Operator's Manual

Combines
M300 - M310

M300 / M300 MCS - S/N => ZN205550_03020001
M300 MCS LC - S/N => ZN205554_03000001
M310 / M310 MCS - S/N => ZN205650_03020001
M310 MCS LC - S/N => ZN205654_03000001

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Original Operator's Manual

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English

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7.2.1.5 Belt drive for hydrostatic pump (5)

This drive is equipped with an automatic tensioner (1).

The belt is correctly tensioned when the length of the spring (2),not including the washers, is 165 mm.

NOTE: *Do a check of the belt tension in intervals of 10 hours for the first 50 hours, then in intervals of 50 hours.*

To repair the belt tension, tighten the nuts (3) on the tie rod (4) until the spring reaches a length of 165 mm.

NOTE:
After each 50 hours of operation, make sure that there is not too much clearance between the nut (5) *and the tension rod* (4). *When the tie rod* (4) *is moved manually in the direction of the belt, the clearance between the spring* (2) *and the belt must be 2–3 mm. If not, replace the nut* (5).

NOTE:
This drive also provides the motion to the triple pump that operates the cutting table, the hydrostatic power steering and the auxiliary hydraulics.

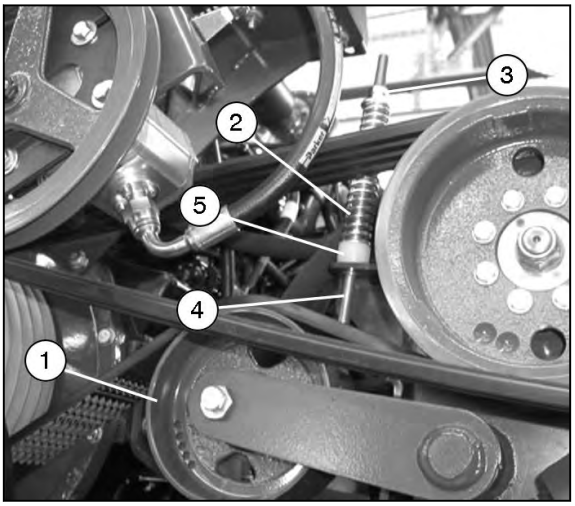


Fig. 8

7.2.2.1 Reel-pump drive belt (20)

Belt tensioning

- Loosen the nuts (1) in the pump body.

  NOTE:
  The belt is tensioned by shifting the pump body.

- Tighten the nut(2) to compress the spring (3) to a length corresponding to that of the gauge (4).

  NOTE:
  Do not tension the belt more than prescribed, to avoid overloading and damage to the pump bearings.

- Tighten the nuts (1) in the pump body.

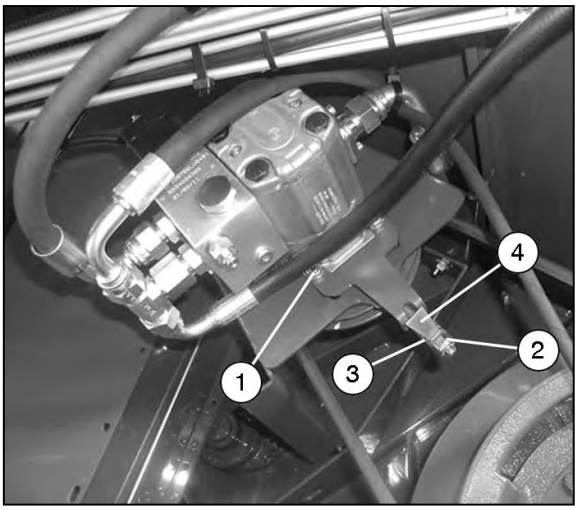


Fig. 23

7.2.2.2 Dust aspirator drive belt (21)

The belt is tensioned with the tensioner (1) which is constantly loaded by the tensile force of the spring (2).

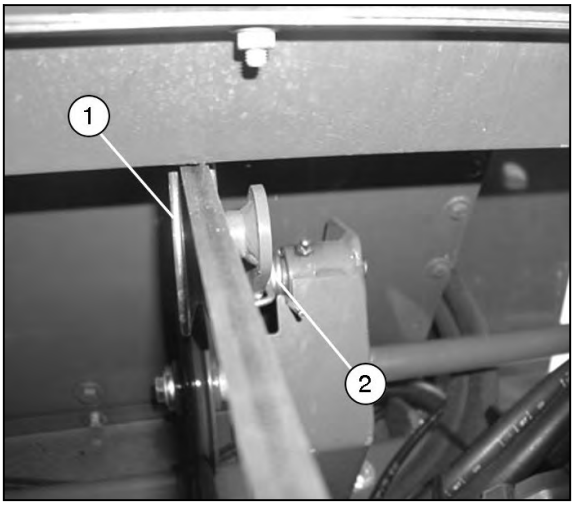


Fig. 24

7.4 Slip clutches

7.4.1 Description

7.4.1.1 Clutch for main crop elevator upper shaft (1)

The clutch is adjusted to 372 Nm (38 kgm). This value is suited for most crops and no further adjustment is required.

Having carried out maintenance work, tighten the nut (1) completely on reassembly to eliminate any play between the components.

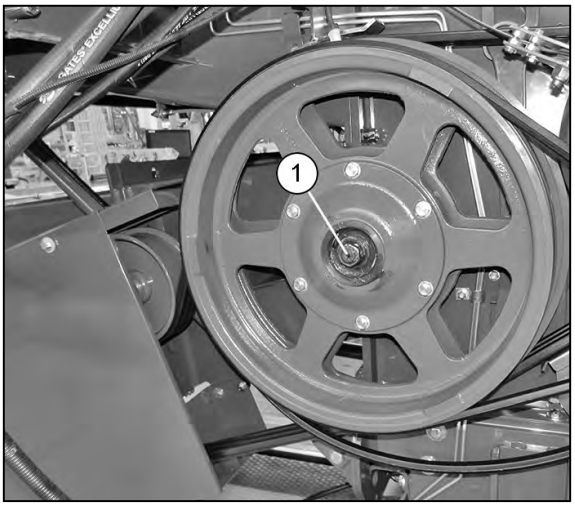


Fig. 41

7.4.1.2 Clutch on finger feed roller (2)

M300 MCS and M310 MCS models only

The clutch is adjusted to 372 Nm (38 kgm).

When you assemble it again, make sure that the key that couples the roller drive shaft to the disc (1) of the plate spring housing is correctly installed, then tighten the nut (2).

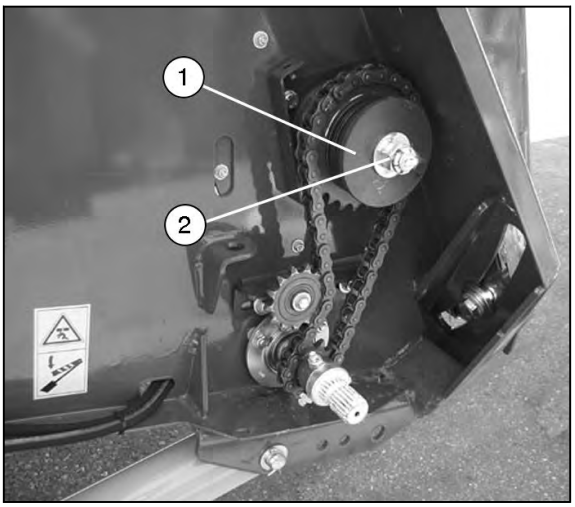


Fig. 42

7.7 Brakes

7.7.1 Service brakes

DANGER: Danger from contact with harmful substances. Protect hands with rubber gloves.

Brake master cylinder seals contain fluoroelastomers, which are quite safe under normal conditions. However, if exposed to temperatures above 315 °C, they will not burn but dissolve.

In this case, an extremely corrosive acid will be generated, which is almost impossible to remove upon contact with the skin.

CAUTION: In case of leaks from the brake system or abnormal operation, contact your local Dealer.

Brake fluid tends to absorb moisture, eventually becoming less efficient. Therefore, the fluid must be changed every two years.

Since brake fluid contains substances that would cause recycling problems when mixed with engine oil or other oils, it is recommended not to mix these oils, rather to collect them separately.

The brakes are essential components for the operator's safety; it is therefore very important that they are kept in perfect condition.

The brake pads (1) are self-adjusting; they must be replaced when they are worn.

Each of the brake discs (2), located on either side of the gearbox, has two calipers (3).

The calipers (3) receive the pressurized fluid from the pumps (4) when the pedals (5) are pushed.

When the operator stops braking, the springs (6) move the pedals (5) back into position.

To change the oil, bleed the circuit or replace the brake pads (1); contact your Dealer.

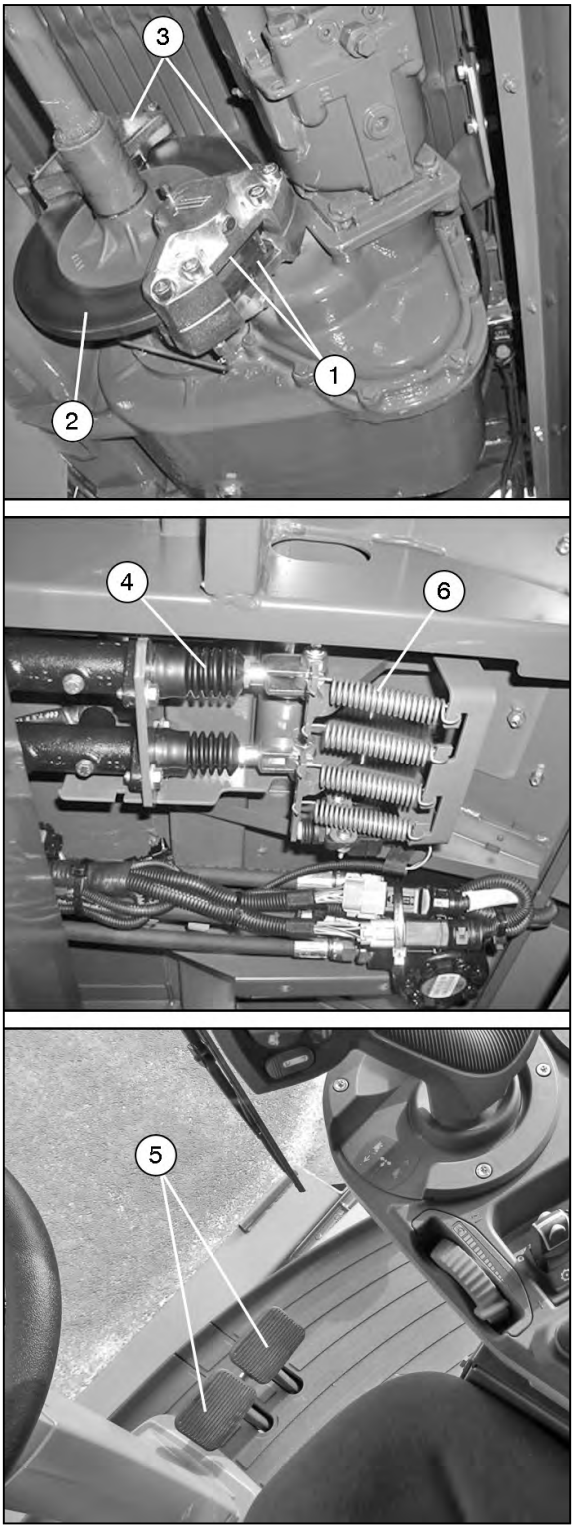


Fig. 53

7.9.2 Suggestions regarding the battery

DANGER: Risk of short circuit. Always take the greatest care.

To connect: Start with the positive and then with the negative.

To disconnect: Start with the negative and then with the positive.

DANGER: Risk of explosion.

Never charge a frozen battery. It could explode.

Avoid sparks or naked flames near the battery, the battery gas could explode.

Never check the battery charge by placing a metal object between the terminals; use a voltmeter or a densimeter.

1. When using an external battery, always connect it in parallel, i.e. positive pole (+) to positive pole (+) and negative pole (-) to negative pole (-).
2. Before connecting a battery charger, always remove the cables.

   Remove the battery plugs so that hydrogen released during charging, can escape.

   Make sure the battery charger is connected correctly.
3. Never start the engine when the cables between alternator and battery are disconnected.
4. At low temperatures, add water immediately before starting the engine.

   In this way, the charging current allows water and electrolyte to mix preventing freezing of the battery.
5. If the engine is difficult to start, do not keep the ignition key in starting position for more than 20 seconds, rather try again after a few seconds.
6. The battery should not be disconnected while the engine is running, as this could cause severe damage to the alternator.
7. Batteries should be stored only when charged.
8. To ensure long life of the battery, switch off all lights before starting the engine.
9. Battery terminals must be regularly cleaned and coated by a film of acid-proof grease or industrial petroleum jelly to prevent corrosion.

1.3.3 Cutting table identification

The cutting table can be identified by a metal plate affixed on the left-hand side.

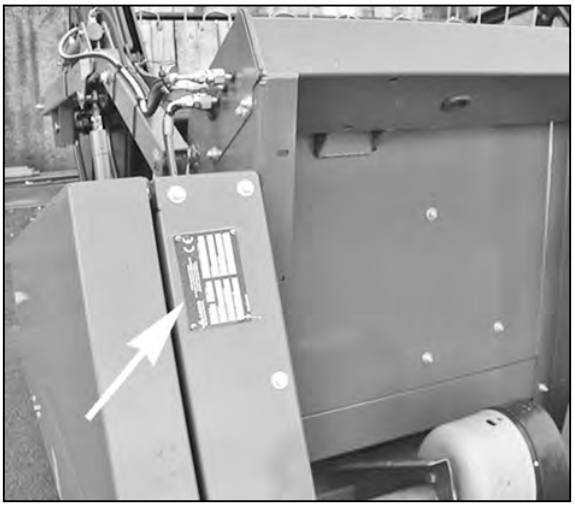


Fig. 6

1.3.4 Operator seat identification

The identification plate is located on the seat support. If you move the seat fully forward, you can access it.

Fig. 7

4.3 Multifunction lever

4.3.1 Main components

WARNING: For safety reasons, the controls on the multifunction lever are deactivated for transport on public roads using the push button (3) on the instrument panel.

If the push button (3) is disconnected (work mode), all controls on the lever (1) can be operated.

The multifunction lever (1) is located on the right-hand armrest of the operator seat.

The lever (1) controls the machine travelling direction and ground speed:

- Forward = Forward travel and speed increase
- Rearward = Reversing and reverse speed increase, with sound alarm
- Left = Immediate emergency stop of the forward or rearward movement of the machine.

WARNING: Only use this function in the event of an emergency.

- On the right = Constant Speed activation (if prerequisites are met)

NOTE: *These functions are also shown in the decal* (2).

NOTE: *When released, the lever automatically goes back to the neutral position (the machine continues to travel forwards at the set speed).*

Push the push button (13) to connect the multifunction lever (1).

IMPORTANT: *Release the push button* (13) *as soon as the machine moves.*

For more information, refer to the chapter **Starting and Stopping the Combine** in the **Field Operations** section.

