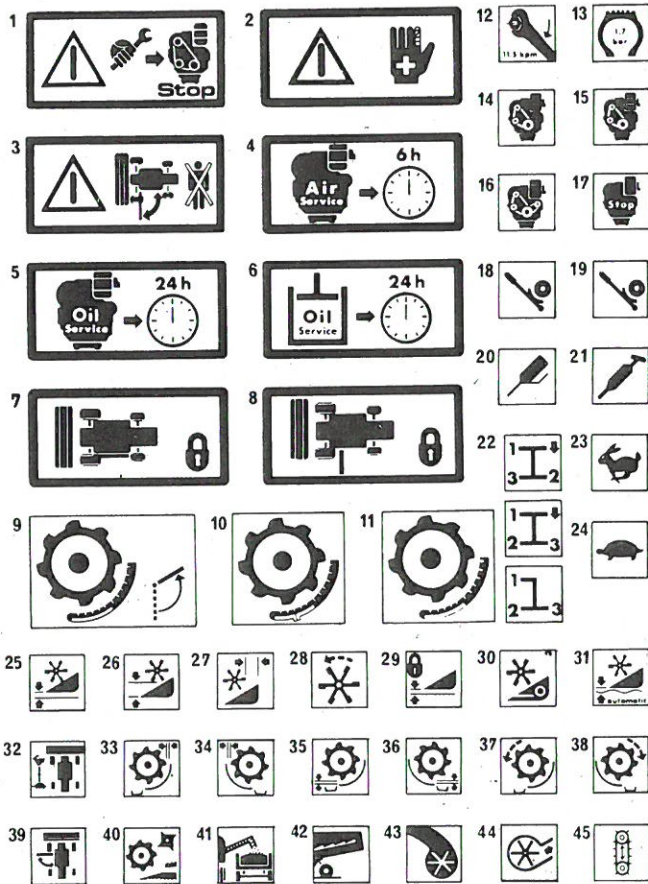


**Operating Instructions  
Combine Harvesters**

**DEUTZ  
FAHR**

**M 2385**



## Key to symbols

1. Warning of danger point. When working on machine stop engine.
2. Warning of danger point. Danger of injury
3. Warning of danger point. When swinging out see no-one is standing in the way
4. Air filter. Check every six hours
5. Check engine oil level daily
6. Check hydraulic oil level daily
7. Be sure to lock discharge pipe when swung in
8. Be sure to lock discharge pipe when swung out
9. Fitting of de-awning plate
10. Fitting of de-awning plate
11. Fitting of de-awning plate
12. Tightening torque
13. Tyre air pressure
14. Air filter monitoring light
15. V-belt monitoring light
16. V-belt monitoring light
17. Engine - Stop
18. Auxiliary and parking brake
19. Monitoring light for auxiliary and parking brake
20. Lubricate with oil
21. Lubricate with grease
22. Diagram of gear change patterns
23. Fast
24. Slow
25. Cutting table height control
26. Vertical reel adjustment
27. Horizontal reel adjustment
28. Reel speed adjustment
29. Cutting table locked
30. Cutting table clutch
31. Cutting table height regulation
32. Travel speed adjustment
33. Clearance between concave and drum left rear
34. Clearance between concave and drum right rear
35. Clearance between concave and drum front left
36. Clearance between concave and drum front right
37. Drum speed adjustment
38. Drum speed adjustment
39. Slewing of grain tank discharge pipe
40. Threshing mechanism clutch
41. Grain tank discharge clutch control
42. Straw walker warning system
43. Return elevator warning system
44. Fan variable speed drive control
45. Tension of conveyor chain

# Operating Instructions Combine Harvesters



**M 2385**

# Table of Contents

	Page		Page		Page
<b>Foreword</b>	4	Control levers on the left-hand side	18	Replacement of the engine-oil filter	34
Side view of combine harvester	5	Steering wheel	21	Cleaning sieve of the fuel feed pump	35
<b>Statutory operating instructions</b>		Driver's seat	22	Replacement of the fuel filter	36
Safety	6	Comfort seat	23	Venting the fuel pipes	36
Fire precautions	7	Service brake	24	Suction pipe and exhaust pipe	38
Traffic regulations	8	Brake systems – checking the service brake and the parking brake	24	Cooling ribs, air duct and fan wheel	38
Staircase to driver's platform	9	Bleeding the brake system	25	Engine air cleaner	39
Chassis number	9	Reservoirs for the brake – and clutch fluids	25	Fuel tank	41
Wheel chock	10	Readjustment of the auxiliary and parking brake	26	Battery maintenance	42
Settings on the machine	10	Gearbox clutch	26	<b>Cutting table</b>	
<b>Controls and monitoring equipment</b>		Checking oil levels of the gearbox and of lateral gears	27	Transport trolley	43
Driver's platform	11	Lateral gears	28	Separating the cutting table from the conveyor channel	44
Controls on the right-hand side from the driver	12	<b>Engine</b>		Knife drive	46
Hydraulic controls and push-button switches	13	Maintenance and servicing	29	Sliding shoes	46
Ignition lock and control instruments	14	Legend	30	Feed auger	47
agrotronic®	15	Lubricating oil circulation	31	Reel speed adjustment	48
Central informer	16	Engine-oil level checking and change	33	Reel adjustment	48
Parking brake	18			Earlifters	49
				Divider points	50
				Conveyor channel	51

	Page
<b>Threshing mechanism</b>	
Cover of the threshing drum . . . . .	53
De-awning plates . . . . .	54
Stone collecting trough . . . . .	54
Concave . . . . .	55
Threshing drum . . . . .	55
Threshing drum-speed variator drive . . . . .	56
Straw walkers . . . . .	57
Cleaning . . . . .	58
Sieve box . . . . .	58
Sieve-box adjustment . . . . .	59
Fan adjustment . . . . .	59
Grain elevator . . . . .	60
Returns elevator . . . . .	61
Transport augers . . . . .	62
<b>Grain tank</b>	
Distributing auger . . . . .	62
Grain level indicator . . . . .	63
Adjustable grain auger guard . . . . .	63
Cleaning hole . . . . .	63

	Page
<b>Tips for the adjustment of drives</b>	
Travelling drive . . . . .	65
Main-drive . . . . .	65
Threshing-drum drive belt and fan . . . . .	66
Threshing mechanism clutch . . . . .	67
Conveyor channel clutch . . . . .	67
Grain tank clutch . . . . .	67
<b>Hydraulic equipment</b>	
Hydraulic scheme . . . . .	68
Working hydraulics – oil reservoir . . . . .	69
Oil change . . . . .	69
Adjusting facilities – lifting and lowering the cutting table . . . . .	69
Steering . . . . .	70
Ballasting the rear wheels . . . . .	70
Torques of wheel nuts . . . . .	72
Tyre inflation pressures . . . . .	72
Adjusting table for the various types of crops . . . . .	73
Rectification guide for cutting- and threshing faults . . . . .	74
Filling quantities and oil grades . . . . .	75

	Page
Wiring diagram . . . . .	76
Jobs to be carried out after the campaign . . . . .	77
Preservation of engine . . . . .	77
<b>Technical data</b>	
Additional equipment . . . . .	78
Measurements and weights . . . . .	79
Greasing chart . . . . .	enclosure
Electrical wiring diagram . . . . .	enclosure

# Foreword

## Advice to the User

With your DEUTZ-FAHR Combine Harvester you have acquired a fully developed and heavy-duty combine.

In order that you can become acquainted with the

- legal requirements for operation
- technical instructions
- rules for setting to work, and
- care and maintenance instructions

we ask you to study the following instructions carefully. This is a pre-requisite for

troublefree setting to work and good results at work, for the maintenance of the value of your machine and for supporting any guarantee claims you may have during the guarantee period.

In your own interest and for your own safety please pay particular attention to the legal requirements in force in your country, covering the use of the machine and travel along public roads. Extracts of the most important points you will find on page 6 to 7.

If anything is not clear please apply to your trader or to our after-sales service department. When you take the machine over please check if any damage has occurred in

transit and also that all parts covered by the order have in fact been delivered.

Inform your trader if anything is not quite right.

Just as much as you it is greatly to our interest and that of your trader that your machine should operate safely.

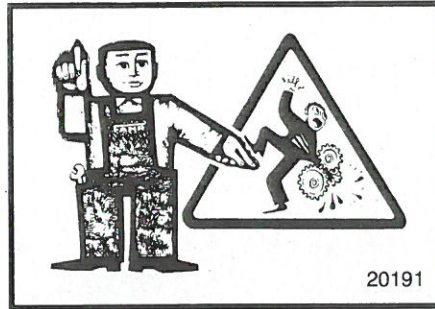
And now – good luck!

Klöckner-Humboldt-Deutz AG  
Zweigniederlassung Fahr



20349

# Safety



**through superior technics,  
correct use, and careful  
maintenance and servicing**

All protective devices are serially provided on the machine, in addition to which transfer-pictures are applied to the combine with symbols which in any case should be obeyed.

**The following rules for the prevention of accidents should be strictly observed:**

- **Only a trained driver is permitted to drive your combine harvester.**
- **Giving incompetent persons a lift is inadmissible.**
- Children and incompetent persons have no business to be on or near the machine.

- The owner of the combine harvester is also responsible for accidents occurred to incompetent persons.
- All guards supplied with the machine have always to be fitted.
- On principle, never use the machine without guards.
- Before starting the engine, give warning signals and make sure that there is not any person – particularly children – who could be seized by moving parts of the machine.
- Lower the cutting table and the reel by the hydraulics before carrying out some or other job on these elements.
- Before doing some or other job under the cutting table jack up the cutting table.
- Stop the engine if the cutting mechanism has to be cleaned.





## Fire Precautions

- When turning on inclines, do this cautiously. Risk of tipping when turning too fast!
- For cleaning, adjusting or servicing the machine stop the engine. Hands off from rotating parts!
- If clogging occurs in the grain tank, use the grain stamper.
- With running engine never enter the grain tank!
- Before doing some or other job in the grain tank, withdraw the key from the ignition lock!
- Self-propelled combine harvesters must never be used stationary in barns for threshing.
- A fire extinguisher must always be mounted on the machine and ready for use. It must be properly checked over for functioning at least every two years. Your trader will be able to advise you of the nearest refilling station.

The above symbol is used in connection with all important safety tips given in this Operating Instruction Book. Please observe said tips very carefully. Please also instruct your staff or other users of your combine harvester accordingly.

## Traffic Regulations

When transporting your combine harvester on a road we point out to the traffic rules in force in your country, particularly with regard to licence, transport width, and speed maximum.

Before transporting your combine harvester on a public road,

remove the cutting table if prescribed by the law,

when cutting table has been dismantled, raise front feed channel to its highest position or when travelling with cutting table or maize picker, set clearance above road to 300 mm,

lock hydraulic control lever,

empty the grain tank,

fold back and secure the grain tank discharge pipe,

fold up bottom part of the flight of stairs and secure same in this position,

put light supports into transport position of the machine, and secure in this position,

when equipped with straw chopper, fold baffle plate towards the front and secure in this position,

when equipped with a 2850 mm cutting table, remove straw dividers including the deflecting plate and supports,

cover the whole of the width of the machine from joining piece to joining piece of crop dividers by a protecting bar, and the cutting table situated below by a guard plate,

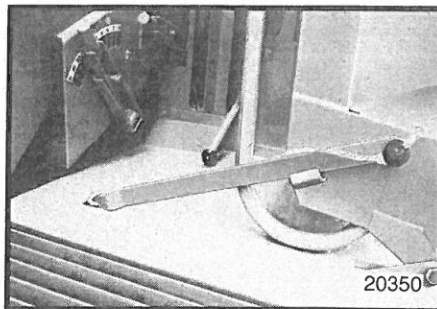
when using a maize picker, remove divider points and fit a guard across the whole width of the machine,

the trailer coupling as optionally fitted to the machine must be exclusively used for trailer models TW 2 of the same manufacturer for transport of working equipment,

when equipped with maize picker or low-mounted front chopper, no transport trailer must be attached to the machine,

in addition, when equipped with cutting table or maize picker with low-mounted front chopper a rear axle load of at least 1050 kg has to be observed,

when optionally fitted with spotlights (only when machine is equipped with a cab) same should be only used at working in the field, but nevertheless make sure that road users are not dazzled by their glare.



## Important



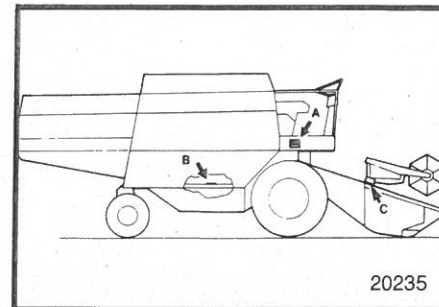
- On the left-hand side of the combine harvester the full name (Christian name and family name) and the residence of the combine owner have to be indicated.
- When travelling on public roads an emergency reflective triangle should be carried along with the machine.
- Watch the braking effect of the machine; readjust brakes in time!
- Be careful at negotiating bends. The combine harvester swings out at the rear.

The bottom part of the staircase has to be folded up and secured (see figure 20350).

For letting down the staircase, use always the cable. Make sure that there is nobody in the folding area of the staircase.

The manufacturer's plate is on the right side member of the driver's platform ("A").

The manufacturer's plate contains as follows: name of manufacturer, year of manufacture, model, chassis number, admissible total weight, admissible front axle load, admissible rear axle load.

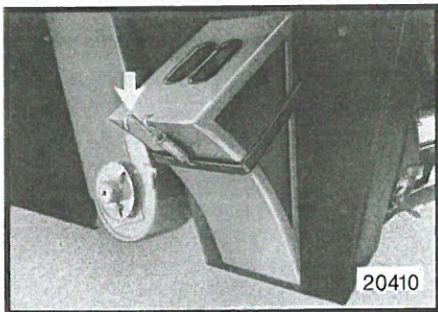


## Chassis Number

Admissible axle loads as given in the manufacturer's plate must not be exceeded, with extra equipment neither.

The chassis number is also on the right chassis side of the machine ("B").

The manufacturer's plate with machine number is also fitted to the right side of the cutting table ("C").



## Wheel Chock

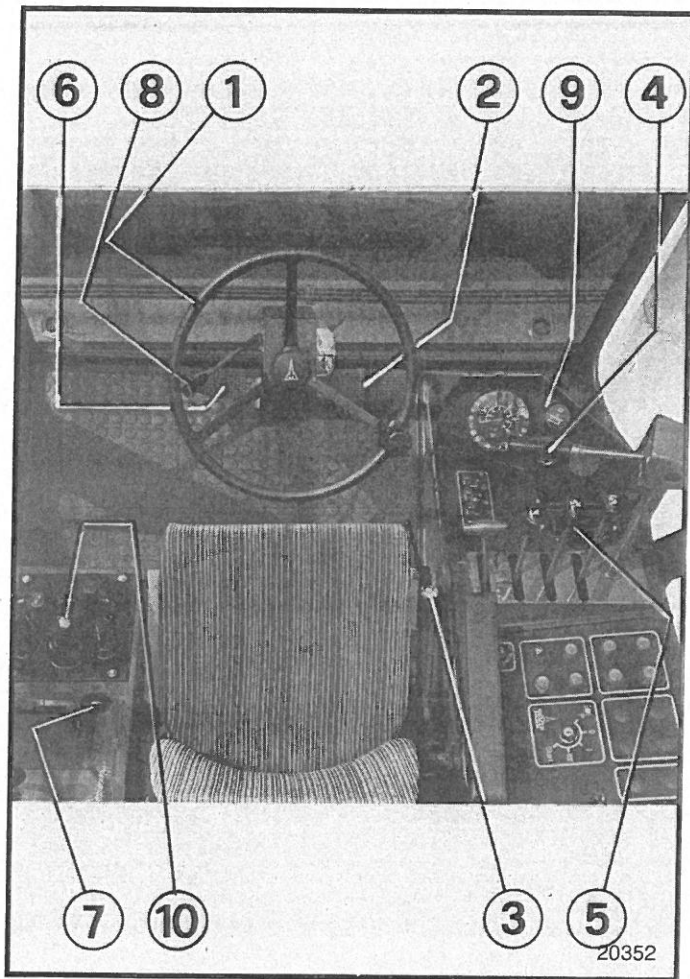


Each combine harvester is supplied with a wheel chock which is located under the left-hand lining of the combine harvester. In this position the chock is sufficiently locked by a spring-loaded hook so that it cannot be lost.

## Settings on the Machine

By precise settings on modern combine harvesters losses can be reduced to a minimum. Owing to harvesting conditions and to the degree of moisture of crops losses cannot be completely avoided, but nevertheless can and should be kept as low as possible. This depends on optimal settings of the combine harvester and on the operation of the machine. As a matter of fact, the crop and ground conditions have to be taken into account.

See Table of Settings on page 73.



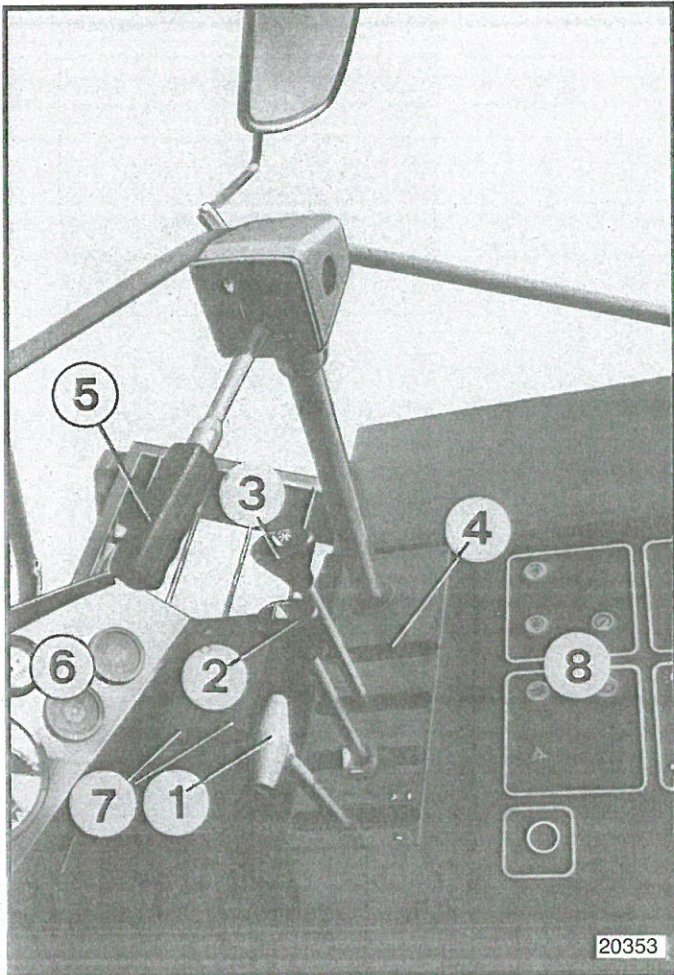
## Driver's Platform

Before starting the operation with your combine harvester please make yourself acquainted with all controls and monitoring equipment.

