Zetor

CRYSTAL

OPERATOR´S MANUAL

1/2015

150 160

Tractor is Zetor. Since 1946.

ZETOR

This Operator's Manual for the Zetor tractors, which we are presenting to you will help you to become familiar with the operation and maintenance of your new tractor.
Although many of you have rich experience with the operation of other tractors, please, read the information contained in this Operator's Manual very carefully.
In the Manual you will find a lot of new information and get a perfect overview of how to use the tractor with maximum efficiency during various kinds of work.
If you observe the rules of tractor operation and maintenance and driving safety, your new tractor will become your reliable and long-term friend.
The manufacturer of the tractor wishes you thousands of hours of satisfactory work.

ZETOR
Brno

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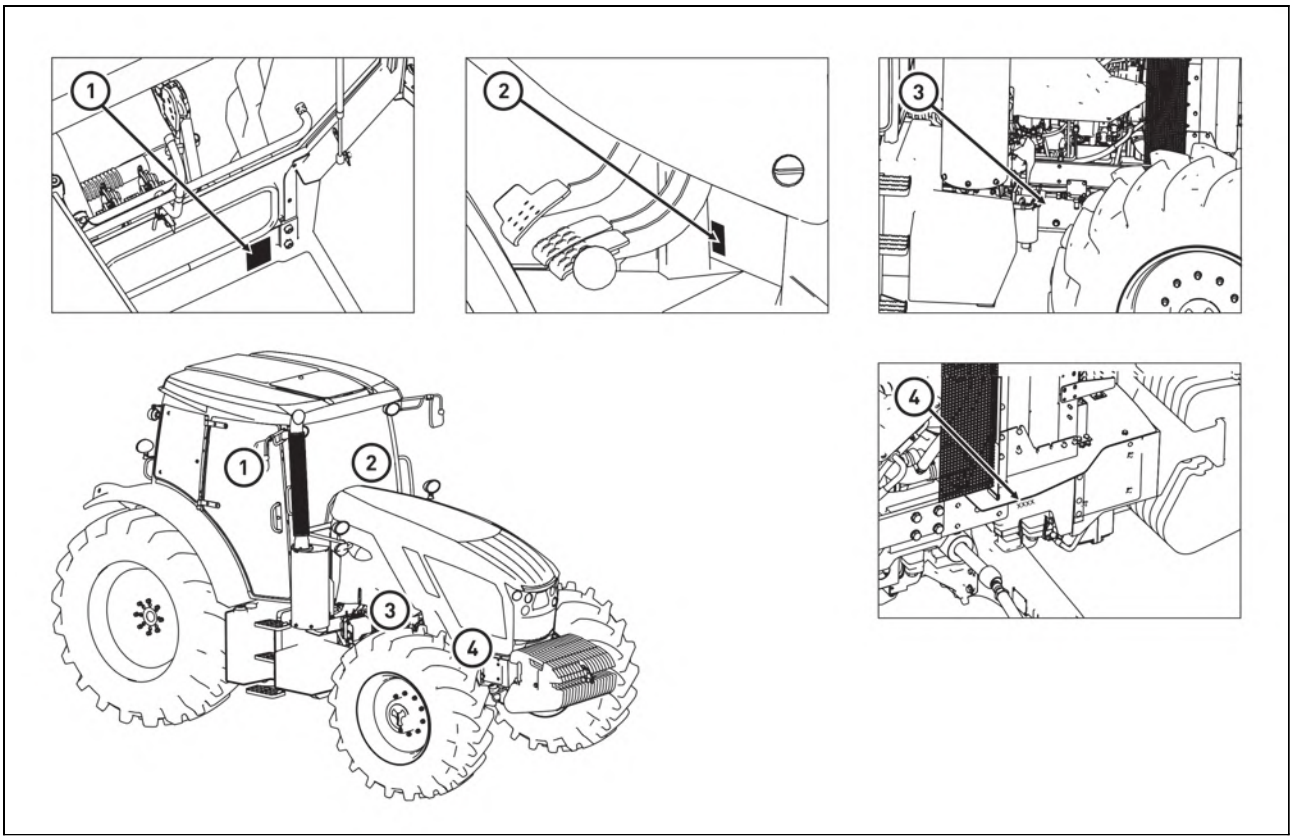
LOCATION OF SERIAL NUMBERS



C15N001

1. Tractor data plate
2. Cab serial number
3. Engine serial number
4. Tractor serial number

When ordering spare parts and within all written and oral communication always specify the data of your tractor that should be written in the frames below.

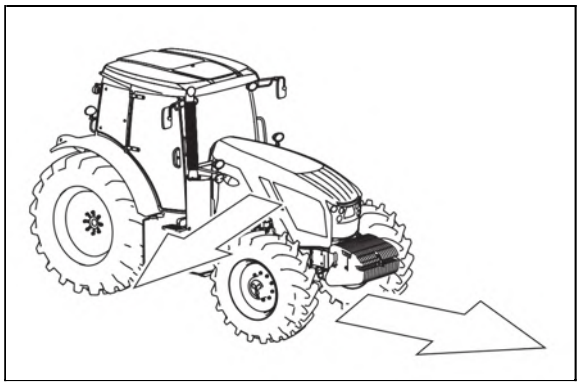
Tractor type

Tractor serial number

Engine serial number

LOCATION OF SERIAL NUMBERS

The 'right', 'left', 'front' and 'back' indications refer to the driving direction of the tractor.



C15N002

SAFETY INSTRUCTIONS FOR USERS

Please, pay increased attention to the parts of the Operator´s Manual that are marked with this symbol.

 This symbol accompanies all important warnings that concern operation safety. Observe these instructions and be extremely careful in these cases! Inform your colleagues and other users about these warnings.

 Carefully study the chapters marked with this symbol before starting to perform operation, repairs and adjustments of your tractor.

 This symbol identifies all important information concerning operation, adjustment and repairs of the starter motor. Observe these instructions and be extremely careful in these cases!

 This symbol marks parts of the Operator´s Manual concerning environment protection. Or possibly sections describing handling of dangerous waste.

* This symbol refers to optional tractor accessories installed by the manufacturer on the customer´s request.

 ***Accessories that are not installed by the manufacturer in the standard way or * optionally on the customer´s request (in the production plant) cannot be subject to a claim.***

General safety regulations

- The tractor may only be operated by a trained person that has a valid driving licence and has been thoroughly acquainted with the operation and safety rules.
- Besides the safety instructions mentioned in the Operator´s Manual you are obliged to respect generally valid safety and traffic rules of the country where the tractor is used.

Proper clothing

- Do not wear loose clothing and free flying long hair.
- During all work use suitable (prescribed) means of personal protection (working boots, gloves, goggles, etc.)

SAFETY INSTRUCTIONS FOR USERS

Starting the engine

- Only start the engine from the driver´s seat with the clutch pedal fully depressed.

Life hazard when starting by means of short-circuiting the starter terminals!

- The key in the switch box must be in the 'I' position.
- When heating the engine with the * electric heater first plug the power supply cord to the heater and only then to the electric mains. After the end of heating first disconnect the heater from the electric mains.

Caution! Electric shock hazard!

Driving operation

- Driving down a slope with the aim of starting the engine is not permitted.
- It is forbidden to put the tractor in motion using another tractor or vehicle with the aim of starting the engine.

- Hoses of the hydrostatic steering, brakes and fuel system must be checked and replaced immediately if any signs of damage are found. These are some examples of hose damage signs: - cracks on the hose surface, releasing of pretensioning of hose connection (which can be verified by easy removal of the hose from the connection) and mechanical damage of the hose. Hoses with indicated service life must be replaced immediately after the expiration of the service period.
- The brakes and steering must be in the perfect condition all the time.
- During driving on roads with trailers and tools the brake pedals must be connected with a latch.
- Driving downhill without an engaged gear is forbidden.
- Pay special attention when driving on a slope and muddy, sandy, icy or uneven ground.

- Observe the maximum prescribed slope gradient of 12°.

- Respect the total permissible weight of the tractor and trailer specified on the data plate of the tractor or on the rear wheel mudguard.
- Do not use the differential lock when driving into a bend.
- It is forbidden to get into and out of a moving tractor.
- When driving with machines attached to the rear hitches the load of the steered axle must not drop below 18 % of the current weight of the set.
- When driving the tractor with agricultural machines attached to the front three-point hitch, reduce the driving speed to 20 km/h.

- During aggregation of Zetor tractors with machines and implements with high tensile resistance when the engine speed drops and the engine tends to stall, the 1R, 2R reduced gears must not be used for the work with these machines (risk of shaft twist-off).

Transportation of persons, operation

- The number of persons transported by the tractor must not exceed the number specified in the technical certificate of the tractor.
- Persons that are not authorized to work with the attached implement must not stand between the tractor and the hitched machine (implement).
- Before putting the tractor in motion make sure there is no person or obstacle in the driving direction.

Recovery, pushing

- To recover a tractor that has sunk in mud use a tow bar or rope attached to the front hook

   ***Never use chains! Rupture of the chain represents a danger of death!***
- During recovery it is dangerous to stand near the towing rope.
- It is prohibited to use the tractor axles (individual wheels) as a winch for releasing a sunken tractor.
- The front hook should be only use to recover the entire tractor, i.e. without any trailer or another attached implement.
- Never recover the tractor with reduced gears engaged.
- When pushing other vehicles (trailers, implements, etc.) with the tractor never insert free wooden blocks or bars between the tractor and the pushed vehicle.

Leaving the tractor

- Park the tractor only on an even land and where not possible, support with a shim assy.
- Do not park the tractor with an attached implement in the lifted position.
- Usually use the left-hand side tractor door when leaving the tractor. Look round whether any vehicle is coming, that could jeopardize your safety when leaving the tractor.
- Use steps and handles when leaving the tractor. When leaving the tractor by the right-hand side door pay attention being in space of shifting lever and hand throttle control.
- Brake the tractor with parking brake before leaving tractor with running engine.

- Before leaving the tractor, do not forget to secure the tractor by manual brake. Engaging a gear does not secure the tractor against rozjetím (clutch is disengaged), remove the key from the switchbox and lock the cabin.

With stopped engine only

- All work connected with refuelling, cleaning, lubricating and adjusting the tractor or attached implements may only be performed with the engine and moving parts of the tractor stopped except functional checks of the brakes, hydraulic system and charging.
- Before removing the side plates of the hood it is always necessary to stop the engine. The tractor engine can only run in a closed building or room if sufficient ventilation is ensured. Exhaust gases are harmful for health.

Fire prevention principles

- Refuel the tractor best after the end of work and with the engine stopped.
- Do not refill fuel up to the top of the fuel tank in summer. Wipe spilt fuel immediately.
- Do not refuel the tractor near open flame and do not smoke.
- Do not smoke and do not use open flame when inspecting the battery electrolyte level.
- Make sure that fire safety instructions are strictly observed in environments with an increased danger of fire (hay-lofts, straw-stacks, etc.).
- The tractors are not equipped with a fire extinguisher from the production plant.

Health and environment protection

- The tractors are not equipped with special filters of air aspirated to the cab. Therefore, they are not designed for work with aerosols and other harmful substances.
- Coolant, brake liquid, kerosene, diesel fuel, mineral oil and other oil products that are used for the operation and maintenance of the tractor may cause various skin disorders in case of direct contact with your skin and can irritate mucous membranes, eyes, the digestive system and upper respiratory ways. Some of them may even cause systemic poisoning when swallowed.
- Persons that handle oil products are obliged to strictly observe safety and hygienic regulations, use suitable means of protection and work in well ventilated rooms.

Working with oil products

- After the end of work or before a meal you should wash yourself with a mild agent and treat your hands with a suitable ointment or cream.
- When connecting and disconnection quick-couplers of the hydraulic circuits use any piece of cloth to remove residual oil remaining in the socket or on the plug of the quick-coupler.

Waste disposal

- When disposing of the tractor or its parts (incl. operation liquids) after the end of their service life you must observe relevant provisions of valid acts and implementation directives of these acts of the country where the tractor is used. The last seller of the tractor is obliged in accordance with the Waste Act to inform the consumer - during the sale of the tractor - about the way of collection of some used parts of the tractor. This is the case of oil and other operation liquids, batteries and tyres. These used products must be received from the consumer without any obligation of the consumer to pay for this service.

Preventive daily maintenance

- Perform this maintenance daily or after every 8 - 10 hours of operation at the latest.

Safety cab

- If the protective frame of the safety cab is damaged by corrosion, an accident or otherwise, the safety cab must be replaced.

Air-conditioning

- Disassembling, turning or otherwise handling the screw union of the air-conditioning system is not allowed in any case. Sudden leak of the coolant may occur, causing quick local cooling. Contact or freezing of components in hands may cause serious damage of some tissues.
- The air-conditioning system is equipped with quick-couplers that make it possible to separate the cab from the tractor body if necessary without any coolant leak. Entrust interventions into the air-conditioning system to a specialized repair shop.

Electric installation

No additional interventions into the electric installation (connection of other electric appliances) are permissible due to its possible overloading!

- The values of the electric installation are:

  Nominal voltage 12 V =
  Grounded minus pole (-) pole
- Using starting trucks or auxiliary power supplies with a different voltage or polarity may cause serious failures of the tractor.
- When handling the battery you must pay increased attention and avoid short-circuits. In tractors equipped with a battery disconnector switch the disconnector off when handling the battery.
- Zetor tractors must not be operated with a disconnected battery as this may lead to a serious failure of the tractor.

Work in a chemically aggressive environment

- If the tractor is operating in a chemically aggressive environment (e.g. working with chemical sprays, fertilizers, in environments with high concentrations of salt, etc.), it is always necessary to clean the tractor thoroughly from chemically aggressive substances and neutralize them after the termination of the work according to the manufacturer's instructions.

Front passenger´s seat notification

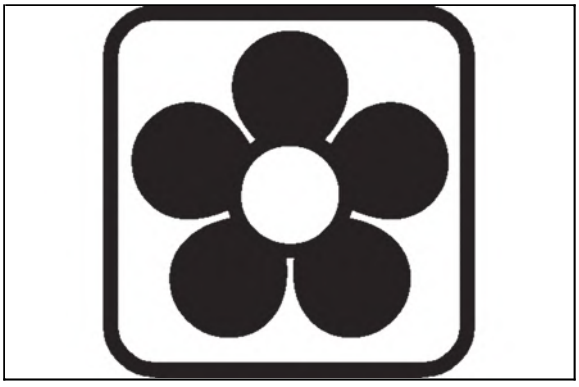
ATTENTION:
Transportation of personnel on front passenger´s seat is allowed only with road transportation.

- Transportation of front passenger outside the seat designed for this purpose is forbidden.
- Using the seat for front passenger during the work with a tractor (e.g. during the work on the fields) is explicitly forbidden.
- The use of safety belt on front passenger´s seat is governed by valid regulations. In this respect, keep the regulations valid in the country, where the tractor is operated.

FH13N002

Protection of cab against aerosols

The cab of Zetor tractors in standard design is not designed for work with aerosols and other health hazardous substances.
The level of cab protection in standard design complies with **EN 15695-1:2009 standard - level 2** (only dust proof cab).



FH13N003

SAFETY INSTRUCTIONS FOR USERS

The level of external noise of tractor

 ***The exposition to the effects of high levels of noise for a longer period of time may lead to hearing disorders or deafness. Protect your hearing with protective means, e.g. headphones, ear plugs etc.***

Resulting levels of noise when measuring noise for hearing of a person near a tractor. Based on European directive 2009/63/EC - Amendment VI.

Model	Crystal 150	Crystal 160
Travel speed	40 km	
Tractor noise levels when travelling dB	83	83,5
Tractor noise levels when standing dB	79	79,5

The level of internal sound of tractor

 ***The exposition to the higher sound levels for longer periods of time may lead to hearing disorders or deafness. Protect your hearing with protective measures, e.g. headphones, ear plugs etc.***

Resulting levels of noise when measuring noise for hearing of driver. Based on European directive 2009/76/EC.

Model	Crystal 150	Crystal 160
Travel speed	40 km	
Noise levels - Closed windows dB	73,5	73,5

The level of vibrations on driver´s seat

ZETOR tractors are classified in A category in classes I and II. ´A´category includes all tractors with set level of vibrations owing to similar specifications of construction:
Results of measurement on testing bench are listed in the following table pursuant to directive 78/764/EEC. The value a*wS is an adjusted value of effective acceleration balanced according to vibration movement. The following table is valid for all type series of Zetor tractors.

Brand of seat	Model	Springing	Class I & II	
			a^*_{wS}(1) (m/s²)	a^*_{wS}(2) (m/s²)
GRAMMER	MSG85/721	mechanical	1,18	0,8
GRAMMER	MSG95A/721	pneumatic	1,16	1,1
MARS	78/764-73xx	mechanical	1,25	1,23
SEARS	3008	mechanical	1,24	1,06
SEARS	3045	pneumatic	1,13	1,03

(1) Values corresponding to driver´s weight of 50 kg.
(2) Values corresponding to driver´s weight of 120 kg.

SAFETY INSTRUCTIONS FOR USERS

Tractors equipped with front end loader

Zetor Tractors in standard design are designed for utilization in agriculture and are not designed for special purposes.
Tractors designed for operation within the European Union must be equipped, in case of using front end loader, with a protective structure (FOPS - Falling Object Protective Structure) protecting drivers from potential falling objects.
It is necessary to observe applicable local valid regulations in countries which are not part of the European Union.

Two types of cab roofs are mounted to Zetor tractors.

1. Standard cab roof
2. Cab roof designed for tractors equipped with front end loader meeting the OECD code 10 (FOPS) conditions.

Tractors ZETOR supplied already from production with front end loader are equipped with cab roof according to point 2.
From safety reasons, series ZETOR tractors supplied without front end loader with standard roof pursuant to point 1 must not be equipped or used with front end loader.
In case of additional front end loader assembly, it is necessary to equip tractor with cab roof pursuant to point 2.

 ***Only front end loaders approved by ZETOR TRACTORS may be mounted to ZETOR tractor. Additional assembly of front end loader approved by ZETOR TRACTORS can be done only by authorized ZETOR service.***
It is forbidden to use front end loaders unapproved of by ZETOR TRACTORS.
Not observing this instruction may cause serious accidents.
Carefully observe instructions for use supplied by the manufacturer of front end loader.

 ***Carefully study operation manual supplied by the manufacturer of front end loader.***
In case of discord of Principles for operating tractors equipped with front end loader and operation manual for front end loader, which was supplied by the manufacturer of front end loader, the wording listed in operation manual supplied by the manufacturer of front end loader shall apply.

- The use of front end loader for transporting material at places accessible to the public is forbidden.
- The use of front end loader for transporting material in places inaccessible to the public is possible only in a limited way. In such case, instructions in user's manual supplied by the loader manufacturer must be observed.
- Observe local valid regulations at all times.
- A strict ban on transportation and lifting of people by means of loader is in effect.
- No matter whether the front end loader is loaded or empty, no-one may stand in front of the loader if it is in lifted position. When driving with a lifted loader, there is a risk of load transported by front end loader falling (there is a risk of disrupting the balance of the tractor).
- Never leave the tractor standing with the loader in lifted position.
- If it is necessary to open the bonnet of the engine at intervention, disconnect the front end loader first or secure hydraulic rollers of front end loader by metallic props designed for this purpose.
- Hydraulic circuit of the front end loader is designed in such a way to endure the maximum operation pressure of 20 MPa (200 bar). Do not do any changes on couplers of hydraulic circuit hoses.
- Any front end loader ZETOR mounting without observing the recommendation of ZETOR TRACTORS valid to the day of pur-chase revokes the validity of guarantee for the whole of supply.
- The loader may be used, maintained and repaired only by people who perfectly know the machine and who are informed about potential risks.
- When driving on roads do not transport any material on the front end loader.
- It is necessary to observe special instructions related to accidents prevention and general rules related to technical safety, la-bour medicine, labour hygiene and regulation defining operation on roads.
- The manufacturer does not bear any responsibility for any potential damage incurred as a result of changes conducted on the loader without their consent.

- Do not ever adjust the front end loader by yourselves and do not use the adjusted front end loader without prior ZETOR´s ap-proval. The loader may become dangerous as a result of not observing these instructions. ZETOR TRACTORS shall not be held responsible in case of any damage or injury.
- Use front end loader without additional weights on the tractor (danger of mutual contact). The load of front and rear drive axle must not exceed the maximum permitted load listed in the manual. The use of front end loader requires mounting of counter weight in the rear part of the tractor.
- Each working tool was reconstructed for the purpose of specific usage and has its own tolerance of resistance and tightness.
- It is forbidden to use front end loader for cultivating soil and stubbing. Such work needs to be done with a special tool, front end loader is not designed for doing this.
- Using controls which would set the loader into motion without driver holding the gear shifting lever is strictly forbidden and re-sults in installation not meeting the prescribed standard.
- To penetrate the loaded material, better use the kinetic energy of the tractor rather than pressing force which causes higher strain of both the loader and the tractor.
- Do not overload hydraulic parts if the load is too heavy or pistons are in end positions.
- Control the loader exclusively from driver's seat, if you are sitting on driver's seat.
- Do not leave the seat if you have not blocked any movement of controls.
- No people can be present in the working zone of the loader.
- When working with a lifted loader, mind electric and external cables etc.
- Loader/tractor set needs to be parked on a horizontal and solid base, the arms of the lifting device must be set in the lower position

You will find more information in user's manual to front end loader.

 ***Important notification: Work always safely and with consideration.***

Zetor tractors used for work in the woods

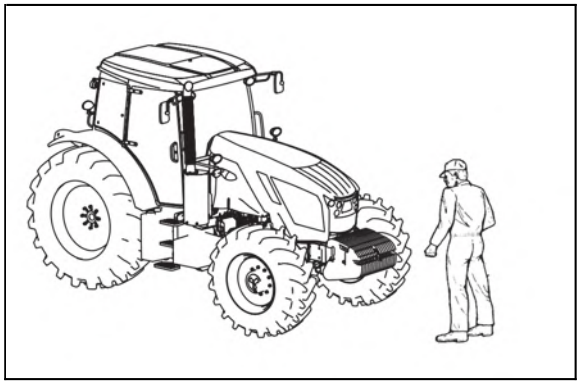
Principles for operating tractors equipped with front end loader

Standard tractors Zetor do not provide sufficient protection for operation in forest terrain as, for example, protection against a fal-ling tree or branch on a cab or penetration of objects to a cab.
If Zetor tractor is utilized for forest work, a tractor operated within the European Union must be protected against these risks.
It is necessary to observe applicable local valid regulations in countries which are not part of the European Union.
To ensure this protection, it is advisable to conduct assembly of a specific protective structure, like for example FOPS / OPS (Fal-ling Object Protective Structure / Operator Protective Structure), tested according to standards for forest machines.

 ***Only forest superstructures approved by ZETOR TRACTORS can be mounted to ZETOR tractors.***

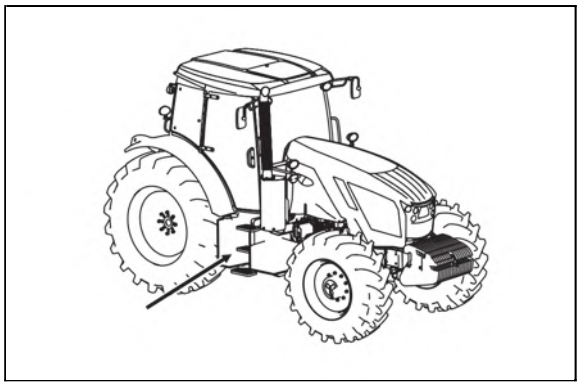
In case of additional assembly of further tractor equipment for working in the woods, full responsibility is borne by the supplier and manufacturer of the protective structure that all the safety regulations (e.g: OPS / FOPS), all the conditions of homologation (e.g. the area of driver's view, lighting, parameters, permissible weight etc.) are met, same as for the provision of due assembly of pro-tective equipment. The supplier/manufacturer of protective construction is also obliged to conduct all the necessary validation (approval) steps required by the legislature of the country in which the tractor is operated.

Preventive daily maintenance
Perform this maintenance daily or after every 8 - 10 hours of operation at the latest.



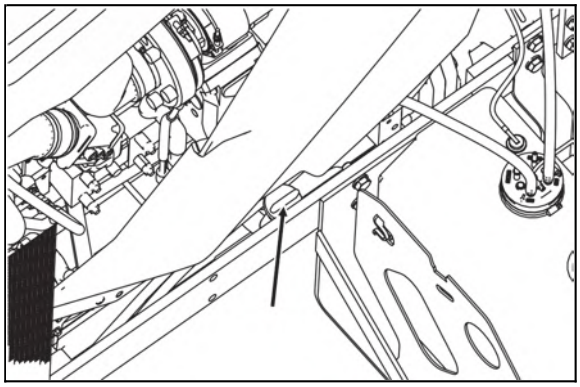
C15N003

Fuel system leaks
Check the fuel system for leaks, including the fuel tank. Repair any leaks immediately. The hole for draining dirt from the fuel tank is found in its bottom.



C15N004

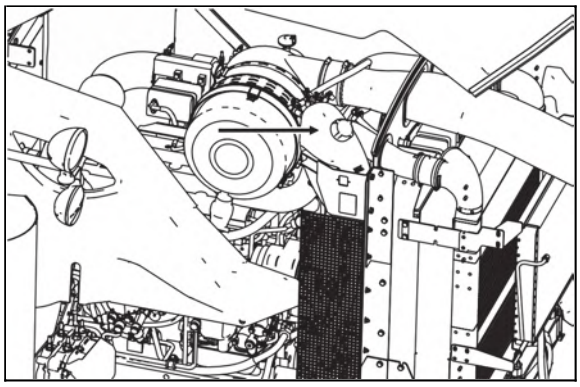
Engine oil level
After unscrewing and removing the oil dip-stick check the oil quantity in the engine and then check the connection of the engine lubrication system for leaks. Maintain the oil level between the dipstick marks.



C15N005

Cooling system
Check the connections of the engine cooling system for leaks and the coolant quantity in the expansion tank. Replenish the missing quantity up to the upper mark indicated MAX. The minimum acceptable cooling liquid level is indicated by the MIN mark.

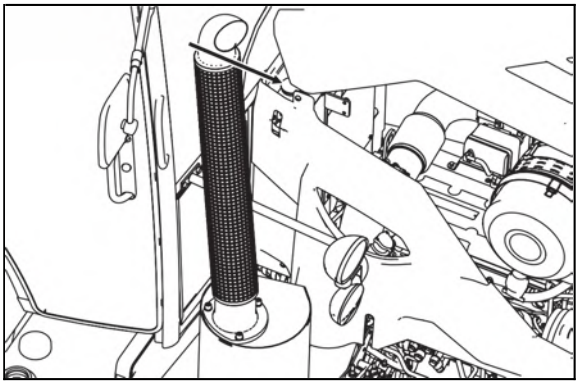
Only release the overpressure plug when the coolant has cooled down! There is a danger of scalding!



C15N006

Liquid brakes

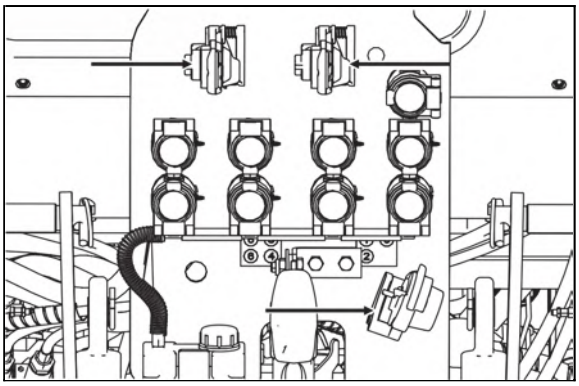
Check the liquid brakes for leaks as well as the liquid control of the clutch and the braking liquid level in the expansion tank.
Maintain the brake liquid level in the range of 3/4 of the tank content (max. level) and 1/2 of the tank content (minimum level).



C15N007

Trailer air brakes

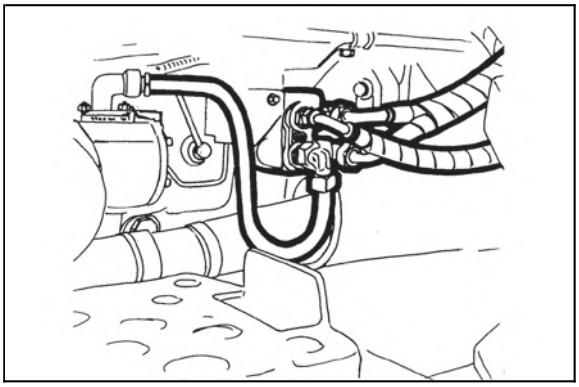
Check the air system of the brakes for leaks and the efficiency of the tractor brakes with a trailer (see the Maintenance instructions chapter; the Checking the air systems for leaks section of this Operator´s Manual).



C15N008

Trailer hydraulic brakes

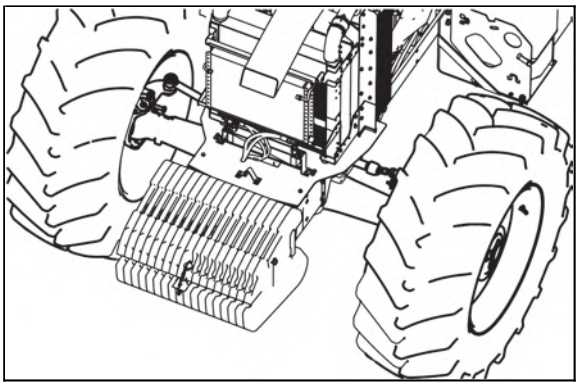
Check the hydraulic brakes of the trailer for leaks.



F13

Hydrostatic steering

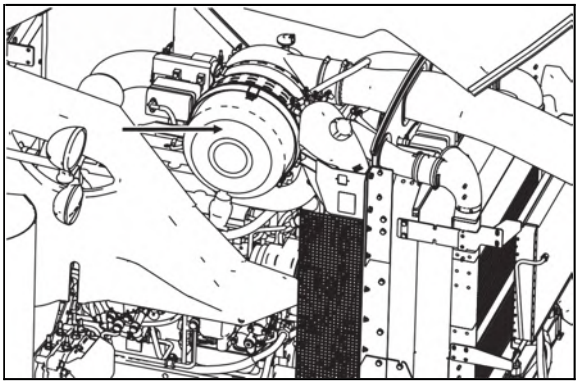
- Check the tightening of screws and nuts of the steering rods and levers.
- Check the condition of all the hoses of the hydraulic steering circuit for damage and for oil leaks.



C15N009

Air cleaner

If the air cleaner is heavily clogged with dirt, this condition is indicated by a sensor that lights up an indicator on the dashboard.

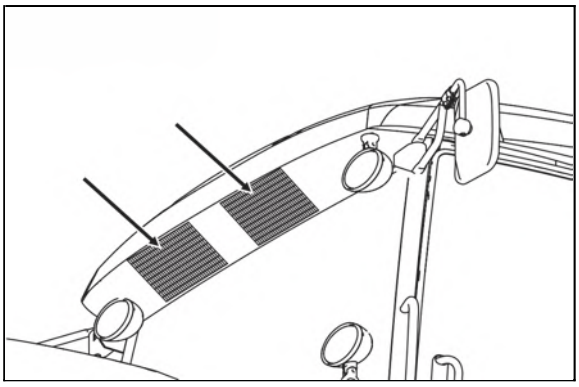


C15N010

Cab filtration

Check and if necessary clean the cab ventilation air filters installed in the front overhang of the roof.
The filter exchange interval depends on the dustiness of the working environment.
Partial regeneration can be performed by beating out or blowing with compressed air.
Do the cleaning or replacement of the filter elements after removing the covering grills in the roof overhang.
At the customer's request we supply filters with active carbon.

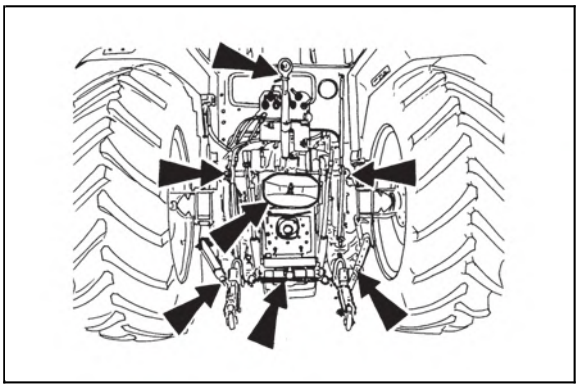
Don't clean the filter; don't flush it with compressed air.



C15N011

Hitches

Check the condition of the hitching and attachment systems of the tractor and trailer.

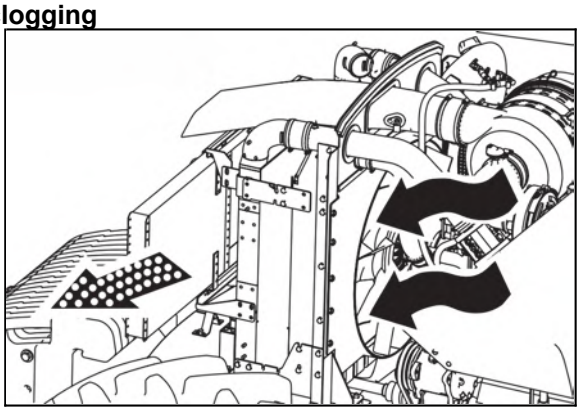


F18

After work with front implements and in case of cooler clogging

After work with front implements:
- Check the connections of the external hydraulic circuit of the control of the front three-point hitch for leaks

Clogging of the coolers:
- Release and slide the cooler to the left side of the tractor.
- Clean the front walls of the engine (gearbox, air-conditioning condenser) cooler with compressed air (blow air in the direction from the engine).
- Remove residual dirt from the space under the hood so that it should not be suctioned again.

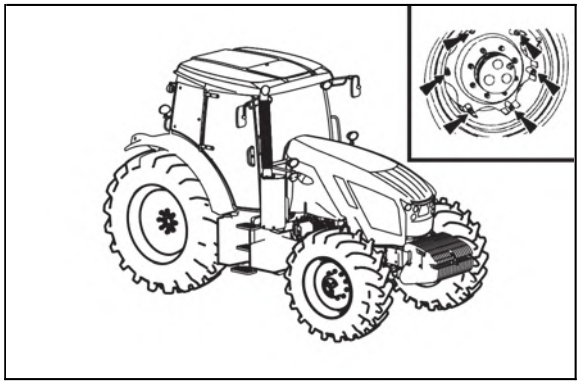


C15N012

Tyres and wheels

Check the air pressure in the front and rear tyres. Depending on the character of work adjust the pressure to the recommended value. Check and if necessary retighten the bolts of the front and rear wheels.

Never drive with loose wheel bolts!

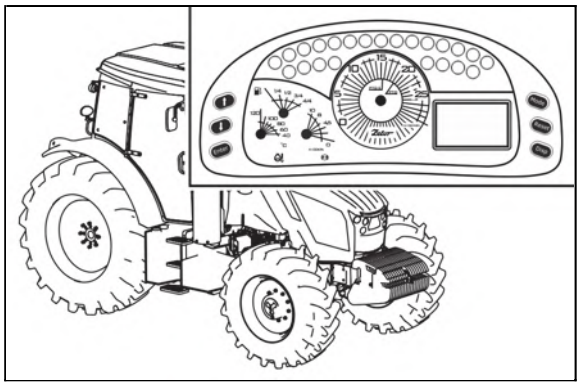


C15N013

Short functional test

When the engine is started, check whether the signal lamp of the hydrostatic control failure and of the charging signal lamp went out, and if the signal lamp of the engine lubrication and signal lamps indicating error messages are off.

Verify the function and tightness of hydraulic control circuits.



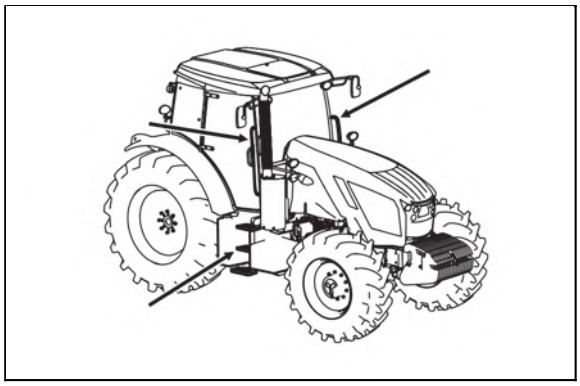
C15N014

Tractor user must be properly acquainted with recommended operating and safety rules for safe tractor operation in advance. It is too late to do it within operation!

Safety cabin

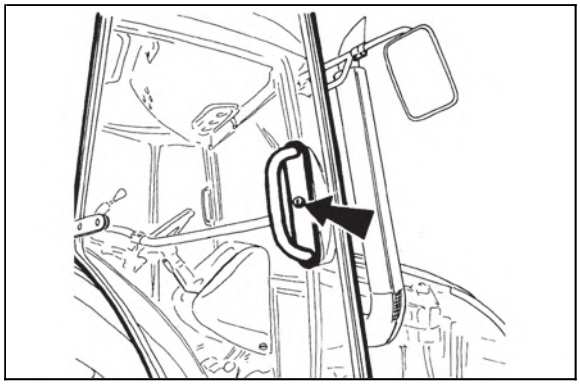
Use the left side of the tractor for getting on and getting off the tractor.
Use three-stage climbing irons and hold the bars when getting on and getting off the tractor.
Pay increased attention in the area of gear shifting lever and manual throttle lever.

Safety cabin is equipped with toned glass.



C15N046

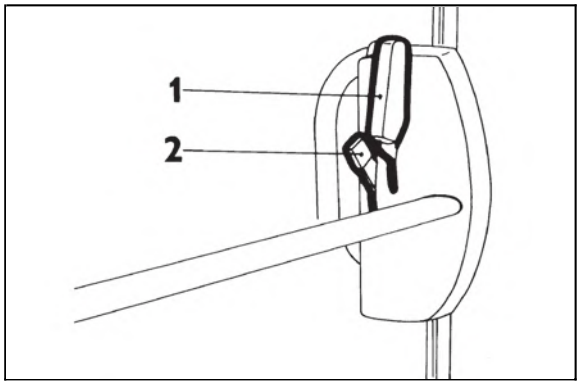
Opening the door from the outside
Door can be opened from the outside by pressing a button. Left door can be locked.



F_02_11

Opening the door from the inside
1. Lever for opening the door from the inside
2. Lever for opening the door from the inside
The door is held by a gas strut with a full opening. Driving with open door is not recommended for their possible damage.

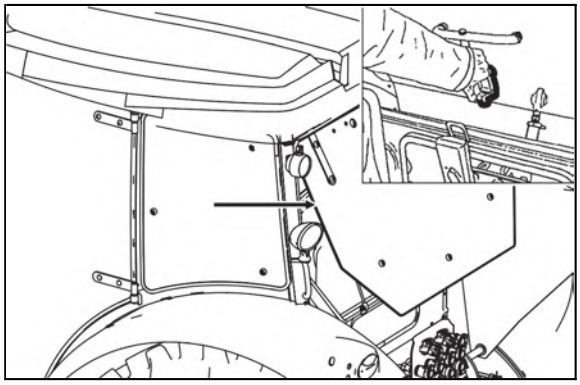
It is forbidden driving with open door due to its possible damage.



F23

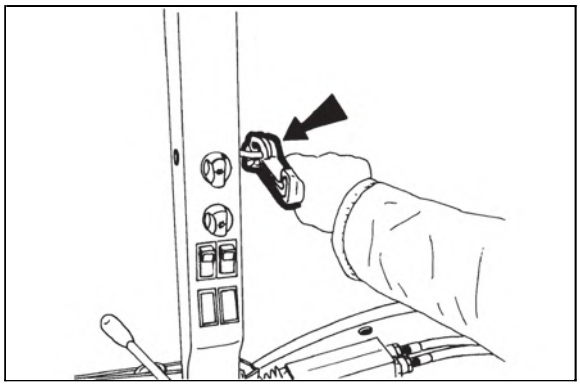
Rear window
Is equipped with a handle and in an open position is locked by gas spruts. Rear window is heated.

When driving on an uneven surface we recommend to secure the window in a closed position - danger of window cracking. Before starting the work with the machinery Before starting the work with mounted in three-point hitch of the tractor, make sure that there is not a danger of collision between the mounted tools with maximum lifting of rear three-point hitch and open rear window. In case of collision we recommend to work with a closed window.



C15N025

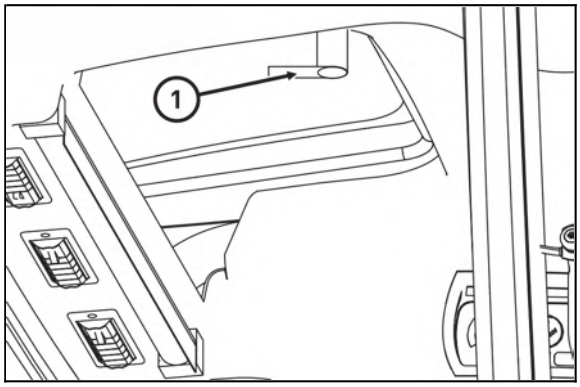
Side window
The window is secured in the partly open position with a plastic latch. You can open the door by lifting the latch towards yourself upwards and pushing it into the groove. Then, the window will be secured in the fixed position.



F25

Hinged lid
It is opened by turning the locking lever of the cover (1) and by pressing the locking lever in the upward direction. The swing cover is closed with the opposite procedure.

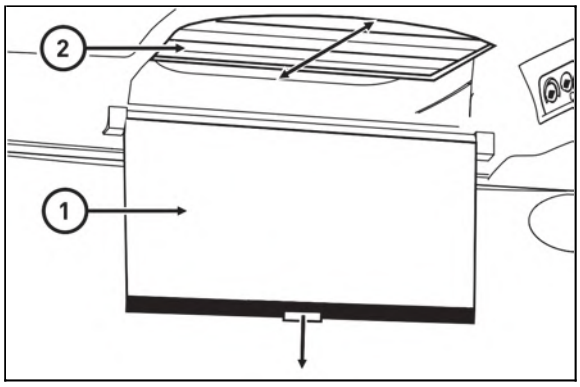
By opening of the swing cover, the total height of the tractor is increased. Therefore always close the cover when driving through or parking in places with a reduced internal diameter.



C15N026

Adjustable screen and cover of the swing lid
Pull out the adjustable screen of the front window (1) by pulling the hand rail in the arrow direction.
To return to the original position, shortly pull the hand rail in the direction of the arrow and release the hand rail.

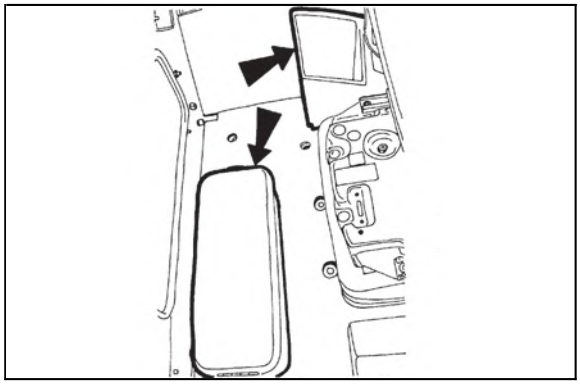
The sliding cover of the swing lid (2) is closed and opened with pressure or by pulling the slots in the arrow direction.



C15N146

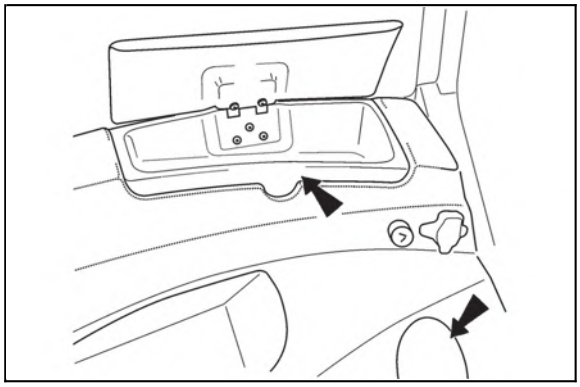
Shelf

Shelf is placed on the left side of driver´s seat.
Toolbox is placed in the rear part of the cabin behind the driver´s seat.



F31

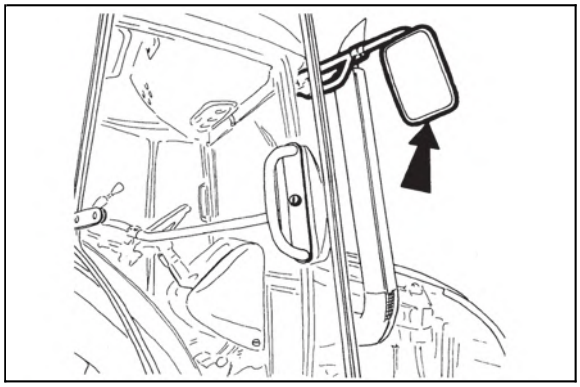
Another shelf is placed on the right mudguard.



FH12N025

Rear view mirrors

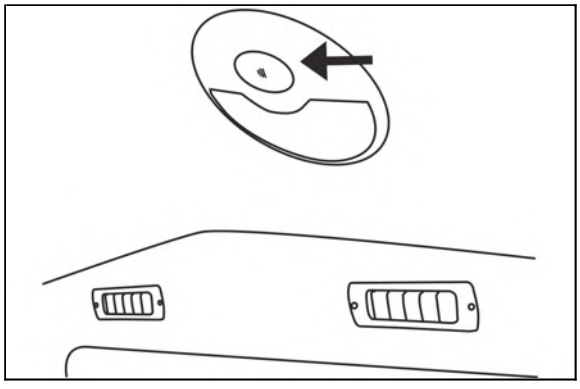
Before the drive or starting the work, adjust rear view mirrors so that they enable to monitor the whole drive way or working field.



F_02_12

Internal lighting

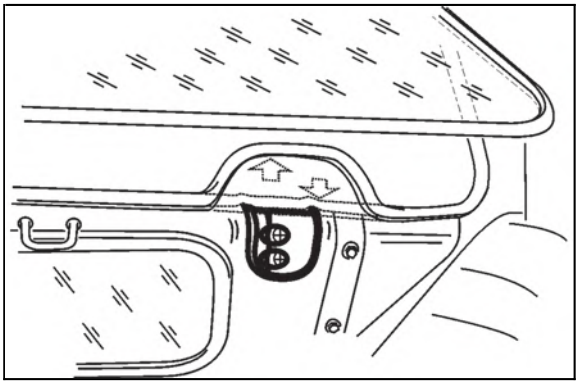
To be turned on and off by means of a button marked with the arrow.



F13BN014

Aggregation opening

Aggregation opening serves for cabelling or Bowden control of aggregated tools placement.
Pull to protrude the part of sealing of rear window in upward direction. Put the aggregated tool control through the originated hole.
Insert cabelling or Bowden controls to the holes of passage of aggregation opening. Return the sealing of the rear window to its original position by exercising pressure.



