance of his combine. Compliance with the advice and instructions given in this manual guarantees the best results at the lowest costs.

Have this manual always in the cab, in the special pocket reserved for it, for convenient reference.

This manual provides descriptions of as well as operating and maintenance instructions for several models in the series. Every combine does not have all the described features. The actual structure as well as the number of accessories and optional equipment depend on what was agreed in the delivery contract. This is to be kept in mind when reading the manual.

Item "Technical Specifications" has a description of the features of the combine. It does, however, not include retro-fitted accessories.

The Manufacturer reserves the right to modify the structure, adjustments or accessories of the combine as well as the service and maintenance instructions without further notification.

***SAMPO ROSENLEW Ltd***

# CONTENTS

This book	1
Safety Precautions	3
Warning Signs	7
Type Marking	9
Technical Specifications	11
Conformity to the EU Directives	13
Acceptance Inspection	14
Opening of the Guards	15
Structure and Functions of the Combine	20
Cut-away Picture of the Combine	21
Operator Controls and Instruments	24
Key to the Symbols	25
Operation and Adjustment	26
Threshing Equipment	36
Comvision	60
Automatic Cutting Height Control (AHC)	91
DHC	97
Driving and Threshing Instructions	98
Approximate Settings	105
Service and Maintenance	106
Transmission	132
Hydraulics	135
Electrical Equipment	138
Lubrication	145
Summary of Periodical Maintenance Procedures	148
Storage when Not in Use	149
Recommended Tools and Accessories	151
Screw Joints	151
Discarding of the Combine	152

## SAFETY PRECAUTIONS

Read carefully these instructions on safety and use before starting to operate the combine. Time spent in becoming familiar with the instructions now will save you money or may even spare you from injury. Before accepting the delivery of the combine, make sure it conforms to the delivery contract. Do not fit the combine with any accessories not approved of by the Manufacturer. The Manufacturer of the Combine is not responsible for any damage or injury caused by such accessories either to people or property.

### 1. TRANSPORTATION ON A VEHICLE OR BY RAIL

Make sure you know the measurements and weights of the combine and the transporter. Comply with any regulations governing the transportation. Use increased tyre pressures (2...2.5 Bar) to improve stability. Fix the combine securely in the transporter. For road transport lower the cutting table fully or disengage it.

### 2. DRIVING IN TRAFFIC

When driving on public roads, comply with the relevant statutory traffic regulations.

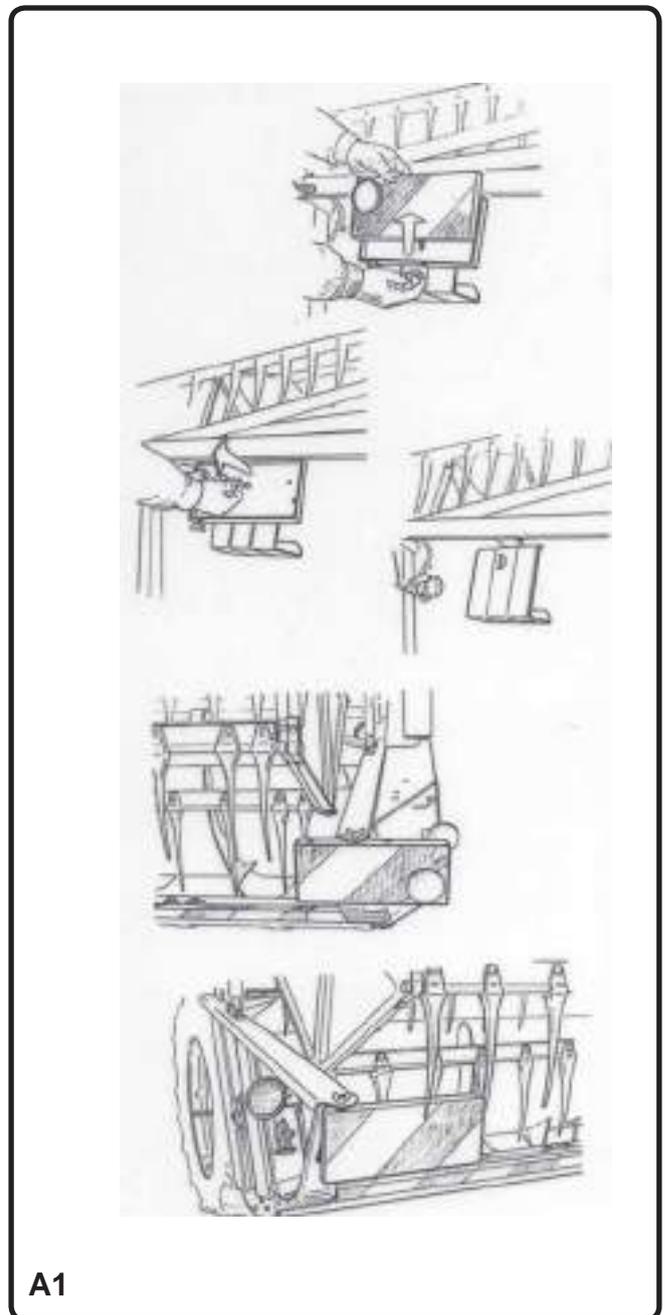
Remember the combine has rear-wheel steering.  
**The brake pedals must be latched together.** Test brake functions before driving on the road. Brake smoothly as the rear wheels of the combine easily rise from the ground when applying the brakes violently.  
**The safety switch on the instrument panel must be depressed.** The threshing equipment must be disengaged, **the straw dividers removed** and the unloading pipe locked for road transport.

**The knife shield and the front warning signs shall be fitted onto the table**, if it is permitted to drive on the road with the cutting table engaged. (Fitting of the front warning signs in accordance with the enclosed illustrations, A1).

The front and rear lights and the rear-view mirrors shall be correctly aligned.  
Never drive downhill with the gears in neutral.  
Never carry passengers on the combine.  
Never use the combine for transporting goods.  
Always have the grain tank empty when driving on the road.

### 3. THRESHING

Get familiar with the structure of the combine by studying the manual before starting threshing. Wear appropriate clothing. Avoid loose clothing that may get caught in moving parts. Keep the doors closed when working to prevent dust and noise entering the cabin. Use of hearing protectors is recommended. **Make sure the protective guards are properly attached and in good condition.** Sound the signal to warn people around the combine before starting the engine. Adjust the rear-view mirrors before starting to ensure good visibility of the road or the working area behind. Never use the combine for anything but threshing. Manual feeding of crops onto the cutting table is prohibited.



A1

Before starting, particularly reversing, make sure that everybody nearby is aware of your intentions. Test the brakes as soon as you start, and stop immediately if the brakes or steering operate defectively.

Never adjust the seat or steering wheel while driving. Never leave the cab while the combine is moving. Never leave the engine running unattended.

**Do not open the guards with the engine running.**

Do not mount, or allow others to mount, on top of the grain tank or the straw walkers with the engine running. Beware of the cutting mechanism and the rotating chopper knife.

Keep in mind that with the chopper rotating, there is a 20 m no-access danger zone behind it. /Fig. A2)

Drive carefully on hillsides; the combine may overturn, particularly with the grain tank full.

The combine cab is no safety cab.

THE RIGHT-HAND SIDE DOOR MAY BE USED AS AN EMERGENCY EXIT. PULL UP THE HANDLE, AND OPEN THE WINDOW. FIG. EXIT”.

Note the recommended safety distances when threshing under power lines.

**Stop the engine before cleaning or servicing the combine.**

Stop the combine and the engine immediately if there is an alarm or any abnormal sounds or smells. Find out the reason for them, and remove the problem before carrying on with threshing.

**Support or lock the cutting table and the reel before going beneath them.**

Never clean the combine without the proper equipment.

When leaving the combine, lower the cutting table, lock the parking brake, stop the engine and remove the ignition key.

**SAFETY DISTANCES WHEN THRESHING UNDER OPEN-WIRE POWER LINES**

The minimum space between the combine and power lines with voltage must be in accordance with the enclosed illustration, in which the danger zone is darkened.

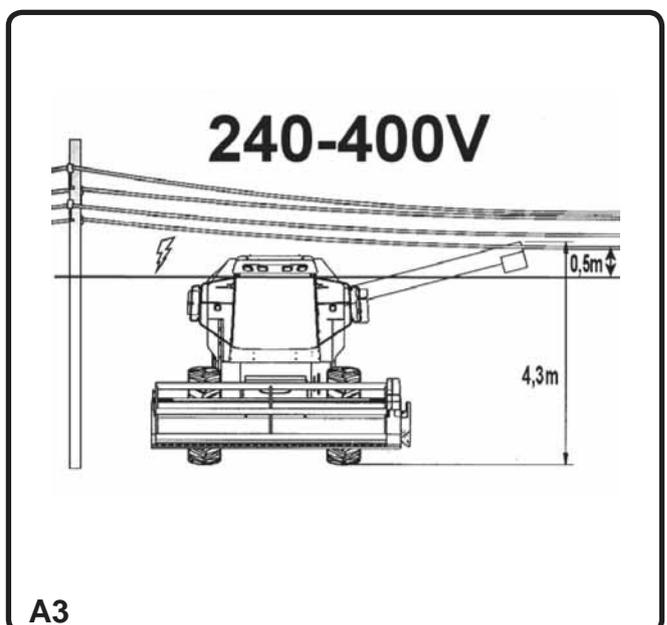
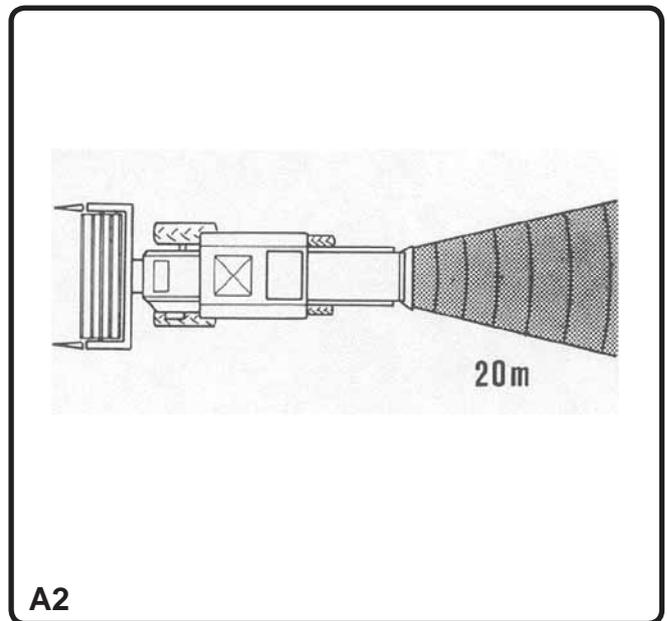
Low-voltage power lines (240/400V), fig. A3, can be distinguished from high-voltage lines (over 1 kV) by the smaller insulators and the fact that there are usually 4 low-voltage lines.

In case the height or voltage of the power line is difficult to estimate, the Electric Company shall be consulted.

**In Case of an Accident**

If there is an accident despite all precautions, keep calm and consider carefully what to do. First try to reverse the combine away from the power line. If there are other people near, ask them to check that the combine is not stuck in the line.

If the combine is just leaning against the lines, try to disengage it by driving. Follow the advice from the people nearby. Due to their own safety, they shall stay a minimum of 20 metres from the combine touching



the power line.

If the combine cannot be disentangled, and you have to leave the combine, jump down with your feet together in order not to touch the combine and the ground simultaneously. Do not make yourself a conductor through which electricity can pass; the real danger lies in touching the combine and the ground simultaneously.

Get away from the combine jumping either with your feet together or with only one foot on the ground at a time. Otherwise the electric field on the ground may create a fatal electric current between your legs. You will be safe at a distance of 20 metres from the combine. Beware of broken power lines lying on the ground. A combine touching a power line may catch fire. Leave the combine immediately if smoke starts coming from the tyres.

Make sure the combine is guarded at a safe distance. Do not try to get on the combine even if the power in the power lines may seem to have gone off.

Remember that open-wire lines never have a "blown fuse", but they are always dangerous unless made dead by an electrician. Even if the power went off, it may come back on in a while due to technical reasons. This may be repeated several times.

Contact the Electric Company and inform them about the exact site of the accident. By doing this, any risk can be eliminated and the fault repaired.

Ask the Electric Company for advice and follow it. Inform them about any contact with power lines even if there was no actual damage.

Source: Koneviesti Magazine 15/87

#### 4. REPAIR AND SERVICE

Always keep the combine in good condition.

Check the condition of fast moving parts daily. Pay special attention to the transmission mechanism and the rotating chopper knives. Replace defective parts before they become dangerous.

Make sure that all the guards and other safety equipment are in good condition and mounted before the combine is used.

Clean, repair and service the combine with the transmission and engine off, the ignition key off the ignition and the master switch in its off position.

Disconnect the battery minus cable before repairing the engine or the electrical instruments.

Do not use inappropriate tools to connect and disconnect the battery.

Do not make an open fire or smoke near the battery. Handle the battery acids with care.

Do not add air in the tyres without a pressure gauge due to risk of explosion.

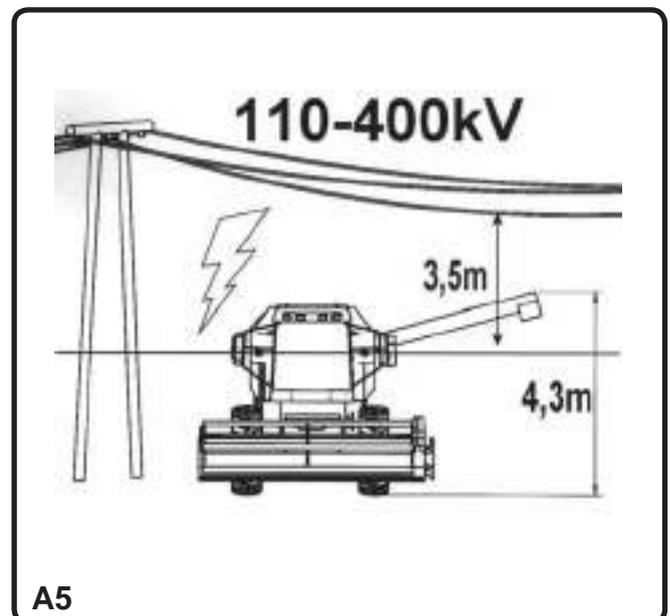
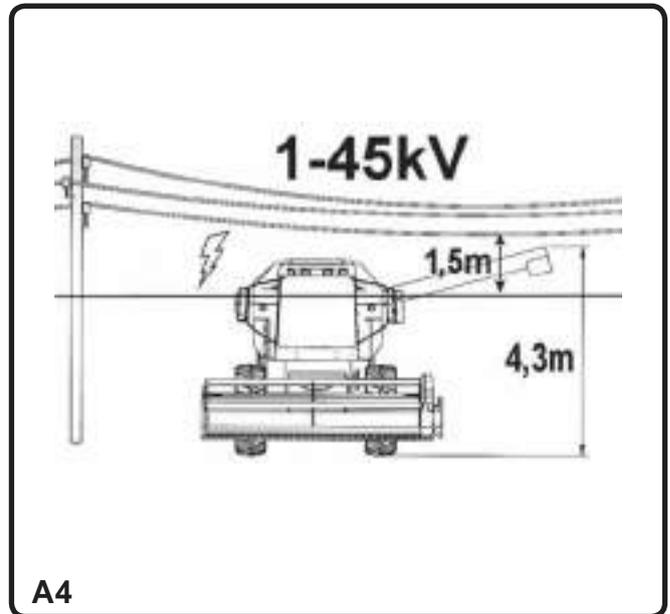
Do not add coolant with the engine running.

Do not remove the radiator cap from an overheated engine. Do not refuel with the engine running.

Do not smoke while fuelling.

Do not adjust the hydraulic working pressure without a pressure gauge due to possible damage to the hoses.

When servicing the hydraulics, be aware of the



high pressure in the system. Make sure there is no pressure in the system or in the pressure reservoir before disconnecting the connectors.

Never use over-sized fuses; they involve risk of accident.

Never start the combine with anything but the ignition key.

When refitting a wheel, tighten the fixing screws to the correct torque.

Attach accessories such as the trailer using the appropriate equipment.

Tow the combine only from designated points.

**This symbol in the manual refers to a special risk involved in taking a certain measure, due to which extra caution shall be practiced.**



## 5. THE LAWS AND REGULATIONS

Combine harvester is a complex device, and dangerous if misused. User manual must always be preserved with the machine at the place reserved for it and if needed, new drivers should be instructed to operate the machine. Different countries have different safety at work and traffic regulations. Get to know the existing regulations of your area.

## 6. FIRE SAFETY

Two factors are needed to start a fire: flammable material and ignition; oxygen is always available.

Threshing generates a lot of light and highly flammable dust. Therefore it is important to clean the combine on a regular basis and the engine compartment daily.

Oil and fuel leaks increase the risk of fire. Repair any defects immediately.

High temperature near the exhaust pipe makes the area fire-prone. A fire may also be caused by a short circuit in the electric system, slipping of an overloaded belt, a damaged bearing or overheating of the brakes.

Make sure there is at least one 6-kilo class AB fire extinguisher located in its marked place on the combine at all times.

In particularly dry and dusty circumstances another similar extinguisher is to be placed near the engine compartment.

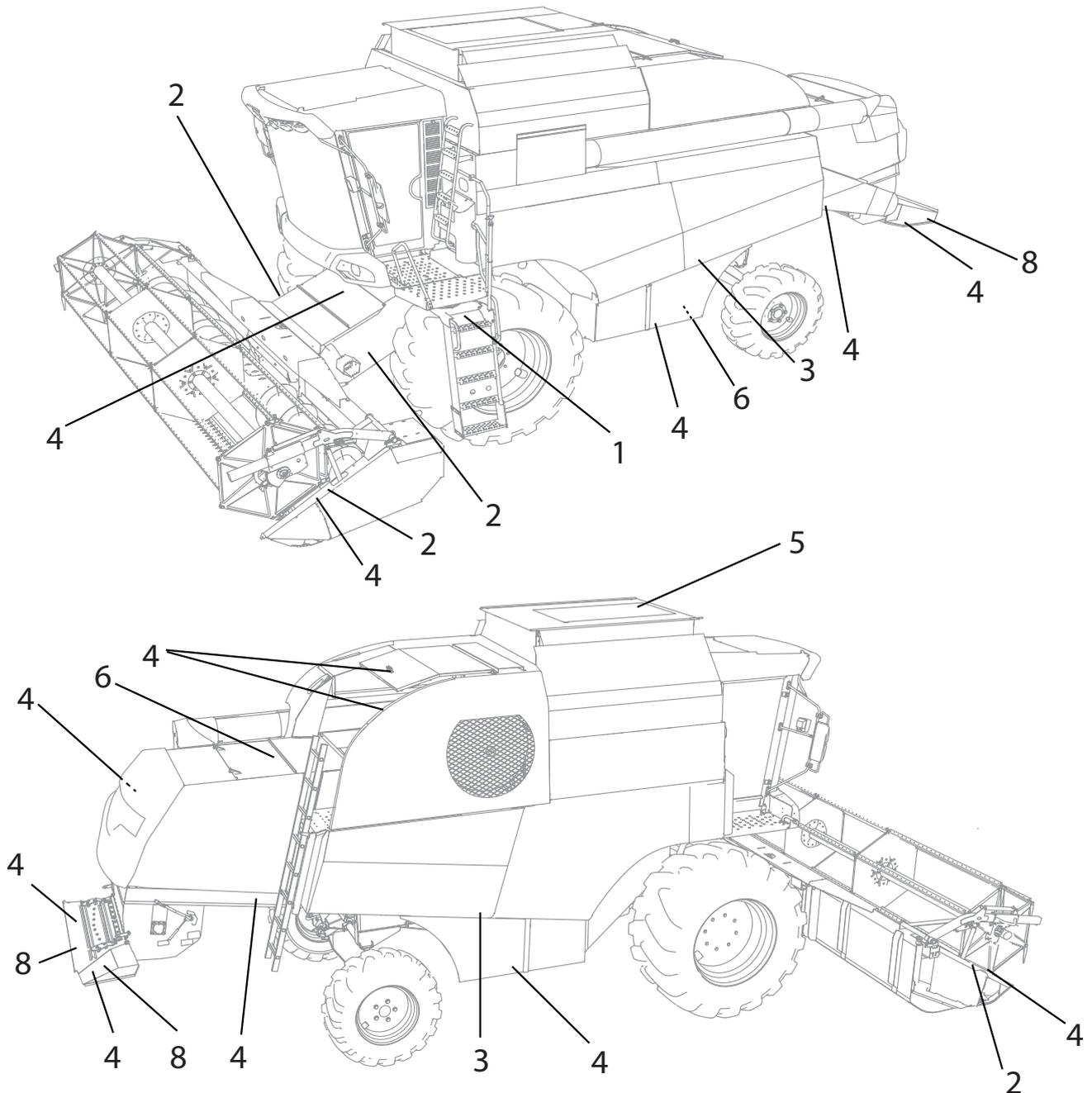


# MARKING OF THE DANGER POINTS

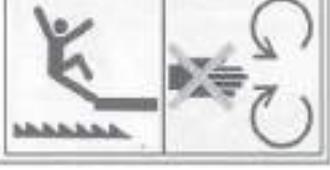
The structures of the combine have been designed to be as safe to use and service as possible. This manual provides instructions on how to eliminate any risks there may be in the use of the combine. The danger points have been marked on the combine using danger symbols. The following diagram shows the location of the markings. Check regularly that the markings are clearly visible.

On the following page you will find the key to these symbols. The danger symbols are based on the international ISO 11 684 standard.

## Location of the Danger Symbols



## DANGER SYMBOLS

Danger	How to avoid it	No	Symbol
Subject to danger due to insufficient information	Read the manual before starting the combine	1	
A raised part may fall down	Support raised parts before going under them	2	
Gap in belt drive	Stop the engine and remove the ignition key before removing any guards	3	
Getting entangled in moving parts	Stop the engine and remove the ignition key before removing any guards and /or reaching a the danger zone	4	
Getting entangled in rotating auger	Stop the engine and remove the ignition key before removing any guards	5	
Getting entangled in rotating auger	Do not reach into an opening with the engine running	6	
Falling into moving machinery	Stop the engine and remove the ignition key before removing any guards	7	
Danger caused by hurtling objects	Keep at a safe distance from the combine	8	
Kickback or upward motion of arm handle	Stop the engine and remove the ignition key before inserting the handle	9	

# TYPE MARKING

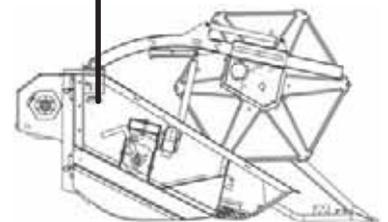
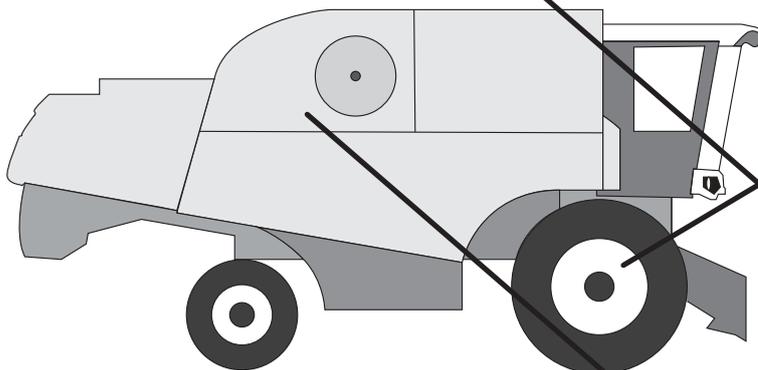
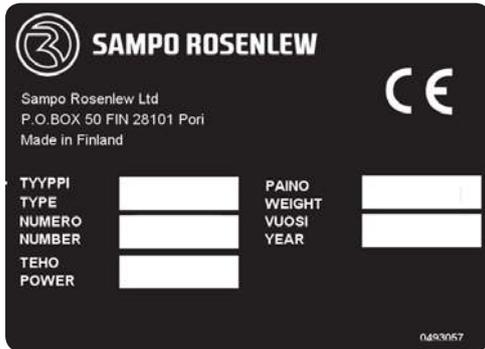
When ordering spare parts or service, always quote the type marking and number shown on the machine plate of the combine. When ordering parts for the cutting table, also quote the type marking and number shown on the cutting table.