All levers and controls on the driver-S platform have been clearly arranged.

## Controls and Monitoring Equipment

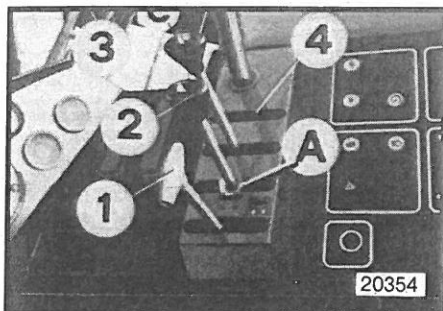
- 1 Steering wheel
- 2 Brake pedals
- 3 Auxiliary and parking brake handle
- 4 Gear shift lever
- 5 Hydraulic control levers
- 6 Gearbox clutch pedal
- 7 Engine speed adjusting lever
- 8 Trafficator control lever
- 9 Instrument box
- 10 Clutch- and control levers



## Controls on the right-hand side from the driver

- 1-4 = Hydraulic controls
- 5 = Gear shift lever
- 6 = Control instruments
- 7 = Fuse box
- 8 = Push-button switches

20353



## Hydraulic Controls

All levers of the hydraulic control apparatus can be easily operated by the driver.

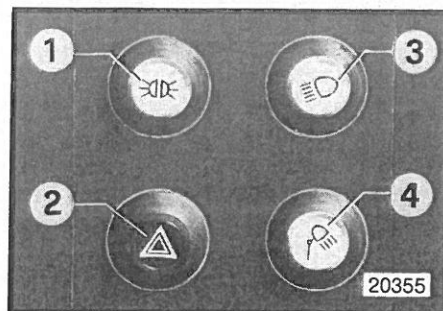
All functions of the hydraulic control apparatus have been marked with symbols.

- 1 **Travelling speed** inf. variable
- 2 **Cutting tale** lifting and lowering
- 3 **Reel** lifting and lowering

### Optional equipment

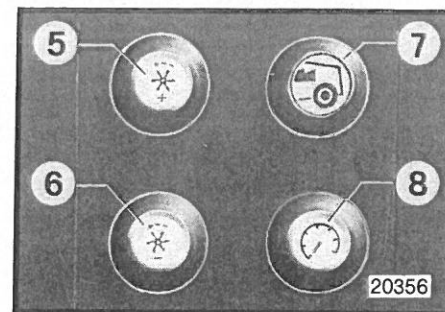
- 4 **Horizontal reel adjustment**

When travelling along the road the lever 1 of the hydraulic control apparatus has to be secured by the hinged piece "A".

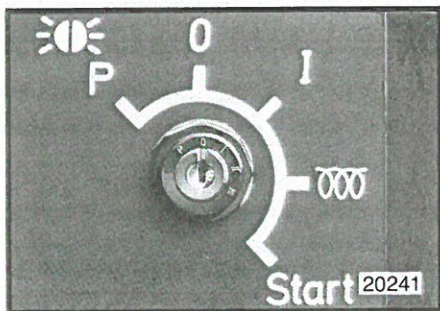


## Push-button Switches

- 1 = Side and tail lamps
- 2 = Flashing hazard light
- 3 = Headlights
- 4 = Searchlight for night working (optional)



- 5 = Increased reel speed
- 6 = Reduced reel speed
- 7 = Straw chopper On - Off (optional)
- 8 = Speedometer or revolution counter for the threshing drum



## Ignition Lock

Positions of the ignition key:

0 = Neutral position

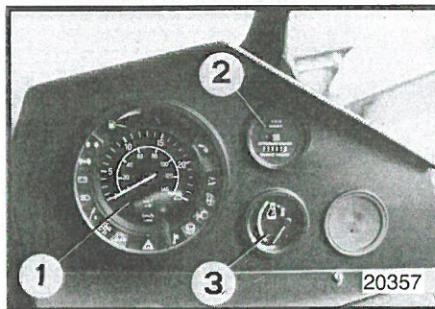
1 = Operating position. The charge control and the oil-pressure control lamp light up with stopped engine

☸ = Preliminary heating position (not connected)

Start = Starting position

P = Parking light position

Ignition key can be withdrawn from the lock in positions P and O.



## Control Instruments

1 = Central informer

2 = Working hours' counter

3 = Engine cylinder head temperature indicator



## agrotronic®

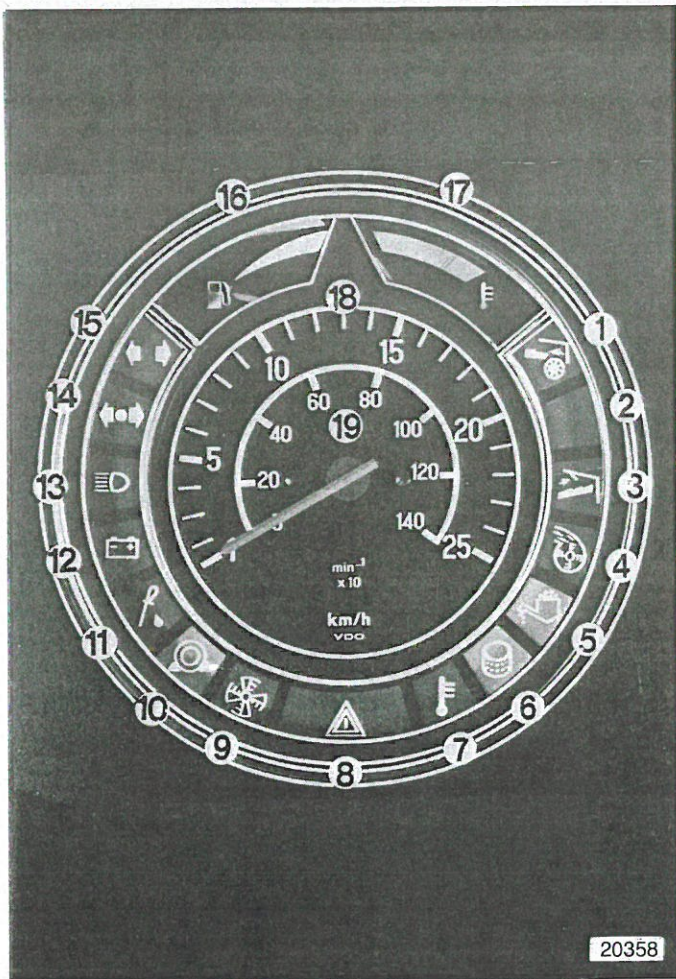
The agrotronic® is a new electronic monitoring system for combine harvesters.

Its main components are as follows:

- a) Sensors for the detection of measuring values or errors on monitoring parts of the machine,
- b) a main control apparatus with electronic processing of sensor signals,
- c) the central informer with optical indication of functional or operational errors.
- d) an acoustic warning signal transmitter in addition to the optical indication of functional or operational errors.

The special features of the above system are as follows:

- Circuit opening connection: In addition to troubles occurring in controlled places even troubles are indicated which take place in the monitoring system.
- **Automatic function control of the agrotronic®** during any starting process of the diesel engine.
- Toolless colour coded connecting system for cables and equipment.
- Wear resisting and short circuit proof operation, independent of voltage fluctuation in the supply system.



20358

## Central Informer

All important functions of the combine harvester are secured by optical and acoustic warning devices.

The central informer contains as follows:

- 1 Straw chopper speed control
- 2 -
- 3 Straw room (straw walkers)
- 4 Returns elevators
- 5 Grain tank filling
- 6 Engine air cleaner
- 7 Cylinder head temperature gauge (extreme value)
- 8 Central warning light
- 9 Engine fan
- 10 Auxiliary and parking brake
- 11 Engine oil pressure
- 12 Charge control
- 13 High beam indicator light
- 14 Direction indicator - trailer
- 15 Direction indicator - combine harvester
- 16 Fuel gauge (diesel)
- 17 Engine oil temperature
- 18 Travelling speed
- 19 Threshing drum speed

The signal lights (items 1–12) are lighting up during the starting process of the engine for function control (3 sec.). At the same time the acoustic warning signal is operated (function control). The disturbance of one other of these functions during the operation is indicated by lighting up (pulsatingly) of the central warning light “8” together with an acoustic warning signal (buzzer).

The irregularity is signalled by individual lights in the central informer.

Disturbances are also signalled if same take place in the wiring system.

**Warning! If lamps are lighting up red stop at once and eliminate the deficiency.**

The warning lights – individually – supply the following informations:

**1 – red – Straw chopper**

If electromagnetic clutch is not operated by the push-button switch “7” (fig. 20356) or if chopper speed drops below 2300 rpm, then an acoustic warning signal is actuated.

**2 – reserved**

**3 – red – Straw room and straw walkers**

Optical and acoustic signals are operated if straw room and straw walker room are clogged.

**4 – red – Fan-type elevators**

Optical and acoustic signals are operated when elevator flaps are clogged.

**5 – yellow – Grain tank filling**

If grain tank is full acoustic and optical signals are operated for abt. 5 seconds. Then individual indication by “5”

**6 – yellow – Engine air cleaner**

If air cleaner is clogged, an optical and acoustic warning signal are operated. Carry out cleaner maintenance at once.

**7 – red – Cylinder head temperature**

If engine is overheated at the cylinder head a warning signal is operated. Stop the threshing group, **keeping engine running for about 5 minutes at half speed.** With stopped engine clean cooling ribs inside and outside.

**8 – red – Central warning light**

Lighting up pulsatingly at the occurrence of trouble at 1–12. In addition, the acoustic warning signal is operated.

**9 – yellow – Auxiliary and parking brake**

Indication with pulled brake. In addition, optical and acoustic signals when machine is put into motion (from about 1.5 km/h).

**10 – red – Engine fan**

Warning signal is operated in case of failure of the engine fan by breakage of the V-belt. Stop engine at once.

**11 – green – Engine oil pressure**

Must go out when engine is running. If it lights up further, get trouble remedied. Optical and acoustic signals are operated.

**12 – blue – High beam indicator light**

**13 – red – Charge control**

Must go out when engine is running. If it lights up further, get the trouble remedied. Battery does not get charged! Optical and acoustic signals are operated (from about 1.5 km/h).

**14 – red – Direction indicator – trolley**

**15 – red – Direction indicator – combine harvester**

**16 – Fuel gauge**

Never operate the machine until fuel tank is empty.

**17 – Engine oil temperature**

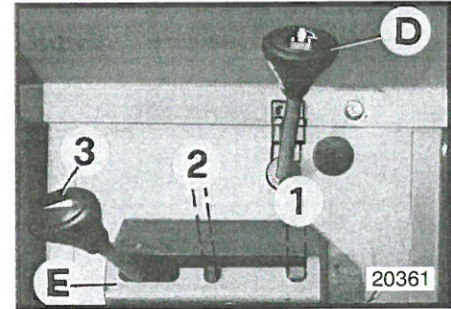
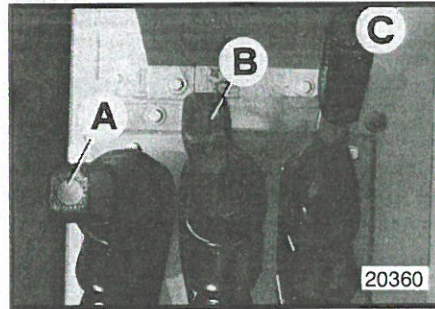
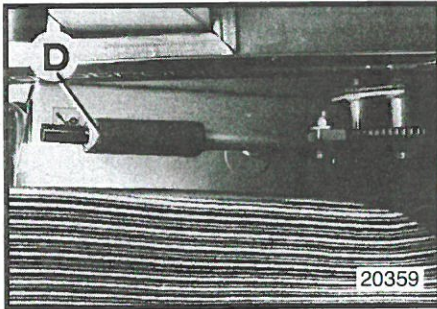
Needle in red field: Check oil level at once, stop the threshing group, keeping engine running at half speed for about 5 minutes. Fill up required oil quantity with stopped engine. Check if oil cooler is clogged, and – when necessary – clean the oil cooler.

**18 – Travelling speed**

Is signalled when push-button switch “8” (fig. 20256) is operated.

**19 – Threshing drum speed**

Is signalled in neutral position of the push-button switch “8” (fig. 20356). During the operation of the machine – particularly at night – constant glowing of the signal lamps can be observed. This is no signalization for troubles.



## Controls



### D = **Parking brake**

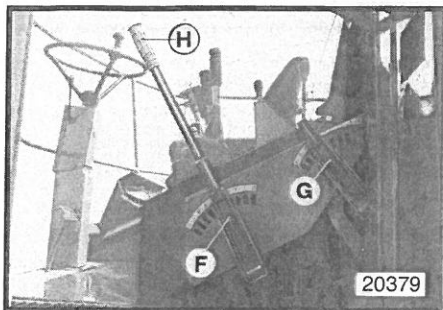
For releasing: Push button and lever towards the bottom –  
 For pulling on: Pull brake lever towards the top, and allow lever to be locked.

## Control levers on the left-hand side

A = Conveyor channel clutch  
 B = Threshing mechanism clutch  
 C = Grain tank emptying

D = Hydraulic control for swivelling grain tank discharge pipe towards the outside  
 E = Engine speed adjusting lever.

1 = Lever position **“working speed”**  
 2 = Lever position **“underload speed”**  
 Absolutely required for operating the steering.  
 3 = Lever position **“stop”**



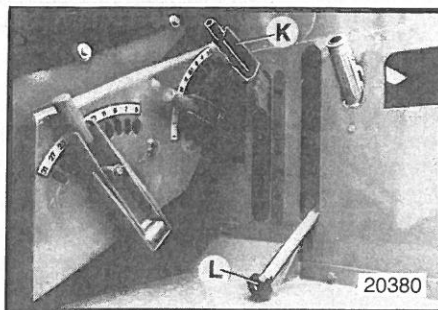
The concave adjustment is affected at the front and at the rear by various levers.

F = Front adjustment  
G = Rear adjustment

For adjusting, take detachable lever "H" from the support and attach same to the respective adjusting arm.

Adjustment towards the front = Large concave passage.

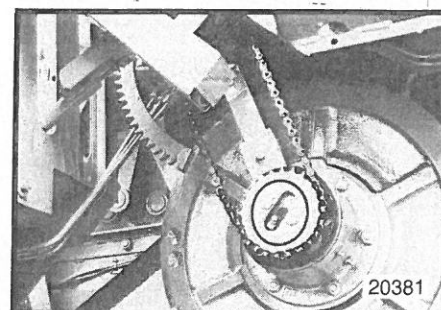
Adjustment towards the rear = Narrow concave passage.



The **underblast fan** can be adjusted by a lever "K". By adjustment towards the top its speed is increased, and by adjustment towards the bottom it is reduced.

Lever "L" is for adjusting the threshing drum speed.

Adjusting area: 450–1300 rpm.



By means of a combined adjusting chain sprocket and by pushing the lever towards the bottom, the threshing drum speed is reduced, and by pushing the lever towards the top, the speed is increased.

By turning on the knurled knob (item "L", fig. 20380) the driving pin for the adjusting sprocket is displaced. To this end pull knurled knob towards the outside and turn by 180°.

## Advice

**Starting the engine by a rapid charger is inadmissible. Use external battery.**

### Starting the engine

- First make sure that all speeds are disengaged.
- Make sure that clutch levers for the threshing mechanism, grain tank and the cutting mechanism are disengaged, and that the engine speed adjusting lever is in central position (idling speed).
- Insert ignition key into the ignition lock and check if oil pressure – and charge control lamps light up in the multi-purpose control instrument.
- **Give warning signal, and make sure that there are not any incompetent persons in the danger area of the machine.**

- Actuate the ignition key. When necessary, repeat the starting operation.
- When engine is running, check if oil pressure – and charge control lamps go out with increasing speed. If the charge control lamp does not go out while engine is being started, increase the engine speed for a short period (2 seconds).
- Heat up cold engine at half speed for at least 1 minute.

### The use of the combine harvester

Engage clutch lever for the threshing mechanism at idling speed of the engine. Also engage clutch lever for the cutting mechanism.

During this operation check if all driving belts and chains and all rotating parts are smoothly running. Then push engine up to its working speed.

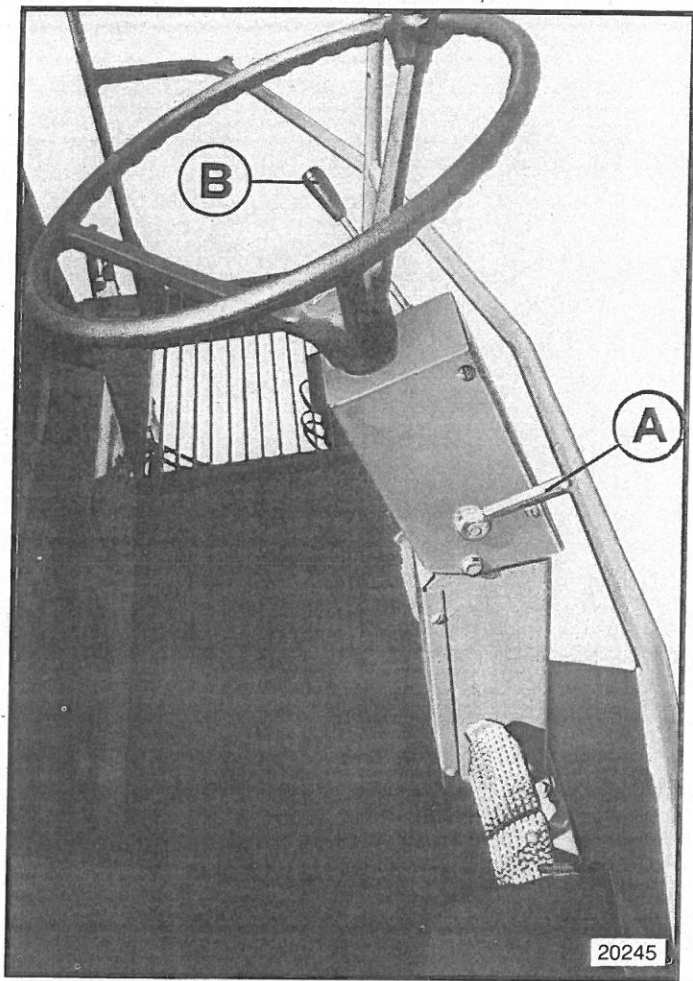
### Checking the clutches

During the trial run at idling speed of the engine check function of the threshing mechanism, cutting mechanism and grain tank by engaging and disengaging the respective clutch levers.