F11N091

Driver´s seat

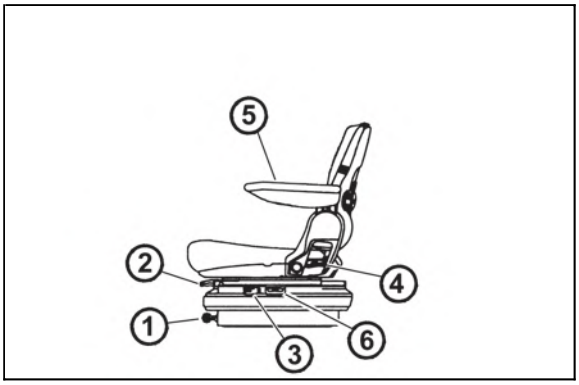
1 - The control of setting the seat suspension according to the driver´s weight (setting by rotation, in the direction according to pictogram on the boot of the seat)
2 - Longitudinal setting of the seat lever
3 - Seat vibrations absorption control (by tilt over of the control forward, floating position of the seat is engaged)
4 - Setting the angle of rest control
5 - Tilting elbow rest
6 - Pneumatic suspension of seat setting control (by pulling in the direction upward, the rigidity of the suspension increases, by pulling in downward direction, it decreases)

Driver´s seat with mechanical suspension

Control according to points 1, 2, 3, 4 and 5
Point 2, lever is placed on the right

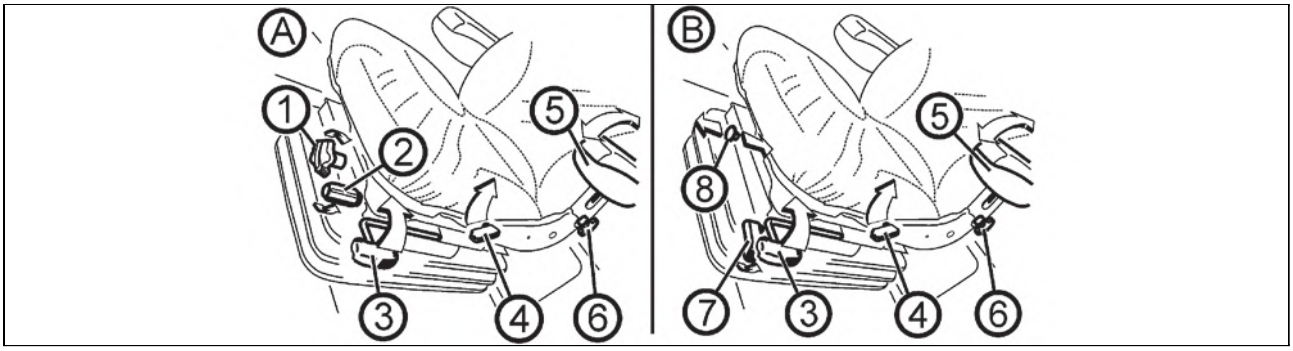
Driver´s seat with pneumatic suspension

Control according to points 2, 3, 4, 5 and 6
Point 2, lever is placed on the left



FH12N026

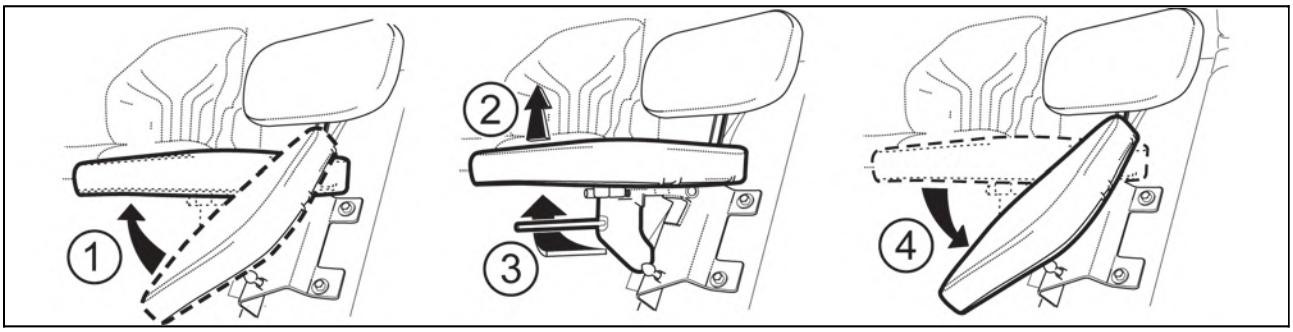
Driver's seat Sears



P13N003

The driver's seat Sears can be made with a mechanical (A) or pneumatic (B) suspension.
1 - The seat suspension adjustment controller according to the driver's weight (turn it in the direction based on icons shown on the seat bellows)
2 - The seat height adjustment controller (release the controller to increase the seat height, tighten the controller to decrease the seat height)
3 - The longitudinal seat adjustment lever (pull the lever to adjust the seat lengthwise, return the lever back to its original position to lock the longitudinal adjustment)
4 - The seat backrest inclination adjustment controller (pull the lever to adjust the seat backrest inclination, return the lever back to its original position to lock the backrest position)
5 - Foldable armrest
6 - The armrest height locking adjustment (release the controller to adjust the height of the armrest, tighten the controller to lock the armrest position)
7 - The seat vibration absorption setting (move the controller up to get the float seat position, move the controller to the lower position to lock it)
8 - The seat height adjustment and seat suspension adjustment according to the weight of the driver (push the controller to increase the air pressure in the pneumatic suspension of the seat - when the driver´s weight is bigger, pull the controller to decrease the air pressure in the pneumatic suspension of the seat - at the lower weight of the driver

Passenger´s seat
Passenger´s seat is tiltable and placed on the left mudguard of the cabin.



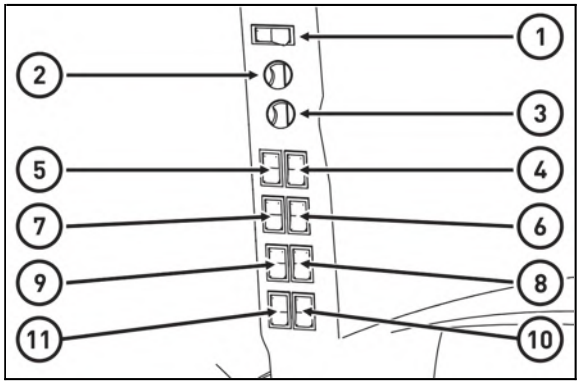
C15N047

Seat tilting out
Passenger´s seat to be tilted out in the direction of an arrow (1) upward. Locking of the seat is done automatically.

Seat tilting
Lift the passenger´s seat in the direction of an arrow (2), pull the lever (3) to the direction of the driver´s seat, tilt the seat in the direction of an arrow (4).

Control panel on the right column of the cabin

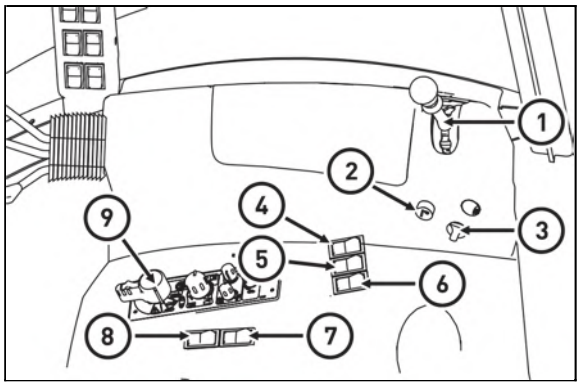
1 - switch of the cycler of the front wiper
2 - two-position switch of the front wiper and of the control of the front washer
3 - switch of the rear wiper
4 - switch of heating of the rear wiper
5 - switch of heating of the rear mirrors
6 - switch of the rear work lights on the cabin roof
7 - switch of the front work lights on the cabin roof
8 - switch of the rear PTO shaft
9 - switch of the front PTO shaft
10 - switch of the automatic switching off of the rear PTO shaft
11 - switch of the revolution control of the rear PTO shaft



C15N051

Control panel on the right rear mudguard

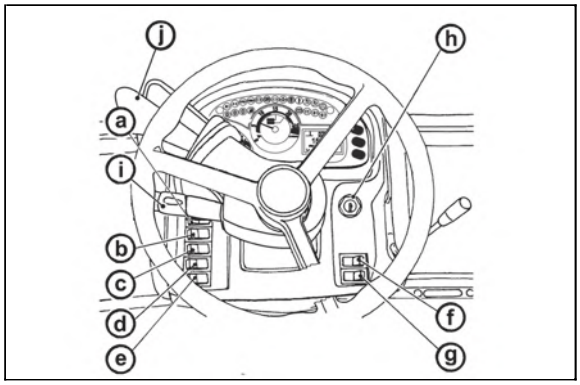
There are controllers located on the control panel on the right rear mudguard
1 - Pre-selection lever of the rear PTO shaft (more information in chapter POWER OF AGRICULTURAL MACHINES)
2 - Firer
3 - Three-pin socket
4 - Switch of the multiplier pre-selection (more information in chapter DRIVING)
5 - Switch of differential closures (more information in chapter DRIVING)
6 - Switch of the control of the front driving axle (more information in chapter DRIVING)
7 - Switch of the height setting of the tractor front part (more information in chapter DRIVING)
8 - Switch of the setting of the suspension mode of the front driving axle (more information in chapter DRIVING)
9 - Panel of the electrohydraulic control (more information in chapter ELECTROHYDRAULICS)



C15N052

Panel of the instrument panel

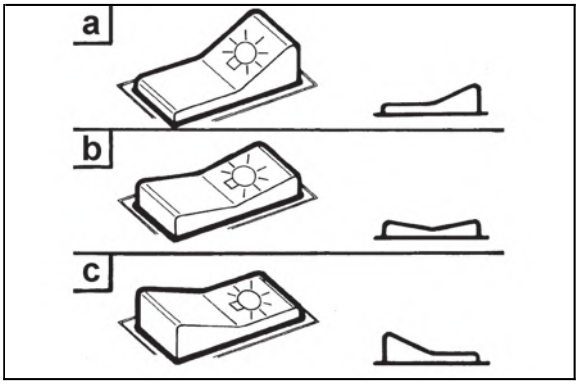
a - lights switch (off, parking, head)
b - lower beam lights in the grill of the tractor and working lights in the cabin of the tractor switch
c - Fog light switch (off - on). Fog light function is signalized by a lit symbol on the switch.
d - Working lamp switch (off - on). Working lamp function is signalized by a lit symbol on a switch.
e - warning lights switch
f - beacon switch (off - on)
g - working lights in the grill of the bonnet switch (off - on)
h - switch box
i - direction lights, lower beam head lights, head lights and horn switches acoustic and light
j - reversing lever (forward, neutral, backward)



FHD14N073

Lights switch

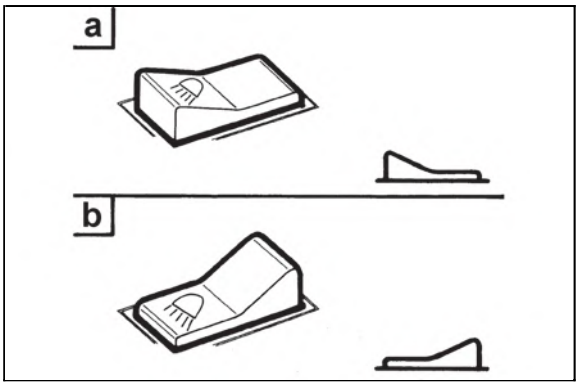
a - illumination off
b - side and end point lights on, illumination of licence label, illuminated
c - all devices on in 'b' position. Lower beam head lights or head beam lights are engaged (according to the position of direction lights, lights and horn switches).



F56

Lights switch between the grill and the cabin

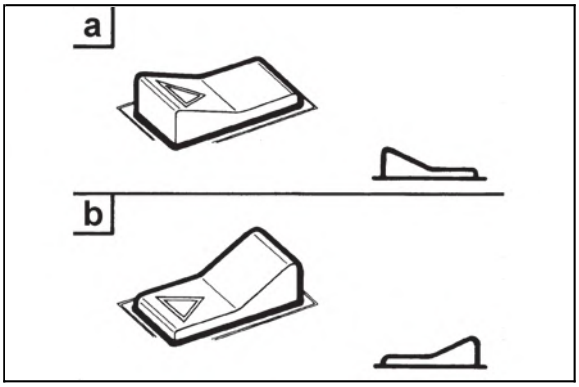
a - roof lights on
b - roof lights off
The switch controls the illumination in the grill or in the roof of the cabin of the tractor. Use the lights in the roof of the cabin only when tools covering headlights in the grill is attached in front three-point hitch. A lit symbol on the switch signalizes light on in the roof.
Headlights can be lit only in the grill of the bonnet.



F59

Switch of warning lights

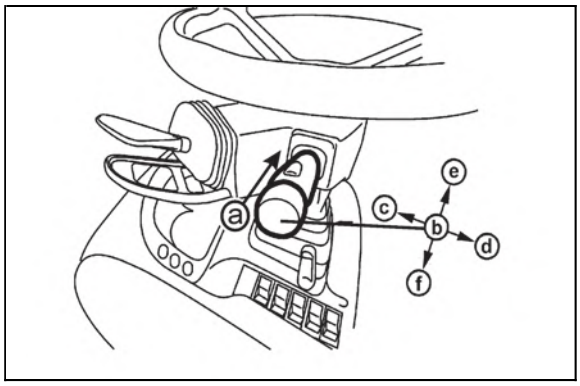
a - warning lights on
b - warning lights off
Function of warning lights is signalized by interrupted blinking control on the dashboard.



F58

Direction lights, lower beam head lights, head lights and horn switches

a - Acoustic horn - press the switch in the direction of an axis
b - Lower beam head lights
c - Direction lights to the right
d - Direction lights to the left
e - Acoustic horn
f - Lower beam headlights

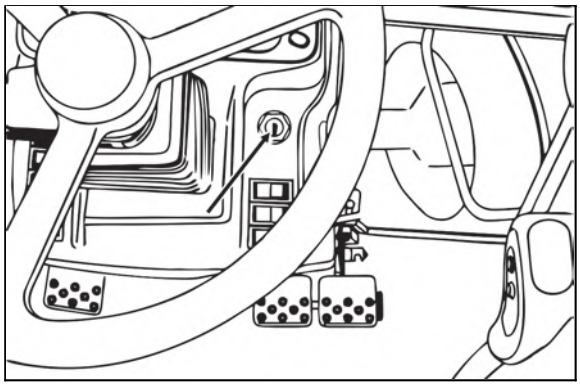


X139

When the signal lamps are turned on, the acoustics signal is activated.

Switch box

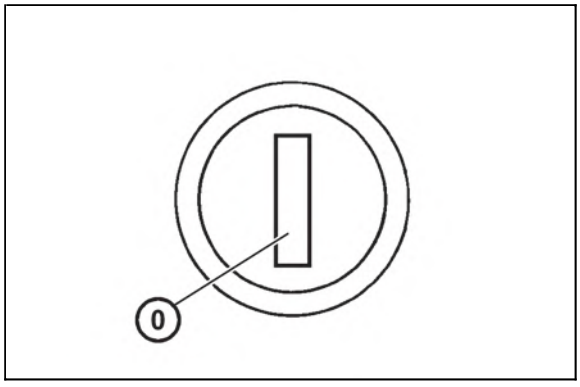
Switchbox is placed on the dashboard, see arrow.



C15N053

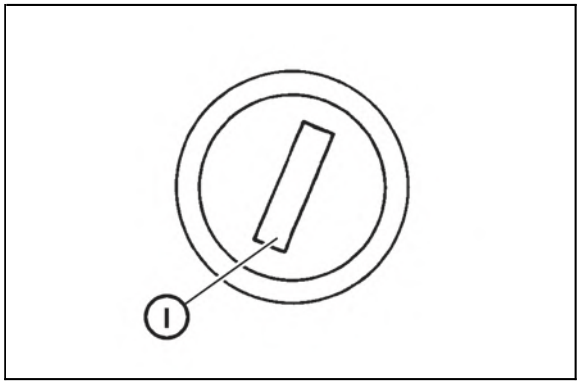
Switch box key in the position (0)

The voltage of all the equipment controlled via the key is disconnected. The key can be removed.



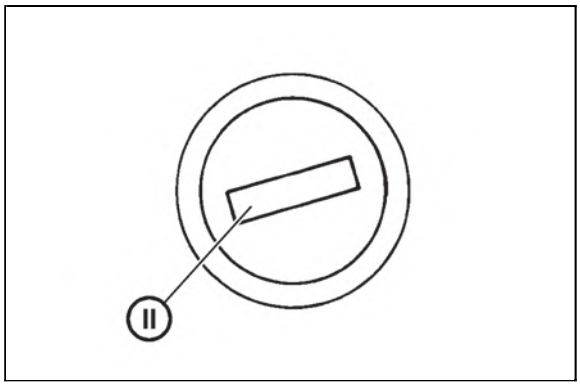
S43

Switch box key in the position (I)
The voltage is connected to all the equipment excluding starter. The key is in this position with the engine running.



S44

Switch box key in the position (II)
Starter and supply of all equipment is connected in this position apart from wipers, washer, cab ventilator and air condition. After starting, the key automatically returns back to 'I' position.

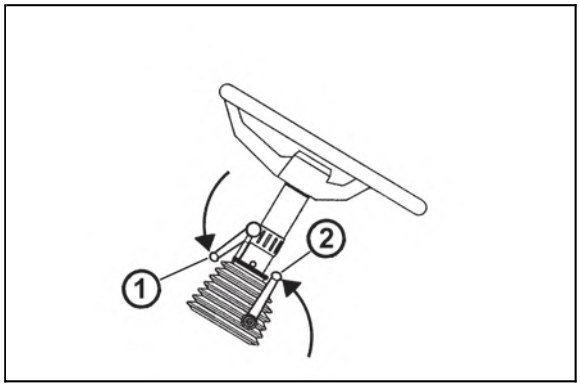


S45

Tilting and protrusion of steering wheel
Tilting column of steering wheel enables variable setting of position of the steering wheel both in terms of angle and height.

Height setting of steering wheel
The setting is done by protrusion or retracting the steering wheel after unlocking arrestment by turning a lever (1) in the direction of an arrow. After setting the steering wheel, lock the lever (1) by tightening in the direction of an arrow.

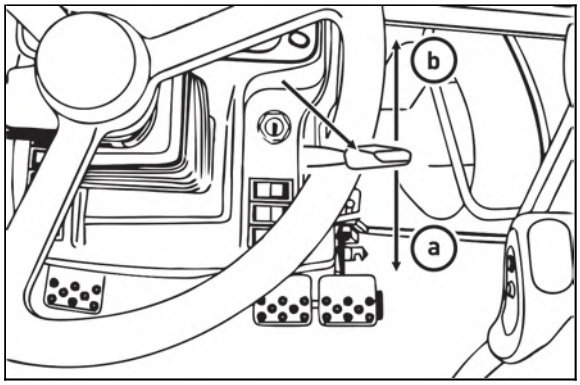
Angle setting of steering wheel
Setting is done by tilting the steering wheel after unlocking the lock by turning the lever (2) in the direction of the arrow. After setting the steering wheel, secure the lever (2) by retightening against the direction of the arrow.



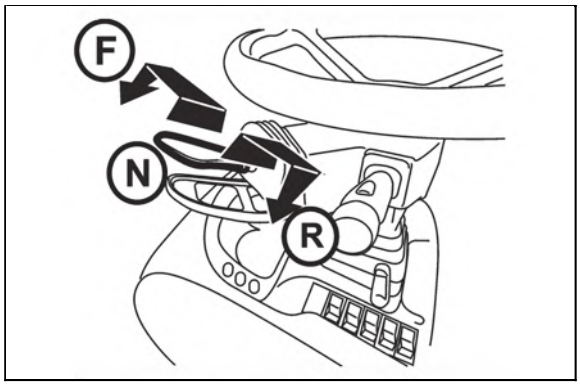
F205

Manual throttle
a - idle run
b - maximum supply

The lever enables to set engine revolutions in the whole range (a) to (b).



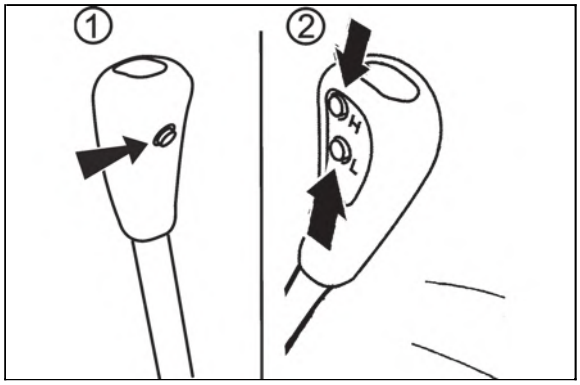
Reversing lever
F - front driving; lever in the front
N - neutral
R - back driving; lever at the back



X212a

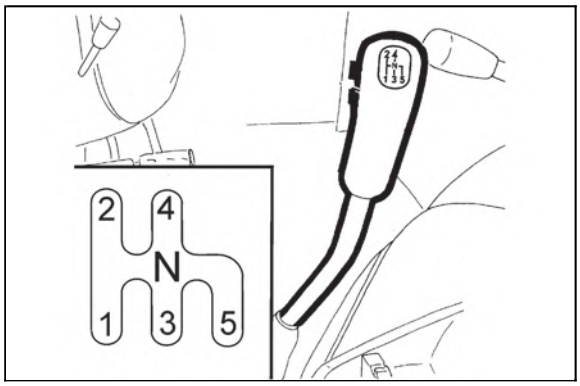
Gear shifting lever
- main gear shifting lever

1. button for disengaging clutch on the head of gear shifting
2. buttons of shifting individual gears of multiplier



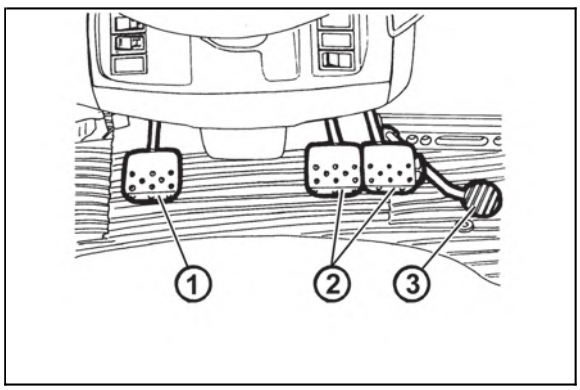
FH12N037

Gear shifting scheme
Reversing speeds can be shifted only by means of reversing lever. The scheme is placed on the head of gear shifting lever.



FH12N038

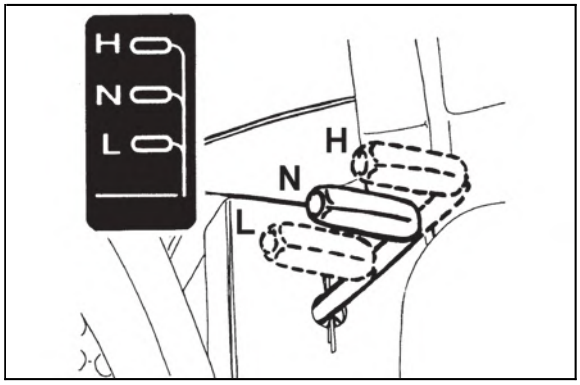
Pedals
1 - travel clutch pedal
2 - foot brake pedals joint by a catch
3 - throttle pedal



FHD14N083

Road and reduced speeds shifting lever
The lever is placed on the right side of driver´s seat.

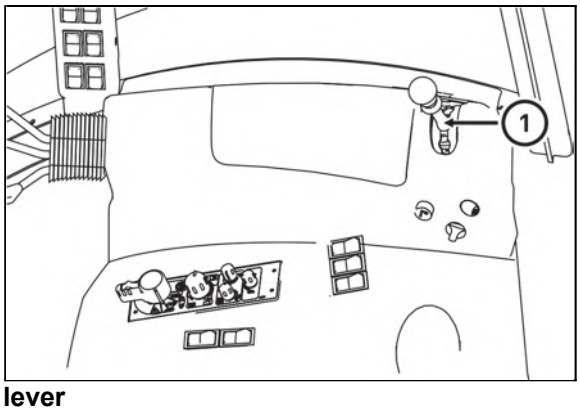
H -	Road speeds
N -	Neutral
L -	Reduced speeds



F72

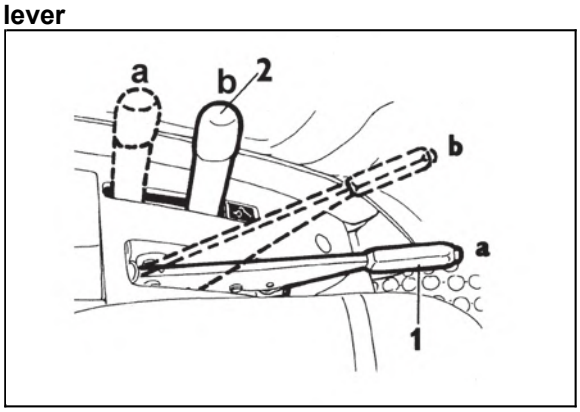
PTO revolutions preselection lever
The lever (1) is placed on the right side of driver's seat.

For more information see the chapter on Drive of agricultural machines.



Manual brake lever and coupling for semi-trailer control lever
1 - manual brake lever
a - unbraked
b - braked

2 - coupling for semi-trailer lever
a - transporting position
b - bearing hooks folded up; tow hook with carrier can be started

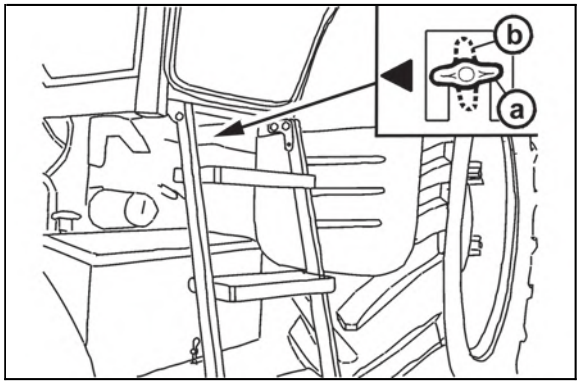


F74

Battery disconnector

Disconnect the battery immediately by battery disconnector which is placed on the right side of the tractor with long-term standstill, repairs or accident.

a - battery connected
b - battery disconnected



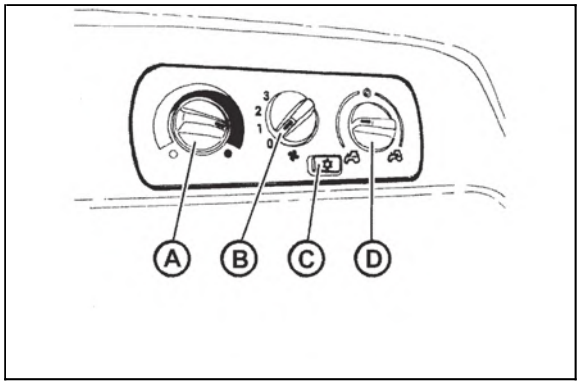
FH12N022

Attention! When the engine is switched off, the engine control unit remains active for about 1 minute because of storage of operation data. During this time the supply of current from the accumulator must not be interrupted. Do not disconnect the accumulator before this time expires.

Heating control panel, * air-condition

The control panel of the heating and of the air conditioning is located on the right side of the lower view of the cabin roof.

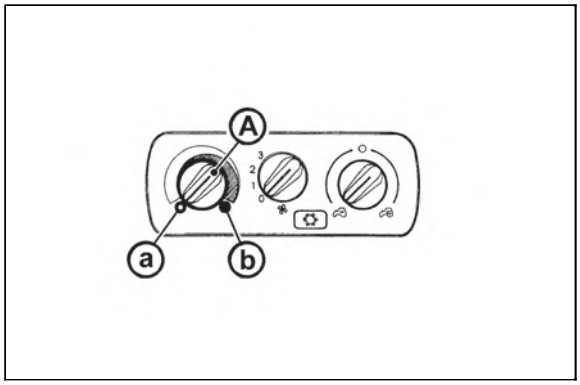
A - valve heating controller
B - fan controller
C - air conditioner switch
D - controller of air circulation in the cabin



F13BN009

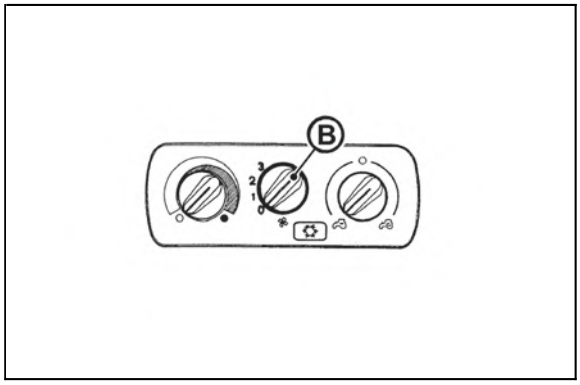
Heating valve control (A)

a - heating valve closed
b - heating valve opened



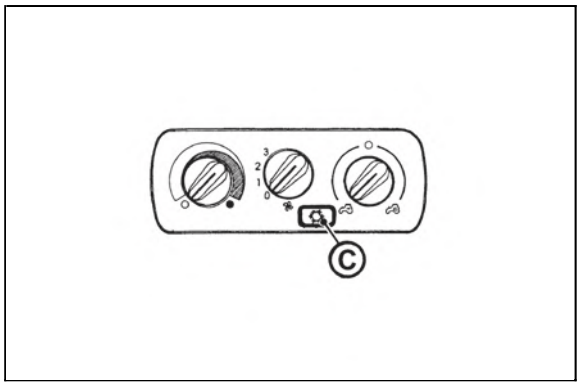
F_02_16_a

Ventilator control (B)
0 - ventilator off
1 - slowly run of ventilator
2 - medium run of ventilator
3 - maximum run of ventilator



F_02_16_b

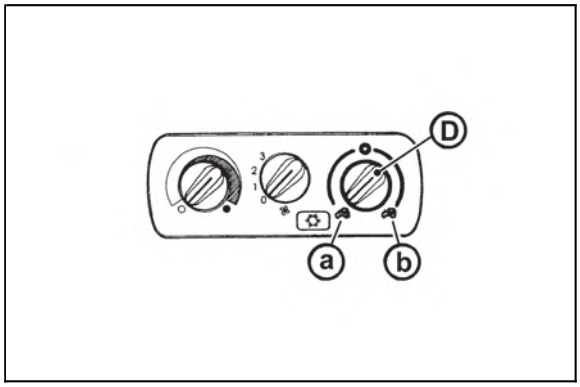
Switch air-condition (C)
Do engagement and disengagement of air-condition system function by switching the switch with a symbol of snow flake (C).
You will set the air-condition system going by pressing the switch (the symbol of snow flake lights up).
You will disengage the air-condition system by repeated press of switch (snow flake symbol switches off).



F_02_17a

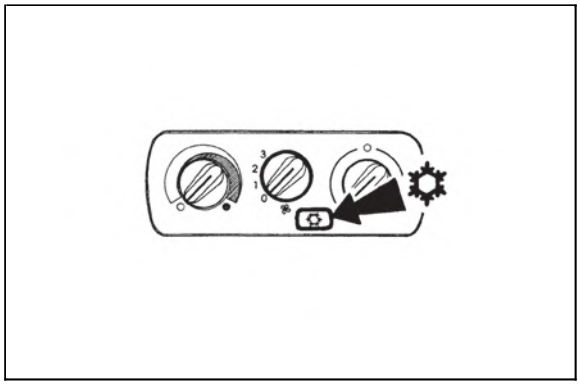
Air circulation in cabin control (D)
a - Surrounding (outside) air is sucked in through filters to cabin - sucking the air from cabin is closed.
b - Air is sucked in from the space of the cabin and again blown off to the cabin (inner air recirculation for fast adjustment of temperature in the cabin).

The intake of air from the outside of the cabin is completely locked and there is no surplus pressure in the cabin which would prevent pervasion of unfiltered air to the cabin! Do not use this position of the control with work of the tractor!



F_02_17b

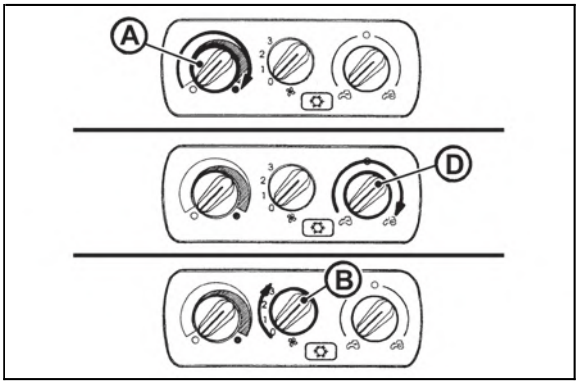
Proper function of the heating and air-condition system
It is necessary to create surplus pressure in the cabin for proper function of the heating or air-condition. We therefore recommend you to close all the windows and doors and tilting cover of the cabin.



F11N009

Fast heating of the cabin area

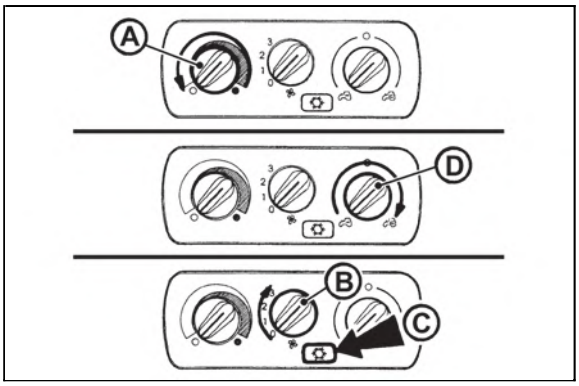
Proceed accordingly:
1 - Turn the heating valve control (A) to the position on the right (fully opened heating valve).
2 - Set air circulation in cabin control (D) to the position of inner circulation.
3 - Select applicable gear of the ventilator run (position 1, 2, 3) by ventilator control (B).
4 - Set the expiration under the requested angle to avoid direct fanning of the people in the cabin.
5 - After heating the space of the cabin, set the air circulation in the cabin control (D) to the position of sucking the outer air - see fig. F_02_17b position (a)



F_02_18a

Fast cooling of the space of the cabin

Proceed accordingly:
1 - Switch the heating valve control lever (A) to the position to the left
2 - Set the air circulation in the cabin lever (D) to the position of outer air sucking
3 - Select an applicable gear of the ventilator run (position 1, 2, 3) by ventilator control (B)
4 - Switch the air-condition system by a switch (C)
5 - Set expiration under the requested angle so that direct fanning of people in the cabin does not occur (the possibility of illness due tointensive cooling of parts of body).

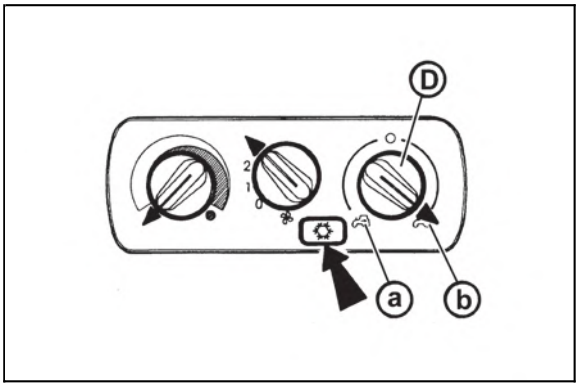


F_02_18

Operation of heating or air-condition with tractor´s work

With engaged inner recirculation of air is the inflow of fresh air closed and there is foul air in the space of the cabin by operator. This state can cause the feeling of fatigue and there can also be penetration of dust to the cabin because of the loss of surplus pressure.
Note: Set the control (D) according to individual requirements on temperature to the position between (a) and (b) so that the ventilator sucks the air from the outside of the cabin through filters, when working.

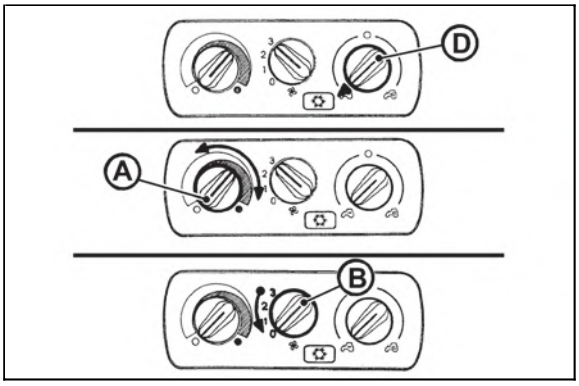
When spraying pesticides and using the heating filter with active carbon, the recirculation controller should be in position 'air is drawn into from the outside' and the fan controller should be in the position 'fan maximum work' to create overpressure in the cabin.



F_02_19

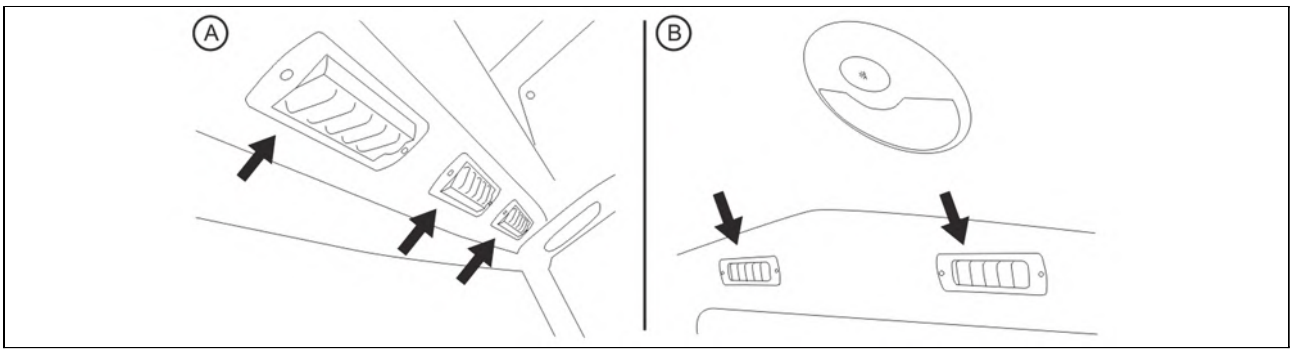
Immediately after cooling the cabin

Immediately after cooling the cabin and lowering the inner temperature on the required values, we recommend the following:
- Switch over the control of air circulation (D) from position (b - air re-circulation) to position (a - outer air suction)
- Do the continuous regulation of the air temperature with air condition on by opening the heating valve (A). The air entering the cabin from expiration is not so intensively dried with this setting.
- Continuous temperature control with air-condition on can be also done by lowering the output of ventilator by switching the control (B) to position 1 or 2.



F_02_20

Air-condition and heating registers (A)

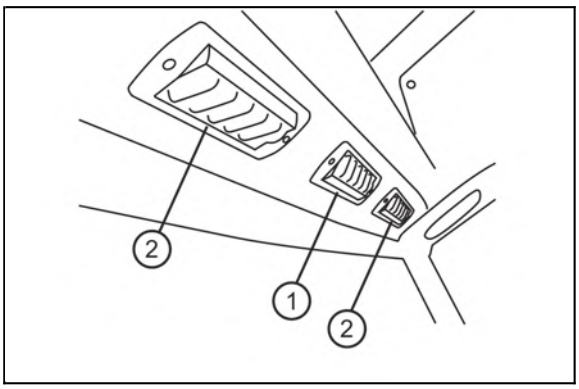


F13BN010

Positionable heating and * air-condition registers, front (A), rear (B).

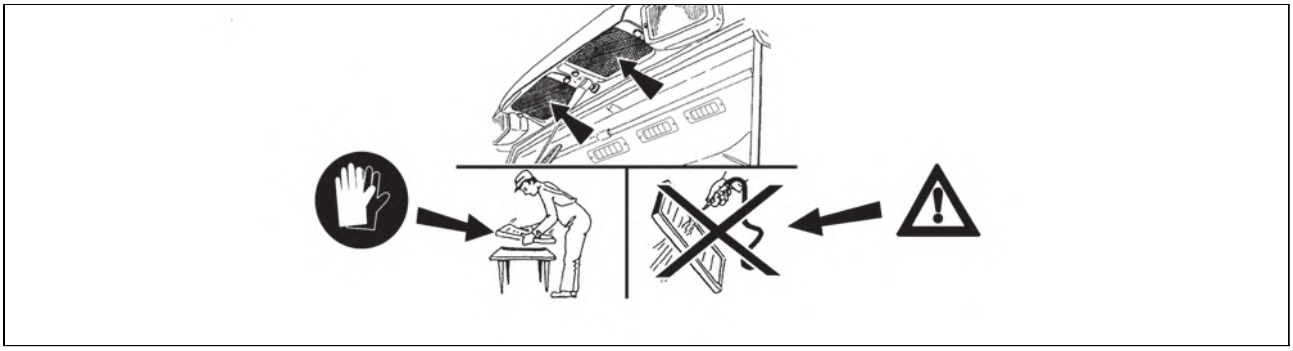
Front windshield (B) defrosting

To ensure quick defrosting of the front windshield direct the central heating outlets (1) under the angle of approx. 45° towards the windshield. Direct the side outlets (2) under the angle of approx. 45° to the cab corners. After defrosting of the front windshield direct the side outlets to the side glasses of the doors as necessary and gradually defrost them. After defrosting direct the outlets in such a way that the air should not be blown directly to the driver, but down to the driver's legs.



F13BN011

***Air filter with active carbon**



F13BN015

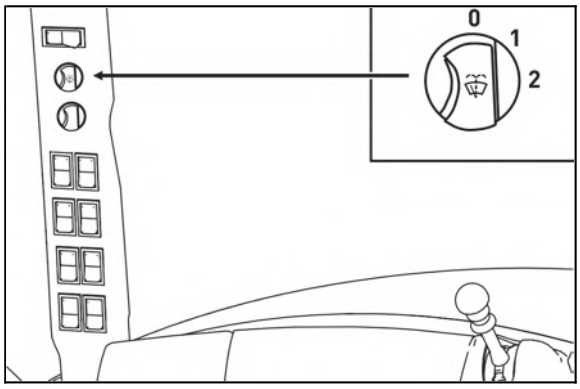
Active carbon filters are installed in the placed of standard dust filter and the replacement is done in the same way as with standard filters. Filter must be inserted with the white side to the grid. Assembly instructions are found in the chapter 'Maintenance instructions'.
Filter is used only when spraying pesticides, then it must be replaced back by a paper filter because the flying dust would clog the carbon filter very fast.
The recirculation control must be in the position 'air is sucked from the outside'.
Ventilator control must be in the position 'maximum ventilator run'.

WARNING: filter does not provide full protection against toxic substances
- Wear protective gloves when manipulating with the filter.
- Do not clean the filter and do not blow through with compressed air.

DANGER: Replace the active carbon filter every 200 hours or 36 months (date of production is given on the filter). If you happen to smell pesticides in the cabin, replace the filter immediately and have the sealing of the cabin checked. Used filters must be damaged in specialized collection centres.

When spraying pesticides and using heating filters with active carbon, the recirculation control must be in the position of 'air sucked from the outside' and the ventilator control 'maximum ventilator run' for creating surplus pressure in the cabin.

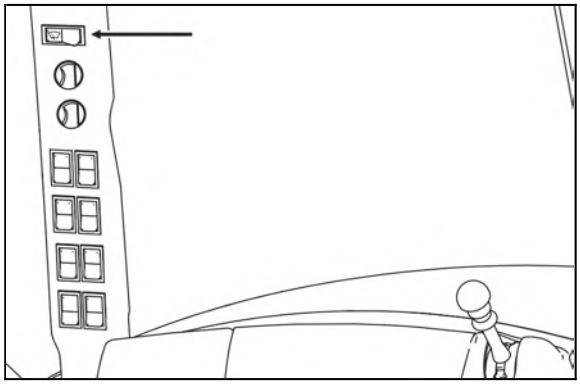
Wiper and washer of the front window
The switch of the front wiper and control of the front washer are located on the right column of the cabin.
The double-speed engine of the front wiper is controlled by the two-position switch of the front wiper.
The windshield washer is activated after pressing the switch of the front double-speed wiper located on the right column of the cabin. The maximum time of continuous operation of the washer pump is 20 s.
When the washer is used, the windshield is automatically wiped by the wiper. The number of wipings depends on the operation time of the washer.



C15N048

Front wiper speed switch

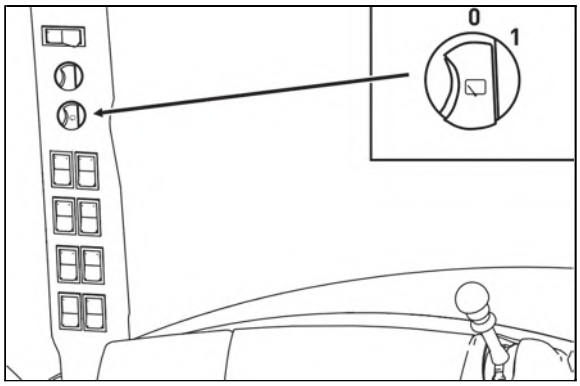
The front wiper speed switch is turned on using the switch located on the right column of the cabin.
Setting the wiper cycle period:
Turn on the speed switch, after the front window has been wiped, turn off the speed switch, wait the required period between wipes and turn on the speed switch.
The required gap between wipes is automatically set.



C15N049

Rear window wiper

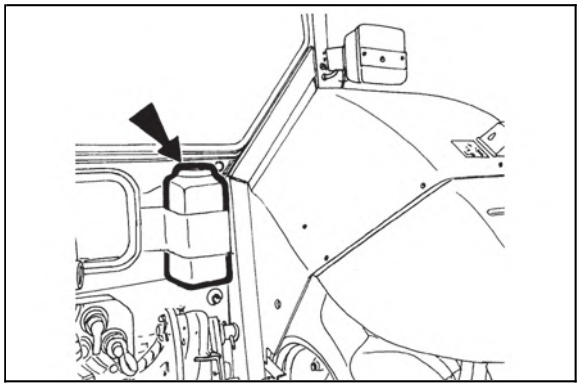
The switch of the rear wiper is located on the right column of the cabin.
The single-speed engine of the rear wiper is controlled by the single-position switch of the rear wiper.



C15N050

Windshield washer tank

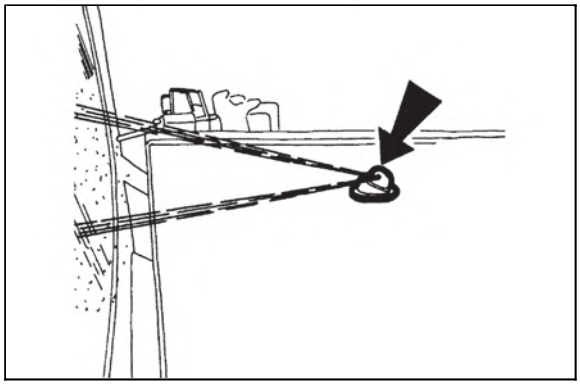
Windshield washer tank is placed on the rear wall of the cabin from the outside side.
The washer tank capacity is 2,5 litres.
In summer the reservoir should be filled with distilled water or mixture for washers.
Antifreeze mixture for washers must be used in winter season for filling the washer tank.



F_02_152a

Washer nozzle

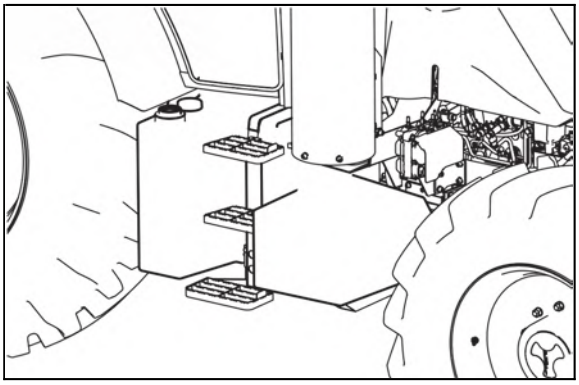
The washer nozzle is situated in the upper part of the hood and is adjustable by needle or steel wire of maximum diameter 0,8 mm.



C128

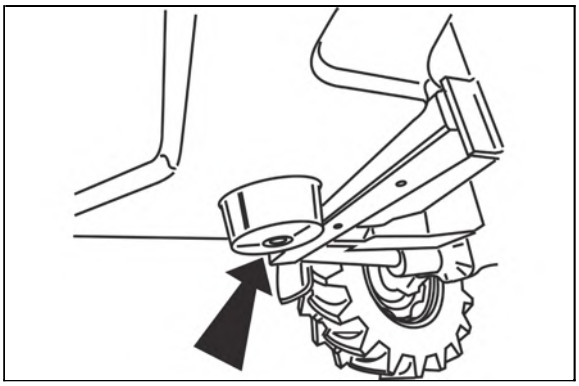
Fuel tank
A plastic tank of 300 litres volume is mounted as a standard for all types of tractors.

Do not step on the fuel tank!



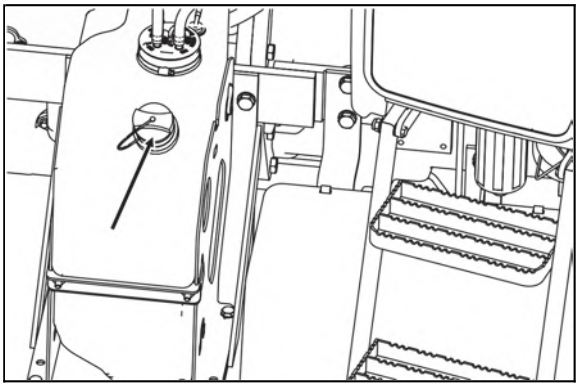
C15N133

Fuel tank drain plug
Plug for draining dirt and fuel off the fuel tank is in its bottom.