When ordering engine parts, also quote the engine number.

Write down the numbers of the combine and engine on this page (and in the spare parts list).

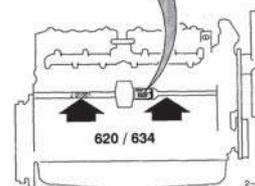
Combine type plate

Cutting table type plate



Combine number

Engine number



Note! Left side of the combine = The side of the cab with the stairs  
 Right side of the combine = The side with the fuel tank

## TECHNICAL SPECIFICATION C10 & C12

(ISO 6689 standard has been used in measuring)

### Cutting table

Cutting width (m)	4,5	4,8	5,1	5,7	6,0	6,3	6,9
Cutting height (m)	-0,20...+1,30						
Knife, Number of Strokes	1020 cycles/min						

### Reel

Diameter (m)	1,05
Speed range RPM	0.....50

### Threshing Cylinder

Width (m)	1,33	Prethreshing Cylinder	1,33
Diameter (m)	0,5		0,4
Number of rasp bars	8		
Speed range RPM	600...1300 MD 400...1150 HD (Maize)		

### Concave

Area (m <sup>2</sup> )	0,62	Pre Concave	0,41
Angle of wrap	105°		
Number of rasp bars	12		
Clearance in front (mm)	6...42		

### Straw Walkers

Number	6
Separating area (m <sup>2</sup> )	6,30

### Shaker Shoe

Area	4,50 m <sup>2</sup>	Chaffer	2,30 + 0,40 m <sup>2</sup>	Sieve	1,8 m <sup>2</sup>
------	---------------------	---------	----------------------------	-------	--------------------

### Grain Tank

Volume (m <sup>3</sup> )	6,00	7,60
Unloading height (m)	4,40	4,40

### Engine Sisu Power

	<b>C10</b>	<b>C12</b>
Power kW / hp / num.of cyl.	175/238/6	221/300/6

RPM	2000	2000
-----	------	------

### Traction Drive

Hydrostatic

### Driving speed (km/h)\*

Final drives	Hydrostatic Traction Drive					
CIT	I	0...6,6	0...5,3 (ger)	4WD	0... 5,8	0... 4,6 (ger)
	II	0...10,7	0...8,8 (ger)	4WD	0... 8,5	0... 7,0 (ger)
	III	0... 25	0...20 (ger)			

\* Speeds may vary depending on the size of the tyres

**Turning radius (m)**      7,7 (C10)      8,0 (C12)

### Tyres / Air pressure (bar)

Front

Tyres	Weight limit kg				
	10500	11200	11230	11700	12700
650/65R38 157A8	1,6	1,8	2,0	2,0	2,0
650/75R32 172A8	1,6	1,8	2,0	2,0	2,0
800/65R32 172A8	1,5	1,6	1,6	1,8	1,9
900/60R32 176A8	1,4	1,5	1,5	1,7	1,8
1050/50R32 178A8	1,3	1,4	1,4	1,5	1,6

Rear

Tyres	Weight limit kg				
	10500	11200	11230	11700	12700
380/70R24 125A8	1,9	1,9	1,9	2,0	2,0
480/65R24 133A8	1,8	1,8	1,8	1,9	1,9
540/65R24 146A8	1,7	1,7	1,7	1,8	1,9

### Wheel track (m)

Front

Final drives	Tyres					
	650/65R38 rim 18x38	650/65R38 rim 16x38	650/75R32	800/65R32	900/60R32	1050/50R32
CIT	2,78 / 2,89	2,68 / 2,99	2,85 / 2,81	2,93	3,03	3,22

Rear

Tyres		
380/70R24	480/65R24	540/65R24
2,71	2,61 (2,80 4WD)	2,61 (2,80 4WD)

### Volumes (litres) (Oil volumes mentioned in the manual lubrication table)

Fuel tank	350 (C10)	450 (C12)
Cooling system	27	
DEF	60	

<b>Weight (kg)</b>	<b>C10</b>	<b>C12</b>					
Without table and chopper	10920	12240					
<b>Cutting table (m)</b>	<b>4,5</b>	<b>4,8</b>	<b>5,1</b>	<b>5,7</b>	<b>6,0</b>	<b>6,3</b>	<b>6,9</b>
<b>Weight (kg)</b>	1290	1340	1400	1500	1500	1600	1650
<b>Chopper weight (kg)</b>	280						
<b>Maize table 6 row (kg)</b>	2000						
<b>Length (m)</b>	<b>C10</b>	<b>C12</b>					
On the road	9,9	10,4					
Without cutting table	8,5	9					
In the field	11,4	11,9					

### Width (m)

On the road w/o table

Final drives	Tyres					
	650/65R38 rim 18x38	650/65R38 rim 16x38	650/75R32	800/65R32	900/60R32	1050/50R32
CIT	3,4 / 3,5	3,28 / 3,58	3,5 / 3,46	3,73	3,93	4,27

<u>With Table (m)</u>	<u>4,5</u>	<u>4,8</u>	<u>5,1</u>	<u>5,7</u>	<u>6,0</u>	<u>6,3</u>	<u>6,9</u>
	5,03	5,34	5,64	6,25	6,56	6,86	7,47

**Height with cabin (m)** 3,95

**Noise level in cabin dB(A) (O. E. C. D.-1967/6)** 75

The weighted acceleration subjected to operator's arms does not exceed 2,5 m/s<sup>2</sup> (ISO-5349)

The weighted acceleration subjected to operator's body does not exceed 0,5 m/s<sup>2</sup> (ISO-2361)

## CERTIFICATE ON CONFORMITY TO THE EU DIRECTIVES

**Manufacturer**

Sampo-Rosenlew Ltd  
Konepajanranta 2A, P.O.Box 50  
28101 Pori Finland

**Collector of technical specification**

Kalle Pärkö  
Sampo-Rosenlew Ltd  
Konepajanranta 2A, P.O.Box 50  
28101 Pori Finland

Declares that the machinery placed on the market:

**Combine Harvester**

Type: \_\_\_\_\_

Serial Number: \_\_\_\_\_

complies with the technical requirements specified in the:

2006/42/EC machinery directive  
97/68/EEC engine emission directive  
89/336/EEC electromagnetic compatibility

The machinery has been designed in conformity with the following international standards:

EN-ISO 4254-7 Combine harvesters and forage harvesters, Safety  
EN-ISO 14121-1 Safety of machinery. Risk assessment  
EN-ISO 14982-1998 EMC acceptance criteria

16.12.2013 Pori



Jali Prihti  
Managing Director  
Sampo Rosenlew Ltd

## ACCEPTANCE INSPECTION AND GETTING STARTED

The combine leaves the factory packaged in an appropriate way to ensure undamaged delivery.

Before using the combine, the following measures shall be taken.

- Read the instruction manual carefully.
- Remove any loose parts stored in the grain tank.
- Check the combine for any transport damage or lost parts. (If necessary, contact the dealer or the transport company.)
- Make sure the combine complies with the purchase contract. (If necessary, contact the dealer.)
- Attach any parts removed before shipment such as lamps, mirrors, etc.
- Put the fire extinguisher in its place.
- Check the oil and coolant levels.
- In case the combine has been stored for over a year, perform annual service according to the manual.
- Check and lower tyre pressures to comply with the manual.
- Make sure the threshing mechanism can rotate unhindered and that there are no foreign objects inside the combine before starting the engine.
- Engage the cutting table if delivered disengaged.
- Assemble, fit and adjust the straw dividers as shown in the drawings in the spare parts catalogue
- Fit the crop lifters as instructed in the manual.
- Test-run the combine as instructed in the manual under "Storage when Not in Use".

## IMPORTANT NUMBERS

Check and write down the following numbers:

The combine serial number \_\_\_\_\_

The cutting table serial number \_\_\_\_\_

The engine serial number \_\_\_\_\_

The cab key number \_\_\_\_\_

The fuel tank key number \_\_\_\_\_

## OPENING OF THE GUARDS

To ensure safety, the movable guards in the combine have been equipped with a locking device. They cannot be opened without the appropriate tool supplied with every combine, hanging on a hook on the back wall of the cab. (The guards can also be opened with a 13 mm socket wrench or a screwdriver.) The guards get locked automatically when closed. Some guards also have additional clamps.

Unlock the guard at the left end of the cutting table, fig. B1b by turning the locking device counter-clock wise. To open the guard, pull the handle outwards and lift the guard slightly upwards at the same time. The guard gets locked automatically when closed.



The side guards, fig. B2b, are released by placing the tool in the hole at the lower part of the guard and turning counter-clockwise. The guard opens when the lower edge is pulled outwards. The guard rests on the gas springs. The guard is locked automatically when closed.

The lower guards on the combine can be opened. The front and rear of the guard can be opened separately. The front of the lower guard is opened by unlocking the front of the guard using the tool. Fig. B2c. To open the rear, slack screws on both sides of the rear guard and remove guard. There is space for a tool kit on the left behind the front guard.



The rear guard of the chopper, fig. B3, (straw spreader) is released by opening the side locks on both sides of the combine. The guard gets locked in the upper position. When the guard is lowered, make sure the guard gets locked at the required height on both sides.

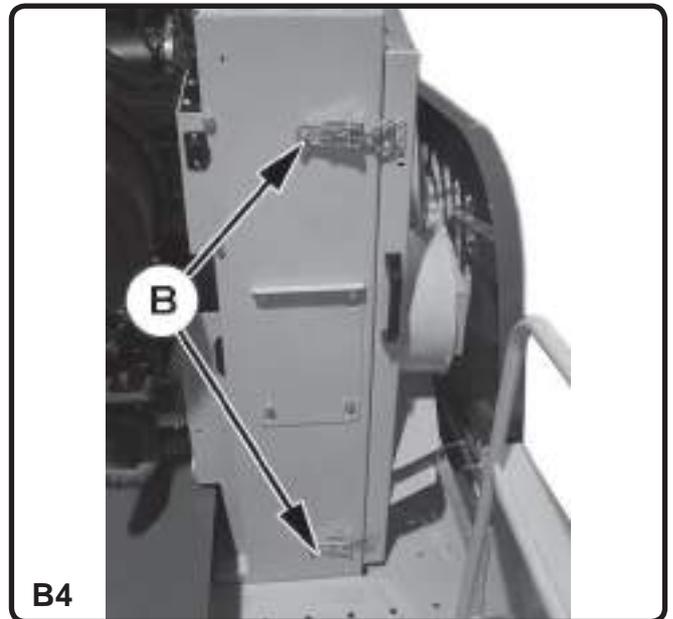
Choppers belt guard is opened by loosening the bolt on the guard and turning the cover open. The guard is secured in the upper position with a rubber strip.

Straw hoods plastic cover is opened by lifting the bottom upwards, then loose the bolts of the inner guard and remove inner guard.

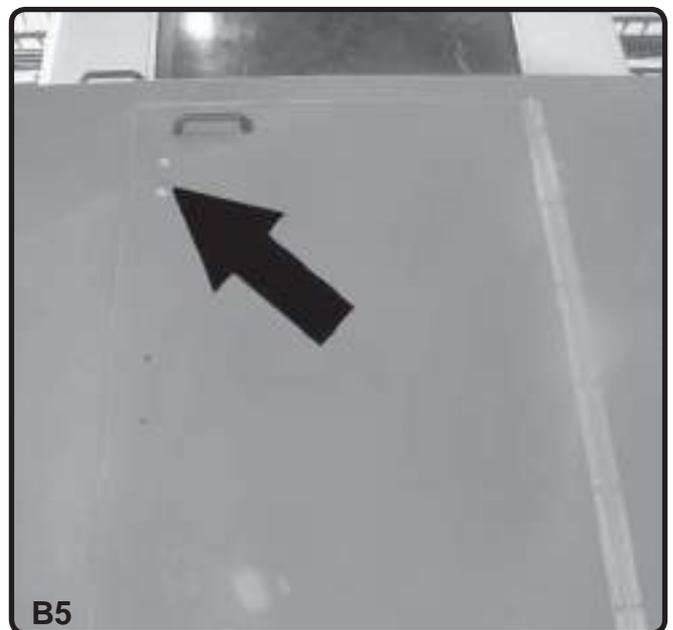


To clean the equipment, the fan unit in front of the radiator may be turned open by opening latches B. (Fig.B4)

The top door to the straw walker compartment is locked with a hexagonal screw.

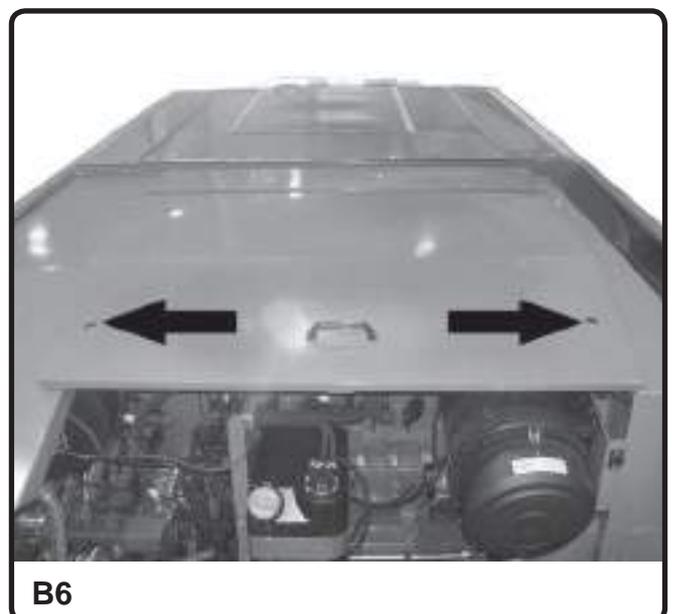


Open the locking on the grain tank cover, fig. B5, by placing the tool in the hole and turning counter-clockwise.



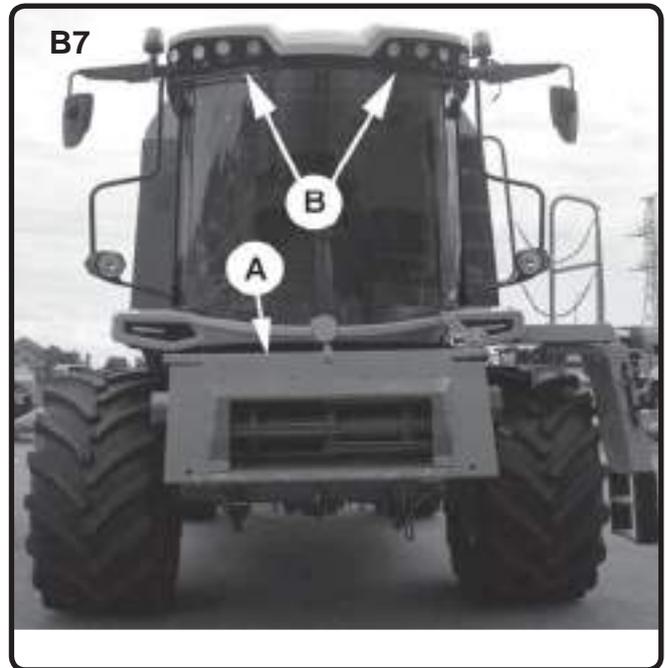
Open the cover above the engine compartment like this:

- Unlock the locks on both sides of the cover using a tool and lift upwards Fig. B6.



## Windscreen cleaning

When cleaning the windscreen, climb on top of the crop elevator A and hold on of the top arms B (Figure B7.)



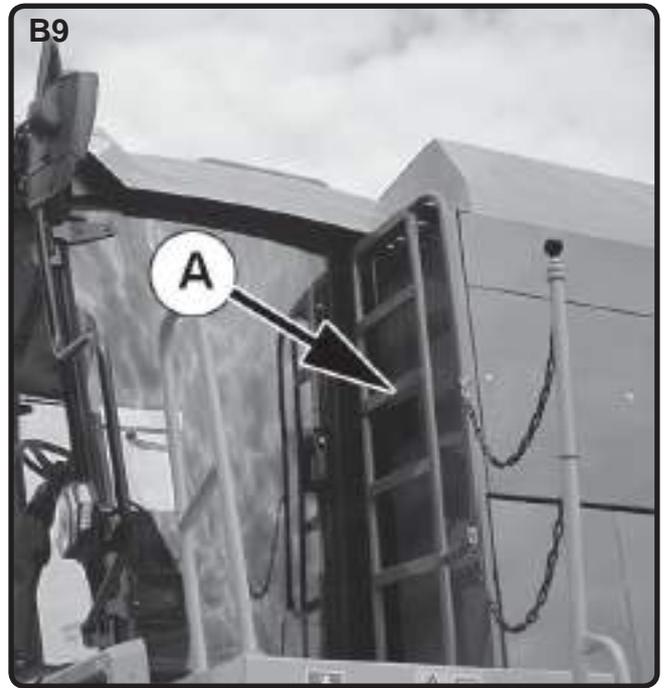
Fire extinguisher is placed in the stairs. (A, Figure B8).



## Access ladder, grain tank

CAUTION: Shut off the engine and set the park brake.

Use ladder A to get into grain tank. (Figure B9.)



# **STRUCTURE AND FUNCTIONS OF THE COMBINE**

## **Standard Threshing Mechanism**

**The cutting and feeding equipment take the crops in for threshing.**

The straw dividers limit the crop to be cut and bring it within reach of the reel.

The reel, together with the crop lifters, lift up the laid-down crop up and take it from the cutting knife onto the table auger.

The table auger gathers the cut crop and feeds it onto the crop elevator, which takes the crop forward to be threshed. Stones and other heavy objects are pushed to the stone trap thus preventing damage to the threshing mechanism.

**The threshing mechanism separates the grains from the straw.**

The threshing cylinder beats the grain off on the concave. Most of the threshed grain and chaff go through the concave into the grain pan.

The rear beater and the concave extension take the threshed straw onto the straw walkers.

**The separating and cleaning equipment sieves the grains.**

The straw walkers separate the grains from the straw and eject the straw out to the field from the rear of the combine. The grains run along the bottom grooves to the grain pan.

The grain pan takes the threshed material to the shaker shoe. The chaff and any light remains are sorted topmost in the grain pan with the grain at the bottom.

The air stream from the fan lifts the light chaff in the air and transports it over the shaker shoe and out of the machine. Heavier grains and any partly threshed material fall through the chaff sieve. Any larger remains move out along the sieve. Clean grain falls onto the grain auger through the grain sieve and is transported from there by the grain elevator and filling auger to the grain tank.

The grains and occasional straw bits, which lie on the shaker shoe extension, fall to the returns course to be re-threshed.

**The chopper cuts and spreads the straw.**

After the straw walker, the straw is either discharged uncut onto the field or taken to the chopper, which cuts and spreads it out.



# **STRUCTURE AND FUNCTIONS OF THE COMBINE,**

## **The TS Threshing Mechanism**

### **The cutting and feeding equipment take the crops in for threshing.**

The straw dividers limit the crop to be cut and bring it within reach of the reel.

The reel, together with the crop lifters, lift up the laid-down crop up and take it from the cutting knife onto the table auger.

The table auger gathers the cut crop and feeds it onto the crop elevator, which takes the crop forward to be threshed. Stones and other heavy objects are pushed to the stone trap thus preventing damage to the threshing mechanism.

### **The threshing mechanism separates the grains from the straw.**

The cut crop first comes onto the pre-cylinder, which gently separates the most easily threshable grains and ejects them through the pre-concave to the front of the grain pan. The pre-cylinder also evens out the feed onto the main cylinder.

The rest of the grains are threshed off by the main cylinder and concave. Most of the threshed grain and chaff go through the concave into the grain pan.

The rear beater and the concave extension take the threshed straw onto the straw walkers.

### **The separating and cleaning equipment sieves the grains.**

The straw walkers separate the grains from the straw and eject the straw out to the field from the rear of the combine. The CSP ruffling drum placed above the straw walkers intensifies the separation of loose grains from the straw by opening a fluffier area into the straw flow. The grains run along the bottom grooves to the grain pan. The grain pan takes the threshed material to the shaker shoe. The chaff and any light remains are sorted topmost in the grain pan with the grain at the bottom.

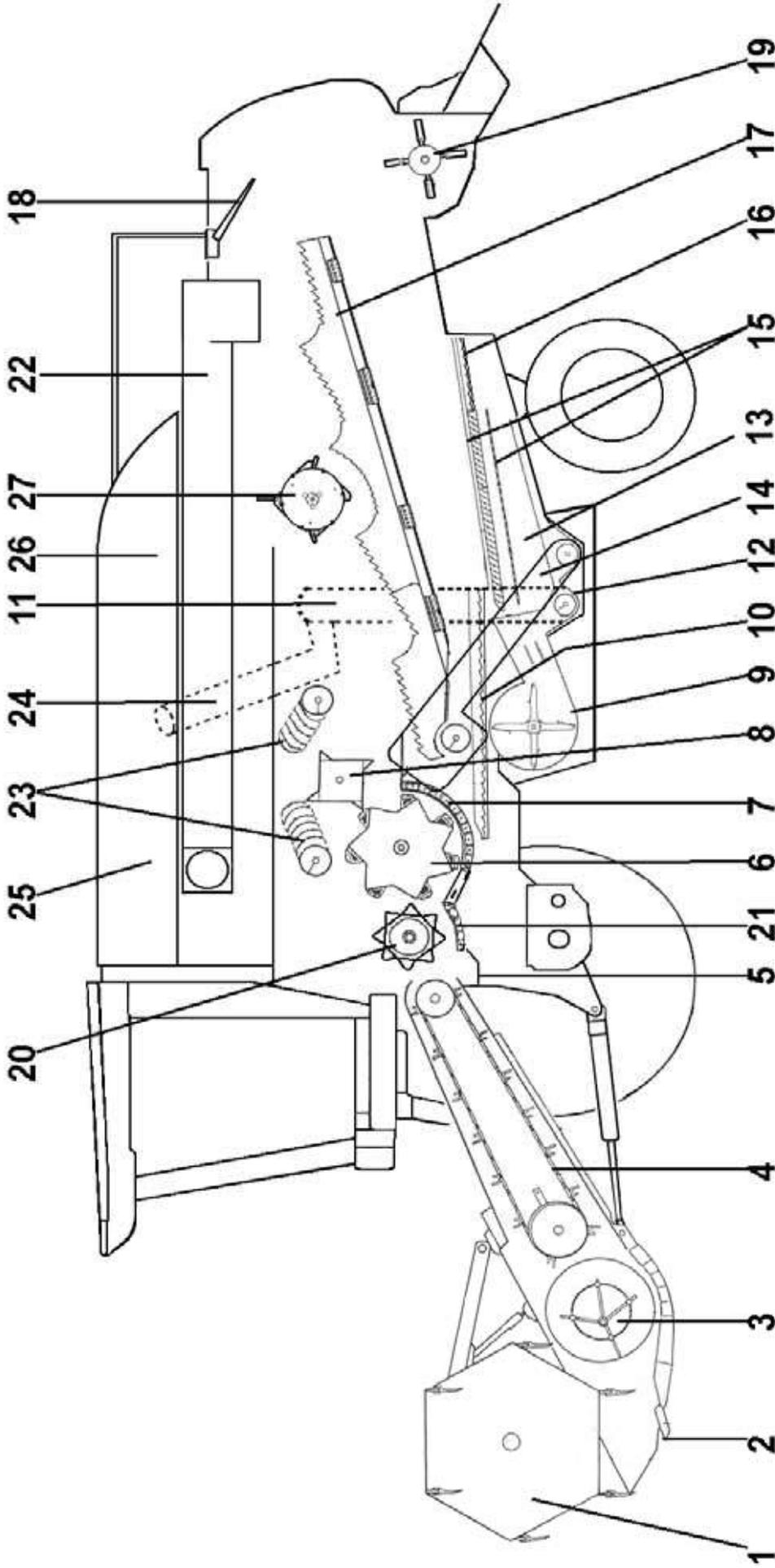
The air stream from the fan lifts the light chaff in the air and transports it over the shaker shoe and out of the machine. Heavier grains and any partly threshed material fall through the chaff sieve. Any larger remains move out along the sieve. Clean grain falls onto the grain auger through the grain sieve and is transported from there by the grain elevator and filling auger to the grain tank.