### Stopping the engine

Push engine speed adjusting lever onto stop.

Set ignition lock onto pos. "0", and withdraw the ignition key.



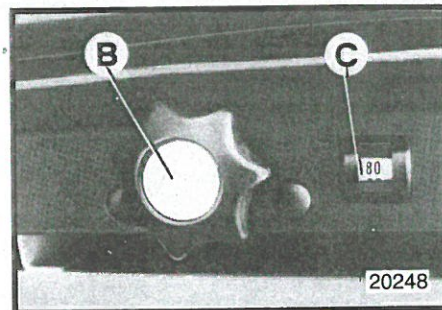
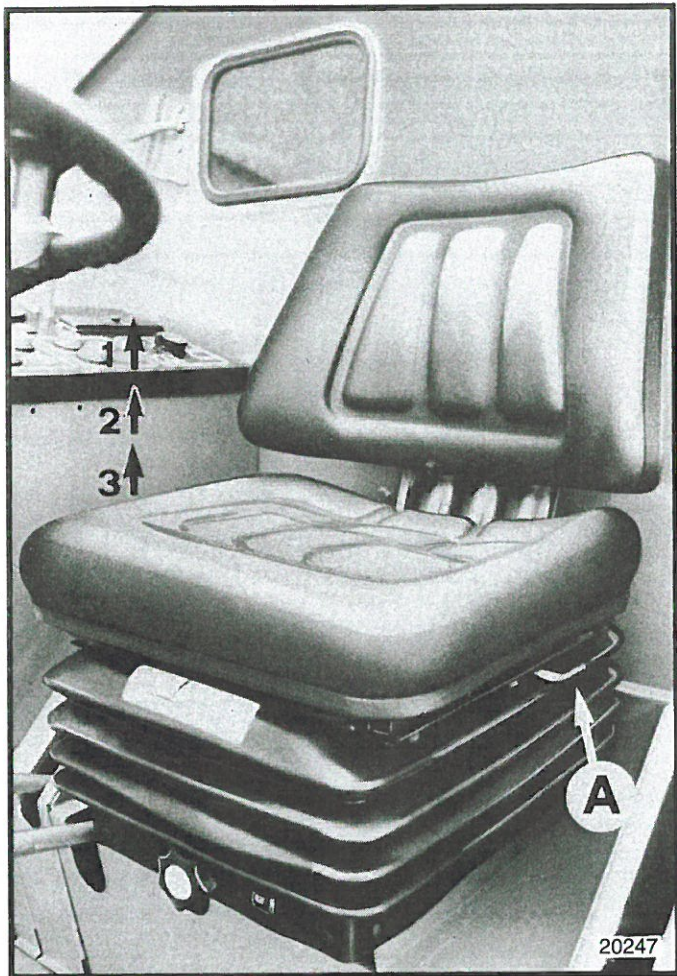
## Steering Wheel



Same is slewable towards the front and rear after undoing the levered nut "A" (fig. 20245).

At the top of the steering column are arranged as follows:

- B = Multi-purpose switch
- low beam - full headlight beam - flashing - direction indicator - horn



## Driver's Seat



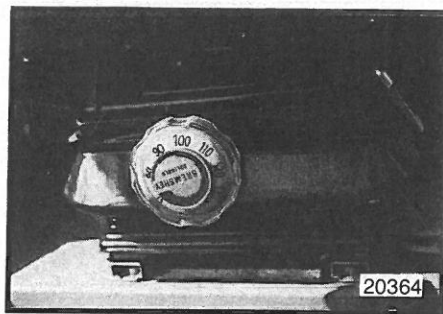
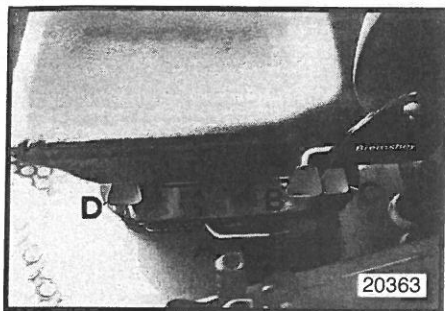
The driver's seat can be vertically and horizontally adjusted. For vertical adjustment seize seat pad by the bottom edge and lift same onto stop. As soon as released, the seat will reach its lowest position. By lifting in the direction of the arrow, the seat is latched in the desired position.

For the horizontal adjustment of the driver's seat pull lever "A" towards the top, bringing the seat into its desired position. For locking in this position lever "A," has to be released. The springing effect of the driver's seat can be adjusted to the weight of the driver.

B = Adjusting handle

C = Weight indicator



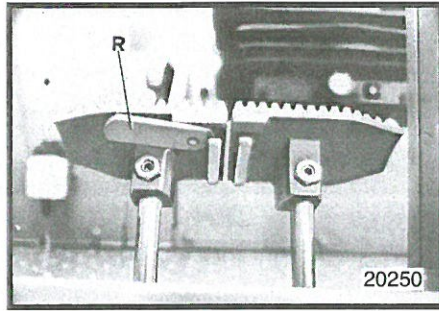
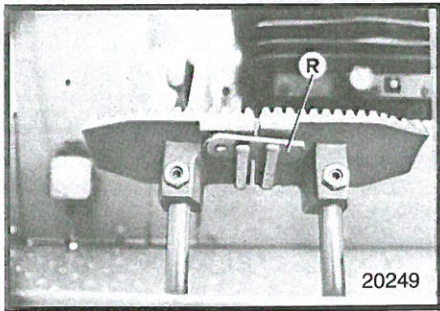


## Comfort Seat



For horizontal adjustment of the driver's seat pull lever "A" towards the top and put seat into the desired position. The position of the back rest can be adjusted by pulling lever "B" towards the top. In addition, after actuating levers "C" and "D" the height and inclination of the seat can be changed.

The springing effect of the driver's seat can be adjusted to the weight of the driver. This adjustment can be made by the handwheel equipped with weight indicator.



## Service Brake



**When travelling along public roads the pedals of the service brake have to be locked by the provided latch "R", so that the driving wheels can be uniformly braked.**

The braking effect is obtained after a third of the length of the pedal path.

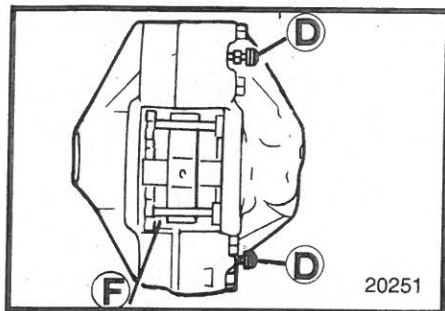
If the wheels have to be braked individually, unlock the two brake pedals.

## Brake Systems Checking the Service Brake and the parking Brake

The combine harvester is equipped with two independent brake systems of which one will be effective even if the other fails. The two brake systems are as follows:

- hydraulic service brake actuated by pedals, and
- mechanical hand-operated auxiliary and parking brake.

For reasons of road safety it is absolutely necessary to get the two brake systems thoroughly checked at regular intervals. Said checking has to be carried out by a KHD-FAHR after-sales service station.

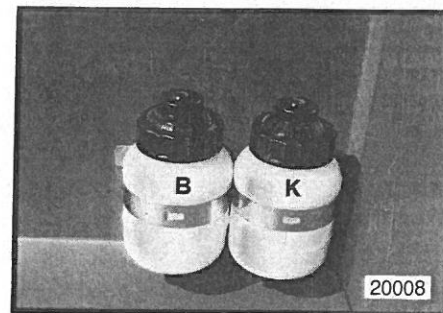


## Bleeding the Brake System



- Fit transparent hose (about 1.3 m long) to the vent valves "D".
- Put free hose ends into a basin filled with brake fluid, the latter being arranged at about the same height as the vent valve.
- Open vent valve by about ¼ of a turn.
- Press pedal slowly and uniformly down to the stop, then release slowly and let pedal return until it has reached its initial position. Repeat this operation until brake fluids emerges without bubbles.
- While pressing down brake pedals the vent valves have to be closed.  
Torque for M 6 = 2.5 – 4 Nm.

In any case brake linings "F" have to be checked for wear.



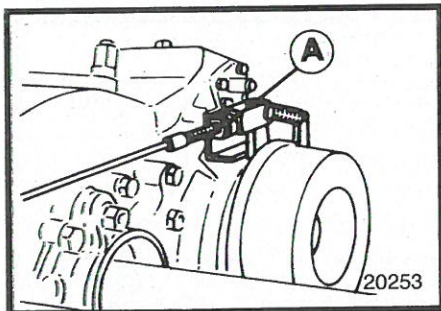
## Reservoirs for the Brake- and Clutch Fluids



The two reservoirs are arranged on the left-hand side from the driver's seat. Before undoing the screwed caps, same have to be cleaned. Every 100 working hours, check level of the brake fluid in reservoirs "B" for the service brake and "K" for the gearbox clutch, and – whenever required – refill up to mark.

Please exclusively use **brake fluids** according to **DOT 4, DOT 3 or SAE J1703**. Quantity requirement per unit: 0.35 litre.

Advice: When using a filling tool or deaerator, filling has to be exclusively actuated via the reservoirs (items "B" and "K").

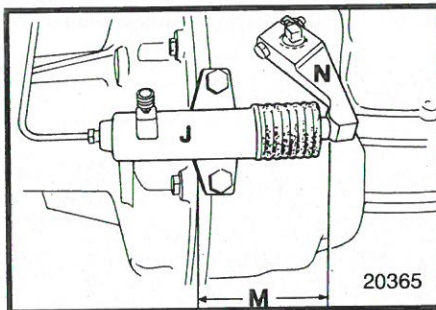


## Readjustment of the Auxiliary and Parking Brake



With pulled brake the catch of the brake lever must lock on the first third of the toothed segment.

If this path is considerably exceeded, then readjustment has to be made on the linkage by the forked head "A".



## Gearbox Clutch



The combine harvester is equipped with a hydraulically operated single dry plate clutch.

The hydraulic operation of the clutch is effected by a pedal via a master cylinder (fitted underneath the driver's platform) to a slave cylinder "J" provided on the clutch housing.

The slave cylinder "J" is self-adjusting. If the clutch lever "N" has to be removed, please be careful at the reassembly that the measurement "M" is **118 mm for the minimum** (and 131 mm for the maximum). This distance measurement results – when fitment is correct – by the toothed profile of the disengaging shaft and the lever. When dismounting, make sure that the piston is not withdrawn from the cylinder.

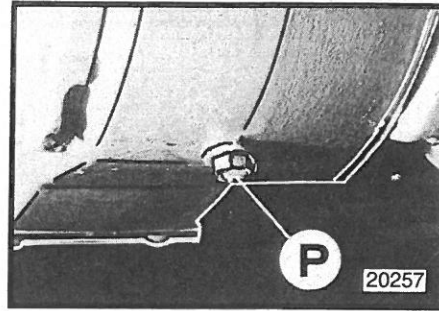
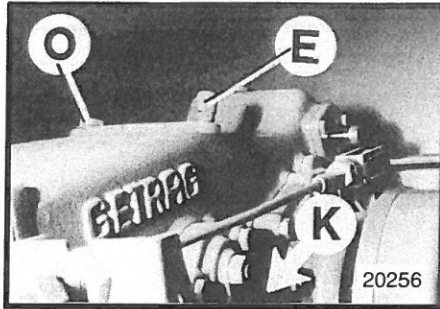
## Bleeding the Gearbox Clutch

The hydraulic clutch has to be carefully deaerated by the use of a filling tool and deaerator for brakes if

- the disengaging path is unsatisfactory (clutch is separating incompletely), and
- so increased grating takes place.

In such case it is also commendable to consult a service station to get the deficiency remedied.

**In any case, check clutch linings for wear!**

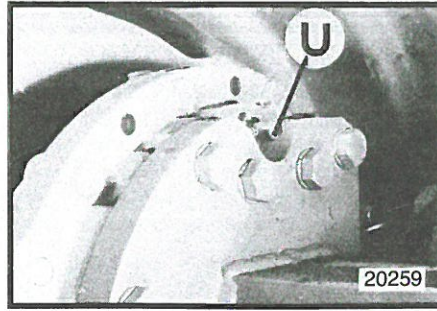
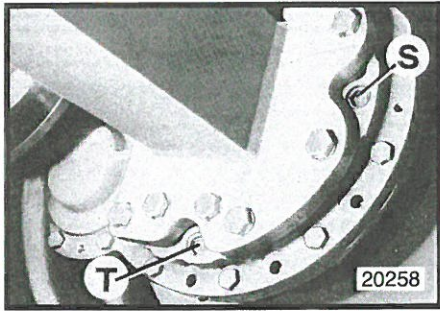


## Checking Oil Levels of the Gearbox and of Lateral Gears

Park combine harvester in a level place, and check the oil level at "K".

Clean and undo filling plug "O" for the oil of the gearbox. "E" is the vent valve.

To change the oil, drain gearbox oil at "P" at an operating temperature degree of the gear oil. Fit vent plug again. When fitting the seal ring do this carefully, to avoid damage.



## Lateral Gears

To change the oil, undo plug "T" and fill in new oil at "S" up to the checking and filling hole. Fit checking and filling plugs again. When fitting the seal ring do this carefully, to avoid damage.

"U" is the vent valve of the lateral gears.

# Engine

## Maintenance and Servicing

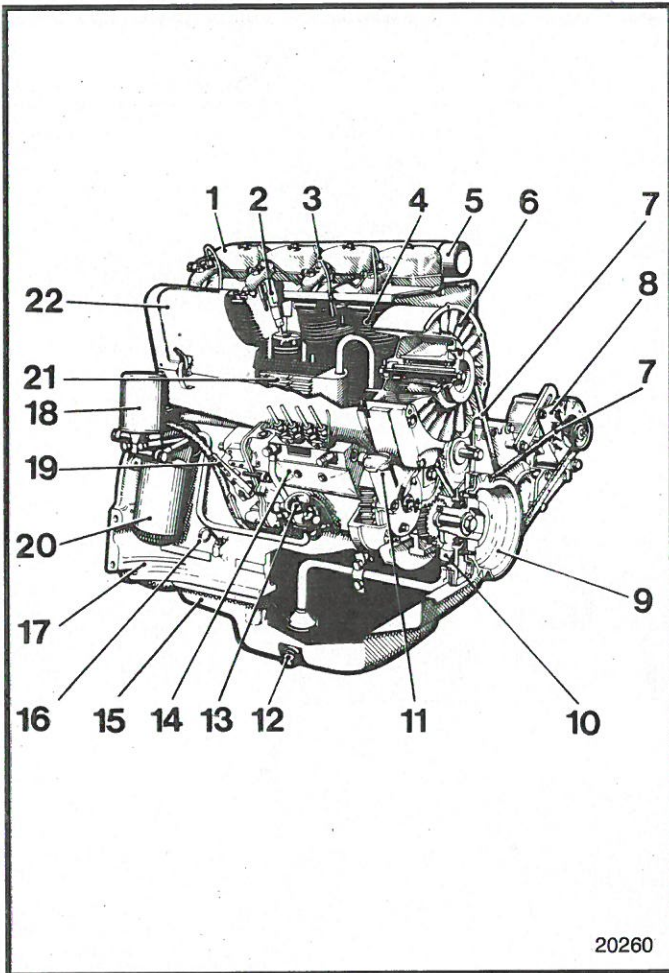
### Engine F 6 L 912

Before carrying out any maintenance jobs, stop the engine.

As to maintenance periods, fuels, and required quantities, see the Maintenance Chart!

**The maintenance of the 6-cylinder engine is equal throughout to that of the 4-cylinder engine as shown in the figures.**

## Engine F 6 L 912



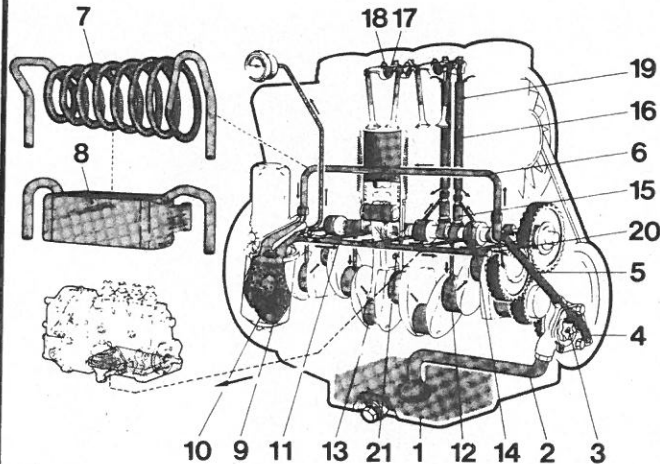
- 1 Cylinder head cover
- 2 Injection valve
- 3 Injection delivery pipe
- 4 Cylinder head
- 5 Air suction pipe
- 6 Fan
- 7 Generator- and fan V-belts
- 8 Rotary current generator
- 9 V-pulley
- 10 Lubricating oil pressure pump
- 11 Filler pipe
- 12 Oil drain plug
- 13 Fuel feed pump
- 14 In-line injection pump
- 15 Oil sump
- 16 Oil level gauge
- 17 Crankcase
- 18 Oil filter
- 19 Engine speed adjusting lever
- 20 Fuel filter
- 21 Block-type oil cooler or radiator coil
- 22 Air duct cowl

20260

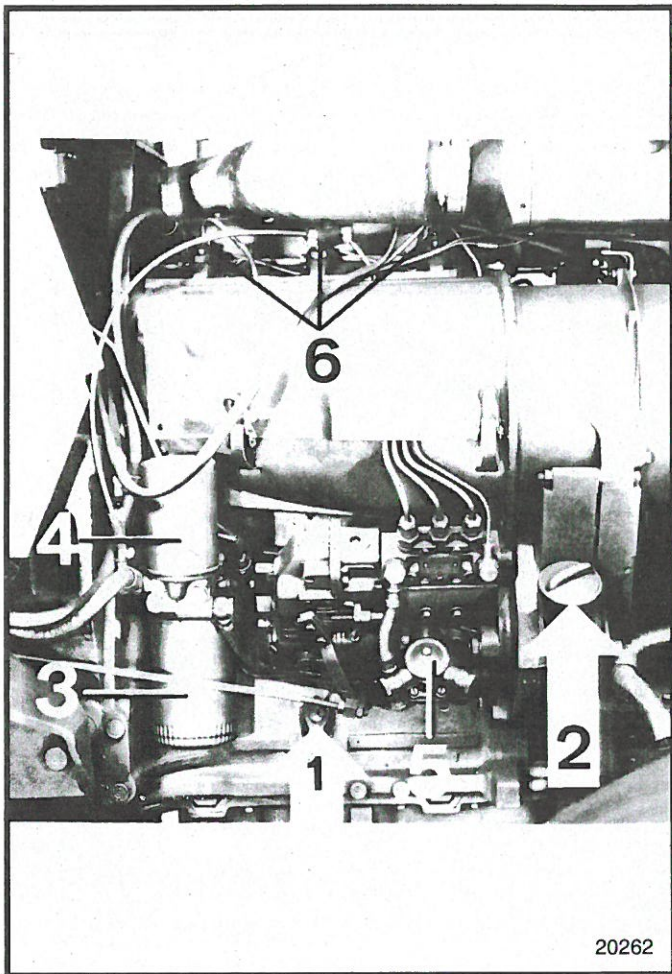


## Lubricating Oil Circulation

- 1 Oil sump
- 2 Suction pipe
- 3 Lubricating oil pump
- 4 Oil pressure adjusting valve
- 5 Delivery line
- 6 Short-circuit line or
- 7 Radiator coil or
- 8 Block-type oil cooler
- 9 Oil filter
- 10 Safety valve
- 11 Main oil channel
- 12 Crankshaft bearing
- 13 Big-end bearing
- 14 Camshaft bearing
- 15 Tappet – with control groove for impulse greasing of rocking levers
- 16 Push rod – hollow, for supplying oil flow to rocker levers
- 17 Rocker lever bearing
- 18 Metering screw – for greasing valves
- 19 Push rod protection tube – for oil return from cylinder head to crankcase
- 20 Throttle hole
- 21 Spray nozzle for piston cooling

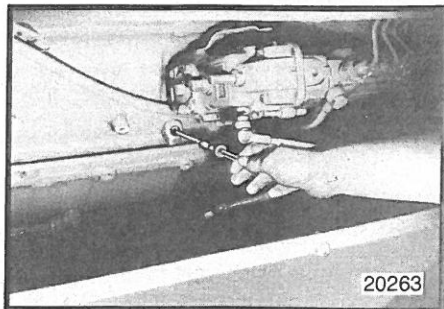


20261



- 1 = Oil level gauge
- 2 = Oil filler plug
- 3 = Engine oil filter
- 4 = Fuel filter
- 5 = Fuel feed pump
- 6 = Injection valves

20262



## Checking Engine-oil Level



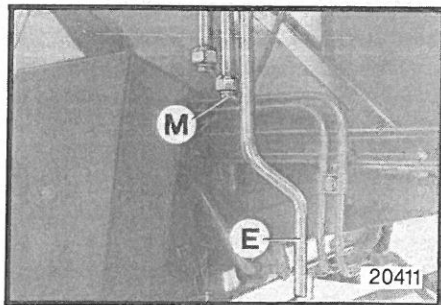
Check daily before starting the harvesting operation.