H800

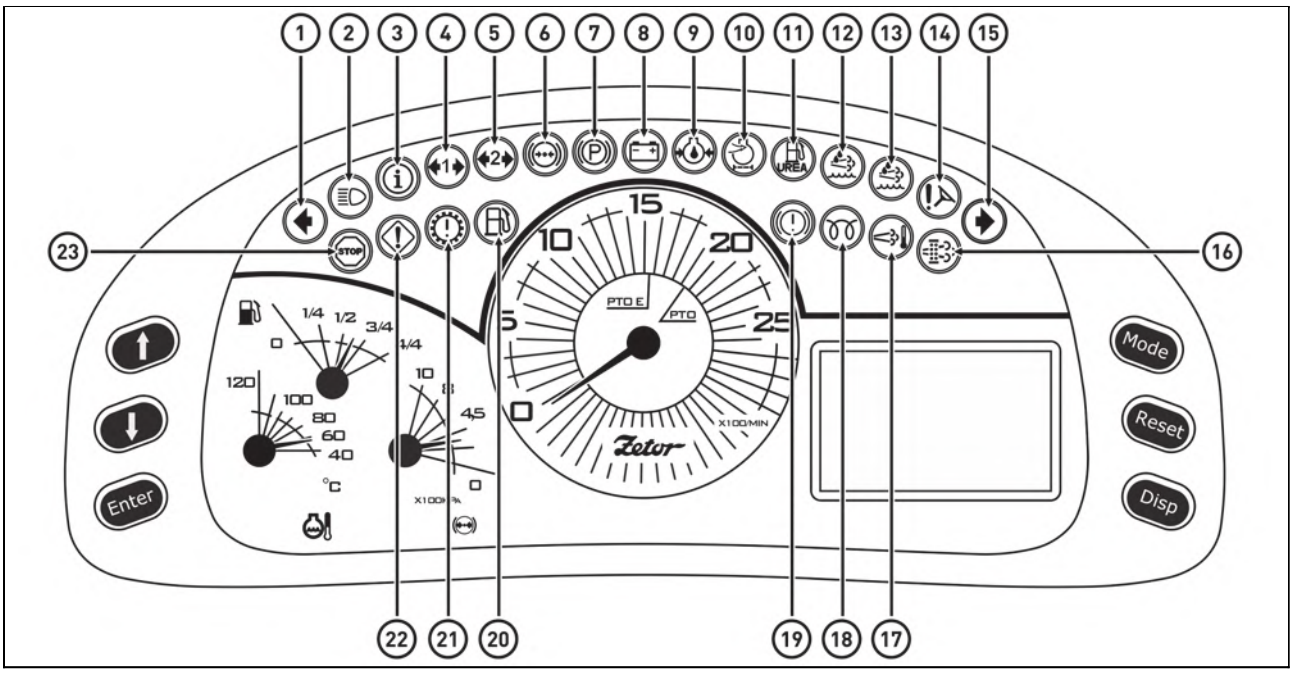
Urea tank
The tank for urea is located in the left side of the tractor and is equipped with the blue plug of the filling hole.
The tank volume is 32 litres.



C15N075

Add only urea!
Other media, even a small amount (e.g. diesel oil), lead to the destruction of the system.
If e.g. diesel oil was loaded and is present in the system, the whole system of urea injection must be replaced!
If the loaded medium (e.g. diesel oil) does not reach the guide or export pump I of the dosing module, all you have to do is to empty and thoroughly clean urea tanks.
Maintain cleanliness.

Instrument panel - signal lamps

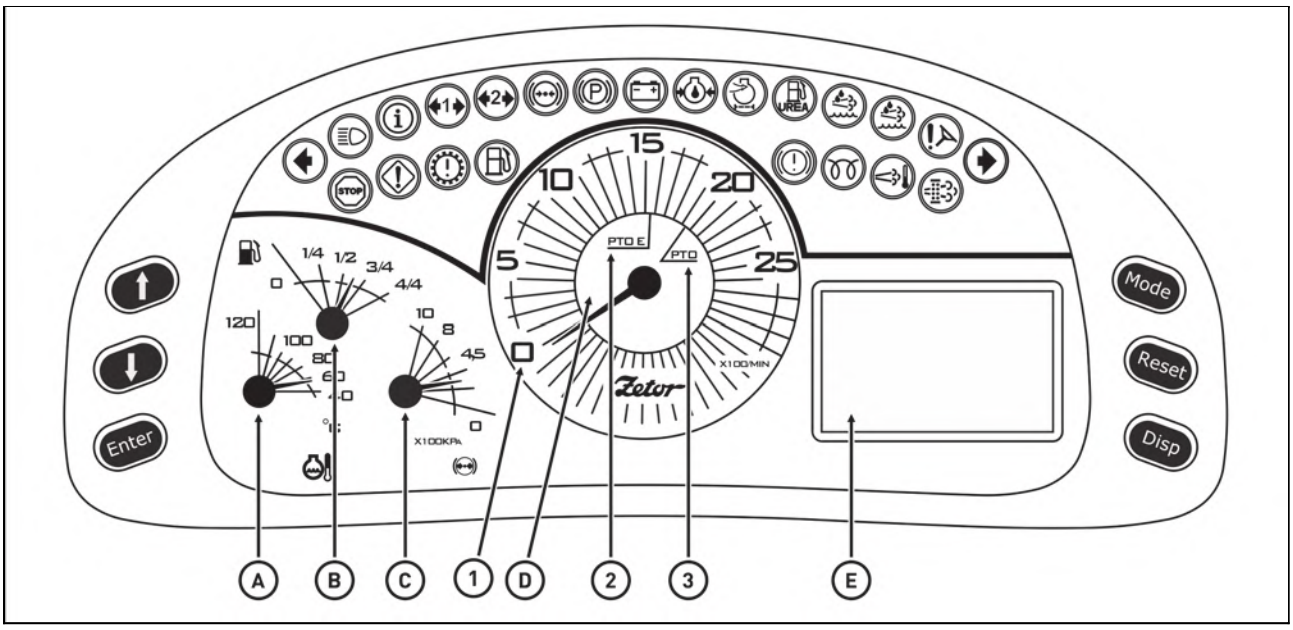


C15N093

When switching the key in the switch box from 0 position to 1 position, all signal lamps light up.

1 - Signal lamp of the tractor left direction lamps (green).
2 - High beam lights (blue). Lights up with high beam lights on.
3 - Operational protection signal lamp (blue). It is lit up when there is disagreement between operational values of the tractor groups.
4 - Signal lamp of direction lights of 1st trailer (green)
5 - Signal lamp of direction lights of 2nd trailer (green)
6 - Minimum air pressure in brake system signal lamp (red). It is lit up with the pressured drop for air brakes of trailer below the critical limit.
7 - Manual brake signal lamp (red). It is lit with engaged manual brake.
8 - Charging signal lamp (red). With engine run, lights up with charging failure. When the engine is at standstill, it must be lit.
9 - Lubrication signal lamp (red). With engine running lights up with the oil pressure drop below the critical limit.
10 - Air cleaner clogging signal lamp (yellow). Lights up with air filter clogging.
11 - Urea level signal lamp (red/orange)
12 - SCR signal lamp (red)
13 - SCR signal lamp (orange)
14 - Indicator (red) of a failure in the hydrostatic control system. It lights with engine operation in hydrostatic control failure. When the engine is at standstill, it must be lit.
15 - Signal lamp of tractor right direction lights (green).
16 - Not connected
17 - Not connected
18 - Engine ignition signal lamp (yellow). Signalizes the activity of the device for facilitation of engine start.
19 - Not connected
20 - Fuel level signal lamp (orange). It is on with the remaining 0 - 1/4 of the tank volume.
21 - Gearbox malfunction signal lamp (dark red)
22 - Warning signal lamp (orange)
23 - Stop signal lamp (red)

Instrument panel - instruments

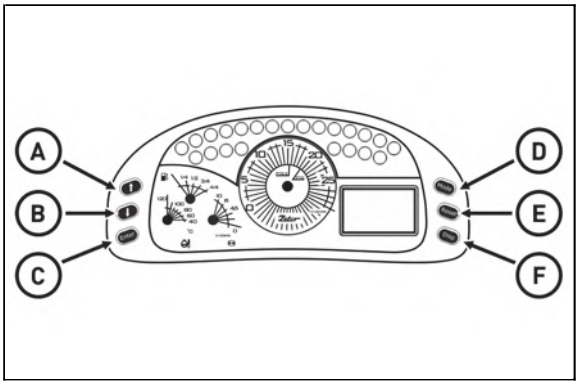


C15N094

A - coolant thermometer
B - fuel gauge
C - air pressure gauge
D - speedometer
1. Engine revolutions
2. Indicator of engine revolutions at which nominal revolutions of the rear PTO at economic revolutions of the rear PTO shaft are achieved.
3. Indicator of engine revolutions at which nominal revolutions of the rear PTO at standard revolutions of the rear PTO shaft are achieved.
E - display

Instrument panel - buttons

A - Rolling up in the menu button
B - Rolling down in the menu button
C - Entry to the menu button, confirming items on the menu
D - LCD backlight inversion button
E - Reset button hours of operation and km
F - Change of display button in the navigation menu

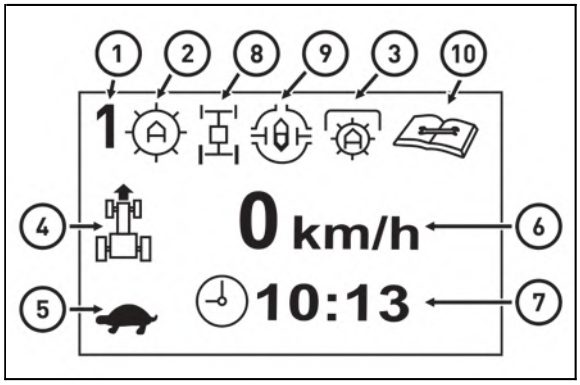


C15N041

Display description

The following values are displayed on the main display:
1 - shifted gear of multiplier of torque, according to shifted gear **1**, **2** or **3** is displayed
2 - switching the switch of torque multiplier preselection
3 - switching the function of rear PTO shaft automatic disengagement
4 - gear shifting lever position, reversing **F** driving forward, **N** neutral, **R** reversing

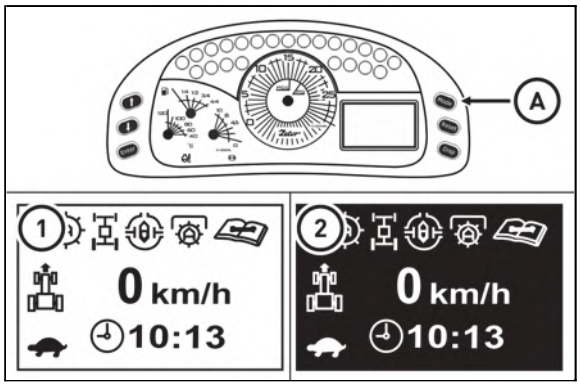
5 - road and reduced speeds shifting lever position, reduced speeds, neutral or road speeds
6 - main field of display
7 - secondary field of display
8 - engagement of front axle drive switch
9 - engagement of differential locks
10 - maintenance interval exceeded



C15N027

Change of the look of display

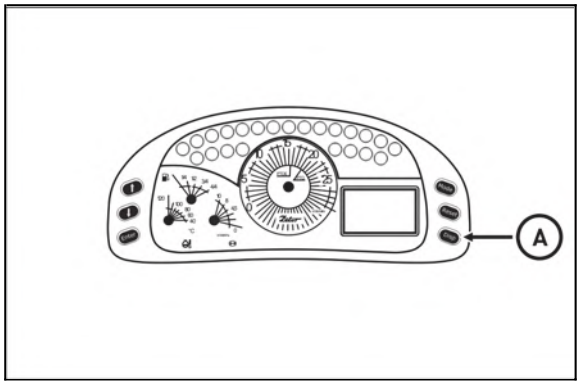
The change of look of display from display (1) to display (2) can be done by pressing a button (A).



C15N028

Display - change of display

By repeated pressing of button (A) you can click between individual displays of data on the display (so called screens).



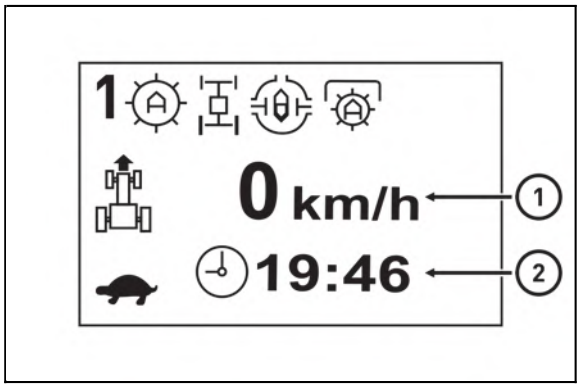
C15N029

When the key in the switch box is moved to position I, the home screen is displayed on the display.

C15N030

After about three seconds the main screen is displayed on the display.

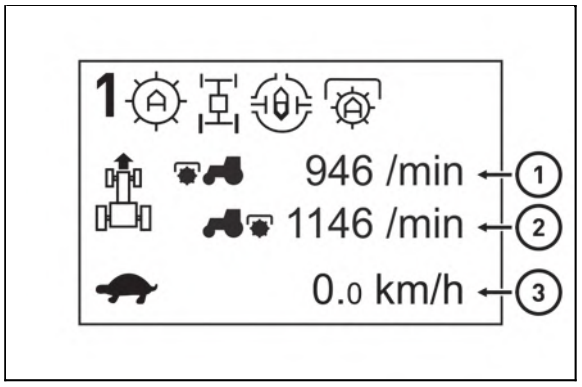
In the main field (1) the travel speed of the tractor is displayed. In the secondary field (2) the current time in 24-hour format is displayed.



C15N031

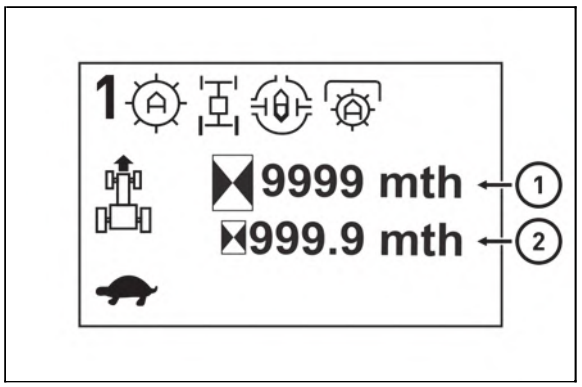
There are data regarding PTO shafts in this screen.

1. Front PTO shaft revolutions, if the shaft is activated.
2. Rear PTO shaft revolutions, when the shaft is switched on.
3. Tractor travel speed.



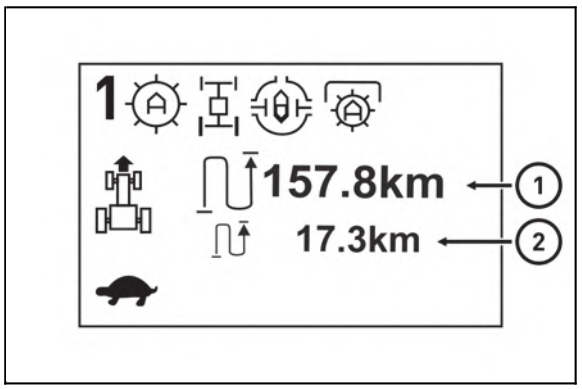
C15N032

In the main field (1) the total moto hours worked by the tractor are displayed.
In the secondary field (2) the total moto hours worked by the tractor from the last resetting of the data are displayed.



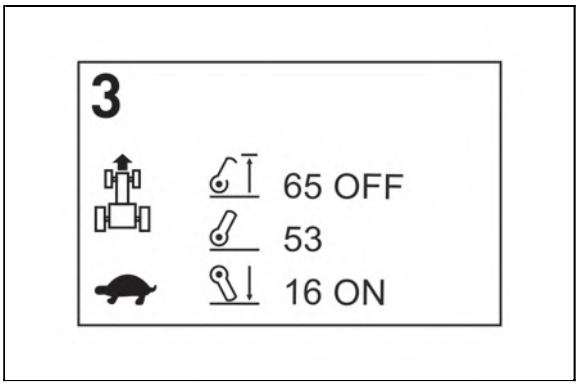
C15N033

In the main field (1) the total kilometres worked by the tractor are displayed.
In the secondary field (2) the number of kilometres travelled by the tractor from the last resetting of the data is displayed.



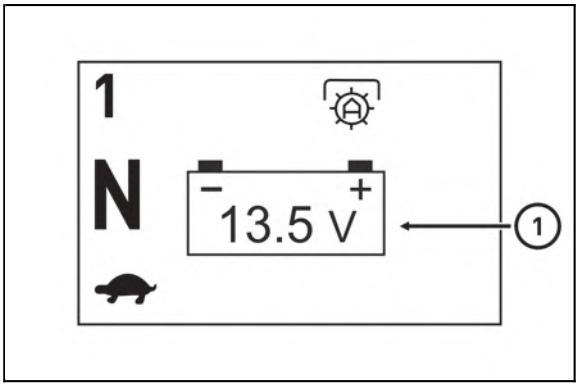
C15N034

There are data regarding the automatic switching off of the rear PTO shaft; more information is available in the chapter Power of Agricultural Machines.



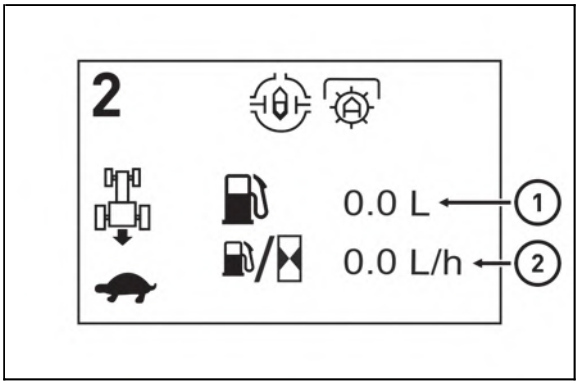
C15N035

In the main field (1) the voltage of the accumulator battery is displayed.



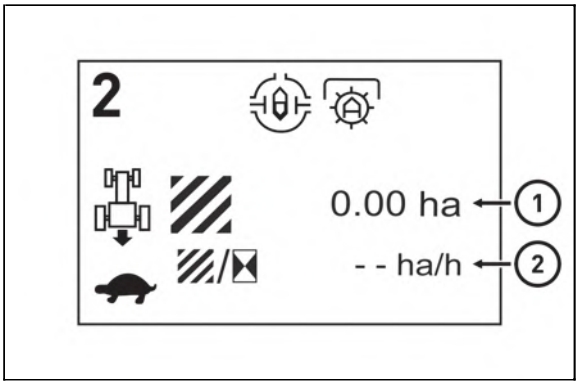
C15N036

In the main field (1) the total amount of the fuel consumed from the engine start is displayed. The entry is automatically cleared after two hours from the engine start. In the secondary field (2) the immediate consumption of the fuel is displayed. The entry is automatically cleared when the engine is switched off.



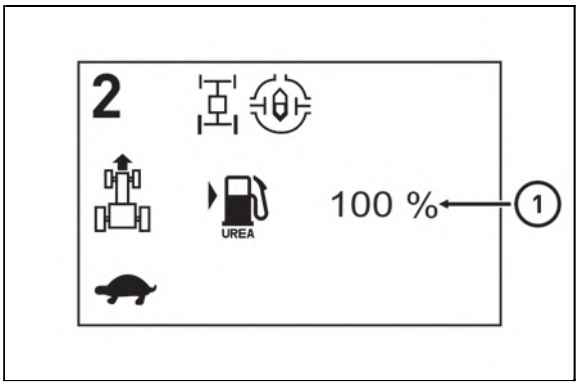
C15N037

In the main field (1) the processed area in hectares is displayed.
In the secondary field (2) the hourly output, i.e. the average of the processed area in hectares per hour, is displayed.



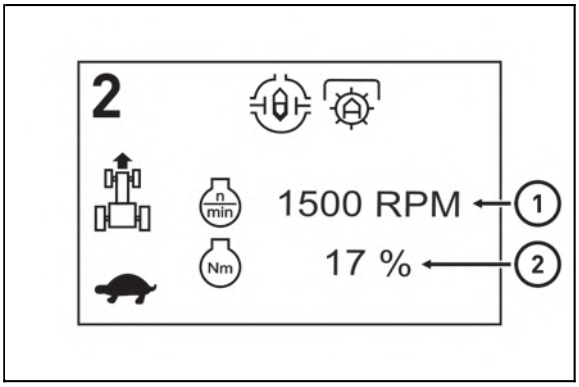
C15N038

In the main field (1) the amount of urea in the tank in the volume percentage of the tank is displayed.
More information in chapter System of Additional Treatment of Exhaust Gases.



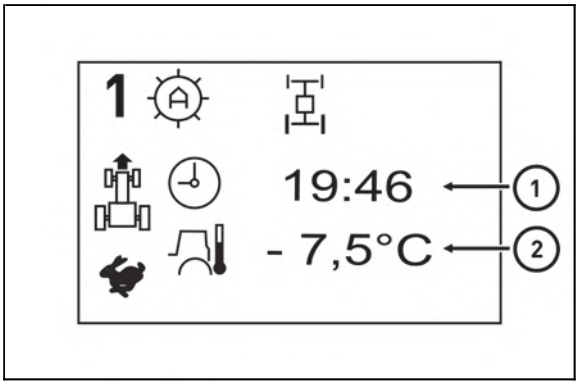
C15N039

In the main field (1) the number of revolutions of the engine per minute is displayed.
In the secondary field (2) the engine load in percentage is displayed.



C15N040

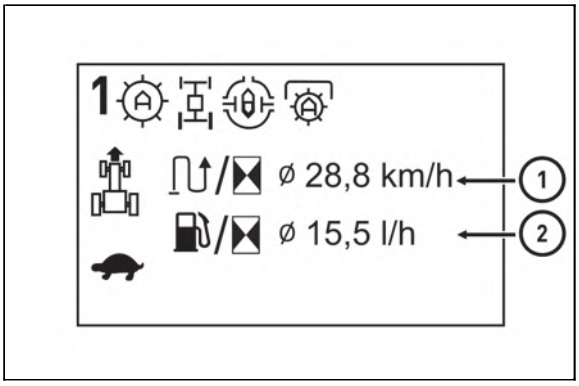
In the main field (1) the time is displayed.
In the secondary field (2) the outdoor temperature is displayed.



C15N095

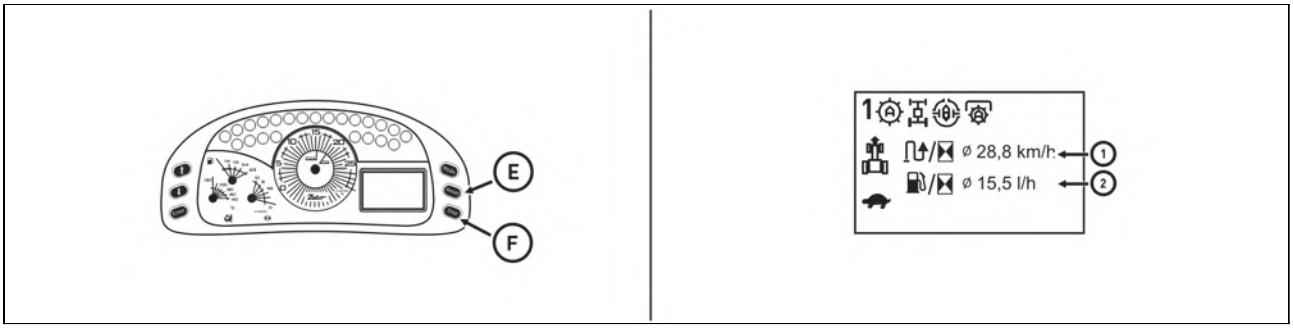
In the main field (1) the average speed of the tractor is displayed.
In the secondary field (2) the average consumption of the fuel is displayed.

The entries are automatically cleared after two hours from the engine shutdown.



C15N149

The average speed and the fuel consumption of the tractor



C15N153

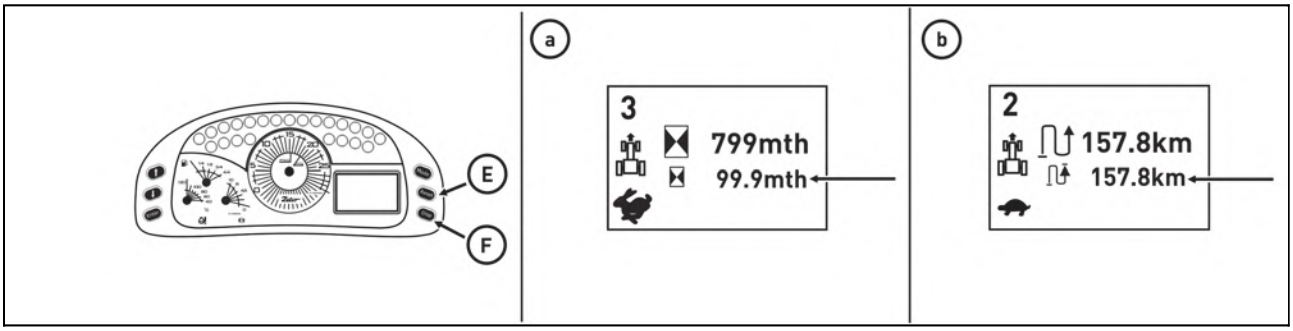
Average speed of the tractor
The average speed of the tractor (1) in km/h from the last reset of the data is displayed on the display.
If you want to determine the average speed for a certain period, you must reset (zero) the value at the beginning of the measurement.
After the reset, 0 is displayed during first 100 m on the display, then the value is updated every 10 s or 100 m of the distance travelled.

Average consumption of the fuel
The average consumption of the fuel (2) in litres per hour from the last reset of the data is displayed on the display (2). If you want to determine the average consumption for a certain period, you must reset (zero) the value at the beginning of the measurement. The value is updated every 10 s.

Manual zeroing (reset) of data
Except automatic zeroing of data, these entries can be zeroed manually.
For manual zeroing of data, the tractor must be with the engine not started and with the key of the switch box in the position I.
Select display of the corresponding main screen using the button (F).
Zero the entry by longer pressing of the button (E) (RESET).

Attention! Both entries are always zeroed simultaneously; a single entry cannot be zeroed.

Display - resetting data
The procedure for zeroing data in the secondary field at the main screens where the data can be zeroed is as follows:
1 - Select display of the corresponding main screen using button (F).
2 - Zero the entry by longer pressing of button (E) (RESET).

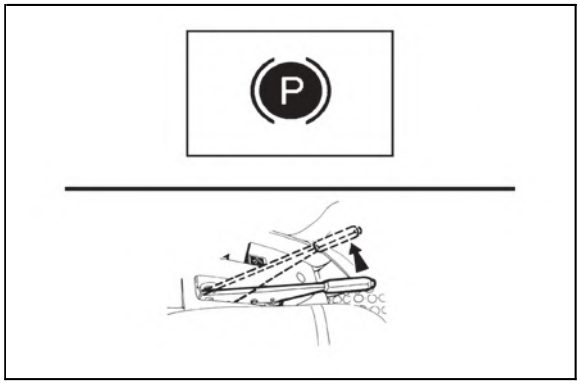


C15N055

Display - manual brake

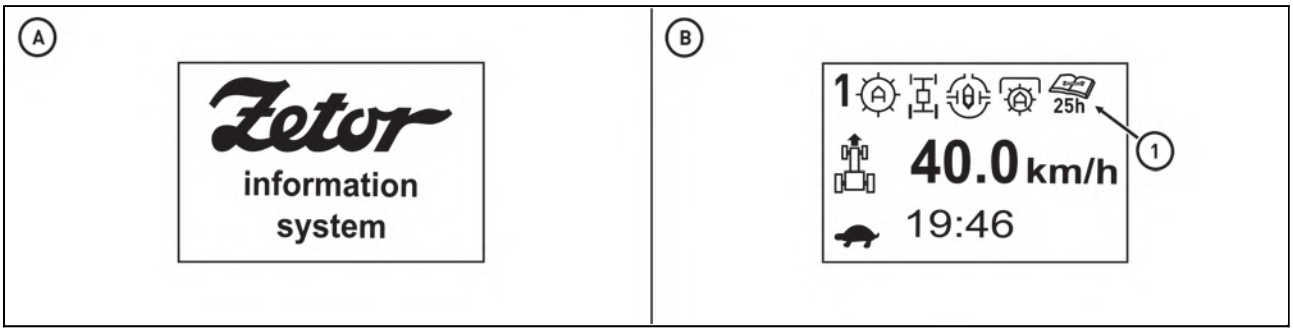
If the tractor is not braked by a manual brake, a warning is displayed on a display (letter **P** in a circle) and at the same time a sound signal is heard. See the chapter "Driving operation" for more.

Brake the tractor by a manual brake.



FH12N039

Display - indicator of service inspection intervals

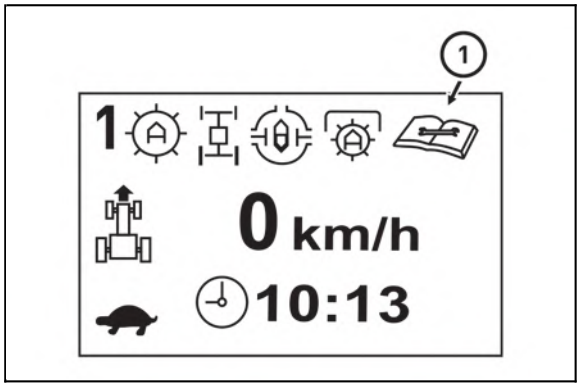


C15N042

The warning regarding an approaching maintenance date (service interval) is displayed if there is less than 30 operating hours remaining to the planned maintenance.
When the key in the switch box is moved to position I, the home screen is displayed on the display (A).
After several seconds the warning regarding an approaching maintenance (B) with the number of operating hours of the tractor (1) remaining to the maintenance date is displayed on the display.

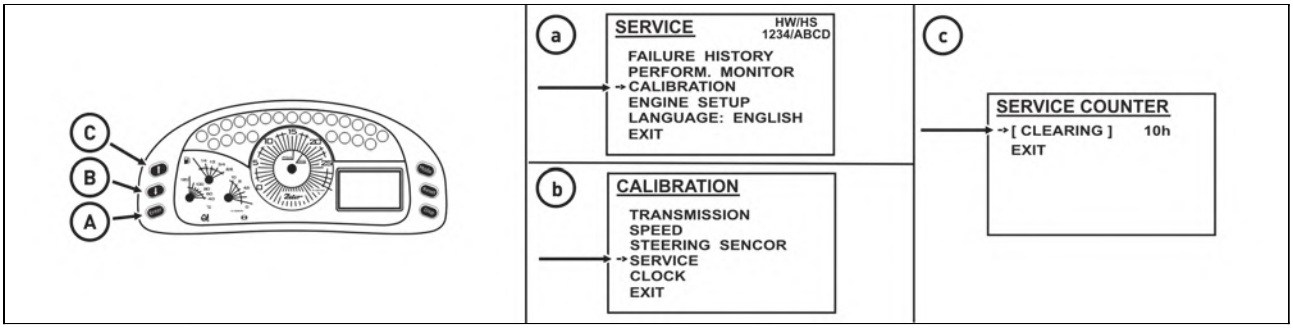
Exceeding the service interval

In case of exceeding the service interval, the maintenance alert is displayed on the display when the key in the switch box is moved to position I.
When the display is switched to the main screen using button (F) (DISP), the symbol (1) remains on all displays of the main screens.



C15N044

Zeroing (reset) of the indicator of service inspection intervals

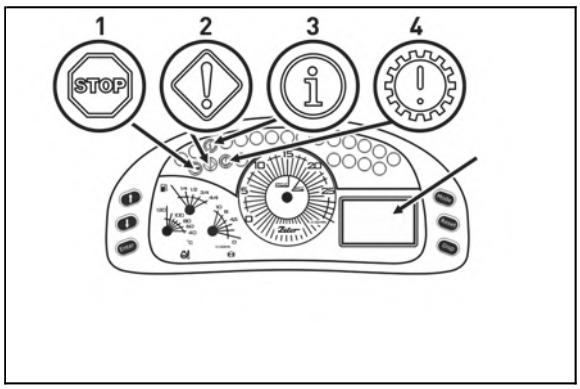


C15N152

When the maintenance was performed, zero (reset) the indicator of service inspection intervals.

Enter the service menu by longer pressing of the button (**A**).
Use the buttons (**B**) and (**C**) to select the item calibration indicated with the arrow (**a**). By pressing the button (**A**) you enter the calibration menu.
Use the buttons (**B**) and (**C**) to select the item service indicated with the arrow (**b**). By pressing the button (**A**) you enter the service menu.
Use the buttons (**B**) and (**C**) to select the item **[clearing]** indicated with the arrow (**c**). By pressing the button (**A**) reset the indicator of the service interval.
To return to the service menu, use the buttons (**B**) and (**C**) to select the item **EXIT** and press the button (**A**) (Enter).

Error signalling
Errors arising during tractor operation are indicated by switching the corresponding signal lamp, acoustic signal and error message in the instrument panel display.
If the error is indicated, the signal lamp still glows, even though the display is switched to the next display.

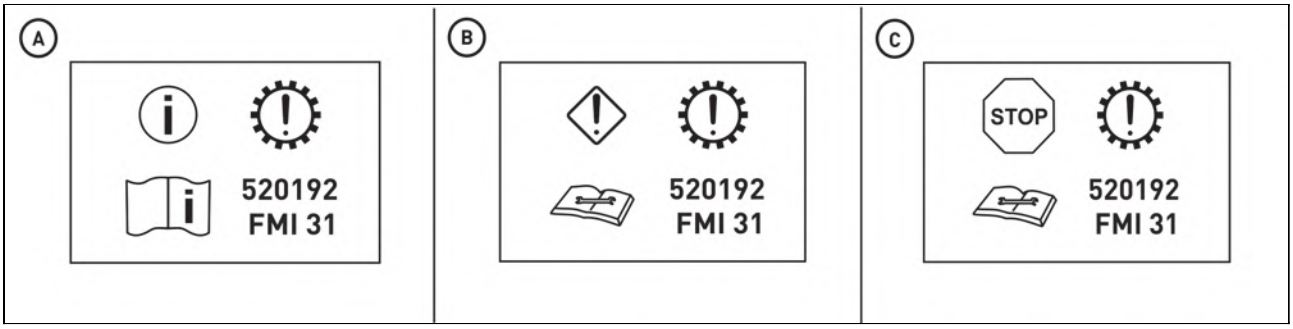


C15N111

If the error is not eliminated or the indicated state has not returned to a normal state:
the corresponding signal lamp glows
when the tractor is switched off, the key in the switch box is moved to position I and then the engine is started, the corresponding signal lamp is switched on again and the error message runs through the display.

1 - The signal lamp of a serious defect of the system (red).
2 - The signal lamp of a less serious defect of the system (orange).
3 - Operational protection signal lamp (blue).
4 - Gearbox malfunction signal lamp (dark red). It glows together with any of the signal lamps indicating errors, as long as the error relates to the gearbox or the system of travelling clutches.
During tractor operation, three types of error messages may appear in the display.

Display - error messages



C15N057

During tractor operation, three types of error messages may appear in the display.

A. - Warning of operational protection,
that a small deviation from the set values or error by the operator occurred.
The warning is displayed in the display for about 10 seconds and then the display is switched to the previously set main screen.

The state is indicated by the signal lamp 
The tractor can be used without limitation.

B. - Less serious defects of the system
If a less serious defect of the system occurs, the defect number is displayed in the display for about 10 seconds. Then the display of the defect is minimized into the main field.
All the tractor's functions remain active; it can happen that some of the functions is not undepreciated.

The state is indicated by the signal lamp 

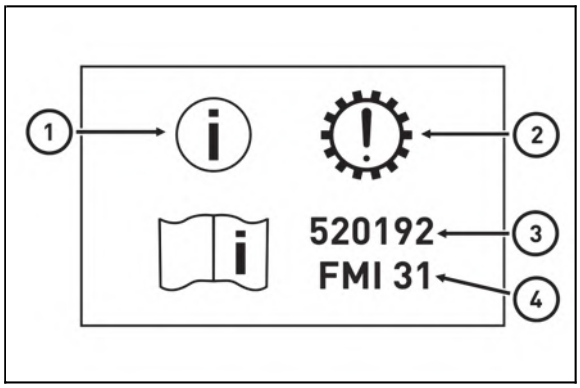
 ***If this situation occurs, finish the work and contact the service centre.***

C. - Serious defects of the system
If a serious defect occurs, the display is backlighted in red there is a label **STOP**. The display cannot be switched to another screen.

The state is indicated by the signal lamp 

 ***If this situation occurs, stop the tractor immediately and contact the service centre.***

Description of the display of error messages
1 - The symbol of the defect significance.
2 - Node of the tractor where the defect appeared.
3 - Main display field - defect code.
4 - Secondary display field - defect specification.



C15N056

DASHBOARD

Symbols of tractor nodes

Engine

Gears and travelling clutches

Spring-loaded front driving axle

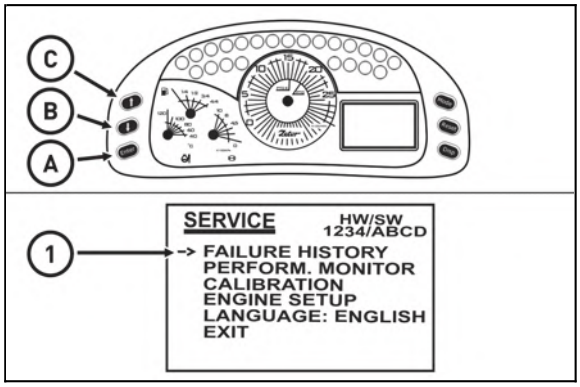
Hydraulic systems

System of treatment of exhaust gases

Systems facilitating start of the engine

Display - service menu

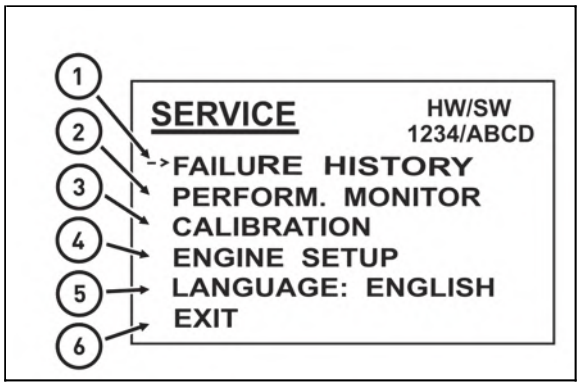
Entry to service menu:
You will enter the service menu by a longer pressing of (A) button.
The selection of items to be done by (B) and (C) buttons.
The selected item is marked by an arrow (1).
Exit from service menu:
By buttons (B) and (C), select an item **EXIT** and press (A) button.



C15N096

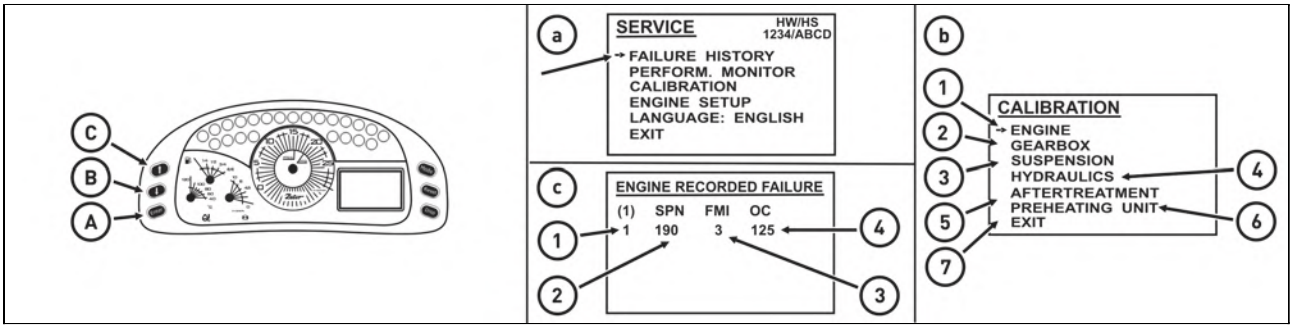
Service menu

Service menu
1 - Failures history, for servicing purposes
2 - Machined area
3 - Calibration
4 - Language selection
5 - Exit service menu



C15N097

Display - history of defects



C15N106

a - enter the service menu
use buttons (A) and (B) to select the item listing of defects and press button (C) (ENTER)
b - selection of tractor nodes
use buttons (A) and (B) to select the tractor node from which the listing of defects is needed and press button (C) (ENTER)

1 - engine
2 - gears and travelling clutches
3 - spring-loaded front driving axle
4 - hydraulic systems
5 - system of treatment of exhaust gases
6 - system facilitating start of the engine
7 - return to the previous screen

c - the listing of defects of the selected tractor node; use buttons (A) and (B) to scroll between individuals defects

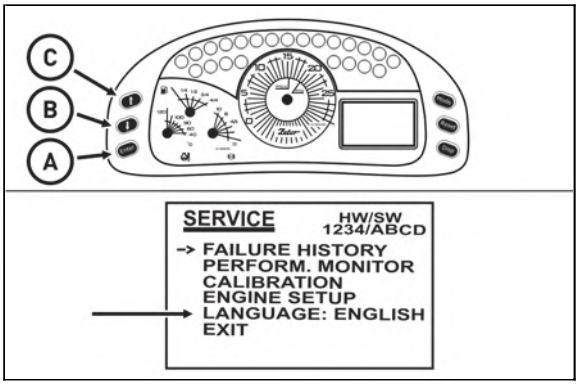
1 - sequence number
2 - defect code
3 - code of defect specification
4 - number of defect repetitions

Return to the main screen by pressing button (C) (ENTER)

Display - setting language mutation

Enter the service menu:
Use buttons (B) and (C) to select the item **LANGUAGE** and press button (A) (ENTER).By successive pressing of button (A) (ENTER), available language mutations are successively displayed. When reaching the required language mutation, exit the service menu.
Use buttons (B) and (C) to select the item **EXIT** and press button (A) (Enter).The instrument panel is switched to the selected language mutation.

If you want to change metric units to Anglo-Saxon, select the language mutation ENG. IMP.

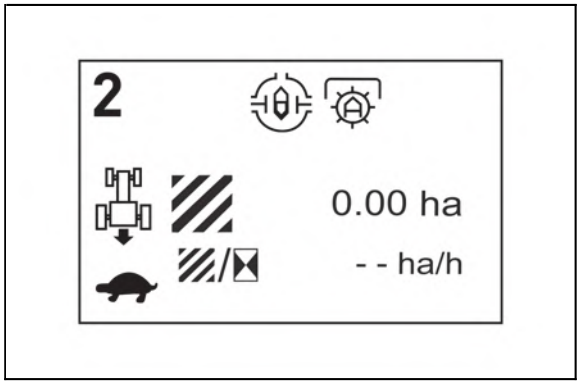


C15N098

Display - machined area

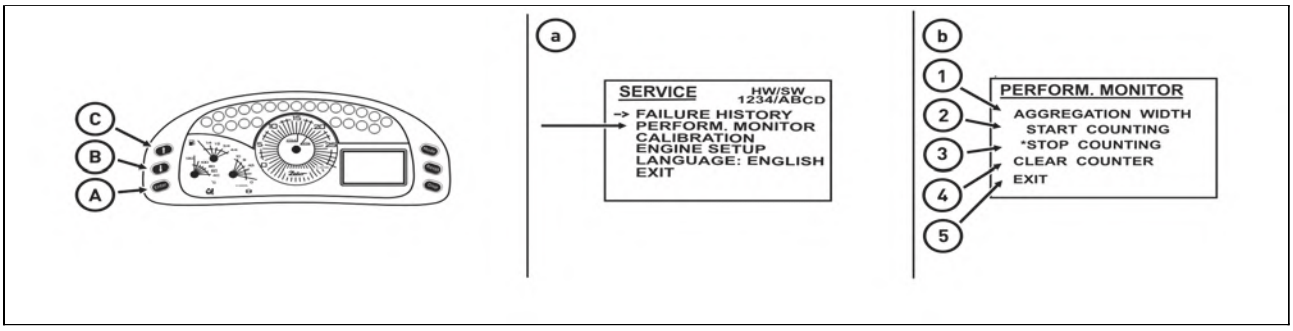
Machined area displays machined area in hectares in the main displaying array, in the secondary displaying array mean in hectares per hour.

It is necessary to set the width of the machined area (i.e. working width of the tools) for the correct calculation of machined area.



C15N099

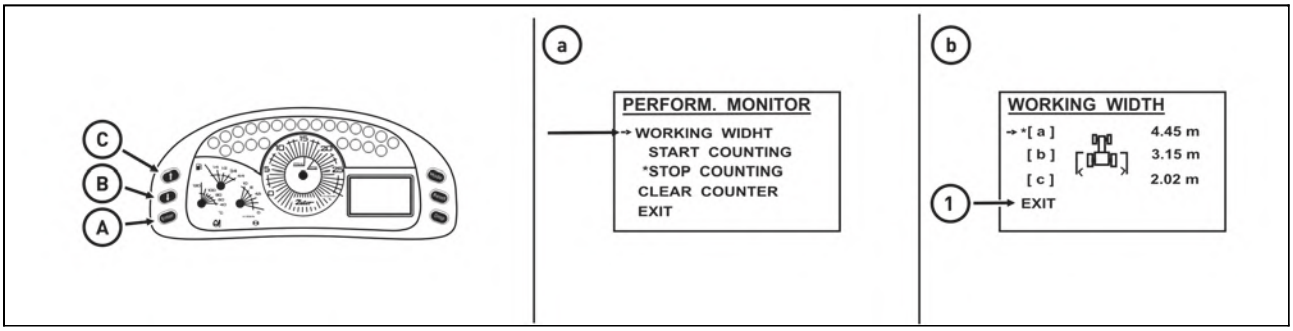
Machined area menu



C15N100

Enter service menu by pressing (**A**) for a longer period of time. Select an item machined area marked with an arrow (**a**) by (**B**) and (**C**) buttons. By pressing (**A**) button, you will enter the machined area (**b**) menu.
Machined area (**b**) menu:
(**1**) - setting the width of machined area (i.e. working width of tools)
(**2**) - start of machined area record
(**3**) - end of machined area record
(**4**) - erase recorded area from ECU
(**5**) - return to service menu

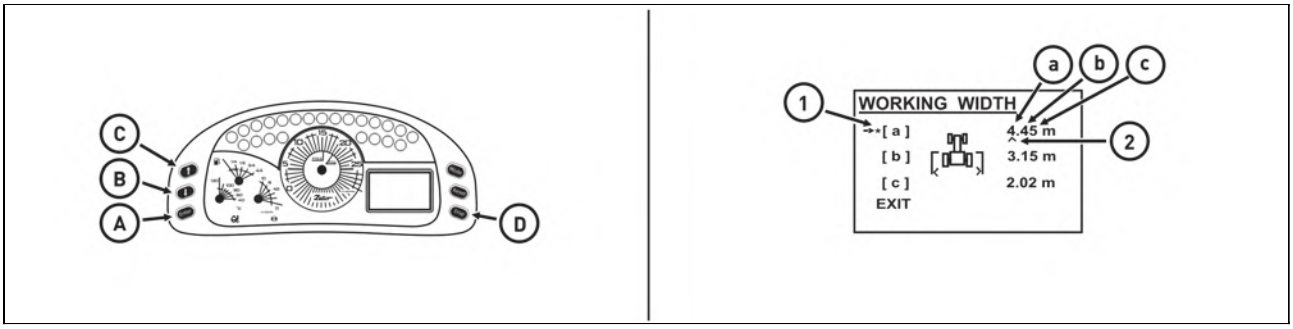
Machined area width



c15n104

Enter machined area menu. Select the item aggregation width marked with an arrow (**a**) by (**B**) and (**C**) buttons and by pressing the button (**A**) shift to the menu aggregation width. There are three preset values of aggregation width in aggregation width menu. Select the required aggregation width by (**B**) and (**C**) buttons and confirm by pressing (**A**) button. Select an item (**1**) by (**B**) and (**C**) buttons and press (**A**) button for return to machined area (**a**) menu.

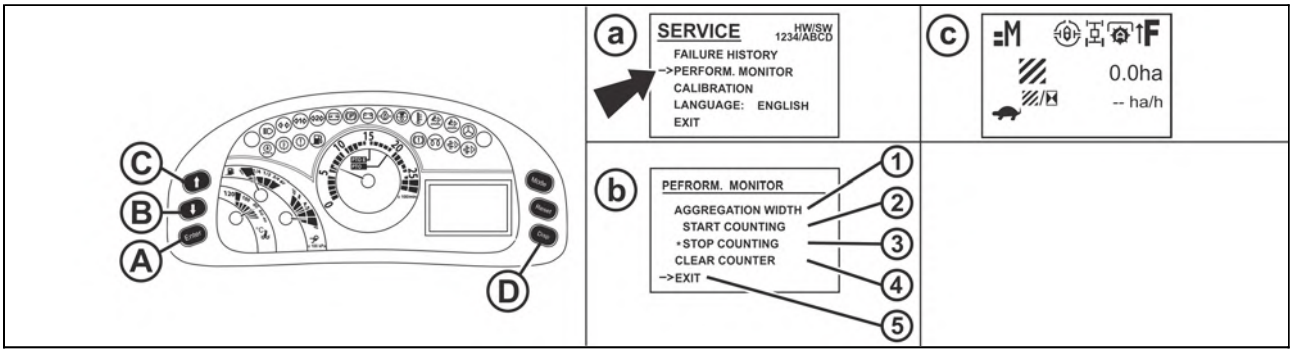
Setting of the user-defined width of aggregation



C15N105

In the aggregation width menu, each of the three preset values of the aggregation width can be changed.
Enter the aggregation width menu, use buttons (**B**) and (**C**) to select the value that you want to change and press button (A) (ENTER). The value is indicated with asterisk (1).
By pressing of button (D) (DISP), value (a) is indicated with arrow (2); you can change this value using buttons (**B**) and (**C**).
By another pressing of button (D) (DISP), value (b) is indicated with arrow (2); you can change this value using buttons (**B**) and (**C**).
By another pressing of button (D) (DISP), value (c) is indicated with arrow (2); you can change this value using buttons (**B**) and (**C**).
By another pressing of button (D) (DISP) you can exit setting.
To return to the processed area menu, select the item exit using buttons (**B**) and (**C**) and press button (**A**) (ENTER).