The grains and occasional straw bits, which lie on the shaker shoe extension, fall to the returns course to be re-threshed.

### **The chopper cuts and spreads the straw.**

After the straw walker, the straw is either discharged uncut onto the field or taken to the chopper, which cuts and spreads it out.

# CUT - AWAY PICTURE OF THE COMBINE, the TS Threshing Mechanism

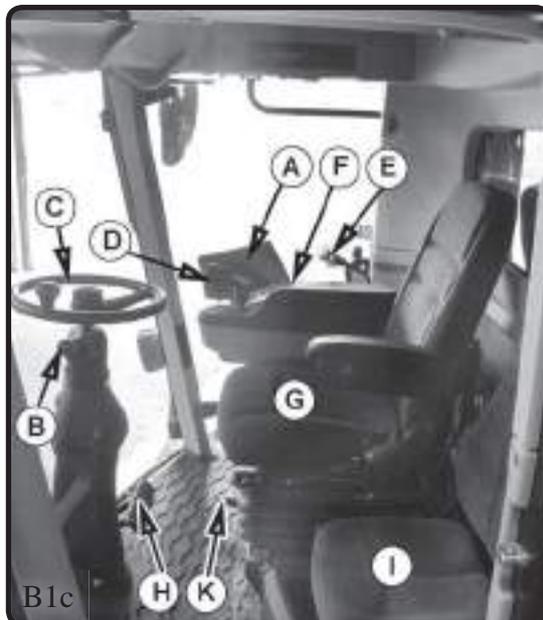


- |                  |                       |                    |                     |                     |            |
|------------------|-----------------------|--------------------|---------------------|---------------------|------------|
| 1. Pick-up reel  | 6. Threshing cylinder | 11. Grain elevator | 16. Sieve extension | 21. Pre-concave     | 26. Engine |
| 2. Cutter bar    | 7. Concave            | 12. Auger housing  | 17. Straw walkers   | 22. Unloading auger | 27. CSP    |
| 3. Table auger   | 8. Rear beater        | 13. Shaker shoe    | 18. Straw alarm     | 23. Bottom augers   |            |
| 4. Crop elevator | 9. Fan                | 14. Return auger   | 19. Straw chopper   | 24. Filling auger   |            |
| 5. Stone trap    | 10. Grain pan         | 15. Sieves         | 20. Pre-cylinder    | 25. Grain tank      |            |

# OPERATOR'S CONTROLS AND INSTRUMENTS

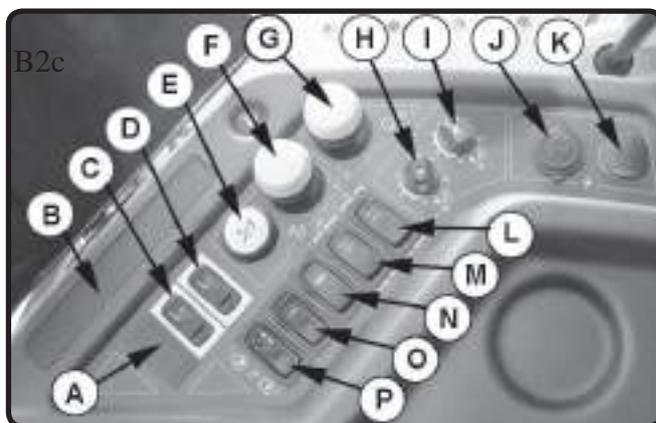
## Operator's Platform / Cab (fig. B1c)

- A Comvision- display
- B Multi-function Lever
- C Steering Wheel
- D Traction Speed Control Lever
- E Gear Lever
- F Instrument Panel
- G Seat
- H Brake Pedals
- I Buddy Seat
- K Handbrake



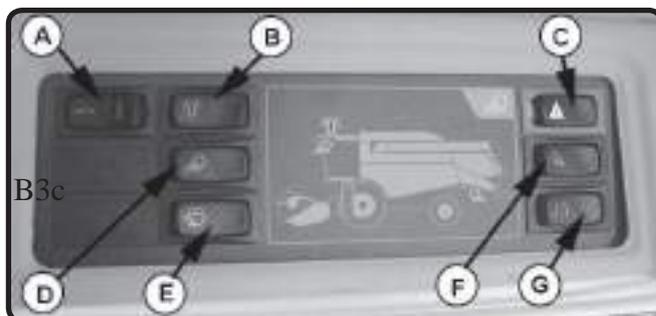
## Instrument Panel (fig. B2c)

- A Cover
- B Instruction light panel
- C Vertical Knife, left (optional)
- D Vertical Knife, right (optional)
- E Reversing of Cutting Table and Feeding Mech.
- F Cutting Table Start/Stop
- G Threshing Mech. Start/Stop
- H AHC Pre-setting height
- I AHC Automatic height
- J USB
- K Electric Outlet
- L Direction of Straw Chopper Spray
- M Direction of Straw Chopper Spray
- N Grain tank cover raising
- O 4WD Switch (optional)
- P Electric accelerator



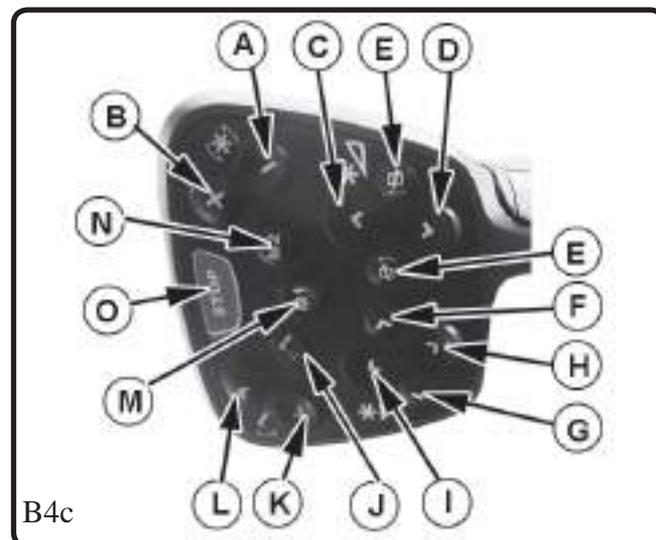
## Switches (fig. B3c)

- A Main switch
- B Rotating Flasher
- C Emergency Flasher
- D Working Lights
- E Windscreen Wiper/Washer
- F Working Lights
- G Safety Switch, driving in traffic



## Multi-Function lever switches (Fig.B4c)

- A Decrease pick-up reel RPM
- B Increase pick-up reel RPM
- C Cutting table up
- D Cutting table down
- E Cutting table tilt
- F Pick-up reel backward
- G Pick-up reel onward
- H Pick-up reel down
- I Pick-up reel up
- J Grain tank unloading start/stop
- K Unloading tube out
- L Unloading tube in
- M Memory slot 1
- N Memory slot 2
- O Emergency stop (Stops cutting table and unloading)



# SIGNS AND SYMBOLS

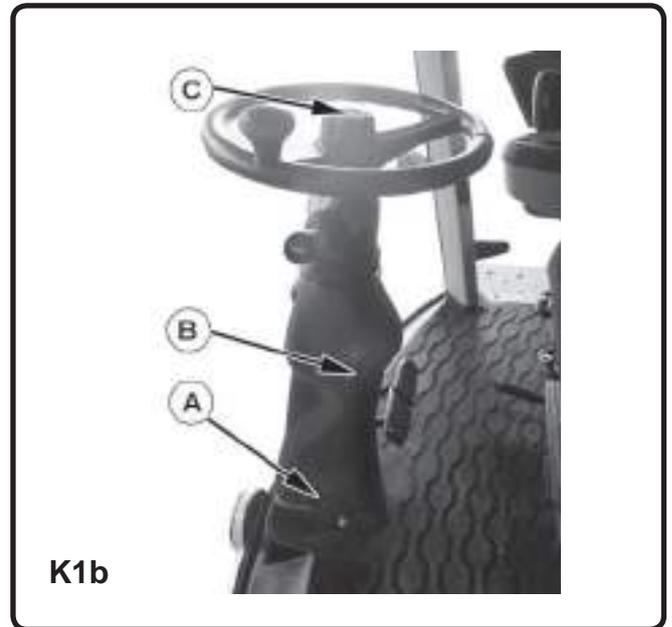
Ignition Lock		CSP Drum	
Master Switch (electric)		Reel Fore & Aft Control	
Ignition Signal		Reel Speed Control	
Oil Warning Light		Air Volume Speed Control	
Alternator Warning Light		Air Direction Control Lever	
		Reversing Switch of Cutting Table	
		Four-wheel Drive	
Engine Revolutions, electric control		Rotating Flasher	
Gear Change Diagram		Emergency Flasher	
Horn		Swinging of Unloading Pipe	
Flasher		Lifting of Grain Tank Cover	
Dip Switch		Grain Tank 1/2 Full	
Headlights		Grain Tank Full	
Working Lights		Grain Elevator Alarm	
Windscreen Wiper		Bottom Auger Alarm	
Temperature Control		Return Auger Alarm	
Air Conditioning		Straw Alarm	
Hand Brake		Coolant Temperature Alarm	
Cutting Table Height		Straw Guide for Chopper	
Cutting Table Side Tilt		Straw Guide for Long Straw	
Reel Height		Air Filters Blocked	
Threshing Mechanism Switch		Hydraulic Filter Blocked	
Speed Control Lever		Hydraulic Oil Too Hot	
Cutting Table Switch		Emergency Exit	<b>EXIT</b>
Grain Tank Unloading Switch		Engine Malfunction Light	
Threshing Cylinder Speed		Safety Switch, driving in traffic	
Concave Clearance Adjustment			

### **STEERING WHEEL Position Can Be Adjusted (Triple Adjustment Steering Column)**

To adjust the steering column angle, depress pedal A and tilt the whole column forward or backward (Fig. K1b).

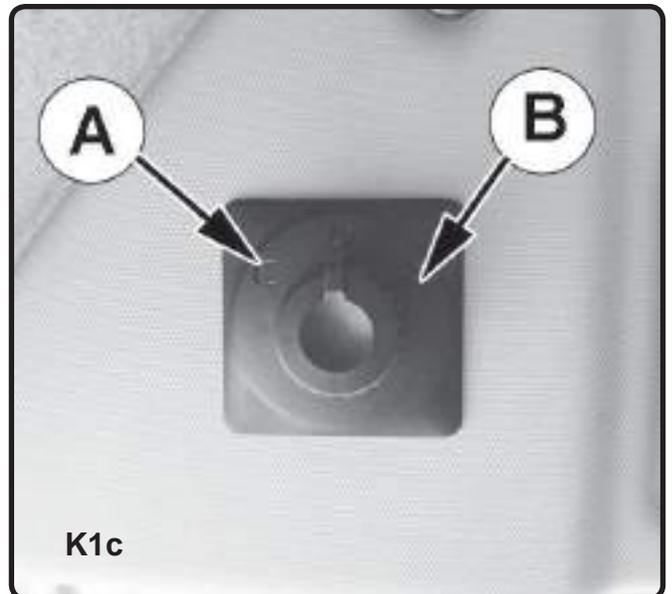
The steering column folds in the middle. Lift the lever B up and adjust the steering wheel to the desired position.

To adjust the height of the steering wheel, loosen the knob C (Fig. K1b) and adjust the steering wheel to the desired position. Remember tighten the knob C.



### **Electrically adjustable mirrors (Fig.K1c)**

- Turn the switch to position A when adjusting left mirror
- Turn the switch to position B when adjusting right mirror



## OPERATOR'S SEAT Adjustments

### Seat Type 1 (fig. K2a)

To adjust the fore and aft position, release lever A under the seat and move the seat to the required position.

Adjust the height by raising or lowering lever B.

Adjust the backrest angle by releasing lever C and turning the backrest.

Adjust the armrest height by loosening hand wheel D. The height of the armrest can be adjusted by moving its fixing point. Remember tighten the hand wheel D.

### Seat Type 2 (Fig. K2b)

To adjust the fore and aft position, release lever A under the seat and move the seat to the required position.

To adjust the height, push adjustment switch B briefly after being seated. The seat will be automatically adjusted to suit the driver's weight. From this position the seat can be moved up and down by using the adjustment switch in the required direction.

Adjust the suspension to suit the weight of the operator by turning screw C.

To adjust the backrest angle, release lever F and turn the backrest.

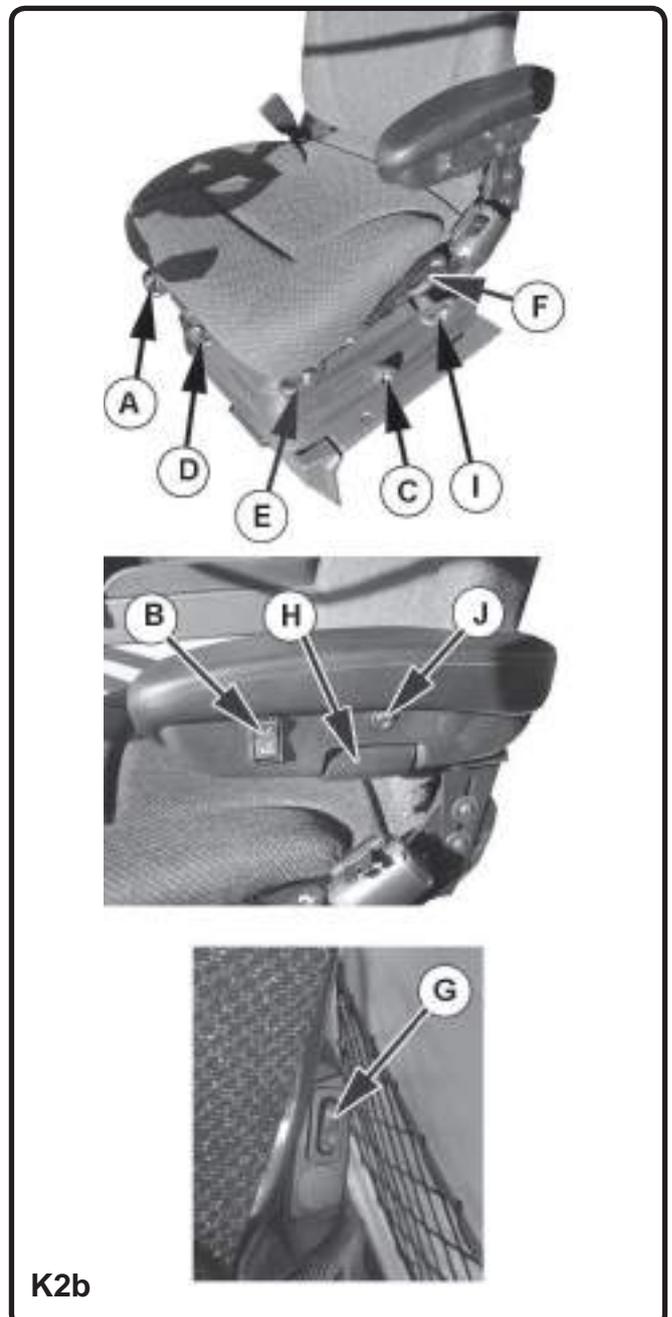
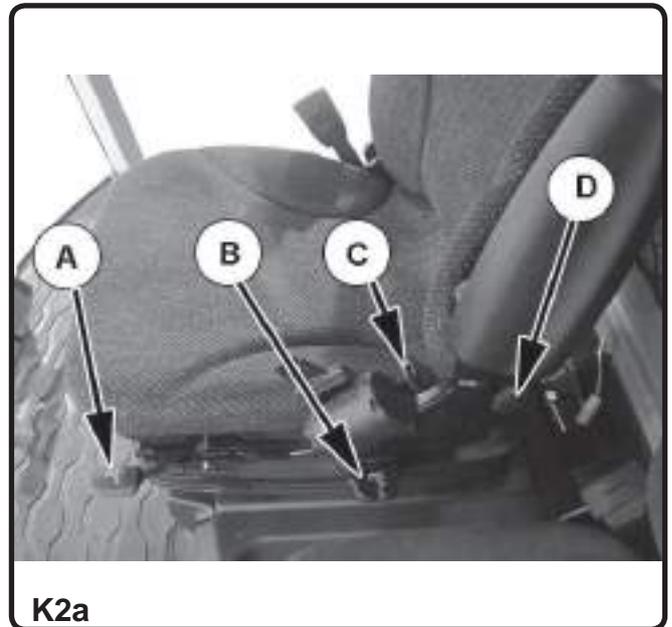
To adjust the lumbar support, push adjustment switch G behind the backrest.

Adjust the armrest angle by turning hand wheel H. To adjust height of the front part of the seat, release lever D.

To switch on seat heating, use switch J.

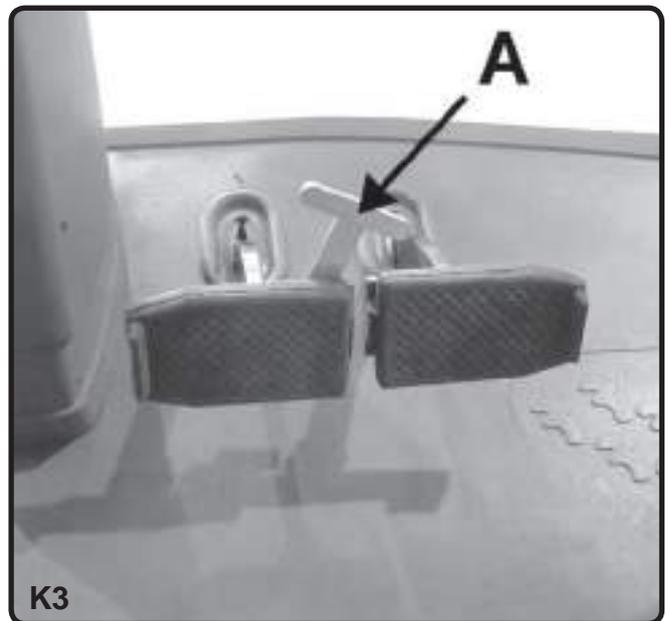
To adjust the seat in relation to the backrest, use lever E.

Movements of the seat backward and forward is enabled or disabled using lever I.



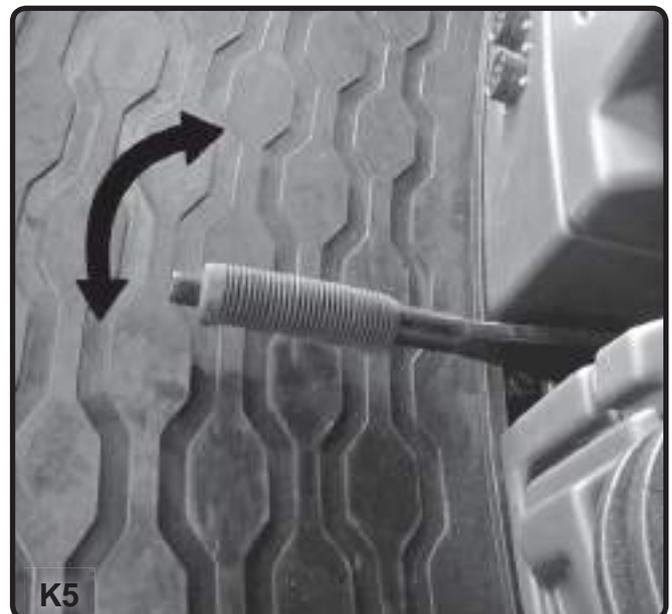
### **BRAKES (fig. K3) While Driving and Turning**

The brakes operate on the front wheels through the drive shafts. They may be used separately as steering brakes by releasing locking pin A. When driving on the road, the brake pedals must be latched together.



### **HAND BRAKE (fig. K5)**

The hand brake operates on the intermediate shaft of the gears. Use the brake only when parking, and fully release it before starting. A symbol light warns of an unreleased parking brake. That light is on only when ignition is switched on.



### **Drive Lever (K6)**

Combines speed and direction is controlled with a drive lever.



## TRANSMISSION

### Hydrostatic Transmission has Three Speed Ranges (fig. K7)

Engine power is transmitted to the hydraulic pump by means of gearing. Transmission from the pump onto the hydraulic motor of the gearing takes place by means of liquid. Pump output is adjusted steplessly on a drive lever between position 0 and the maximum +/-.

There are three gear speed ranges, which are selected using lever A, fig. K7. Ranges 1 and 2 are for threshing and range 3 for driving on the road. Never use range 3 on the field. Gears should be changed on level ground with drive lever B, fig. K7, in its mid position.

**Transmission is hydraulically eased. The front of knob A has a switch, which is pressed to open the gear lock hydraulically. The engine must be running to provide pressure in hydraulics!**

The speed and direction of the combine are controlled using lever B, fig. K7. With the lever in its mid position the combine is stationary if the gear is on and the engine running.

The combine will move forward when the drive lever is pushed forward from its mid position. The further the lever is pushed the higher the speed.

To reverse the combine, pull the lever backward from the mid position.

**A combine equipped with hydrostatic transmission must never be parked using only the gear, but the parking brake must always be engaged. A hydraulic engine cannot keep the combine stationary for any length of time.**

Shift the gear into neutral to enable towing, if the engine cannot be started for some reason. (In case of eased gearboxes the gear lock prevents the shifting of gear into neutral.)

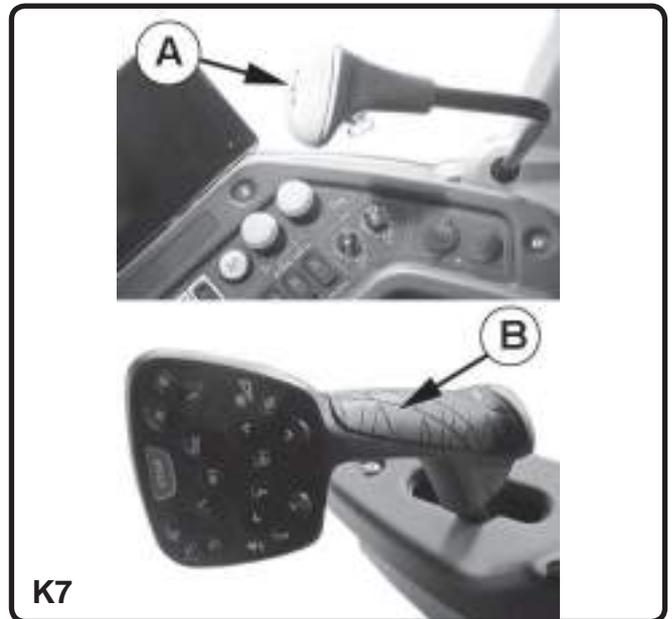
### Optional FOUR-WHEEL DRIVE (fig. K8)

The combine is equipped with assistant four-wheel drive. There is hydraulic parallel connection between the rear and the front wheels. When using speed range 2, the front and the rear wheels drive in relation to the axle weight. Due to the parallel connection the peripheral speeds of the wheels adapt to different driving conditions even within speed range 1. Rear-wheel drive is switched on electrically using switch on the instrument panel, fig. K8 (see operator's controls and instruments page 24) The coupling can be done with the combine moving.