Place machine on a horizontal terrain.

Withdraw the oil-level gauge, wipe same off with a nonfuzzing cloth, and insert and withdraw again.

The oil level should be positioned between the marks affixed on the oil-level gauge.

When necessary, top up oil.



## Engine-oil Change



Place machine on a horizontal terrain.

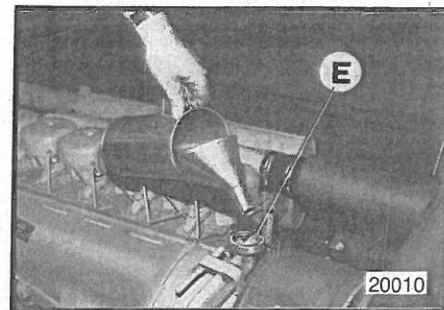
The engine should still be warm.

Warning when draining hot oil – danger of scalding!

For the oil change undo screwed plug "M".

E = Venting device for the crankcase.

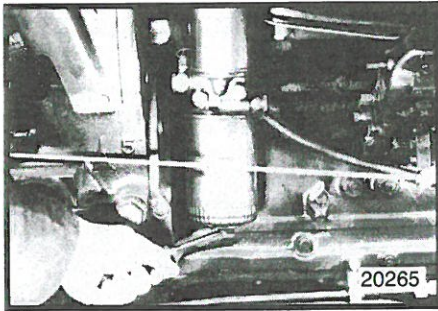
**When changing oil take care for absolute cleanliness.**



During the running-in period of the machine check oil level of the engine several times a day. The oil type used at the supply of the combine harvester is a primary filling quality EM 28 with anti-corrosion properties, and inappropriate for full load operation.

**Before setting the machine to work it is absolutely necessary to replace the above oil by an engine oil of the classification MIL-L-2104 C (API-CD) and of the viscosity class SAE 30 or SAE 20 W 50.**

**For the oil change periods, see Engine instruction Book.**



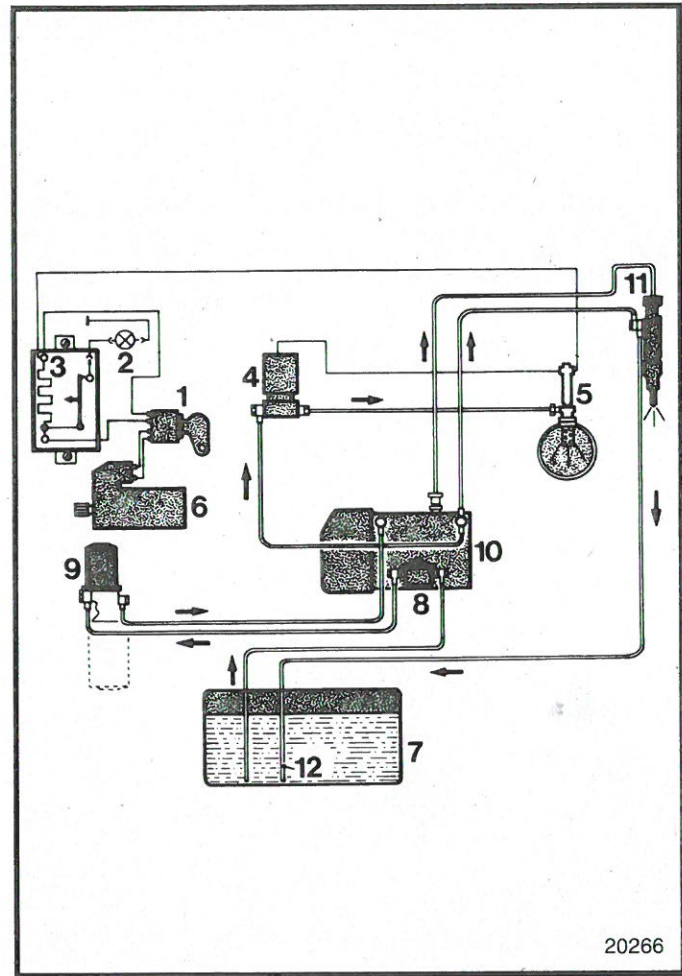
## Replacement of the Engine-oil Filter

Undo filter cartridge by a screwdriver, and screw off by hand.

Clean sealing surface on the fitting flange. Slightly oil the rubber sealing.

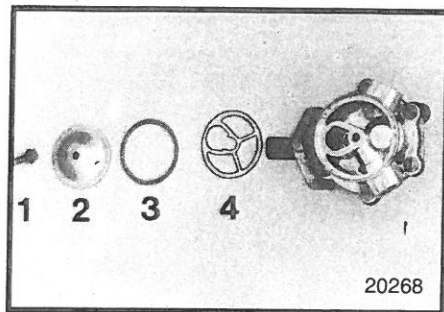
Fit new filter cartridge by hand until cartridge sits close with the sealing.

Make sure once more for satisfactory tightness. Then retighten filter cartridge by another half turn.



20266

## Fuel Scheme – Direct Injection



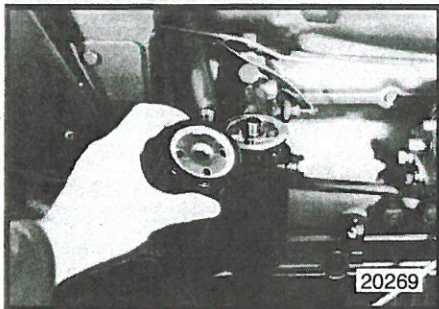
### Cleaning Sieve of the Fuel Feed Pump

- 1 Lighting and ignition switch
- 2 Preliminary heating control
- 3 Glow resistance
- 4 Magnetic valve
- 5 Flame glow plug
- 6 Starter
- 7 Fuel tank
- 8 Fuel feed pump
- 9 Fuel filter
- 10 Injection pump
- 11 Injection valve
- 12 Fuel return pipe

- 1 = Take off screw
- 2 = Remove the cap
- 3 = Take off seal ring and the
- 4 = Sieve

Clean sieve by fuel. When reassembling, make sure that there is satisfactory tightness and that the assembly is correct (nose towards the top).

Vent the fuel pipe – see page 36 – start the engine. Check fuel sieve if tightness is perfect.



## Replacement of the Fuel Filter

Undo and screw off filter cartridge.

Clean sealing surface on the fitting flange. Slightly oil the rubber sealing.

Fit new filter cartridge by hand until cartridge sits close with sealing.

Check once more if tightness is satisfactory. Then retighten filter cartridge by another half turn.

Vent the fuel pipe.

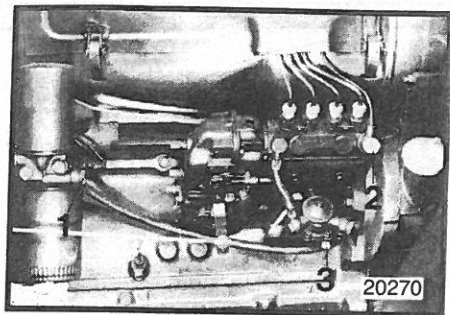
Start the engine, and check fuel filter if tightness is perfect.

## Venting the Fuel Pipes

To avoid the penetration of dirt into the system, clean all screws with a brush and diesel oil before the former are removed.

Keep some basin ready for collecting the diesel fuel.

After replacing the fuel filter, cleaning the fuel feed pump, replacing the fuel pipes positioned between the fuel tank and the injection pump, it suffices as follows:

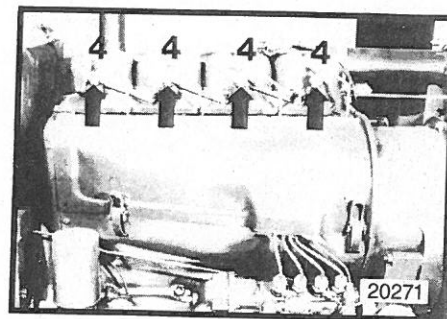


Speed adjusting lever towards the bottom = full speed.

- 1 = Undo screw and wait till fuel emerges without bubbles – collect fuel – and retighten screw;
- 2 = undo screw, and
- 3 = actuate lever of the fuel feed pump until
- 2 = fuel emerges from screw without bubbles.

Collect the fuel – and retighten screw.

The feed pump when operated by hand will work only when the membrane of the feed pump is not raised by the camshaft of the injection pump. When actuating the handle, the straining point (which is clearly palpable and constitutes the beginning of stroke of the membrane) must be positioned in the first quarter of the path complete.

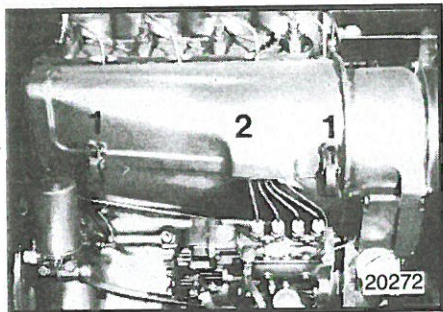


If the machine has been operated until the fuel tank is completely empty, continue the venting operation as follows:

- 4 = Undo the screwed caps by two or three turns, and operate engine by means of the starter until fuel emerges without bubbles. Collect the fuel.

- 4 = Retighten screwed caps.

Subsequently start the engine for trial.

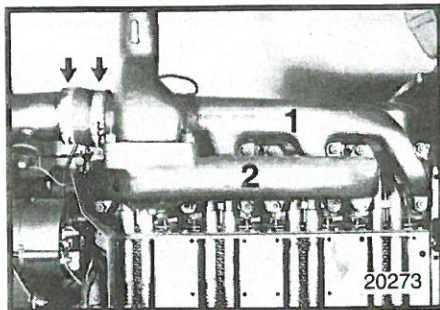


## Suction Pipe and Exhaust Pipe – Check Fitment

Check at second replacement of the engine oil, and then at least once a year.

Fitment of

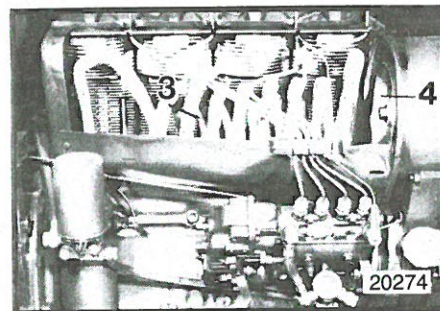
- 1 = suction pipe with socket joint, and
- 2 = exhaust pipe on cylinder heads. When necessary, retighten screws.



## Cooling Ribs, Air Duct and Fan Wheel – Clean according to the Maintenance Chart

The cooling effect is reduced by dust mixed up with fuel and lubricating oil on the cooling ribs and cylinder heads.

- 1 = Undo fasteners
- 2 = Take off air guide cowl and hex. head bolts on the opposite side (drawing-off air side), and remove the drawing-off air plate. Clean cooling ribs in a dry state with wire and – whenever possible – by blowing with compressed air. Keep vertical cylinder head ribs particularly clean.



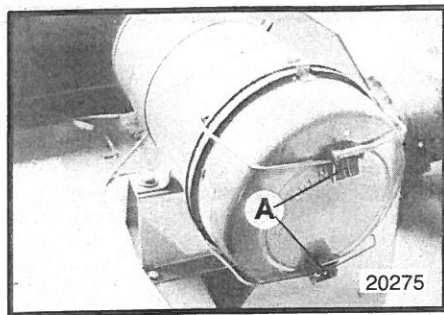
- 3 = Clean oil cooler or the cooling coil.
- 4 = Clean air duct and the fan wheel.

If washed with diesel fuel, remove fuel residues with a soda dissolvent.

Let engine run until water residues have been evaporated.

Fit drawing-off air plate and air duct cowl again.



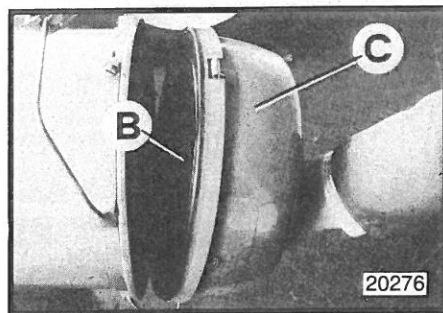


## Engine Air Cleaner – Emptying the Dust Collector

If the yellow signal lamp "6" (fig. 20358) lights up, the filter cartridge has to be cleaned.

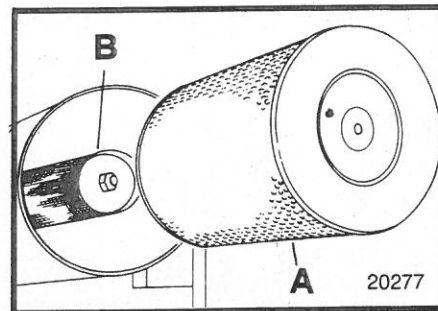
Stop the engine.

Fold up clamp clips "A" towards the top and the bottom.



Take off cover "B" and the dust collector "C" and empty the basin.

When emptied, reassemble just the other way round. The recess in the cover and the support on the dust collector must fit. In case of horizontal fitment of the air cleaner, make sure that the mark "oben" is at the top.



## Replacement of the Fine-filter Cartridge

Through frequent disassembly and reassembly of the cartridge the sealing between the filter cartridge and the filter housing might be injured; therefore, clean and replace cartridge only when necessary, i.e. when the control lamp lights up and the horn resounds.

Remove the dust collector, take off hex. nut and the dirty cartridge "A" and clean or replace cartridge by a new one. (If the cartridge has been cleaned 5 times it has to be replaced by a new one. Replacement is also required if the cartridge is sooted.).

## **Cleaning the Fine-filter Cartridge**

### **Dry-cleaning of the fine-filter cartridge**

Knock face of the filter cartridge several times against the ball of your thumb or on a soft level surface, so that the dirt falls off, but make sure that the face of the cartridge is not deformed or damaged. The cartridge can also be cleaned by a jet of dry compressed air not exceeding 5 bar, which has to be made in an oblique sense from the inside and from the outside (never use compressed air for cleaning the filter housing).

### **Wet-cleaning**

Move the fine-filter cartridge in lukewarm water after adding at non-foaming special rinsing agent (MANN 053 cleaning agent). When this has been made, rinse in clean water effectively, then shake and let dry sufficiently. (Never use petrol or hot fluids.)

## **Safety Cartridge**

Before fitment, check with a hand lamp if the filter cartridge has not been damaged (if damaged, replace same by a new one). Then make sure that the affixed sealing has not been damaged.

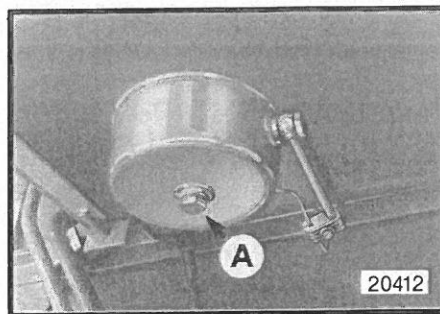
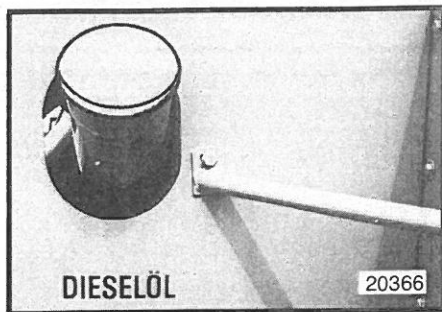
The safety cartridge "B" (fig. 20277), cannot be cleaned but has to be replaced after 5 servicings of the fine-filter cartridge, as described above.

For replacing the safety cartridge, the dust collector and the fine-filter cartridge have to be removed. Then undo the flat hex. nut M 16 x 1.5 and withdraw the cartridge.

When the cartridge has been removed, the engine must not be started.

Fitment is the other way round, but make sure that the two cartridges are correctly seated.

If at servicing the main cartridges it becomes evident that the maintenance was not correct or that the main cartridge is defective, then the safety cartridge has to be also checked and immediately replaced when necessary. If after maintenance the maintenance indicator is immediately operated, then the safety cartridge has to be also replaced.



The fuel tank has a capacity of approx. 190 litres. Never drive until fuel tank is completely empty, as otherwise venting the injection system would be necessary. The tank inlet pipe is near the rear access to the maintenance platform for the engine.