Machined area record



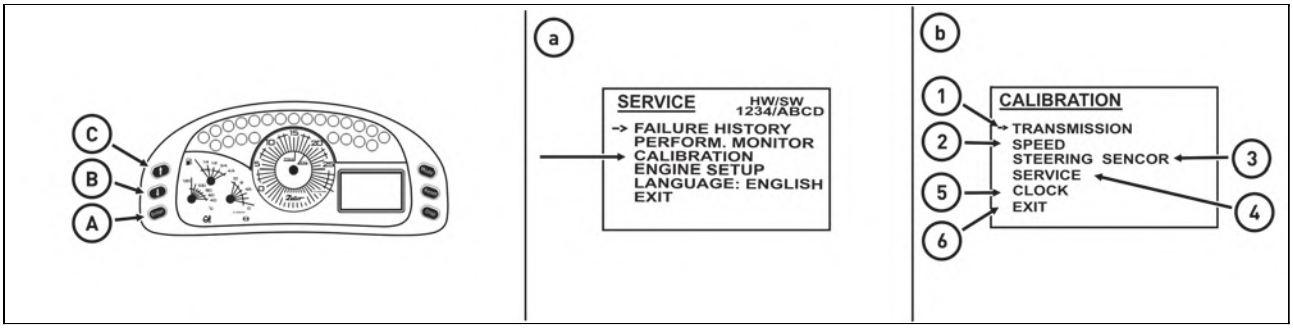
FHD14N070

Enter service menu (a) by longer pressing the (**A**) button. Select the item machined area marked with an arrow by (**B**) and (**C**) buttons. By pressing the(**A**) button, you will enter the machined area menu (**b**).
Select an item (1) by (**B**) and (**C**) buttons and in the aggregation width menu select a requested value and return to the machined area(**b**) menu.
Select an item (2) by (**B**) and (**C**) button and by pressing the button (**A**) start recording of machined area and exit service menu. From this time on, if the tractor is moving, machined area will be recorded depending on the aggregation width and the travelled distance.

The record of the machined area will end if you select item (**3**) in the machined area menu(**b**) and press (A) button.
If you start the record of machined area again, the newly read values will be added to the already saved values.
After annulling the values in the main and secondary array, select an item (**4**) in the menu by (**B**) and (**C**) buttons in the machined area menu(**b**) and by pressing the (**A**) button, confirm the selection. After returning to the main screen Machined area, there will not be any data in the main and secondary array of the display (**c**).

Overridden values cannot be renewed in any way.

Display - setting and calibration



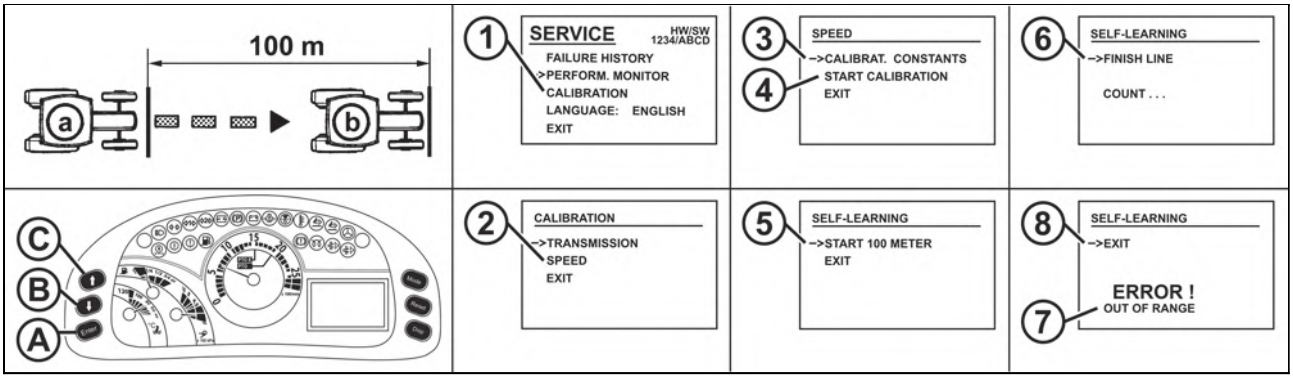
C15N060

Enter the service menu by a longer pressing of button (**A**):
a - Use buttons (**B**) and (**C**) to select the item calibration indicated with arrow.

b - By pressing button (**A**) you enter the calibration menu.

1 - calibration of travelling clutches
2 - calibration of travel speed
3 - setting of steering sensors of the front axle
4 - service setting
5 - setting of hours
6 - return to the main screen

Travel speed calibration

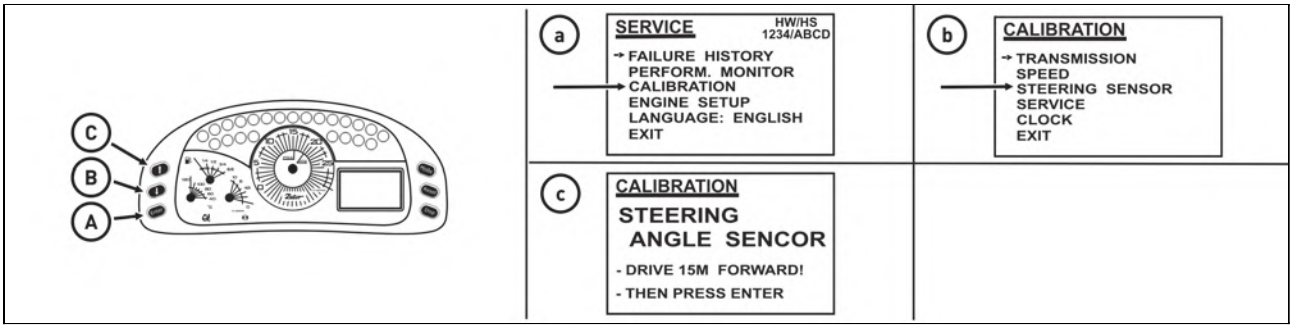


FHD14N072

Dashboard is calibrated after assembly at a production plant.
Do repeated calibration in the following cases:
- after a significant wear of tyres
- when mounting new tyres
- when replacing dashboard

Calibration procedure
- at a suitable place, mark a track of 100 m at length
- inflate tyres of tractor on the prescribed pressure, see tables of this Instructions manual
- start the engine
- move the tractor to the beginning of the 100-metre track
- enter the service menu by pressing **(A)** button
- select the item (**1**) by (**B**) and (**C**) buttons and by pressing (**A**) button go to calibration menu
- select the item (**2**) by (**B**) and (**C**) buttons and move to the speed menu by pressing (**A**) button
- select an item (**4**) by (**B**) and (**C**) buttons and by pressing the (**A**) button, move to the following menu. The item (**3**) serves only for setting the travelling speed in the production plant
- select an item (**5**) by (**B**) and (**C**) buttons and confirm with the (**A**) button
- start the tractor with a stable speed of approximately 10 km/h
- after travelling the whole distance of 100 m stop the tractor at the marked end of the track (**b**)
- select the item (**6**) by pressing the buttons (**B**) and (**C**) and by pressing (**A**) button, save the newly read values and you will return to initial screen
- if calibration of travelling speed did not run properly, error report will appear on the display (**7**), after confirming the item (**8**) you will return to initial screen by pressing the (**A**) button without saving the new values

Setting of steering sensors of the front axle

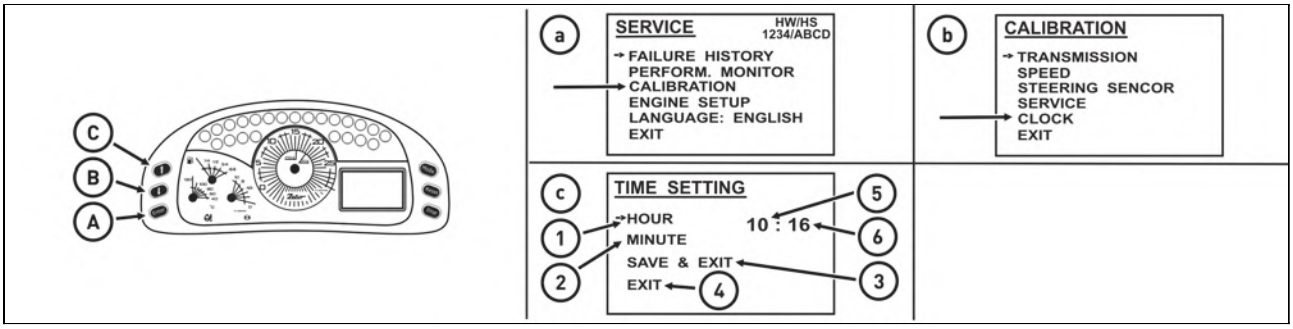


C15N109

Setting of steering sensors of the front axle
- During any interference in geometry of the front axle
- During replacement of sensors of the front axle
- During replacement of the instrument panel
- During replacement of the front axle

Calibration procedure
- Indicate the track of the length of 15 m on suitable place
- Inflate the tractor tyres to the required pressure
- Start the engine
- Park the tractor at the start of the track
- By pressing button (A) enter the service menu
- Use buttons (B) and (C) to select the item CALIBRATION indicated with arrow (a) and by pressing button (A) you enter the calibration menu
- Use buttons (B) and (C) to select the item SETTING OF STEERING SENSORS OF THE FRONT AXLE indicated with arrow (b) and by pressing button (A) you enter another screen
- Drive the tractor straight forward 15 metres and stop the tractor
- By pressing button (A) the values are stored and you are returned to the main screen

Setting of time



C15N110

By pressing button (A) enter the service menu
a - Use buttons (B) and (C) to select the item CALIBRATION indicated with arrow (a) and by pressing button (A) (ENTER) you enter the CALIBRATION menu
b - Use buttons (B) and (C) to select the item SETTING OF TIME indicated with arrow (b) and by pressing button (A) (ENTER) you enter the next screen
c - Setting time screen

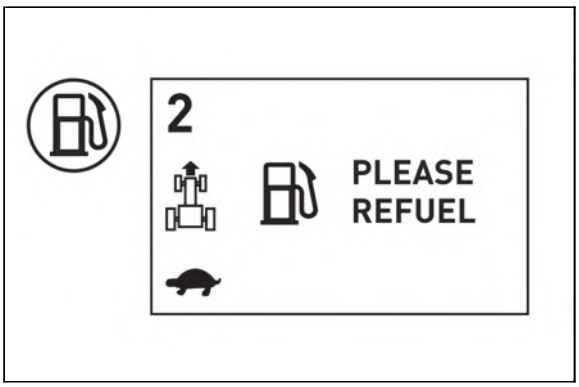
1 - Setting of hours
2 - Setting of minutes
3 - Store and return to CALIBRATION menu (b)
4 - Return to CALIBRATION menu (b) without saving
5 - Display of hours
6 - Display of minutes

Procedure for setting of time
Use buttons (B) and (C) to select the item hours (1); by successive pressing of button (A) (ENTER) we change the value of hours in the display; changes are displayed directly in the position (5).
Use buttons (B) and (C) to select the item minutes (2); by successive pressing of button (A) (ENTER) we change the value of minutes in the display; changes are displayed directly in the position (6).
Use buttons (B) and (C) to select the item STORE AND RETURN (3) to confirm changes in the setting of time and for the return to the CALIBRATION menu or select the item RETURN (4) to return to the CALIBRATION menu without saving the time setting and confirm it by pressing button (A) (ENTER).

If the accumulator battery of the tractor is disconnected for a longer time, ca. after ten days the set time is reset (zeroed). When accumulator battery is connected, the current time must be set again.

Instrument panel - warning

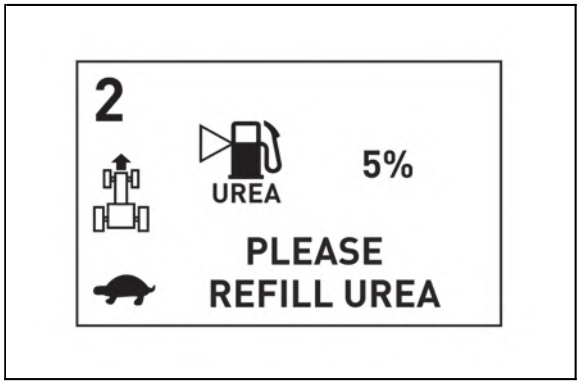
Replenish fuel
When the fuel signal lamp is lit up, the appeal for replenishment of the fuel appears in the display for about 3 seconds.



C15N061

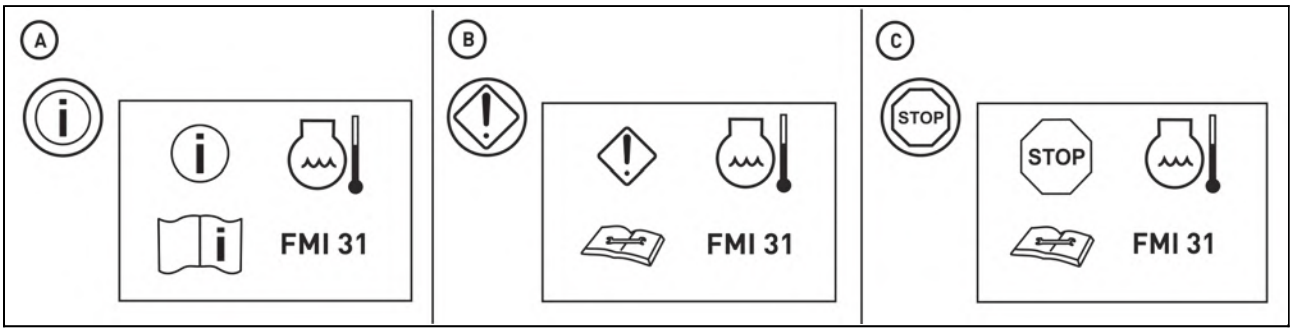
Add urea

When the level of the urea tank content drops, the prompt for the addition of urea and the amount of urea in the tank in percentage of the tank volume are shortly displayed on the display.



C15N151

High temperature of the cooling liquid

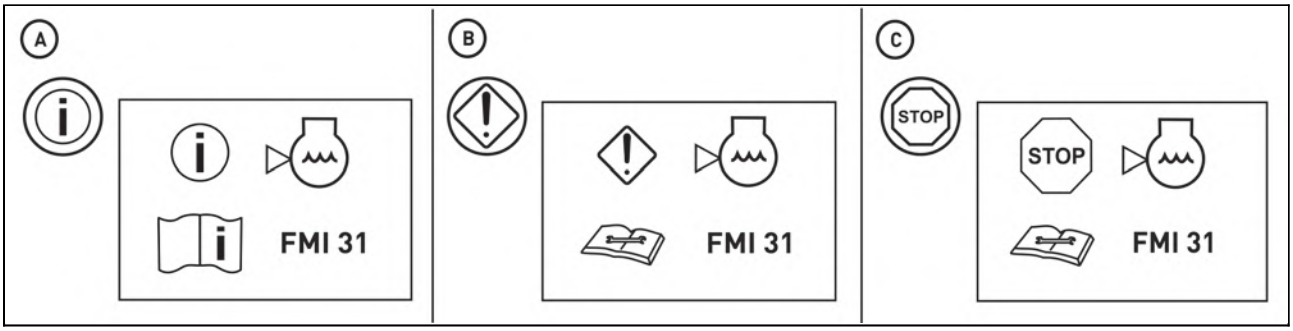


C15N112

High temperature of the cooling liguid is indicated in several stages of warning

A - informative - reduce the engine power
B - warning - stop the tractor, set the engine to idling until the temperature of the cooling liquid is reduced
C - caution - stop the engine, wait until the temperature of the cooling liquid is reduced and check the level of the cooling liquid; if the cooling liquid starts to be overheated again when the engine is started, stop the engine and contact the service centre

Low level of the cooling liquid



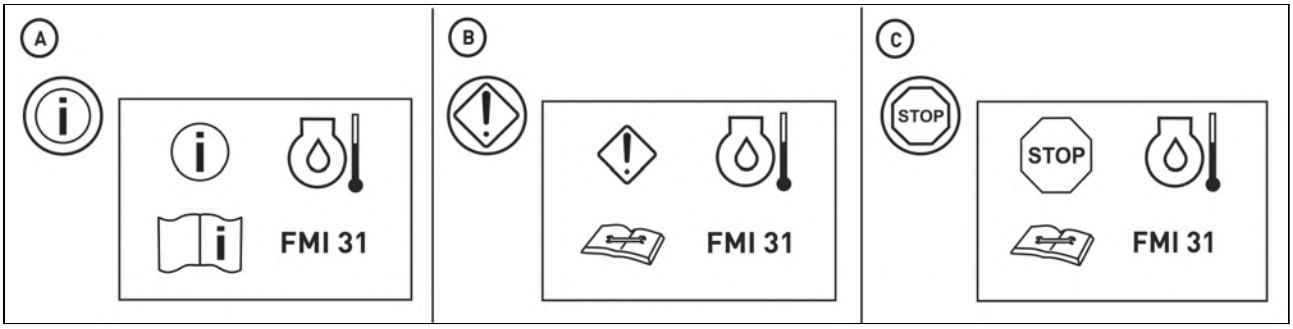
C15N113

Low level of the cooling liguid is indicated in several stages of warning

A - informative
B - warning - the cooling liquid must be replenished
C - caution - stop the engine, wait until the temperature of the cooling liquid is reduced and replenish the cooling liquid

Do not release the overpressure plug unless the cooling liquid is cold! Danger of scald burns!

High temperature of the engine oil

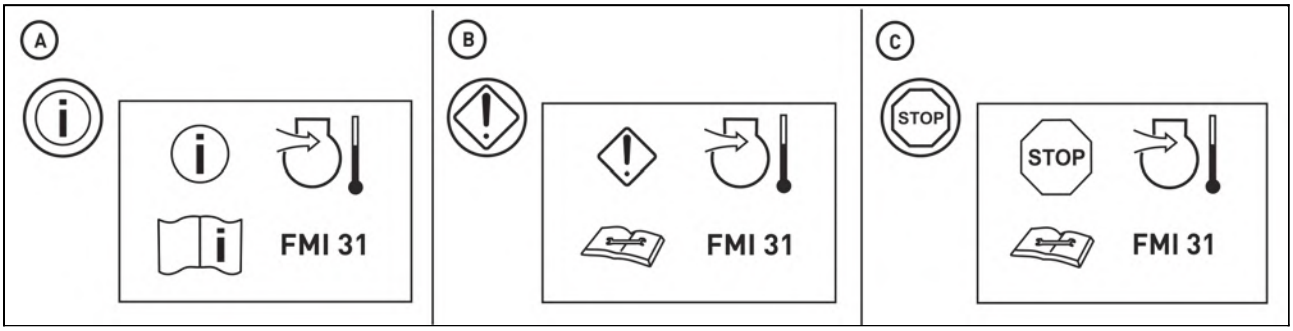


C15N114

High temperature of the engine oil is indicated in several stages of warning

A - informative - reduce the engine power
B - warning - stop the tractor, set the engine to idling until the temperature of the engine oil is reduced
C - caution - stop the engine, wait until the temperature of the engine oil is reduced and check the level of the engine oil; if the engine oil starts to be overheated again when the engine is started, stop the engine and contact the service centre

High air temperature in the engine air intake system

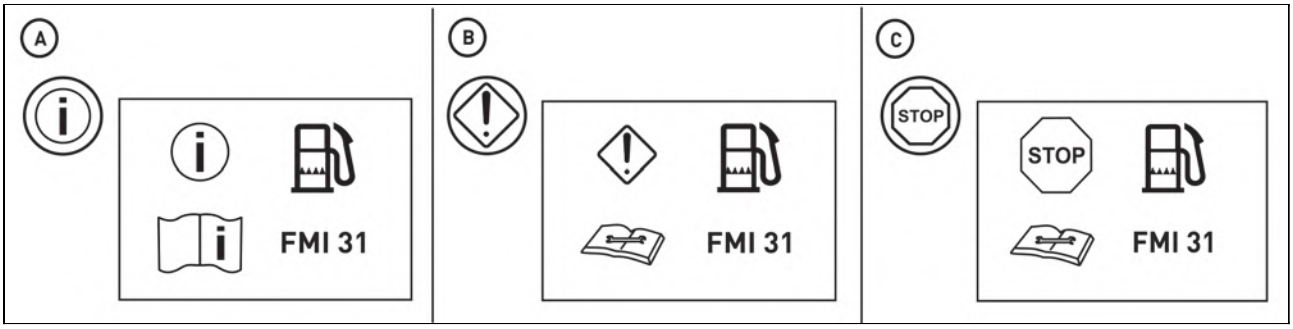


C15N115

High air temperature in the engine air intake system is indicated in several stages of warning

A - informative - reduce the engine power
B - warning - stop the tractor, set the engine to idling until the air temperature in the engine air intake system is reduced
C - caution - stop the engine and wait until the temperature in the engine air intake system is reduced; if the air in the engine air intake system starts to be overheated again when the engine is started, stop the engine and contact the service centre

Water in the coarse filter of fuel

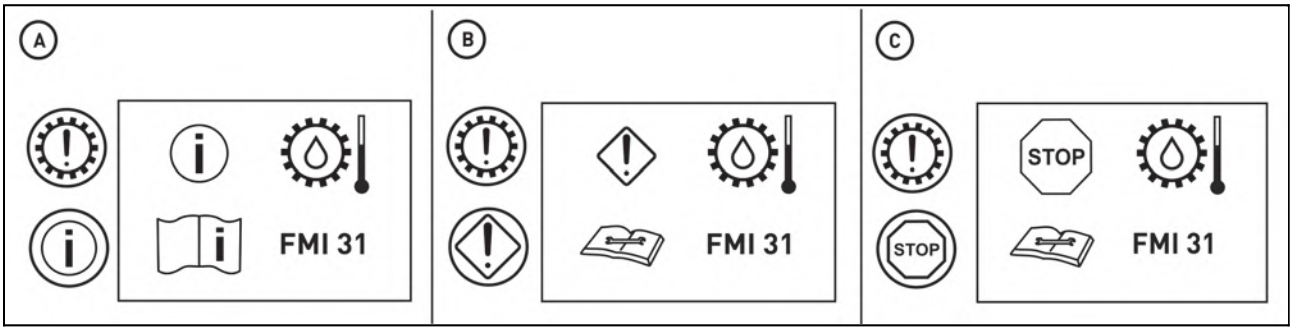


C15N116

High water level in the coarse filter of fuel is indicated in several stages of warning

A - informative - it will be necessary to perform defecation of the fuel coarse filter (see chapter Maintenance Guidelines)
B - warning - it will be necessary to perform defecation of the fuel coarse filter (see chapter Maintenance Guidelines)
C - caution - stop the engine and perform defecation of the fuel coarse filter (see chapter Maintenance Guidelines)

High oil temperature in the gearbox

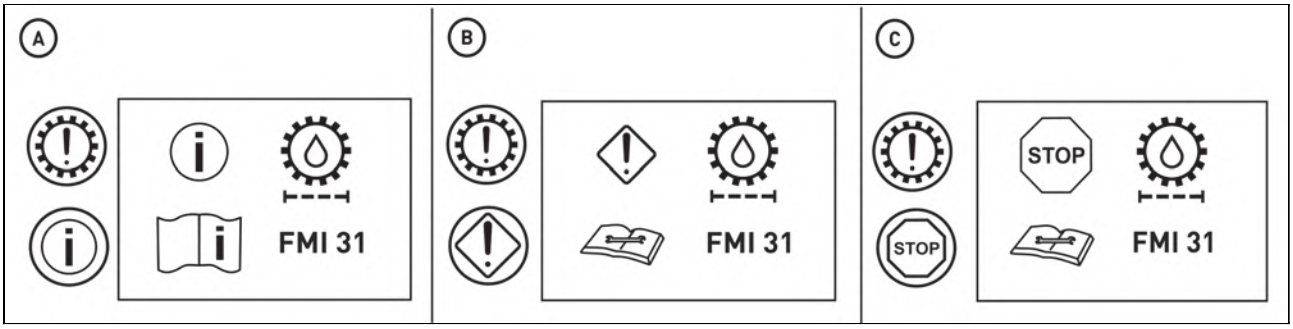


C15N118

High temperature of the gear oil is indicated in several stages of warning

A - informative - reduce the engine power
B - warning - stop the tractor, set the engine to idling until the temperature of the gear oil is reduced
C - caution - stop the engine, wait until the temperature of the gear oil is reduced and check the level of the gear oil; if the gear oil starts to be overheated again when the engine is started, stop the engine and contact the service centre

Full pushing filter of the gearbox distributor

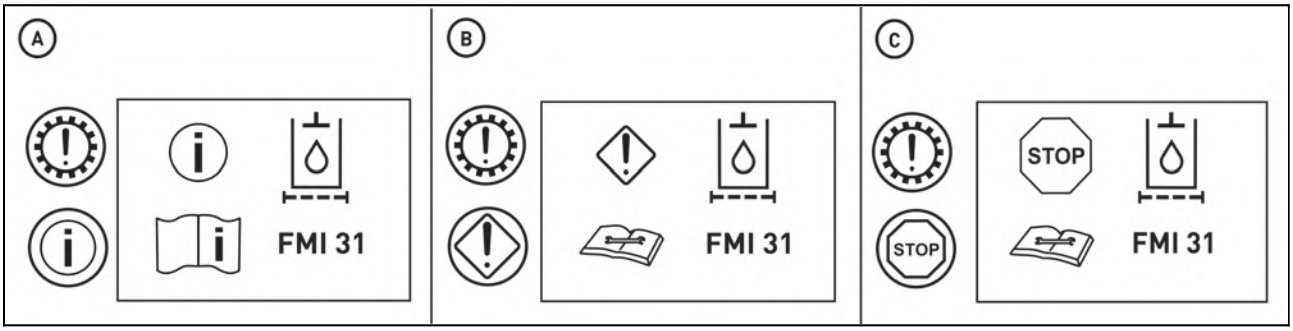


C15N121

The full oil filter of the gearbox distributor is indicated in several stages of warning

A - informative - it will be necessary to perform replacement of the oil filter cartridge of the gearbox distributor (see chapter Maintenance Guidelines)
B - warning - it is necessary to perform replacement of the oil filter cartridge of the gearbox distributor (see chapter Maintenance Guidelines)
B - caution - perform immediate replacement of the oil filter cartridge of the gearbox distributor (see chapter Maintenance Guidelines)

Full pushing filter of the hydraulics



C15N122

The full oil filter of the hydraulics is indicated in several stages of warning

A - informative - it will be necessary to perform replacement of the oil filter cartridge of the hydraulics (see chapter Maintenance Guidelines)
B - warning - it is necessary to perform replacement of the oil filter cartridge of the hydraulics (see chapter Maintenance Guidelines)
C - caution - perform immediate replacement of the oil filter cartridge of the hydraulics (see chapter Maintenance Guidelines)

SYSTEM OF ADDITIONAL TREATMENT OF EXHAUST GASES

System of additional treatment of exhaust gases (SCR)
The tractor is equipped with the engine fulfilling emission limits STAGE IIIB.
The compliance with the emission limit is achieved, among others, by injection of the reduction agent (urea) into the exhaust manifold (SCR) and consequent catalytic reduction in the catalyst of exhaust gases.
Using the SCR system, emissions of NOx (NOx = nitrogen oxides) exhausted by the engine can be continuously decreased.
At the same time, the reduction agent injected into the exhaust system reacts in SCR catalyst with NOx emissions contained in exhaust gases which are reduced to nitrogen (N2) and water (H2O).
The control of the injected amount of urea is performed using the engine electronic control.

Conditions for system SCR operation
The amount of urea in the tank is displayed on the instrument panel.
If the amount of urea in the tank is exhausted when the engine is running, the injector in the exhaust manifold is in danger of being damaged.
In this way also the catalytic reduction is stopped and the amount of harmful emissions in exhaust gases is increased.
When urea is added in the tank, the catalytic reduction is restored.

Conditions for proper functioning of the system
- temperature of cooling liquid must be higher that 60°C
- working temperature of the catalyst must be higher than 250°C
- outdoor temperature must be higher than -20°C
- engine revolutions must be higher than 1,000 rpm
- requirement for the withdrawn torque must be higher than 20%

Urea (Aqueous Urea Solution AUS 32)
Urea is a highly pure aqueous urea 32.5% solution used as a reducing agent NOx for additional treatment of exhaust gases SCR of motor vehicles with diesel engines.
The product is labelled as Urea or AUS 32 (AUS: Aqueous Urea Solution) and complies with the standard ISO 22241-1 Reducing agents NOX AUS 32.
The urea solution AUS 32 is known in USA and North America as Diesel Exhaust Fluid (DEF).

The lifetime of urea without the loss of the quality is influenced by storage conditions.
It crystallizes at ambient temperature of -11°C and at ambient temperature over +35°C it initiates hydrolytic reaction which means that a slow decomposition to ammonia and carbon dioxide begins.
It is essential to protect unprotected vessels from direct sunlight. Barrel must not be stored longer than one year! Pay attention to the resistance of the used materials and store vessels. Urea freezes below the temperature of -11°C.

Principles for safe handling of urea

Contact with skin
- Prolonged or repeated contact may cause skin irritation.

Contact with eyes
- Prolonged or repeated contact may cause eye irritation. Rinse eyes with plenty of water for at least 15 minutes. If irritation persists, visit a physician.

Ingestion
- In case of ingestion of small quantities, toxic effects are not likely. Higher amount may cause intestinal or stomach problems. Do not induce vomiting. Drink half a litre of water or milk. In case of ingestion of a larger than small quantity, visit a physician.

Fire-fighting measures
- The product has fire extinguishing properties.

Extinguishing means
- If the material got in the fire, use large amount of water for extinguishing.

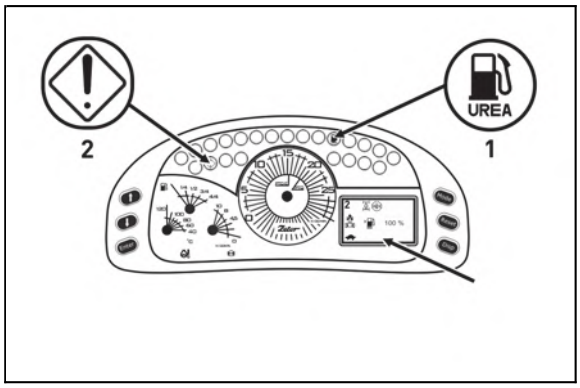
Accidental release measures
- Minimize contact of the spilled material with the soil so that you do not allow product to reach surface or underground water courses.
- Soak up the spilled material with dry soil, sand or other non-flammable material.

SYSTEM OF ADDITIONAL TREATMENT OF EXHAUST GASES

Limitation of the engine power and engine revolutions
If there is a serious error of SCR system or if the level of urea in the tank is low, the reaction of the system is reduced engine power output and revolutions.
According to the error type, so-called one-stage or two-stage reduction of engine output is performed.

stage 1	Reduction of engine power by 20%
stage 2	Reduction of engine power by 20% Reduction of engine revolutions to 1,200 rpm

Indication of amount of urea in the tank
The amount of urea in the tank is displayed on the corresponding main screen in percentage of the urea tank volume.
Small amount of urea in the tank is indicated with urea signal lamp (1), defect signal lamp (2), acoustic signal and reduced engine power output and revolutions.



C15N124

amount of urea in the tank	urea signal lamp	defect signal lamp	acoustic signal	limitation of the engine power and engine revolutions
less than 15%	glows			
less than 10%	flashes (0.5 Hz)			
less than 5%	flashes (0.5 Hz)	glows	yes	
less than 5%	flashes (1 Hz)	glows	yes	reduction of power by 20%
0%	flashes (2 Hz)	glows	yes	reduction of power by 20% reduction of engine revolutions to 1,200 rpm

Long-term shutdown of tractor
During a long-term shutdown of the tractor, the urea filling must be drained from the tank.
Before operating the tractor, the urea tank must be filled with a new filling again and the urea filter element must be replaced.

The urea filling should not stay in the tank longer than four month; then it should be replaced.

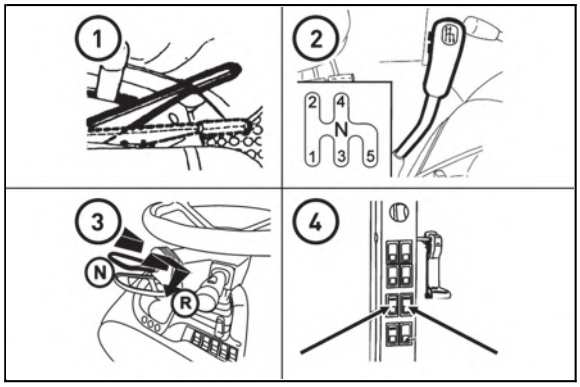
Repairs and maintenance of the system of additional treatment of exhaust gases

All repairs and maintenance of the system of additional treatment of exhaust gases must always be performed by a professional service All interventions in the system, except authorised service, are prohibited.

Before a drive with the new tractor get to know how to shift gears and try individual positions of the shifting lever when the engine is stopped.
During normal operation and before you set up, make sure that the technical condition ensures safe operation of the tractor.

Before you start

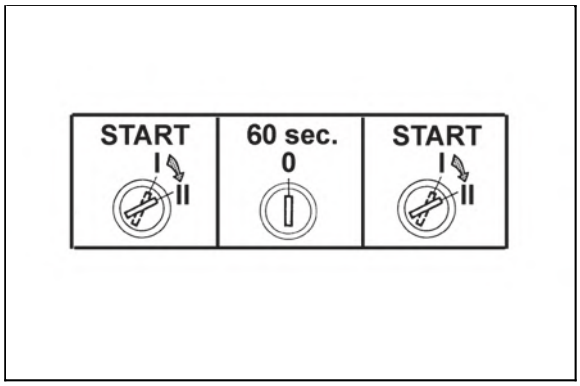
Before you start the engine, make sure that:
1. ***the tractor is properly braked.***
2. ***the main gear shifting lever of gears in neutral position.***
3. ***Reversing lever is in neutral position***
4. ***PTO switches are off***
If clutch pedal is not depressed the tractor cannot be started - start protection switch is not switched



C15N062

If you do not succeed in starting the engine
Return the key to '0' position. Wait 60 second and repeat the start.

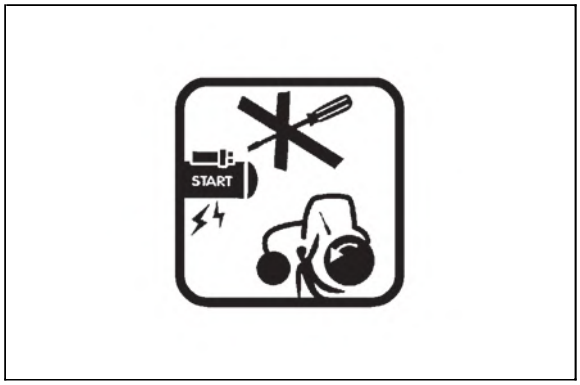
Never help the stopping engine by a starter. You are being exposed to the danger of starter damage.



C15N127

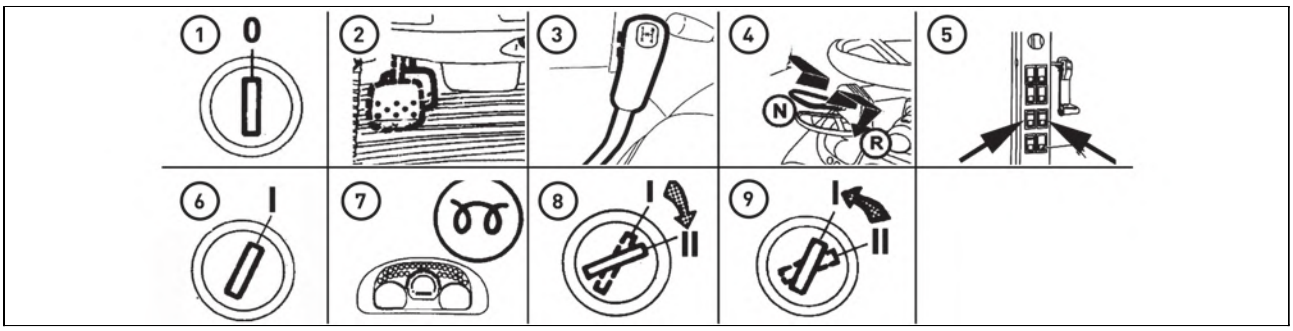
Non-permitted starting

It is forbidden to start the tractor by short-circuiting the starter clamps. Start only from the driver´s seat. It is necessary to disconnect minus pole of accumulator and all the shifting levers including PTO shaft shifting lever to be shifted in neutral position with any manipulation or repair of the starter. The starter´s clams are covered with a cap.



C15N125

Starting the engine of the tractor



C15N126

When starting the engine, it is necessary to sit on the driver's seat.

1. Insert the key to the switchbox ('0' position).
2. Depress the clutch pedal.
3. Shift the main gear shifting lever to neutral position.
4. Shift the reversing lever to neutral position.
5. Make sure that all PTO switches on the right column of the cabin are switched off.
6. Turn the key to 'I' position. A yellow control will light up on the dashboard signalising the proper igniting function.

7. Wait for the ignition control to turn off (the time is dependent on the temperature of the coolant).
8. Turn the key to the 'II' position (start).
9. After starting the engine, release the key immediately. **Do not start for more than 20 sec.**

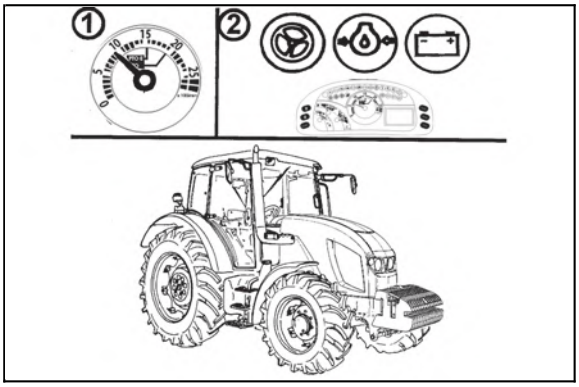
Blocking of the start

If the engine cannot be started and the defect signal lamp is flashing, it means that blocking of the start was activated by electronic regulation of the engine and this way the engine is protected.
The blocking of the start is interrupted when the key in the switch box for about 30 seconds is moved to position 0.

Immediately after start

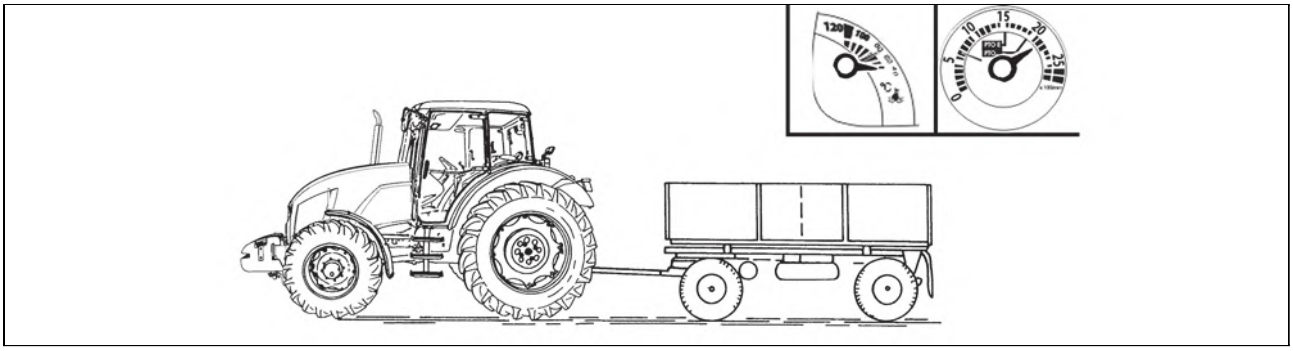
When the engine is started, leave it idling without load for ca. 2 minutes.

During this time, perform checking of lubrication, charging, hydrostatic control (signal lamps must not be illuminated) and other functions ensuring proper operation of the engine. The time of engine operation without load must be adhered to, especially in winter period.



FH11N092

Engine heating

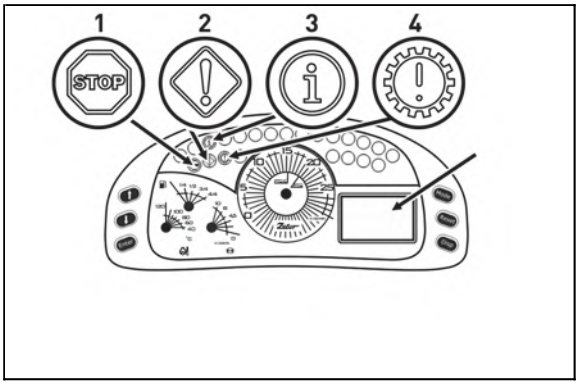


FH11N091

Do further heating of the engine during the drive. The heating of the engine by lengthy idle run or sharp increase in revolutions is harmful to the engine. If the temperature of coolant has not reached 45°C, do not exceed the engine revolutions over 2000 rpm.

Error signalling

Errors arising during tractor operation are indicated by switching the corresponding signal lamp, acoustic signal and error message in the instrument panel display.
If the error is indicated, the signal lamp still glows, even though the display is switched to the next display.
If the error is not eliminated or the indicated state has not returned to a normal state:
the corresponding signal lamp glows
when the tractor is switched off, the key in the switch box is moved to position I and then the engine is started, the corresponding signal lamp is switched on again and the error message runs through the display.



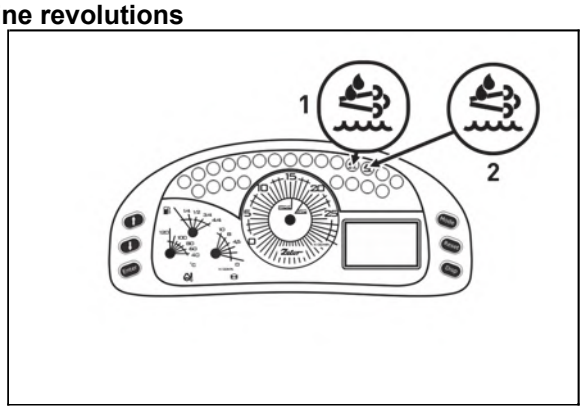
C15N111

1 - The signal lamp of a serious defect of the system (red).
2 - The signal lamp of a less serious defect of the system (orange).
3 - Operational protection signal lamp (blue).
4 - Gearbox malfunction signal lamp (dark red). It glows together with any of the signal lamps indicating errors, as long as the error relates to the gearbox or the system of travelling clutches.

More information in chapter Instrument panel.

Indication of the limitation of the engine power and engine revolutions

If there is a serious error in control or auxiliary systems of the engine, SCR system or if the level of urea in the tank is low, the reaction of the system is reduced engine power output and revolutions.

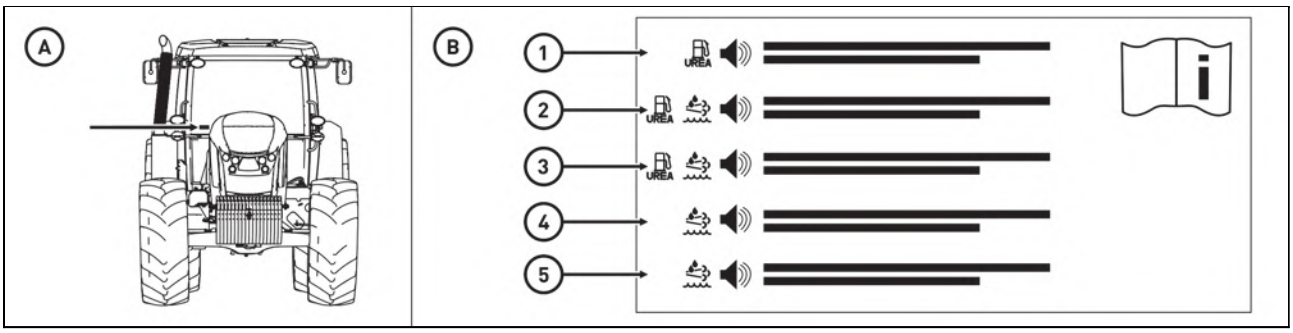


C15N129

According to the error type, so-called one-stage or two-stage reduction of engine output indicated by glow of the signal lamps (1) and (2) is performed.

stage 1	Reduction of engine power by 20%	signal lamp (1) glows
stage 2	Reduction of engine power by 20% Reduction of engine revolutions to 1,200 rpm	signal lamp (2) glows

Signalling errors in the system of additional treatment of exhaust gases



C15N148

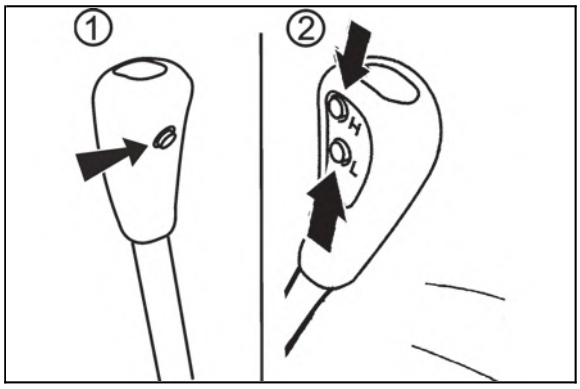
The label with a short description of indication of errors in the system of additional treatment of exhaust gases and subsequent activities of operators is located in the right bottom corner of the windshield (A).

On the label (B) in the left part there is a combination of signal lamps glowing or flashing on the instrument panel indicated using pictograms including their colours and the pictogram of the sounding acoustic warning signal.In the right part of the label a required reaction of the tractor operator is described.

1. Add urea.
2. Add urea.The engine power will be limited.
3. Add urea.Engine revolutions will be minimised.
4. Increase the engine load or contact service.The engine power will be limited.
5. Contact service.The engine power will be limited and engine revolutions will be minimised.

Gear shifting

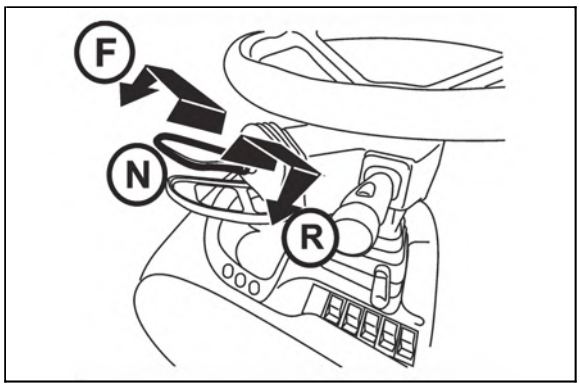
The tractors are equipped with a five-gear synchronized gearbox, three-gear torque multiplier, reversing and two-gear reduction.
Five-gear gearbox is shifted by main shifting lever with buttons for disengaging the travel clutch (1) and for shifting the individual gears of multiplier (2).



FH12N037

Reversing lever

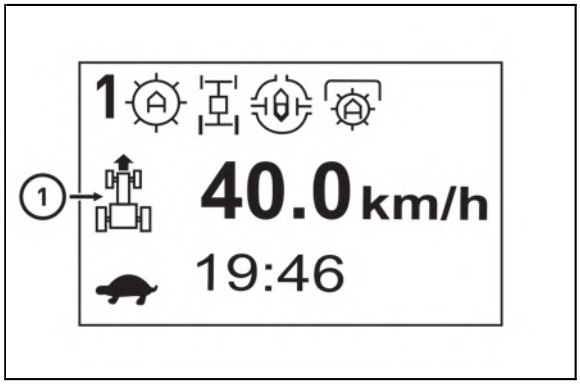
The selection of the direction of travel drive is done by reversing lever (forward, backward).
F - driving forward
N - neutral
R - driving backward
The lever also serves for starting the tractor without the depressed clutch pedal.



X212a

Reversing lever position signalization
The individual positions of reversing lever are signalized by a sign (1) on the display.

	driving forward
N	Neutral
	driving backward



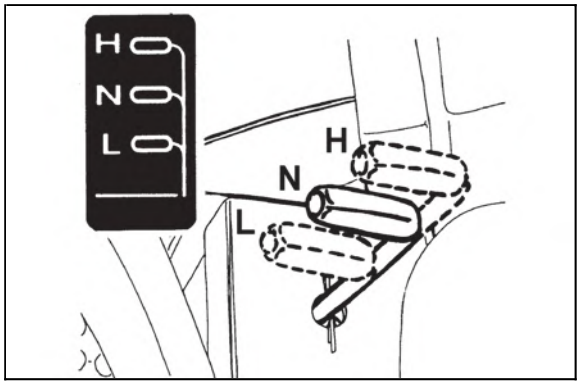
C15N063

Shifting road and reduced speeds

H -	Road speeds
N -	Neutral
L -	Reduced speeds

Shifting the gears of the main gearbox with reduced speeds is the same as with road speeds.