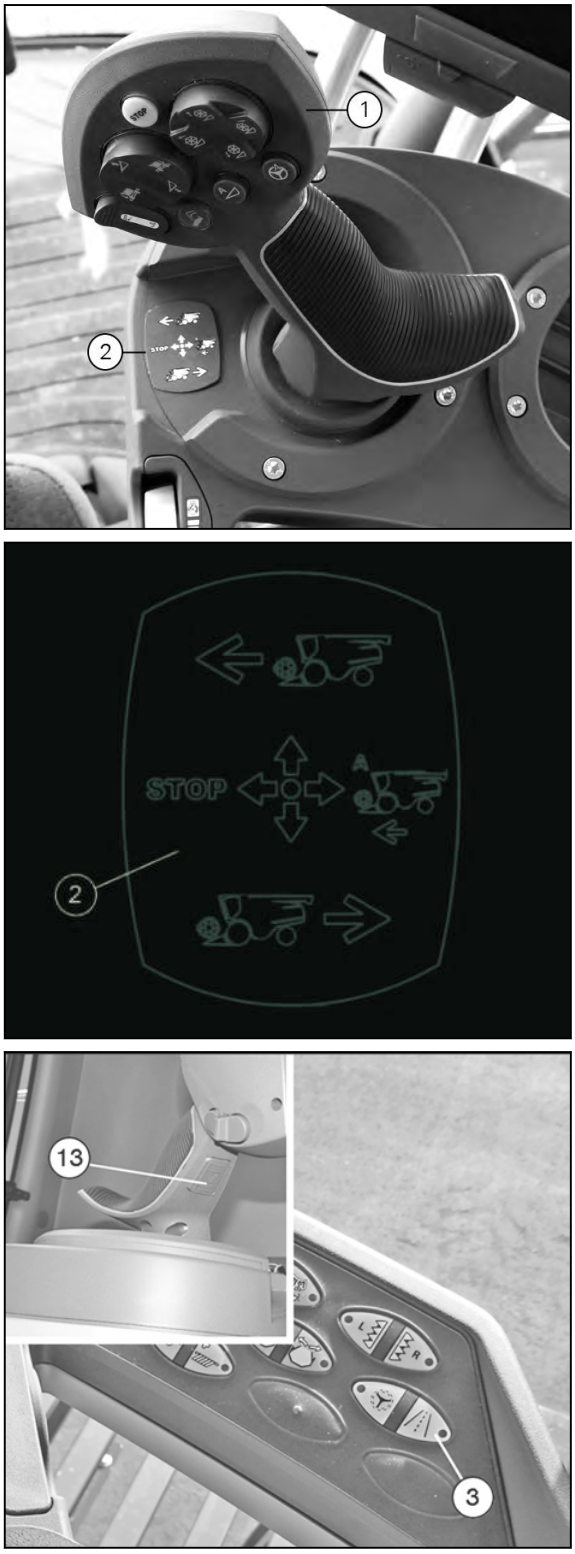


Fig. 8

4.5.11 Switch for cross leveling mode

The switch (20) has three positions:

- Enable **manual control** (upward)
- Neutral (center)
- Enable **automatic control** (downward).

Fig. 24

4.5.12 Toggle switch for machine front position

The switch (21) can temporarily assume two positions (as soon as it is released, it automatically returns to the neutral position):

- **Machine front lifting** (upward)
- **Machine front lowering** (downward).

IMPORTANT:
When maneuvering, move at slow speed (to allow the front track width to be adjusted).

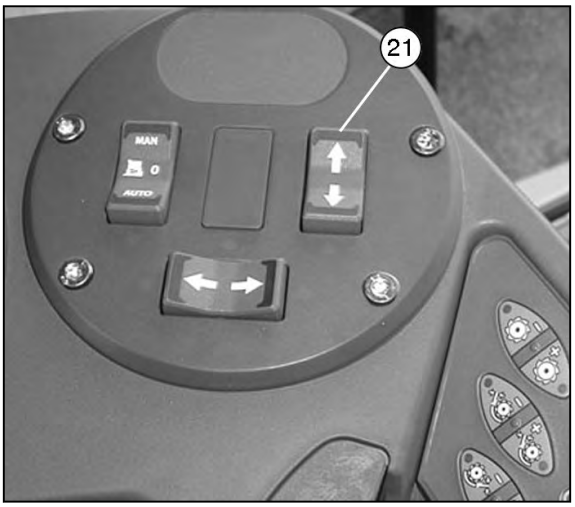


Fig. 25

Parking brake being deactivated.

Rear-wheel drive activated

Operator NOT in the driver's seat – yellow symbol

Gear selected.

Cutting table touches the ground.

Overload of the straw walker (red symbol flashes with acoustic alarm).

Minimum level of catalytic fluid. Based on the level, the light indicator is continuously on or flashes.

If the operator presence sensor is faulty, the operator can choose whether to continue to use the machine; this decision is entirely his or her own responsibility.

The icon at the side shows the last choice made by the operator.

Constant Speed:

- Neutral background if enabled but not active
- Green background if active

Gray symbol against a gray background — Manual cross leveling switch pressed, the leveling function is engaged.

Gray symbol against a flashing yellow background — Manual cross leveling switch pressed, but the leveling function is not engaged.

Green symbol against a gray background — Automatic cross leveling switch pressed, the leveling function is engaged.

Green symbol against a flashing yellow background — Automatic cross leveling switch pressed, but the leveling function is not engaged.

Maximum cross leveling reached (yellow symbol).

To make sure that the data set is correct and to save it permanently, push (4) and then (7).

To make sure that the data set is correct, but to save it only temporarily, push (5) and then (7).

IMPORTANT: *If you change the data on this screen, the header must be re-calibrated.*

To exit the menu without saving, push (6) and then (8).

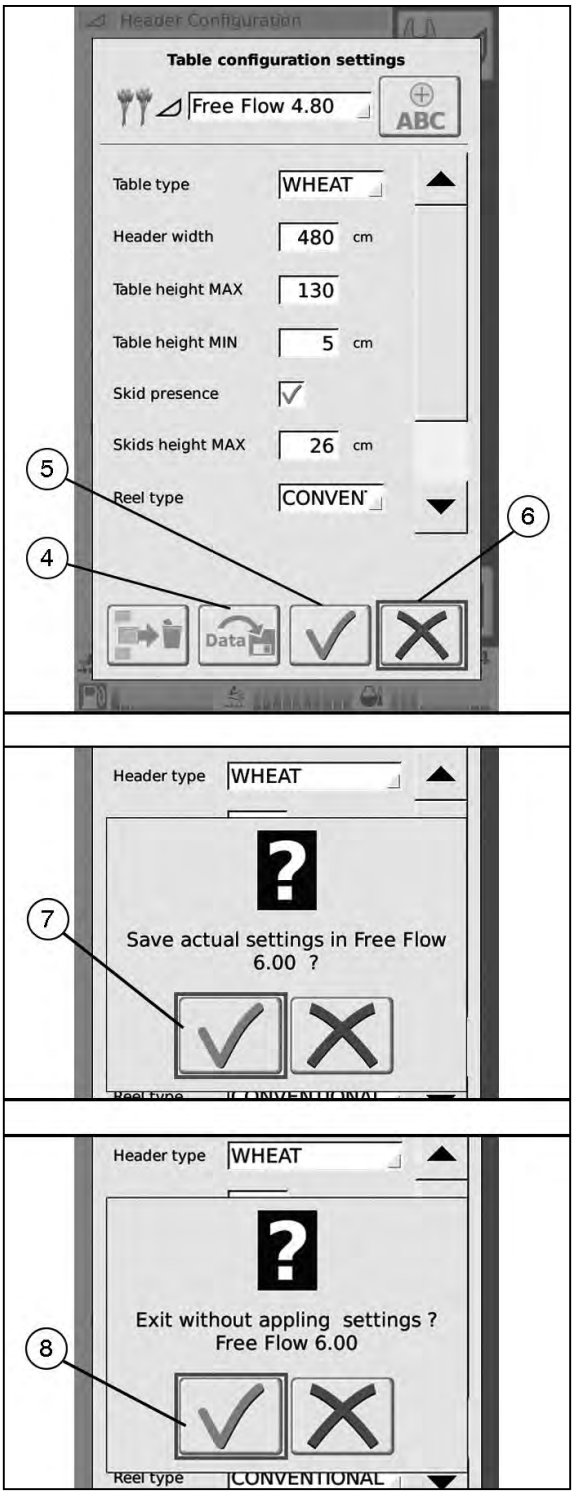


Fig. 53

4.6.14.2 Pre-set height and Field pressure

Push the push buttons (1 and 2)to use the two automatic controls together.

The behavior of the cutting table will be similar to the behavior of the **Field pressure** mode, except that:

If you push the push button on the multifunction lever shown here (with the feed mechanism engaged), the cutting table quickly lowers to height (3) and then slowly lowers until it touches the ground (4).

The bar changes its color to blue.

With option (5) selected, if you push one time the push button to lift and lower the cutting table, the height setting (3) is changed.

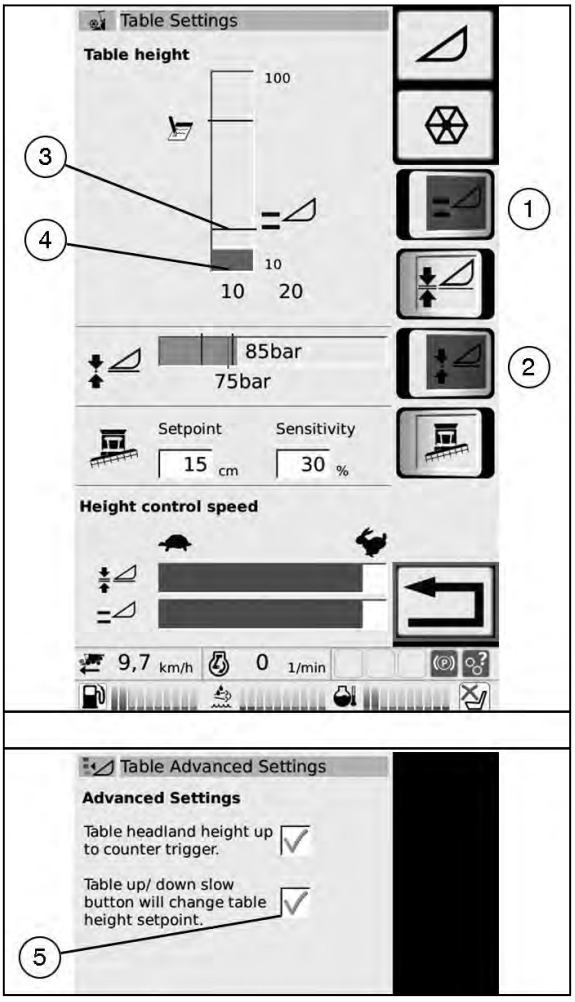


Fig. 63

4.6.14.3 Pre-set height and Lateral flotation

NOTE: *Using this combination is not recommended.*

4.6.16 Shafts and engine

Pressing the icon on the side of the **Main menu** screen displays the **Shafts and engine** page.

This screen displays information about:

1. Cylinder speed
2. Fanning mill speed
3. (MCS) rotary separator speed
4. tailings elevator speed
5. Crop elevator to tank speed
6. Straw chopper speed
7. Hourly fuel consumption
8. Catalytic fluid hourly consumption
9. Engine load
10. Internal engine pressure
11. Battery voltage
12. Coolant temperature

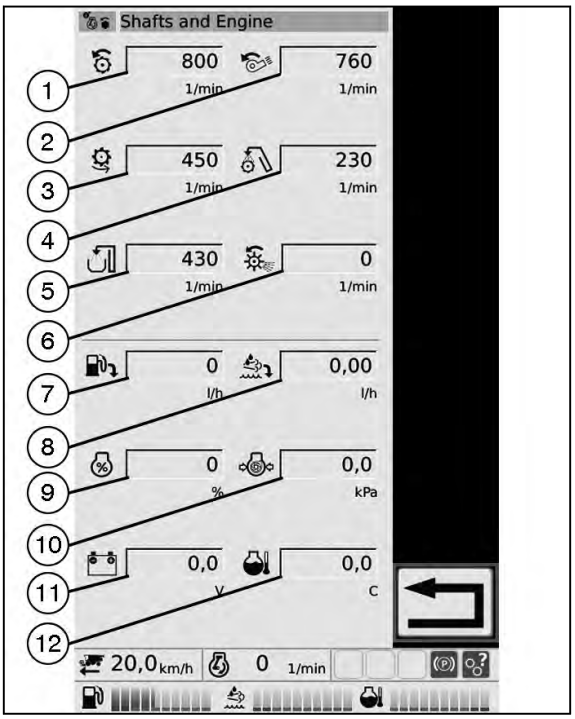


Fig. 76

The codes are divided into four groups, according to the severity of the error:

Alarm: serious hazard to the operator.

In addition to the message on the screen, the system will emit a continuous alarm.

If the operator pushes the symbol (2) but the problem continues, the visual and auditory alarms will stay connected until the error is corrected.

Warning: moderate hazard to the operator or serious hazard to the machine.

In addition to the message on the screen, the system will emit an intermittent alarm.

If the operator pushes the symbol (2) but the problem continues, the visual and auditory alarms will stay connected until the error is corrected.

Message: minor hazard to the operator or abnormal operation of the machine.

The system shows a message on the screen, which goes out of view if the operator pushes the symbol (2).

Info: information for the operator regarding the correct management of the machine.

The system shows a message on the screen which goes out of view automatically after three seconds if the operator does not push the symbol (2) first.

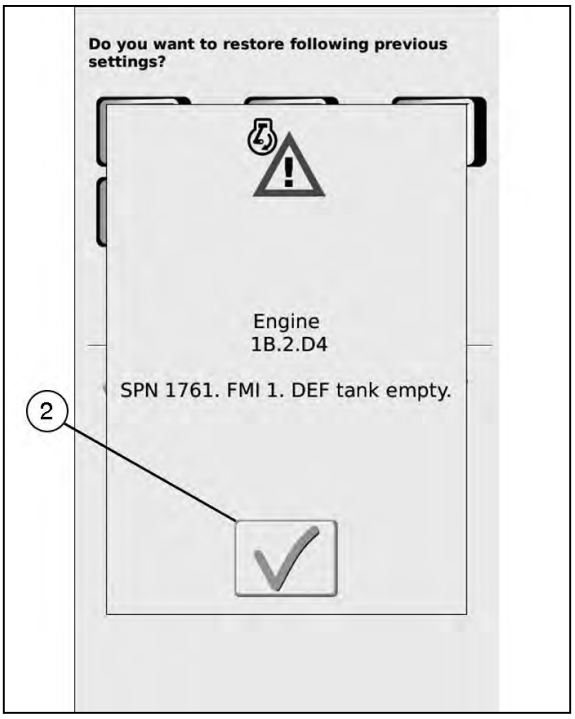


Fig. 87

4.7.2 Air conditioning

Operation

Heating and air conditioning are easily started from inside the cab (1). It is possible to get warm dehumidified air during the winter and cold dehumidified air during the summer.

IMPORTANT:
During the winter storage period or if the air conditioning is not used for a long period of time, it is extremely important to use the air conditioning system every two weeks for at least 15 minutes to lubricate the internal air conditioning components and to prevent leakage of air conditioning gas.
This operation must only be carried out with the engine running and only if the external temperature is above 15°C.

Fig. 99

4.7.2.1 Compressor

This component (1) sucks low-pressure gas from the evaporator and sends it to the condenser after compressing it, thereby considerably increasing pressure and temperature.

IMPORTANT:
The system is equipped with a receiver dryer (2) inserted on the piping that connects the condenser to the expansion valve.
It is essential that this receiver dryer is regularly replaced to ensure that the system functions correctly.

NOTE:
To replace the receiver dryer, see section ***Lubrication and maintenance****.*

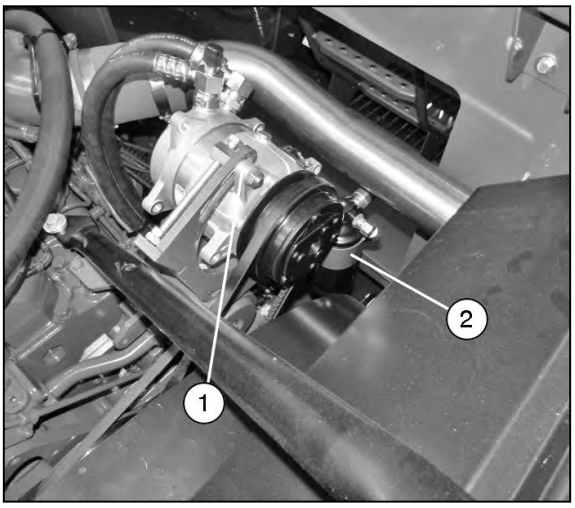


Fig. 100

- Adjustment of the **right-hand armrest position**: use the levers (8 and 9) to adjust.

  Pull in the lever (8), set the armrest back (vertically) and then release the lever.

  Similarly, to adjust the position of the right-hand armrest lengthways (forward/rearward), you can use the lever (9).