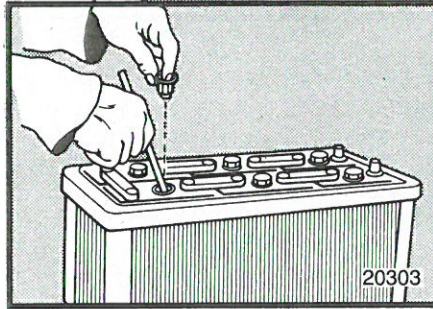
Dirt and water can be drained from the fuel tank by undoing the plug "A".

**Drain at least once a year before the campaign.**

Owing to fluctuations in temperature in the evening and during the night condensation water may be formed above the fuel level on the inside walls of the fuel tank, which – after refuelling – may cause troubles in the combustion engine.

**It is commendable therefore, to refill the fuel tank each time in the evening after finishing the daily operation with your combine harvester.**

The engine is accessible by the stairs provided for the maintenance platform at the rear of the machine.



## Electrical Equipment

All jobs carried out on the battery have to be done carefully.

The gases emerging from the battery are subject to explosion; therefore, avoid sparking and open fire close by the battery. Do not smoke.

Avoid acid getting on your skin or clothes.

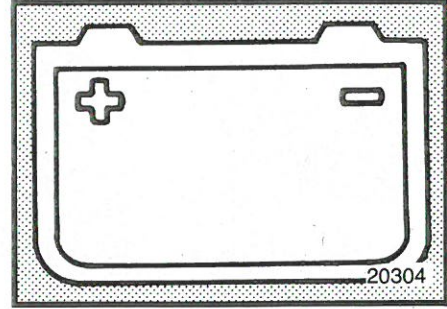
## Battery Maintenance



Undo screwed plug of the battery.

The acid level should be 10–15 mm above the top edge of the battery plates – check with a clean wooden rod. When necessary, top up with distilled water. Never top up with acid! Fit screwed plug again.

If battery is low, get same recharged immediately.



## Battery – Connecting and Disconnecting



To avoid short-circuiting and battery damages, proceed exactly as follows:

**Connecting:**

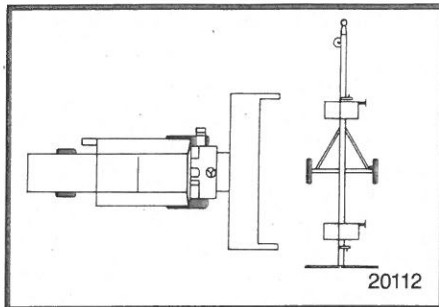
Fit positive lead to positive pole of the battery. Then connect earthing lead to the negative pole of the battery.

**Disconnecting:**

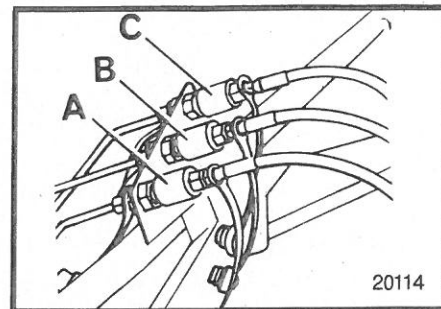
First take off earthing lead from the negative pole of the battery. Then remove positive lead from the positive pole of the battery.

Keep pole heads and terminals always clean and greased. Keep battery always firmly fitted.

# Cutting Table



## Transport Trolley



## Quick-locking Unions



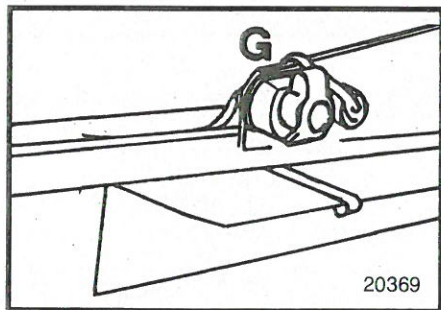
The cutting table can be deposited to the ground and left in this position in the farmyard or field. Depositing the cutting table on the transport trolley is as follows:

Put the transport trolley before the combine so that it is perfectly parallel to the latter, and make sure that the accepting and locking devices coincide with those of the cutting table.

### Cutting table

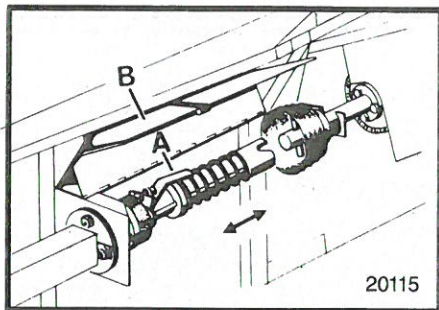
Lift same to its highest position, at the same time lowering and moving the reel to the rear. Put the cutting table on the transport trolley.

Separate the **quick-locking unions** of the hydraulic pipes by undoing the threaded sleeves. Close the two ends (plug and sleeve) by the provided caps. Attach the hoses to the provided support on the driver's platform.



20369

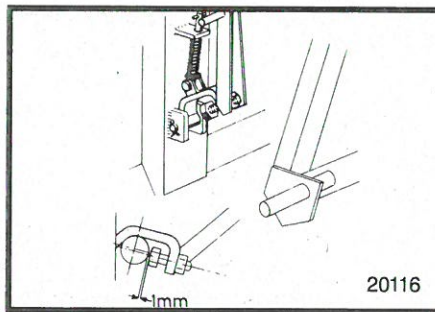
Take off plug for the electrical reel speed adjustment from the socket "G" and attach to support on the driver's platform.



20115

## Cutting Mechanism Drive

Undo the sleeve locking "A" on the counter-shaft, and separate the coupling device by displacing the connecting sleeve.



20116

## Separating the Cutting Table from the Conveyor Channel

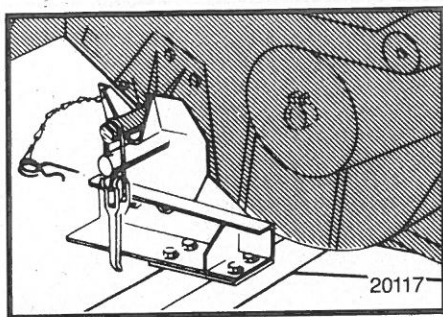
For this scope open the locking clips on the right-hand side and on the left-hand side, and lower the conveyor channel until centering pins are free.

Back the combine harvester.

### Important!

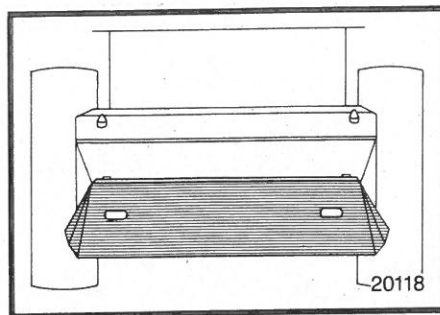
When backing the combine harvester, lift the conveyor channel, but be careful that the tyres of the transport trolley are not damaged by the conveyor channel.

The thrust bolts of the cutting table lockings should be so adjusted that they show a clearance of 1 mm to the pin.



**Fasten the cutting table on the transport trolley, close the lockings and secure with spring clips.**

To avoid accidents, cover the front of the conveyor channel by the provided guard.

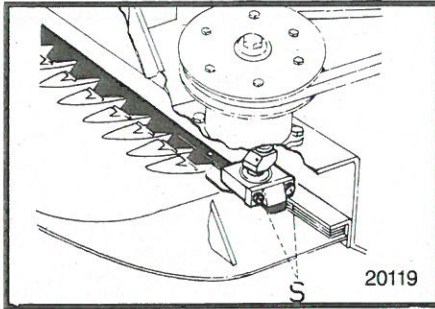


Fitment of the cutting table to the conveyor channel is made the other way round.

To avoid confusing the hydraulic unions, same are marked with different colours as follows (fig. 20114):

- A = Horizontal reel adjustment towards the front = red
- B = Horizontal reel adjustment towards the rear = silver
- C = Vertical reel adjustment = black

**Put guard "B" into protecting position (fig. 20115).**

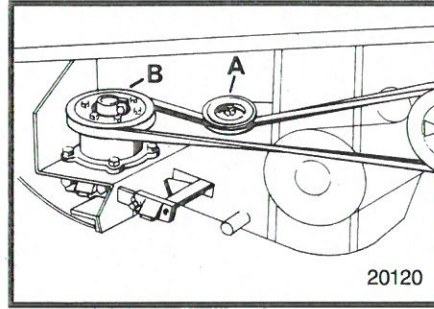


## The Cutting Mechanism – Knife Drive

The knife sections – in both end positions – must exceed the finger centres. In case of repairs, this adjustment should be observed for the knife drive gear.

**When changing the knife**, undo the two screws “S” in front of the knife head, and withdraw the knife.

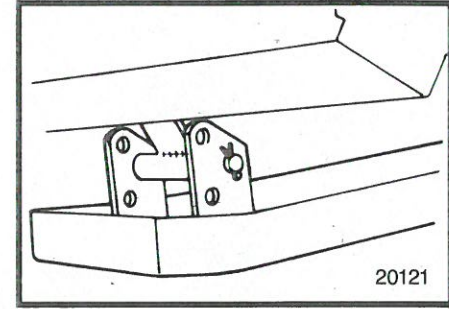
The cutting knife should be easily movable by hand. A good cut can be only obtained if the knife runs correctly. All fingers, knife guides and clips should be correspondingly adjusted. The knife guides should be frequently and abundantly greased during the harvesting season.



Readjustment of the knife drive belt is by the tension roller “A”. Additional readjustment of the knife drive belt can be made by removing the spacer from the knife drive pulley “B”.

A spare knife is provided under the feed plate between the cutter bar and the feed auger.

**The spare knife should be always secured!**



## Sliding Shoes

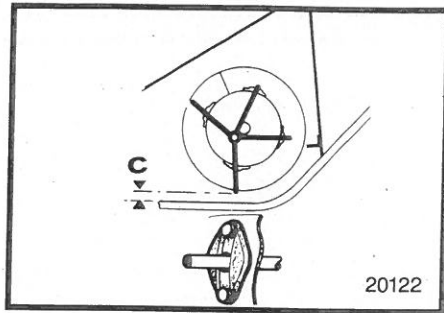
For a better adaption to all field conditions the sliding shoes under the cutting table are adjustable.

**When backing, lift the cutting table!**

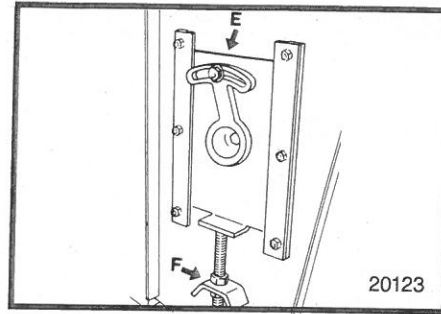
Whenever necessary, the friction clutch on the auger shaft can be readjusted.

**Before proceeding to the elimination of troubles it is absolutely necessary to disengage the cutting mechanism, to stop the engine, and to withdraw the ignition key.**

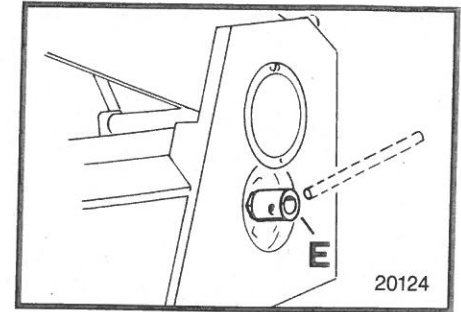




20122



20123



20124

## Feed Auger

The correct height adjustment of the feed auger impedes wrapping and safeguards regular feed to the conveyor channel.

Normally, the distance "C" between auger and floor plate of the cutting table should be 6–12 mm.

Vertical adjustment of the feed auger is by tension bolts "F" at the right and left outer bearings.

The right-hand outer bearing of the feed auger is equipped with a movable flange "E" by which the auger tines can be adjusted.

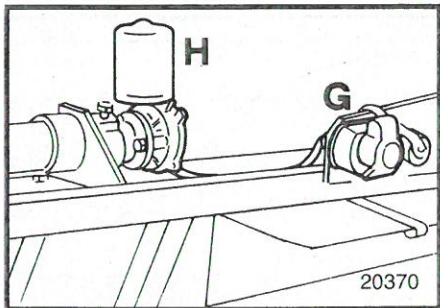
Make sure that the tines disappear at the rear completely in their provided guides.

In case of feeding troubles at the cutting mechanism, a threaded bush "E" supplied as standard may be fitted to the driving counter-shaft.

The cutting mechanism can be freed by the use of a suitable bar.

**For this purpose disengage the drive of the cutting mechanism, stop the engine, and withdraw the ignition key!**

**As soon as the feeding trouble has been eliminated, remove the threaded bush and fit the guard!**

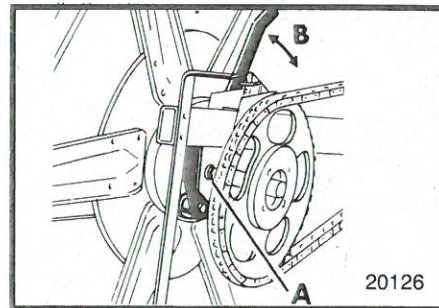
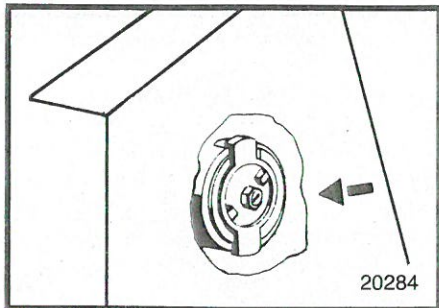


## Reel Speed Adjustment

The circumference speed of the reel should be somewhat higher than the travelling speed.

The reel speed is adjustable from the driver's platform via an electrically driven belt variator (item "H") between 16–45 rpm.

To reduce or increase the reel speed, depress switch (items 5 + 6) (fig. 20356). We point out that this adjustment should be made with running cutting mechanism only.

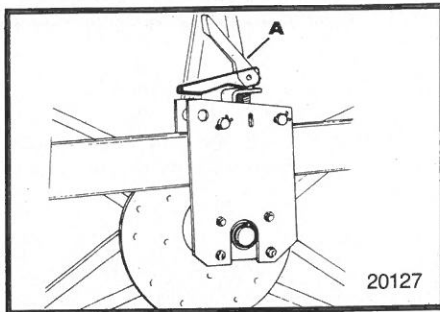


## Reel Adjustment

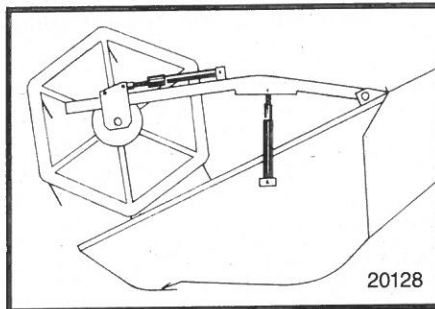
The position of reel tines can be changed by turning the roller support on the left-hand drive side of the reel.

When screws "A" have been undone, the position of tines can be adjusted by the lever "B".

The reel height can be adjusted during work from the driver's seat.



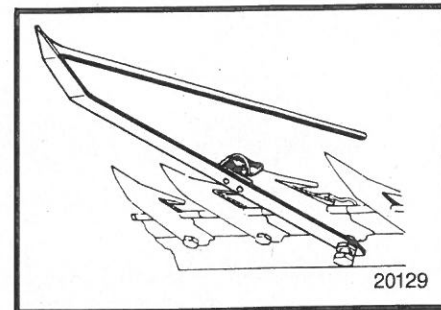
Mechanical horizontal reel adjustment is by unlocking by the folding lever "A".



For combine harvesters with hydraulic horizontal reel adjustment horizontal adjustment is made by a control lever 4 (fig. 20354).

In long laid crops, adjust the reel sufficiently towards the front and as low as possible, while in short crops it has to be adjusted towards the rear.

Whenever required, the friction clutch on the reel shaft can be readjusted.



## Earlifters

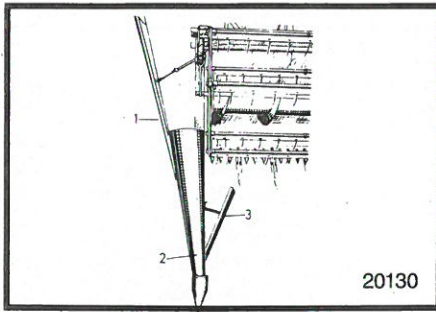
In laid crops it is advisable to use earlifters. For the fitment of earlifters guide nuts have been provided which serve for the reception of the earlifter sole. Earlifters can be fitted either to the top or bottom groove of the guide nuts. By this means a more or less inclined position is obtained.

### Fitment of earlifters

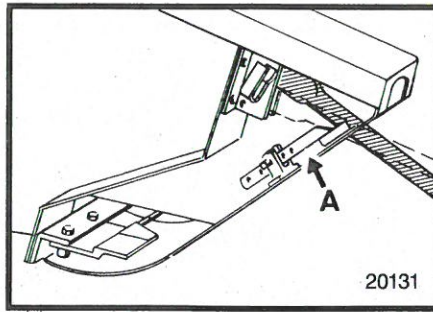
Put the earlifter sole on the annular groove of the guide nut and shift the earlifter with its fixing yoke from one side to the respective finger on the cutter bar. The safety pin snaps in automatically.

### Removal of earlifters

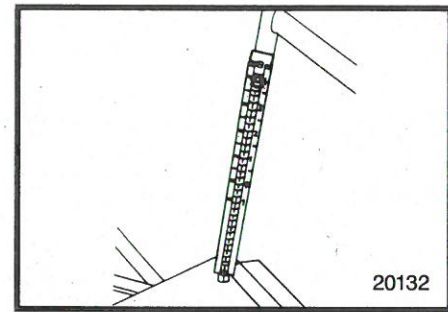
Push safety pin to the inside. Withdraw the earlifter with fixing yoke from the finger to one or the other side, and take off earlifter sole from the guide nut groove.



20130



20131



20132

## Divider Points

In heavily inclined crops **the outer divider sheet (1)** should be sufficiently set towards the outside, to reject the stalks to the field and to avoid grain loss during the next pass.

**The inner divider sheet (3)** should be adjusted close to the ground and to the inside.

**The central divider sheet (2)** should be rather high and close to the reel.

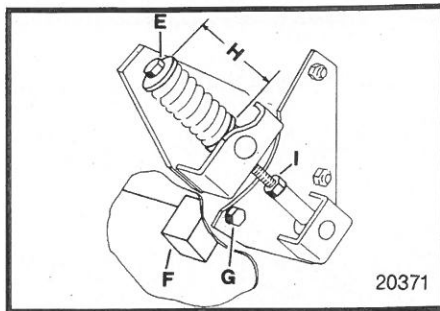
**Important! – Make sure that a sufficient passage for the reel is available!**

The divider point can be adjusted to various heights by changing the suspension height on the provided pins and by means of the front sliding piece.