**Four-wheel drive may be used in speed ranges 1 and 2 only.**

When towing the combine, four-wheel drive must be off and the engine running to allow the wheel motors to be disengaged.

Switch four-wheel drive off when driving down a steep hill. The combine may rush forward unless the rear wheels grip the ground.



### Starting the ENGINE with the Ignition Key

The combine is equipped with a safety ignition system, which prevents the combine from moving when the engine is being started. It allows the start-up to take place only with the traction speed control lever in neutral.

It is advisable, however, always to start the engine with the gear in neutral.

### Electrically Controlled Engines, Fig. K9a

Electrically controlled engines have no throttle lever but a throttle control switch with three positions. On idle the switch B rear is depressed. Fig. K9a.

The power is switched on by turning the ignition key to the right. The alternator and oil pressure warning lights will come on.

To start turn the key to position A (fig.K9b). Do not start until the lights have come on. It takes some time to activate the control unit.

### Cold weather starting at below +5°C

The engines are equipped with a pre-heating resistance controlled by the engine control unit. In cold weather it functions automatically. When pre-heating switches itself on, control light C, fig. K9a, comes on. Start the engine as soon as the control light goes off. After the engine has started, the heater switches itself on again for some time.

### Fault Codes on Electrically Controlled Engines

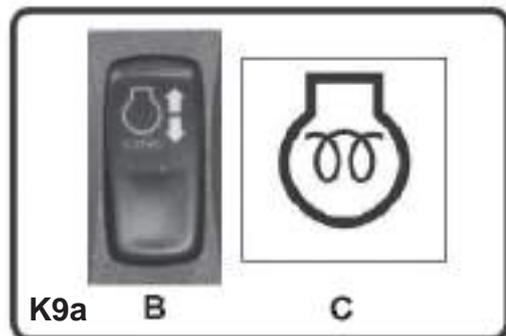
Fault codes are shown by the Comvision- display. For more details, see engine manual.

The ignition lock allows only one start-up function. Turn the key to the "0" position before restarting.

Combines with hydrostatic transmission must not be started in temperatures below  $-15^{\circ}\text{C}$  as the oil is too stiff and the machinery may get damaged.

### Stopping of the ENGINE

Before stopping the engine, move the throttle into the idling position and disengage the threshing mechanism. Turn the ignition key to the 0- position.



### THE STAIRS (fig. K10a)

The stairs can be turned forward to the front of the wheel to reduce combine width. They can be turned standing on the ground by lifting locking lever A. The turn can also be done standing on the cab landing by lifting knob B to release the locking.

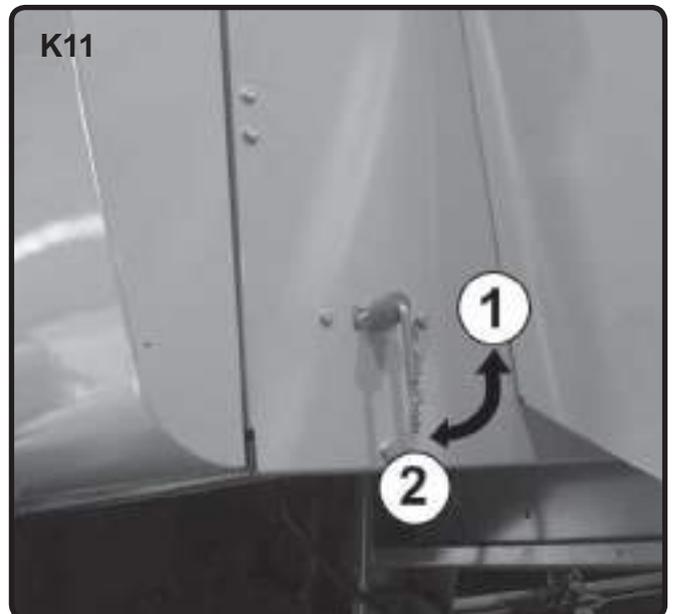
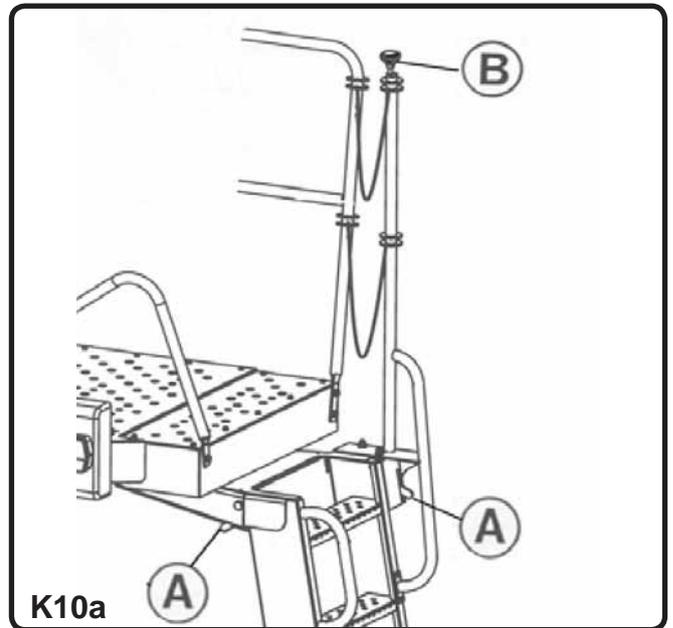
The stairs shall always be turned forward when the combine is driven on the road without the cutting table.

### MASTER SWITCH (fig. K11) Controls Electricity for the Whole Combine

There is a master switch to control the electrical equipment of the combine. It is located on the left-hand side, on the rear guard. The current is connected in position 2. To disconnect the current, turn the switch to position 1, in which position the key may be removed.

#### Electrical Master Switch

Depending on the specification the switch may also be electrically controlled. The operating switch is in the cab (see page 24). The switch disconnects current to all other electrical devices except to its own control circuit.

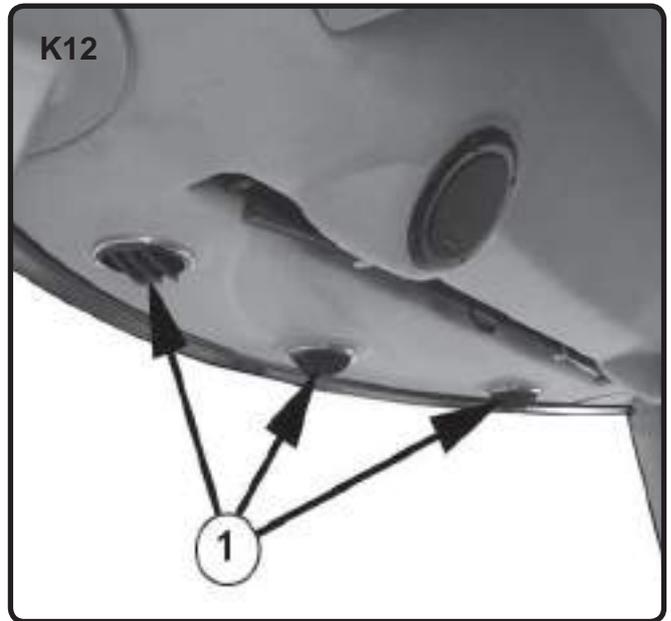


**CAB (fig. K12 and K13) Fresh-air Fan Provides Good Ventilation**

The fan is started using switch A. To change the airflow direction, turn nozzles 1 at the front top of the cab. Air coming into the fan is taken through detachable coarse mesh and fine filters.

To keep up the fan capacity and to secure the purity of the air, the filters have to be cleaned daily and replaced often enough to prevent harmful impurities and fungi from clogging the filters. In dusty conditions it is necessary to clean the coarse mesh filter several times a day.

By pushing button B, cab indoor air can be circulated through the fan, which reduces the need for outdoor air and thus reduces the risk of blocked filters. When circulating indoor air, it is circulated through inner filter in the left side of the cabin.



**HEATER Provides Additional Heat from the Engine**

The air in the cab is heated by a heating element in which the engine coolant circulates. Turn switch C to the right to increase the amount of coolant circulating in the element. This will increase the temperature in the cab.

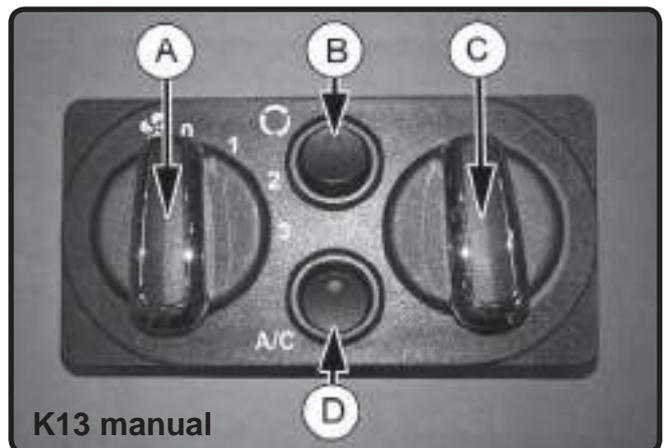
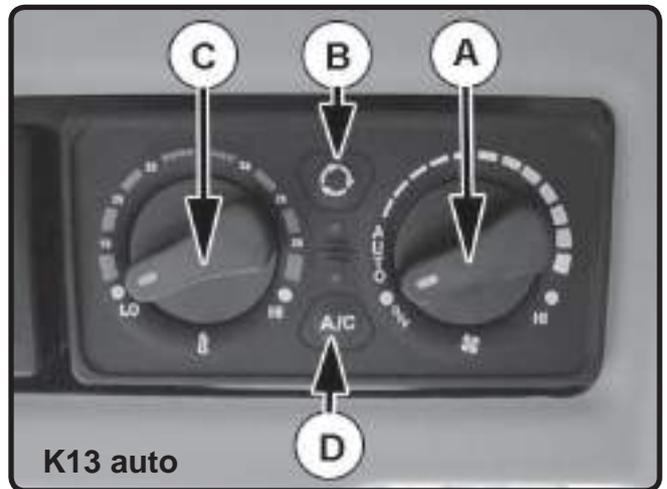
**AIR CONDITIONER Cools the Air in the Cab**

The cab can be equipped with an air conditioner system.

Push switch D to switch on air conditioning. Push switch B to re-circulate the cooled cab air, which will further cool down the cab.

Note! A difference of over 8°C between indoor and outdoor temperatures is harmful to your health.

Keep the cab door closed when the air-conditioning is on.



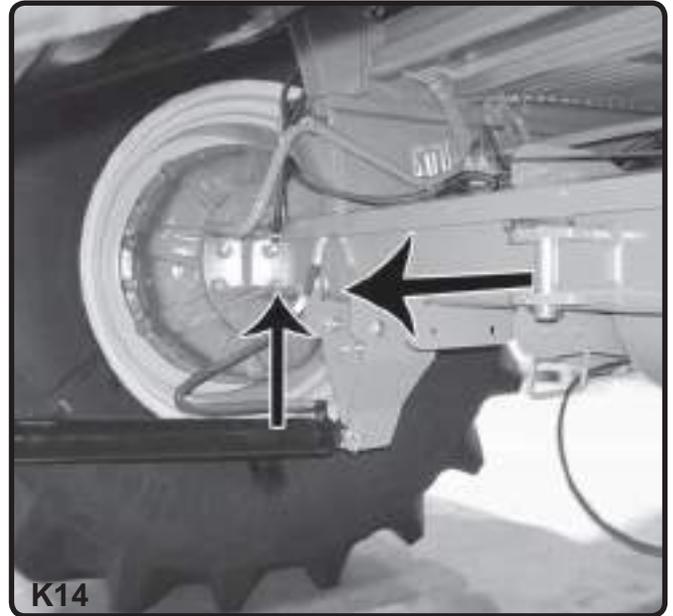
### **TOWING (figs. K14 and K15) Allowed from Towing Points Only**

The combine may be towed from designated points only. When towing forward, the towline is hooked to the link on the front axle, fig. K14. When towing backward, wind the towline round the rear carrier, fig. K15. The towline must not be wound round the rear axle.

With the combine on tow, the operator must be in the cab and the engine running to enable steering. The brakes must be latched together and the gears in neutral. Four-wheel drive must be off.

**Unless the engine can be started, the combine must be towed with great care; without power steering engaged, the combine is slow and heavy to handle.**

When towing on the road, statutory traffic regulations must be followed.



### **Correct LIFTING of the Combine (figs. K14 and K15)**

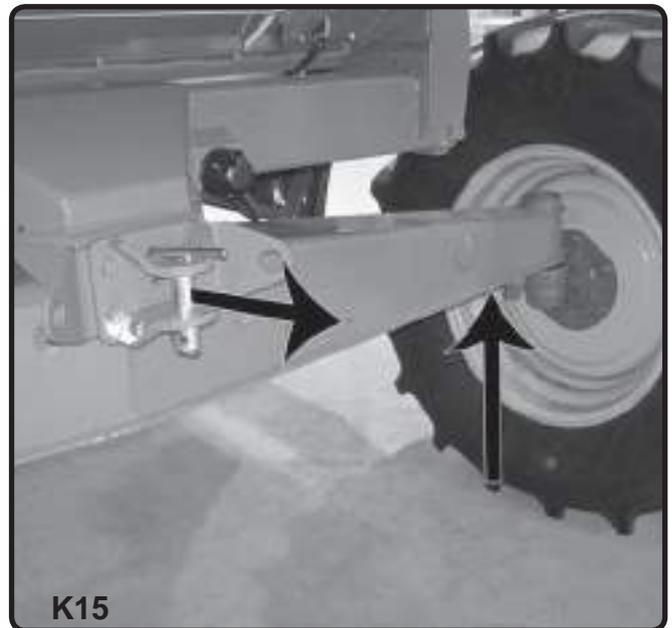
The combine may be lifted using the designated points only. It shall be lifted on level, sturdy ground. The grain tank shall be empty. The lifting capacity of the jack shall be a minimum of 10 tons. If an ordinary jack is used to raise the combine, a sufficiently high and firm, one-piece platform with an area of a minimum of 300 x 300 mm is to be placed underneath the jack.

Before the lift, the combine must be immobilized by placing wedges in front of and behind the wheels on the ground.



Use a sturdy trestle to secure the combine in its raised position.

If several wheels are to be removed at the same time, the ground surface of the trestles is to be a minimum of 600 x 600 mm.



## TABLE TRAILER (figs. K16, K17 and K18) for Road Transport of Wide Cutting Tables

The need for a table trailer depends on farm conditions. The trailer may be necessary for a 3.9 m and 4,2m cutting table if transportation is necessary on busy, narrow roads. Cutting tables 4.5 and wider should always be transported on a trailer in order not to inconvenience traffic and risk the safety of road users.

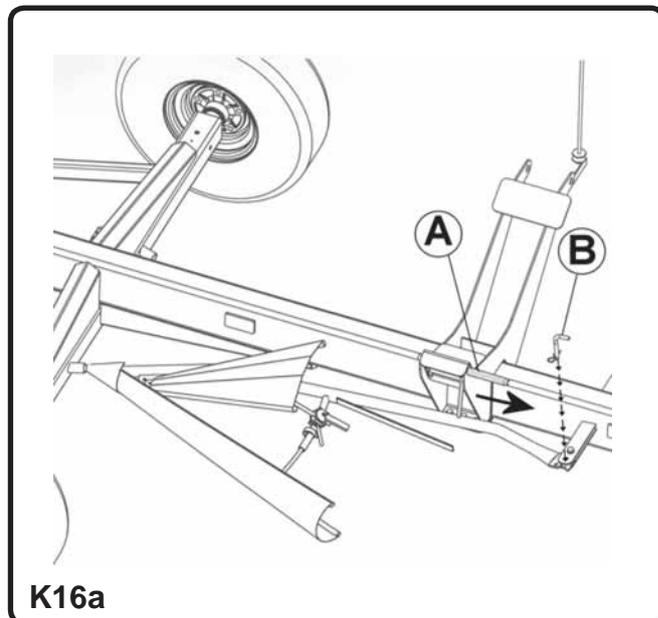
The trailer has no traction unit, but shall be towed attached to the combine. No other cargo except for a cutting table must be transported on the trailer, nor must any other attachment except for the trailer be hooked to the combine towing hook. In case the trailer is attached to another traction unit, a tractor, for example, the attachment shall be made in accordance with the instructions, and the statutory traffic regulations shall be followed.

### Placing the Table on the Trailer

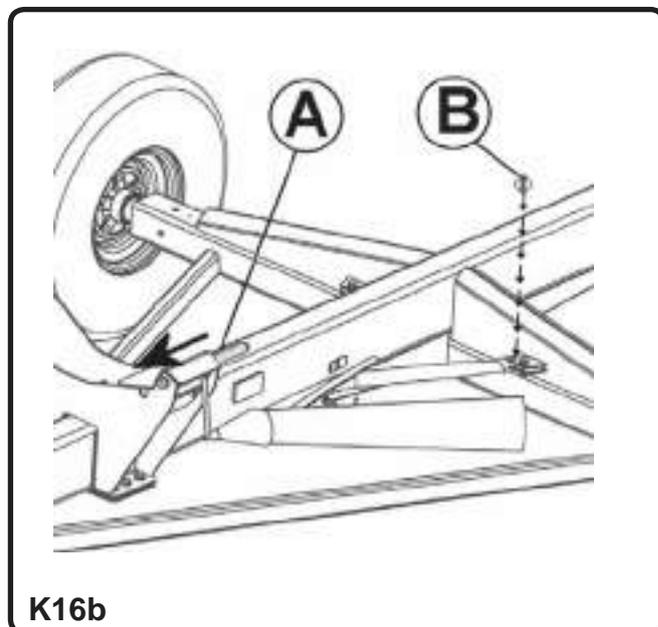
Disengage the table from the combine as instructed in paragraph "Removing the Table". Connect hoses for reel drive and reel horizontal movement to each other. Protect the other connectors with rubber cups.

Place the trailer on level ground and align its frame with the ground by adjusting the cam wheel. Pull locking pins A into their open position, fig. K16.

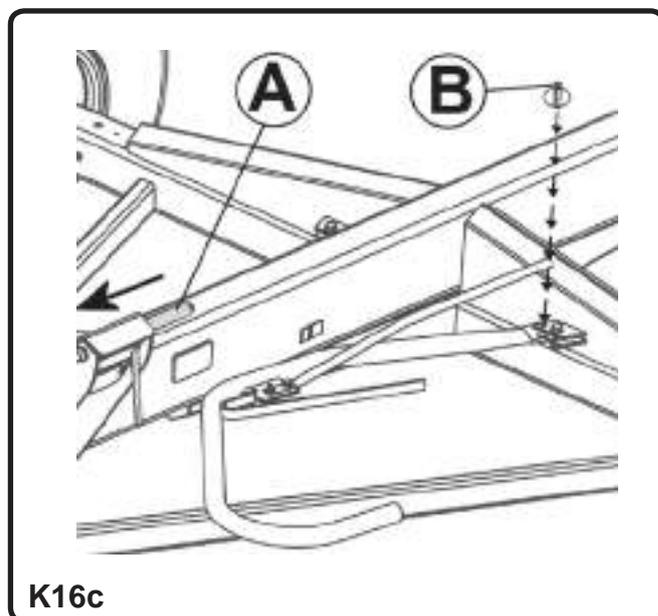
Remove the straw dividers from the table and place them on the brackets on the trailer. Depending on the type of dividers, the brackets are either at the front or the back of the axle. Lock the dividers with ring cotter and/or locking pivot B, fig. K16. When needed, adjust the guides of the adjustable divider in a narrower position so that the table bottom does not touch the divider.



K16a

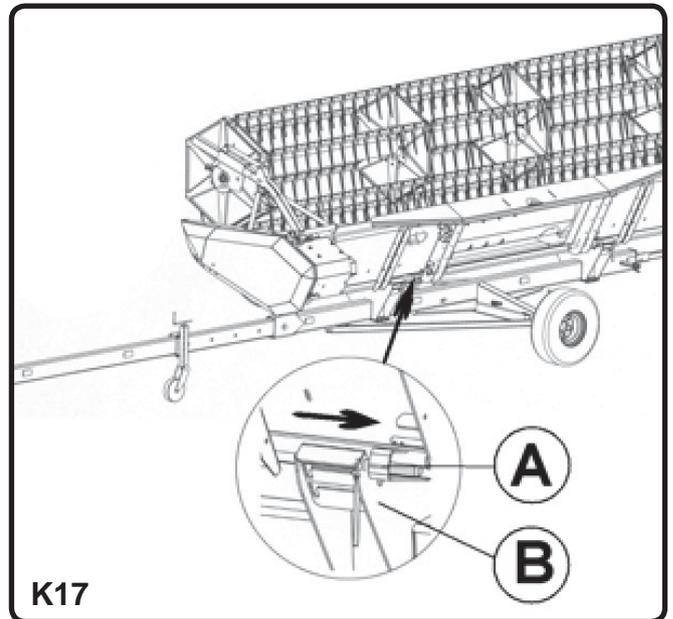


K16b



K16c

Drive the table above the trailer from the left-hand side so that the knife is level with the trailer marking sticks and brackets A at the rear of the table, fig K17, are between carriers B. Lower the table slowly. Make sure the table is positioned correctly: Reverse slowly so that the rear end of the table is against both the carrier limiters. Lower the crop elevator further so that it becomes disengaged from the cutting table and back up the combine with caution. Raise the crop elevator as soon as possible. Push the rear locking pins into their locking position. The trailer is equipped with a winch, which can be used to pull the trailer to the combine hook after the combine has been reversed near the trailer. Hook the trailer to the combine and plug in the electric cable. Place the winch on the axle (fig17b), hook the table with the winch and tighten.



### Attaching of the Cutting Table to the Combine

is done in reverse order. In case the trailer must be left on the road temporarily, place appropriate warning signs.

Connect hydraulic hoses and the PTO shaft, Fig. K18. Tighten hydraulic hose fittings all the way to the bottom. If there is pressure in the hoses, a spanner may be needed. However, the fittings do not need to be tightened to any certain torque.

### Trailer on Tow

Extreme caution shall be exercised when towing the trailer.

The total length of the vehicle is approx. 16 m, so turning the vehicle requires space.

Do not turn the rear wheels to their extreme position as the trailer arm may touch the rear wheel and the vehicle will get stuck.

However, if this is the case, back up the combine and use the steering brake at the same time.

Reverse very carefully. Watch the trailer movements in the mirror.



# THRESHING EQUIPMENT

## SAFETY SWITCH

There is safety switch (A, Fig L1) on the instrument panel. It must be switched off before any mechanisms can be switched on.

When the safety switch is pressed, all engaged mechanisms (threshing, chopper, cutting table and unloading) stop.

The safety switch also stops the reversing of the feeding equipment.