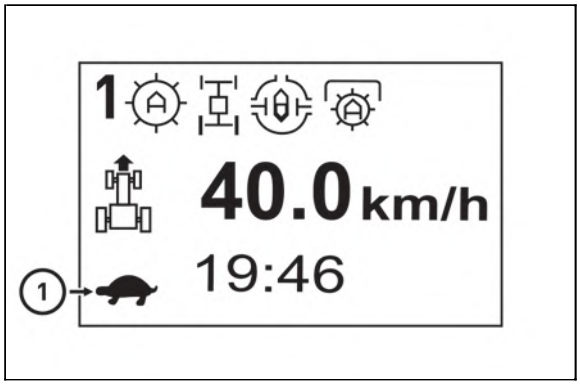
Road and reduced speeds shifting lever can be shifted only with a tractor at standstill.



F72

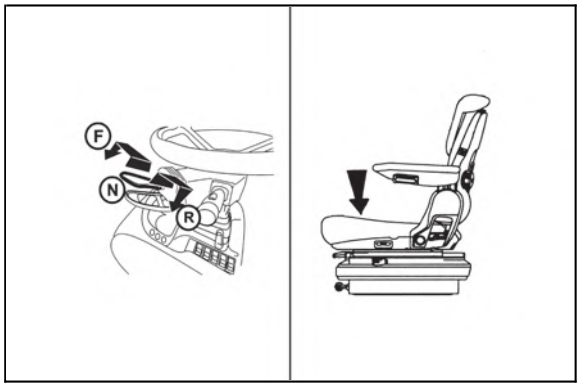
Road and reducing speeds lever position signalization
The individual positions of road and reduced speeds lever are signalized by a sign (1) in the left bottom corner of the display.

	road speeds
	neutral position
	reduced speeds



C15N064

Driver´s seat - safety switch
The driver´s seat is equipped with a safety switch which signalizes the system of driver abandoning the driver´s seat.
If the tractor is started, there is nobody on the driver´s seat and reversing lever under the steering wheel is shifted to **F** or **R** position, **N** position is shifted automatically and tractor does not start.
If this situation occurs, it is necessary to sit on the driver´s seat, to return the reversing lever under the steering wheel to **N** position and then to select the direction of drive again (**F** or **R**).



The principles of appropriate use of tractors

 ***The listed principles for tractor´s operation serve for facilitating the operation and guarantee corresponding service life of travel clutch!***

The description of the system of travel clutches
The tractor is equipped with two individual travel clutches, one for travelling forward and one for travelling backward.
The selection of the driving direction and also the choice of a specific travel clutch is done by shifting the reversing lever under the steering wheel from neutral position to the position forward or backward.

The way of controlling the travel clutch by
1 - Reversing lever
2 - Clutch control button on the head of reversing lever
3 - Clutch pedal

The differences in ways of controlling the travel clutch by
1 - Reversing lever
This way of control has automatic start function.
When shifting the reversing lever to neutral position, there is release of travel clutch.
When shifting the reversing lever to the forward or backward position, there is a switch of travel clutch and subsequent smooth dead start of the tractor in the direction defined by reversing lever.
The speed of switch of travel clutch and the smoothness of dead start is controlled by a controlling unit on the basis of information saved in calibration and the operators cannot influence it.

 ***Automatic dead start function is sparing to travel clutches than the control of travel clutches by clutch pedal, therefore use the ways of controlling travel clutch with the function of automatic dead start for the regular operation of tractor with dead start, gear shifting or the change of the driving direction.***

2 - Clutch control button on the head of gear shifting lever
This way of control has the function of automatic switch of travel clutch.
When pressing the button of clutch control on the head of gear shifting lever there is release of travel clutch.
When releasing the red button of control clutch on the head of gear shifting lever, there is a switch of travel clutch.
The rate of travel clutch switch is controlled by electronic control unit on the basis of information saved with calibration and the operator cannot influence it.

3 - Clutch pedal
When depressing the clutch pedal, there is release of travel clutch.
When releasing the clutch pedal, there is a switch of travel clutch.
The speed of travel clutch switch is dependent on the speed of releasing the clutch pedal.
The clutch pedal does not enable the function of automatic dead start and operators influence the speed and smoothness of dead start.

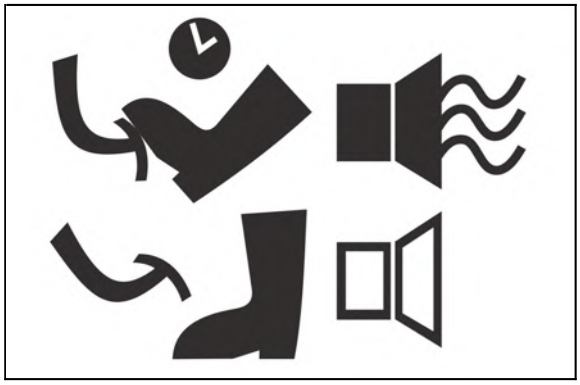
 ***Use the clutch pedal only for stopping the tractor in regular operation.***

 ***For the need of delicate inching, for example when connecting tools or when manipulating with the tractor in crammed spaces, when even the reduced gear speeds are not slow enough, use the clutch pedal for short time.***

 ***It is forbidden to control the speed of tractor by partial depression of the clutch pedal with engine revolutions higher than 1200 revolutions per minute. Do not use the clutch pedal as a foot rest. There is a danger of limiting service life or failure of travel clutches.***

Interrupted sound signal

If the speed of tractor is control by partial depression of the clutch pedal with engine revolutions higher than 1 200 rpm, there is an interrupted sound signal and gearbox failure control is still lit. If this situation occurs, fully depress the clutch pedal immediately to stop or release the clutch pedal to the upper position and wait until the sound signal goes silent and the control of gearbox failure. Lower the engine revolutions under 1 200 revolutions per minute and then continue working with the tractor. If you do not do it, 8 seconds later the interrupted acoustic signal changes to uninterrupted signal.



FH12N047

Dead start of the tractor

If at dead start, engine revolutions are higher than 1400 rpm **L** gear of multiplier is automatically shifted, not depending on the switch of multiplier pre-selection on dashboard being on or off**.**
If the multiplier pre-selection switch on the dashboard is on at dead start, **L** gear of multiplier is shifted automatically independent on the number of engine revolutions at dead start (i.e. when the engine revolutions are lower than 1400 rpm).

A very fast dead start can cause overloading of driving gear, increased fuel consumption, excessive wear of tyres and damage to load. Use dead start on the 1st gear only when driving with heavy trailer to the slope and in difficult terrain.

Dead start of tractor in regular operation - automatic dead start function

- Use the control of travel clutch by reversing lever under the steering wheel for dead start of the tractor.
- Select the slowliest **L** gear of torque multiplier for dead start of the tractor.

Note: When starting or stopping the engine of the tractor, the fastest gear **H** is always automatically shifted.
- If the road and reducing speeds shifting lever is shifted in the group of road speeds, shift the lowest gear speed for tractor dead start with respect for operational conditions.
- Use the lowest possible engine revolutions for tractor´s dead start, such that there is no turn off. After the switch of travel clutch, increase the engine revolutions according to your needs.

Dead start by means of automatic dead start function

Automatic dead start function is in the shift of reversing lever with engaged applicable gear followed by dead start without using the clutch pedal or clutch control buttons.
1. Start the engine.
2. Shift appropriate gear for starting the engine.
3. Release the manual brake, if you are standing on a slope, brake the tractor by foot brake.
4. When shifting the reversing lever form neutral to the requested direction of tractor drive (forward or backward), the tractor starts.
5. When you increase the engine revolutions simultaneously, release the foot brake.

When depressing the clutch pedal, the automatic dead start function is put off from operation.

Dead start of tractor in regular operation - clutch pedal

In regular operation use the clutch pedal only for stopping the tractor. For the need of delicate inching, e.g. when connecting the tools or when manipulating with tractor in crammed spaces, if even the reduced gears are not slow enough, use the clutch pedal only for short time.

It is forbidden to control the speed of tractor by partial depression of clutch pedal with engine revolutions higher than 1200 rpm. Do not use the clutch pedal as a foot rest. There is a risk of limited service life or failures of travel clutches.

DRIVING OPERATION

Dead start - using the clutch pedal

1. Start the engine.
2. Depress the clutch pedal.
3. Select road and reduced speeds.
4. Shift an applicable gear for starting the tractor.
5. Shift the reversing lever to the direction requested (forward or backward).
6. Slightly increase the engine revolutions.
7. Prepare the manual brake for unbraking.
8. Release the clutch pedal only to the point of travel engagement and with simultaneous increase of revolutions continue in a continuous release of the clutch pedal.
9. Fully unbrake the manual brake.
10. Start smoothly and slowly.

 ***Use this way of dead start when you need to inch carefully, for example when connecting tools etc.***

Change the direction of drive

Change the direction of drive by means of reversing lever

 ***Change the direction of drive by means of reversing lever is done with travel speed lower than 10km/h. When you attempt to change the direction of drive in speed higher than 10 km/h, acoustic signal starts (uninterrupted tone) and the tractor engages neutral. The signal switches off after the shift of reversing lever back to N position, when depressing the clutch pedal or pressing the button of switching clutch on the head of gear shifting lever. It is also necessary to lower the travel speed of tractor under 10km/h, shift the reversing lever to neutral position and to repeat the shifting of requested direction.***

Keeping the following instructions when changing the direction of the drive, contributes to prolonging service life of travel clutches.

· For changing the direction of the drive of tractor use reversing lever under the steering wheel without using the clutch pedal.
· For changing the direction of the drive of tractor, select the slowliest gear L with torque multiplier.
· For changing the direction of the drive of tractor, select lower gear with regard for the subsequent dead start and tractor load.

 ***Changing the direction of drive by means of reversing lever is done at tractor travel speed lower than 10km/h. When you try to change the direction of drive at the speed of more than 10 km/h, an acoustic signal starts (uninterrupted tone), the signal switches off after the shift of the lever back to N position, when depressing the clutch pedal or pressing the button for switching off the clutch on the head of the gear shifting lever.***

1. Lower the travel speed of tractor under 10km/h by means of brake pedal.
2. Shift the reversing lever to the requested direction of tractor drive.
3. The tractor stops automatically and travels in the requested direction.
4. Continue in smooth dead start of the tractor with simultaneous incresae of engine revolutions.

 ***Should the tractor speed drop below 10km/h, tractor shift neutral and it is necessary to lower the travel speed of tractor under 10km/h, shift the reversing lever to neutral position and to repeat the shifting to the required direction.***

 ***When depressing the clutch pedal, the automatic function is put off operation. If the above mentioned is done subsequently after the attempt to change the direction of drive above 10 km/h, it is necessary to lower the travelling speed of tractor below this speed. In opposite case, after the release of clutch pedal the neutral remains shifted.***

Change the direction of drive - using the clutch pedal
1. Depress the clutch pedal and stop the tractor by foot brake.
2. Shift the reversing lever to the requested direction of tractor drive.
3. Release the clutch pedal only to the point of travel engagement and with simultaneous increase of engine revolutions continue in smooth release of the clutch pedal.
4. Start smoothly and slowly.

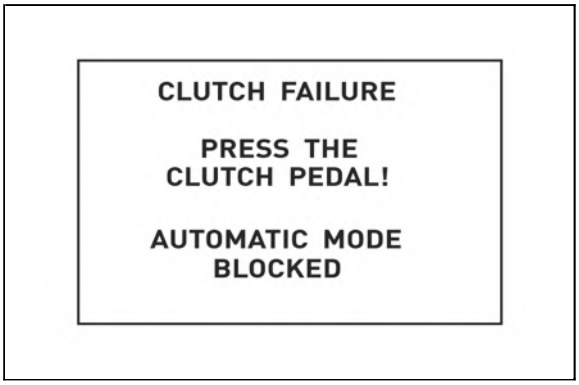
Gear shifting
- For shifting the gear speeds while travelling use the travel clutch control by a red button of clutch control on the head of gear shifting lever.
- When shifting gears, press and hold the red button of clutch control on the head of gear shifting lever, release the gas pedal, throw out the gear, shift an applicable gear speed, release the red button and then increase the engine revolutions.
- If operation conditions permit, use the function of multiplier preselection.

Gear shifting - Using the clutch pedal
Depress the clutch pedal (clutch disengaged). At the same time release the pedal of foot throttle and shift the applicable gear speed. Release the clutch pedal smoothly (clutch is being engaged) and at the same time increase the engine revolutions.

Gear shifting - using the clutch control button on the head of gear shifting lever
Press the clutch control button on the head of gear shifting lever. At the same time release foot throttle pedal and shift the applicable gear speed. Release the button of clutch control (clutch is being engaged) and at the same time increase the engine revolutions.
Note: Clutch pedal is always preselected to the use of button of clutch control on the head of gear shifting lever.

Blocking the automatic dead start function
With some failures of travel clutches system, the function of automatic dead start is blocked. This situation is signalized by an inscription displayed on a display. In this case reversing lever under the steering wheel serves only for the selection of direction of drive, the button for clutch control on gear shifting lever does not work. For dead start of tractor and gear shifting, it is possible to use only clutch pedal.

If this situation occurs, finish your work and contact service.

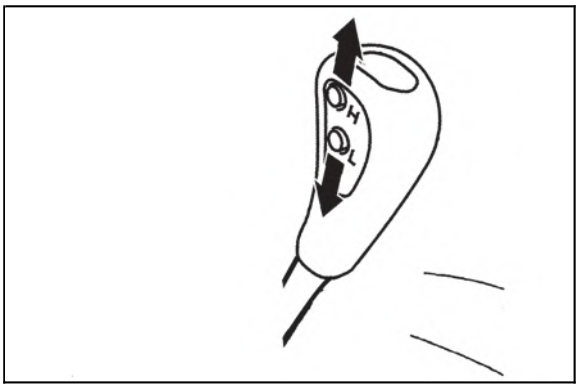


C15N128

Three-gear torque multiplier
Three-gear multiplier is a standard equipment of all types of tractors. Shifting individual gears of three-gear multiplier is controlled by two buttons on the head of main gear shifting lever.

H-	Increasing travel speed
L-	Decreasing travel speed

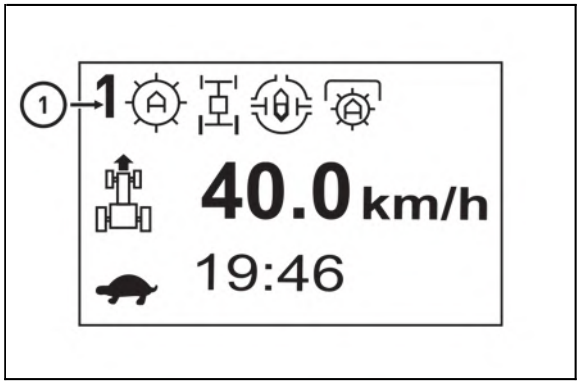
It is done without travel clutch pedal depressed (under load).



FH12N058

Signalization of multiplier function
Individual engaged gears of multiplier are signalized by a sign (1) in the left upper corner of the display.

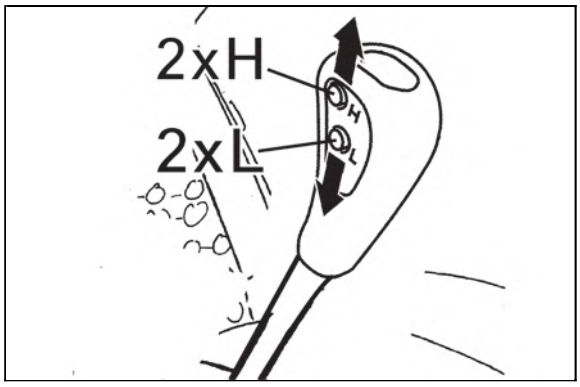
3	The highest gear (the fastest)
2	Middle gear
1	Lowest gear (the slowest)



C15N065

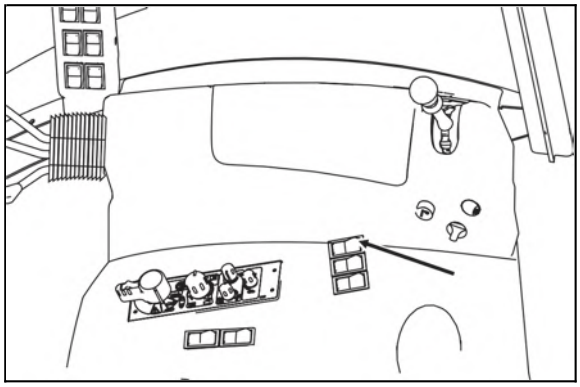
Increasing, decreasing the travel speed by two gears

2xH	Increases the travel speed by two gears
2xL	Decreases the travel speed by two gears



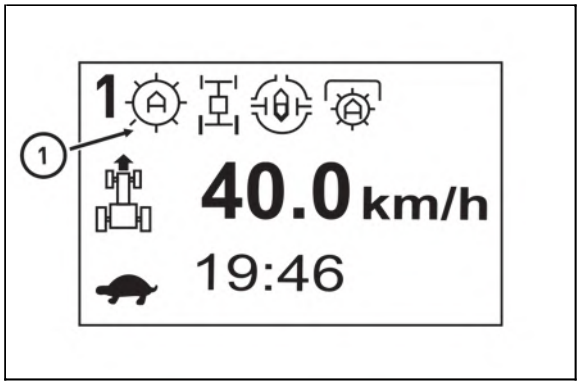
FH12N054

Multiplier preselection switch
Multiplier pre-selection switch is located on the control panel on the right rear mudguard. Engaging the switch is signalized by a lit symbol on the switch.
If the preselection switch is offthe gears of multiplier can be engaged by buttons on the gear shifting lever
If the preselection switch is on **(b)** the gears of multiplier are shifted automatically depending on engine revolutions according to pre-saved values.



C15N067

Multiplier pre-selection signalization
The switch of multiplier reselection switch is signalized by a sign (1) on the display of dashboard.



C15N066

Automatic multiplier shifting
The system of automatic multiplier shifting is switched by multiplier pre-selection switch. If the multiplier pre-selection switch is on (control on the switch is lit), the gears of multiplier are shifted automatically depending on the engine revolutions according to preset values (engine revolutions). The system of automatic multiplier shifting is not dependent on the engaged speed gear. With engaged multiplier pre-selection switch, it is possible to turn the engine off and start and the saved values (engine revolutions) do not change. The values for automatic multiplier shifting are read always when the pre-selection switch is off, with tractor drive with engine revolutions higher than 700 rpm, with travel speed higher than 2 km/h.

When meeting the previous conditions, the system will remember
a - Engine revolutions with last use of **L** button on gear shifting lever for automatic shifting of multiplier gears for lowering the travel speed
b - Engine revolutions with last used of **H** button on gear shifting lever for automatic engagement of gears of multiplier for increasing the travel speed
The difference between the engine revolutions for **a** and **b** must be greater than 250 rpm

Example of use:
We are driving with a tractor with multiplier pre-selection off with multiplier shifted to **2** gear, with engine revolutions of 1,600 rpm we press **L** button on the gear shifting lever, by this we shift the torque multiplier to **1** gear, now we increase the engine revolutions to 1,900 rpm and we press **H** button on the gear shifting lever, by this we shift the torque multiplier back to **2** gear. We continue driving with the tractor. Now we turn on the multiplier pre-selection switch. From this time, the automatic multiplier gear shifting system shifts gears of torque multiplier without any intervention of the driver in the following way:
a - With the drop of engine revolutions under 1,600 rpm automatically shifts the multiplier to lower gear (lowering travel speed)
b - When increasing the engine revolutions above 1,900 rpm, the multiplier automatically shifts to a higher gear (increasing the travel speed)

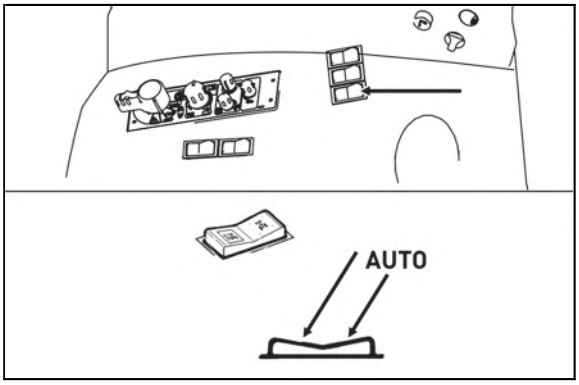
The values 1,600 and 1,900 engine revolutions necessary for automatic multiplier shifting used in this example are purely informative, in practice the number of revolutions is set by the driver according to the specific use of tractor.
With multiplier pre-selection on, it is possible to shift the multiplier gears also manually on a gear shifting lever, but only within the range of set values (engine revolutions); i.e. in the example presented in the range of revolutions from 1,600 to 1,900 rpm, when reaching the saved revolutions for automatic shift of multiplier gear the multiplier is automatically shifted without driver´s intervention. In this case (multiplier pre-selection switch on), manual shifting of multiplier by buttons on gear shifting lever does not influence the values (engine revolutions) that are saved in the system of automatic multiplier shifting. After turning the multiplier pre-selection on the dashboard off (the control on the switch is not lit) it is possible to shift the torque multiplier gears only manually by buttons on gear shifting lever.

Beware!
With tractor travel, when the pre-selection multiplier switch on the dashboard is off, the system of automatic multiplier selection keeps on reading the values (engine revolutions) with every use of H or L buttons use on gear shifting lever. After switching the multiplier pre-selection switch, the system of automatic multiplier shifting uses the last read value (engine revolutions) i.e. values read with last usage of H and L buttons on the gear shifting lever with multiplier pre-selection off.

Recommendation
Before switching the switch of multiplier on the dashboard, do the manual shift of multiplier gear when using **H** and **L** buttons (once by **H** button and once by **L** button) on gear shifting lever with requested engine revolutions. The values (engine revolutions) will be saved and after subsequent engagement of the multiplier pre-selection switch on dashboard, the system of automatic multiplier shifting will automatically shift multiplier gears according to these engine revolutions
With multiplier pre-selection switch on, in case of release of travel clutch, for example with gear shifting, stopping and subsequent dead start of tractor or while using reversing, the system of automatic shifting of multiplier sets an applicable multiplier gear with subsequent switch of travel clutch.

Front drive axle control

Front drive axle control button is placed on the panel on the right rear mudguard.
By pressing the upper part of the button, the function manual mode is engaged - front drive axle control.
By pressing the lower part of the button (auto symbol) the function automatic mode - front drive axle control is engaged.
With the tractor at stand-off (tractor braked, engine stopped, the key of switchbox disengaged) front drive axle drive is off.
After restart of the engine, front drive axle returns to the mode it was before turning the engine off.



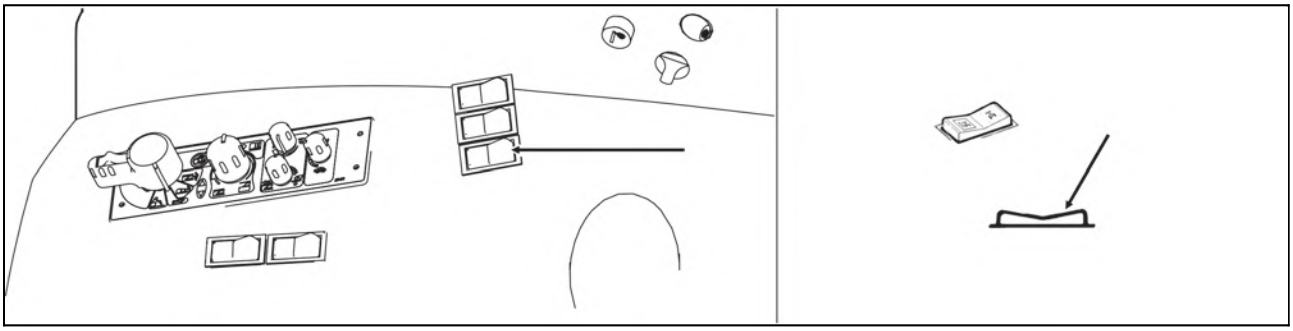
C15N070

Driving with engaged front axle drive

Use front drive axle when rear wheels slip to increase the tractor´s traction. It is not recommended to drive with engaged front axle drive on the roads or hard surfaces (driving with engaged front axle drive causes increased wear of front tyres).

Permanent engagement of front drive axle is admitted if there is an agricultural machine or tools mounted to the tractor from the front. This condition is listed in instructions manual of an applicable machine. The maximum permitted speed of these sets is 15 $km.h^{-1}$.

Manual Front drive axle control



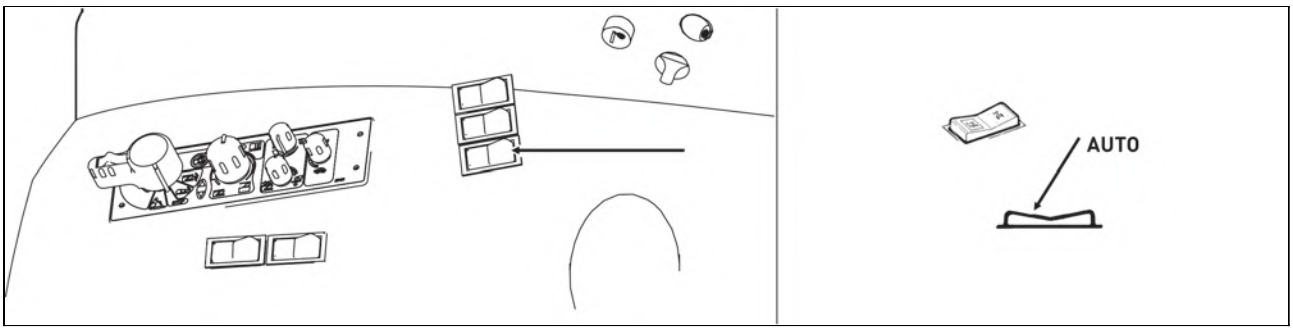
C15N069

Engagement of front drive axle in manual mode is done by pressing a button which returns to its initial position after release. The disengagement of front drive axle is done by repeated pressing of the button. The engagement of front drive axle is signalized by a lit symbol on the switch and a symbol on the display of the dashboard.

Automatic disconnection of front drive axle

When exceeding travel speed of 20 km/h, the drive of front drive axle is automatically disconnected.
Automatic disconnection of the drive is signalized by blinking of control in a switch. After switching off of the blinking control, front drive axle is automatically disconnected.
With the drop of travel speed under 20 km/h, front drive axle can be connected by a repeated depression of a button.
With speeds higher than 20 km/h, the drive of front drive axle can be connected by repeated depression of a blinking button.Front axle drive is engaged permanently by a long pressing of a button (app. 3s) for the whole period of tractor drive (without disengagement of automatics). Front axle drive remains engaged also when overcoming travel speed of 20 km/h. By putting the tractor at standstill, front axle drive is disengaged automatically.
The switch from manual to automatic mode can be done after the disengagement of manual mode.

Automatic front drive axle control

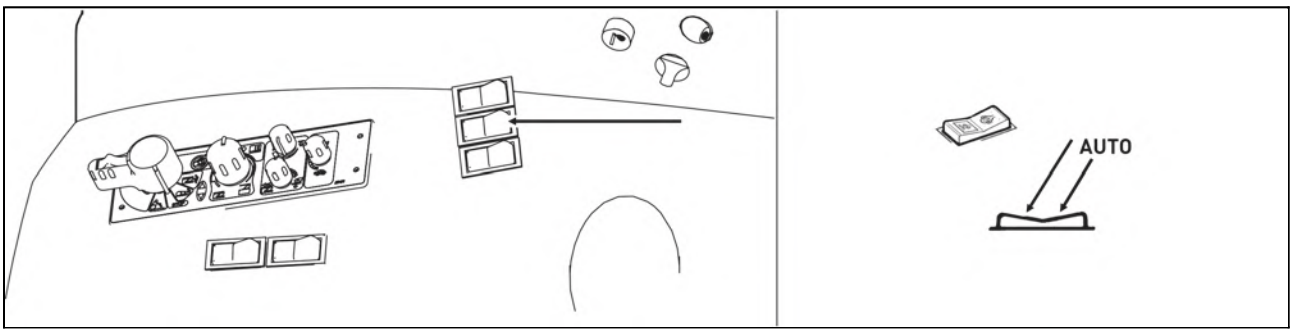


C15N068

Engagement of front drive axle in automatic mode is done by pressing a button which returns to its initial position after release. The disengagement of front drive axle is done by repeated pressing of the button. Engagement of front drive axle is signalized by a lit symbol on the switch and a symbol on the display of dashboard.

Automatic mode of front drive axle control
When automatic front drive axle control is on, the drive of front axle connects automatically, if the angular front wheels displacement is smaller than 15° and travelling speed is lower than 20 km/h,
When you exceed the angular displacement of front wheels 25° or with travelling speed higher than 20 km/h, the drive of front axle disconnects. When the front wheels angular displacement change has lower value than 15°, the drive of front axle connects automatically.
If there is a disconnection of front axle drive for the reason of travel speed higher than 20km/h, then the drive of front axle does not connect automatically with lower travel speed and it is necessary to connect it by pressing a button.
The switch from automatic to manual mode can be done by pressing the button of manual mode.

Axle lock control of rear and front axle

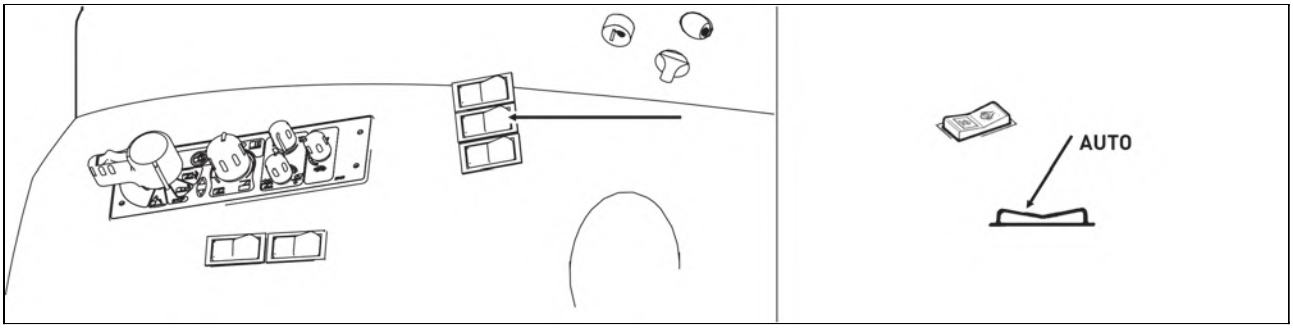


C15N071

Axle lock control button is placed on the panel on the right rear mudguard. Engagement of axle locks is done by pressing the button which returns to its initial position after release. By pressing the upper part of the button, manual mode of axle locks control function is engaged. By pressing the lower part of the button (auto symbol) the function automatic mode of axle locks is on. Axle locks engagement is signalized by a lit symbol on the switch and a symbol on the display of the dashboard. It applies for mechanical and automatic mode of axle locks.

Axle locks cannot be engaged if front drive axle drive is not engaged. When engaging both of the brake pedals, the locks remain switched.
When achieving travel speed which is higher than 15 km/h for the time period of 5 seconds, the axle locks switch off automatically. This condition is signalized for a time period of 5 seconds before the axle locks are disengaged by a blinking of the button symbol. If the axle locks were disengaged due to higher travel speed than 15 km/h, then with a lowered travel speed the axle locks are not engaged automatically and it is necessary to turn them on by pressing a button.
Axle locks are disengaged by repeatedly pressing a button or by engaging one of the brake pedals. The switch from manual to automatic mode can be done by pressing the automatic mode button.

Automatic axle lock control of rear and front axle



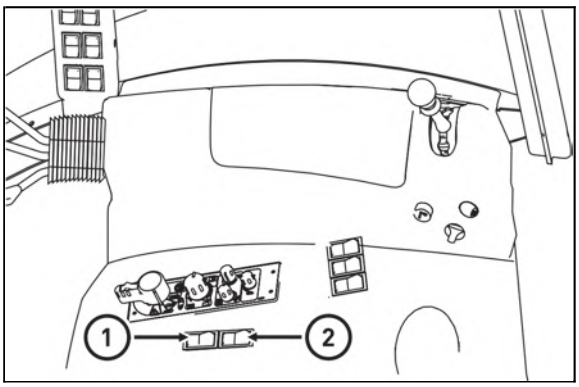
C15N072

The engagement of axle locks of rear and front drive axle in automatic mode is done by pressing a button which returns to its initial position after release. The disengagement of this function is done by a repeated pressing of the button.
The engagement of the axle locks is signalized by a lit symbol on the switch and a symbol on the display of the dashboard.

Automatic mode of axle locks control
Automatic mode of axle locks control lies in disengagement of axle locks if any of the following situations occur:
1. the angular displacement of front wheels is greater than 15°, if the angular displacement of front wheels changes to smaller than 15°, axle locks turn on automatically
2. arms of the rear three-point hitch are heaved in a position, in which the PTO shaft clutch is automatically disconnected (for more see DRIVE OF AGRICULTURAL MACHINES chapter), when lowering the arms of the rear three-point hitch, the axle locks get engaged automatically
3. travel speed is higher than 15 km/h, with lowered travel speed the axle locks are not engaged automatically and it is necessary to turn them on by pressing a button

The switch from automatic to manual mode can be done by pressing the manual mode button.
Disengagement of axle locks is to be done by pressing the button auto again or by depressing a brake pedal.

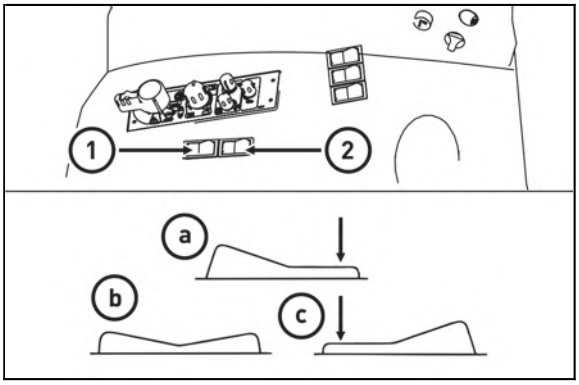
Suspension front drive axle
Tractors can be equipped with a suspension front drive axle upon request.
Suspension drive axle control buttons (**1**) and (**2**) are located on the panel in the area of the right rear mudguard.
Button (**1**) serves for setting the suspension mode of front drive axle.
Button (**2**) serves for height adjustment of the front part of the tractor.



C15N073

If travelling speed of the tractor is higher than 13 km/h, front drive axle transfers automatically to automatic mode where the axle is automatically kept in approximately half of the suspension heave.

Front drive axle suspension mode setting
Button (1) serves for front drive axle suspension mode setting.



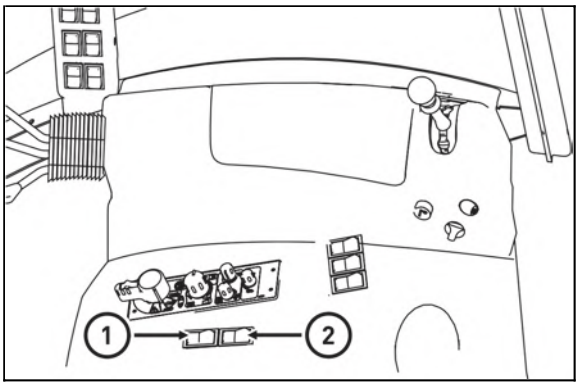
C15N074

(**a**) - after pressing the upper part of the button, there is a lock of front drive axle suspension, the front part of the tractor is lowered to the lowest position. Suspension does not work with the axle and the axle acts as if there were no suspension. The button is locked in (a) position. Front drive axle suspension lock mode can be disengaged by switching the button (**1**) to (**b**) position.
Use this mode always when working with a front loader.

If a tractor is at stand-off with a button (1) in position (a), with next engine starting the suspension of front drive axle is locked.
(**b**) - middle position of the button, the so-called manual mode. Height adjustment of front drive axle works in this position by the button (2). Suspension works by the axle.
(**c**) - after pressing the lower part of the button, front drive axle goes to automatic mode where the axle is automatically kept approximately in half of the suspension heave. This mode is signalized by a lit symbol on the button (**1**). Suspension works with the axle. Automatic mode can be disengaged by switching the button to (**b**) position.

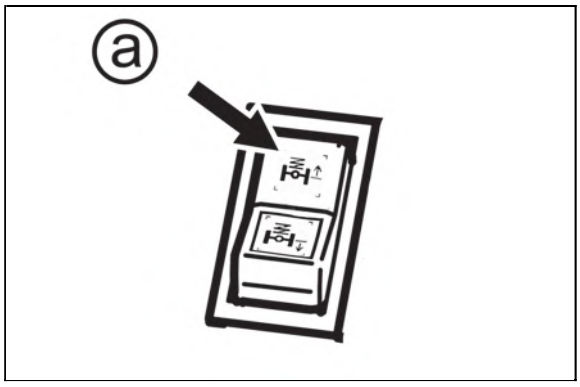
The blinking of the symbol on the button signalizes a failure in the circuit of front drive axle suspension. The code of failure is displayed on the dashboard display.

Height adjustment of the front part of the tractor
Button (**2**) serves for height adjustment of the front part of the tractor. Button (**1**) must be in the manual mode position.



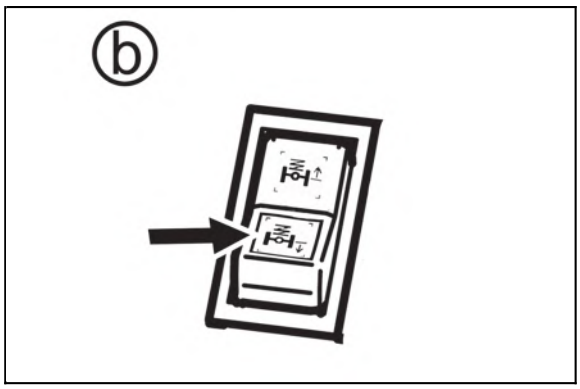
C15N073

(**a**) - by holding the upper part of the bottom for a longer period of time, the front part of the tractor lifts upward after a certain delay, it is lifting for the time of button holding to the end position of the suspension.



FHD14N057

(**b**) - by holding the lower part of the button, after a certain time, the front part of the tractor goes down. It is going down for the time of holding the button to the end position of the suspension.

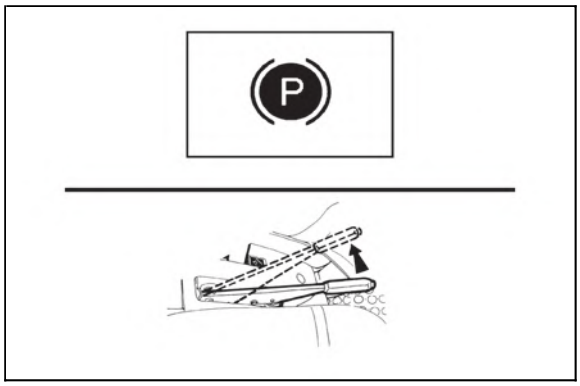


FHD14N058

Manual brake - signalization

If the tractor is not braked by a manual brake, a warning is displayed on a display (a letter **P** in a circle) and at the same time there is a sound signal.
This situation occurs in two cases
a - a tractor unbraked by a manual brake with engine running and a driver leaves its seat
b - a tractor unbraked by a manual brake standing with engine off and the key is shifted in '0' position.

Brake the tractor with a manual brake.

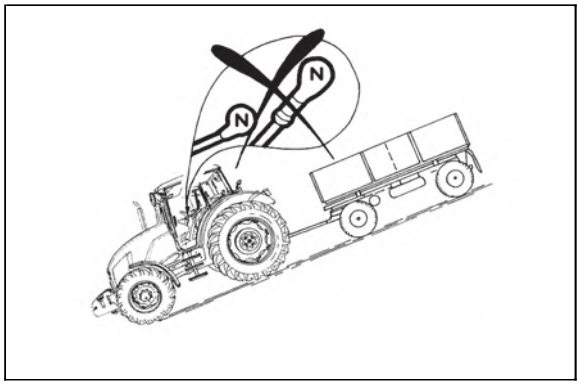


FH12N039

Driving down the slope

Driving down the slope without engaged gear speed is forbidden. If you travel from a longer slope, shift the lower gear speed the steeper the slope is. Shift the lower gear speed before the slope, if possible.

Note: The gear speed with which you easily overcome an ascent, you will also successfully manage descent.



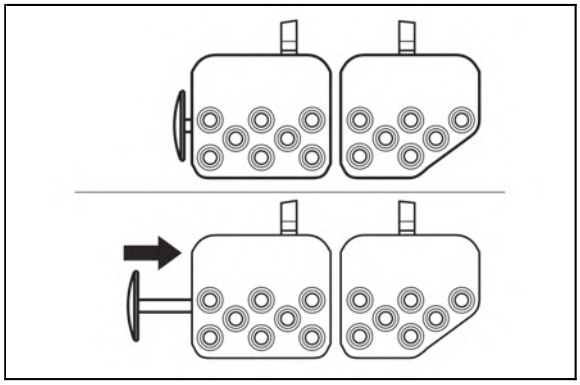
F11N021

Foot brakes
They are disc, wet, hydraulically controlled, double-pedalled with automatic pressure equalizer.

When driving on the road, both pedals must be connected by valve. Use disconnected pedals for braking right or left wheel only when working in terrain or on the field.

Note: When going down a steep slope with a trailer or articulated trailer equipped with air or hydraulic brakes, it is necessary to brake by a foot brake from the beginning of descend.

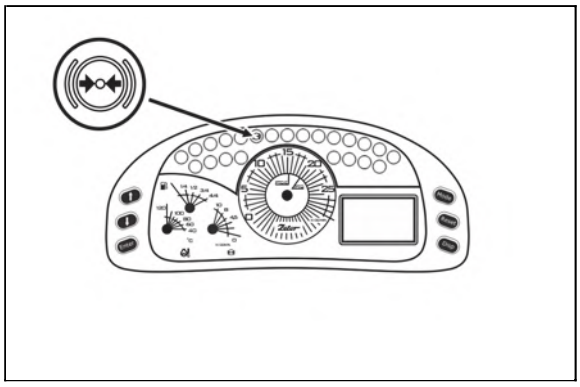
When braking with one brake pedal trailer´s brakes are not active!



FHD14N086

Warning signalization of air pressured drop
Air pressure drop below 450 kPa is signalized by alit red control bulb placed on a dashboard.

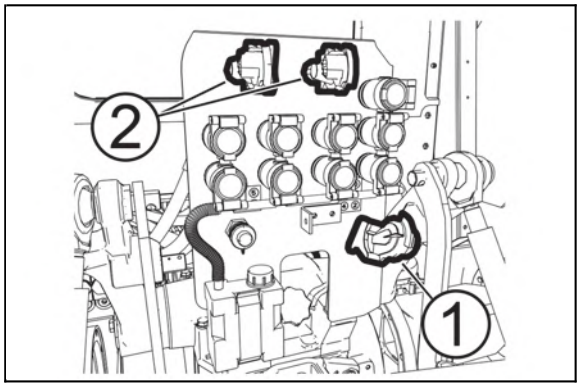
Tractor with braked trailer or articulated trailer with pressured drop in air pressure system under 450 kPa must not continue in transport if there is not increase in air pressure.



C15N092

One-hose and two-hose brakes
1. clutch head of one-hose brakes
2. clutch heads of two-hose brakes

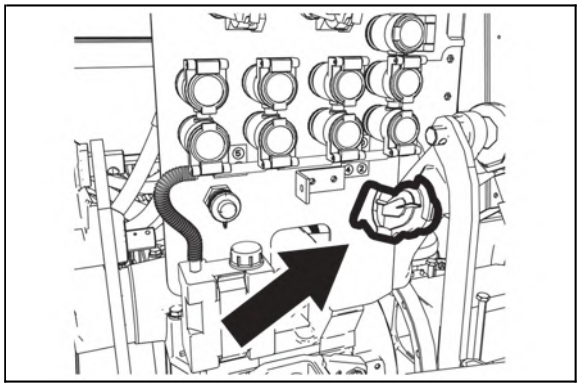
Clutch heads after disconnection or without a connected trailer, articulated trailer must be closed by a valve.



FHD14N061

One-hose brakes
Valve is marked with a black colour.
Operating pressure is adjusted with the control valve at 600 ± 20 kPa.

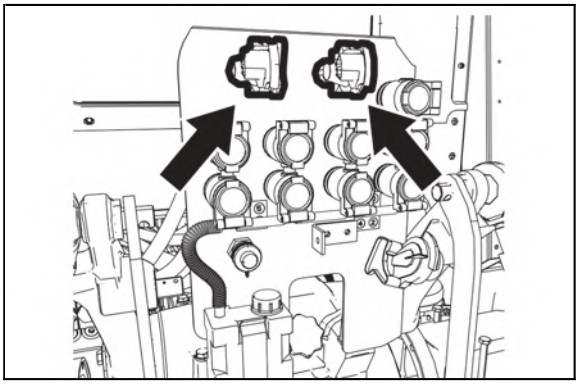
When connecting the trailer (articulated trailer) with a maximum allowed weight approved for the type of tractor at stake is a maximum allowed speed of the set of 30 km per hour! Maximum allowed speed of the set is defined by maximum allowed speed of the slower vehicle of the set.



FHD14N062

Two-hose brakes

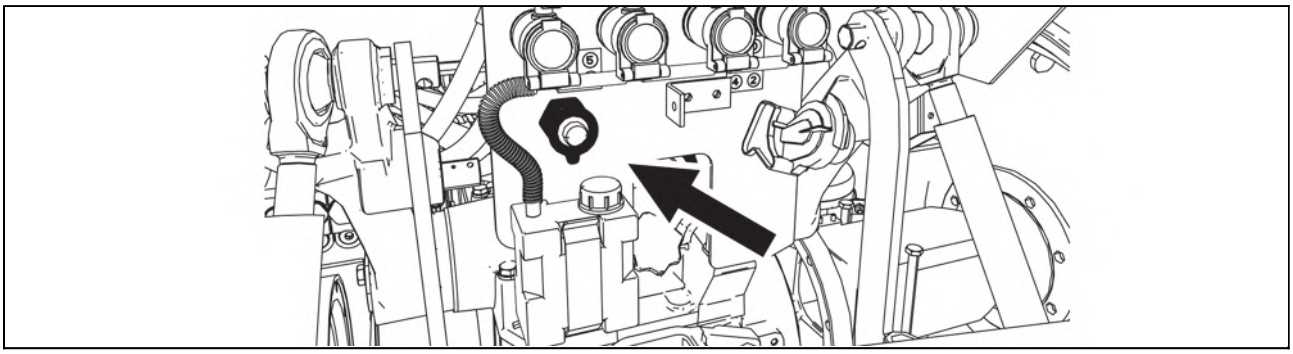
Operating pressure is adjusted with the control valve at 740 ± 20 kPa. Capacity of air tank is 20 l.
The valve of the left head is labelled in yellow (braking branch), the valve of the right head is labelled in red (filling branch).



FHD14N063

When connecting the trailer (articulated trailer) with a maximum permitted speed approved for the type of tractor, the maximum permitted speed of set is 40 km per hour!
Maximum permitted speed of set is given by maximum permitted speed of the slower vehicle of the set.

Hydraulic brakes of trailers



FHD14N064

Connect hydraulic brakes of trailer or articulated trailer to the quick couplings marked by an arrow.
Control of hydraulic brakes of trailers (articulated trailers) and control of tractor brakes is done so that the braking effect of both vehicles is synchronized. Working pressure is derived by oil supplied by non-switched on/switched off gear pump of hydraulics. Brake valve of the trailer is done by the pressure of brake fluid from main braking rollers depending on the force effecting on the brake pedal. The pressure on clutch head must be 12 - 15 MPa with maximum depression of brake pedal. Brake valve of trailer prefers the function of brakes to the function of hydraulics. If there are shocks when foot brake pedals are depressed in the pipeline of hydraulic circuit, it is necessary to bleed the hose from the brake valve to the quick coupling.

When driving with connected trailer or articulated trailer, the pedals of foot brake must be connected and secured by a valve! When braking with one brake pedal, hydraulic brakes of the trailer are not active.

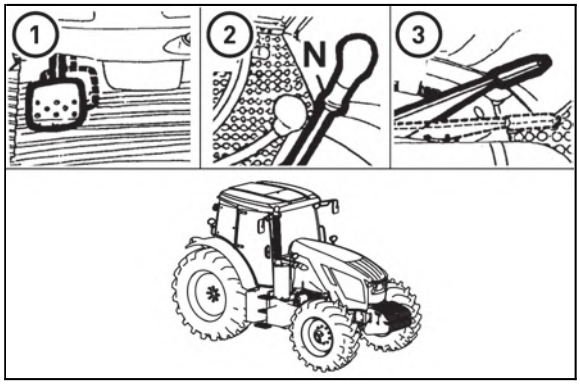
Connecting and disconnecting quick couplings of trailer hydraulic brakes

When connecting and disconnecting quick couplings, take increased care with regard for remaining oil which remains in the socket or in the plug of quick coupling. For ecological reasons, it is necessary to remove this remaining oil after every disconnection of quick couplings with any textile material.