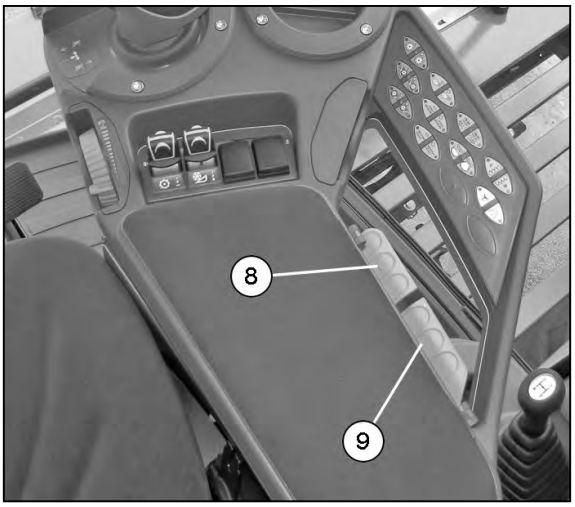


Fig. 112

Passenger seat

To the left of the driver's seat, there is an additional seat (1) that, during harvesting operations, **can only be used by a trainee or instructor and not other personnel.**

WARNING: This seat is not intended for children.

In road transport, one person employed for agricultural jobs is allowed in the passenger seat, provided this is permitted by local regulations and provided that a seat for transport of a passenger on public roads is in accordance with the combine documentation.

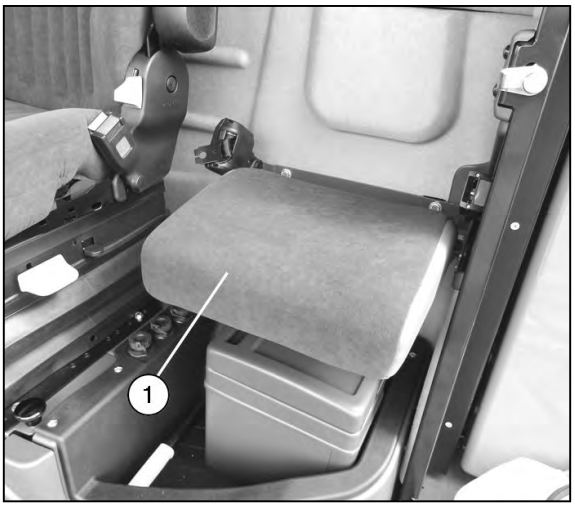


Fig. 113

With the cover (5) in the open position, open the hatch (6) and go into the tank with your back turned to the cab.

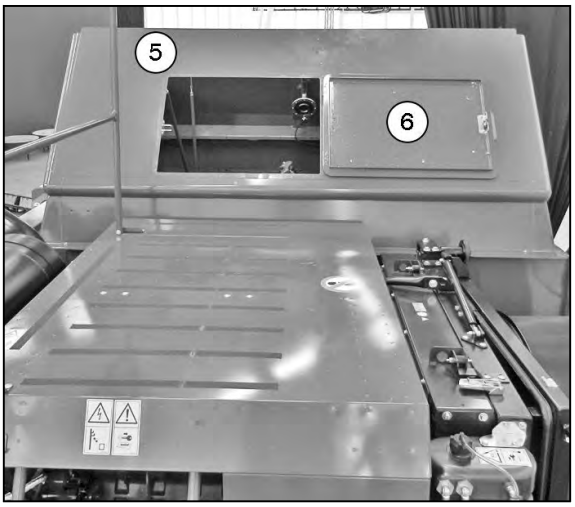


Fig. 133

4.8.7 Access to the inside of the grain tank

DANGER: Risk of getting trapped, squeezing or cutting.

Never enter the grain tank unless the engine has been switched off and the ignition key has been removed from the switch.

Access to the upper part of the combine when it is moving is prohibited.

Use the steps (1) to get down to the bottom of the main grain tank.

The grille (2) gives a convenient and safe area for the operator to stay on his/her feet.

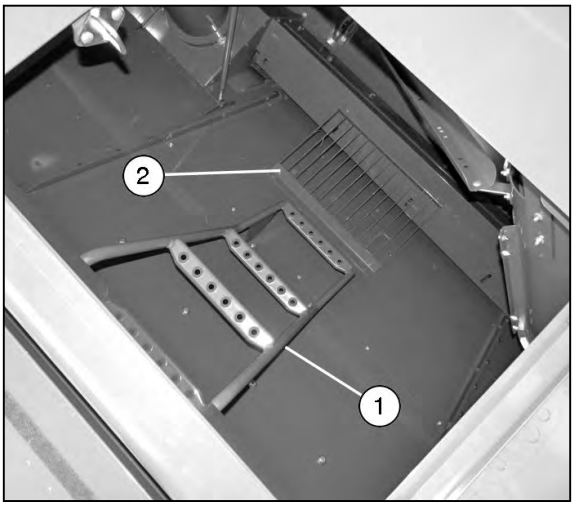


Fig. 134

Procedure

- Align the adapter with the main crop elevator housing.
- Place a 21x42x4 washer between the main crop elevator (7) and the adapter (1).
- Place the M20x50x1.5 bolt (8).
- Repeat the operations on the opposite side of the machine.

NOTE:
All the components required are included in the equipment provided with the machine.

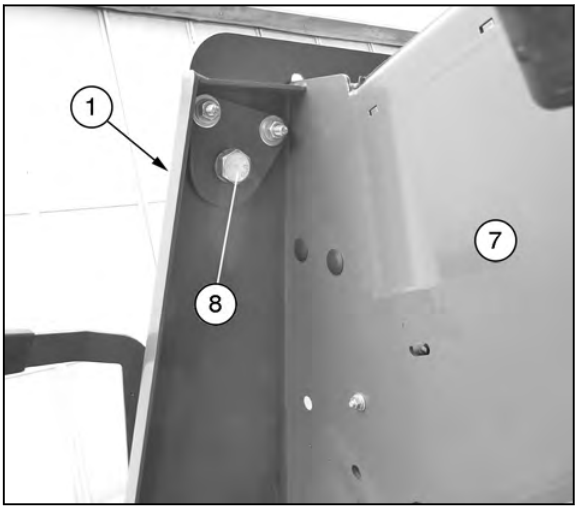


Fig. 10

5.5.1.1 Unblocking the cylinder

Procedure

- Disengage the threshing mechanism and cutting table by moving the respective control switches to the central position.
- Open the concave as far as possible with the two push buttons (1 and 2).
- Reduce engine speed to idling.
- Try to unblock the threshing drum by engaging the threshing unit.

  If this does not remove the blockage, proceed as follows:

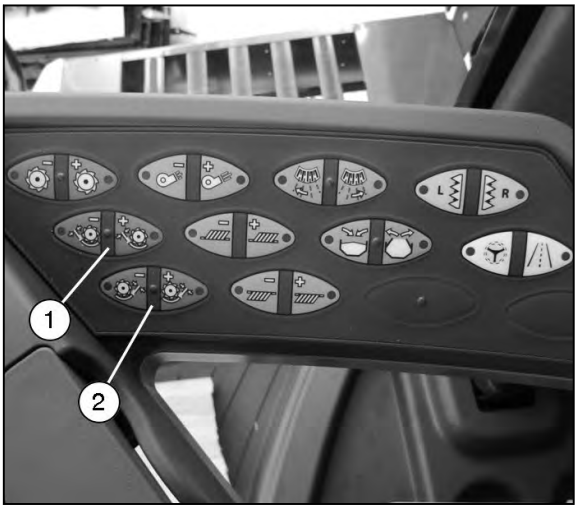
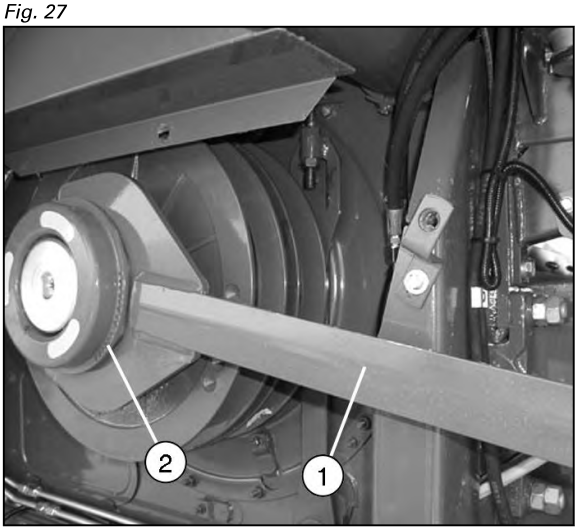


Fig. 27

- Switch off the engine.
- Engage the wrench (1) in the groove on the threshing-drum variator spring housing (2).
- Turn the threshing drum manually in either direction to remove the material blocking the threshing drum.
- After you complete this operation, put the wrench in the top part of the main-crop elevator housing and make sure it is attached with the pin (3).
- Start the engine at low speed and engage the threshing unit.
- Bring the concave back into its initial position.



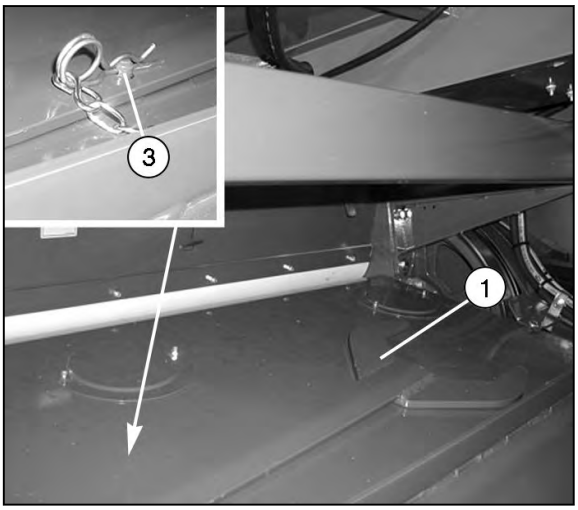


Fig. 28

Procedure

- check the centering of the cylinder in relation to the concave.

  Where centering is not correct:

- Remove the splines (1)
- Move the cylinder laterally so that the tines are centered on those of the concave.

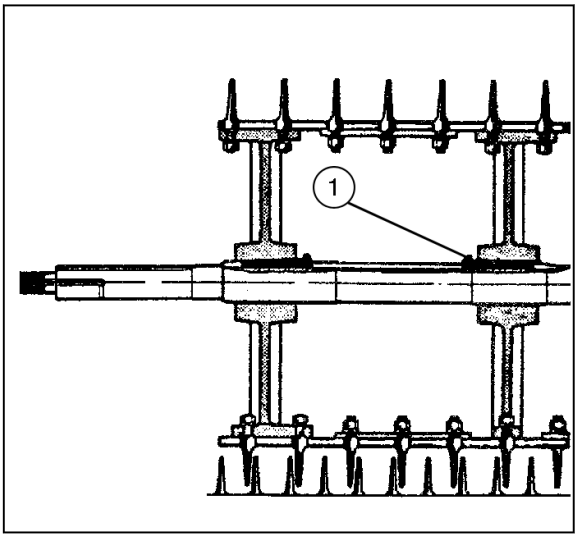


Fig. 46

The correct operation of the main grain pan also causes good operation of the machine. It is very important to keep the bottom of the main grain pan clean.

To make sure that there are no deposits or encrustations on the bottom of the main grain pan, the operator can use the hatch (9) on the right-hand side and the inspection door (10) on the left-hand side.

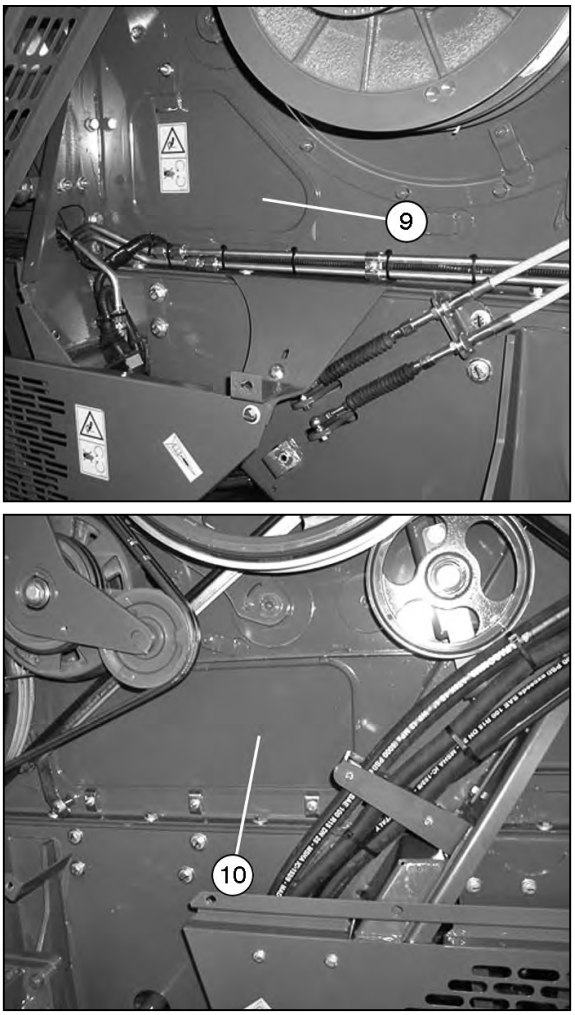
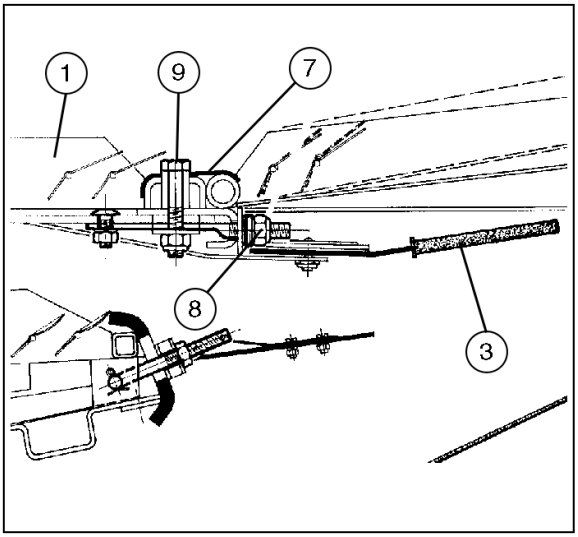


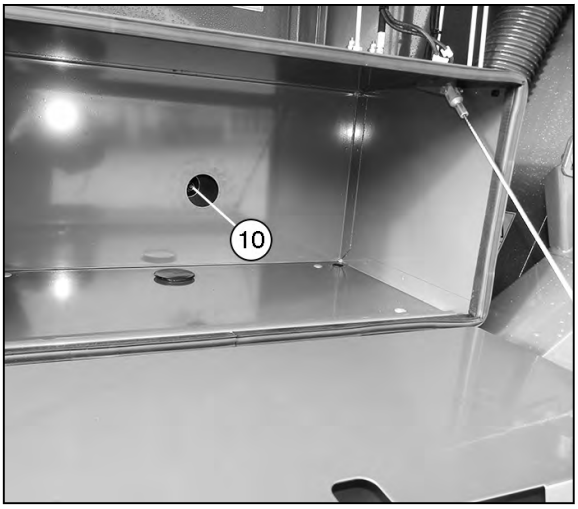
Fig. 59

Mounting the Top Sieve

- Proceed in the reverse order.

IMPORTANT:
When you install the sieve, it is very important to position the sieve (1) *correctly in the front support* (11). *To do so, tighten the nuts* (8) *before you tighten the screws* (9) *and the sieve fastening nuts.*





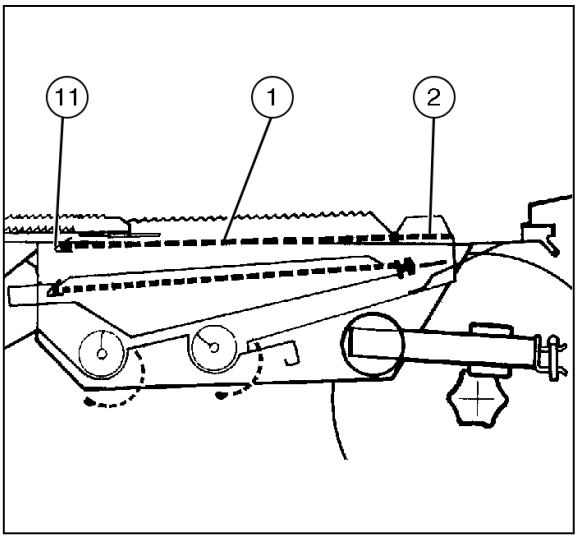


Fig. 74

Access door (4) to clean the horizontal unloading auger.