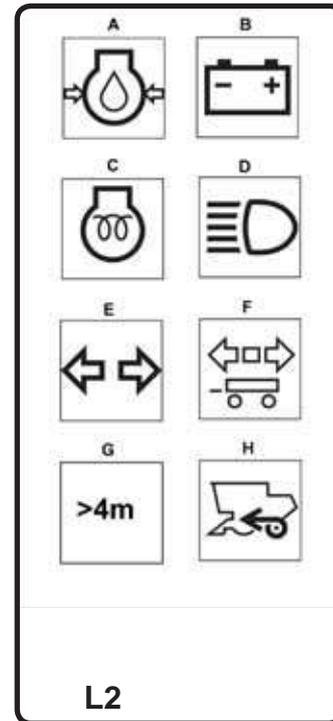
The unloading pipe cannot be turned with the safety switch pressed. **The switch must always be depressed when driving on the road!**



## WARNING LIGHTS and CONTROL LIGHTS(fig. L2) warn

There are control lights on the instrument panel to indicate the mode of combine functions.

- A Engine oil pressure too low
- B Charging not working
- C Pre-heating
- D Head lights
- E Flasher
- F Trailer flasher
- G Max. height exceeds 4 m
- H 4WD switched on

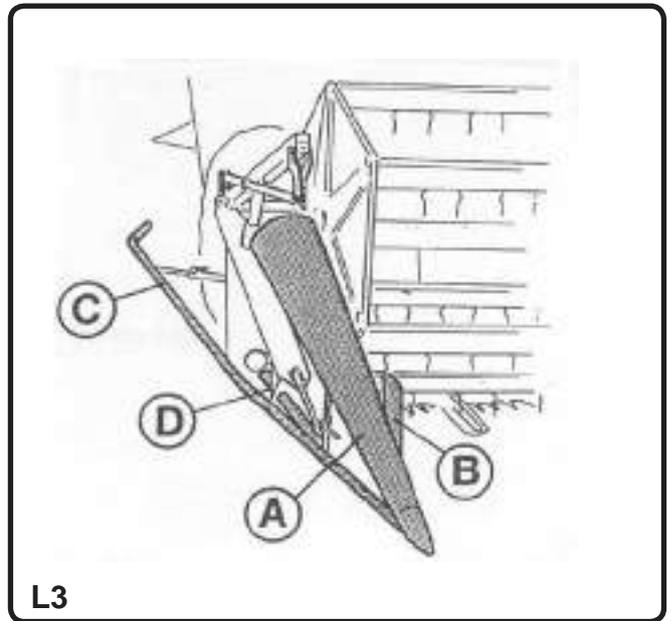


**STRAW DIVIDERS (fig. L3) Have to be Adjusted**

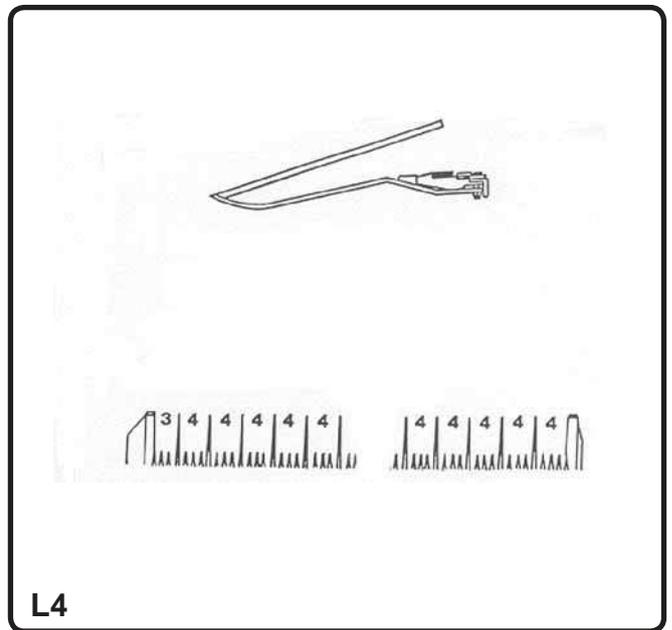
The straw dividers are fitted on both sides of the cutting table.  
 Their height is adjusted by means of slide pieces D with holes.  
 Depending on the specification the dividers can be of the following types:  
 Long torpedo dividers with fixed frames  
 Short torpedo dividers with fixed frames  
 Medium-long torpedo dividers with foldable frames  
 Arc-type dividers

Adjust guide plates A and B to suit the threshing conditions.  
 The outside guide tube is attached to the divider at the front and to the table side at the rear. The adjuster for the tube is at the rear. Always attach the tube on the side of the uncut crop.  
 Long dividers are used to thresh long-stawed crops such as rye and oats.  
 Short dividers are used to thresh short-stawed crops such as barley and wheat.  
 Dividers with foldable frames are suited for different crops. They do not need to be removed but can be turned to their transport position.  
 Arc-type dividers are suited for short-stawed crops and crops that do not need dividing but are pressed down in a narrow section, such as turnip rape and flax.

The straw divider can be replaced with an electric vertical knife. It is particularly efficient when threshing oil plants.



**L3**



**L4**

**CROP LIFTERS (fig. L4) Spaced Correctly.**

Below you can see the appropriate number of crop lifters for different table widths:

3.9 m	12
4.2 m	13
4.5 m	14
4.8 m	15
5.1 m	16
5.7 m	18
6.3 m	20
6.9 m	22

Attach the crop lifters with the knife finger fixing screw as shown in the figure. The numbers in the figure indicate the number of finger spaces. The crop lifters operate well if clearance to the ground is 8...10 cm, which clearance also prevents stone pick.  
 In some cases, for example, when threshing peas, it may be advisable to install more lifters, maybe even in every other knife finger.

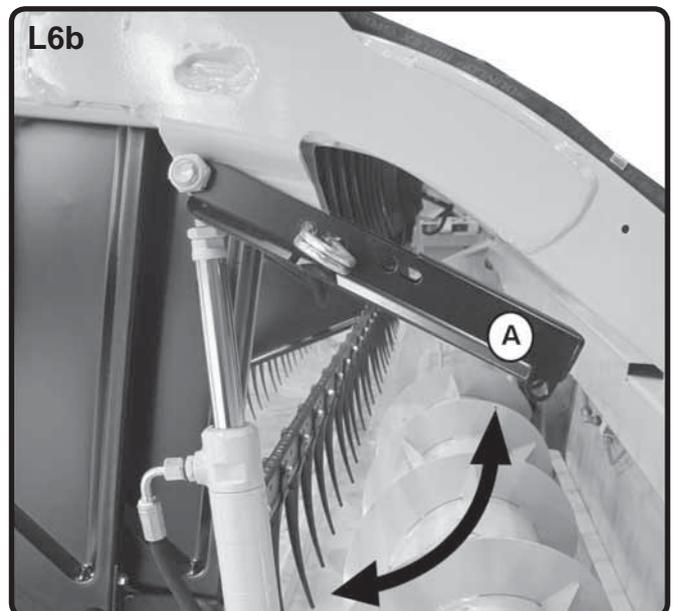
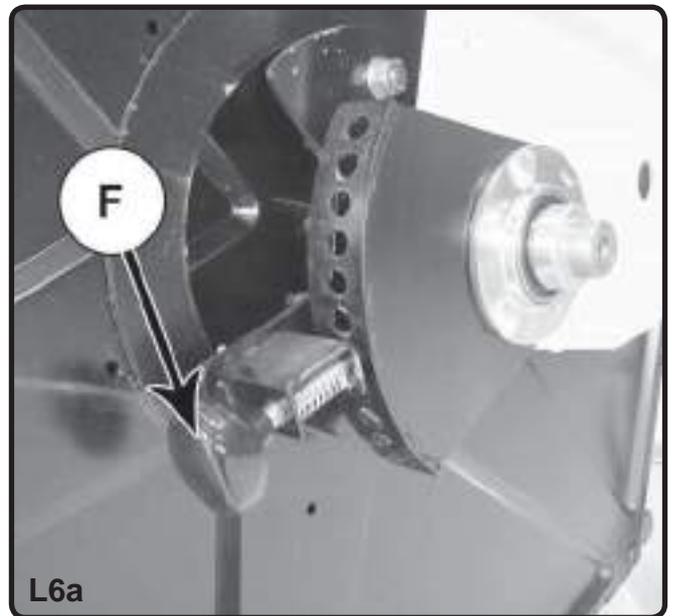
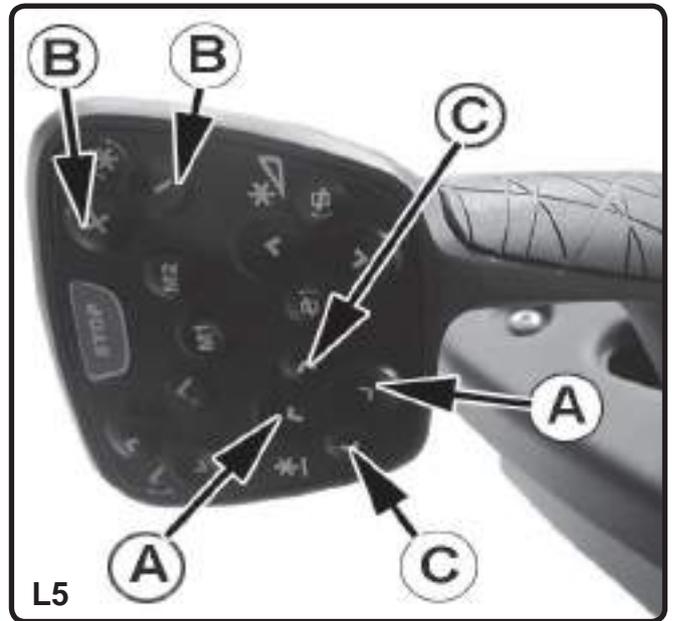
## REEL ADJUSTMENTS

### Four Adjustable Settings (figs. L5 and L6)

1. Reel height is controlled by switches A, fig. L5.
2. Reel speed is controlled by switches B, fig. L5. Speed can only be adjusted with the reel rotating.
3. The fore and aft adjustment is made by switches C, fig. L5.
4. The blade angles are adjusted by pulling at button F and turning the adjustment lever in the required direction, fig. L6a. When harvesting laid-down crops, the tines shall be adjusted to gather the crops efficiently. The torque of the reel is restricted by means of a relief valve in the control valve.

**Do not adjust the reel in its rear-most position if the tine angle is adjusted rearwards. The tines may reach the table auger and get damaged.**

**Place locking A on the reel, fig. L6b, in the support position if working beneath a raised reel.**



## CUTTING KNIFE Must Be Kept in Good Condition!

No actual knife adjustments can be made during threshing. The knife must be in perfect condition to produce good threshing results. For more precise service and adjustment instructions, see under Maintenance. A spare knife is stored in the case at the top of the table.

### TABLE AUGER (fig. L7) Height and Finger Positions Are Adjustable

Adjust the feed auger vertically to suit the amount of straw in the crop being threshed.

Average clearance X is 10 – 15 mm. When threshing e.g. heavy rye or turnip rape, adjust clearance X between the auger and cutting table wider, approx. 30...40 mm. In special conditions even a 5 mm clearance can be used.

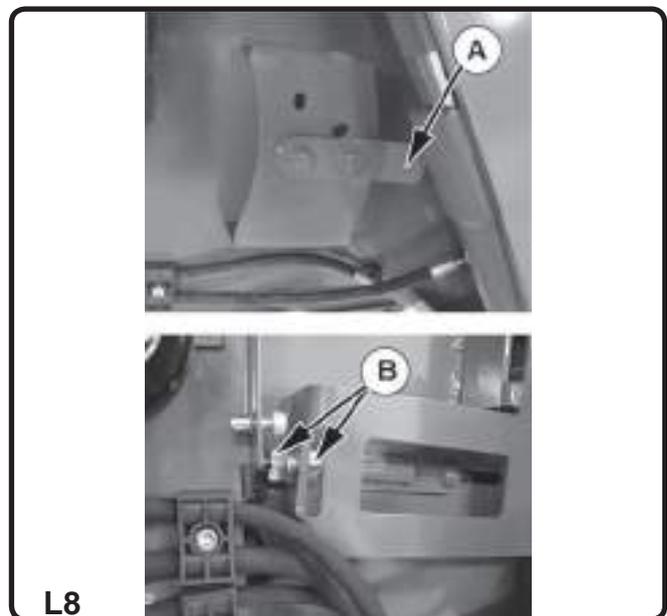
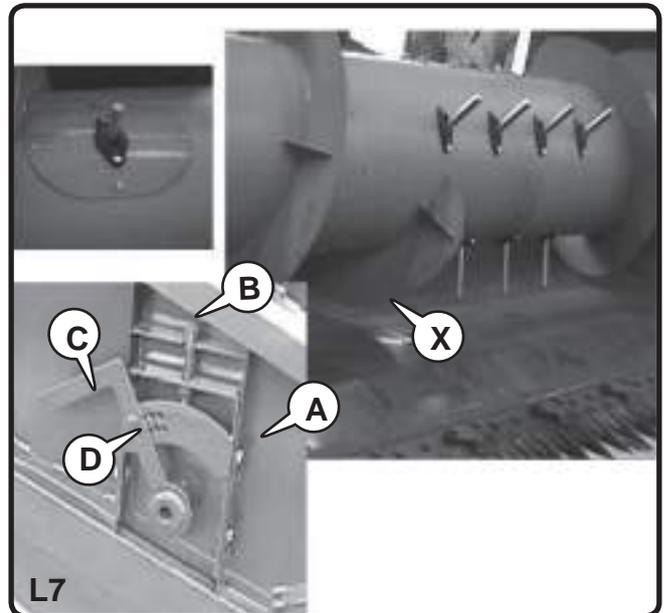
To adjust, loosen screws A at both ends of the cutting table. Now the table auger can be lifted or lowered as required using adjustment screws B. Clearance between the feed auger and the bottom must be equal at both ends of the table. After moving the feed auger, check the drive belt tension. Loosen screw D to adjust the feed finger position with lever C at the right hand end of the cutting table. A minimum clearance of 10 mm is required between the feed fingers and the table bottom. The fingers must recede into the auger sufficiently early to allow the crop to be transported forward. Otherwise tall and damp crops in particular may wrap around the auger.

Depending on the model, the table auger may be equipped with a safety switch. Adjustment instructions under "Service and Maintenance".

### Adjust Feeder House Conveyor Chain Tension FIG. L8

**IMPORTANT: Make sure that height and tension are always correctly adjusted.**

The feeder house has a fixed top roller and a floating bottom roller to enable the feeder house to oscillate according to the flow of the crop on it. Adjust the clearance between the bottom roller and the bottom of the feeder house by changing the position of lever (A). Adjust the feeder house conveyor chain tension with nuts (B). To check the tension, open the inspection door at the top of the feeder house. The tension is correct when the deflection midway between the top and bottom roller is approximately 80 mm. If the chain is assembled too tight, it wears out quickly and in some cases it can even break.



**TABLE AUGER AND CROP ELEVATOR REVERSE DRIVE (fig. L9) Eliminate Blockage from the Table**

Blockage in crop feed may stop the table auger and crop elevator as the safety switches slide. The blockage can be cleared by turning the feed equipment backwards. To do this, disengage the drive to the table and press reverse switch (fig. L9). The table auger and elevator will rotate in reverse direction and clear the blockage.

**NOTE! The reverse drive will only operate with the engine running and the safety switch in its OFF position.**



L9



L9a

**Engaging and Disengaging of the CUTTING TABLE**

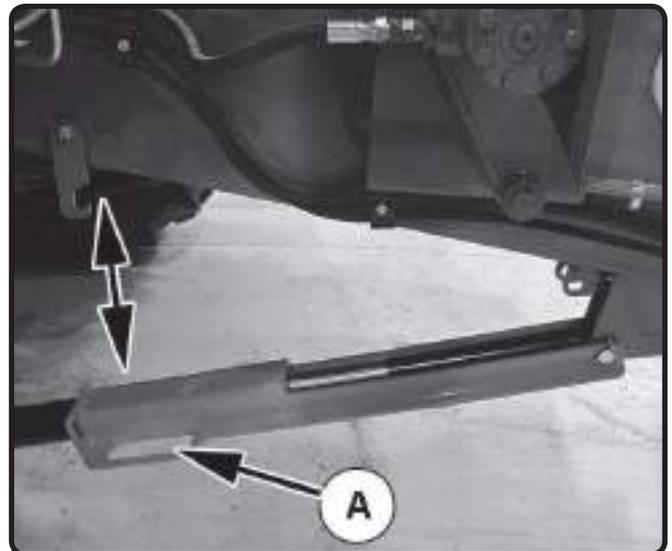
The cutting table is engaged and disengaged using switch (Fig. L9a). Pull up yellow switch to engage the table. The actual engagement is done by means of a hydraulic drum clutch.

**Caution! The cutting and feeding mechanism disengaged using the switch can start running when, for instance feeding disorders are eliminated from the table. Therefore, always stop the engine before any work is carried out on the table.**

**Supporting of the CUTTING TABLE (fig. L10)**



Before doing repairs and maintenance beneath the table, raise it to its full height and lock the support over the ram by means of lever A, fig. L10, on the right-hand side of the table auger. Do not use the cutting table support while driving on the road.



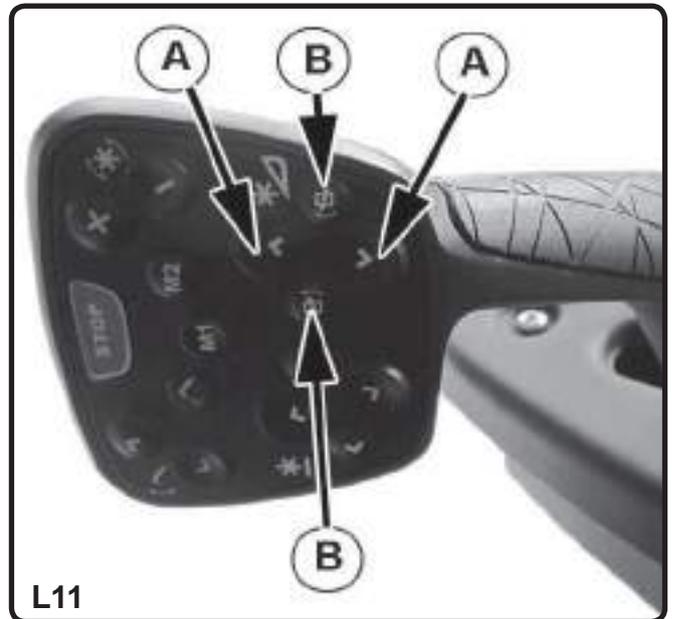
L10

### Height of the CUTTING TABLE (figs. L11)

Table height is controlled using switches A, fig. L11. Cutting height is shown on the Comvision display,

### Side Tilt of the CUTTING TABLE

The transverse position of the cutting table to the ground can be adjusted hydraulically using switches B on the traction speed control lever, fig. L11. Side tilt may be needed on a sloping field when the combine tends to tilt downhill.



## STONE BLOCK Behind the Knife

An optional stone block can be fitted on the cutting table behind the knife. It has proved extremely useful on fields with a lot of small stones. They are stopped by the stone block and can be removed from there. Always stop the combine and the engine and fit the supports for the table and the pick-up reel before carrying out any work on the cutting table.

## STONE TRAP (fig. L14) Must Be Emptied Regularly

The stone trap prevents stones from getting onto the concave. It is located between the crop elevator and concave. The hinged bottom can be opened and locked using lever A.

The stone trap must be emptied daily; the contents of it must be of soft nature. When harvesting short stubble on stony fields, empty the stone trap more often.

## Engage THRESHING MECHANISM (fig. L15) at Engine Idling Speed Only

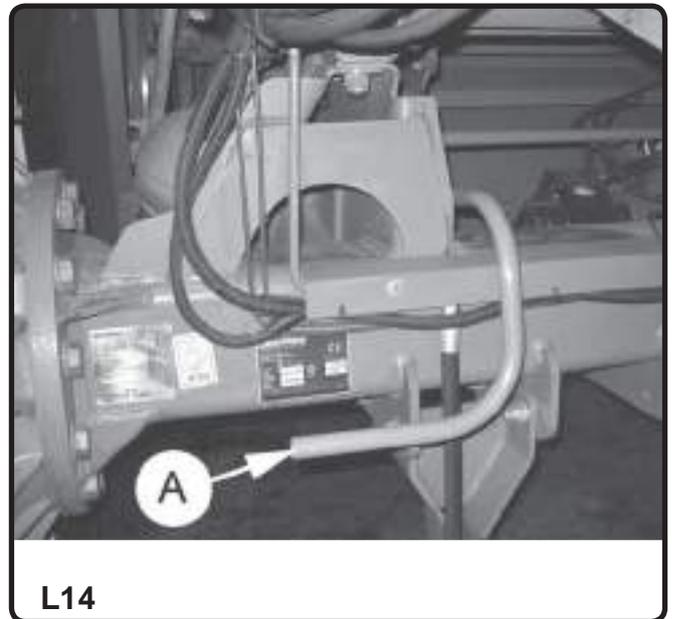
Engage and disengage the threshing mechanism using switch (fig. L15). Engage the threshing mechanism by pulling up yellow switch. The function is electro-hydraulic.

The levers in the belt coupling are turned hydraulically. The chopper starts first if the chaff guide plate is for the chopper. The threshing mechanism is switched on after the chopper.

**NOTE! ENGAGE AND DISENGAGE THE THRESHING MECHANISM AT ENGINE IDLING SPEED ONLY. DO NOT INCREASE THE ENGINE SPEED BEFORE THE WHOLE THRESHING MECHANISM HAS BEEN SWITCHED ON!**

## Control of THRESHING CYLINDER Speed (fig. L16)

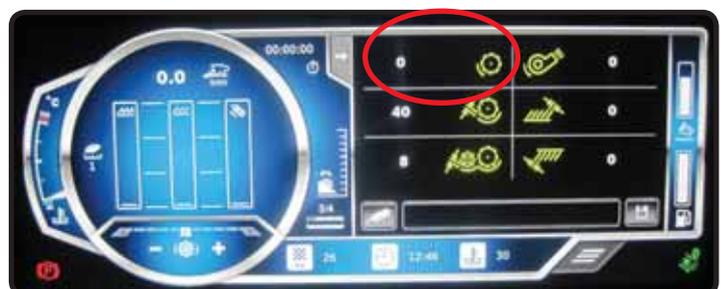
The speed of the threshing cylinder is controlled using Comvion- display. The rotation speed may be changed with the threshing mechanism running only. The threshing cylinder speed is displayed in Comvion-display. Settings for various crops are given in the adjustment table on the cab window.



L14



L15



L16

## STANDARD THRESHING CYLINDER

### Adjusting of the CONCAVE Clearance (figs. L17 and L18)

Clearance between the concave and the threshing cylinder is adjusted using Comvision- display.

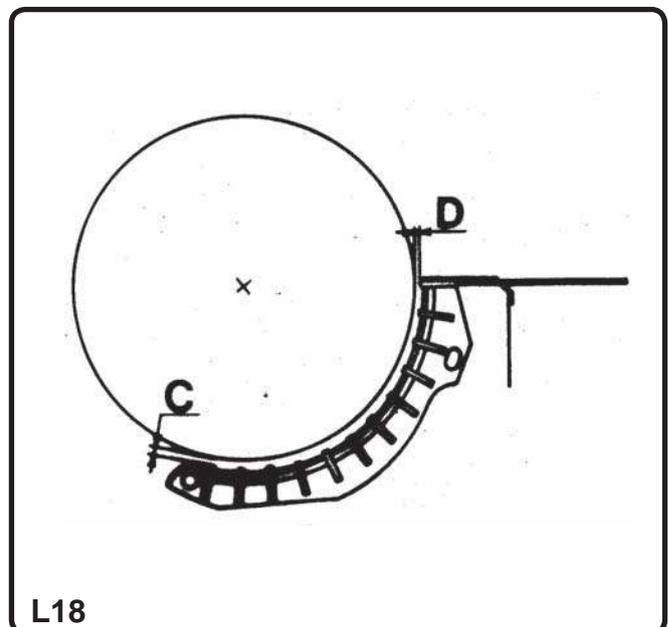
Clearance is also displayed in Comvision-display.