Stopping the tractor - manual brake

Stop the tractor slowly under standard conditions. Shortly before stopping:

1. Depress the clutch pedal.
2. Shift the main gear shifting lever to neutral position.
3. With every stopping, secure the tractor against spontaneous dead start by manual brake.

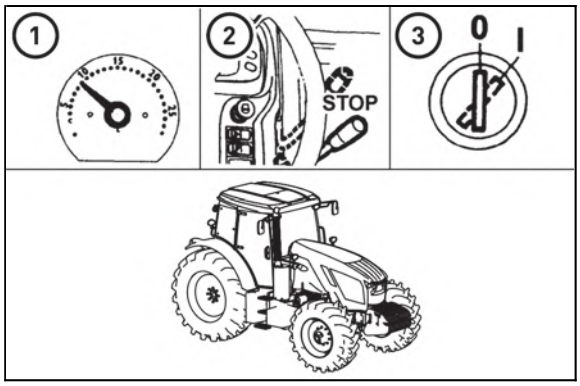


C15N142

Stopping the engine

After the work of tractor when the engine was fully loaded, it is necessary to secure its cooling.

1. Before stopping the engine, lower the revolutions to 800 - 1000 revolutions per minute and allow it to run for the time of approximately 5 minutes.
2. Shift the lever of manual throttle to STOP position.
3. The engine stops after turning the key from 'I' position to '0' position.



C15N143

Leaving the tractor

Before leaving the tractor with a safety cabin, do not forget to remove the key from the switch box in '0' position (in position 'I' and 'II' the key cannot be pulled out).

Tractor must be secured against spontaneous start:

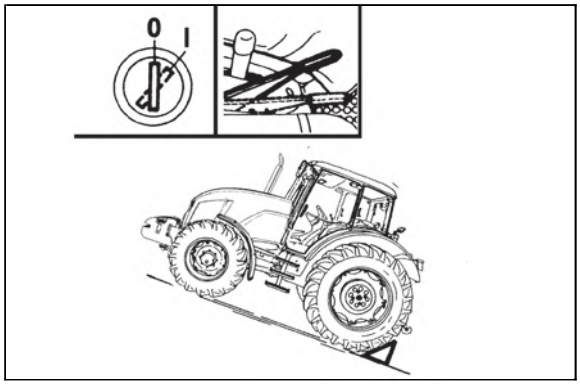
1. Engine off

2. Braked by manual brake

3. Wheels based by wedges.

Engaging a speed gear does not secure the tractor from start (clutch is switched off).

Lock the cabin.

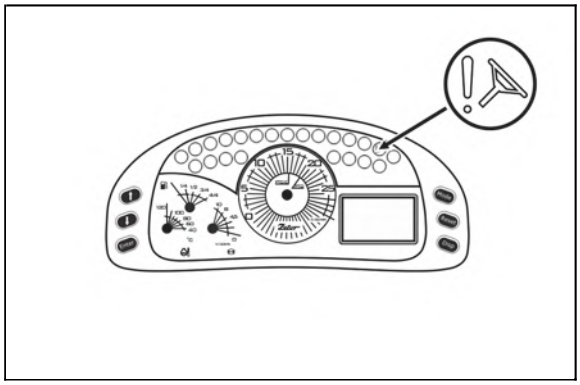


FH12N077

Warning signalization of hydrostatic steering failure

Hydrostatic steering pump failure is with oil pressure drop under 120 kPa behind a pump signalized on a dashboard by an applicable symbol.

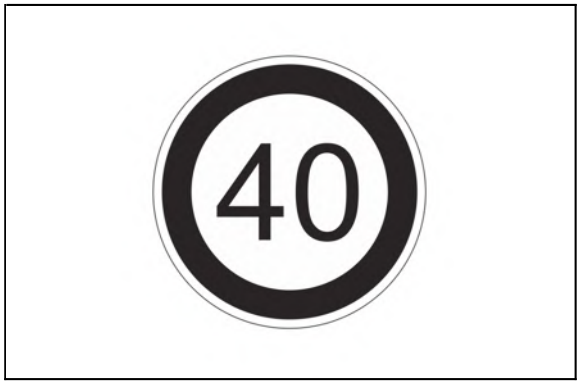
Note: When starting the tractor or with low engine revolutions, the control may blink, if it switches off after starting or increasing the revolutions, it is not a failure.



C15N091

Limiting travel speed

With the threat of exceeding the travel speed of 40 km/h, the maximum engine revolutions are automatically reduced. This function cannot be switched off.

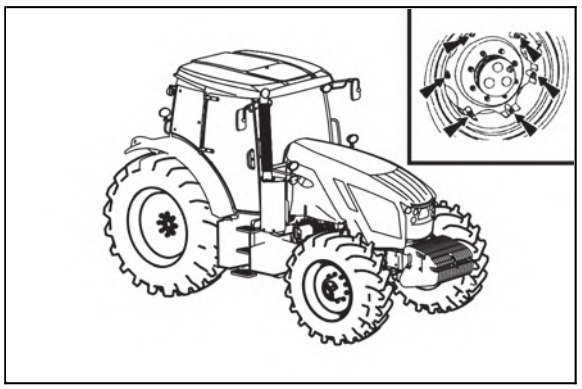


FHD14N068

RUNNING IN THE TRACTOR

General principles of new tractor run-in in first 100 hours of operation
During first 100 hours of operation:
- Load tractor in a normal way, avoid operation with low or maximum engine revolutions
- Avoid operation under partial loading of the engine
- Avoid excessive idle run operation
- Check oil levels in engine often (during this time increased oil consumption is normal)
- Check screw joints in particular in supporting parts of tractor
- Learned insufficiencies to be removed immediately, you will thus prevent subsequent damage or endangered operation
- Keep the same procedure also after tractor complete overhaul

In first 10 hours of operation
- perform run-in in traffic
- tighten fastening nuts of front and rear wheels including connectionbead / rim with prescribed torque



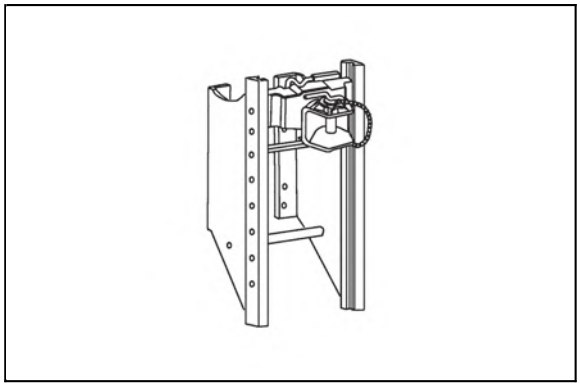
C15N013

From 100 hours of operation
After drive in completion you can work with tractor without limitations.

Before you start, make sure that the technical condition of the tractor corresponds to requirements for safe operation. When a trailer or implement is attached, check its connection and proper fixation of the load. Never leave the tractor while it is moving to connect the trailer by yourself. Also take care of your assistant's safety.

CBM stage quick-adjusting hitch

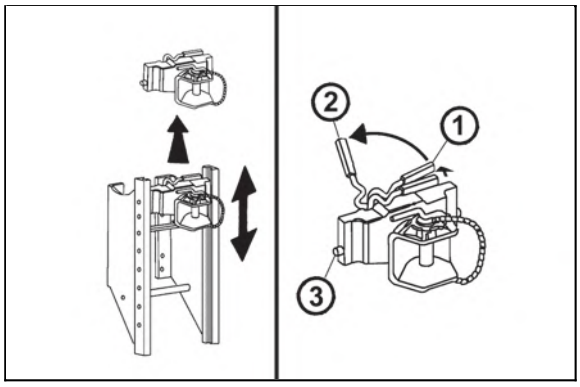
It is designed for attachment of double-axle trailers or lighter single-axle semi-trailers. The guiding mouth is height adjustable. During work with various implements it may be necessary to adjust the height of the hitch or to disassemble the entire hitch.



D201

Height adjustment and disassembly of the CBM stage hitch

By moving the control lever in the arrow direction to position (1) you will release the lever and by moving it subsequently to position (2) you will retract the locking pins (3). Now, the stage hitch is released and you can adjust its height or disassemble it. When you release the lever from position (2), the locking pins (3) will extend and the lever will automatically return to the initial position.

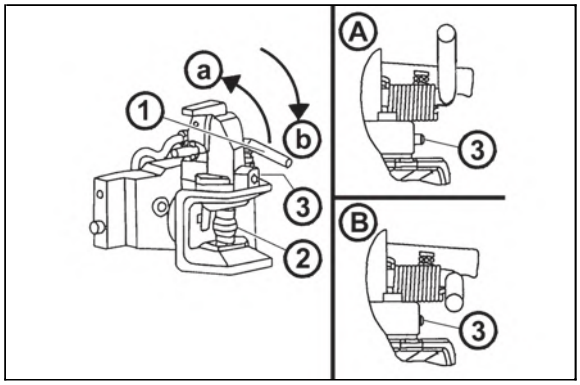


D202

Automatic mouth of the CBM stage hitch

When the lever (1) is moved in the direction of the arrow (a), the pin (2) is retracted to the upper position, which is signalled by the extended indicator (3), see fig. (A). When the mouth gets onto the shaft lug, the pin will automatically slide into the lug of the connected trailer. You can lower the hitch pin (2) manually by moving the lever (1) in the arrow (b) direction. The insertion of the pin is signalled by the retracted indicator (3), see fig. (B).

After the attachment of the trailer you must always check whether the indicator (3) is retracted in accordance with fig. (B).

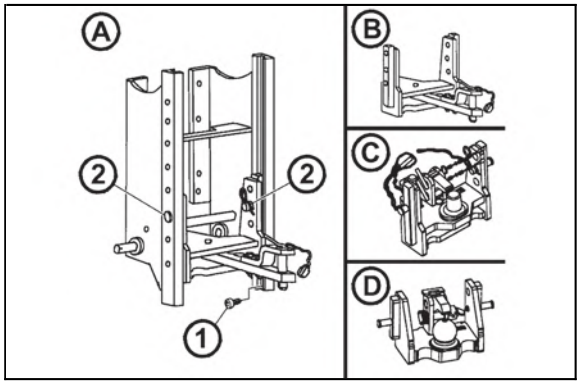


E304

Modular system of hitches for trailers and semi-trailers
Module types:
Fig. (B) - Swinging draw-bar console
Fig. (C) - Swinging draw-bar console with a fixed pin
Fig. (D) - Console with a ø 80 ball

Disassembly, fig. (A):
1 - Remove the locking screw (1).
2 - Secure the module against sinking, release and disassemble the pins (2).
3 - Slide the module out of the console downwards.

Do the assembly in the reverse order.

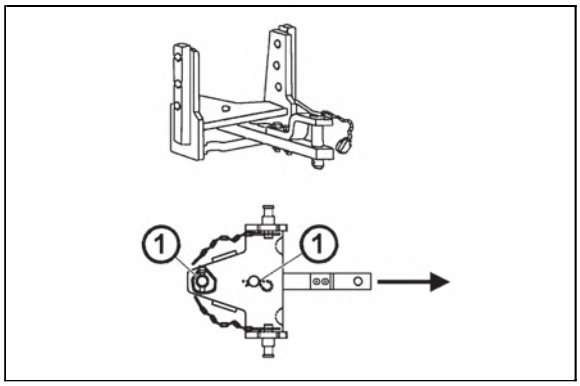


D204

Swinging draw-bar console module
The swinging draw-bar console module is located in the stage hitch console.

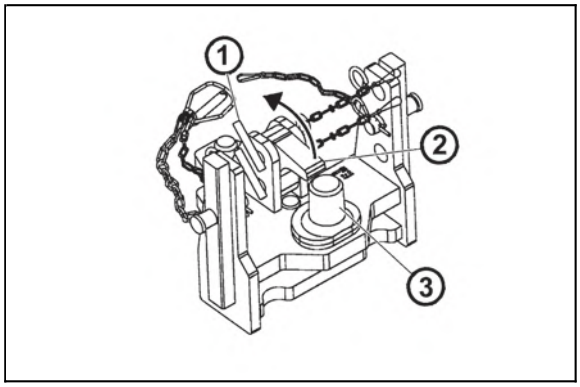
Swinging draw-bar
Disassembly:
1 - Release and remove the pins (1).
2 - Slide the swinging draw-bar out in the arrow direction.

Do the assembly in the reverse order.



D205

Swinging draw-bar console with a fixed pin module
Perform the assembly and disassembly of the swinging draw-bar in accordance with the 'Swinging draw-bar' chapter.
Connecting the shaft lug to the fixed pin (3):
1 - Release and remove the pin (1).
2 - Lift the locking wedge (2) in the arrow direction.
3 - Connect the shaft lug to the fixed pin (3):
4 - Return the locking wedge (2) to the original position and secure it with the pin (1).

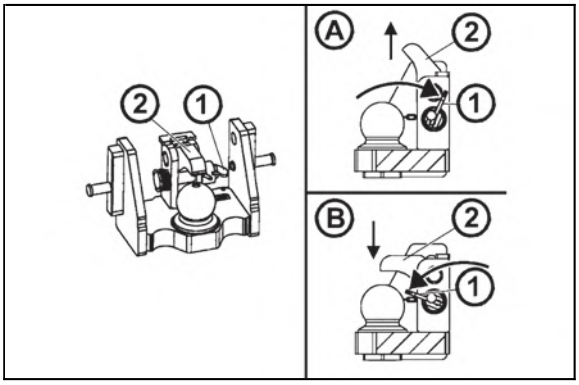


D206

Console with a ø 80 ball module

The console with a ø 80 ball is only used to connect semi-trailers with a hitching device designed for a ø 80 ball.

Releasing the hitch, fig. (A):
By moving the lever (1) in the arrow direction you will remove the locking wedge (2).
Locking the hitch, fig. (B):
By moving the lever (1) in the arrow direction you will retract the locking wedge (2).



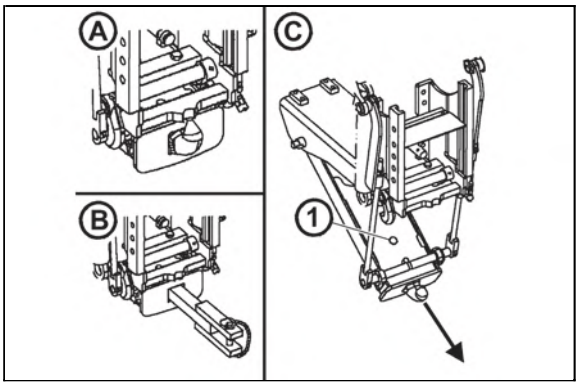
D207

Hitch for a single-axle CBM semi-trailer

The hitch for a single-axle semi-trailer may be equipped with a hook (A) or with a swinging draw-bar (B).

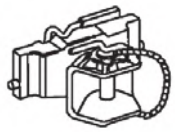
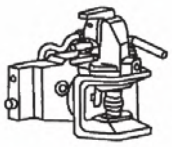
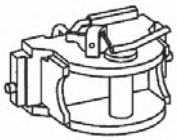
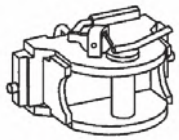
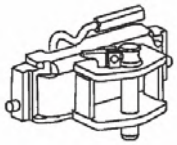
Replacing the hook with the swinging draw-bar (C):
1 - Lower the hitch.
2 - Release and remove the pin (1).
3 - Remove the hook in the arrow direction.

Install the swinging draw-bar in the reverse order.

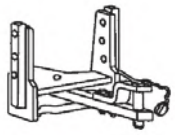
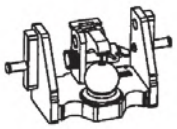
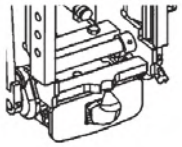
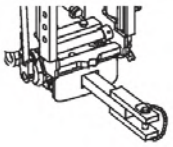
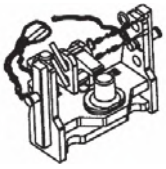


D208

Maximum permissible vertical static load of hitches for trailers and semi-trailers

Hitch type	Permissible vertical static load	Hitch pin Ø	Hitch type	Permissible vertical static load	Hitch pin Ø
	2 000 kg	31 mm		2 000 kg	38 mm
Hitch class D2			Hitch class D3		
	2 000 kg	43 mm		2 000 kg	50 mm
Hitch class C					
	2 000 kg	28 mm			

The maximum weight of an aggregated braked trailer or semi-trailer must not exceed the value specified on the data plate of the tractor and the value specified in the technical certificate of the tractor. The maximum permissible speed of the set results from the maximum permissible speed of the slower vehicle in the set.
Hitch of class C: max. weight of the trailer 6,000kg.
Hitch of class D2: max. weight of the trailer 14,000kg.
Hitch of class D3: max. weight of the trailer 20,000kg.

Hitch type	Permissible vertical static load	Hitch pin (ball) Ø	Hitch type	Permissible vertical static load	Hitch pin (ball) Ø
	736 kg	31 mm		2 000 kg	80 mm
	3 000 kg	47 mm		1 200 kg	31 mm
	Fixed pin 2,000 kg	44,5 mm			

The maximum weight of an aggregated braked trailer or semi-trailer must not exceed the value specified on the data plate of the tractor and the value specified in the technical certificate of the traktor. The maximum permissible speed of the set results from the maximum permissible speed of the slower vehicle in the set.

NOTES

Work with PTO shaft

Before attaching of an implement, driven by means of the tractor PTO shaft, check the speed compatibility of both, it means tractor PTO shaft and implement driven shaft (540 rpm or 1,000 rpm). Different PTO speed values may cause serious damages and injuries.

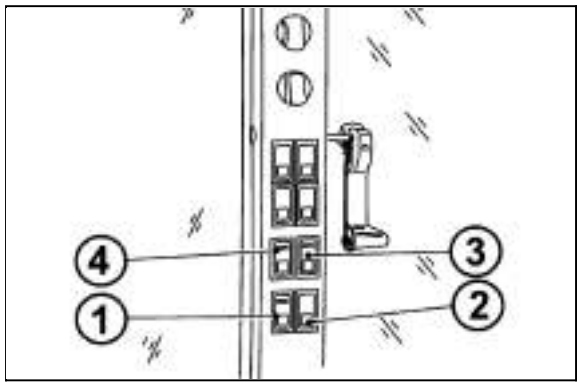
Within any repair or modification on the implement powered by PTO or within any operation on terrain in its working range the tractor engine ought to be switched off (ignition key in position 0).

1. When working with PTO shaft mind that all the covers are duly fixed.
2. After completing the work, always mount the cover of PTO shaft back.
3. Any repairs or cleaning of aggregated machines parts driven by PTO shaft to be done only with the engine at halt and PTO clutch disengaged.
4. Before starting an aggregated machine driven by PTO shaft, make sure that there are no unauthorized personnel near, there is a risk of injury.

Controlling the front and rear PTO shaft

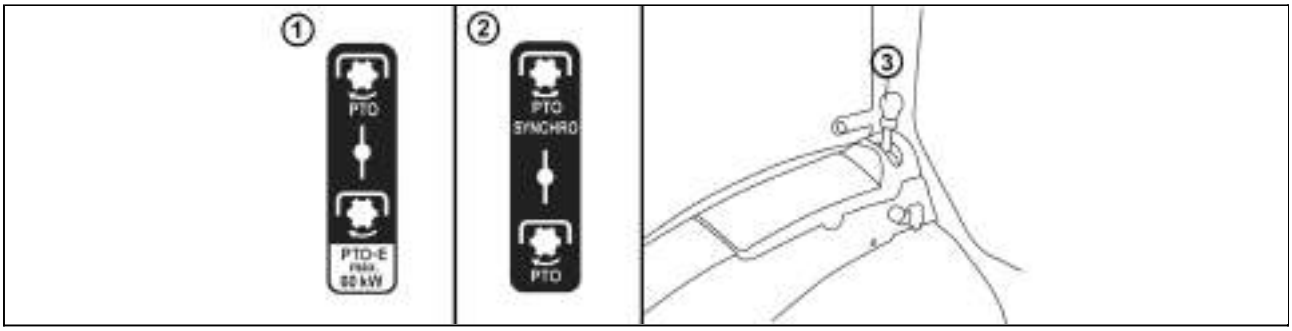
Switches of the control of the front and rear PTO shaft are located on the right pillar of the cabin.

1. The switch of the revolution control of the rear PTO shaft.
2. The button of the automatic switching off of the clutch of PTO shaft.
3. The switch of the rear PTO shaft.
4. The switch of the front PTO shaft.



FH13N012

Rear PTO shaft revolutions preselection lever



FH13N005

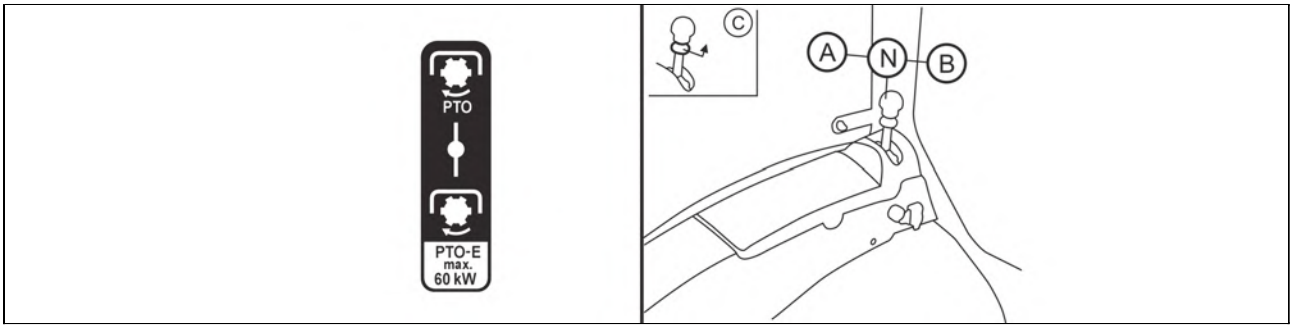
The tractor may be equipped with one of two systems of rear PTO shaft revolutions preselection. The system used in the tractor is marked on the label placed by rear PTO shaft revolutions preselection lever.

1. Standard and economical independent revolutions of rear PTO shaft - label (1)
2. Dependent and independent revolutions of rear PTO shaft - label (2)

Rear PTO shaft revolutions preselection lever (3) is located on the right side of driver's seat.

Independent rear PTO shaft revolutions - number of revolutions is dependent on the number of engine revolutions.
Dependent rear PTO shaft revolutions - number and the direction of revolutions is dependent on the engaged gear and reversing lever position.

Standard and economical independent revolutions of rear PTO shaft



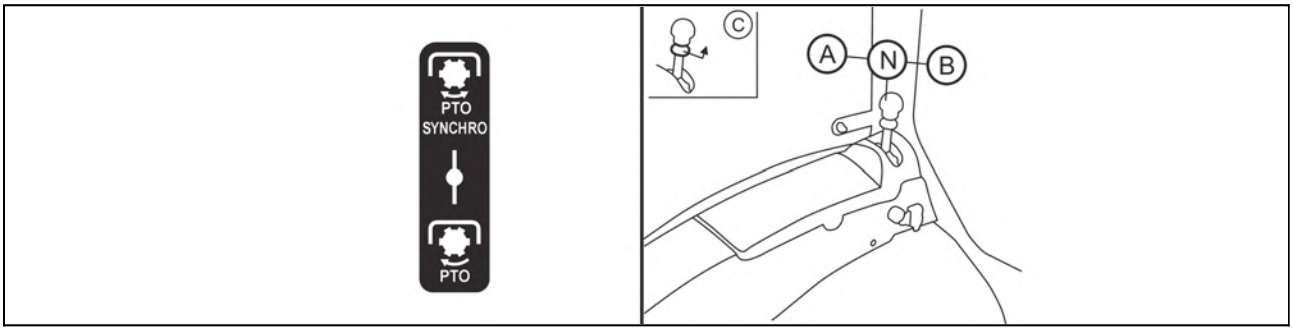
FH13N006

The system used in the tractor is marked on the label placed by rear PTO shaft revolutions preselection lever.
This system has only independent revolutions of rear PTO shaft.

A - Standard PTO shaft revolutions engaged
N - Neutral position (rear PTO shaft end-point can be spun freely)
B - Economical revolutions of PTO shaft engaged

With engaged standard PTO shaft revolutions (A), one can engage 540 or 1000 revolutions of rear PTO shaft on the right side of the cab column by the revolutions selection switch.
With engaged economical PTO shaft revolutions (B), the switch of rear PTO shaft revolutions preselection on the right column of the cab can be used to engage 540E or 1000E rear PTO shaft revolutions.
The lever is placed on the right side of driver's seat. After shifting the lever, it is necessary to lift collar in the direction of the arrow (C).

Dependent and independent rear PTO shaft revolutions



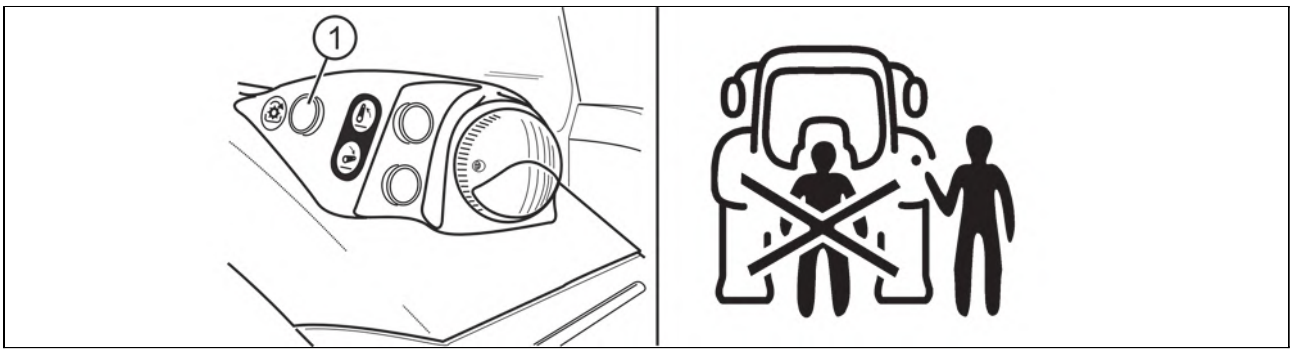
FH13N007

The system used in a tractor is marked on the label placed by the rear PTO shaft revolutions preselection lever.
This system has only 540 or 1000 rear PTO shaft revolutions.

A - PTO shaft dependent revolutions engaged
N - Neutral position (rear PTO shaft end-point can be spun freely)
B - Independent PTO shaft revolutions engaged

With engaged dependent (A) or independent (B) rear PTO shaft revolutions (B), the switch of rear PTO shaft revolutions preselection on the right column of the cab can be used to engage 540E or 1000E of rear PTO shaft revolutions.
The lever is placed on the right side of driver's seat. For shifting the lever, it is necessary to lift collar in the direction of the arrow (C).

Facilitating connection of joint shaft of an aggregated machine to the tractor

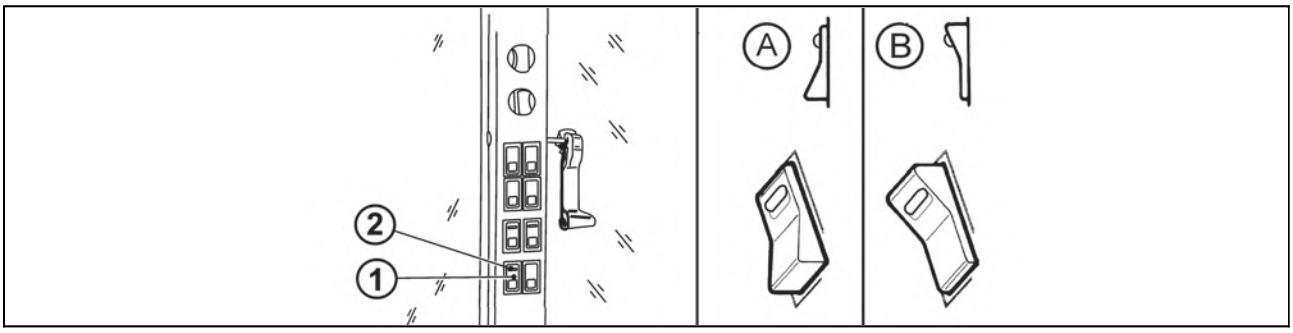


FH12N002

For facilitating the connection of joint shaft of aggregated machine to a tractor a button (1) placed on mudguards can be used.
With the engine running and rear PTO shaft switch off, spinning of rear PTO shaft occurs after pressing the button (1). PTO shaft stops spinning after releasing the button.
Beware: Rear PTO shaft revolutions preselection lever must not be in (N) position or in the position of a dependent revolution of rear PTO shaft.

When manipulating with PTO shaft by means of buttons (1), the operator must stand beyond the space of the connected tools not to be caught or injured.

Selection switch of rear PTO clutch revolutions (P.T.O.)



FH13N014

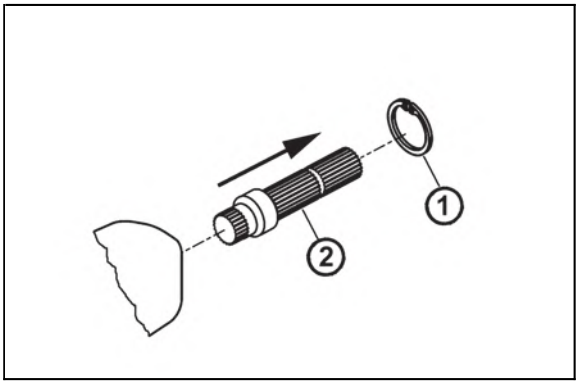
Shifting rear PTO shaft revolutions is done by a switch (1) The switch is equipped with a mechanical lock (2) against unwanted switch. When switching the switch, depress the lock in downward direction.

A -	540 rpm
B -	1000 rpm

The change of PTO shaft revolutions - 540 and 1000 per minute to be done only with PTO shaft at halt! Check that the revolutions of PTO shaft are set accordingly with regard for the connected tools!

Replaceable end points of rear PTO shaft

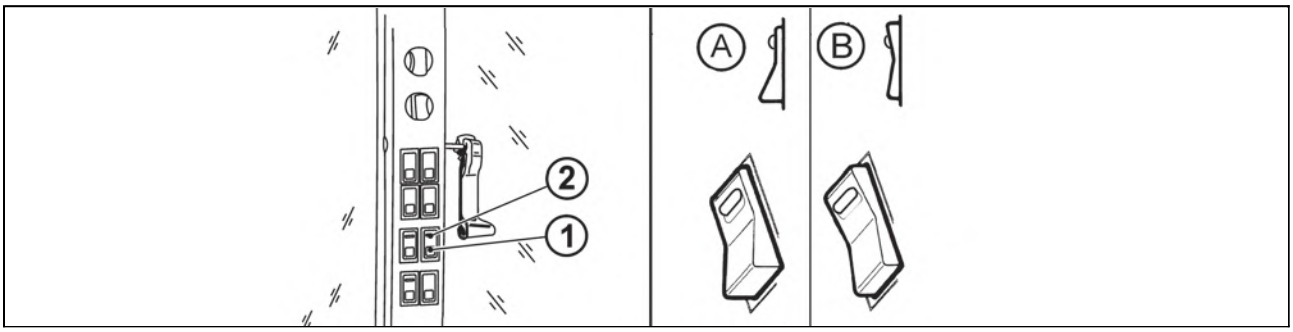
The tractor is equipped with six or twenty-one splined replaceable end point of rear PTO shaft.
Replacement procedure:
1. Use safety ring pliers to demount a safety ring (1)
2. Remove replaceable end point by pulling in the direction of an arrow (2)
3. Mount the end point in an opposite way, pay increased attention to the mounting of the safety ring (1)



E357

Replacement of the terminal shall be performed when the engine is stopped.
Rpm of the output shaft and terminal type shall be chosen depending on the prescribed rpm of the coupled mechanism.
Shifting 540 and 1,000 or 540E min^{-1} is possible regardless to the number of splines of the installed terminal.

Rear PTO switch



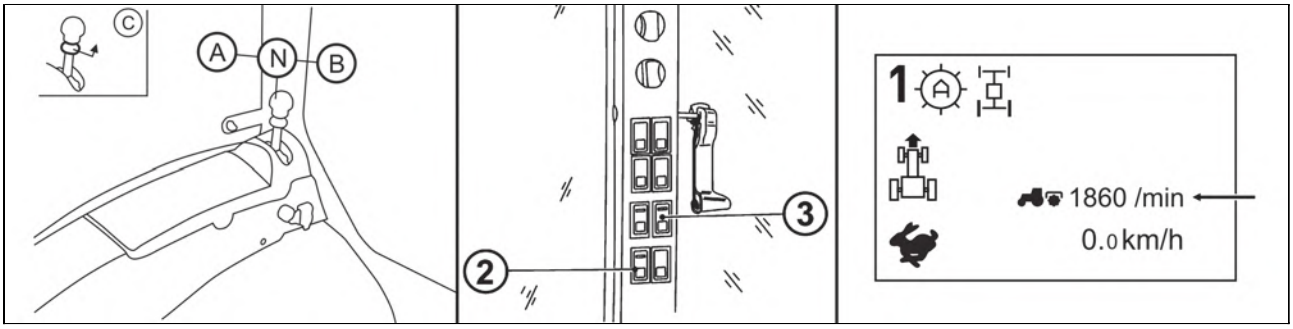
C15N016

Rear PTO shaft clutch is engaged by switch of rear PTO shaft. After engagement of the switch the shaft spins.
The engagement of the rear PTO clutch is done by a switch (1) placed on the right column of the cabin. The switch is equipped with a mechanical lock (2) against unwanted switch. When switching the switch, depress the lock in downward direction.
After switching the switch (1) from (A) position to (B) position rear PTO shaft clutch is engaged and the shaft spins.
After switching the switch (1) from (B) position to (A) position rear PTO shaft clutch is engaged and the shaft stops.

A - rear PTO shaft clutch disengaged
B - rear PTO shaft clutch engaged

Check that the PTO shaft revolutions are set properly with regard for the connected tools!

Engaging rear PTO shaft - Independent revolutions



C15N017

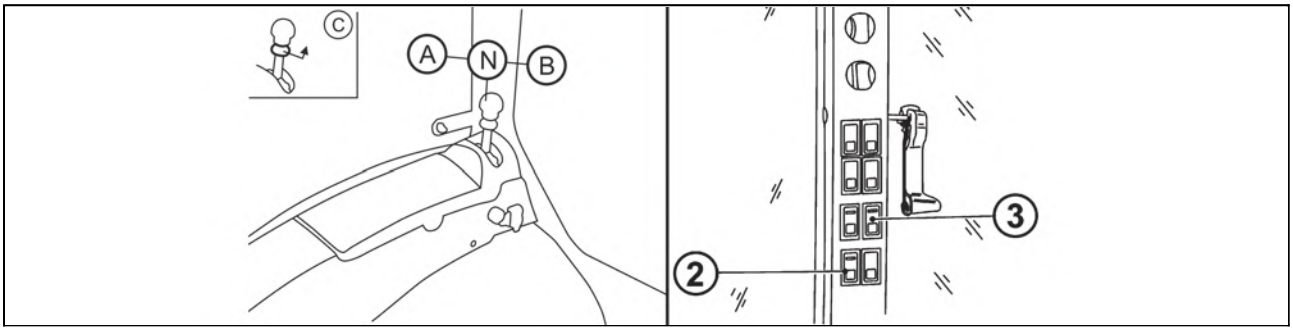
The number of PTO shaft revolutions is dependent on the number of engine revolutions.

With engine running:
1. Select applicable operation mode PTO shaft revolutions preselection lever.
2. Select applicable revolutions by switch of selection of rear PTO shaft (2) revolutions.
3. Rear PTO shaft is set into operation by switching the switch of rear PTO shaft (3).

Engagement of rear PTO shaft is signalized by the display of the number of rear PTO shaft revolutions on the display of the dashboard.

If the aggregated machine allows it, engage the rear PTO shaft with minimum revolutions of 1500 rpm.

Engagement of rear PTO shaft - dependent revolutions

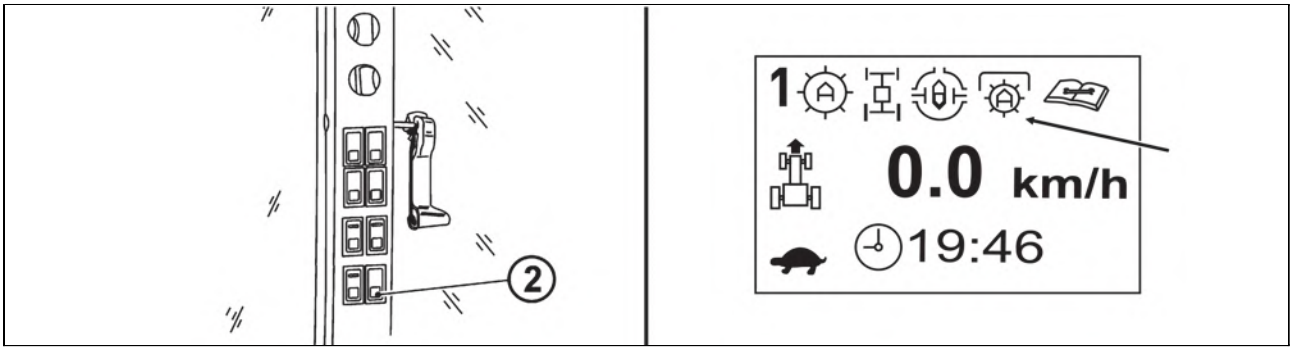


C15N18

The number and the direction of the revolutions are dependent on the engaged gear and the position of reversing lever. The position of reduction lever does not have any influence on the number rear PTO shaft revolutions in dependent revolution mode.
With engine running:
1. Rear PTO shaft dependent revolutions are selected by PTO shaft revolutions preselection lever.
2. Rear PTO shaft switch (3) is not functional in this mode.
3. Select applicable revolutions by rear PTO shaft selection switch (2).
4. Engage gear by the main gear shifting lever and the direction of drive by reversing lever. When tractor drives off, rear PTO shaft also spins.

Automatic PTO clutch disengagement is not functional in this mode.

Automatic disengagement of PTO clutch



C15N020

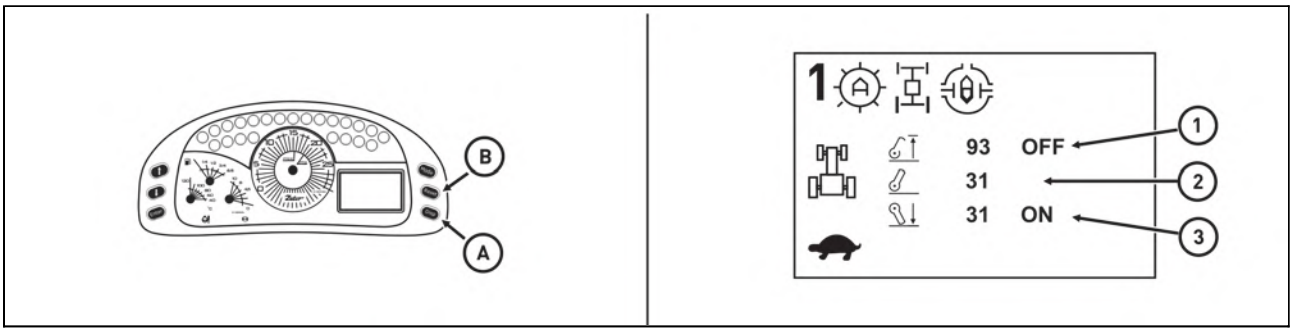
The function of automatic deactivation of the clutch of PTO shaft means that when the PTO shaft is activated and the arms of the rear three-point hinge are lifted, the clutch of the rear PTO shaft is automatically deactivated and the shaft is stopped; when the arms of the rear three-point hinge are lowered again, the clutch of the rear PTO shaft is automatically activated and the shaft starts rotating provided that the driving direction is engaged with the return lever and the travelling speed of the tractor is 0.3 km/h at least.

When the clutch of the rear PTO shaft is activated, automatic deactivation of the clutch of PTO shaft is activated by pressing the button (2) for at least three seconds. When the button (2) is released, it returns into its original position.

Further pressing of the button (2) causes deactivation of this function.

The activation of the function of automatic deactivation of the clutch of PTO shaft is indicated by the symbol on the display of the instrument panel.

Setting automatic disengagement of PTO shaft clutch - display description

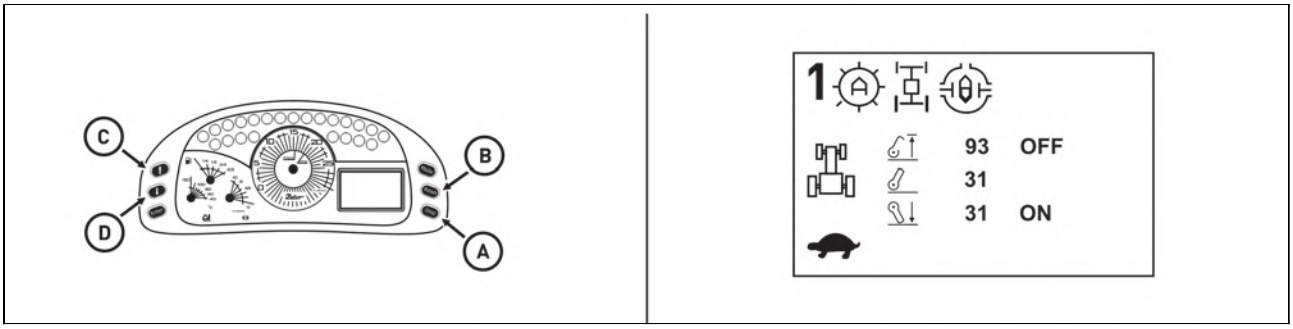


c15n101

Display the third display on dashboard by gradual depressing of (A) button.
These values are displayed on the display:
H-LIMIT (1) **-** position of arms of three-point hitch at which disengagement of rear PTO shaft clutch
ACTUAL (2) **-** current position of arms of three-point hitch
L-LIMIT (3) **-** position of arms of three-point hitch at which engagement of rear PTO clutch occurs
The number with individual items has only informative value.

Automatic disengagement of PTO shaft clutch - return to basic setting
Basic values set by the manufacturer are:
H-LIMIT - 55
L-LIMIT - 45
By pressing the button (B) basic values are set on dashboard with displayed display.

Setting automatic disengagement of PTO shaft clutch



C15N102

Setting automatic disengagement of PTO shaft clutch is done with standing tractor with started engine, with disengaged PTO shaft clutch switch and reversing lever under the steering wheel in neutral position. Display the third display on dashboard by gradual depression of (A) button.

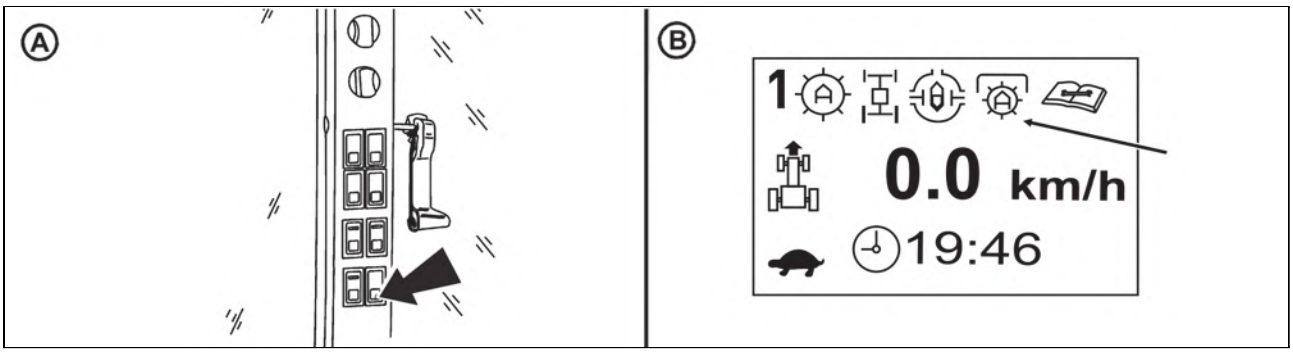
Setting **H-LIMIT** position
1. Set the arms of three-point hitch to a position of the required disengagement of rear PTO shaft clutch.
2. Press (C) button on the dashboard. By this a new value is saved and the number by **H-LIMIT** item changes and equals to **ACTUAL** value.

Setting **L-LIMIT** position
1. Set the arms of the three-point hitch to the position of required engagement of rear PTO shaft clutch.
2. Press (D) button on the dashboard. By this a new value is saved and the number with **L-LIMIT** item changes and equals to **ACTUAL** value.

The number by **H-LIMIT** item must be always greater at least by 10 than the number by **L-LIMIT** item, or the new value will not be saved.

Beware! When setting the position of arms of automatic disengagement of rear PTO shaft clutch outside basic values set by manufacturer not bearing any liability for damage incurred from this setting.

Work with automatic disengagement of PTO shaft clutch



C15N021

Switch automatic disengagement of PTO shaft clutch by (A) switch with tractor at standstill with engine running. Switching automatic disengagement of PTO shaft clutch is signalized by (B) display on the display of the dashboard.
After switching the function with a switch (A), the rear PTO shaft is at standstill; this is signalized by blinking of (B) symbol on the display of the dashboard.

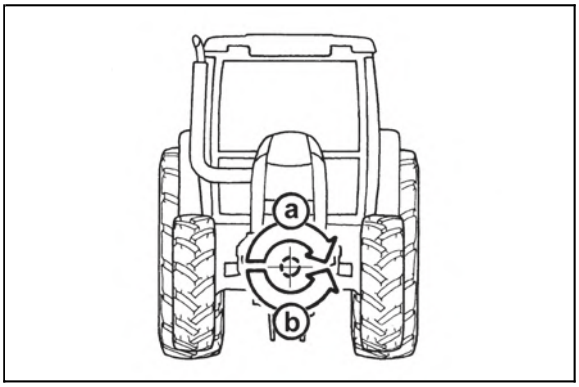
Starting rear PTO shaft
Rear PTO shaft spins if the arms of three-point hitch are lowered lower than **L-LIMIT** is set and the tractor goes at a rate faster than 0.3 km/h. When spinning the rear PTO shaft, the display of symbol (B) on the display stops blinking.

Stopping rear PTO shaft
Rear PTO shaft stops if the arms of three-point hitch are lifted higher than **H-LIMIT** is set**.** When stopping rear PTO shaft, the display of symbol (B) starts blinking on the display.

Restarting rear PTO shaft
For subsequent spinning of rear PTO shaft it is necessary to proceed in accordance with see **Starting rear PTO shaft.**
If with **Stopping rear PTO shaft** also stopping of tractor occurs which lasts for more than three minutes, there is a blockage of starting rear PTO shaft. (B) symbol is not displayed on the display, control on switch (A) is blinking and PTO shaft does spin also when meeting the conditions for **Starting rear PTO shaft.**
If there is a blockage of blocking the starting of rear PTO shaft, it is necessary to switch the switch to (A) position - off. Then switch the rear PTO clutch again by switch A according to previous articles.

Front PTO shaft
Front PTO shaft is equipped with a solid six or twenty-one splined end point and it comes only in design of 1,000 revolutions.
Tractor may be equipped with front PTO shaft with varied direction of spinning:

a -	In compliance with the direction of engine revolutions (standard)
b -	Against the direction of engine revolutions (*on request)

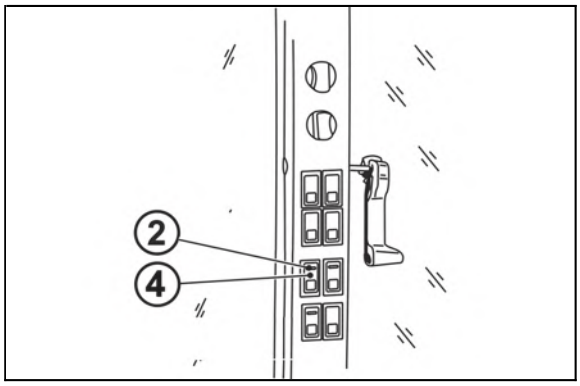


F_02_64

Front PTO shaft control

Engagement and disengagement of front PTO shaft is done by a switch (4) The switch is equipped with a mechanical lock (2) against unwanted switch. When switching the switch depress the lock in the downward direction.

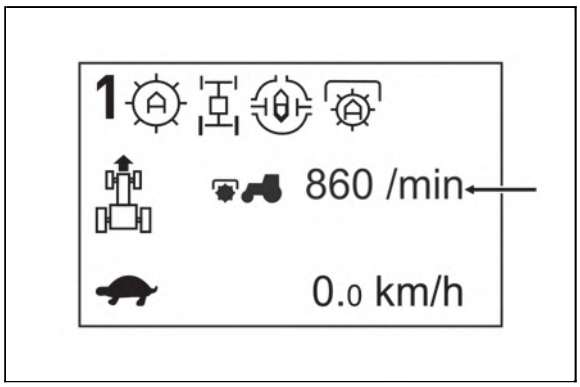
Front PTO shaft is set into activity by switch of a switch.