WARNING: To operate inside the door (4), open the auger completely and then use applicable means of access.

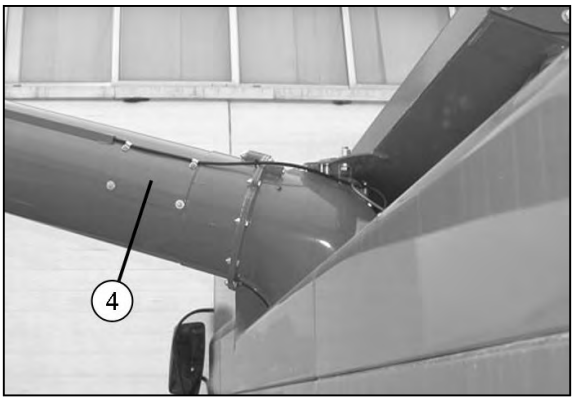


Fig. 89

5.13.1.5 Vertical auger tank drain door

DANGER: Risk of cutting or squeezing.

If any moving part becomes blocked or jammed, release it only when the engine is stopped and after you remove the starter switch key from the switch. Wait until all machine parts have fully stopped.

The above also applies to all maintenance and cleaning work.

If the grain tank requires thorough cleaning, any residue can be removed through the door (5). It is positioned on the bottom part of the vertical unloading auger.

Procedure

- Remove the guard over the left wheel:
- Remove the lock screw (6).
- Fully open the door (5).
- Remove the residual product.
- Close the door (5).
- Replace the stop (6).
- Lock the stop in this position.
- Reinstall the guard.

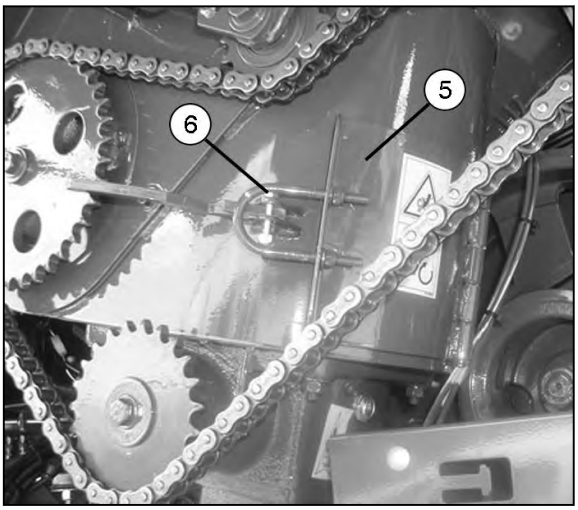


Fig. 90

5.13.1.6 Tank bottom door

A second door (7) is located below the grain tank bottom auger, on the right-hand side of the machine.

DANGER: Risk of cutting or squeezing.

If any moving part becomes blocked or jammed, release it only when the engine is stopped and after you remove the starter switch key from the switch. Wait until all machine parts have come to a complete stop.

The above also applies to all maintenance and cleaning work.

6.3 Scheduled Service Inspection

6.3.1 Operation and adjustment

Operation

The system warns the operator when the scheduled service inspections are to be carried out.

The scheduled intervals are listed in column (1).

When one of these deadlines is got, for example 50 hours, the symbol (2) shows next to it.

The icon appears on the side of the control panel to inform the operator.

The operator should consult the operator's manual as soon as possible and perform all the recommended operations at the specified intervals.

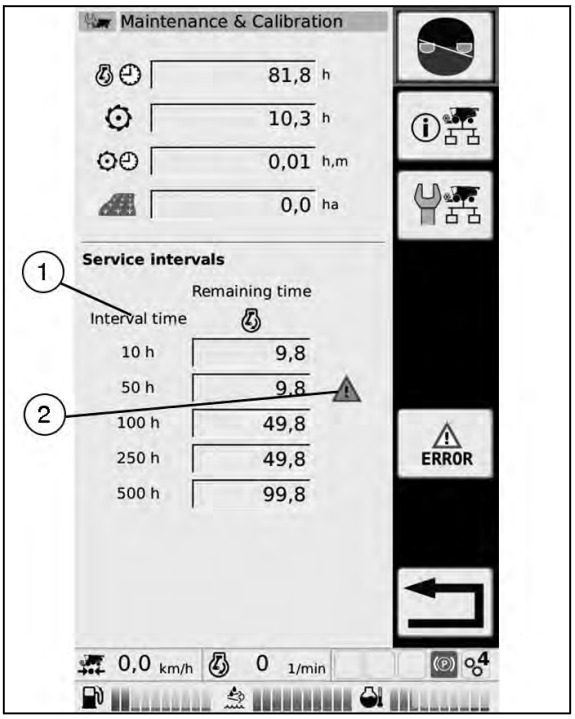


Fig. 4

Recording the performed service inspections

To record the maintenance operations done, it is sufficient to touch the symbol (2) on the display.

The screen shows an alert prompting the operator to confirm the resetting of the time interval.

Touch the screen on the symbol (3) to confirm that the maintenance was correctly done.

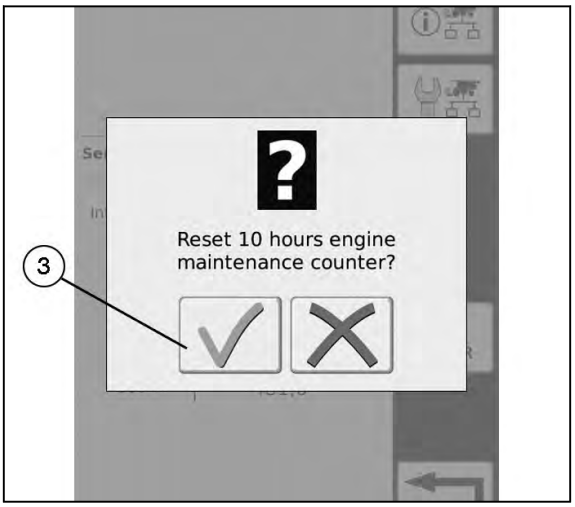


Fig. 5

6.3.4 Interval - 50 hours

6.3.4.1 Rear axle support (11)

Apply Laverda Grease to the grease nipple indicated.

If the machine is fitted with a trailer hitch, apply grease to the two grease nipples shown in the box.

Use the same type of grease as mentioned above.

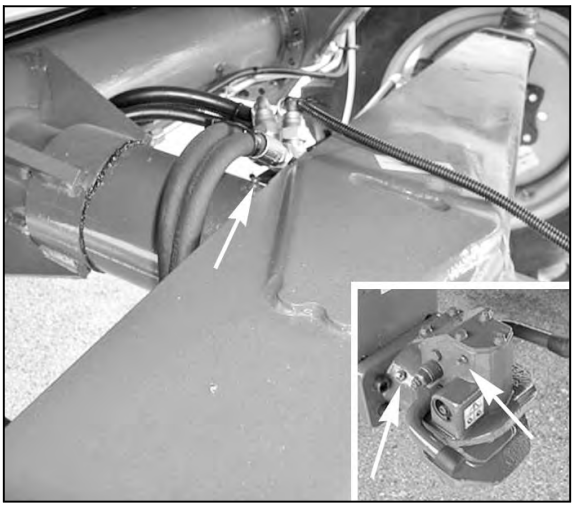


Fig. 17

6.3.4.2 Table drive-belt tensioner (12)

Apply Laverda Grease to the grease nipple indicated.

Fig. 18

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6.3.4.14 Rear straw walker shaft supports (23)

Procedure

- Apply Laverda Grease to all the grease nipples (5 or 6) on the rear shaft.

  Once a year, before you start harvesting operations, it is recommended to:

- Loosen the nuts and lock nuts (1)
- Open the bearings (2)
- Clean residual grease and dust from the surfaces
- Grease the bearings (2) again
- Refit the bearings (2)
- Tighten the nuts (1) to a torque of 10 Nm
- Lock the lock nuts (1).

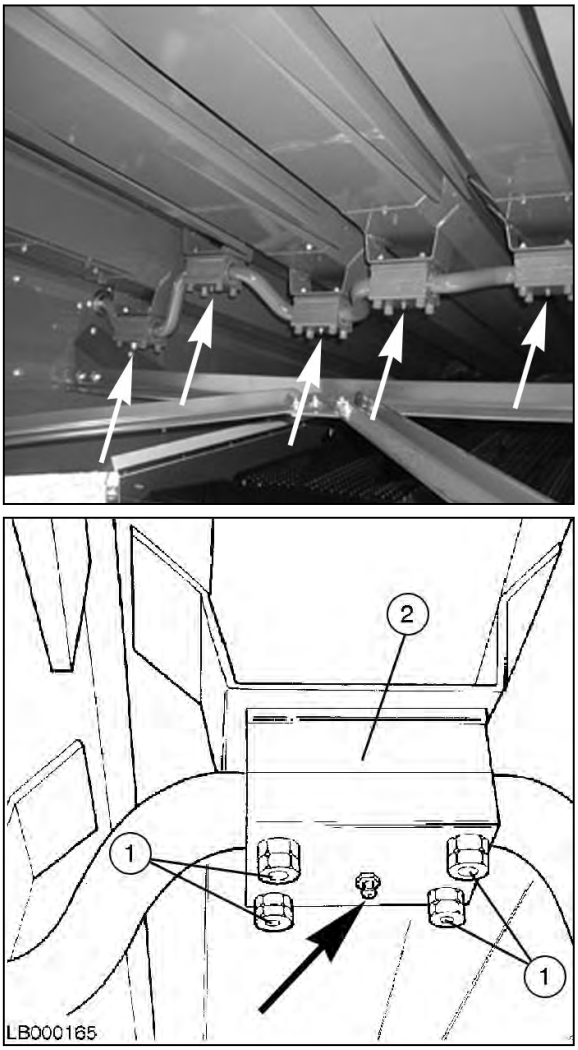


Fig. 32

6.3.5.15 Engine air filter (45)

CAUTION: Always wear eye protection and a dust mask when cleaning the air filter.

To clean the engine air filter, lift the cover (1), loosening the four quick-release hooks(2) (snap closure).

The engine air filter comprises a prefilter (3) and an inner safety filter (4).

Check that the prefilter (3) is not cracked and that the filter surface is even; replace it immediately if this is not the case.

If the prefilter (3) is completely intact, it can be cleaned up to a maximum of six times with compressed air from the inside (max 6 bar). Keep the nozzle at least 5 cm from the filter.

Irrespective of how many times the prefilter (3) has been cleaned, it must be replaced once a year (before the start of each new season).

IMPORTANT:
The inner safety filter (4) *cannot be cleaned. It must be replaced by a new one every three times the prefilter* (3) *is replaced. It is therefore advisable to keep a record of all maintenance work carried out.*

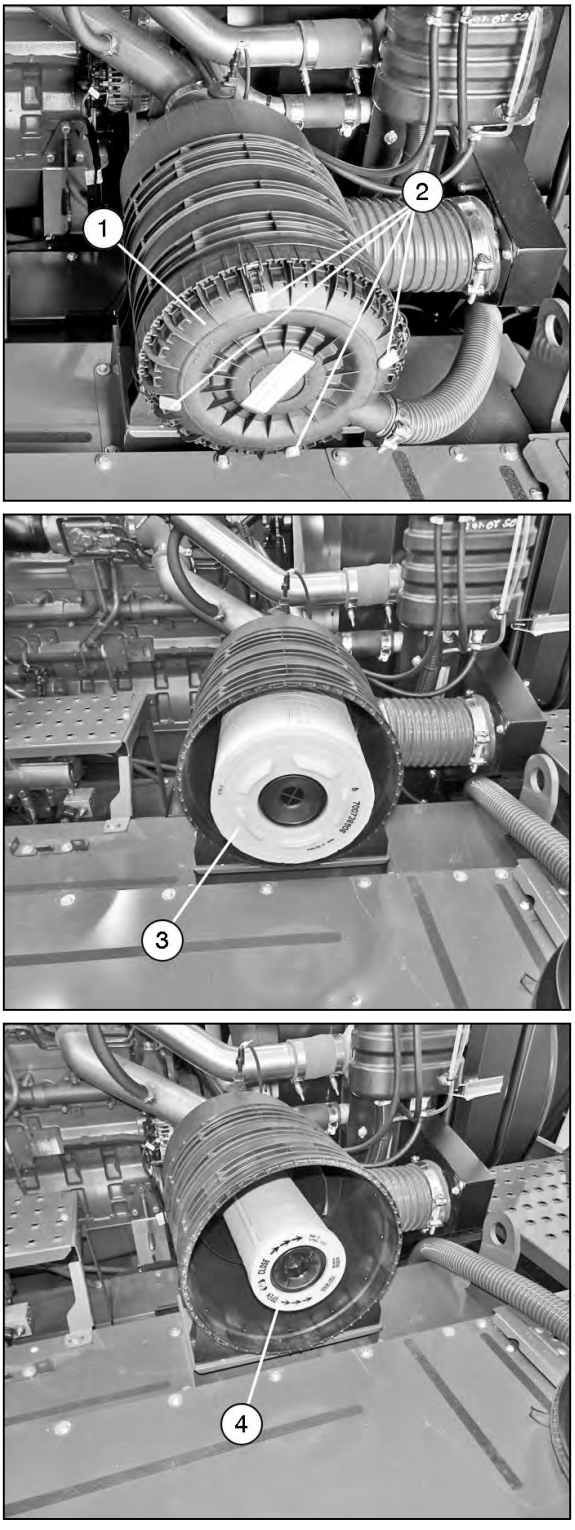


Fig. 50

- Pour the oil into the engine through the filler cap (5).

  NOTE:
  Do not overfill beyond the maximum level.
  Excessive oil can cause serious damage to the engine.

- Using the dipstick (6) check that the oil level is between the minimum and maximum marks.
- Start the engine.
- Check that no oil is leaking from the filter.
- Switch off the engine.
- Top up the oil level (if necessary).
- Ensure that the oil vapour condenser (7) is not damaged or leaking at each oil change.

  IMPORTANT: *Do a check to see if the holes* (8) *are blocked by dust or impurities.*

  For the quantity and specifications of engine oil to use, see the **Capacities and specifications** table at the end of this section.

  IMPORTANT: *The procedures for off-season storage must be observed (see the section* ***Off-season storage****).*
  Oil and filter must be replaced every year, even if the machine has not reached 250 hours in operation.