L17

The adjusting mechanism has been designed to maintain the ratio between the front and rear clearances. The normal ratio is 2:1; front clearance C is double rear clearance D, fig. L18. The concave clearance should be checked at the beginning of each harvest season.

See the settings for various crops in the adjustment table on the cab window.



L18

### Adjusting of the ADJUSTMENT RATIO (fig. L19a)

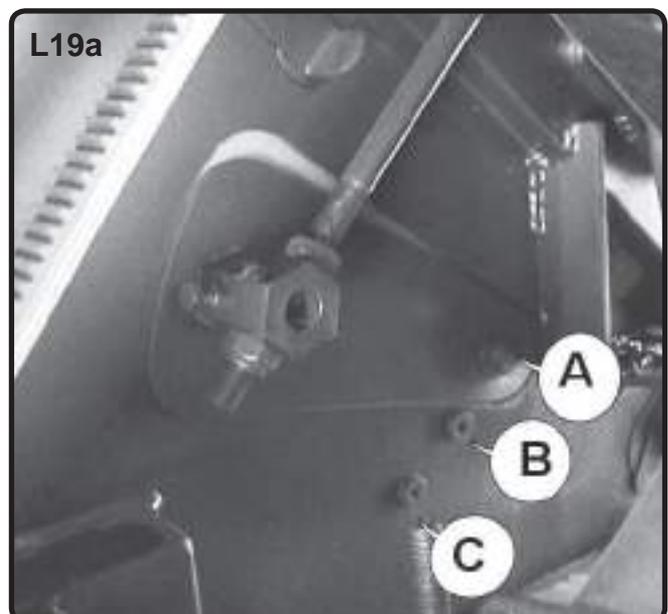
The adjustment ratio between the concave and the cylinder can be changed so that instead of the normal 2:1 ratio, ratios 1.5:1 or 1:1 are used. When changing the ratio, move the ratio lever on both sides of the machine to position A, B or C.

A = 2:1

B = 1.5:1

C = 1:1

Adjustment A is best suited for damp and adjustment C for extremely dry conditions when it is important to prevent the straw from breaking on the threshing cylinder.



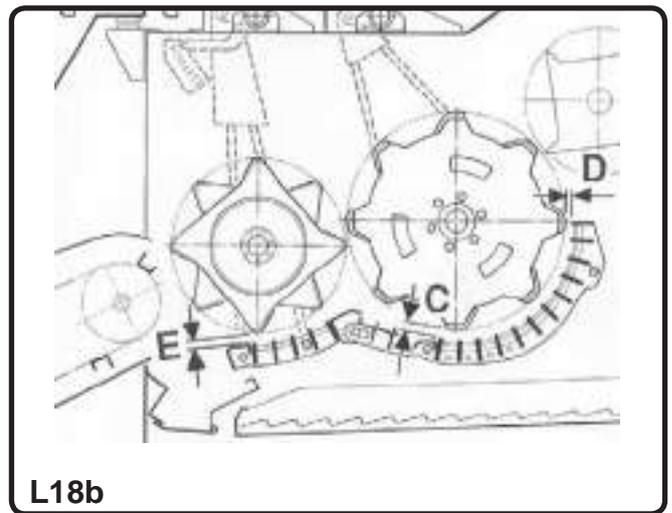
## THE PRE-THRESHING CYLINDER

### Adjusting of PRE-CONCAVE

Clearance between the pre-concave and pre-cylinder  
E fig. L18b is adjusted using Comvision- display.  
Clearance is also displayed in Comvision-display.



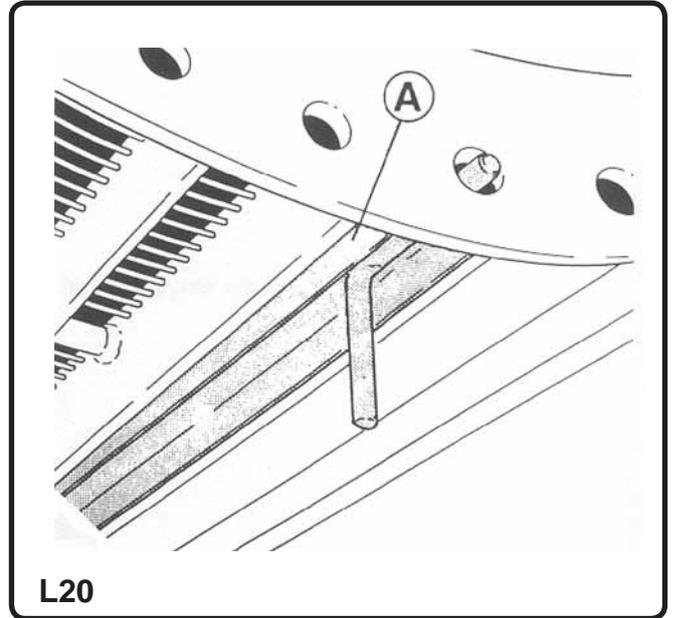
L17b



L18b

### CONCAVE FILLER PLATES (fig. L20) Remove the Barbs

The threshing effect of the concave can be improved by fitting filler plates A under the first concave beaters. Pass the filler plates through the holes at both ends of the concave where the springs keep them fixed. The same filler plates fit the main concave and the pre-concave on the TS model.

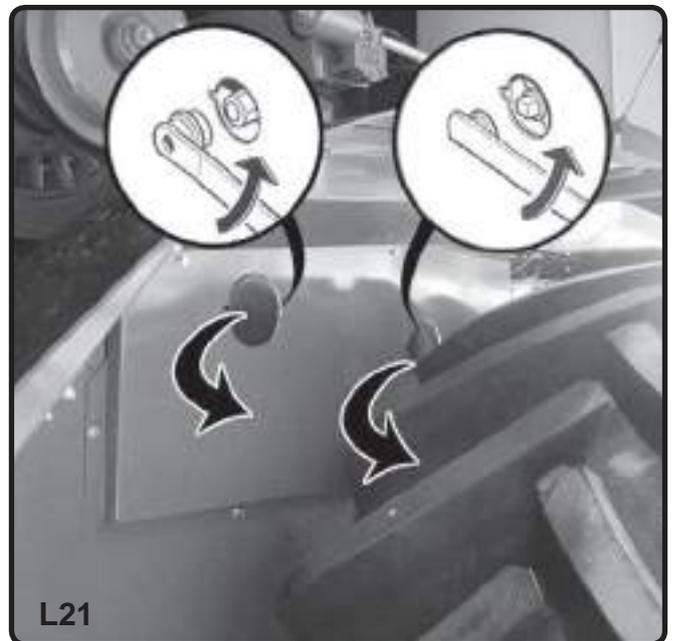


### REVERSING THE CYLINDER (fig. L21)

In order to remove a blockage from the threshing cylinder, a tool (under the right-hand side guard) is supplied by means of which the cylinder may be turned manually.

Open the plastic cover on the mudguard to reveal the shaft end. The cover can be opened with a screwdriver.

The engine and the threshing mechanism coupling must be off. The concave should be in its bottom position. If necessary, the blockage may also be cleared through the service openings.



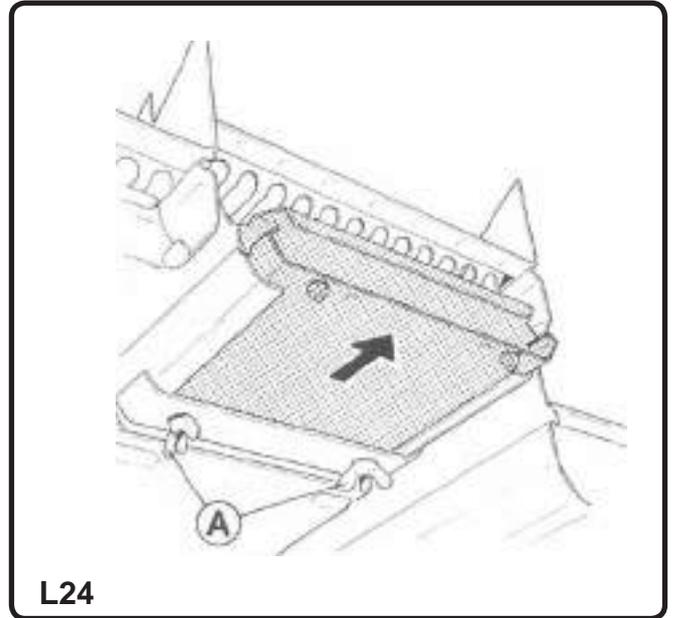
## STRAW WALKERS (fig. L24) Keep the Bottoms Clean

The bottom cassettes of the straw walkers can be removed for cleaning by releasing clamps A and pulling the cassettes out from the rear door to the chaff hood.

The switch on the chaff hood top lights an alarm lamp if an excessive accumulation of straw causes a blockage.

Immediately disengage the threshing mechanism, clear the blockage and find out the cause for the trouble before going on working.

**Note! Always check the operation of the warning device before starting harvest.**



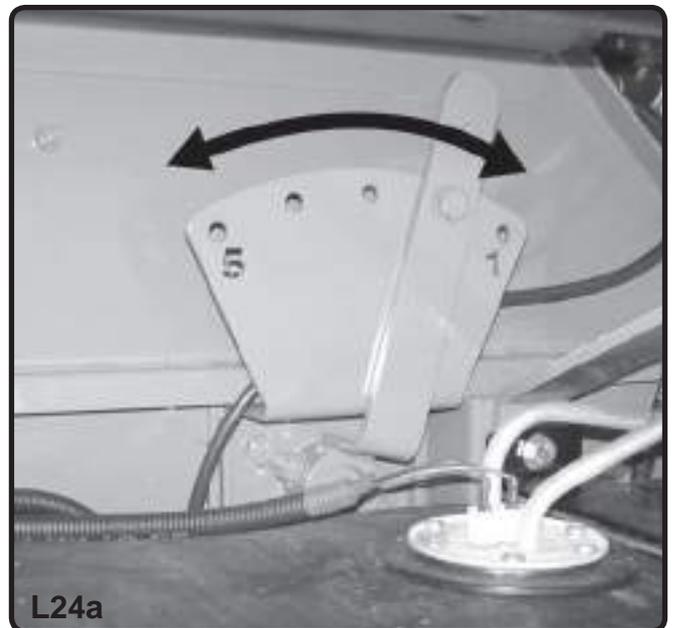
## CSP Straw Ruffler

Depending on the specification, there may be a belt-driven ruffling drum above the straw walkers to fluff up the mass of straw to improve grain separation. The ruffler finger angle can be adjusted by changing the position of the adjustment lever on the right side of the combine. The normal position is in the middle of the adjustment range.

When the lever is moved backwards (to the left), the fingers will retract earlier in the direction of rotation and vice versa. This should be done when threshing turnip rape of flax.

A speed monitor monitors the ruffler rotation. Activated alarm indicates a speed drop in the CSP drum.

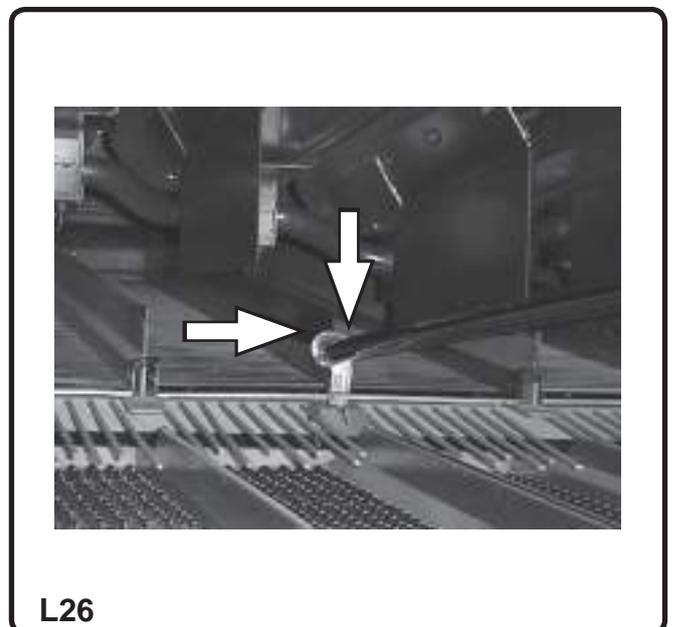
Check the drive belt tension regularly.



### GRAIN PAN (figs. L25 and L26) Clean the Segments

The grain pan can be removed in three segments for cleaning. A removal tool is supplied under the right side guard, fig. L25. Pass the flat end of the tool into the hole at the mid-plate of the segment. Press with the side of the tool to unlock the segment and pull backwards out of the machine, fig. L26. Before the removal of the segments the top sieves shall be removed.

When harvesting in damp conditions, check daily that the segment surfaces are clean, and remove any sticking dirt. A dirty surface will reduce the transporting ability and cause uneven burden on sieves and increase threshing losses. Moreover, the dirt will cause extra weight, burden the grain pan and may even lead to damage.

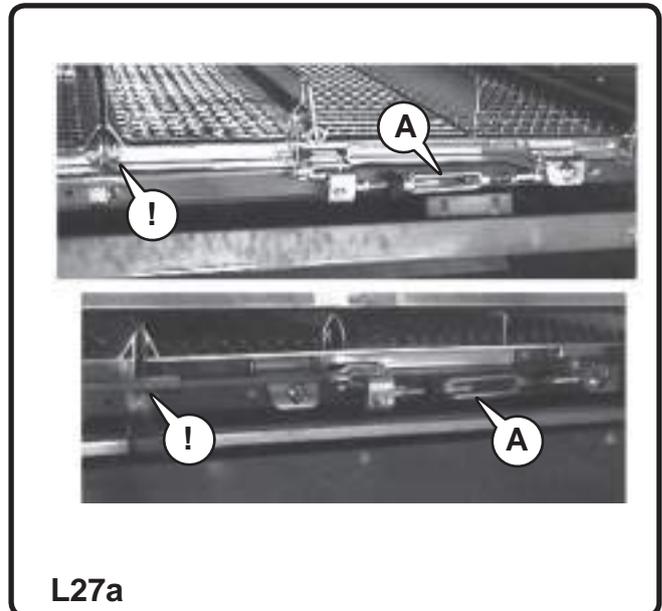


### SHAKER SHOE (fig. L27a) Mechanical Adjustment

The shaker shoe has been divided in two lateral sections. Both the top and the bottom sieves are of the adjustable lamella type.

The adjustment is made using the adjustment screws at the rear of the shaker shoe. The threshing mechanism and the engine shall be stopped before any adjustments are made. Open the back door to the shaker shoe to adjust the lower sieve. The sieve openings may be read on the scale on the connecting rod of the adjustment levers.

When adjustments are made, adjust always at a smaller value first and after that at the required value. Settings for various crops are given in the adjustment table. At regular intervals, check that the reading on the scale and the sieve opening are consistent.



### SHAKER SHOE Electric Remote Control Adjustment (fig. L27b)

The shaker shoe has been divided in two lateral sections. Both the top and the bottom sieves are of the adjustable lamella type.

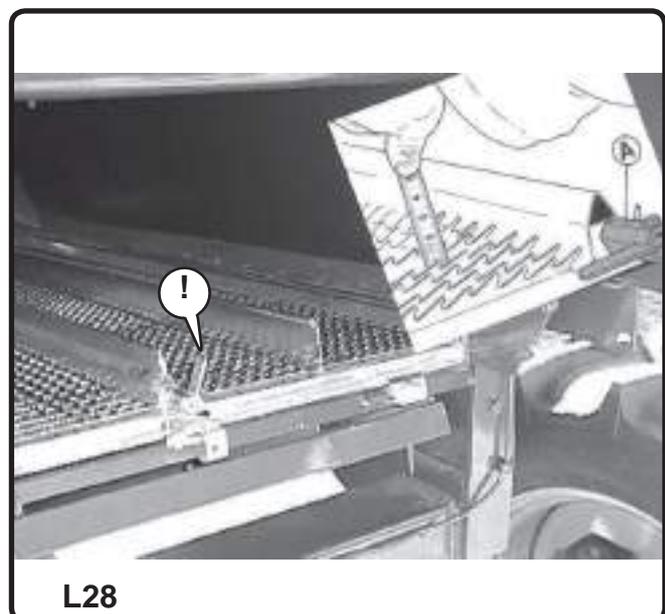
The adjustment is made using Comvision-display. Adjustments can be made while threshing. Make sure the sieves are clean.

Settings for various crops are given in the adjustment table. At regular intervals, check that the reading on the scale and the sieve opening are consistent.



### Adjustment of the CHAFFER SIEVE EXTENSION

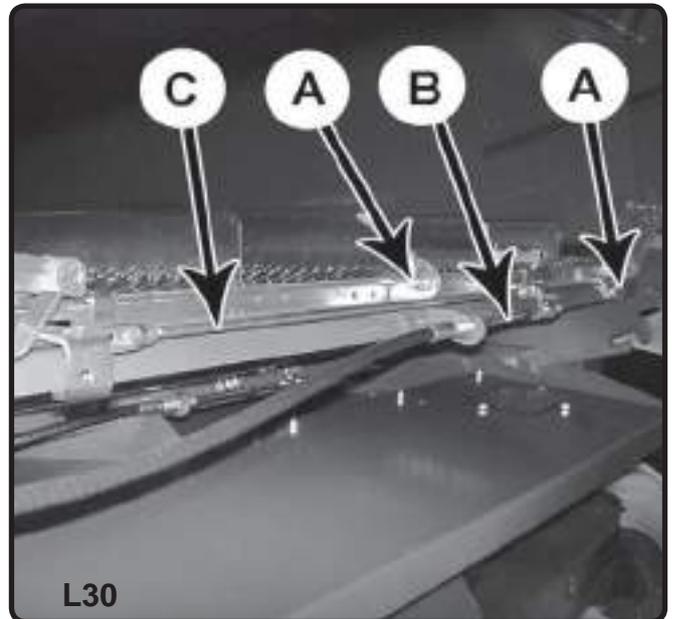
Each chaffer sieve has a separately adjustable extension. It is adjusted using the adjustment screw at the rear of the extension. The threshing mechanism and the engine shall be switched off before any adjustments are made.



### Removal and Refitting of CHAFFER SIEVES (fig. L30)

The sieves must be removed for cleaning. The rears of the sieves are fixed to the shaker shoe frame with hexagonal screws A. Before the sieves are removed, remove cable B in the adjustment device and connecting rod C between the sieves. Refitting is done in the opposite order. Do not make any changes in the adjustment devices.

After refitting make sure that the adjustment scale and the actual adjustment value are consistent.



### Removal and Refitting of SEED SIEVES (figs. L31 and L32)

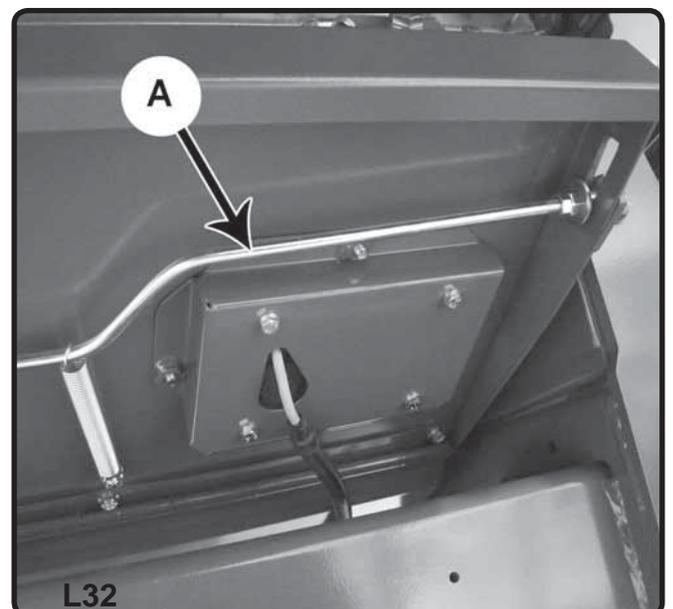
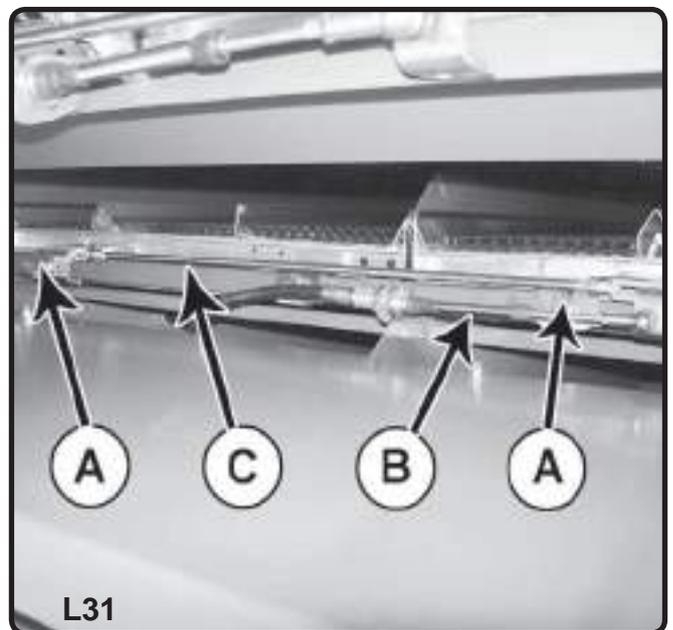
To reach seed sieves for adjusting or cleaning the rear door of the shaker shoe is needed to open. Pull backward the locking rod A, fig 32 to get the door opened.

The rears of the sieves are fixed to the shaker shoe frame with hexagonal screws A.

Before the sieves are removed, remove cable B in the adjustment device and connecting rod C between the sieves. Refitting is done in the opposite order. Do not make any changes in the adjustment devices.

After refitting make sure that the adjustment scale and the actual adjustment value are consistent.

The standard seed sieve is adjustable. For special purposes there are also fixed sieves available. Hole size 3 – 16mm.



## CLEANING FAN (figs. L33, L34 and L35) Provides Sufficient Air Flow

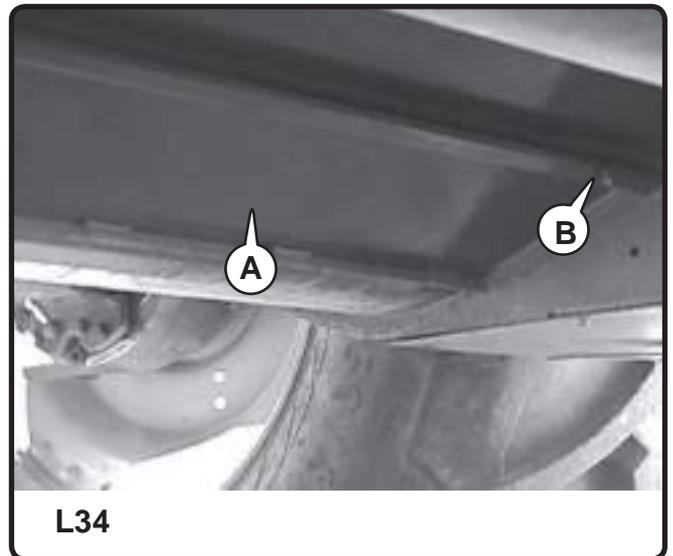
The airflow is adjusted steplessly by changing the variator speed. The cleaning fan speed is adjusted in Comvision- display. The cleaning fan speed is displayed in Comvision-display.