C15N022

The engagement of front PTO shaft is signalized by displaying the number of revolutions of front PTO shaft on the display of dashboard.

If the aggregated machine permits, engage front PTO shaft with min. engine revolutions of 1500 rpm.



C15N147

Maximum transferred output

PTO shaft	Transferred output
Front	
1000 per minute	90 kW
Rear	
1000 per minute	full engine output
540 per minute	full engine output
1000E per minute	60 kW
540E per minute	60 kW

F_02_46

DRIVE OF AGRICULTURAL MACHINERY

Drive of machines with greater inertia masses
(crushers, rotary harrows, reaping machines, etc.)
Cardan shaft for drive of these machines must be equipped with the so called freewheel clutch which ensures disconnection of torque transfer with retroaction from the machine on the tractor.

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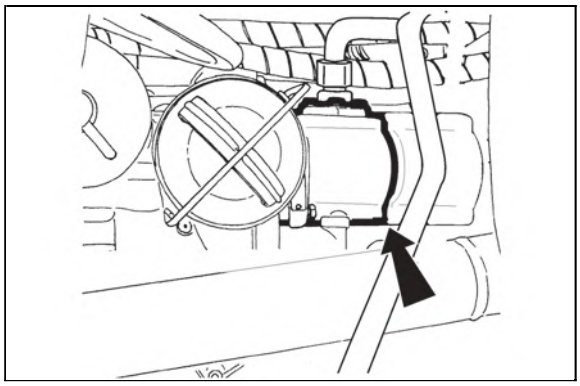
Hydraulic system
The system consists of the inner and outer circuit.
The source of pressurized oil is a gear pump.
Oil is drawn from the common filling of the gearbox and final drive housing.

Hydraulic pump
The hydraulic pump cannot be disengaged. When the engine is running, the pump is in operation.

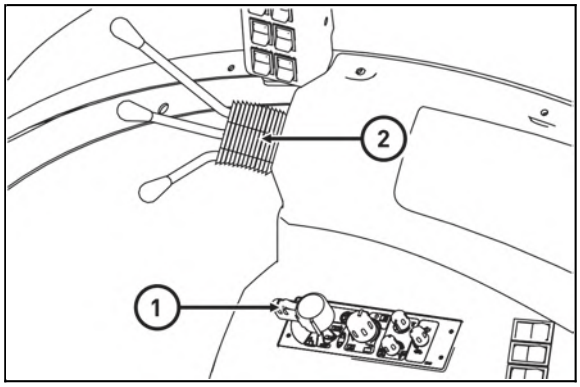
Pump type	Delivered quantity
GHD0 32/12,6L	85 l/min

The pressure generated in the hydraulic system by the hydraulic pump is limited by a relief valve to 20 MPa.



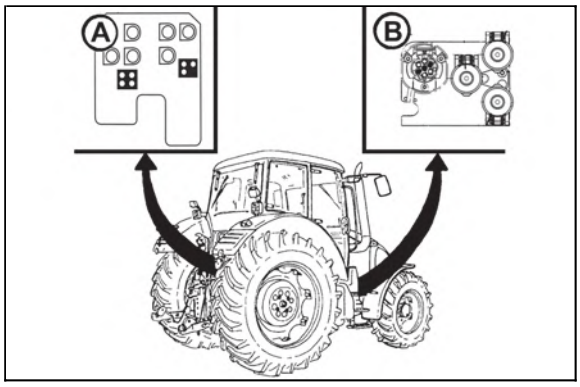
F_02_113a

Control elements placement
Control panel is placed on the right rear mudguard.
1. Electrohydraulics control
2. External hydraulic circuit control



C15N023

Outer hydraulic circuit
The outer circuit supplies pressurized oil to hydraulic implements connected to the outer outlets of the hydraulic system terminated with quick-couplers.
The sockets of the rear (A) as well as front (B) quick-couplers have the inner diameter of 12.5 mm and comply with the international ISO 5675 standard.



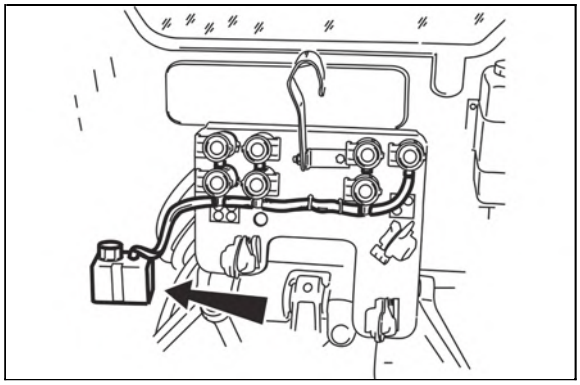
C15N024

Connecting and disconnecting quick-couplers

When connecting and disconnecting the quick-couplers pay increased attention with regard to the residual oil that remains in the socket or on the plug of the quick-coupler. For environmental reasons after every disconnection of quick-couplers this residual oil must be removed with any textile material.

Quick-couplings with drip collection

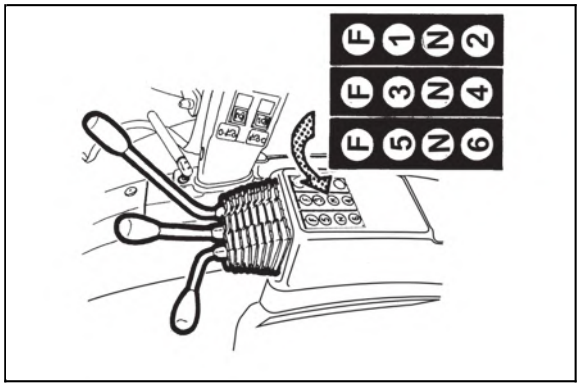
On request, dripping system for holding leakage oil can be installed. Regularly check whether the tank is not full; dispose of the oil in an environment-friendly way.



FH12N046

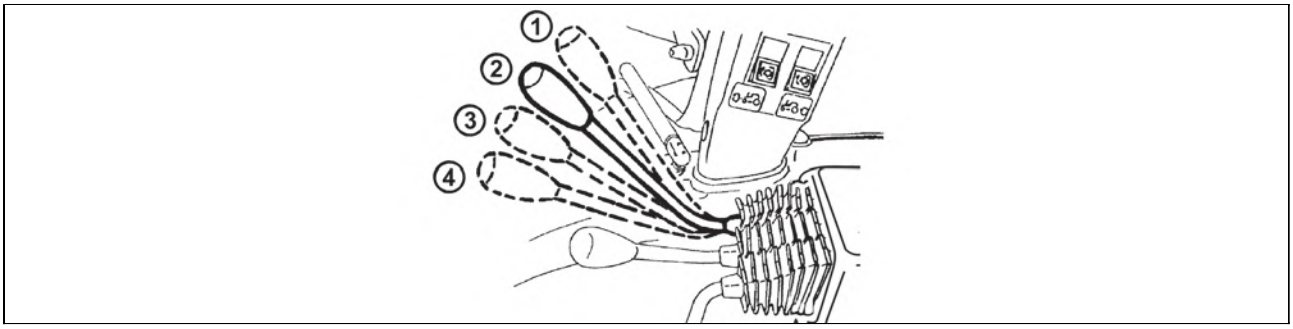
Hydraulic distributor of the outer hydraulic circuit

The outer circuit of the tractor hydraulics is controlled by the distributor with three four-position sections controlled by levers.
The control levers of the sections are located in the cabin on the mudguard of the right rear wheel.
The numbers on the label of the control levers correspond to the numbers of the quick couplers.
The levers controlling both end sections are locked in the rear position at maximum oil flow rate into the quick couplers 2 or 6. After overcoming the increased resistance the locked lever can be returned into the position (N).
The quick couplers 2, 4 and 6 are equipped with the return valve - use for the connection of the working branch of the machine with the increased requirement for tightness - minimum drop of the tools e.g. during transport.



FH12N048

Description of the functions of individual positions of control levers of the hydraulic distributor



FH12N049

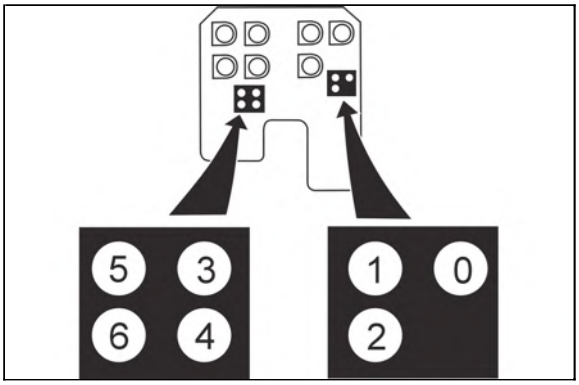
	Lever position	***Function***
1	***Rear (upper) position***	Pressurized oil flows to quick-couplers: '**2**', '**4**', '**6**' Quick-couplers connected to the return line: '**1**', '**3**', '**5**'
2	***Central position***	Neutral
3	***Front (lower) position***	Pressurized oil flows to quick-couplers: '**1**', '**3**', '**5**' Quick-couplers connected to the return line: '**2**', '**4**', '**6**'
4	***Front limit position***	With an increased force you can shift the control levers from position (3) further to the front to position (4), i.e. floating (free) position, where the levers are locked. Both the quick-couplers of each section are connected to the return line in this position.

Always connect a single-acting cylinder to quick couplers:
'2', '4' of the two-section auxiliary distributor and
'2', '4', '6' of the three-section auxiliary distributor.
Always connect a double-acting cylinder to quick-couplers of one section.

Rear outlets of the outer hydraulic circuit
In the tractor version that is not equipped with the front outlets or the front three-point hitch and that is equipped with:

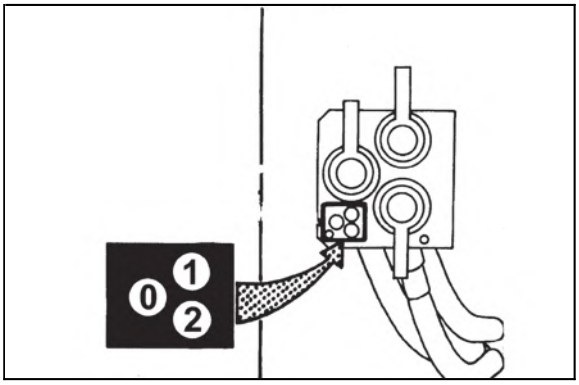
a - a three-section distributor the rear outlets are terminated with pressure quick-couplers '1' to '6'.
b - a two-section distributor the rear outlets are terminated with pressure quick-couplers '1' to '4'.

The third quick-coupler marked '0' is directly connected to the final drive housing and is designed for return oil from external hydraulic implements (e.g. from rotational hydraulic motors, etc.).



FH12N044a

Front outlets of the outer hydraulic circuit
They are installed on a panel in the right front part of the tractor.Their installation is bound to a three-section distributor. They are designed for the control of frontally attached adapters.The marking of the outlets and their use is the same as in the case of the rear outer outlets.



F168

If the tractor is equipped with a three-point hitch, the (F)(3)(4)(N) lever is used for its control. Quick couplers must not be connected at the time of three-point hitch usage connected because they are pressurized together like front three-point hitch!
After terminating the work with a front three-point hitch for further usage of the section with quick couplers 3 and 4 with the connection of three-point hitch, it is necessary to lift the arms of the front three-point hitch to transporting position and the lever of the cock of the front three-point hitch in the 'closed' position.

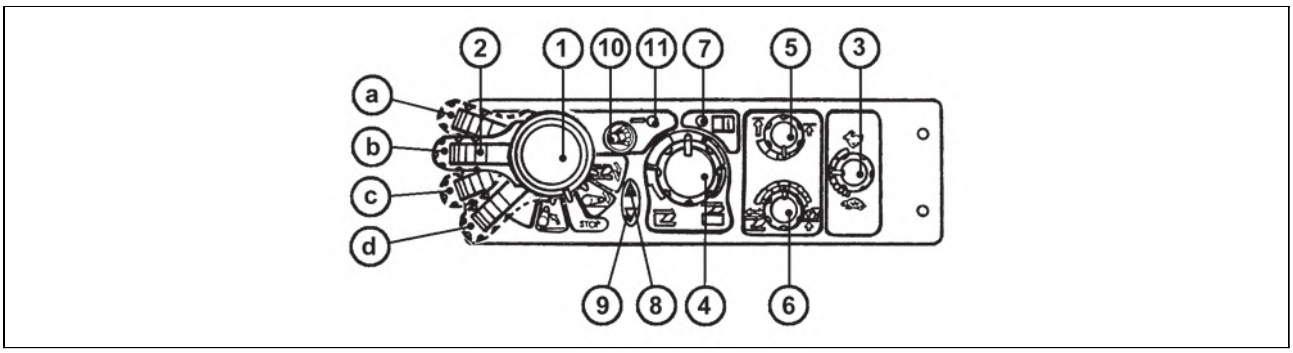
Connecting machines and implements to the outer hydraulic circuit

Connecting machines and implements consisting of more parts
During work with agricultural machines that consist of more parts (combinators, skids, harrows) and that have side frames hat are hinged to the central frame and during transport are folded to the vertical position by separate hydraulic cylinders controlled by the outer hydraulic circuit of the tractor, the folding of the side frames must always be controlled by the upward (backward) movement of the auxiliary distributor lever. The 'lifting' branches of the cylinders must be connected to quick-couplers '2', '4' or '6'.

Connecting a rotational hydraulic motor
If a rotational hydraulic motor is connected to an outer outlet of the hydraulic system, its return branch must always be connected to quick-coupler '0'. In case of connection of the filling (pressure) branch to quick-coupler 1 or 2 the hydraulic motor is protected by the 'kick-out' function against overloading. This function interrupts the operation of the hydraulic motor at the pressure value in the filling branch of 17.5 - 1.6 MPa.

Connecting a reversing hydraulic motor
A reversing rotary hydraulic motor must be connected to quick-couplers '1' and '2' for functional reasons. However, relief valves must be inserted in both the branches in this case as they can reliably limit the pressure peaks during the stopping of the machine. The oil return lines from these valves are connected to quick-coupler '0'.

Control element functions

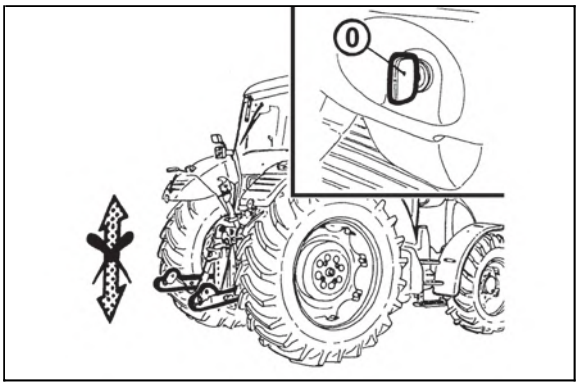


F_02_162

1. Lifting switch
a - Transport, lifting
b - STOP
c - Regularity of lowering (working)
d - Free position, fast sinking- automatic return of lever to (c) position by a spring

2. Blocking (in transport position)
3. Lowering speed
4. Setting the position of lifting device
5. Upper position restriction
6. Smooth setting - of manual control
   - automatic control
7. LED - diagnostic
8. LED - lifting
9. LED - lowering
10. Engaging compensator (softening vibrations)
11. LED - softening vibrations engaged

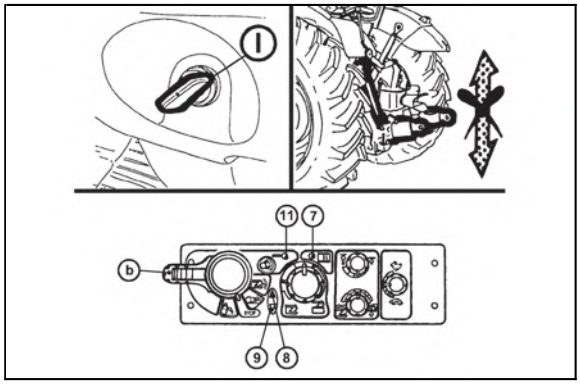
Equipment 'OFF'
Electric installation deactivated with the key of the switching box. The electronic system is off, the lifting device is blocked.



F_02_188

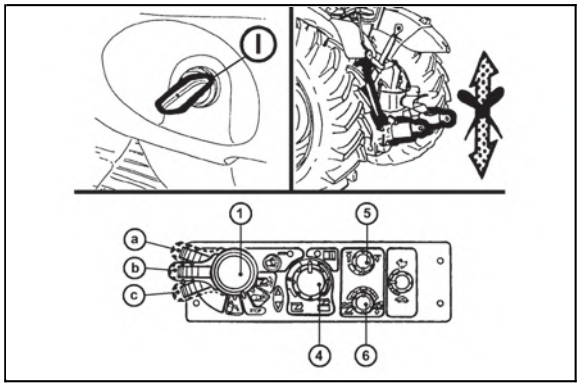
Blocking cancellation

When you switch on the electric installation with the key of the switching box (I), the lifting device remains blocked electronically - the lifting and lowering function is deactivated; on the EHR-B control panel the diagnostic LED (7) and the vibration dampening LED (11) shortly light up - the system self-test is in progress. The lifting LED (8) and the lowering LED (9) are off. After a short time permanent illumination of the diagnostic LED (7) indicates the state of EHR-B blocking.
If the diagnostic LED (7) is permanently illuminated, the control circuits are disconnected.



F_02_164

The engine can only be started if the engine (1) is in position (b).
The EHR-B electro-hydraulic system is only active when the engine is started.
Activation of the EHR-B system is only possible when the lubrication indicator has gone off.
The blocking can only be cancelled (system activated) with the engine running by moving the lifting lever (1) to position (a) - short-time switching is sufficient.
By moving the lever (1) to position (c) you will bring the three-point hitch to the position corresponding to the element setting, i.e. the current position of controls (4), (5), (6).

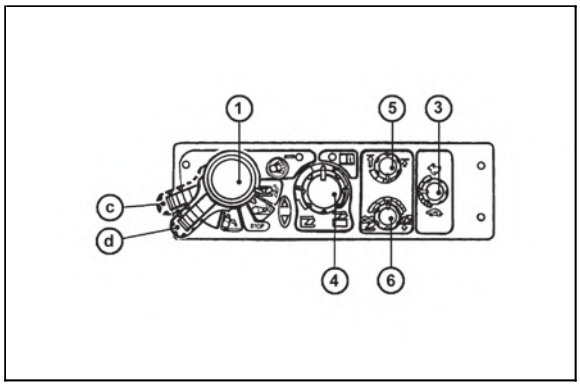


F_02_163

After the activation of the system EHR-B first for safety reasons limits the lifting speed of the hydraulic arms. When the hydraulic arms first reach the selected position, this safety limitation is cancelled and then the lifting speed of the hydraulic arms is normal.

Quick sinking

Lever (1) in position (d) - free position. You must hold the lever in this position; after releasing the lever will return to position (c) - the system works in accordance with the setting of controls (3), (4), (5) and (6).

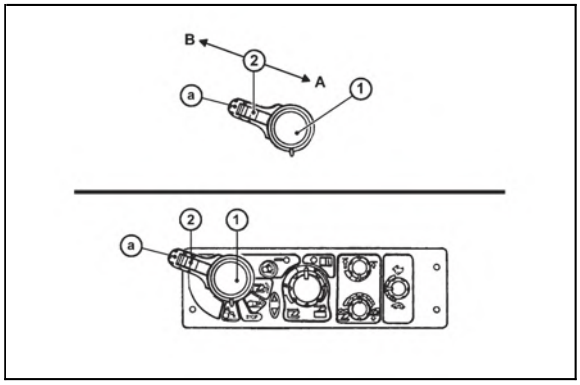


F_02_165

Transport of implements

Shift the lifting lever (1) to position 'a' and block it with the moving latch (2).
Blocking the lifting lever (1) by the moving latch (2) in position (a):
A - Lever movement blocked
B - Lever movement not blocked

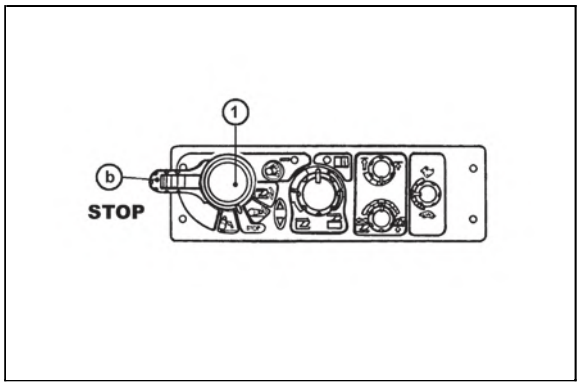
When the tractor with an attached implement is stopped, the implement must be lowered onto the ground (it must not be left in the lifted position).



F_02_166

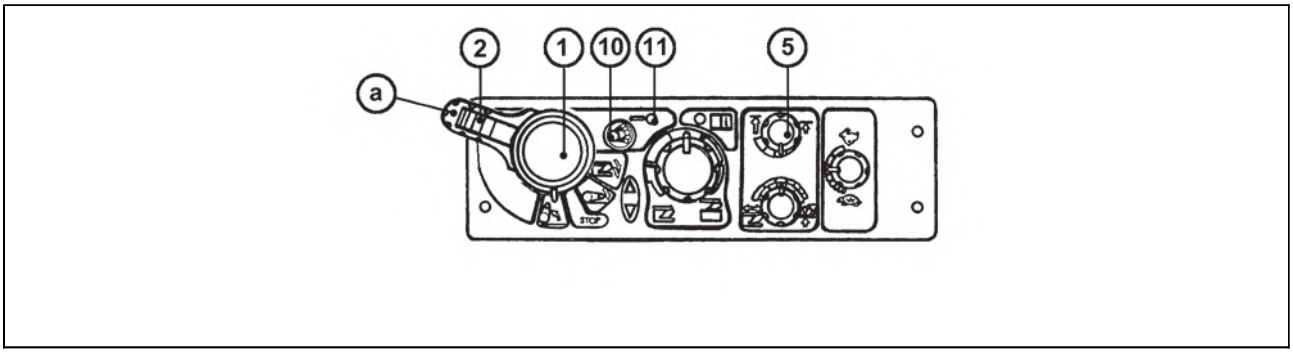
Stop position

By moving the lever (1) to position (b) - STOP position - you will immediately stop the movement of the three-point hitch.



F_02_167

Vibration compensator (damper)



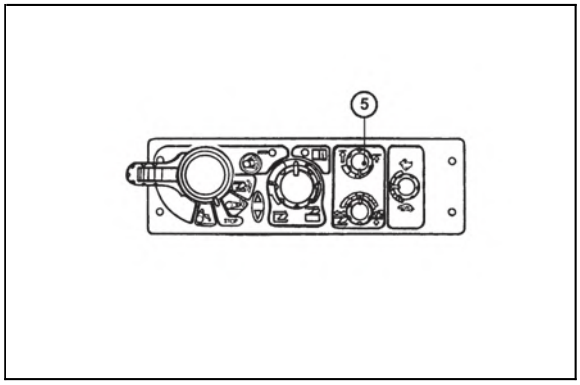
F_02_168

It is used during transport of a heavy implement attached to the rear three-point hitch.
After activation of the vibration compensator (10) the arms of the rear three-point hitch sink by approx. 4%, which allows oscillation of the arms in the range of approx. 8% of the lift. The upward oscillation is always limited by the position of the upper position limiter (5).

Advantages of active dampening of vibrations during transport of a heavy implement attached to the rear three-point hitch.
1. Increased operation safety (the steering axle is not unloaded so much
2. Stabilization of the transported implement
3. Reduced dynamic stress of the hydraulic system and the rear three-point hitch

During the adjustment of the hitch for a single-axle semi-trailer the vibration compensator must be off.

Limitation of the upper position of the three-point hitch
It is activated with the control (5). The limitation can be implemented in the upper half of the three-point hitch lift.

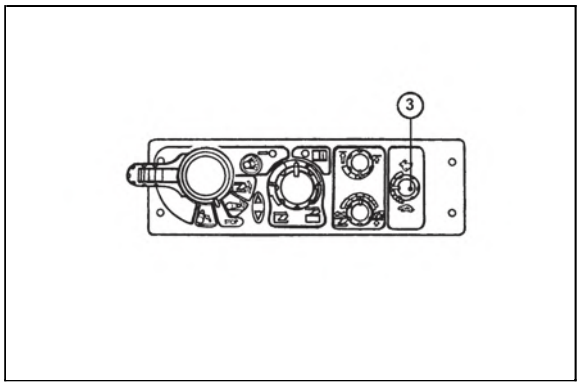


F_02_169

Lowering speed
The lowering speed of the three-point hitch is set with the control (3).

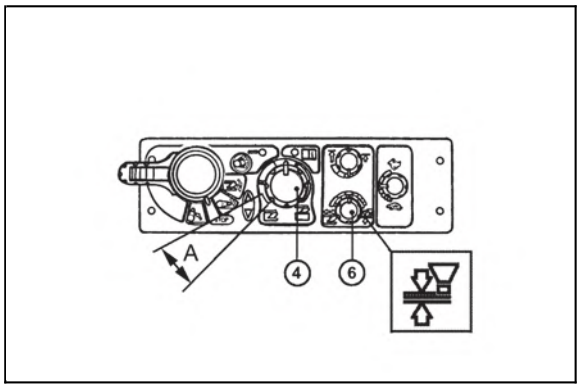
Symbol of the maximum lowering speed	
Symbol of the minimum lowering speed	

In the vibration dampening mode and during the use of the rear control buttons the lowering speed setting is out of function.



F_02_170

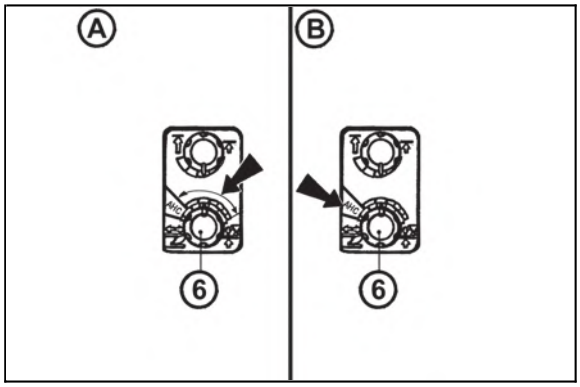
Free position
For permanent work with free hydraulic system, e.g. during work with a plough with a support wheel the position of the control (4) under the indication (A) and the position of the control (6) at the positional control symbol is used.



F_02_171

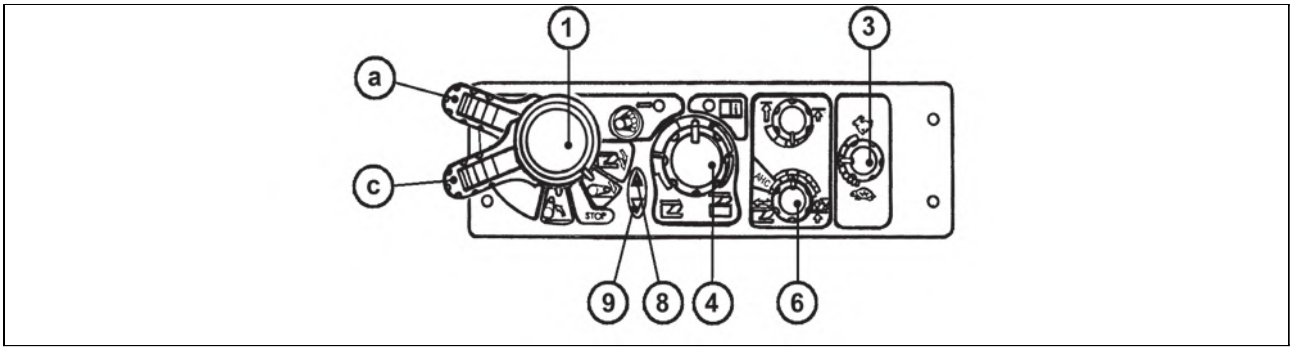
Setting the control of three-point hitch
Electrohydraulics enables two ways of three-point hitch control.
A. Manual control setting - control (6) is set in the range see arrow
B. Automatic control - control (6) is set in HitchTronic (AHC) position see arrow

Automatic control can be at any time exchanged for manual and the other way round by a control (6).



ahc_01

Manual setting of control of three-point hitch



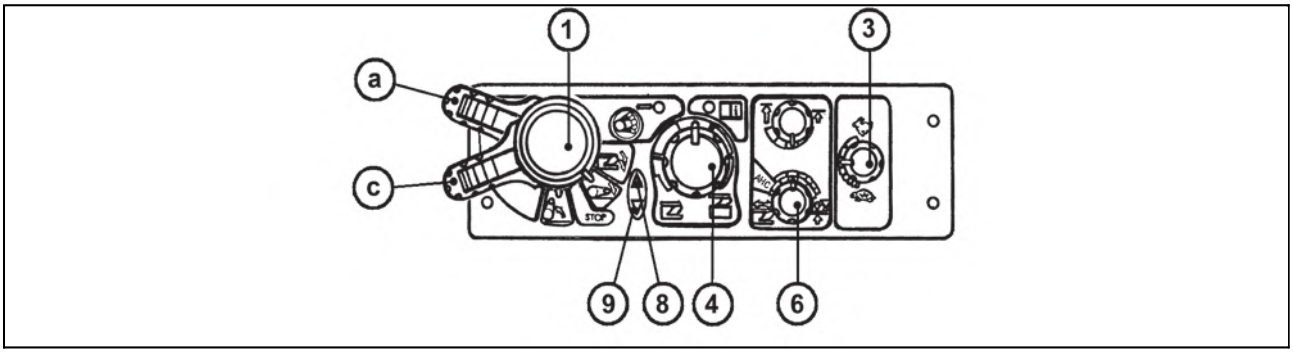
F_02_172a

Perform according to 'Cancel blocking' part and set the required position of elements with regard for the nature of performed works. To reach the depth of working tools, there is a control (4). For setting the kind of control and its mixing, use a control (6).

Power control symbol	
Position control symbol	

The activity of control (lifting and lowering) can be monitored by means of indication diodes (8) and (9). Na shift the lever (1) (a) position, after turning, set again to (c) position. Control system takes the previous working position (memory of ploughing). For setting the required speed of starting, there is a control (3).

Automatic control of three-point hitch

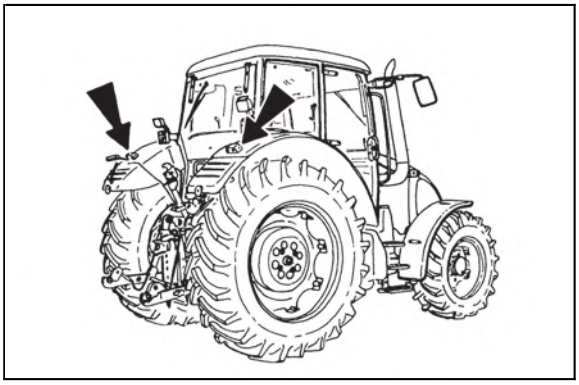


F_02_172a

Do the step according to 'Cancel blocking' part. Set the control (6) to hitchtronic (AHC) position. By control (4), set the working depth of tools attached to rear three-point hitch.
When the implement attached in the rear three-point hitch reaches the depth set by the control (4), control system measures the soil resistance and this value is used as default for further control.
The activity of controls (lifting and lowering) can be monitored by means of indicated on diodes (8) and (9).
At dead end, shift the lever (1) to (a) position, after turning set the (c) position again.
For setting the required speed of lowering, there is a control (3).
After reaching the depth set by the control (4) control system again measures the soil resistance and this value is used as default for further regulation.

Using the rear control

The rear control is used to connect and disconnect implements. The lifting switching lever (1) on the EHR-B electro-hydraulic control panel must be in position (b) or (c). The designation symbols of buttons on both the tractor fenders correspond to the movement direction of the three-point hitch after their pressing. The movement only lasts as long as the button is held.
Every use of the rear control causes blocking of the control system and the 'Blocking cancellation' must be repeated.



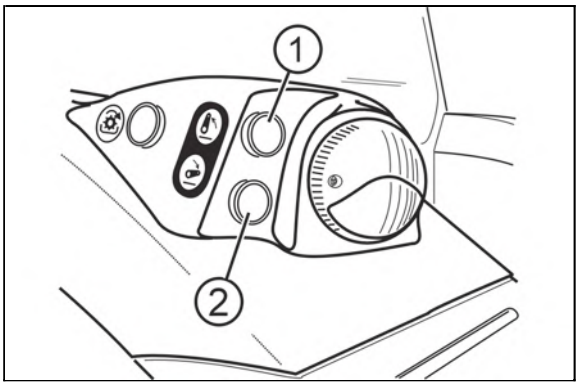
F_02_98

External control buttons of the electro-hydraulic system

1. Lifting
2. Lowering

The movement only lasts as long as the buttons are held.

External hydraulic control buttons are functional also without previous activation of electrohydraulics even in case of electrohydraulics blockage for the reason of possible failure. Control the arms of the rear three-point hitch by external electrohydraulics buttons only at the lower half of arms lift.



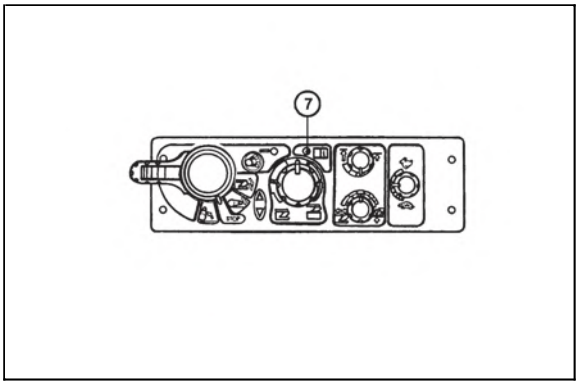
FH12N001

When handling the three-point hitch with the external control buttons the operator must stand out of reach of the connected implement to avoid being caught or injured by the implement.

F_02_65

Indication of EHR-B errors

The electronic part of the electro-hydraulic system continuously checks proper functioning of the system. Possible errors are indicated by repeated flashing combinations of the diagnostic LED (7).
After the remedy of the error the diagnostic LED (7) goes off.
Permanent illumination of the diagnostic LED (7) indicates the state of blocking of the electro-hydraulic system.



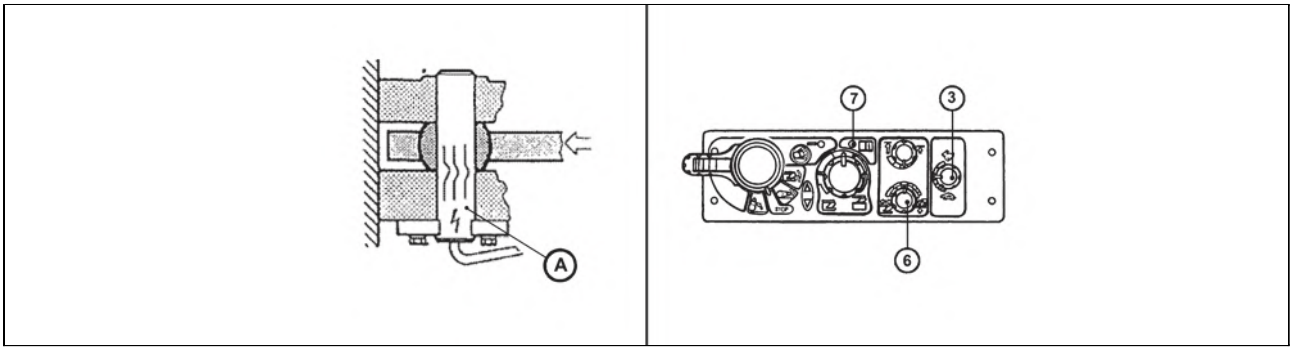
F_02_173

Description of signals of EHR-B electro-hydraulic system errors

Flashing combination of the diagnostic LED (7).				Error category	Error description
Long pause	No. of flashes	Short pause	No. of flashes		
	1x		1x	Serious error	Error with internal safety shutdown of the electro-hydraulic system - the electro-hydraulic system is out of operation - the work with the tractor must be stopped
	1x		2x		
	1x		3x		
	1x		4x		
	1x		5x		
	1x		6x		
	2x		2x	Moderately serious error	Error with internal safety shutdown of the electro-hydraulic system - the electro-hydraulic system is out of operation
	2x		3x		
	2x		4x		
	2x		8x		
	3x		1x	Minor error	The electro-hydraulic system works with a limitation resulting from the error type
	3x		2x		
	3x		4x		
	3x		6x		

Have EHR-B errors repaired by a specialized workshop.

Description of minor errors of the EHR-B electro-hydraulic system



F_02_174

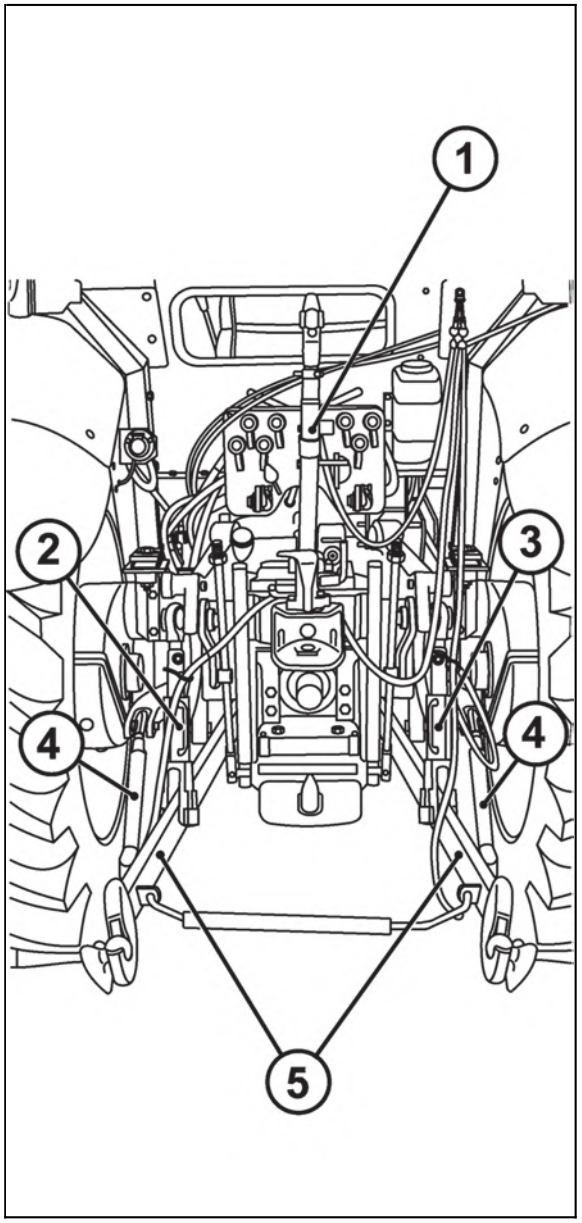
Flashing combination of the diagnostic LED (7).				Error location	Possible cause of the error
Long pause	No. of flashes	Short pause	No. of flashes		
	3x		1x	Right dynamometric pin (A)	Faulty dynamometric pin
	3x		2x	Left dynamometric pin (A)	Faulty contact or interrupted conductor of the dynamometric pin
					Short-circuit of the dynamometric pin conductor
					Possible overloading of the dynamometric pin
	3x		4x	Lowering speed control (3)	Faulty potentiometer of the control (3)
					Faulty contact or interrupted conductor of the control
	3x		6x	Control setting switch (6)	Faulty potentiometer of the switch (6)
					Faulty contact or interrupted conductor of the switch

Rear three-point hitch

It is intended for attaching carried or semi-carried agricultural machines and implements with hitching points of ISO category III.

Category III.	
Hitch axis length	1010 mm
Ø of openings of connecting balls of the lower draw-bars according to ISO	37 mm
Ø of the upper draw-bar opening	32 mm

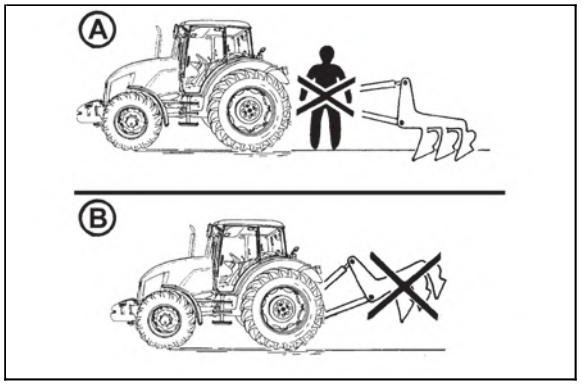
1. Upper draw-bar
2. Left lifting draw-bar
3. Right lifting draw-bar
4. Limiting draw-bars
5. Lower draw-bars



E451

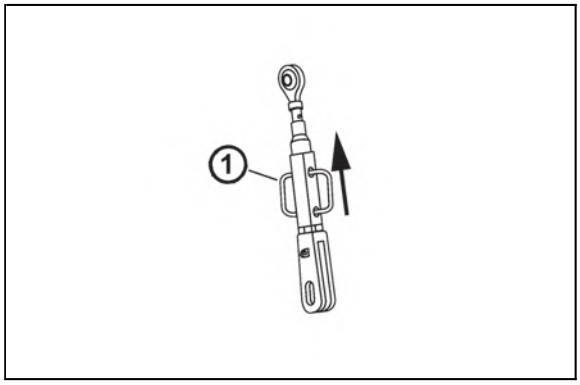
Safety principles of working with the three-point hitch

Persons that are not authorized to work with the attached implement must not stand between the tractor and the hitched machine (implement) - (A). Do not park the tractor with an attached implement in the lifted position (B). During a drive without an implement the lower draw-bars (5) must be connected with springs and the upper draw-bar (1) must be inserted into the spring suspension! During transport of implements the limiting draw-bars (4) of the lower draw-bars must be adjusted in such a way to avoid unwanted lateral movement of the implement!



F11N032

Height adjustment of the lifting draw-bars
Extend the capstan (1) in the arrow direction and make the adjustment by turning the capstan.

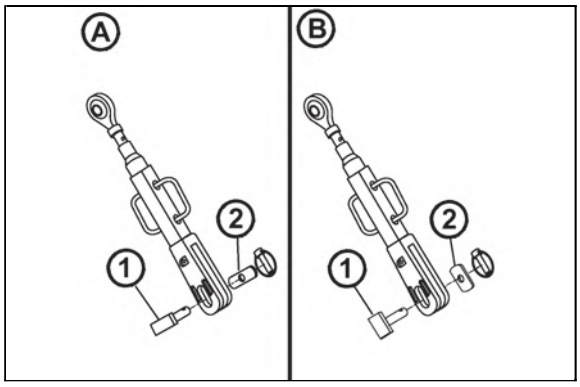


FHD14N085

Fixed and free position of the lower hydraulic draw-bars
Fixed position of the lower hydraulic draw-bars (A):
The pin head (1) and washer (2) are installed horizontally.

Free position of the lower hydraulic draw-bars (B):
The pin head (1) and washer (2) are installed vertically.

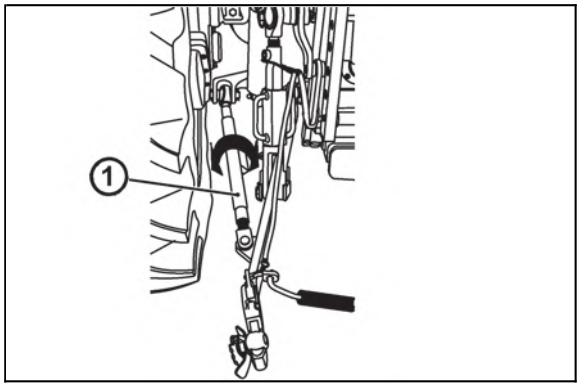
The free position enables free connection of the tractor and implement. In this case both the draw-bar ends may move freely against each other as regards their height.



E454

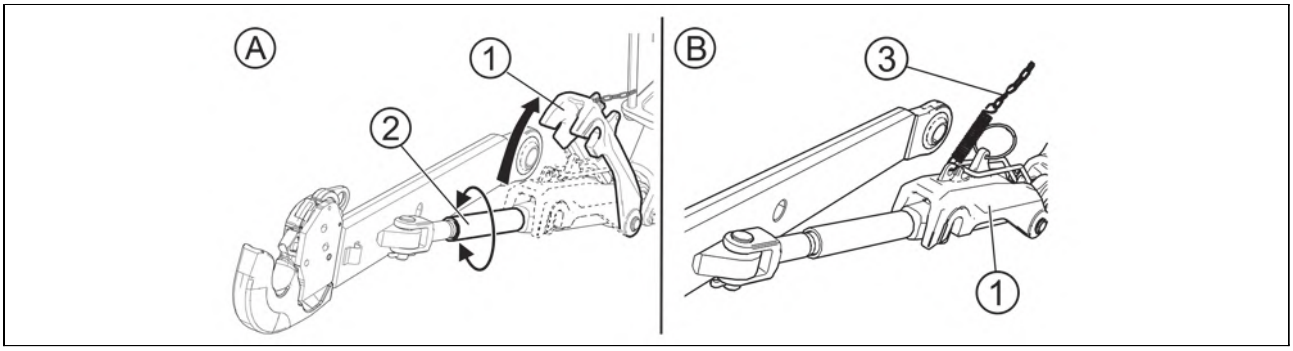
Limiting draw-bars
The limiting draw-bars - stabilizers (1) limit or completely prevent lateral swinging of the lower draw-bars. The adjustment of the left and right limiting draw-bar is performed by turning of the draw-bar pipe, see arrow.

Both the limiting draw-bars must always be installed on the tractor.



E455

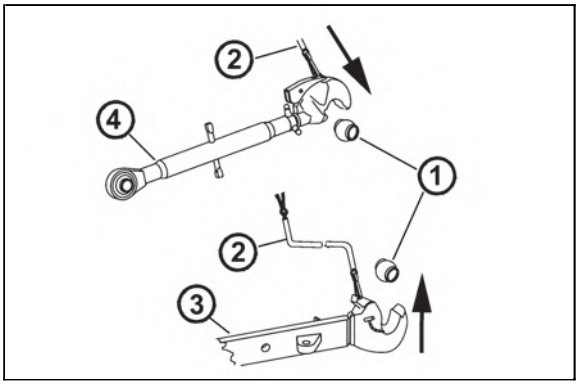
Automatic limiting draw-bars



FHD14N087

Both limiting drawbars must be mounted to the tractor at all times.
The length adjustment of the left and right limiting drawbar is done by turning the tube of the drawbar (**2)** after heaving the securing block (**1**) in the direction of an arrow (**A**). Floating position of limiting drawbars (**B**).
If the tools connected in the rear three-point hitch require floating position, set the applicable length of chain (**3**). Securing block (**1**) remains hanging on the chain (3) in lifted position when you lower the arms of rear three-point hitch and limiting drawbars enable side swing of tools connected in the rear three-point hitch. After lifting the arms of the rear three-point hitch, securing block returns to initial position and blocks the side swing of arms of the rear three-point hitch.

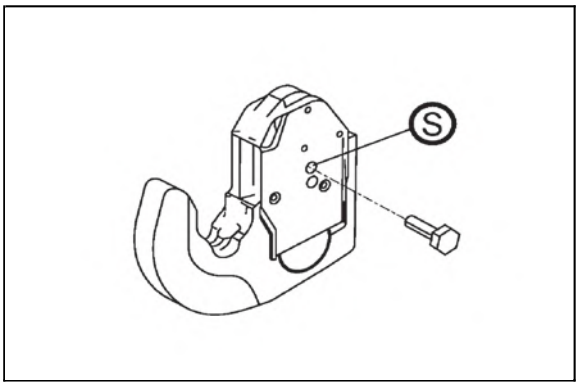
***Lower draw-bars with CBM hooks**
The lower (3) and upper (4) draw-bars of the hitch are equipped with CBM hooks.
First, suspension CBM balls (1) must be fitted to the implement and the limiting draw-bars must be used to set the distance between the lower draw-bars of the hitch (3). After reversing and subsequent lifting of the three-point hitch its lower draw-bars (3) are connected to the implement and then the driver connects the upper draw-bar (4) of the three-point hitch from the cab.
When disconnecting the implement release the hooks, with the control wires (2) lift the upper draw-bar (4) and by lowering the three-point hitch disconnect the lower draw-bars (3).



E460

Securing the lower draw-bars with CBM hooks

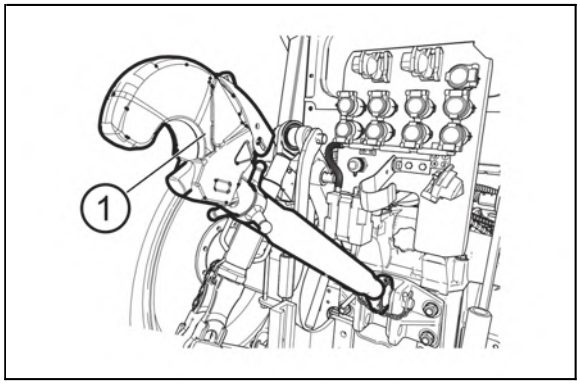
For especially demanding working positions (aggregation with heavy machines on slopes or aggregation with machines overhanging to one side) we recommend you to securely lock the lower draw-bar hook by inserting an M8 screw in the opening (S) and locking it with a nut.