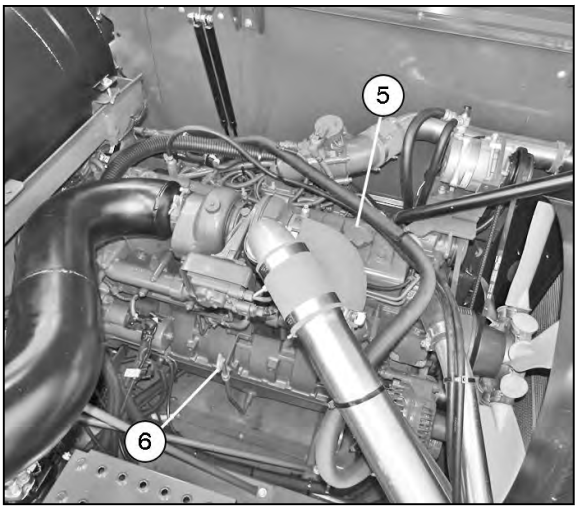
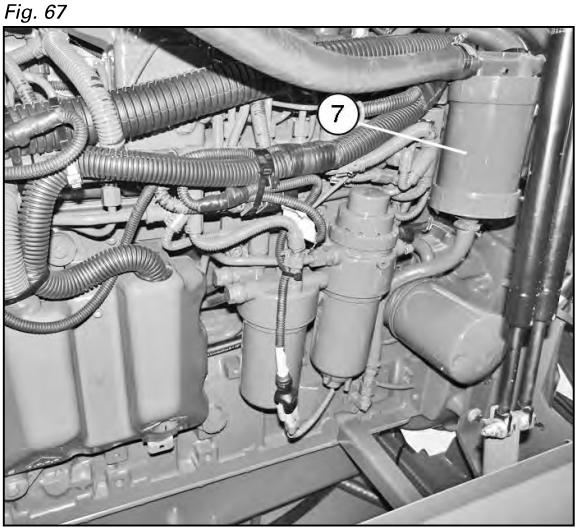


Fig. 67



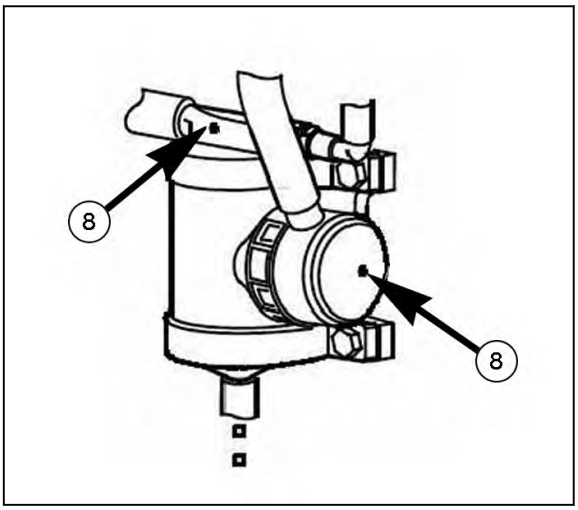


Fig. 68

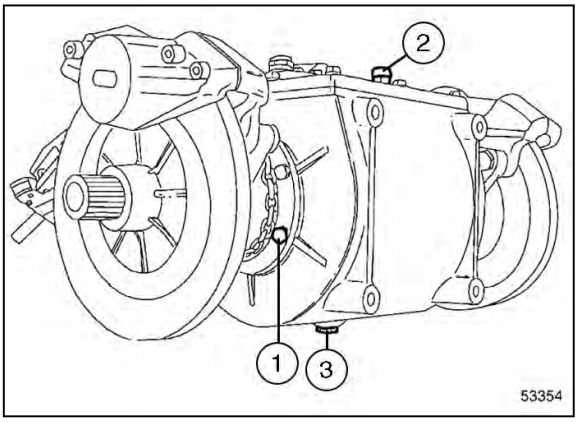
6.3.7.9 Gearbox (89)

Procedure

- Drain the oil from the plug (3); the magnet on this plug must be cleaned whenever the oil is changed.
- Collect the waste oil in a suitable container and do not let it percolate into the ground.
- Top up from the plug (2) until the oil reaches the correct level, corresponding to the screw (1).

  The required quantity of oil is 12 liters.

  Use Laverda Gear Oil 80W-90.



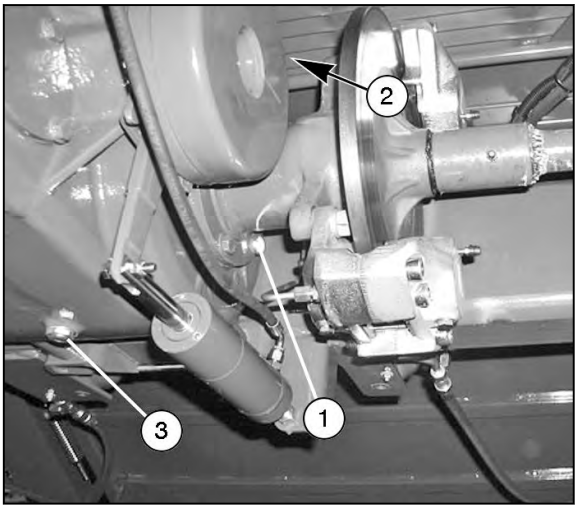


Fig. 82

6.3.7.10 Air compressor (if installed) (90)

Check that the oil level is in the middle of the sight glass (1).

If it is necessary to add more oil, **use the same type of oil as that used for the engine.** Do not mix different types of oil.

IMPORTANT:
The oil should be replaced immediately if it presents color variations (whitish = presence of water / dark = overheated).

The oil in the compressor must be replaced at the start of each new harvesting season. Use plug (2) to drain and plug (3) to fill up.

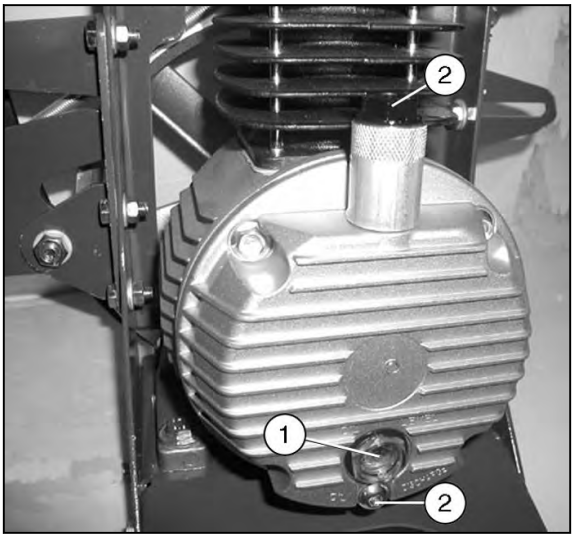


Fig. 83

3.4 Stage 3

3.4.1 Separation

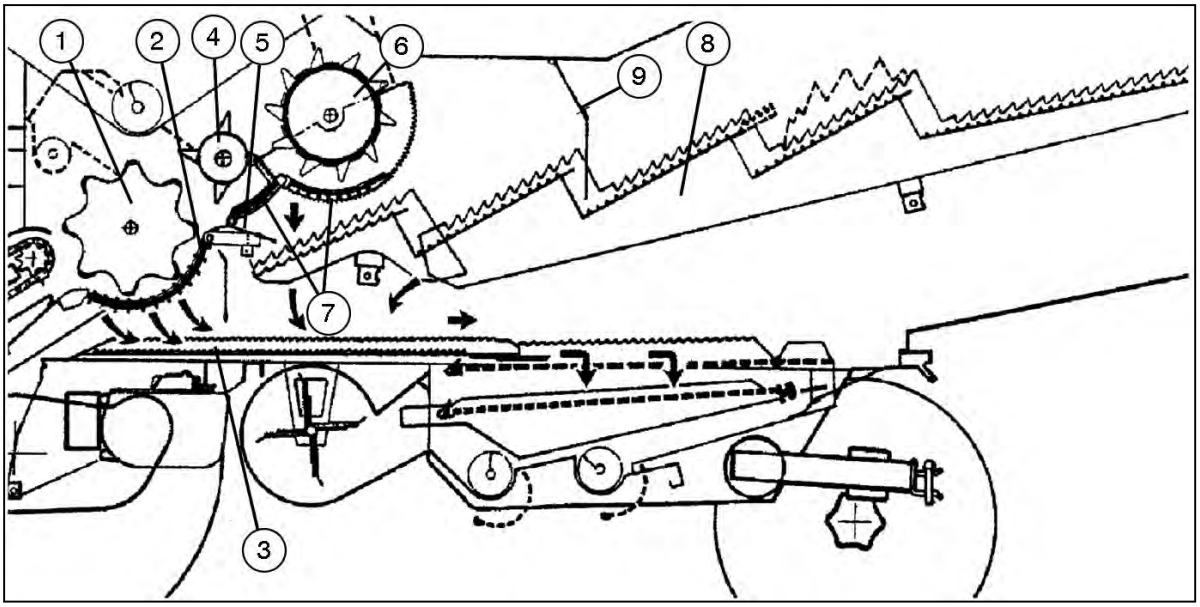


Fig. 4

When the combine operates at close to maximum capacity, about 90% of the threshed crop is supplied to the main grain pan (3) by the centrifugal force of the cylinder (1) and rear beater (4), and the aggressive action of the concave (2) with its rake (REV module) (5).

The efficiency of these components depends on crop type, moisture content and volume of crop.

To increase the performance of the combine, it is necessary to separate the grain and straw as efficiently as possible before the crop reaches the straw walkers.

In MCS models, straw and non-separated grains are moved to the cylinder (6) of the Multi Crop Separator with mobile concaves (7).

The Multi-Crop-Separator further separates the straw flow.

When the Multi Crop Separator cannot function satisfactorily because the straw is brittle or because of the crop type, it can be used without its concaves and the straw is simply blown by the cylinders (4 and 6).

The separation of the remaining grains is done on the straw walkers (8), which have four fall steps assembled on crankshafts. The separated grain that falls through the straw walkers is then sent to the main grain pan (3).

A curtain (9) prevents that the straw is thrown too far on the straw walkers, which makes possible full and better use of the separation capacity of the straw walkers.

As standard, the curtain is adjusted to half stroke and must be lifted further if high straw raisers are applied.

A pair of lights (2), located under the operator platform, allows the operator to constantly check the cutting height.

Fig. 5

A pair of lights (3), located at the rear of the machine, illuminates the rear wheels, making it easier to reverse at night.

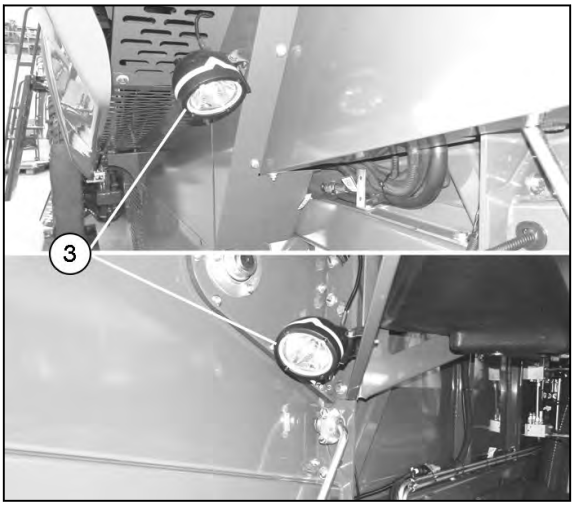


Fig. 6

A pair of lights (4), located under the side doors of the machine, assist with maintenance operations.

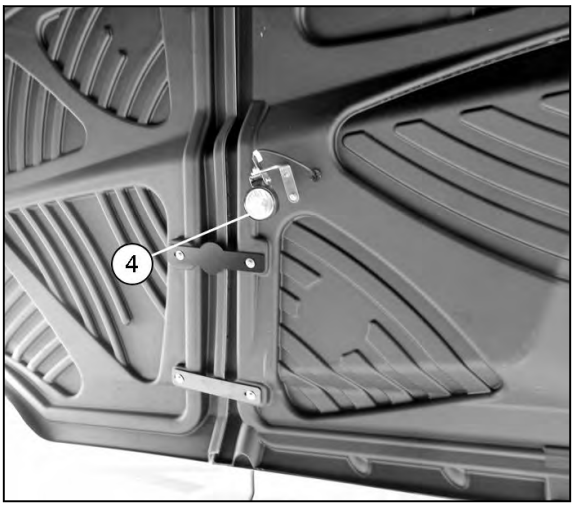


Fig. 7

11.3 Equipment for threshing

11.3.1 Equipment for maize

The following equipment is available for maize harvesting:

- Maize concave (1)

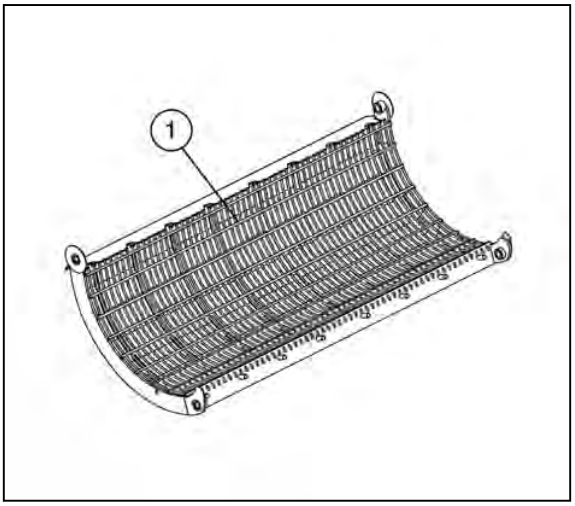


Fig. 26

- Sectional concave (2).
  - A = for grain
  - B = for maize

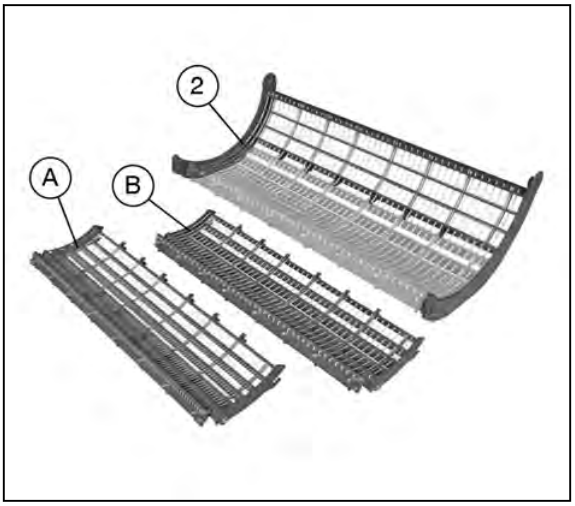


Fig. 27

- Universal concave (3)

  If the universal concave is used for harvesting grain or barley, the striated rasp bars must be fitted on the first two concave drains.

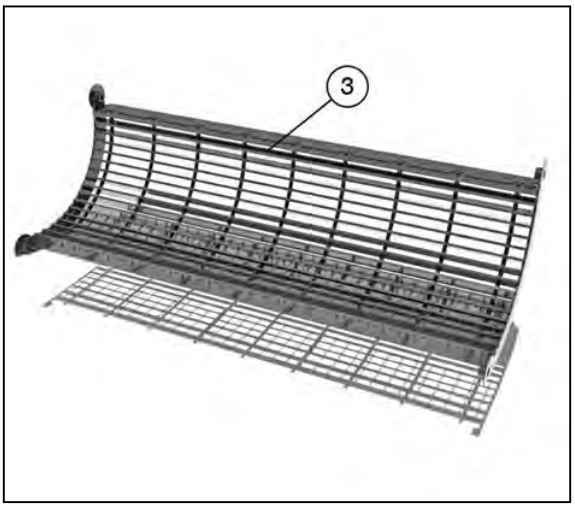


Fig. 28

When the combine is towing the table trailer, the spreader hood (1) must be folded up, as shown in the diagram.

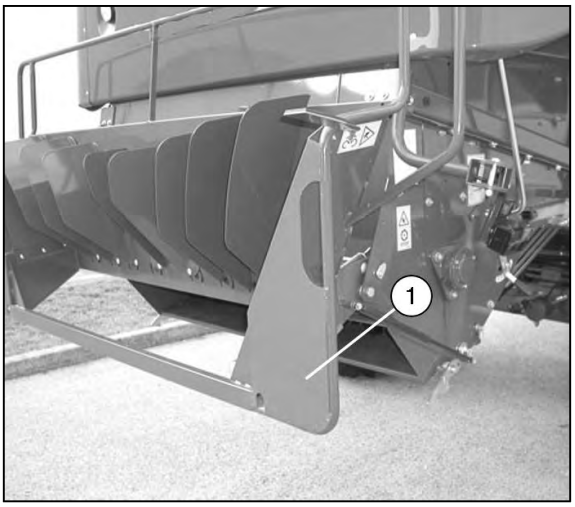


Fig. 43

To fold up the spreader hood, release it using the lever (2), turn it upwards and then secure it with the locking device connected to the lever (3).

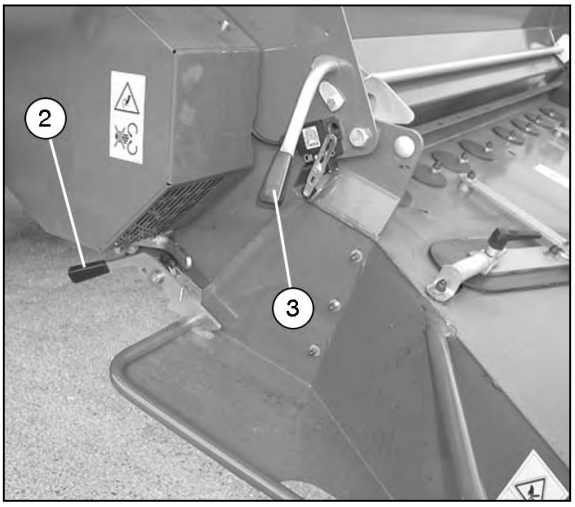


Fig. 44

11.5.3 Working position

DANGER: Risk of solid parts being thrown out.