NOTE! Adjustments can only be made with the threshing machinery engaged.



L33

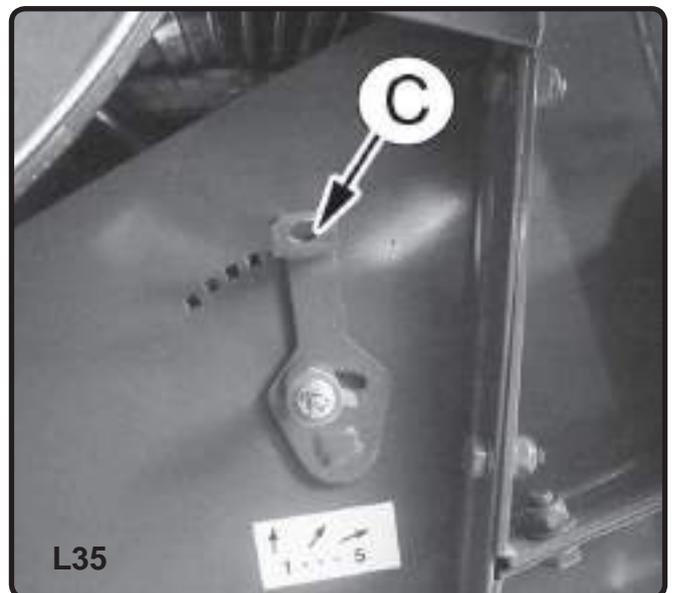
With smaller seeds requiring a weaker airflow, open door A beneath the fan by loosening screws B, fig. L34, and find the correct air flow by adjusting the variator with the door open.



L34

Adjust the airflow direction using regulating lever C, fig. L35. With the lever in its front position the air is directed forward and up. By moving the lever backwards, the air direction turns down and rearwards.

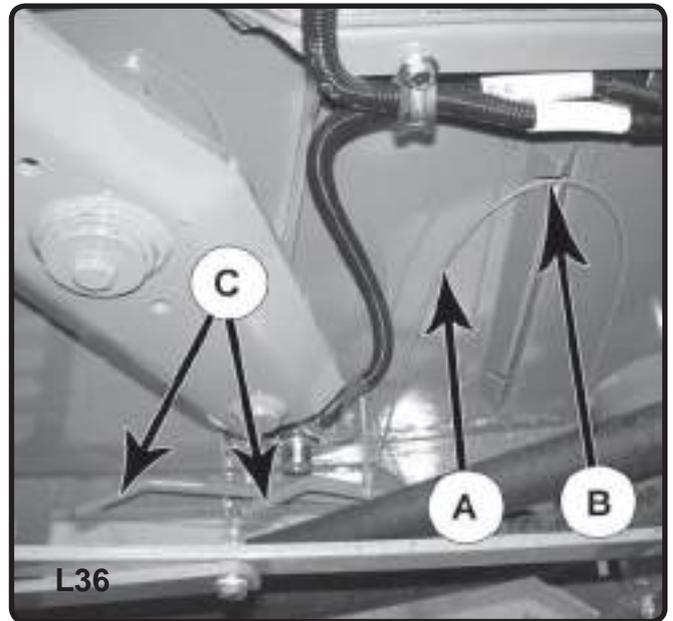
Suggested air speed and direction settings for various crops are given in the adjustment table.



L35

### **AUGER HOUSING (Fig. L36) Bottoms Can Be Opened from the Side**

From the shaker shoe, the clean grains fall to the front transport auger and the returns to the rear transport auger. The bottom troughs in the transport augers can be opened by lifting wire A from groove B and letting locking levers C go down, which will open the doors. To close the doors, lift the wire back to groove B and turn up the locking levers. A warning light will flash if the bottom auger of the returns is blocked. Immediately stop the machine, clear the blockage and find the cause for the trouble.

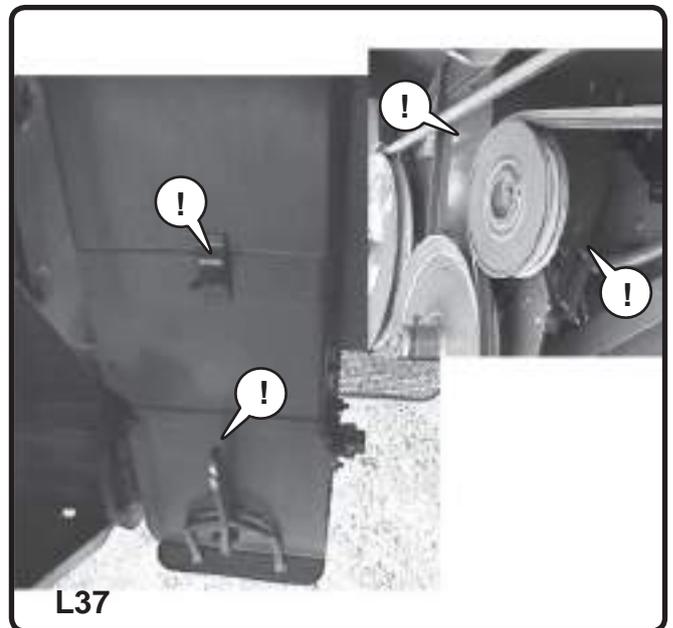


### **GRAIN ELEVATOR AND GRAIN AUGER (Fig. L37) Must Be Kept Clean and the Alarms in Working Order**

The grain elevator and the auger attached to it are on the right-hand side of the combine. The elevator doors enable the operator to check the tension of the chains and clean the elevator. An alarm will indicate a drop in the elevator speed. Any blockage can be cleared through the elevator service doors. After having cleared a blockage, operate the threshing machinery at low speed for some time before continuing threshing.

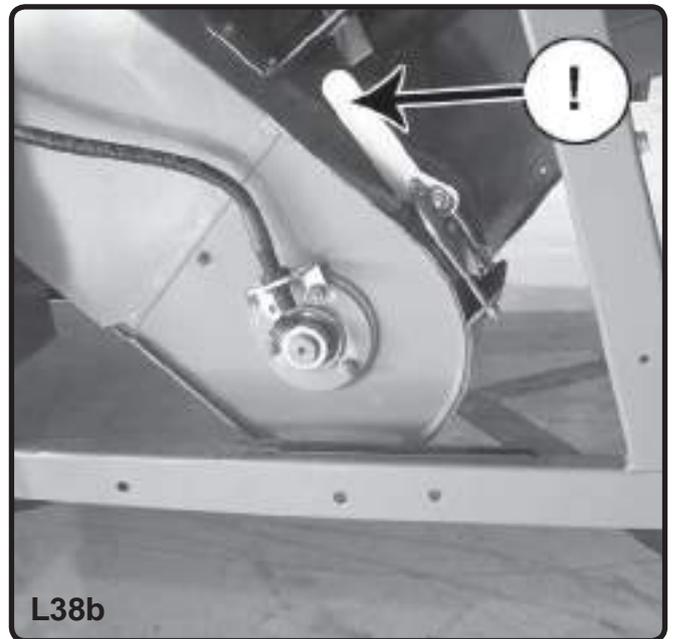
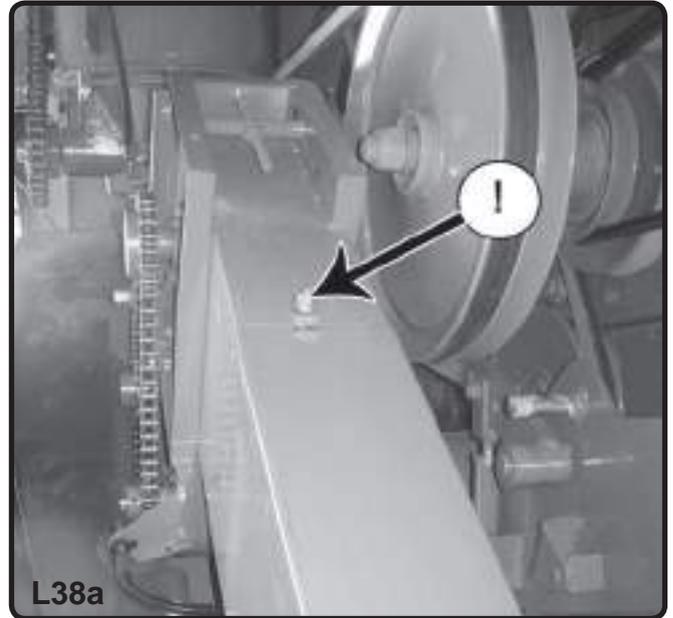
The auger next to the elevator fills the grain tank. Doors at the lower end of the auger can be opened to clean the auger. Especially when harvesting in damp conditions, the grain transport system must be cleaned often to maintain its transporting capacity.

At the lower end of the filling auger inside the housing there is a grease nipple for periodic lubrication.



**A Warning Light Controls the RETURN SYSTEM  
(Fig. L38)**

The re-thresher is located on the left-hand side of the combine. A warning light will flash when there is a blockage in the return system. There are doors in the elevator housing for cleaning and clearing any blockage.



**GRAIN TANK WITH CLOSED UNLOADING PIPE (figs. L40a and L41a)**

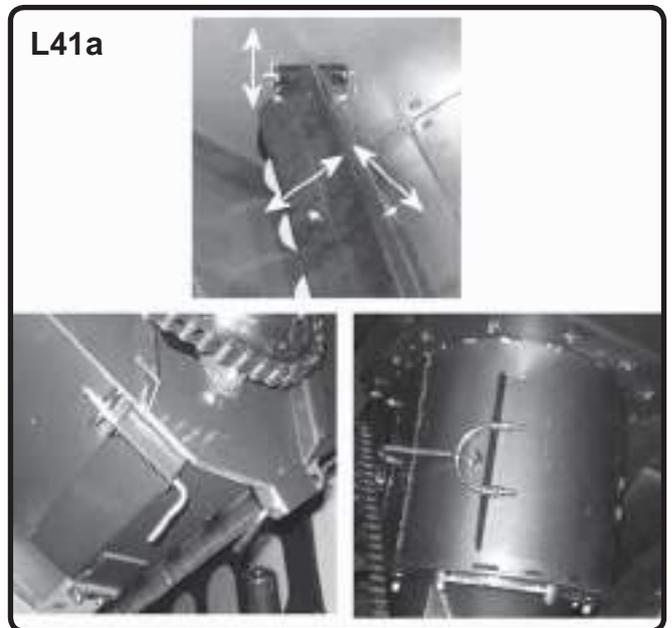
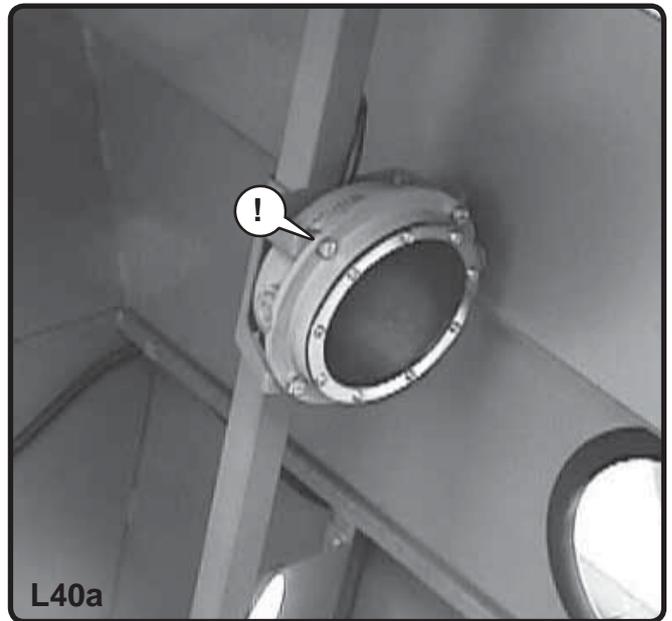
The grain tank is filled by the filling auger. Filling up is indicated by a two-sensor alarm. The alarm sensor height can be adjusted by moving the sensor to a different hole. This will either advance or delay the alarm. The lower one turns on the tank ¾ signal light, and the top one turns on the tank full signal light and the alarm. The lower sensor is to be adjusted at the height at which a signal of approaching unloading is required. The top sensor is to be adjusted at the height at which threshing needs to be stopped.

On top of the tank bottom auger there is a division brush. Its right-end height and the opening of the side plates can be adjusted.

The tank cover can be lifted up to utilize the whole capacity. Threshing can also be done with the cover down. The cover is raised with switch fig. 42a, on the instrument panel. The cover will rise with the engine running when the outer end of the switch is pressed down, and it will lower when the inner end is pressed down.

**The “>4m” signal light is on in the cab when the cover is up.**

To facilitate cleaning of the tank, the division brush on the bottom auger can be removed. The grain tank also has doors at the right-hand end and at the bottom end of the vertical auger for cleaning and on the rear wall for servicing of the engine. Both ends of the vertical knife have grease nipples, which must be greased in the 50h service. If cleaning or service jobs require entry into the tank, the engine must be switched off and the ignition key removed from the lock to ensure the engine cannot be started.



## Turning and Operating of the UNLOADING PIPE (Fig. L43a, L43b)

### Closed Unloading

The unloading pipe is turned with switches C on the traction lever. The safety switch (A fig L43b) must be in its off position before swinging of the unloading pipe.

There is a rapid motion, which turns the pipe to its extreme position (in a designated time) at the push of a button. The movement will stop if either button is pressed during the movement. A new push will turn the pipe in the selected direction.

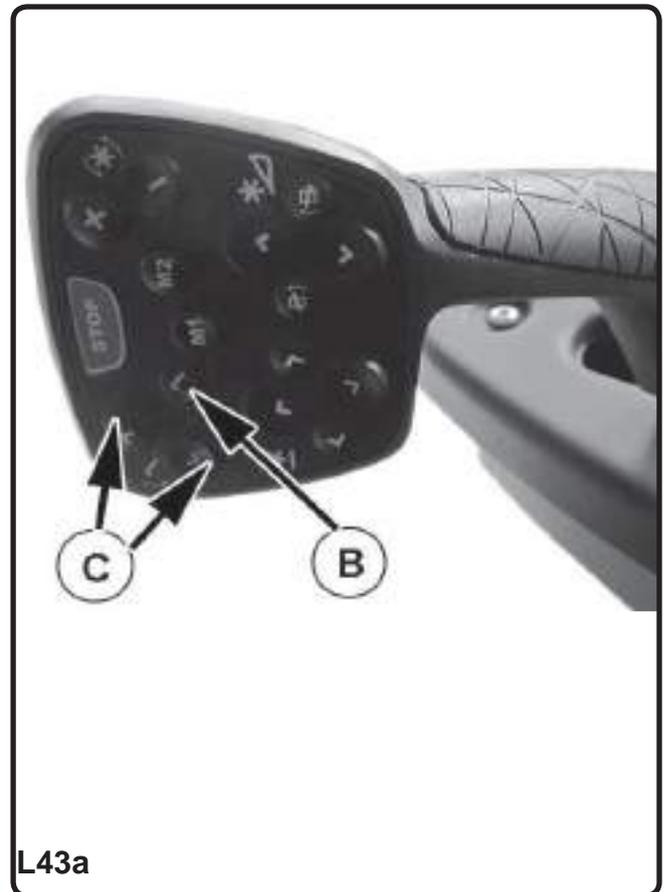
The movement can also be stopped by pressing down the SAFETY SWITCH A, FIG. L43B. **The switch must always be depressed when driving on the road.**

### Unloading can be done in any position.

Unloading is switched on by depressing the operating switch B. Unloading will stop when the switch is pressed again.

**During unloading it is important to ensure that there is enough space beneath the pipe spout for the unloading grain. The auger and transmission may get damaged if the grain cannot unload unhindered.**

The ">4m" signal light is on in the cab when the pipe is up.



L43a



L43b

**Danger Zone behind the STRAW CHOPPER (Figs. L45, L46 and L47)**

**Beware of the rotating straw chopper knife!**

**Never make adjustments or clean the chopper while the engine is running!**

**Never stand in the no-access danger zone behind the rotating chopper!**



The straw chopper is powered directly by the engine by means of a separate belt drive. It also has its own clutch. The chopper will always switch on as the threshing mechanism is started if the straw guide plate is in its "to the chopper" position. The control lever is on the rear right. The straw is guided to the chopper with the plate in position B. In position A unchopped straw is guided onto the field. Fig. L45. A control light in the cab will indicate the guide plate position when the safety switch in the threshing mechanism is activated.

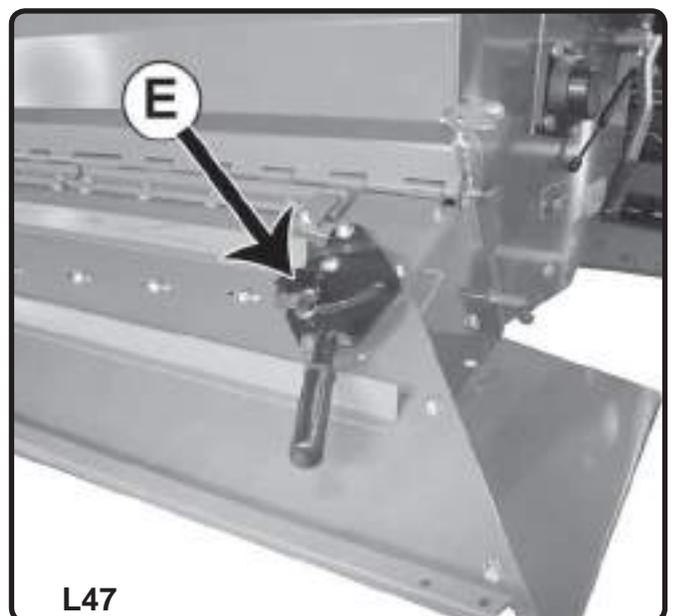
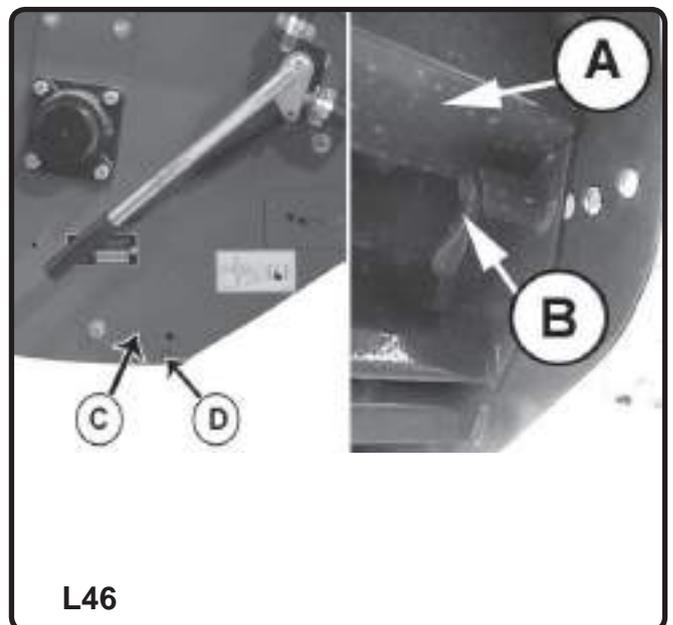
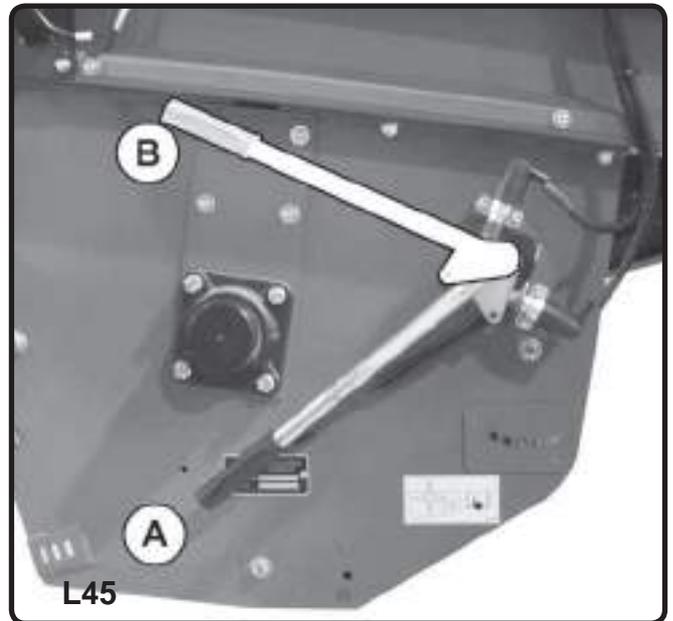
The degree of chopping can be varied by turning counter knife beam A, fig. L46. To do this, slacken screws B on both sides of the chopper, and turn the counter knife beam into the required position.

With the counter knives at right angles to the rotor centre, the straw is chopped short and chopping absorbs more power. With the counter knives down from the rotor centre, the chaff is cut longer and the power demand decreases. In their lowest position, the chopping action is minimal, but for turnip rape and flax still sufficient and recommended. When extremely short chaff is required, turn stop plate C on the bottom of the chamber up by undoing clasps D.

The chaff distribution pattern is varied by changing the vane position in the spray hood after slackening screws E in the holes on both sides of the chopper, fig. 47. A lever is used to adjust the front of the vanes. The rear of the vanes can be adjusted by slackening the sectional screws.

NOTE! Avoid adjusting the spray hood in such positions that the chaff is spread onto uncut crop, as this can block the knife, overload the sieves and result in poor grain in the tank.

When servicing the knife, the spray hood may be raised to rest on a support. It shall, however, always be lowered as soon as the service job has been completed.



## ELECTRICAL ADJUSTMENT OF THE CHOPPER

The combine can be equipped with a remote-controlled electrical chop guide.

The controls are located on the instrument panel. Fig. L48.

The left-hand switch controls the left-hand guide vane and the right-hand switch the right-hand vane. The vanes spread out when the front of the switch is pressed and become narrower when the rear of the switch is pressed.



L48

## CHAFF SPREADER Spreads the Chaff Evenly on the Field

The specification of the combine may include a chaff spreader. It is powered by the same hydraulic circuit as the pick-up reel. The spreader will switch on whenever the threshing mechanism is running.

The spreader is fastened behind the shaker shoe with joints. It is turned to the front in its working position. The rear position is needed while servicing the sieves. If necessary, the spreader may be removed from the combine. In this case thick hydraulic hoses are to be connected to each other using fast couplings as the whole oil flow for the reel drive pump flows through here.

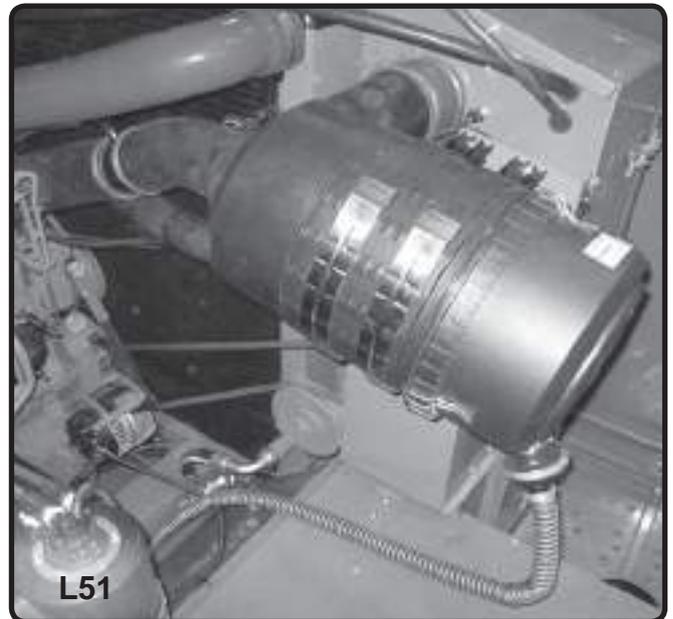
## ENGINE, Source of Power

The engine is a water-cooled, four-stroke, six-cylinder, direct-injection diesel. For a more detailed description of the engine, see the engine manual.