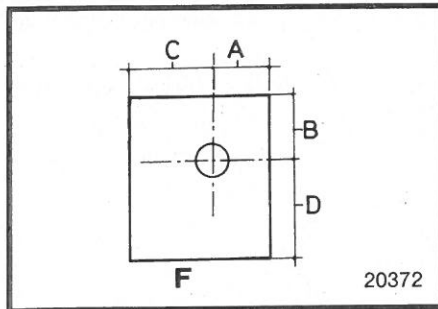
The cutting height of the cutting table can be checked by an indicator scale arranged on the left-hand side.

To readjust the indication of height, proceed as follows:

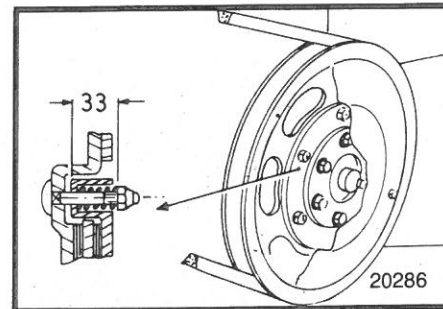
- Place combine harvester on a level terrain.
- Lower cutting table completely.
- Readjust length of Bowden cable until height indicator on scale is on "O".



20371



20372



20286

## Conveyor Channel

The tension of the transport chain in the conveyor channel has to be checked every day. The transport chain is kept in its prescribed position by the two compression springs. If the tension is correct, the **dimension "H"** will be **83 mm**.

Owing to lengthening of the transport chain the prestress of springs may change. In this case readjust springs by the straining screw "E" after undoing the counter-nut "J". When straining has been made, retighten counter-nut "J".

The height of the front roller in the conveyor channel and so the free space between the transport bars of the chain and the channel floor, can be adjusted by an eccentric (item "F") to 4 minimum heights.

For this purpose press front roller towards the top, undo screws "G" on both sides, and turn eccentric tube "F" to the desired position. Retighten screws "G", and lower front roller again.

The distances of the conveyor-chain transport bars at the height of the front roller and at the various positions of the eccentric (item "F") to the floor plate are as follows:

- A = approx. 20 mm
- B = approx. 20 mm
- C = approx. 25 mm
- D = approx. 40 mm

## Safety Clutch

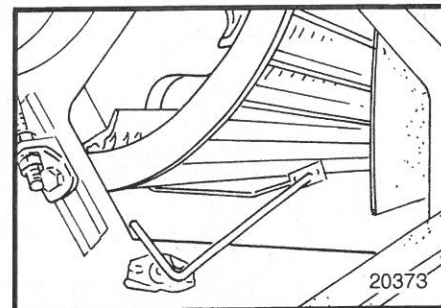
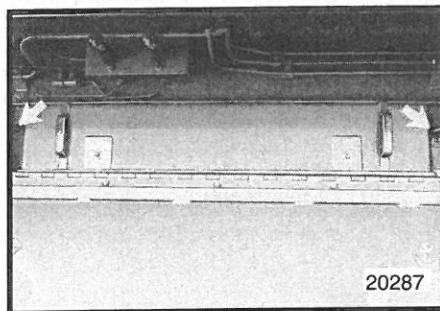
The friction clutch is situated on the top shaft of the conveyor channel.

This clutch serves as overload protection of the feed elements in the conveyor channel. The safety clutch has been adjusted at Works. In case of disassembly due to troubles, make sure that when reassembling, the length of the compression springs is approx. 33 mm. This dimension is obtained when the springs are fully tightened and the hexagon nuts are subsequently turned back by two turns. The safety clutch is transmitting then approx. 350 Nm.

**After checking or readjustment, fit guard again!**



# Threshing Mechanism



## Cover of the Threshing Drum to be opened for Maintenance Work

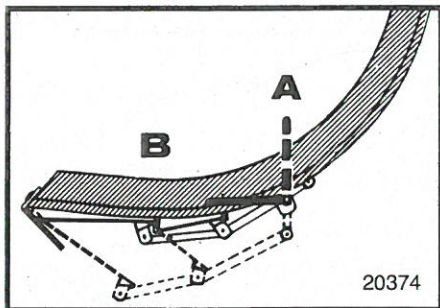
The threshing unit comprises as follows:

- Threshing drum and concave
- Straw stripper drum
- Straw walkers
- Sieve box
- Cleaning fan
- Transport augers and elevators

For opening the above cover, unlock the locking device by turning it by 90°.

After removing the cover, the threshing drum is accessible.

The concave is accessible from underneath through the two lateral holes on the right and left side walls of the chassis.



## De-awning Plates

If in spite of a narrow concave gap and a high threshing drum speed the threshing result – e. g. in winter barley – is unsatisfactory, the de-awning plates under the concave should be additionally utilized, which can be swung in or out by a lever on the concave on the left-hand side of the machine.

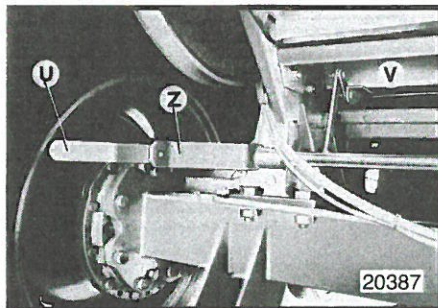
### Lever towards the top (A).

De-awning flaps open.

### Lever towards the bottom (B).

De-awning flaps closed.

In normal conditions in wheat, rye, etc., the de-awning flaps have to be opened (swung-out position).

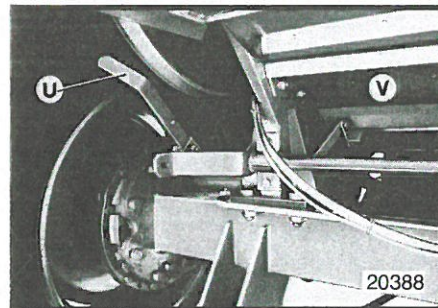


## Stone Collecting Trough

The stone collecting trough supplied as standard, is arranged between the conveyor channel and the threshing group (drum and concave).

The stone collecting trough is accessible from the front underneath the conveyor channel.

When closed, the lever "U" has to be locked at "Z".

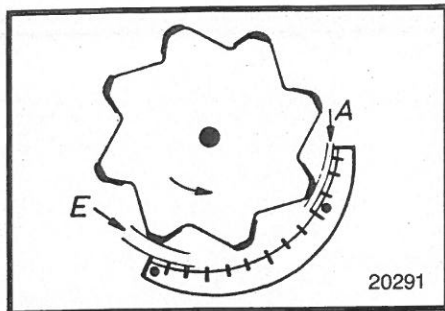


For cleaning the stone collecting trough, lift the conveyor channel, **stop the engine and withdraw the ignition key.**

Unlock lever "U" by pulling it towards the outside and to the top. By this operation the stone collecting trough opens at "V" and is accessible for cleaning.

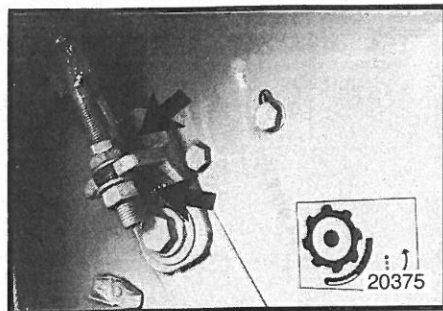
**Take notice of the safety rules!**



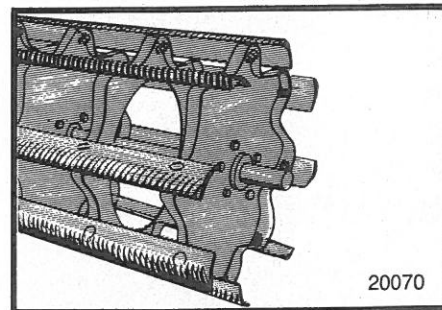


## Concave

On the new machine as supplied ex Works, the front gap of the concave "E" has been adjusted to 6 mm (measured at the 3rd bar), and the rear gap "A" to 3 mm (measured at the last bar).



In addition to the concave adjustment from the driver's seat (fig. 20379), the position of the concave can be also changed by means of two adjusting nuts (arrow), allowing a fine adjustment of the concave.

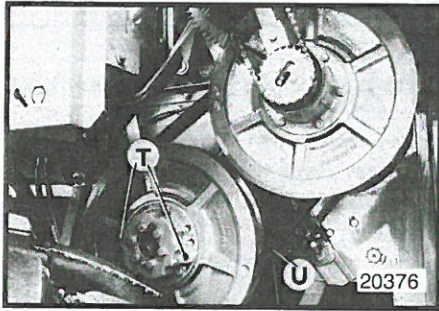


## Threshing Drum

The threshing drum is equipped with 8 rasp bars, and balanced.

After repairs or when incorrectly running, the threshing drum has to be re-balanced.

**If fitment of rasp bars should be required, use only rasp bars of equal weight!**

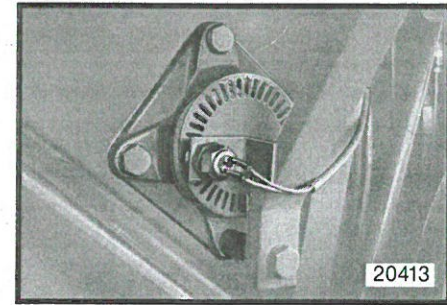


## Threshing-drum Speed Variator Drive

The threshing drum speed can be infinitely adjusted by means of a V-belt driven speed variator from 450–1300 rpm.

**The threshing drum speed adjustment should be made with running threshing mechanism, from the driver's seat.**

To ensure at any time a smooth function of the variator, it is recommended to actuate same from time to time over its whole regulating area.



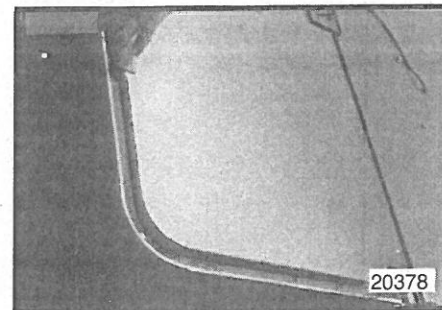
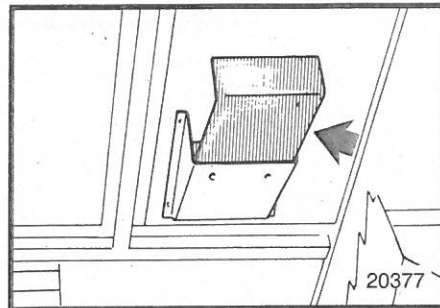
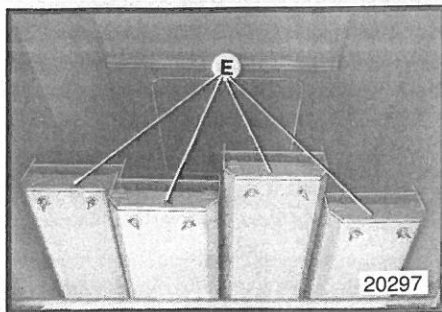
If, unexpectedly, a blockage of the threshing drum should take place, proceed as follows:

- Disengage the conveyor channel and the threshing mechanism.
- Open the concave completely.
- Engage the threshing mechanism.



**Important! – Before cleaning or servicing, stop the engine, and withdraw the ignition key.**

The rotation speed of the threshing drum is determined by the inductive transmitter and can be read off from the central informer (item "19", fig. 20358) on the driver's platform.



## Straw Walkers

For mounting the straw walkers, the cover at the rear of the straw hood can be removed.

**The idling speed of the straw-walker crankshaft has to be  $193 \pm 3$  rpm.**

For pulling out straw walker extensions, undo the winged nuts and shift extensions into the desired position. Retighten the winged nuts.

The compartment of straw walkers has been secured against clogging and subsequent damages by a warning equipment. The optical signal is effected by a pilot lamp "3" (fig. 20358). The acoustic warning signal is by the horn. For a daily function test actuate the ignition, and push flap towards the bottom. **Do not start the engine!**

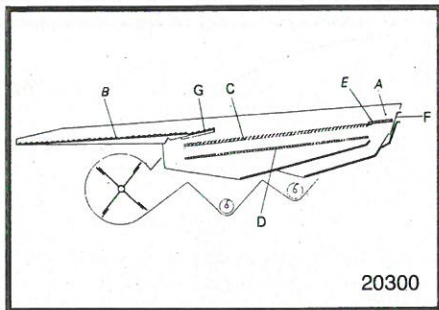
The straw walkers are serially equipped with a two-row spray cloth.

The 4-part straw walkers are accessible for cleaning and servicing from the top of the straw hood. For this scope, open the turning locks, raise the cover, displace same towards the rear, and fold it up.



**Important! Before working on straw walkers, stop the engine and withdraw the ignition key.**

After cleaning and servicing, close and lock the entrance hatch.

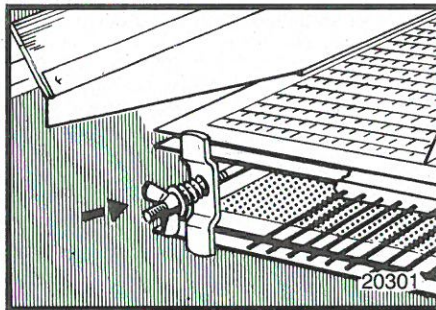


## Cleaning

The sieve box "A" consists of a stepped floor "B", a short-straw screen "C", a grain sieve "D", a short-straw rake "E", a chaff slide "F", and a toothed strip "G".

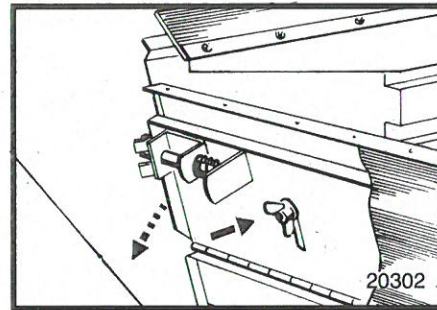
Effective cleaning requires the use of the adjusting facilities; only thus a really clean sample will be ensured under all threshing conditions.

For the sieves and adjustments which are required for the various types of crops, see The Adjusting Table on page 73.



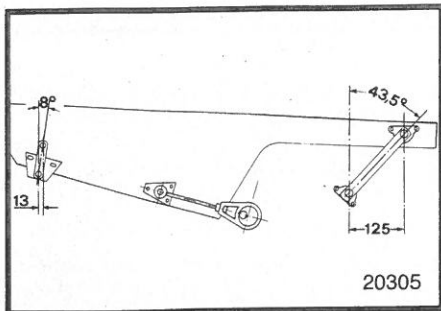
## Sieve Box

For the adjustment or removal of sieves, undo the two lateral lockings, and fold down rear-positioned chaff slide and the sieve-clamping clips.



The grain catchplate is adjustable for height after releasing the winged nuts. Match position of the sieve extension to that of the short-straw screen.

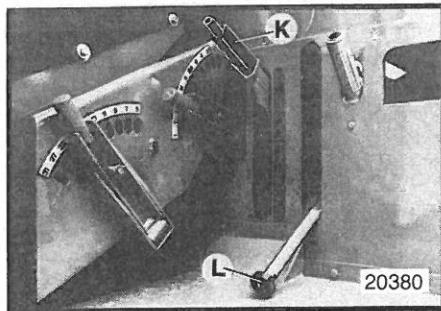
The grain catchplate should not be adjusted too high, to allow the short straw and chaff to be blown out onto the field.



## Sieve-box Adjustment

For safeguarding satisfactory work, check sieve-box kinematics from time to time.

For checking the dimensions, shift sieve box into foremost position.

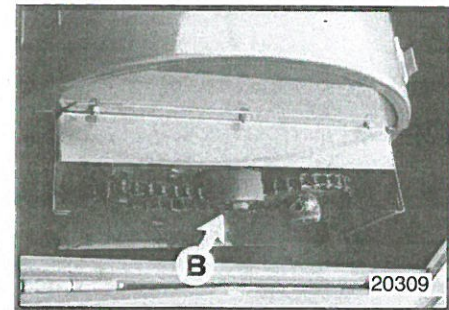
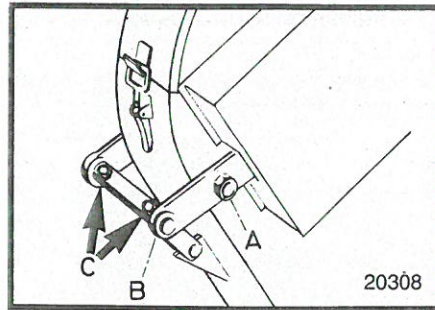
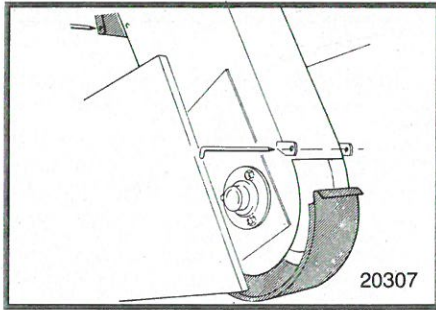


## Fan Adjustment

The intensity of wind of the fan can be adjusted by an adjusting crank positioned at the rear on the left-hand side of the combine harvester.

The wind produced by the cleaning fan should not be stronger than necessary for obtaining a satisfactory separation of grains from the chaff.

**Use fan-adjusting lever "K" only when machine is running.**



## Grain Elevator

The grain elevator is equipped with flaps for checking and cleaning.

After these flaps have been opened, checking the elevator chain and cleaning the elevator trough before starting the threshing operation or before proceeding to another type of crops, is possible.

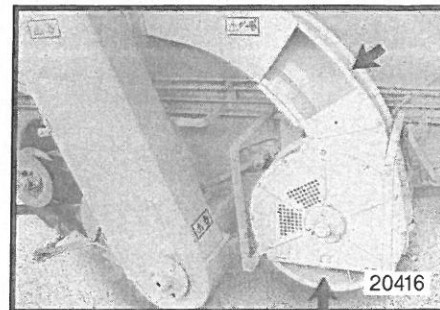
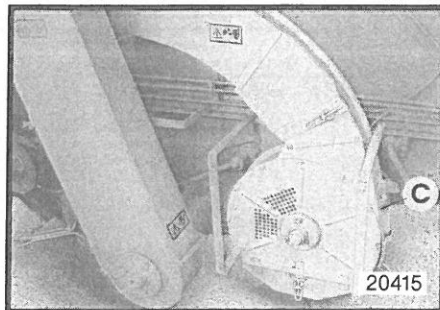
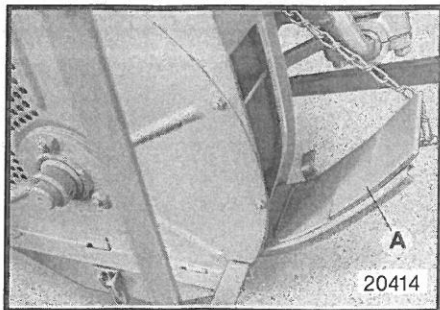
### Warning!