Never fold up the spreader hood when working or immediately after disengaging the straw chopper since the straw chopper continues rotating for quite some time.

Never engage the straw chopper when the spreader hood is folded up.

IMPORTANT:
Avoid using the straw chopper on downhill gradients approaching the maximum authorized values, particularly if the crop is wet or does not flow freely.

DANGER: Risk of cutting.

11.6.2 Chaff spreader speed

Normal speed is:

- 630 rpm

  (for machines with 5 straw walkers)
- 790 rpm

  (for machines with 6 straw walkers)

You can alter the chaff spreader speed by replacing the two pulleys:

- For machines with 5 straw walkers, you can increase the speed to 790 rpm when you install pulleys with reference nos. 323567650 (1) and 84056120 (2).
- For machines with 6 straw walkers, you can increase the speed to 630 rpm when you install pulleys with reference nos. 323567550 (1) and 84074790 (2).

NOTE:
To reduce the speed of the chaff spreader still further, particularly when using 4.80 m cutting tables, a special belt and drive pulley are available from the Spare Parts Department.

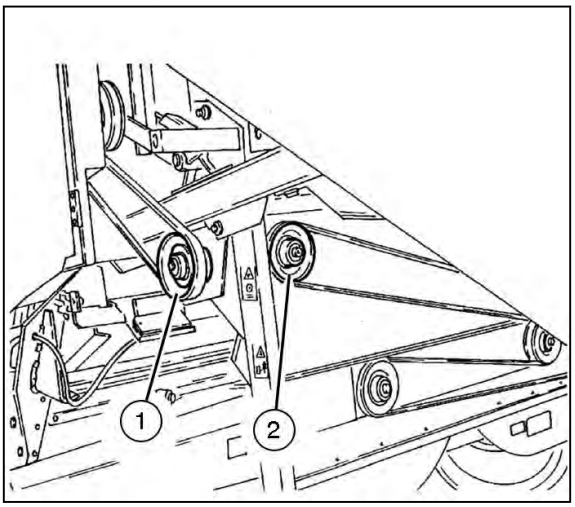


Fig. 59

11.6.3 Disengaging the chaff spreader

When the chaff spreader is not being used, remove the drive belt (1) and the pulley assembly (2); leave the chaff spreader in the vertical position.

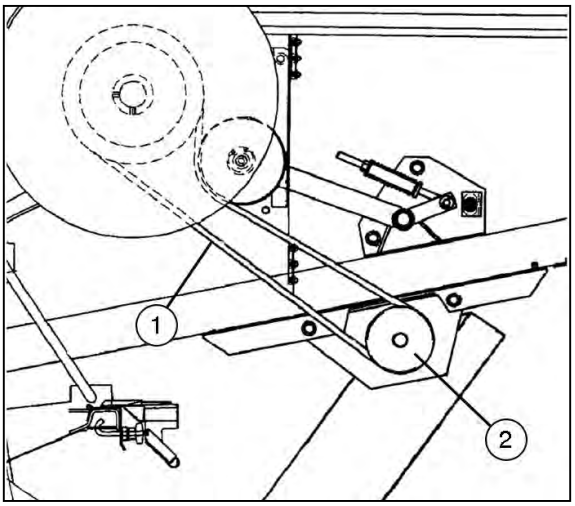


Fig. 60

11.6.4 Chaff spreader belt tensioning

Check regularly that the length of the springs loading the tensioners of the two chaff spreader belts corresponds to the range of the gage.

DANGER: Risk of squeezing, cutting or getting trapped. The guards have been removed to provide a better view. Never use the combine without guards.

Furthermore:

- If the machine tends to tilt forward when working on slopes, lower the cutting table completely.
- Take turns and descents at moderate speeds (3 – 4 Km/h).

  Halve the speed when the grain tank is full.
- During harvesting operations, always use the leveling system, if fitted.

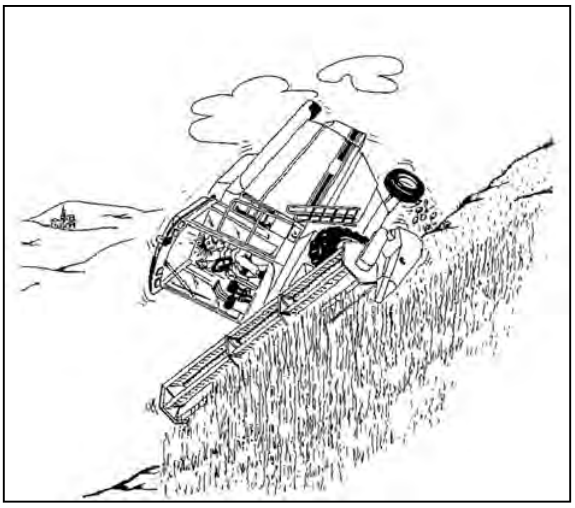


Fig. 7

DANGER: Risk of squeezing, cutting or getting trapped.

- If any moving part becomes blocked or jammed, release it only when the engine is switched off and all drives have come to a complete stop. Never push the crop into the main crop elevator using hands, feet or any other means. This could result in severe injury or death.
- Never enter the grain tank unless the engine has been switched off and the ignition key has been removed from the instrument panel.

DANGER: Risk of breathing in dust.

- Threshing dust may cause allergic lung diseases. The dust may also contain residues of pesticides injurious to health. Keep the cab doors shut when threshing. Wear a protection mask when carrying out service work involving exposure to dust (cab filters, rotary screen etc.) and when working with compressed air.
- Keep a fire extinguisher within easy reach. Check the extinguisher at the intervals prescribed by national law. Replace or recharge it whenever it has been used, even if only partially. The type of extinguisher approved for Europe contains 6 kg of extinguishing agent and belongs to fire class ABC. We recommend checking the dimensions of a potential new extinguisher to ensure that it can be stored underneath the operator's seat (see the paragraph **Safety devices**).

2.6 Leveling information

Warnings for the leveling system

- On models designed for hilly ground, the leveling system allows the machine body to remain horizontal up to the following slopes:
  - Transversal 20% (15% for machines without rear-wheel drive)
- Pay attention to the slope and the type of ground, as this could reduce the machine grip. On rough ground, drive carefully and reduce speed.
- **When using cross leveling, never exceed the allowable limit, which is indicated by the audible alarm and a specific message on the display unit. Only work if the machine body is horizontal; it is extremely dangerous to drive when the machine is inclined to one side.**
- When working on a downhill slope, do not exceed the permitted working limits.
- Preferably work in crosswise passes; when changing direction, always point the cutting table uphill.
- Make no sudden turns, especially when the grain tank is full: record that the leveling system has a technical response time.
- Couple the brake pedals to prevent braking errors. Keep the braking system perfectly efficient. Check the oil level in the tank frequently and replace the friction pads before they are completely worn.
- Change gears on flat ground or where there is only a slight gradient. Proceed as follows:
  - Make sure that four-wheel drive is engaged
  - Gradually reduce the forward speed until the machine stops
  - Lower the cutting table
  - Press the service brakes and change gear
  - Do not use fourth gear for work in the field.
- Overconfidence in the use of the combine can result in a lack of attention and can therefore create dangerous situations.
- Do a check on the efficiency of the manual leveling systems frequently, as they give additional safety in case the automatic leveling feature fails; record that the manual systems override the automatic systems, although they are not normally in operation.
- Never operate the machine, not even for a short time, when it is manually inclined on flat ground, as the engine lubrication may be inadequate.
- Do a check of the tire pressure: Insufficient pressure compromises tire integrity, with potentially serious consequences.
- Before driving on public roads, remember to activate the road transport mode switch.

Decal 22 - 4375987M1

Fasten driver and passenger safety belts before moving the machine.

Fig. 47

Decal 23 - 321700650 and 341000095

Max. speed limit of the machine during road transport; this decal is only available in some countries (e.g. Austria, Germany, France, Russia etc.).

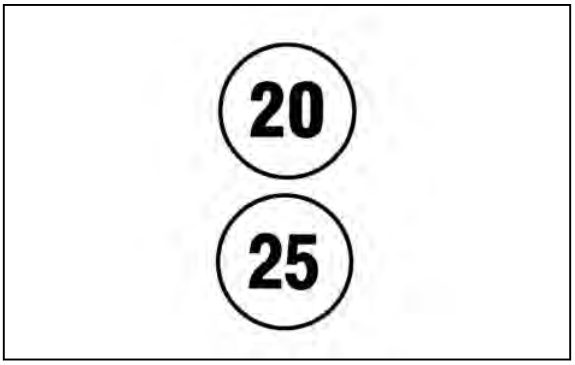


Fig. 48

Decal 24 - 4375903M1

Before uncoupling or parking the machine, place the sprags in the appropriate position.

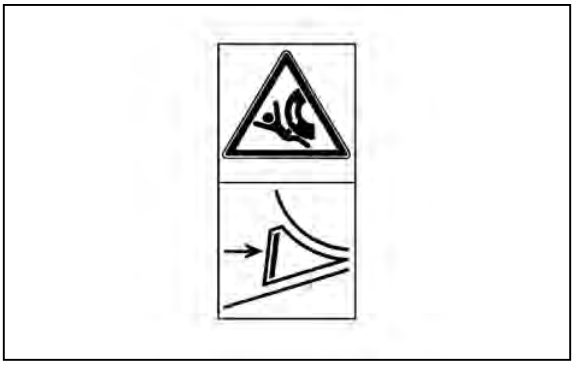


Fig. 49

Decal 25 - 4375783M1

Avoid fluids escaping under pressure. Consult this manual for service procedures.

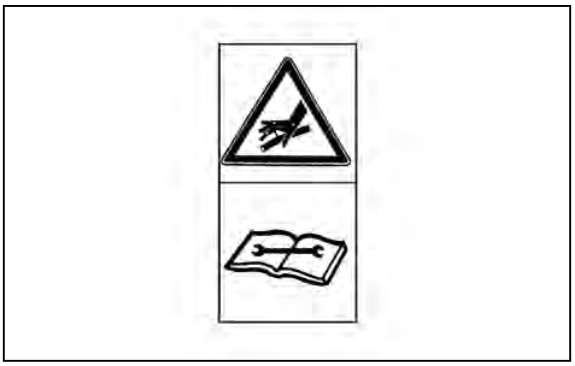


Fig. 50

2.9.3 Safety belts

There are safety belts on both the operator's seat (1) and the second seat (2), which is used by an instructor if present.

IMPORTANT: *Check the safety belt for damage or wear at the beginning of each new harvest season.*

DANGER: Risk of ejection or falling. Ensure safety belts are buckled correctly. Never buckle a safety belt that is twisted or wedged between seat components.

To use the safety belts correctly, proceed as follows:

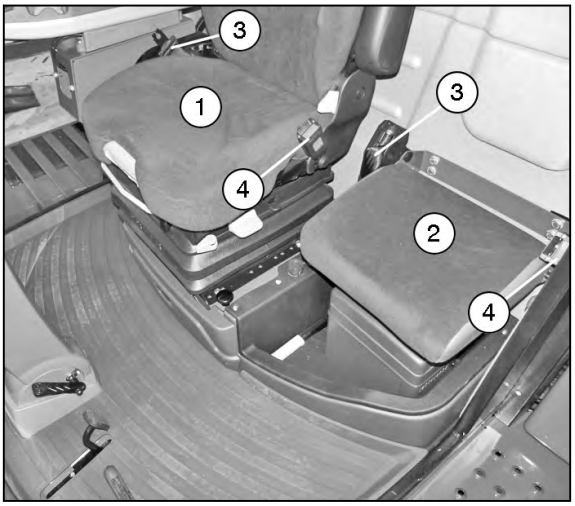


Fig. 77

Procedure

- Adjust the operator's seat according to the operator's physical characteristics.
- Rest your back comfortably against the seatback.
- Pull the moving part (3) of the seatbelt.
- Check that the belt fits closely to the body and covers the abdomen in the lowest position possible.
- Insert the tongue into the buckle (4) until it clicks into place.
  To release the safety belt, press the red button on the upper part of the buckle.

2.10.2 CUNA and CE trailer hitches

DANGER: Risk of overturning.

The EC hitch (1 – rotary) must always be combined with a draw bar with a fixed eyebolt (A) that conforms to DIN 11026, 11043 and 74058.

The CUNA hitch (2 – fixed) must always be combined with a draw bar with a CUNA eyebolt (B – rotary).

No other type of coupling is permitted with these types of trailer hitches.

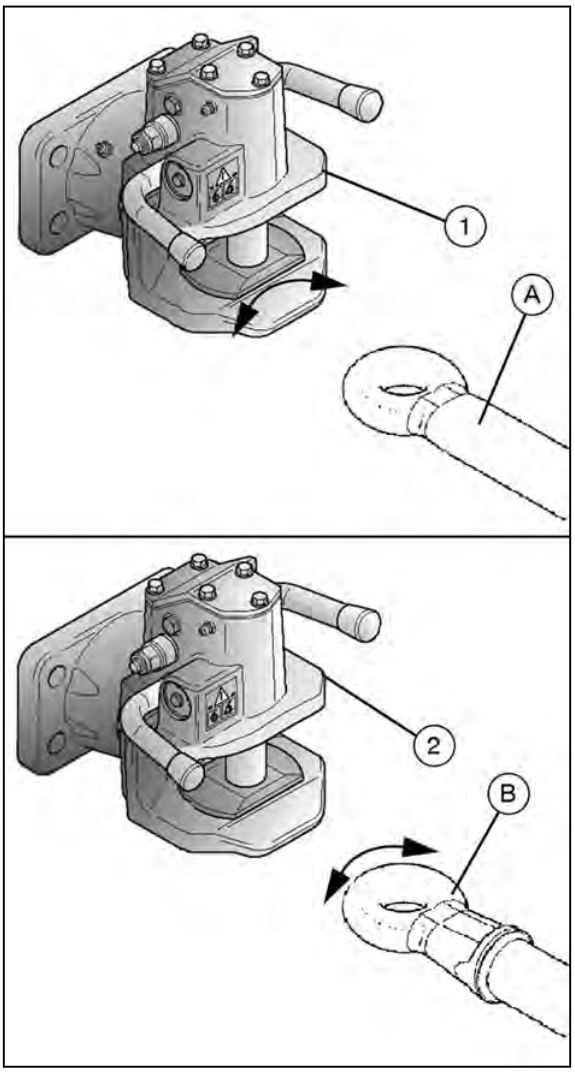


Fig. 91

Additional headlights ((1)) are available from AGCO as an option on request.

The equipment includes electric cables and fitting instructions.

DANGER: Auxiliary headlights (1) must be positioned so that the low beam meets the ground at a distance of no more than ten meters.

Fig. 100

Parking lights and direction indicators ((2)) are available from the manufacturer of the flip-up table and should be fitted on the front of the table.

The following installation dimensions of the lights are statutory for road transport:

- Max. ground clearance (A) for ranges from 600 to 1500 mm;
- Distance from lights to outer edge of the machine (B), less than or equal to 400 mm.

The electrical connections must not enable the standard lights installed on the combine to be switched on at the same time as the additional lights.

In transport on roads with flip-up table attached, the following lights must be switched on:

- Auxiliary headlights ((1));
- Parking lights and front direction indicators ((2)) on the table;
- Sidelights (standard equipment on the machine)
- All tail lamps.

The following lights must be switched off:

- Headlights fitted as standard on the machine
- Parking lights and front direction flashers fitted as standard on the machine.

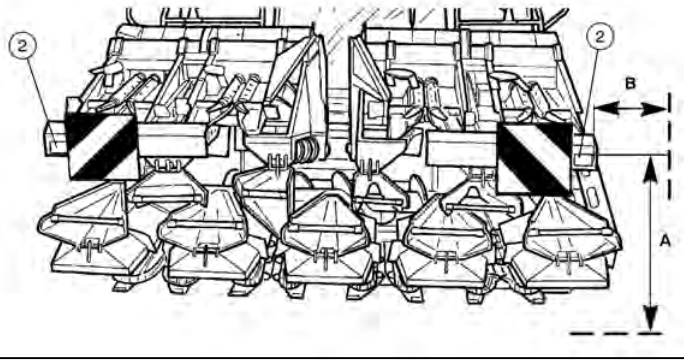


Fig. 101

8.3 Engine air intake and exhaust system

8.3.1 Operation

The engine intake air filtering system consists of a rotary screen (1), a filter (2) and an inner safety filter (3).