The power is transmitted from the rear of the engine to the traction, threshing mechanism, grain tank unloading and the hydraulic pump. At the front of the engine there are belt drives for the fan and alternator and the compressor of the optional cab cooling system.

### Suction Air Filters (Fig. L51)

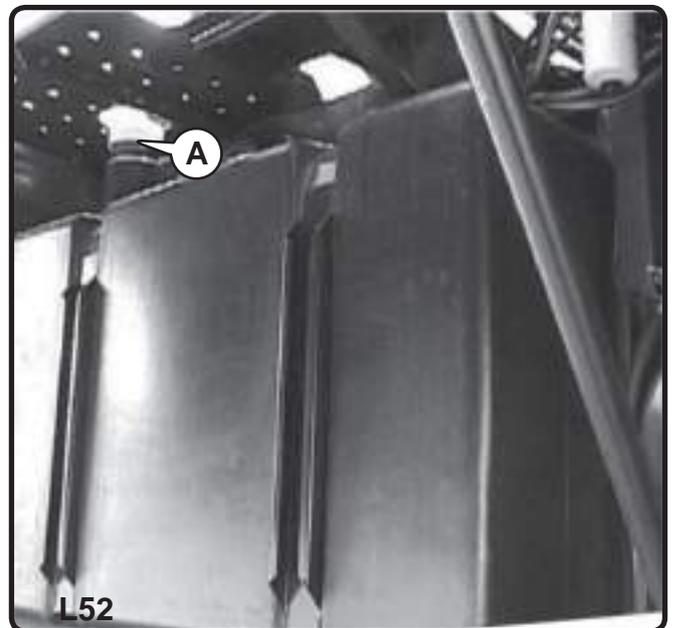
The engine suction air is cleaned by a coarse filter and a two-part paper filter. There is a control light to indicate a blockage in the filter system. See cleaning instructions under "Maintenance". The coarse filter is on the filter housing and it is being emptied continuously by means of the exhaust fume ejector.



### The Fuel Tank (Fig. L52) Shall Be Filled with Pure Fuel Only

The fuel tank is on right hand side of the combine. Use pure and water-free gas oil as fuel. Before refuelling, remove all impurities from around filler A. Be sure to clean the step above the filler, too.

The filler is equipped with a refuse strainer. Clean the strainer at regular intervals.



### PRE-FILTER (fig. L52a) and water separator

The fuel pre-filter and water separator are located near the engine.

There is a stopcock at the tank end (Fig. L52a).



4th generation AGCO SISU POWER motors has adopted exhaust gas treatment with SCR technology (Selective Catalytic Reduction). In SCR technology a liquid called DEF (Diesel Exhaust Fluid) is injected into exhaust gases. Most commonly known trademarks of DEF are AdBlue, Air1 and Greenox.

For the DEF requirements, see engine manual.

DEF tank (60 liters) is located in the engine compartment, and the filler neck shown in Figure L53.



**Be careful when handling DEF. DEF is aggressive to some materials and corrosive to some metals. DEF becomes crystalline when in contact with air. In case of a spillage rinse with plenty of water and dry with a clean cloth.**

**Even small amounts of diesel fuel in DEF tank may damage the gaskets of the SCR system!**

Combine is not equipped with a heating system for DEF, so use of combine below  $-10^{\circ}\text{C}$  temperatures is prohibited. Start up and short-term transfers are possible.

AGCO SISU POWER SCR system is durable and almost maintenance free. Only main filter change for supply module is required in normal use. AGCO SISU POWER SCR is equipped with on-board diagnostic, which will warn the operator or limit the usage of the machine if any problems (e.g. leakages or blocking of lines) occur in the system.

For the maintenance and adjustment of SCR, see engine manual.



## Daily Checks of the Engine (Fig. L54)

### Lubrication System

It is of utmost importance to use correct lubricating oil, in accordance with the load placed on the engine. See Lubrication Table under "Maintenance".

Check the oil level daily before starting; it shall be between the minimum and maximum marks on dipstick A, preferably near the maximum, fig. L54. Oil is refilled through filler B. A control light indicates low oil pressure. Should the oil pressure warning light come on with the engine running, stop the engine immediately and find the cause for the trouble.

### COOLING SYSTEM (Fig. 55)

The engine cooling air is purified by a rotating screen. The cooling fan is located inside the rotating screen in front of the radiator.

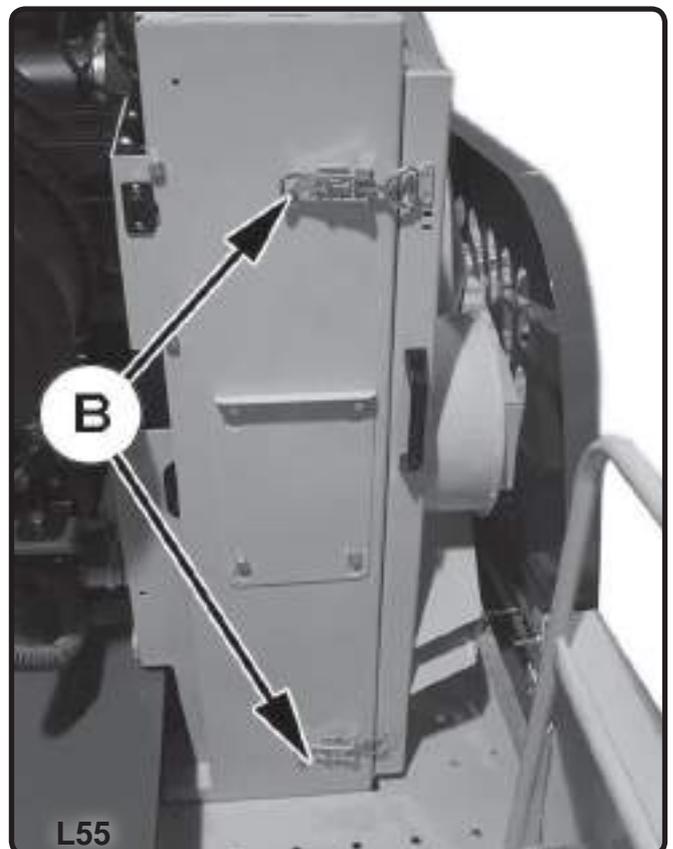
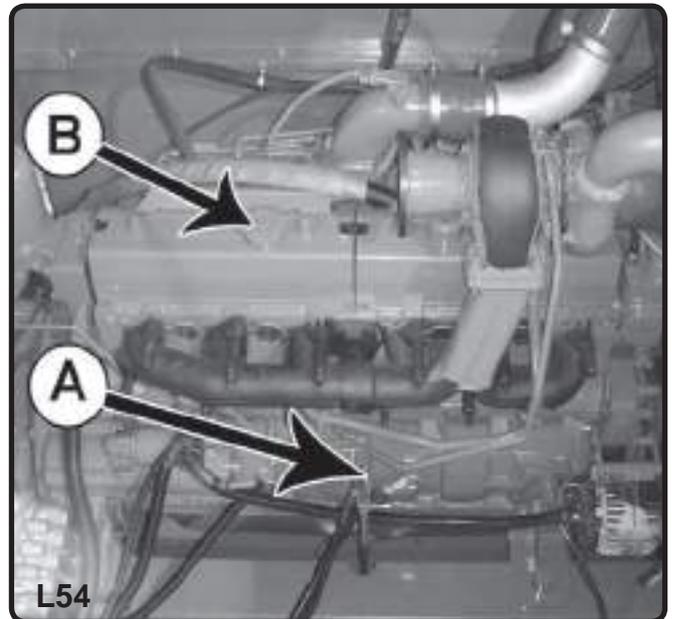
When the combine leaves the factory, the engine cooling system has antifreeze added. Do not use ordinary water as coolant because of the risk of corrosion.

Check the radiator coolant level daily before starting. It must be in the middle line of the expansion tank when the engine is cold.

The coolant temperature gauge indicates the temperature of the engine coolant. In normal working conditions the needle must be between 75 - 95°C. Comvision-display indicates engine overheating. The alarm temperature is approx. 100°C.

If the temperature starts to rise, check that the outside of the radiator is not clogged. To remove any blockage, direct compressed air from the side of the fan through the radiator, or use a brush. Always be careful not to damage the lamellas.

To clean the equipment, the fan unit in front of the radiator may be turned open by opening latches B.

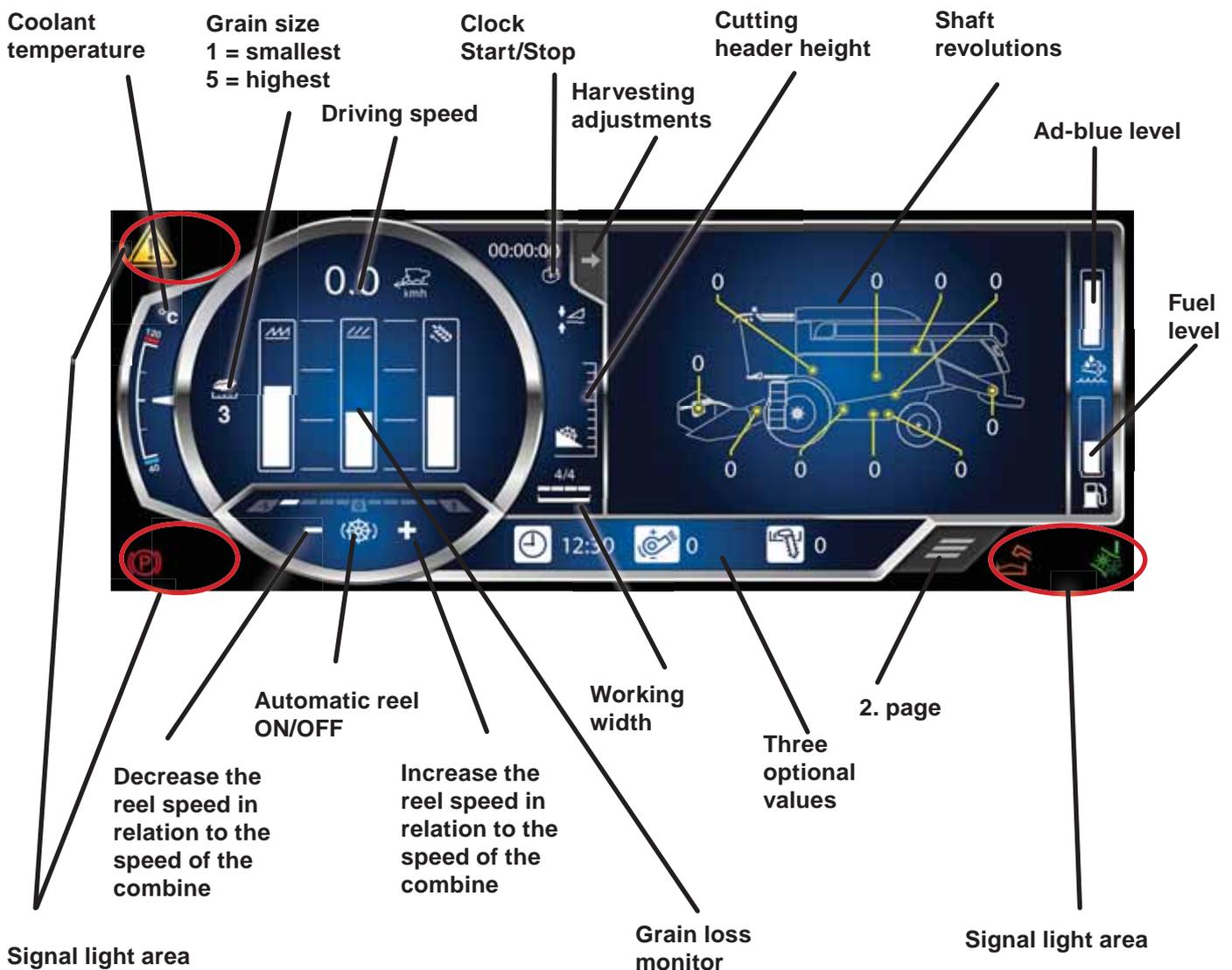


# COMVISION

This section deals with the use of the COMVISION monitor. In addition to grain losses the monitor also measures the threshed area, the threshing time used, it estimates the finishing time for the section, monitors and alarms the rotation speeds of certain shafts, adjusts reel speed, controls the grain tank filling up and measures the amount and quality of the returns. Comvision shows also engine information. Harvesting adjustments are controlled in Comvision.

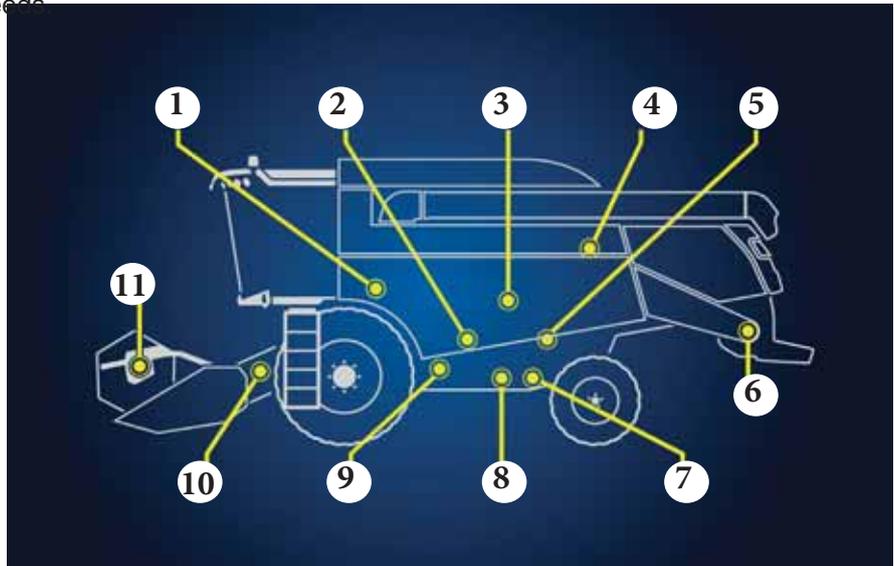
The equipment consists of a touchscreen main unit, loss sensors, pulse sensors and limiter switches. The equipment is connected to the forward speed sensor, the threshing cylinder, CSP and fan speed sensors, the grain tank sensors and the straw alarm sensor. There is a sensor on the return auger to measure the amount of returns.

The figure below shows the home view, from which you can select the required function by pressing the icon.



“ Shaft revolutions” shows shaft speeds

- Threshing cylinder (1)
- Returns (C10&C12) (2)
- Straw walker (3)
- CSP drum (4)
- Returns (C6&C8) (5)
- Chopper (6)
- Returns (C6&C8) (7)
- Grain elevator (8)
- Fan (9)
- Feeder (10)
- Pick-up reel (11)

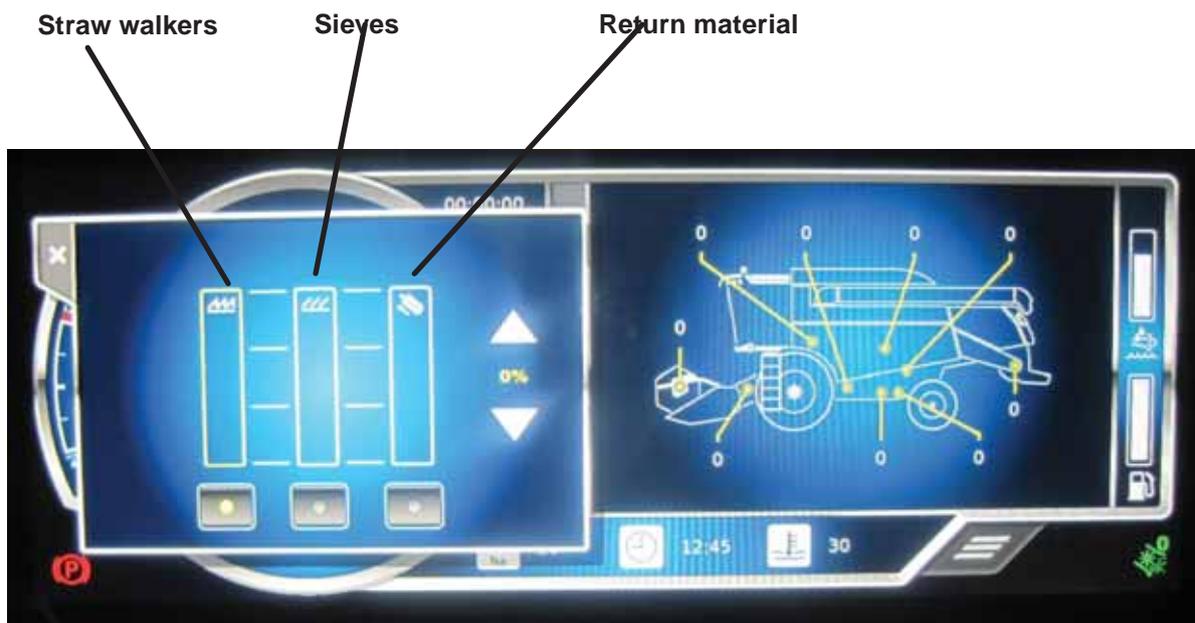


Engaging 3rd gear or pressing safety switch A (driving in traffic switch) will switch on driving mode in Comvision display.

Driving speed meter with trip meter shows on the left side of the monitor.



When pressing grain loss monitor at home page, new window will pop-up on the left side of the monitor. On this window you can adjust the sensitivity of the grain loss display. Select the bar you want to adjust and press button UP or DOWN .



When pressing **Harvesting adjustments** at home page, new window will pop-up on the right side of the monitor. On this window you can adjust:

1. **Threshing cylinder RPM**
2. **Fan RPM**
3. **Concave cap**
4. **Upper sieve**
5. **Pre-Concave cap**
6. **Lower sieve**



When pressing the value, new window will pop-up on the right side of the monitor. On this window you can adjust the selected value with arrow UP or DOWN. After adjustment, accept or reject the value with the buttons at the bottom of the window.



When pressing grain crop symbol at **Harvesting adjustments** window, “Taelli”- control system (OPTION) will pop-up. On this window you can make proper adjustments for different crops and then moving between them becomes more easy.

Pre-adjustments can be made for:

1. Threshing cylinder RPM
2. Fan RPM
3. Concave cap
4. Upper sieve
5. Pre-Concave cap
6. Lower sieve

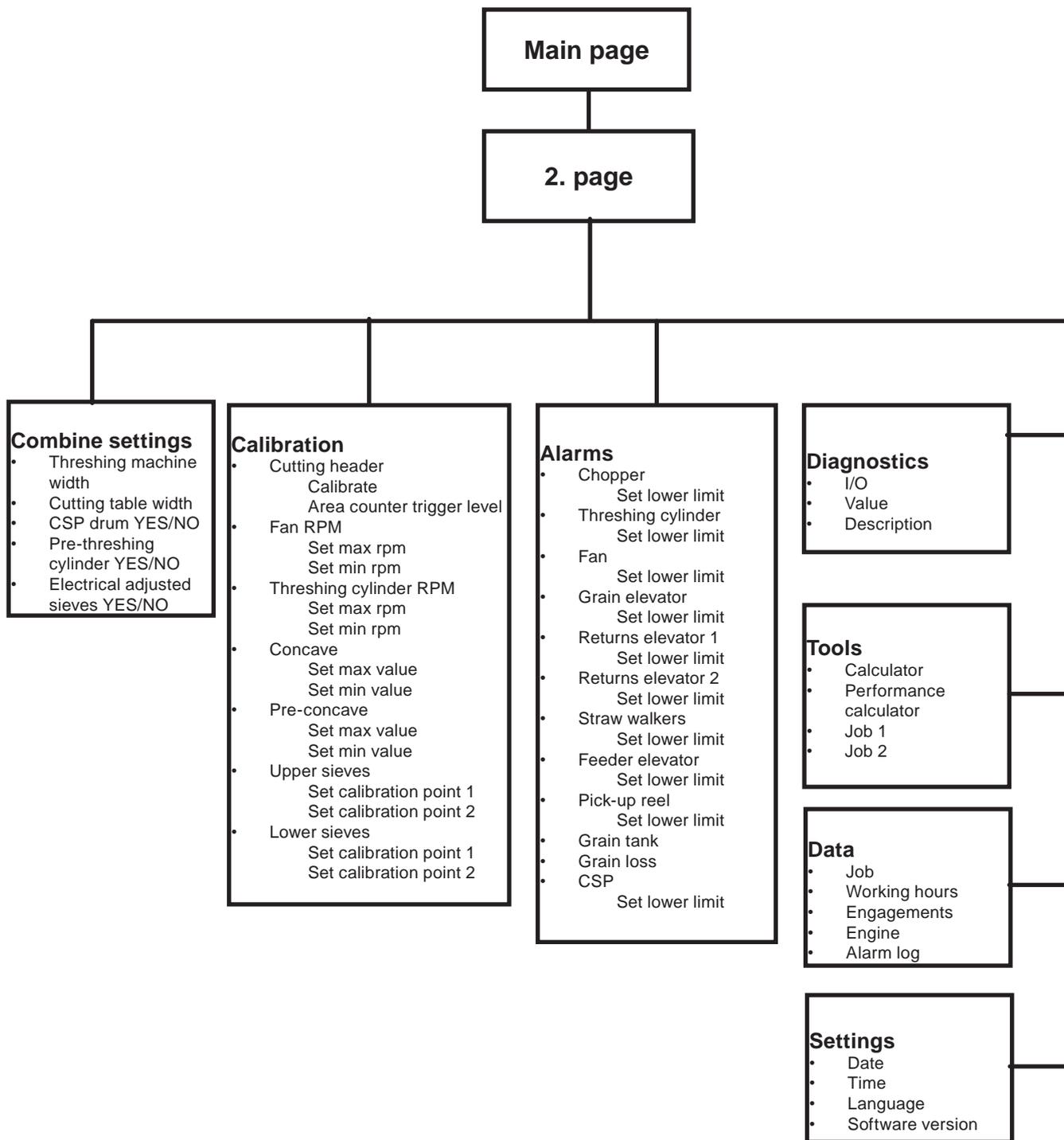


Pressing any meter on bottom of the home view will open a window which displays all meters. You can choose three meters to be displayed in home view simply by pressing desired meter.



1. Hectares threshed
2. Bottom auger RPM
3. CSP RPM
4. Oil pressure
5. The outdoor temperature
6. Hectares left
7. Return RPM
8. Engine RPM
9. DEF consumption liter/hours
10. Total fuel consumption
11. Hectares per hour
12. Feeder Elevator RPM
13. Fuel consumption liter/hours
14. Fuel temperature
15. Charge pressure
16. Estimated time by which the programmed area is threshed at current speed
17. Fan RPM
18. Coolant temperature
19. The charge air temperature
20. The fuel feed pressure
21. Chopper RPM
22. Grain elevator RPM
23. The engine load percentage
24. DEF temperature
25. Operating Hours
26. Threshing cylinder RPM
27. Time
28. The battery voltage
29. Exhaust temperature
30. Fuel consumption liter/hectare

The Comvion menu structure is shown in figure below.



2. **page** button at the main page opens a menu for settings, calibration, adjusting alarms, diagnostics, tools for harvesting and data menus.