**Never put your hands or a tool into openings of elevators when machine is running.**

The tension of the transport chain in the grain elevator should be checked from time to time.

At the head of the grain elevator the two axle nuts "A" and the counternut "B" have to be released, and the straining screws "C" re-tightened.

If due to elongation of the elevator transport chain readjustment of the drive chain becomes necessary, this has to be made by the tension roller "B".



## Returns Elevator

The fan-type returns elevator is equipped as standard with a baffle plate "A".

Insufficiently threshed ears are rubbed out by a rubbing plate "B" supplied in the tool box with the machine, which can be fitted instead of the ordinary baffle plate.

The fan-type returns elevator is optically and acoustically protected against overcharge.

If clogging occurs, the safety flap "C" is pushed towards the outside, thus operating the horn. At the same time the signal lamp "G" (fig. 20239) lights up simultaneously.

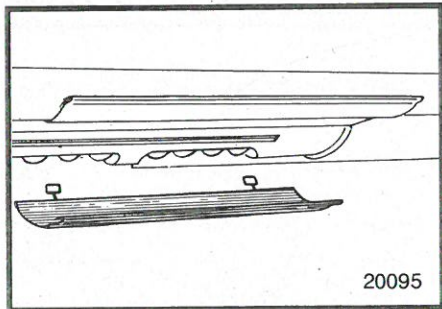
**Let machine run until all elements have stopped running, stop the engine, withdraw the ignition key, and close safety flap again.**

### **WARNING!**

**Never put your hands or a tool into openings of elevators as long as the machine is running.**



The fan-type returns elevator is equipped with two cleaning flaps. Before cleaning, stop the engine, open flaps, and clean the elevator trough. When cleaned, close flaps again, yet carefully.



## Transport Augers

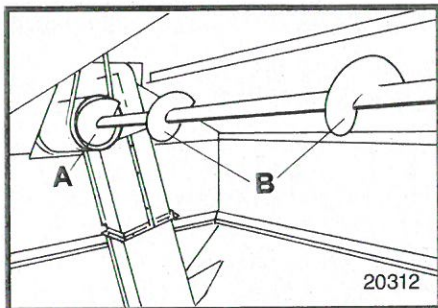


The transport augers provided for the grain-and returns elevators are accessible from the bottom face of the auger troughs. The cleaning flaps can be removed.

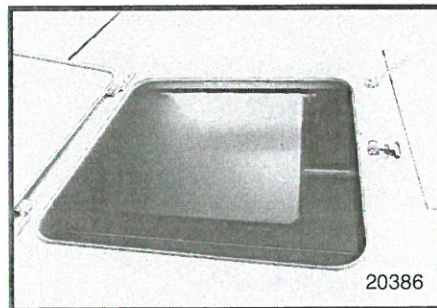
**Stop the engine and withdraw the ignition key!**

After cleaning, close flaps carefully. Make sure that the cover is firmly attached to the holding device.

Secure clamping locks by spring clips.



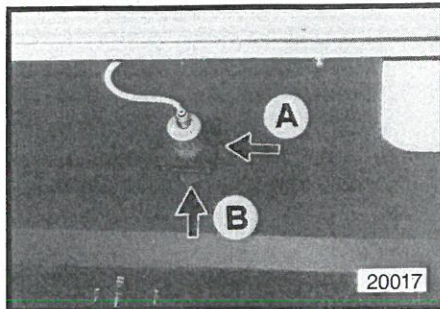
## Grain Tank – Distributing Auger



Filling the grain tank is by the chain conveyor in the grain elevator via the cross auger "A". The crop is distributed in the grain tank by means of two individual auger spirals "B".

The cross auger is secured against access by a guard plate provided in the grain tank opening.

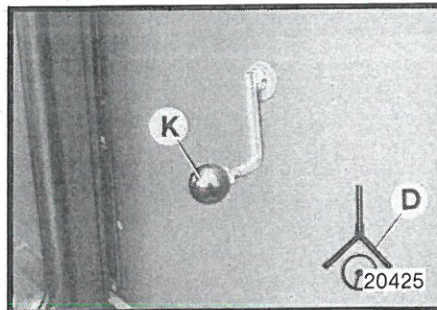




Via a transmitter "A" of the filling indicator in the grain tank, the grain level is signalled to the combine driver by a warning lamp "5" (fig. 20358). At the same time – as acoustic signal – the horn is operated.

**Function control:**

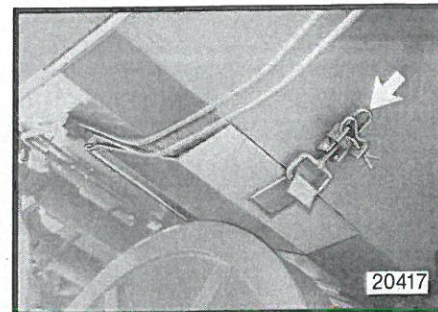
By contact with the transmitter face from below (arrow "B"), the prescribed indication has to take place.



The roofed plate "D" above the transport auger is vertically adjustable for the regulation of the amount of grains by a crank "K" from the driver's seat.

In case of dry crops, the gap should be changed only to a certain extent, so that damages to the clutch belt or transport auger due to overcharge cannot take place.

In case of badly flowing crops, the gap may be changed correspondingly.

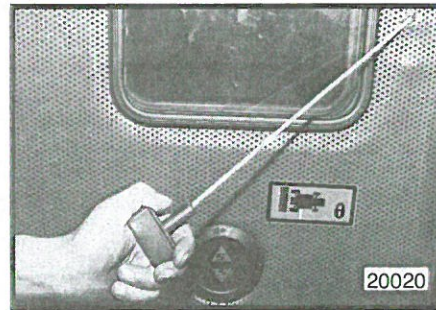
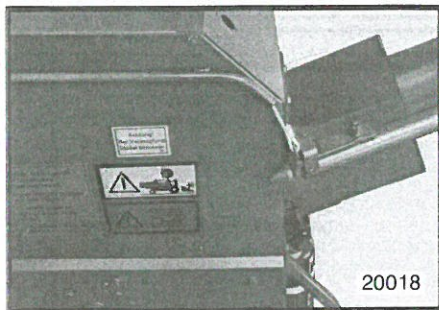


## Access Hole for Cleaning the Universal Joint



Cleaning the passage from the grain tank to the discharge pipe is possible through this hole.

**Important! After cleaning close the slide.**

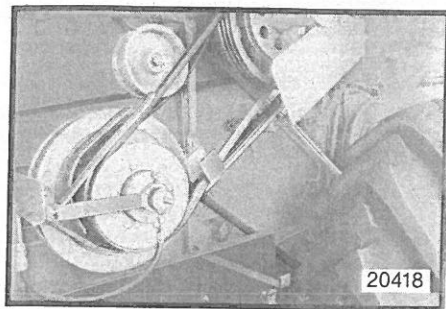


## Discharge Pipe

The grain tank discharge pipe is hydraulically swung in and out by a control lever "D" (fig. 20361). By latching the stop lever on the locking pipe, the telescopic bar is locked in its discharge position.

Additional precise adjustment of the telescopic bar is possible by the threaded pins (arrow).

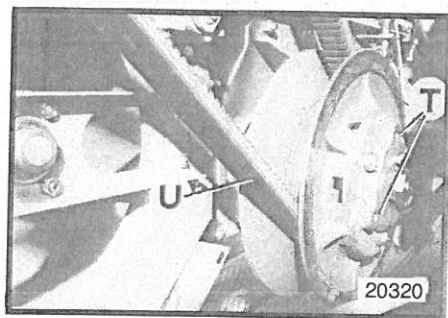
When swinging in to road travelling position, unlock discharge pipe by pulling on the toggle, and actuate the respective hydraulic control lever.



## Tips for the Adjustment of Drives

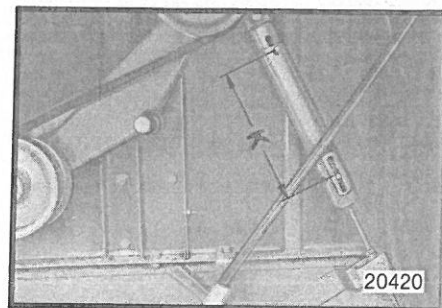
For the adjustment and readjustment of drives, and for the replacement of variator belts without problems, mind the following:

The adjustment of the travelling drive is by an hydraulically operated variator. This operation is actuated via a control valve "1" (fig. 20354).



## Travelling Drive

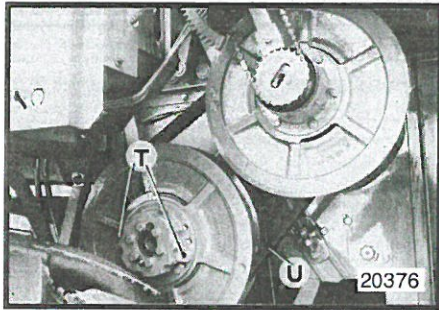
For replacing belts, adjust travelling speed variator to maximum speed. Space pulley halves by bolts "T" M 16 x 140. Push safety ring on the sliding sleeve of the pivot pin towards the inside.



## Main Drive

The tensioning unit (telescopic tube) of the compound belt for the travelling drive guarantees optimal belt tension if the lower guide pin is situated at the height of the reference arrow.

The distance measurement "K" must be 273-5 mm.

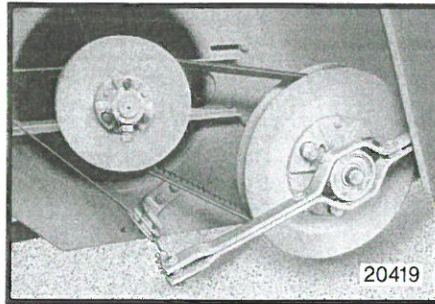


## Threshing Drum

To replace the drum drive V-belt (variator), proceed as follows:

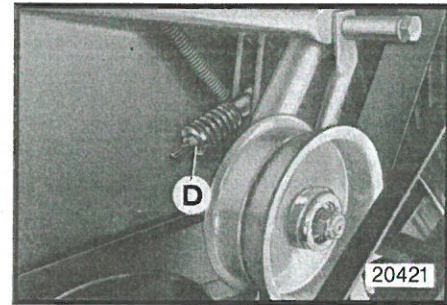
Push variator to maximum speed. The driven pulley opens. Fit hex. head screws "T" (2 M 16 x 140 are supplied in the tool box with the machine), and space pulley halves by the above screws, as much as possible. Now lower speed until the driving pulley is also completely opened. Stop the engine, and replace belt "U".

After fitment of a new driving belt, push up speed again, and take off the spacing screws.



## Cleaning Fan

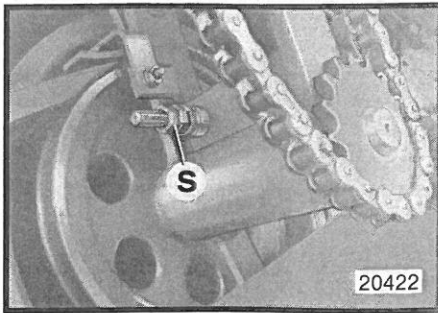
The adjustment of the wind intensity of the cleaning fan is by the fan speed variator, covering a speed range of 370-1000 rpm.



## Threshing Mechanism Clutch

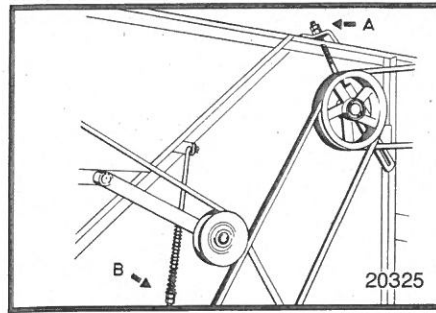
The threshing mechanism clutch is fitted to the right-hand side of the machine, and can be readjusted by a tensioning device "D".

The compression spring as fitted to the linkage - to give good function - should have a pack dimension of 70 mm taken between the two spring plates.



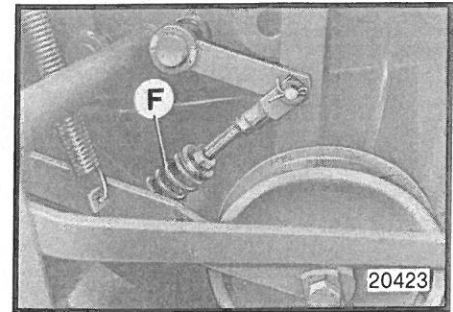
## Grain Tank Clutches

Readjustment of the grain tank clutch is by a tensioning device "S".



## Driving Belts

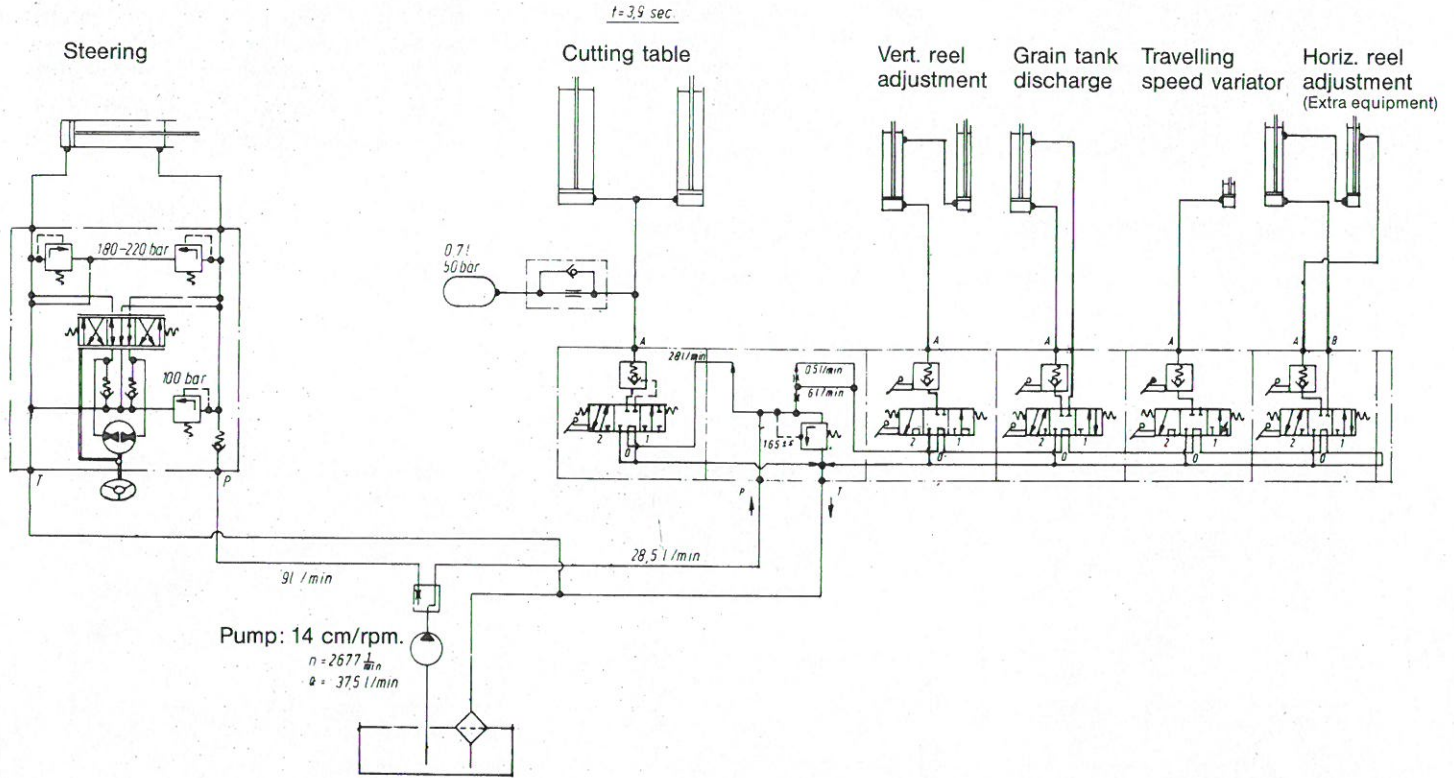
The driving belts of the straw stripper drum/tension arm and tension arm/fan-type elevator can be readjusted at "A", and that one of the grain elevator/straw walkers at "B".

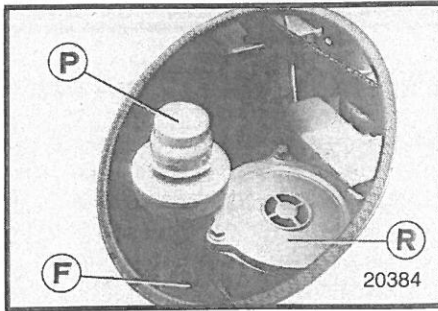


## Conveyor Channel Clutch

The conveyor channel clutch is also fitted to the right-hand side of the machine. The pack dimension of the compression spring "F" is also 70 mm.

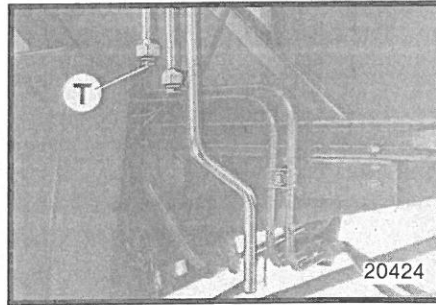
# Hydraulic Scheme





## Working Hydraulics

The oil tank "F" for the working hydraulics and the system has been filled up with hydraulic oil H-LP 46 (ISO) at Works. The required quantity for the system is approx. 15 litres. Please observe the oil level mark at "P".



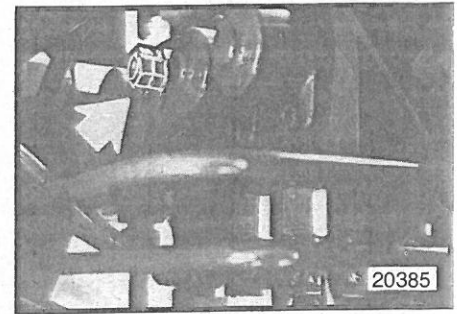
## Oil Change

To drain the oil, undo the drain plug "T".