The intake air passes through the rotary screen (1), which traps most impurities except for the smallest particles, which are trapped by the filter (2) and removed by the extractor (4).

The extractor (4) is connected to the dust aspirator near the rotary screen.

The inner safety filter (3) prevents impurities from entering the engine in case of damage to or incorrect installation of the filter (2).

WARNING: Always wear safety goggles and a dust mask when cleaning the filter.

For maintenance of the filter (2) and of the inner safety filter (3), follow the instructions in the **Lubrication and maintenance** section.

The system is equipped with a pressure sensor (5) that is located on the intake pipe coming out of the filter, which indicates if the filter is obstructed.

If the filter is obstructed, a message will appear on the display.

The intake system also includes hoses between the air filter and the turbocharger, between the turbocharger and the radiator, and between the radiator and the intake manifold.

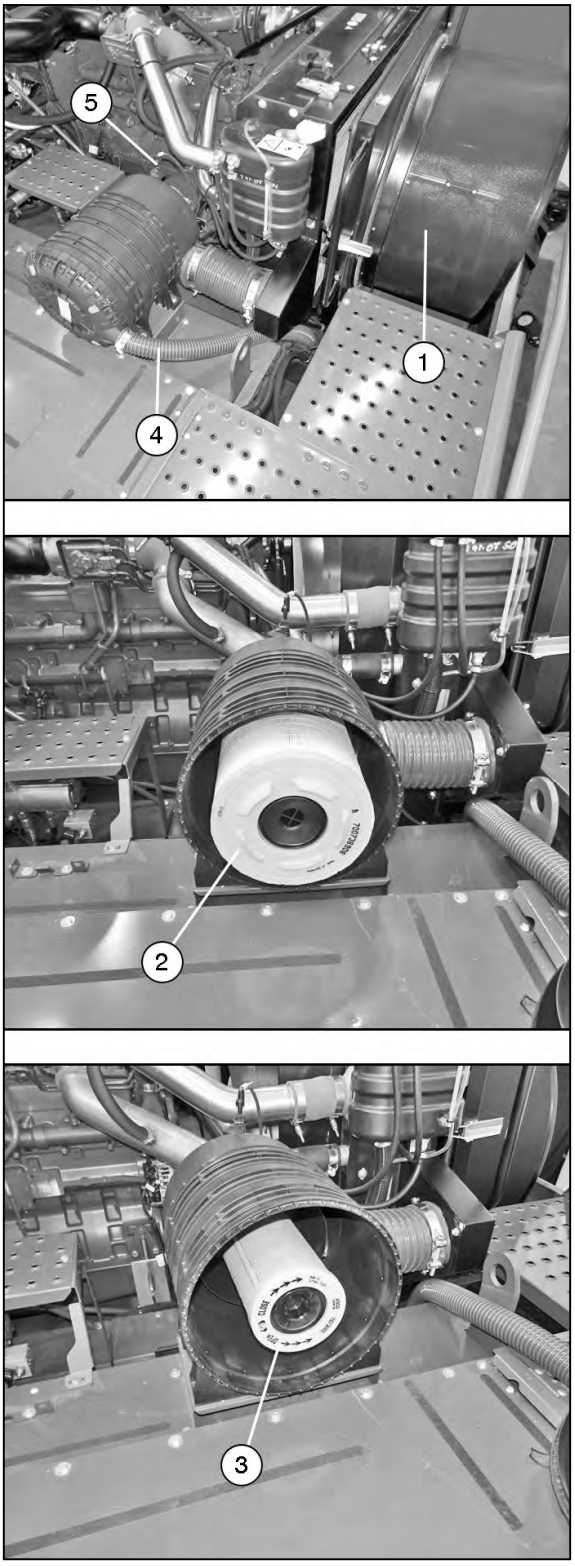


Fig. 11

NOTE: *A second filter, suitable for retaining large impurities, is located inside the tank at the intake pipes* (7).

IMPORTANT: *Do not under any circumstances modify the pressure relief valve setting in the hydraulic circuits.*

In case of failure, do not adjust the control valve, but contact your Dealer.

Hydraulic hoses are important components in modern machines.

Hose features may change over the years when exposed to pressure, vibrations, heat and UV rays.

Local regulations and good practice may require hose replacement after 6 years.

8.7.2 Table and grain unloading auger positioning hydraulic circuits

Table up/down and reel up/down and longitudinal positioning circuit, and grain unloading auger opening/closing

Solenoid valve position:

1. Table lift
2. Table lowering
3. Main valve/by-pass valve
4. Reel lowering
5. Reel lift
6. Reel adjustment fore/aft
7. Grain unloading auger (opening/closing)

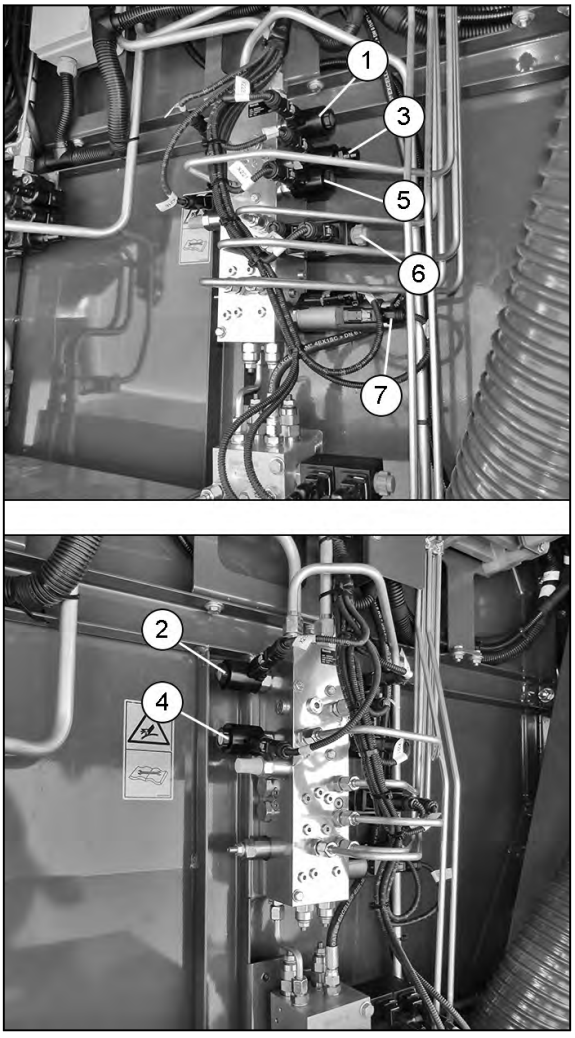


Fig. 24

8.8 Hydrostatic transmission system

8.8.1 Front-wheel drive

WARNING: If the machine does not move correctly, contact your Dealer immediately.

The combines in this series use a hydrostatic system to move the machine.

This system ensures easy and precise combine movement.

Both the travel direction and speed required are selected by simply moving the lever (1).

The two basic system components are a variable-displacement hydrostatic pump (2) and a fixed-displacement hydrostatic motor (3).

The position of the servo control (4) is determined by the lever (1) connected to an electrical circuit. This position in turn determines the stroke and delivery side for the pistons inside the pump.

Immediately after the motor is activated, the button (5) must be pressed to enable the system.

Until handle (1) is moved, the piston stroke in the pump (2) is zero, and the machine will not move, even if put into gear.

When the lever (1) is moved forward or backward (with a gear engaged), the pistons start to stroke and send pressurized oil to the hydrostatic motor. The motor then shifts into gear, thereby allowing the machine to move.

IMPORTANT:
Immediately release the button (5) *as soon as the machine begins to move.*

To maintain the thermal equilibrium, part of the oil (hot) that turned the hydrostatic motor is sent to a heat exchanger (lowermost radiator core in the heat exchanger assembly) through the line (6), and is subsequently returned to the tank.

When working on a slope, if the front-wheel drive alone does not provide sufficient traction on particularly steep hillsides, rear-wheel drive can be engaged (if fitted).

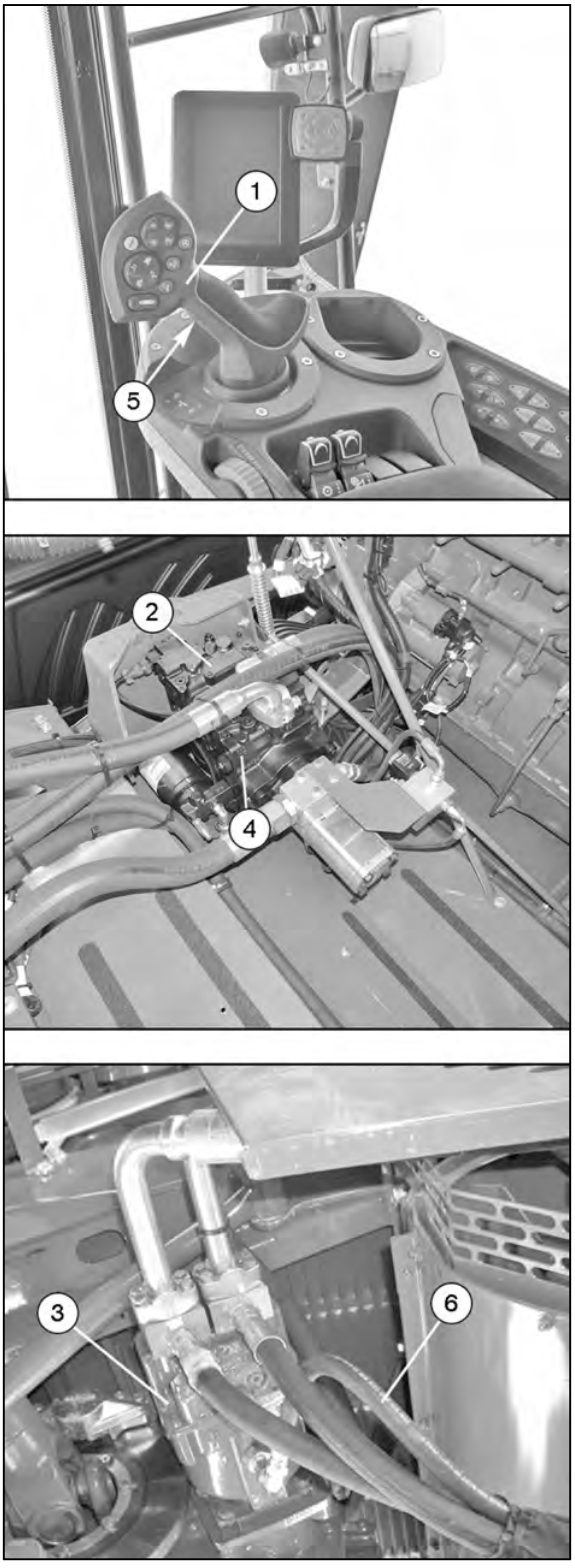


Fig. 36

In the engine area, near the starter motor, there is one fuse that protects the following function:

1. F116: 250 A for alternator protection

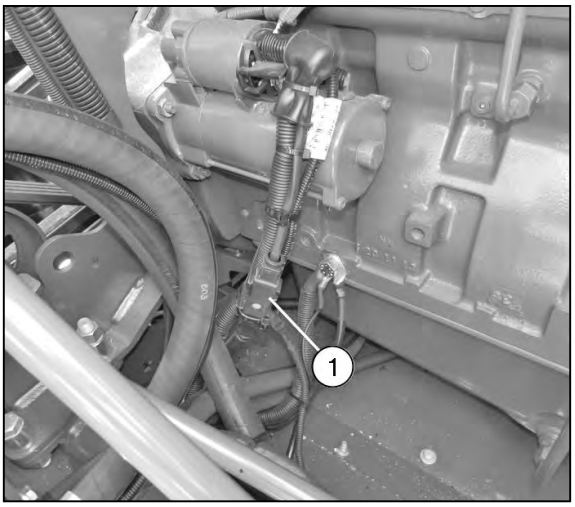


Fig. 49

One 250 A fuse is located in the engine preheating circuit (cold start).

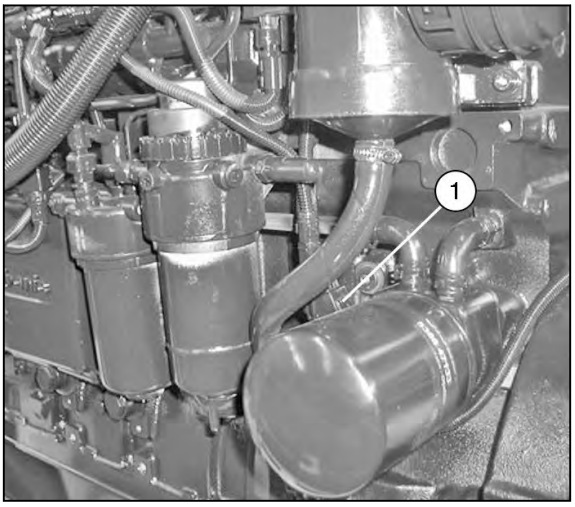


Fig. 50

8.9.5 Relays

As with the fuses, most of the relays are located inside the box (1) positioned below the operator seat.

To access the relays, remove the door (1).

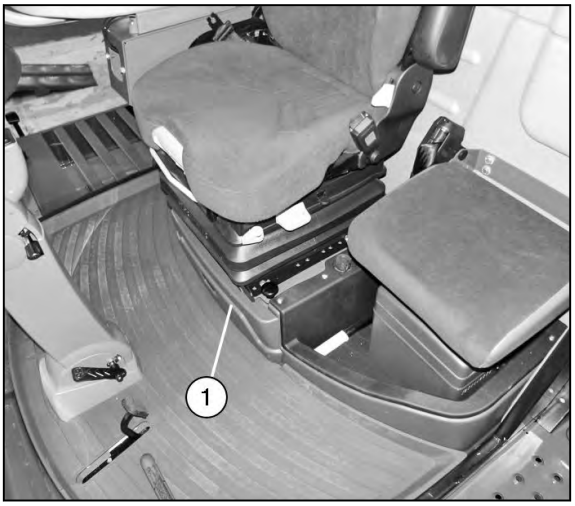


Fig. 51

8.9.6.7 Engine sensors and control unit

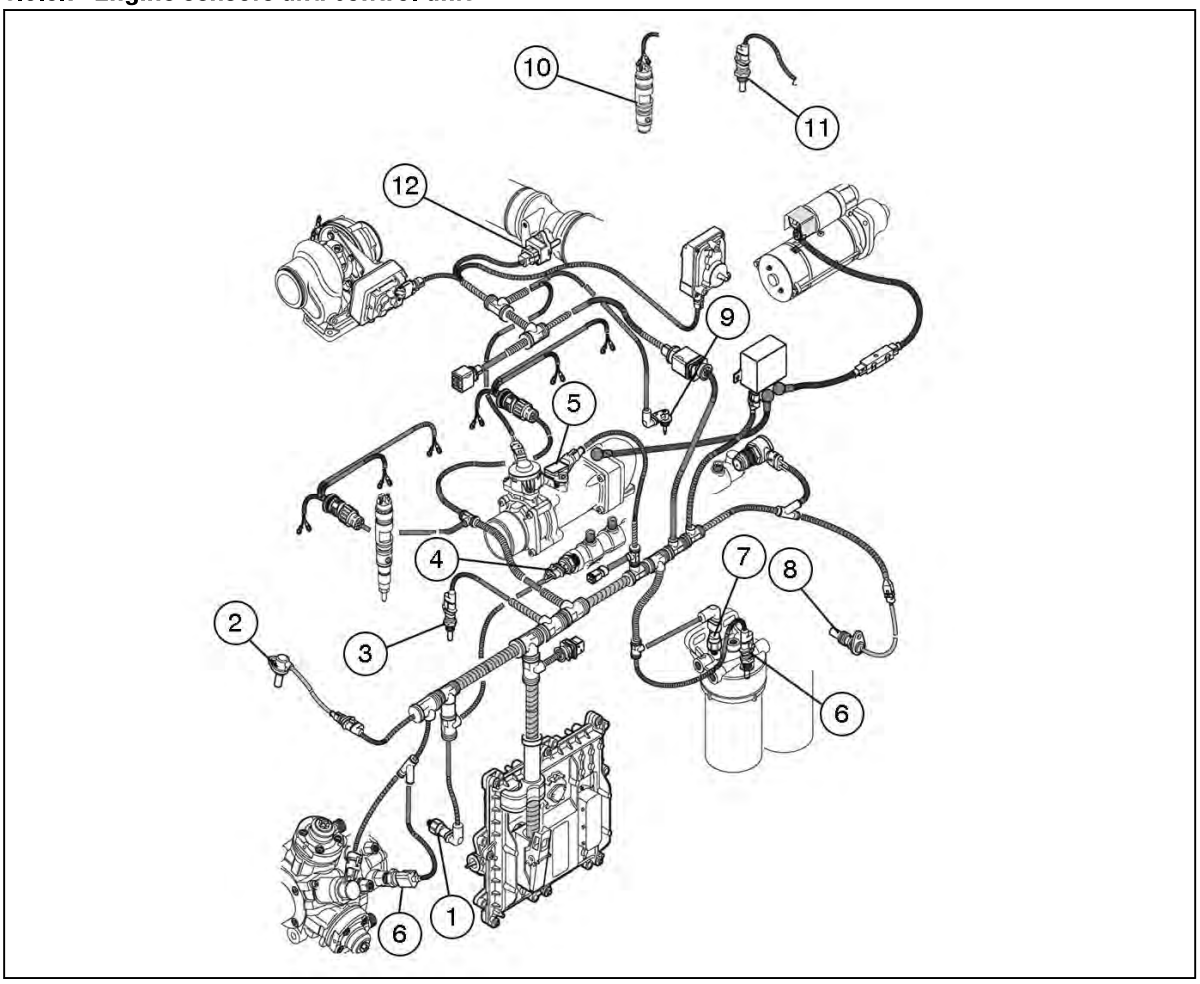


Fig. 67

The engine is managed by an electronic control unit that communicates constantly with all the sensors located on the engine and with the EXT control unit. The sensors control the following functions:

1. Lubrication oil pressure
2. Camshaft rotation speed
3. Coolant temperature
4. Main pipe fuel pressure (RAIL)
5. Turbocharger exhaust air pressure
6. Fuel temperature
7. Fuel pressure
8. Crankshaft rotational speed
9. Air supply pressure sensor
10. Quantity of nitrogen oxides in exhaust gasses
11. Exhaust gas temperature
12. MAF sensor (not used)

IMPORTANT:
If the system detects a fault, it automatically sends information to the operator via a screen (which is yellow or red according to how serious the fault is) that appears on the display; this visual warning is reinforced by the activation of a sound signal (audible alarm).

In the event of a serious failure, engine power is automatically reduced. Engine power may cut off if the situation is serious enough to warrant this.

8.9.8.10 Exhaust gas sensors

The system that manages the emissions includes various sensors that control:

- The quantity of nitrogen oxides in the exhaust gasses (1)
- The temperature of the exhaust gasses (2)
- The level of DEF fluid in the tank
- The temperature of the DEF fluid (inside the supply module).

The sensors are protected by 10 A fuse F106.

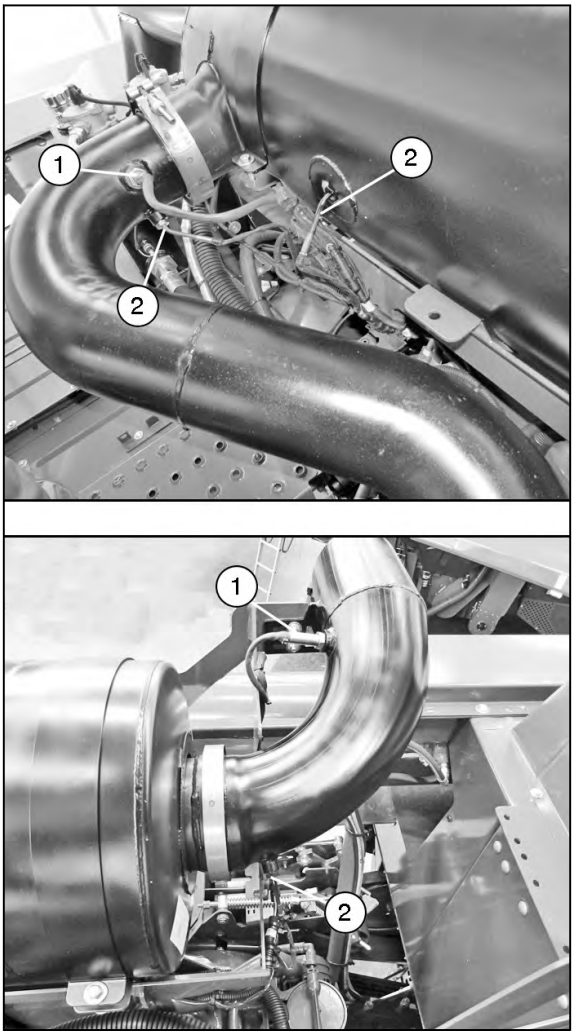


Fig. 86

8.9.8.11 Returns control sensors

These sensors (if fitted on the machine) allow the operator to control the quantity of crop that is returned and put back in the cycle.

The less crop recovered, the greater the machine's separation capacity.

The sensors are protected by 5 A fuse F33.

Fig. 87

Front tires						
Pressure with table attached	bar	2.7	2.7	2.7	2.7/2	2.7
Front wheel base		3290	3360	3400	3500	3600
Rear wheel track 2 WD		–	–	–	–	–
Rear wheel track 4 WD		2725	2725	2875	3025	3025

1. it must be absolutely coupled with the rear tire 460/70 R24.
2. alternative supplier.

M310 MCS LC models

Front tires					
		650/75 R32 172 A8 (1)	**650/75 R32 172 A8 (1) (2)**	**710/75 R32 177 A8**	**800/65 R32 172 A8 800/65 R32 178 A8**
Rim type		DWW20x32	DWW21Bx32	DWW23Bx32	DWW27Bx32
Right rim flange offset	mm	+160	+100	+90	+50
Left rim flange offset	mm	+160	+160	+165	+135 (110(2))
Pressure with table attached	bar	2.7	2.7	2.7	2.7
Front wheel base		3500	3630	3690	3800 (3870(2))
Rear wheel track 4 WD		3025	3025	3175	3175

1. it must be absolutely coupled with the rear tire 460/70 R24.

12.2.2 Clearance between unloading auger and table

Models M300 — M310

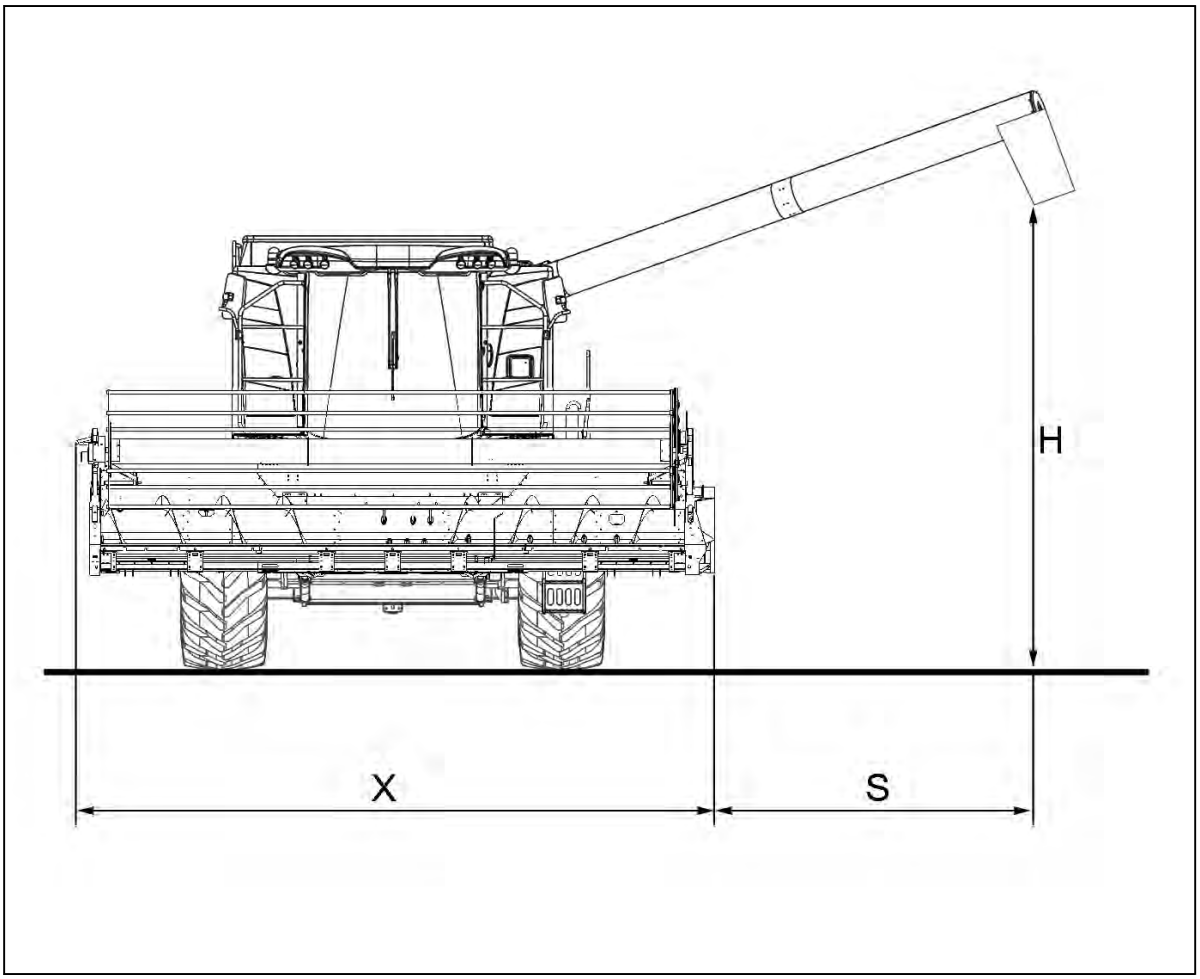


Fig. 7

Cutting table model (X)	S (mm)	H (mm)
FF 480	3011	4375
FF 540	2886	
FF 600	2401	
FF 700	1944	
FF 760	1639	
PF 18'	2642	
PF 20'	2337	
PF 22'	2032	

Grain tank	Units of measure ment	M300 MCS M300 MCS LC	M310 MCS M310 MCS LC
Length of unloading tube	m	5.0	
Unloading speed	liters/sec	105	
Filling sensors	no.	2	

12.3.5 Hydraulic system

All models

Hydraulic system	Units of measure ment	M300 M300 MCS M310 M310 MCS	M300 MCS LC M310 MCS LC
Oil tank capacity (combined)	liters	36	
Table up/down - Reel up/down and fore/aft - Grain unloading auger opening/closing			
Pump capacity	liters/min	38	35.5
Max. pressure	bar	210	
Max. pressure (grain unloading auger opening/closing)	bar	100	
Filter on hydraulic tank	micron	16	
Threshing mechanism engagement - Grain unloading engagement - Feed mechanism engagement - Straw chopper engagement - Cylinder variator - Cutting table leveling			
Pump capacity	liters/min	4.1	3.9
Max. pressure	bar	85	
Max. pressure (cylinder variator)	bar	50	
Max. pressure (cutting table orientation)	bar	210	
Filter on hydraulic tank	micron	-	
Steering			
Pump capacity	liters/min	21.5	20
Max. pressure	bar	175	
Anti-shock valve max. pressure	bar	225	
Filter on hydraulic tank	micron	16	
Reel speed			
Pump capacity	liters/min	30	
Max. pressure	bar	140	

Grain loss from the straw walkers.		
Cause	**Remedy**	**Subject/Section**
The concave is clogged and the grains are thrown onto the straw walkers.	Clean the concave thoroughly.	–
Broken curtain.	Replace the broken curtain. Lift the position of the straw-saving curtain.	–
Incorrect position of the concave.	Make sure the concave is parallel with the cylinder.	Concave / **Field operations**

Excess straw damage.		
Cause	**Remedy**	**Subject/Section**
The cylinder speed is too high.	Reduce the cylinder speed.	Cylinder housing / **Field operations**
The cylinder to concave clearance is too narrow.	Increase the clearance until optimum threshing is achieved.	Concave / **Field operations**
The Multi-Crop Separator increases straw damage.	Cut-out the Multi-Crop Separator concave.	Multi-crop separator / **Field operations**

The finished sample is not sufficiently clean.		
Cause	**Remedy**	**Subject/Section**
Insufficient air blast from the fanning mill.	Increase the fanning mill speed so that the grain is cleaned without being thrown out of the sieve.	Fanning mill / **Field operations**
The fan belts are slipping.	Adjust the belt tension.	Fanning mill variator belt / **Adjustments**
Incorrect threshing unit speed.	Make sure the belt between engine and rear beater shaft is correctly tensioned.	Threshing unit belt drive / **Adjustments**
Incorrect fan deflector position.	Correct the deflector position.	Fanning mill / **Field operations**
Top sieve opened too much.	Reduce the sieve opening.	Top sieve / **Field operations**
Bottom sieve opened too much.	Reduce the opening and clean the sieve, if required.	Bottom sieve / **Field operations**
Too high a cylinder speed or too narrow a cylinder to concave clearance, causing sieve overload.	Reduce the cylinder speed and increase the cylinder to concave clearance, ensuring that the crop is properly threshed and reducing straw damage.	Concave and cylinder housing / **Field operations**

Code	SPN	FMI	Fault description	Response
1B.7A	520228	12	ECU internal error: 0121	-
1B.7B	4363	3	Catalyser outlet temperature sensor - High voltage or open circuit	E
1B.7C	4363	4	Catalyser outlet temperature sensor - Low voltage	E
1B.7D	4363	2	Catalytic outlet temperature sensor - Abnormal value	E
1B.7E	4360	3	Catalyser intake temperature sensor - High voltage or open circuit	E
1B.7F	4360	4	Catalyser intake temperature sensor - Low voltage	E
1B.80	4360	2	Catalytic inlet temperature sensor - Abnormal value	E
1B.81	3031	3	DEF tank temperature sensor - High voltage	E
1B.82	3031	4	DEF tank temperature sensor - Low voltage	E
1B.83	3031	16	DEF fluid - Temperature above standard	-
1B.84	1761	3	DEF fluid level sensor - High voltage	E
1B.85	1761	4	DEF fluid level sensor - Low voltage	E
1B.86	4375	5	DEF fluid pump - Low voltage or open circuit	E
1B.87	4375	31	DEF fluid pump - Excessive temperature	E
1B.88	4375	3	DEF fluid pump - Supply short circuit	E
1B.89	4375	4	DEF fluid pump - Short circuit to ground	E
1B.8A	4374	8	DEF fluid pump - Abnormal speed	E
1B.8B	4374	14	DEF fluid pump - Permanently abnormal speed	E
1B.8C	4374	31	DEF fluid pump - Cannot be activated	E
1B.8D	4334	3	DEF pressure sensor - High voltage or open circuit	E
1B.8E	4334	4	DEF pressure sensor - Low voltage	E
1B.8F	521000	8	DEF fluid pump - Incorrect temperature	-
1B.90	521000	2	DEF fluid pump - Abnormal temperature	-
1B.91	4376	5	DEF fluid control valve - Low voltage or open circuit (lower part)	E
1B.92	4376	3	DEF fluid control valve - Short circuit to battery (lower part)	E
1B.93	4376	4	DEF fluid control valve - Short circuit to ground (lower part)	E
1B.94	4376	31	DEF fluid control valve - Overheating (lower part)	E
1B.95	521002	31	DEF fluid control valve - Overheating (top part)	-
1B.96	521002	5	DEF fluid control valve - Low voltage or open circuit (top part)	-
1B.97	521002	3	DEF fluid control valve - Short circuit to battery (top part)	-

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