First oil change after 200 working hours, then after 500 working hours – but at least after every 3rd campaign.

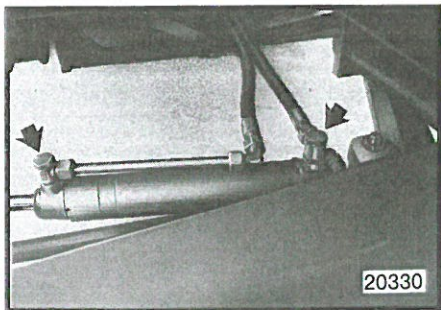
At this opportunity replace easy-change filter "R" in the oil reservoir of the hydraulic system, and the air filter "P".

**When changing the oil make account of scrupulous cleanliness.**



## Adjusting Facilities

For the circulation of oil of the working hydraulics a pressure relief valve has been arranged in the connecting apparatus of the control block. The pressure limit has been adjusted to 165 bar, which protects the whole of the working hydraulic system against overcharge. The lowering speed for the cutting table can be adjusted by a setting screw (arrow) on the control apparatus.



## The Steering



Satisfactory steering is safeguarded only if the oil level in the tank is correct and the steering system has been perfectly vented.

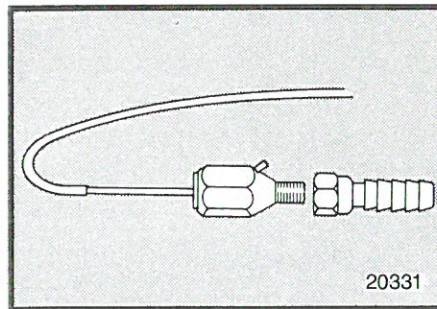
If the combine harvester refuses steering in a straight line (rolling motion), check if there is air in the system.

For venting undo threaded unions on the steering cylinder, and actuate the steering wheel several times over the whole steering range with running engine, until there are emerging no more air bubbles and foaming oil.

If by this procedure the deficiency cannot be eliminated, contact your Dealer.

**Emergency steering facilities have been provided.**

For trailing, e. g. in case of engine failure, the combine harvester can be steered by hand with increased steering power requirement.



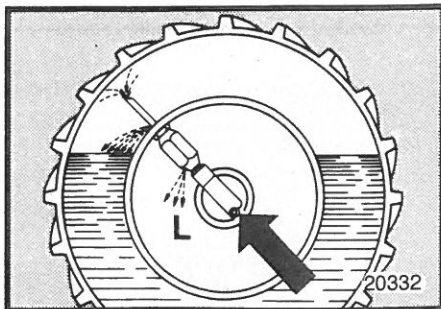
## Ballasting the Rear Wheels

With attached cutting table or maize picker, the rear wheel load in road transfer position should be at least 1900 kg. Ballasting can take place by ballast weights or water filling of the steering-wheel tyres.

Even if ballasted with water, make sure that the admissible axle loads and the admissible total weight are not exceeded!

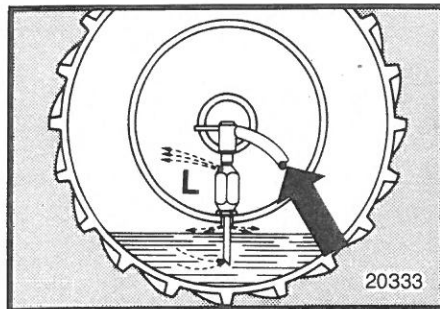
Necessary equipment: Combined water filling and discharge valve ("Hanauer Maus") available by EHA Ventilfabrik W. Fritz KG, Mülheim (Main), West Germany.





## Filling up Tyres

Jack up combine harvester,  
 turn tyre valve to the top,  
 take off valve core,  
 fit water filling valve to the tyre valve,  
 fit water hose,  
 fill in water until latter emerges at the vent  
 piece "L",  
 take off water filling valve,  
 fit valve core again,  
 inflate tyres with air up to the prescribed  
 pressure.



## Emptying Water from Tyres

Jack up combine harvester,  
 turn tyre valve to the bottom,  
 take off valve core,  
 drain the water,  
 fit combined valve,  
 inflate tyres – the last remainder of water is  
 escaping via the vent piece "L",  
 take off the combined valve,  
 fit the valve core,  
 inflate tyres up to the prescribed pressure.

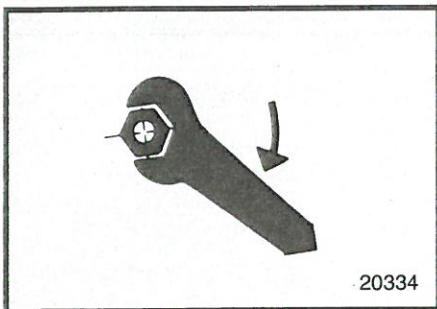
## Water Filling

If there is frost hazard, add an antifreezing  
 agent, to avoid freezing of the water and the  
 destruction of the tyres.

Recommend antifreezing agents: magne-  
 sium chloride or calcium chloride.

Mixing can be made in a larger vessel. Add  
 antifreezing agent to the water, continuously  
 stirring until agent is completely dissolved.

Filling up tyres with the solution is by a pump  
 or bucket positioned to the required height.



## Torques of Wheel Nuts



Driving wheels: 310 Nm (31 kp)  
Steering wheels: 140 Nm (14 kp)

**In any case check and whenever necessary retighten wheel nuts after 5 travelling and/or working hours at the latest.**

## Tyre Inflation Pressures



**Tyre inflation pressures**  
of driving wheel tyres

18,4-30 AS/ 8 PR	1,8 bar
18,4-30 AS/10 PR	2,3 bar
23,1-26 AS/ 8 PR	1,5 bar
of steering wheel tyres	
11,5/80-15 Impl. 6 PR	2,75 bar

Adjusting Table for the Various Types of Crops						M 2385		
Type of crop	Threshing drum  RPM	Concave adjustment		Short-straw screen aperture  mm	Grain sieve  ∅ mm	Cleaning fan	Remarks	
		front mm	rear mm					
Winter barley	1000-1200	9	3- 4	9-15	11-13	1/2 open	with de-awner partly with de-awner	
Summer barley	1000-1100	14	6	9-15	11-13	1/2 open		
Rye	900-1100	14	6	5-13	9-11	1/2 open		
Wheat	900-1200	14	5-12	5-13	11-13	1/2 open		
Oats	900-1100	14	5-15	8-13	13	1/3 open		
Peas	400- 500	26	12-17	10-15	11-13	compl. open		
Beans	400- 600	26	12-17	10-15	13	compl. open		
Rape	500- 900	26	12-17	4- 6	4- 7	1/3 open		
Grass seeds	750- 900	14	6	4- 6	7-11	compl. closed		slide closed
Maize	300- 500	26	12-17	nosed sieve 32	15-18	compl. open		
<b>Standard equipment:</b> Short-straw screen = lamellar type Grain sieves = round hole types (∅ 9, 11, 13)				<b>Extra equipment:</b> Round holed sieves = ∅ 3, 4, 5, 5, 7, 15, 18 Adjustable sieve = smaller US lamellar type z 23 lamellar type				

# Rectification Guide for Cutting- and Threshing Faults

		Reel transports irregularly	Cutting mechanism transports irregularly	Bad cutting	Drum wrapping	Bad threshing	Broken grains	Grain loss by the reel	Grain loss by straw walkers	Grain loss by sieve	Unsatisfactory cleaning	Too much short straw	Grain elevator overcharged	Returns elevator overcharged	Warning signal resounds and lamp lights up
Threshing output	Travelling speed too high			●					●	●			●	●	
Elevators	Check fan-type returns elevator												●	●	
	Check grains elevator												●	●	
	Check drive												●	●	
Cleaning fan	Cleaning wind too weak										●				●
	Cleaning wind too strong									●					●
Sieve box	Sieves are clogged									●					
	Sieve apertures too small									●					
	Sieve apertures too large										●	●	●		
Straw walkers	Check spray cloth				●				●						
	Check speed				●				●						
	Straw walkers clogged								●						●
Concave	Concave clogged						●	●							
	Bars bent or worn					●	●								
	Gap too narrow						●								
	Gap too great					●							●		
Threshing drum	Check drive				●										
	Bars bent or worn					●	●								
	Drum speed too low				●	●									
	Drum speed too high						●					●			
Reel	Check cutting mechanism drive			●											
	Check position of tines	●													
	Check reel speed	●		●			●								
	Check position of reel	●		●			●								
Cutting mechanism	Check position of dividers	●	●												
	Check position of tines		●												
	Check auger clearance		●												
	Check knife and stroke			●											
	Check earlifters			●											

# Filling Quantities and Oil Grades

Fuel tank	190 l Diesel
Deutz-diesel engine	17,5 l Engine oil <sup>1)</sup>
Change-speed gear	4,0 l Gear oil <sup>3)</sup>
Lateral gear, L. H.	4,0 l Gear oil <sup>3)</sup>
Lateral gear, R. H.	4,0 l Gear oil <sup>3)</sup>
Working hydraulics	15 l Hydraulic- or engine oil <sup>2)</sup>
Brake hydraulics	0,35 l Brake fluid <sup>4)</sup>
Clutch hydraulics	0,35 l Brake fluid <sup>4)</sup>

1) Engine oil MIL-L 2104 C (API-CD) SAE 30 ó 20 W 50 ó 15 W 40

2) Hydraulic oil H-LP 46 (ISO) or

Engine oil MIL-L 2104 C (API-CD) SAE 20 W 50/15 W 40/15 W 50/20 W 20 or

Engine oil MIL-L 2104 B (API-SE, -SD, -CC) SAE 20 W 50/15 W 40/15 W 50/20 W 20

3) Gear oil MIL-L 2105 A (API-GL 4) SAE 90

4) Brake fluid conforming to requirements according to DOT 4, DOT 3 or SAS J 1703

Reference to <sup>2)</sup>: For conditions with an ambient temperature of more than 30° C (86° F), an hydraulic or engine oil of the viscosity SAE 30 or an equivalent multigrade oil has to be used.

For the engine and extra equipment, see greasing charts of the special Instruction Books.

## Wiring Diagram

Please find wiring diagram enclosed in the pocket at the back of this Instruction Manual.

### Attention!

Due to the rotary current generator at the engine, please observe the following:

1. Assisted starting of the engine with rapid charger is **not** permissible. Use in any case a separate battery.
2. When charging the battery, make sure that the polarity is correct. Otherwise the diodes will be destroyed.
3. Jobs on voltage-carrying elements may be only carried out, if the battery has been previously disconnected.
4. To avoid damaging semi-conductors, never check voltage by tipping against the earthing cable.
5. If electro-welding has to be carried out on the combine harvester,
  - a) disconnect the battery and so the electric circuit, and
  - b) attach the negative holder of the welding equipment as close as possible to the weld.

### **Jobs to be carried out after the campaign and for wintering the combine harvester**

Clean combine harvester thoroughly. To do this, open all cleaning covers on auger troughs and elevators, and let machine run until all elements stop running.

- Retract all hydraulic rams, and fill oil tank completely for preservation.
- Remove drive chains, and clean and immerse in oil.
- Relieve tension on all V-belts.
- Remove and grease knife, and oil knife guides.
- Clean sieves and spray with a rust-preventing agent.
- Lubricate all bearings which need lubricating.
- Preserve diesel engine and hydraulic components according to instructions.
- Tighten up all screws and pipe unions.
- Repair or replace all damaged components.
- Repaint all parts where required.
- Spray machine with rust-preventing agent, also internally.
- Park machine in a weather-proof room.
- Jack up machine to relieve tyres of load.
- Take battery into qualified workshop for maintenance.
- Change oil of the change-speed gear and of lateral gears.
- Fill up fuel tank with diesel oil to the top (see point 3 of Preservation of Engine).

### **Preservation of Engine**

If your engine is to stand idle for a long time (e. g. during the winter), we recommend the following measures to prevent rusting:

1. Clean outside of engine with diesel fuel or dry-cleaning spirit.
2. Drain engine oil while still warm, and fill up with anti-corrosion engine oil.
3. **Fill fuel tank completely,** mixing 10% of anti-corrosion oil with diesel fuel. Instead of mixing anti-corrosion oil with the fuel, the tank can also be filled with testing oil as used on injection pumps and having anti-corrosion characteristics.
4. Drain or suck off oil from injection pump and governor, and fill with anti-corrosion oil.
5. Run engine for 10 minutes to get pipes, filters, pump and injection nozzles filled with the preservative mixture.
6. After doing so, take off cylinder head cowls and injection-pump side cover, and spray interior of rocker levers and fuel-pump spring chamber with a mixture of diesel fuel and 10% anti-corrosion characteristics. Then fit cowls and covers again.
7. Now turn engine several times by hand without starting, in order to spray the combustion chambers.
8. Remove V-belts and spray grooves in V-pulleys with anti-corrosion oil. Remove this oil before setting to work again. Seal off air-cleaner intake opening and also exhaust opening.

These conservation measures will be sufficient, depending on weather conditions, for a period of between 6 and 12 months approximately. Before setting to work again, drain off anti-corrosion oil and replace with fresh engine oil. As an exceptional measure, anti-corrosion oil can be used for up to 10 operating hours at half load.

# Technical Data

## Basic extent of supply

### FAHR-agrotronic®

with integrated closed circuit system, with integrated check-control for travelling and working, with central informer for optical and acoustic control of 17 important functions of the machine, working hours counter, control panel with push-button switches for the reel and threshing drum speeds, travelling speed indicator, straw chopper and lighting with quick-action couplings

### Heavy-duty cutting table

Cutting width **3.00 m** (optionally 3.60 m, 4.20 m)  
Steel-bar earlifters 9, 11, 13 pcs., depending on width of cutting table  
Crop dividers adjustable, right one long, left one short  
Cutting height hydraulically adjustable from -170 up to +1240 mm  
Load indication automatically  
Height adjustment hydro-pneumatic  
Horizontal adjustment 6-part, with spring tines  
Speed adjustment mechanically  
Speed adjustment variator, electrically adjustable from 16-45 rpm, stepless

### Threshing drum

Drum width 1030 mm  
Drum dia. 560 mm  
Number of rasp bars 8  
Drum drive by variator, mechanically  
Speed from 450-1300 rpm, stepless

### Concave

Number of concave bars 12  
Stone collecting trough folding  
De-awning 3 laterally operated flaps  
Concave adjustment from the driver's seat, independent front and rear

### Straw walkers

Shaking area  
Separating area  
Bearings  
Cleaning  
Speed adjustment  
Sieves, divided

Total sieving area

### Returns

Grain tank  
Discharge pipe  
Drive  
Engine

Fuel tank

Travelling speeds  
1st speed  
2nd speed  
3rd speed  
reverse

### Brakes

### Steering

Tyres

### Lighting

Serial accessories

4-part, with 5 steps and extension trays

4.03 m<sup>2</sup>

4.56 m<sup>2</sup>

ball bearings, maintenance-free

air blast, steplessly adjustable

by variator, mechanically

top sieves: with US-type blades, adjustable, with extension

bottom sieves: round hole types 9, 11, 13 mm dia. 3,04 m<sup>2</sup>

Fan-type returns elevator with friction plates capacity approx. 3200 litres, with cover spring-mounted, slewable

DEUTZ 6-cyl. diesel - 4 stroke -

F6L 912, 76 KW/F6L 913, 89 KW air-cooled

capacity 190 litres

with tyres 18.4 - 30 AS

1.3 - 3.5 km/h

2.5 - 7.0 km/h

7.0 - 20.0 km/h

2.5 - 5.6 km/h

hydraulic footbrake for use as individual wheel brake;

separate parking brake

hydrostatic: steering wheel steplessly adjustable

front: 18.4 - 30 AS, 8 PR

18.4 - 30 AS, 10 PR

23.1 - 26 AS, 8 PR

rear: 11.5/80 - 15 Impl. 6 PR

Lighting and flashing hazard indicator

Spare knife, tools, various spare parts, driving mirror, printed matters



## Additional Equipment

Commander's cab, modern seat type, with 3-step fresh-air fan

Compressor operated cooling apparatus for the commander's cab

Tempered safety glass, shaded, for the commander's cab

Heater for the commander's cab, independent of the engine

Multi-adjustable comfort seat

Sunshade

Electronic speed control for straw walkers, fan-type returns elevator, and grain tank filling auger

Hydraulically slewable grain tank discharge pipe

Electronic grain tank filling indicator

Grain-Control (grain loss indication by monitor)

Hydr. horizontal reel adjustment instead of mech. adjustment for heavy-duty cutting table 3.00 m

do., but for heavy-duty cutting cable 3.60 m  
do., but for heavy-duty cutting cable 4.20 m

Additional control apparatus with accessories

3 additional reflectors

Fire extinguisher (serial equipment)

Double floor for heavy-duty cutting cable 3.00 m

Double floor for heavy-duty cutting cable 3.60 m

Double floor for heavy-duty cutting cable 4.20 m

2 additional sliding shoes for heavy-duty cutting tables up to 4.20 m

Hinged earlifters instead of steel-bar earlifters

1 crop divider, long, adjustable

Crop lifting bar complete (for long crop divider)

Set of chain sprockets Z 7/75 for lower reel speed (11-30 rpm)

Transport trolleys for heavy-duty cutting tables up to 4.20 m

Coupling for trolleys

Round hole sieve 3 mm  $\emptyset$

Round hole sieve 4 mm  $\emptyset$

Round hole sieve 5.5 mm  $\emptyset$

Round hole sieve 7 mm  $\emptyset$

Round hole sieve 9 mm  $\emptyset$

Round hole sieve 11 mm  $\emptyset$

Round hole sieve 13 mm  $\emptyset$

Round hole sieve 15 mm  $\emptyset$

Round hole sieve 18 mm  $\emptyset$

Adjustable sieve with small US-type blades as bottom sieve, instead of sieves 9/11/13 mm  $\emptyset$

Adjustable sieve Z 23 as top sieve, instead of small US-blade lamellar sieve

## Measurements

### ● Transport

Length with cutting table	8570 mm
Length without cutting table	6770 mm
Width with cutting table 2.70 m*	3000 mm
Width without cutting table*	2860 mm
Height with tyres*	3470 mm

\* all measurements with tyres 23,1-26.

## Weights

- Standard equipment with cutting table 2.70 m, 6050 kg
- Adm. total weight 8000 kg
- Adm. front axle load 5400 kg
- Adm. rear axle load 2650 kg

**The KLÖCKNER-HUMBOLDT-DEUTZ AG, Zweigniederlassung FAHR, policy is to always endeavour to improve production and design. They, therefore, reserve the right to introduce modifications and improvements where they feel necessary. There is no obligation to apply such modifications and improvements to machines and implements already supplied.**

**All figures, dimensions and weights of this Operating Instruction Manual are not binding.**