X901

Upper draw-bar
The upper draw-bar (1) has adjustable length. It is attached to the tractor to the console openings.

When extending the upper draw-bar you must make sure that both the joints are unscrewed from the draw-bar pipe to the same length.

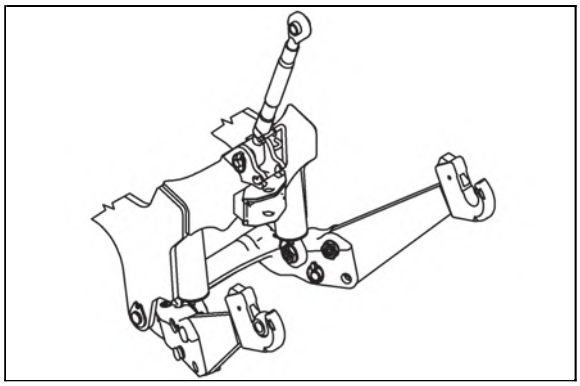


FHD14N084

***Front three-point hitch**
It is designed for attachment of frontally carried agricultural machines and implements in accordance with ISO 8759-2.

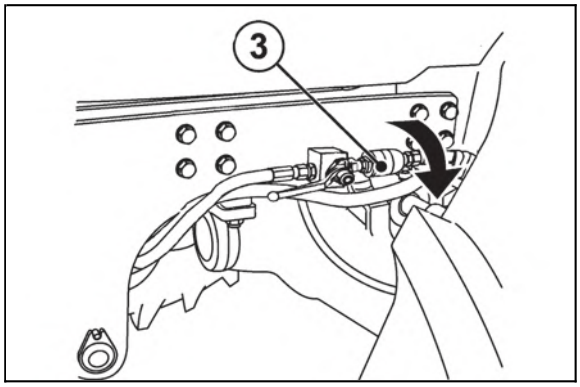
During transport of a carried implement the hitch must always be hydraulically locked in the lifted position with valves that are installed on the left side of the tractor over the front axle.

This hydraulic lock is recommended even in case no machine is attached to the three-point hitch.



E461

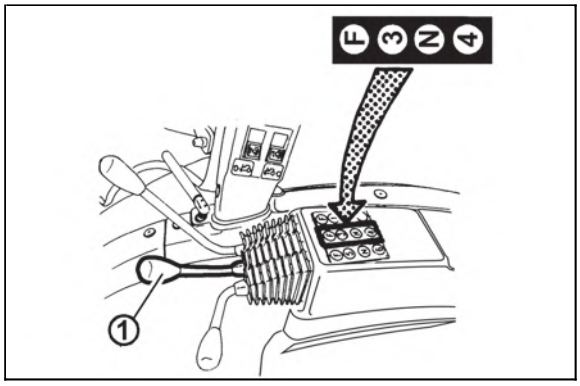
Adjusting the lowering rate of the front three-point hitch
Before the start of work with an implement attached to the front three-point hitch it is recommended to adjust the time necessary to lower the implement from the highest to the lowest position to 1 - 1.5 s by setting the throttle valve. By turning the valve body to the left (in the arrow direction) you will increase the lowering speed. During the adjustment the valve levers of the front hitch must be directed horizontally.



X463

Controlling front three-point hitch
The hitch is equipped with two hydraulic cylinders that are supplied with oil from the integrated hydraulic distributor. The lifting and lowering is controlled by the control lever of the integrated distributor (1):

Position 3	Lifting
Position 4	Lowering
Position N	Hitch lock

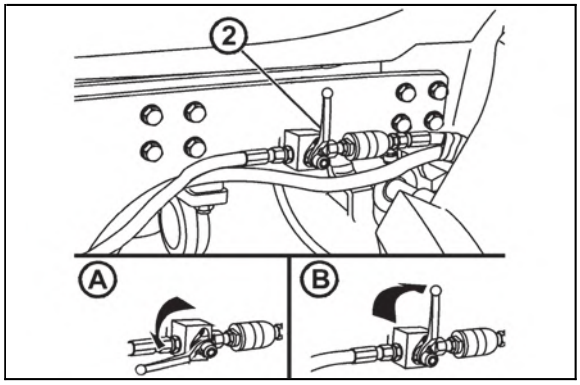


FH12N065

Hydraulic lock of the front three-point hitch

Hydraulic locking of the front three-point hitch is performed in any position of the hydraulic cylinders with the ball valve in the front part of the tractor (2).

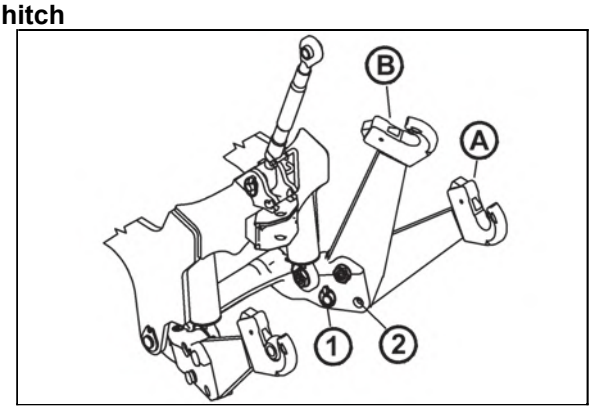
A	Free position Valve levers are in the horizontal position - The hitch can be controlled from the cabin
B	Locked position Valve levers are in the vertical position - The hitch is locked



X464

Working and transport position of the front three-point hitch

A	Working position of the front three-point hitch
B	Transport position of the front three-point hitch



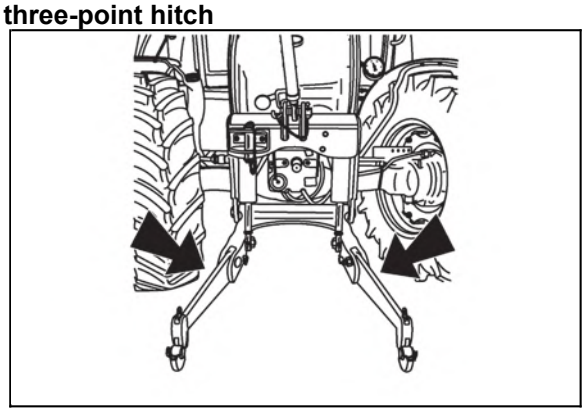
E466

Changing the position of the draw-bars of the front three-point hitch:
1. Release and remove the pin (1) from the opening.
2. Lift the arm from position (A) to position (B).
3. Lock the arm by inserting the pin (2) in the opening (2) and secure the pin.

Only insert the pin in the openings, never check whether the opening is free with your fingers!

Driving with agricultural machines attached to the front three-point hitch

The maximum permissible speed of the tractor with agricultural machines attached to the front three-point hitch is 15 km.h^{-1}. If no implement or weight is attached to the front three-point hitch, we recommend you to lift the lower lifting draw-bars to the transport position.

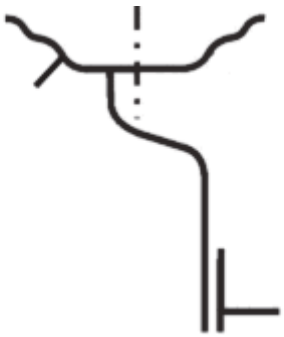


FH12N066

NOTES

WHEEL TRACK CHANGE

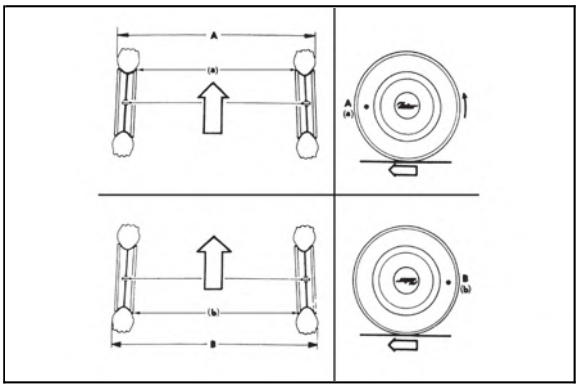
Front wheels track of front drive axle in tractors equipped with non-removable discs

Front wheels track

1 974 mm

***Tighten the nut of front wheels at a torque of* 300 - 350 Nm.**

- Nuts tightening front wheels to be tightened at a torque of 300 - 350 Nm.
- After travelling the distance of 100 m with an unloaded tractor, tighten the nuts tightening the front wheels again to the prescribed torque.
- After loading the tractor, tighten the nuts tightening the front wheels after 3 Mh.
- After 10 Mh, retest the tightening of nuts fixing the front wheels.

Toe-in of the wheels of the front driving axle
Proper toe-in or toe-out (S) of front wheels in a tractor with front drive axle is measured on wheels´ rim
Toe-in or toe-out is determined by the difference of measured values.



F_02_189

Tractors with solid front drive axle
b = a + 0 to 2 mm

Tractors with suspension front drive axle
S value changes with height setting of front part of the tractor (see DRIVING OPERATION chapter).

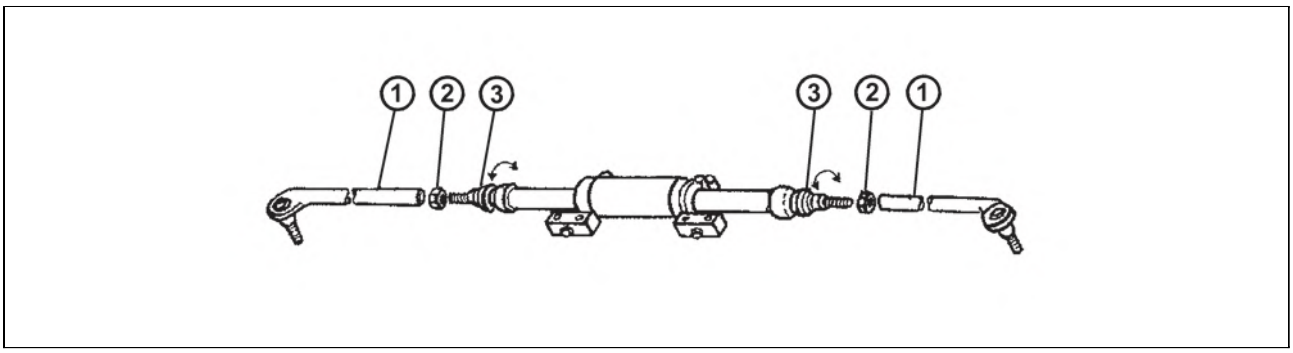
Front part of tractor in the highest position
b = a +6 až -10 mm

Front part of tractor in the medium position
b = a + 0 až -4 mm

Front part of tractor in the lowest position
b = a + 2 až -2 mm

WHEEL TRACK CHANGE

Adjustment of toe-in of the wheels of the front driving axle

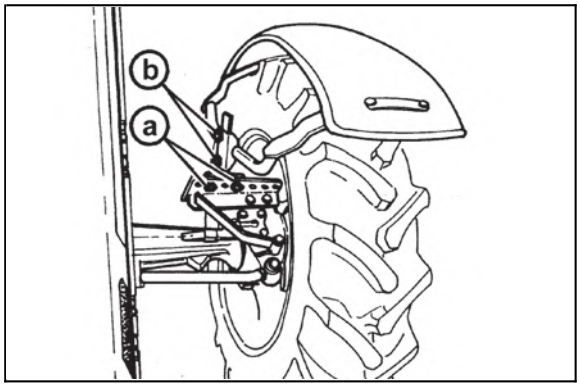


C507

Note: Tractors are in standard equipped with hydrostatic device.

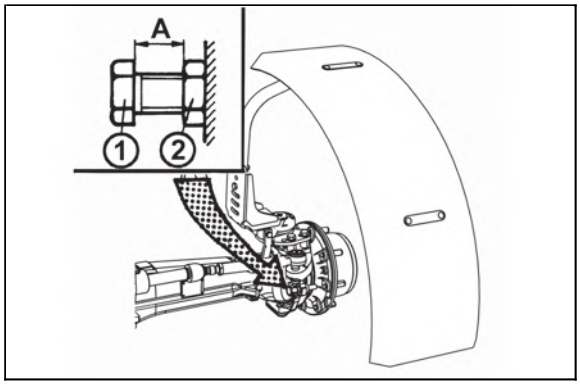
- Set the wheel symmetrically with longitudinal axis of a tractor.
- Measure the distance between rims in the front on horizontal level of wheel axis. Mark the place of measurement.
- Travel forward with a tractor so that the marked places would be on horizontal level of rear wheel axis (turn by 180°) and remeasure the distance between marked places.
- Release locking nuts of ball joint heads (2) of connecting rods of devices in hydraulic cylinder.
- Adjust toe-in by turning the pin of ball joint (3). Do the adjusting symmetrically with both joints to keep the same lock of wheels to both sides (do the measurement on the sides of rims).
- Locking nuts of heads of ball joints (2), tighten with a torque of 122 - 136 N. Upper surfaces of heads must be (1) parallel.

Front drive axle fenders can come in two designs
A - Fenders with solid consoles where the axis of fenders turn corresponds with the axis of front wheel turn. Fenders are on adjustable holders that can be set according to required tracks and the type of tyres used on the side (by relocating screws (a) to different openings) and also in terms of height (by relocating screws (b) to different openings).
B - Fenders with turnable consoles where the axis of turning corresponds to the axis of front wheel only partially. This design enables the setting of greater front wheels lock. Fenders are on adjustable holders which can be set according to the kind of tyres used in terms of height (by relocating screws (b) to different openings).



E505

Set the stops always with any wheel track change or tire replacement with front drive axle.
Wheel stops with front drive axle must be set so that there would be a distance of at least 50 mm between front drive axle tires and tractor with full lock and full axle swing around central pin.



F13BN033

Setting wheel stops with front drive axle check
1. Set full lock to one side and check that the distance between a tire and the nearest solid point on the tractor is at least 50 mm. Check both front tires.
2. Turn the steering to full lock to the other side and check according to point 1.
3. Heave one side of the front axle to the maximum swing (front axle leans against the bracket) and check according to point 1 and 2.
4. Hoist the other side of front axle to the maximum swing (front axle leans against the bracket) and check according to point 1 and 2.

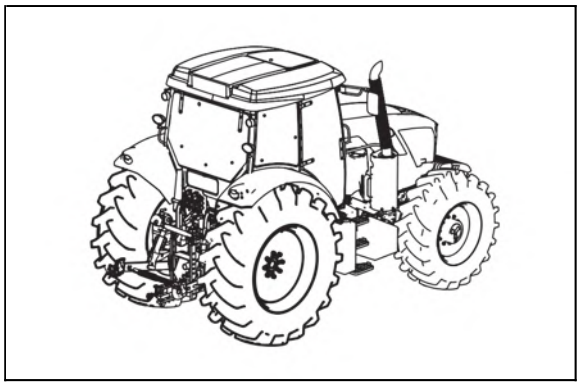
WHEEL TRACK CHANGE

The setting of stops (A) changes after the release of a nut (2) and unscrewing or screwing in a screw (1).

After the change in setting wheel stops with front drive axle, it is always necessary to check their setting according to points 1 to 4.

Rear wheels wheel track

Rear wheels wheel track in a tractor is **1 950 mm.**



C15N015

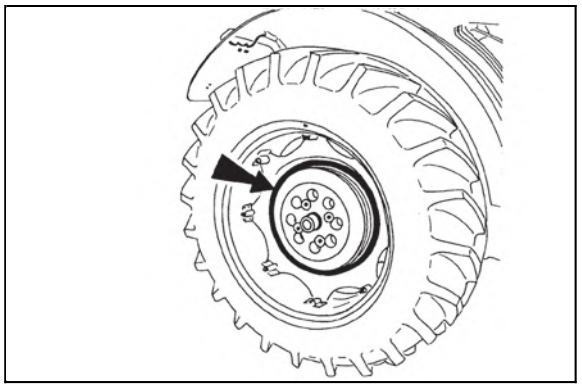
NOTES

BALLAST WEIGHTS

Ballast weights are necessary to additionally load the tractor axles and to ensure manoeuvrability and stability of the tractor.

***Rear wheel weights**

Combination of weights (pcs)	Mass of weights (kg)	
2+6	2x25 + 6x30	230
2+10	2x25 + 10x30	350
2+14	2x25 + 14x30	470

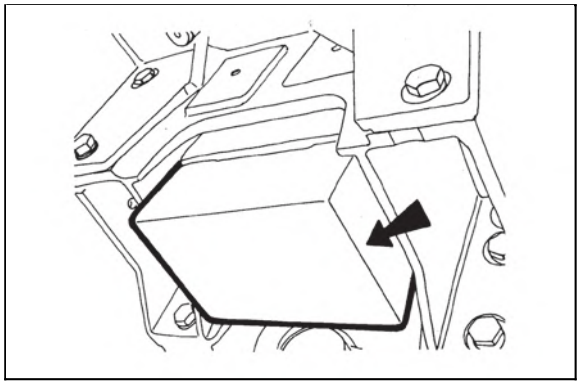


F222

Bottom weights

Combination of weights (pcs)	Mass of weights (kg)	
2	2x34	68

They are installed in case the tractor is not equipped with the front PTO into the frame tub casting cavity with screws that are accessible after removal of the battery holder.

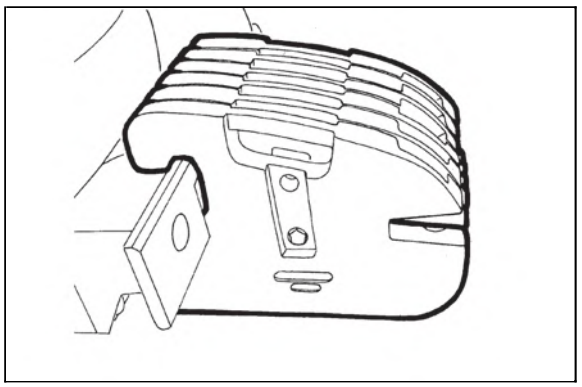


F223

***Front weights**

Front weights		
Combination of weights (pcs)	Mass of weights (kg)	
3+3	6x50	300
5+5	10x50	500
7+7	14x50	700
9+9	18x50	900

The front weights of the can type are suspended in the tool carrier. They are protected from lateral movement with a pin inserted between the central weights. The other weights are attached to the central ones with two clamps.
Note: After the insertion of the pin the front weights and the weight carrier can be used as the front hook for emergency towing of a sunken tractor.

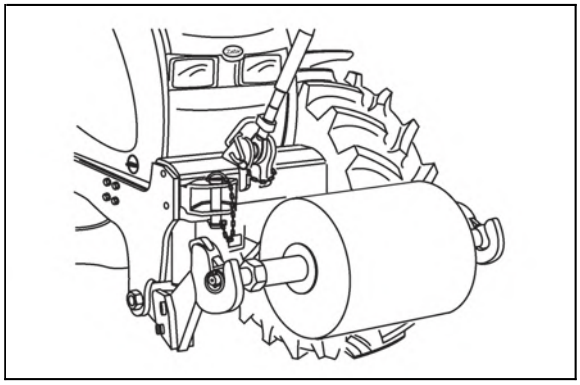


F_02_26

BALLAST WEIGHTS

***Weight of the front three-point hitch**

Material	Weight mass (kg)
Cast-iron	460
Concrete	800
Concrete	1200

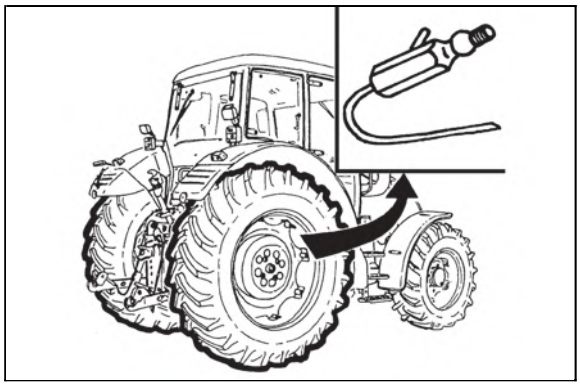


E552a

Valve for filling tyre tubes with liquid

All the tubes of the rear wheels are equipped with a valve that makes it possible to fill the tubes with liquid with the use of an adapter.

Filling the tubes of the front tyres and double mounting of the rear wheels with liquid is not permitted.

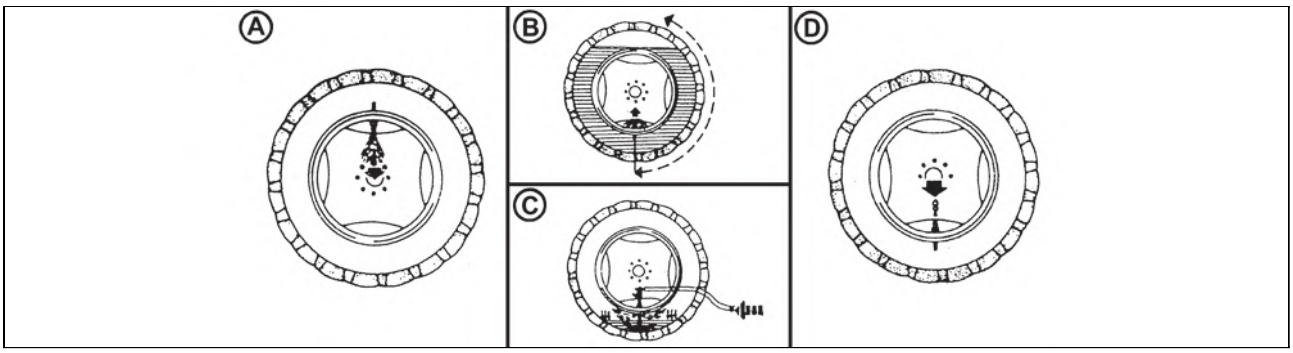


F_02_109

1. Unload the tyre by lifting the tractor and turn it with the valve upwards (A).
2. Deflate the tyre and unscrew the valve insert.
3. Screw the adapter for water filling on and attach the liquid supply hose to it.
4. Fill the tyre with the prescribed quantity of liquid.
5. For the filling you can use a gravity tank (B) or you can fill the tyre under pressure (C).
6. Remove the hose and unscrew the adapter for water filling.
7. Screw on the valve insert and inflate the tyre to the prescribed pressure.
8. After inflating screw the protective cap on the valve.
9. Fill the other tyre in the same way.

Water must not freeze in a tyre!

Procedure of draining liquid from the tyres

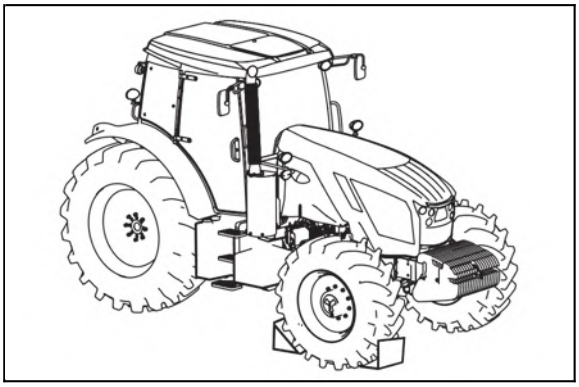


F227

1. Unload the tyre by lifting the tractor and turn it with the valve upwards (A).
2. Deflate the tyre and unscrew the valve insert; turn the wheel with the valve downwards.

During draining of liquid vacuum may occur in the tyre. Therefore, turn the wheel time after time to get the valve to the upper position (B).

3. Remove the rest of the liquid after screwing on the adapter for water filling by supplying pressurized air (C).
4. Blow out the liquid until it stops running through the tube of the air adapter.
5. Unscrew the adapter for water filling
6. Screw the air part of the valve back on and inflate the tyre to the prescribed pressure.
7. Screw the protective cap on the valve.
8. Drain the liquid from the other tyre in the same way.



C15N132

Antifreeze solution for tyre filling

Water for solution preparation	Calcium chloride $CaCl_2$	Hydrated lime	Solution density at 20° C	Freezing point approx.	Total volume	Added weight
(l)	(kg)	(kg)		(°C)	(l)	(kg)
45	11.8	0.21	1.13	-18	50	57
45	13.9	0.23	1.18	-25	50	59
45	15.4	0.25	1.21	-30	50	61

Solution preparation:

1. Dry calcium chloride $CaCl_2$ is added to water, never the other way round!

2. The solution is not dangerous, but it is necessary to work carefully with it. Remove spilt drops with clean water.
3. Before filling leave the solution to cool down. Observe the prescribed quantity of hydrated lime.
4. The solution must not get in contact with metal parts and the electric installation! The solution is not harmful for the tube valve.
5. The antifreeze solution with the above mentioned composition must not be used in the cooling system!
6. After draining dispose of the antifreeze liquid as special waste!

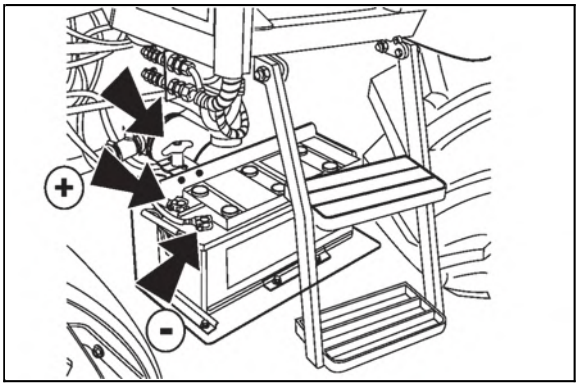
NOTES

ELECTRIC INSTALLATION

No additional interventions may be carried out on electric installation of the tractor (connection of other electric consumers) due to its possible overloading!
With repairs of electric installation pay special attention in particular to manipulation with the battery to avoid any contact of electrolyte with skin or clothing.

Basic service information

The battery must always be connected with the 'minus' pole to the ground and with the 'plus' pole to the alternator. If the battery is connected the other way round, it will destroy the whole semiconductor equipment of the alternator. When starting the tractor with the use of an auxiliary battery, do not forget to connect the terminals 'plus' to 'plus' and 'minus' to 'minus'. If you replace a part of the charging circuit, disconnect the battery from the tractor ground (-) with the battery disconnector. This way you will avoid accidental short-circuits on the terminals.



E602

In case of any handling or repair of the started motor the minus pole of the battery must be disconnected and all the shifting levers, incl. the PTO shifting lever, must be in the neutral position (do not forget to check whether the locked PTO switches on the right cabin pillar are off as well to prevent spontaneous start and endangering of the service person's life).

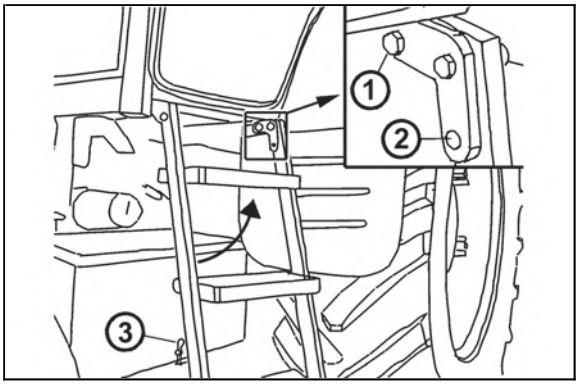
It is forbidden to start the engine by short-circuiting the starter motor terminals. Only start the tractor from the driver's seat!

Accumulator battery

The accumulator battery is installed under the cover on the left side of the tractor under the cab step. The battery is accessible after folding up of the cab step.

During folding up of the cab step the cab door must be closed.

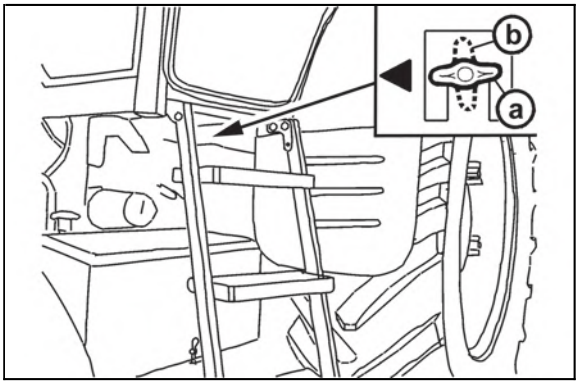
1 - Remove the screw (1)
2 - Lift the step in the arrow direction
3 - Secure the lifted step with a screw inserted to the opening (2) in the step
4 - Remove the safety pin (3)
5 - Grasp the bottom edge of the cover and remove it



D305

Battery disconnector

Batterydisconnector is placed on the left side of the tractor behind the stairs of the driver.
a - Batteryconnected
b - Batterydisconnected

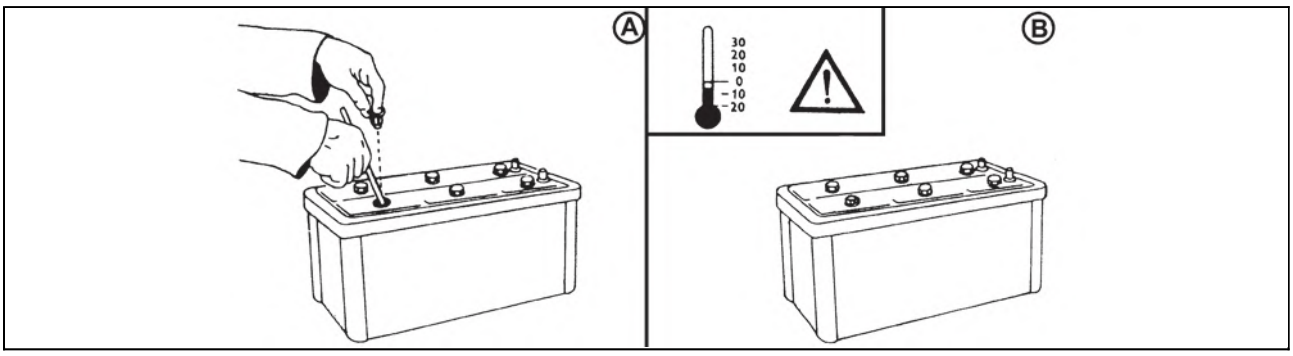


FH12N022

When the tractor is at dead parking, disconnect the battery by means of the battery disconnector (1). If a tractor is dead parked for a longer period of time, it is necessary to recharge at least once a month from the reasons of self-discharge of battery.

Attention! When the engine is switched off, the engine control unit remains active for about 2 minutes because of storage of operation data. During this time the supply of current from the accumulator must not be interrupted. Do not disconnect the accumulator before this time expires.

Accumulator battery maintenance



F298

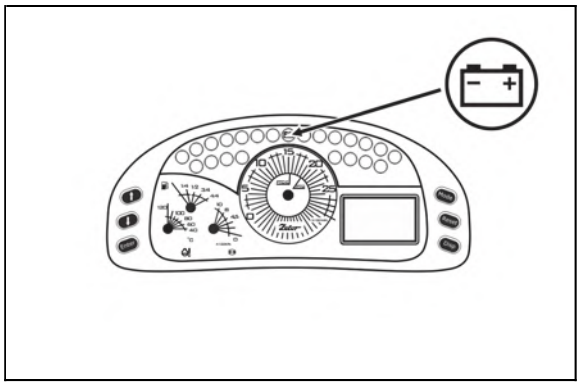
Keep the accumulator battery clean and properly fixed to the vehicle. However, the fixing device must not deform the battery case. In the case of polypropylene batteries the electrolyte level must not be below the minimum mark indicated on the case.

Only add distilled water to the battery!
1. When working with the battery first read the attached manual.
2. During work with the battery protect your eyes with goggles or a safety shield!
3. The electrolyte is a caustic substance; therefore, handle it with proper care.If your skin or clothes get stained by electrolyte, wash the skin or clothes with water and neutralize them with soap.
4. During charging hydrogen is released from the electrolyte on the electrodes. Hydrogen mixed with the air forms an explosive mixture. Therefore, it is prohibited to handle open fire near the battery during charging.
5. An explosion may also be caused by a spark created on the disconnection or release of a terminal when the charging circuit is on.
6. Keep the battery out of reach of children!
7. A discarded battery is dangerous waste for the environment - when buying a new battery hand the old one over to the dealer, who will dispose of it free of charge.

Alternator

Charging is monitored by the red indicator on the combined dashboard instrument.

During repairs of the tractor by electric welding all the conductors must be disconnected from the alternator. Protect the '+B' conductor from a short-circuit.



C15N135

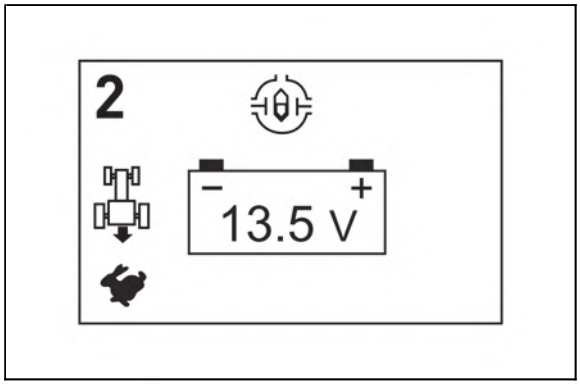
Alternator maintenance

When washing and cleaning the tractor protect the alternator from penetration of water or diesel fuel! During operation the alternator must not be disconnected from the battery! The alternator must never be put in operation without load, i.e. with the conductor disconnected from the '+B' terminal and the '+D' terminal connected. Such a condition may induce an extremely high voltage when the engine speed is increased, which would destroy the semiconductors! Never short-circuit any alternator terminal during operation! The alternator must not be additionally excited. Such an intervention would damage the semiconductors. Ensure perfect electric connection of the alternator terminals and proper grounding of the alternator! Poles of the alternator may not be re-versed even for a short time!

Electric installation overload

Is signalized by the selected display changing to a display with a symbol of a battery. It is a condition when electric installation of the tractor has such take-off, that the alternator performance is not sufficient to accumulator charging. If this state occurs, turn off a device or increase engine revolutions, load of electric installation drops and originally selected display is displayed.

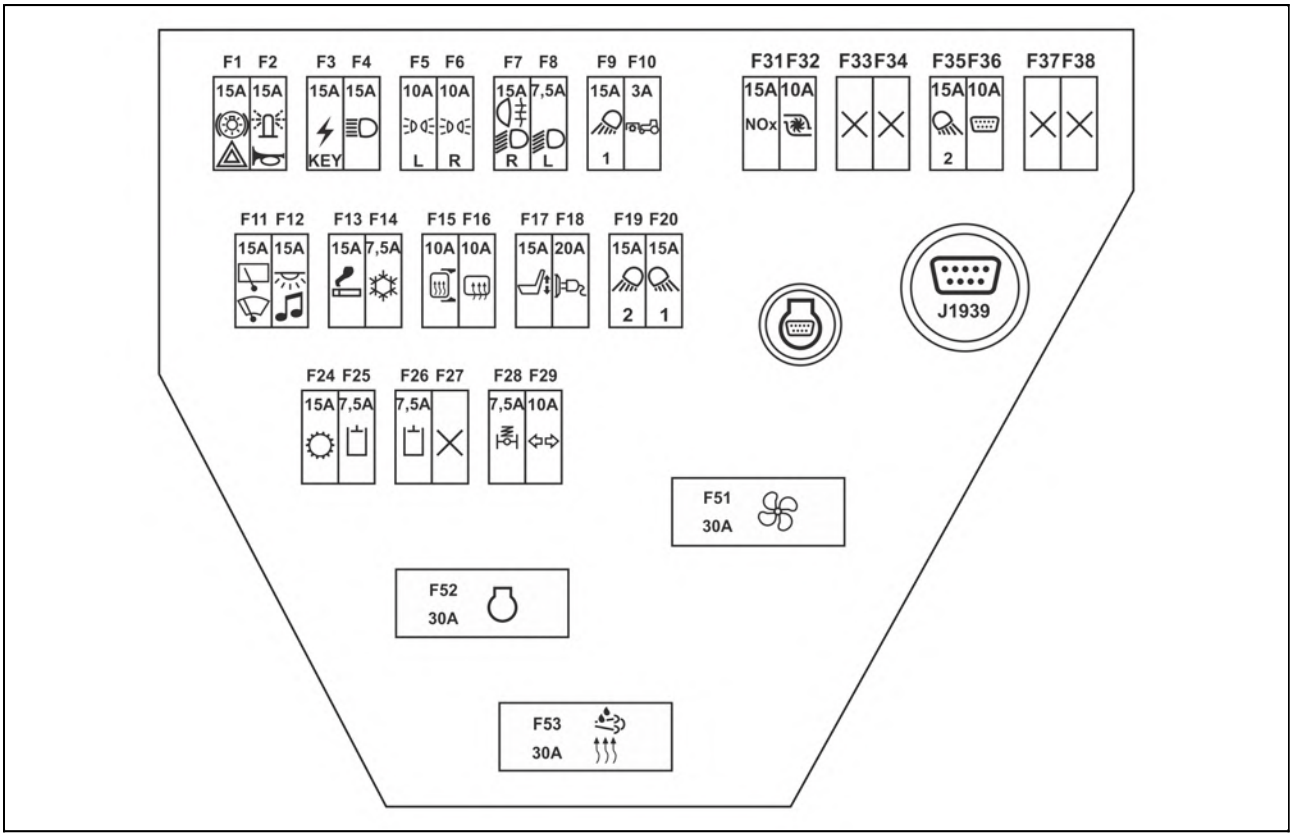
The operation of tractor in the electric installation overload mode can lead to accumulator depletion.



C15N144

ELECTRIC INSTALLATION

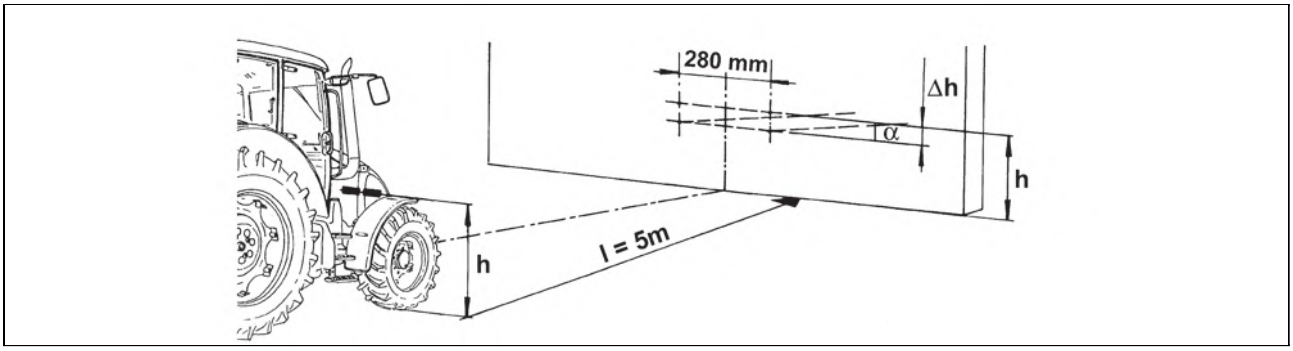
Fuse panel
The fuse panel is accessible after the left side cover of the control bracket is removed.
During replacement of fuses it is necessary to adhere to the prescribed value of the fuse. If interrupted repeatedly, search the nearest service.



C15N120

Pos..	Fuse size	Secured system
F1	15A	brake lights, tripper of warning lights
F2	15A	horn, beacon
F3	15A	appliances fed when key is in position I
F4	15A	distance lights with signal lamp
F5	10A	left position lights, instrument panel lighting, number plate lighting
F6	10A	right position lights
F7	15A	right dimmed lights, fog-lamp with signal lamp
F8	7,5A	left dimmed lights
F9	15A	Front work lights in engine bonnet
F10	3A	front PTO shaft
F11	15A	front and rear windshield, windshield washer
F12	15A	radio, dome light
F13	15A	Firer, two-pole socket
F14	7,5A	air-conditioning
F15	10A	heating of mirrors
F16	10A	heating of rear window
F17	15A	compresor of driver´s seat
F18	20A	three-pin socket DIN 9680
F19	15A	work lights under the roof
F20	15A	work lights under the roof
F24	15A	ECU power supply of gearbox
F25	7,5A	EHR
F26	7,5A	EHR
F27		unoccupied
F28	7,5A	spring-loaded front axle
F29	10A	tripper of direction lights
F31	15A	SCR system
F32	10A	turbo-blower
F33		unoccupied
F34		unoccupied
F35	15A	Rear work lights on the cabin
F36	10A	diagnostic socket, instrument panel
F37		unoccupied
F38		unoccupied
F51	30A	heating
F52	30A	engine control with electronic regulation of revolutions
F53	30A	heating of urea

Checking the adjustment of the front grill headlights



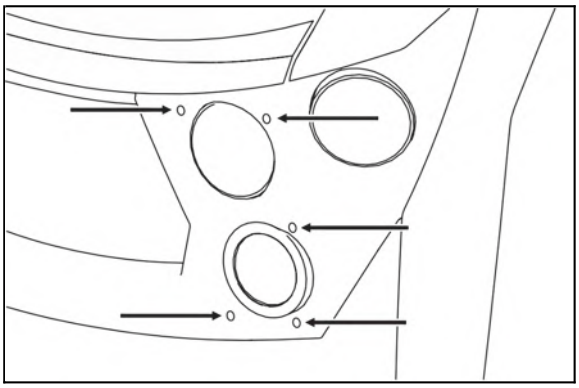
F_02_145

During a check on a test wall the tractor must stand on a level surface and the tyres must be inflated to the prescribed pressure. The basic vertical setting is 3.5% at the shipping weight of the tractor.In the horizontal direction the light beams must be parallel with the longitudinal axis of symmetry of the tractor.

l	-	distance of the test wall from the headlight (5 m)
h	-	height of the headlight centre above the road surface
Δh	-	headlight inclination (-3.5 %) to the distance of the test wall = 17.5 cm
α	-	raising of the outline of an asymmetrical headlight (15%)

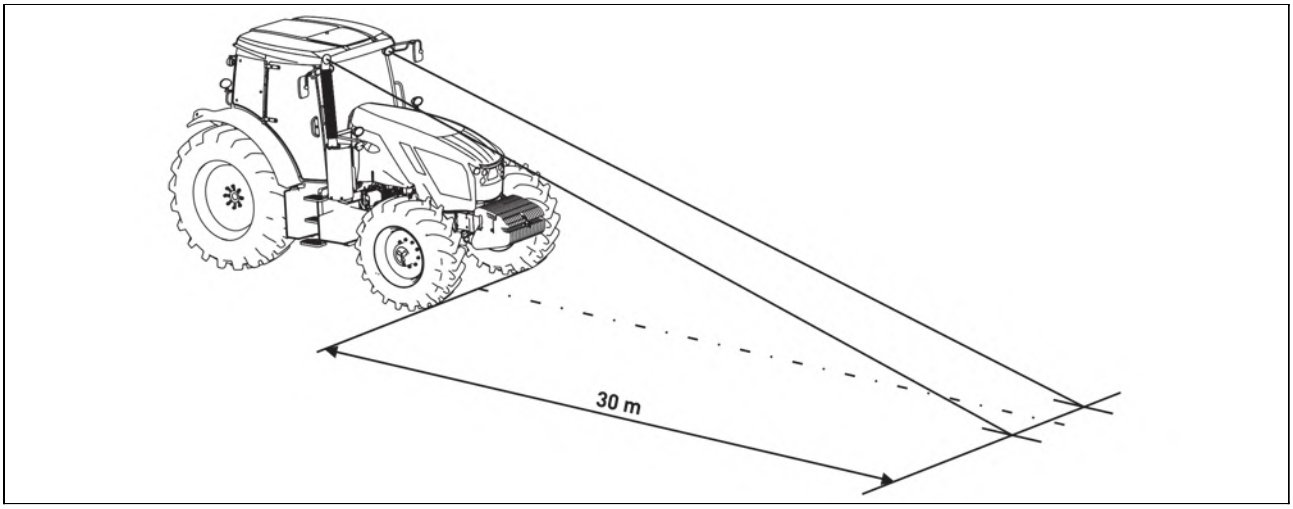
Adjusting the front grill headlights

The adjustment is performed simultaneously with all the screws for the vertical and horizontal direction of the beam. In the adjusted condition all the springs of non-adjusting screws must be pre-tensioned. Each headlight is adjusted separately. The lamps are replaced by removing from the rear side of the reflector.



C15N134

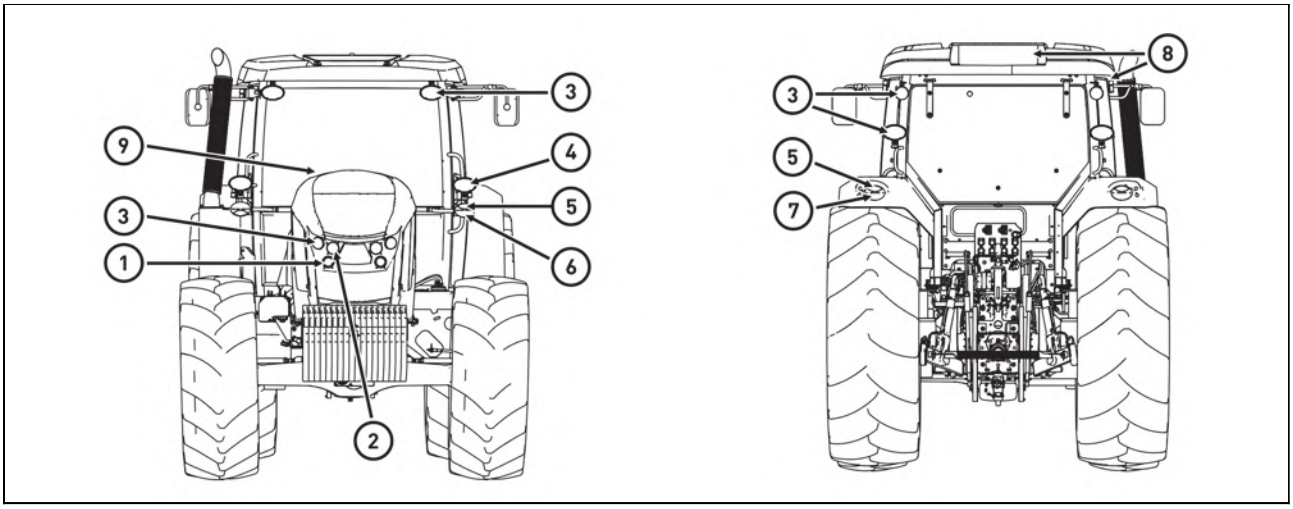
Checking the adjustment of the cab roof headlights



C15N136

In the vertical direction there must not be any point of illuminated area lying on the road surface plane to the left from the longitudinal vertical plane passing through the headlight centre further than 30 m from the front outline of the tractor.
In the horizontal direction the light beams must be parallel with the longitudinal axis of symmetry of the tractor.
Check the adjustment of the headlights at the shipping weight of the tractor. The front roof headlights may only be used when driving on public roads when the tractor carries a frontally attached machine or implement covering the main headlights (in the tractor grill).

List of lamps



C15N123

pos.	Lamp location	voltage	power	lamp type
1	Dimmed headlight	12V	60W	HB3
2	Distance headllight	12V	60W	HB3
3	Work headlight	12V	65W	H9
4	Dimmed headlight	12V	55W	H7
5	Direction light	12V	21W	P21W
6	Position light	12V	5W	R5W
7	Position / brake light	12V	21W/5W	P21/5W
8	Lighting of number plate and interior	12V	5W	W5W
9	Lighting of switches	12V	1.2W	1.2W

TRACTOR MAINTENANCE

Steps performed daily before the start of work
Check that the signal lamps in the instrument panel are off and if there are no error messages.

Before starting the engine
Check the oil level in the engine
Check the level of cooling liquid and tightness of connections of the cooling system
Check the quantity of the brake liquid and check the liquid brakes for leaks
Check the oil quantity in the gearbox and final drive housing
Check the air pressure in all tyres
Check the tightening of wheels
Check the condition of hitching and attaching equipment

After starting the engine
Check the engine lubrication function (indicator)
Check the charging function (indicator)
Check the steering function (indicator)
Check the function and tightness of the steering circuit
Check the function and efficiency of the tractor brakes
Check the function and efficiency of the brakes of the trailer or semi-trailer

Steps performed every 50 hours of work
Lubricate the tractor in accordance with the lubrication plan

Steps performed every 100 hours of work
Clean the cooler blades with pressurized air
Perform maintenance of the dry air cleaner (in accordance with the signal of the clogging indicator)
Check the oil quantity in the gearbox and final drive housing
Check the oil quantity in the gear box of the front PTO
Check the oil quantity in the reducers and in the box of the front driving axle
Drain condensate from the air reservoir
Cleansing and greasing of accumulator clamps with a layer of grease

Steps performed every 500 hours of work
Cogged belt tension check
Hydrostatic steering system clearance check
Pivot of front drive axle clearance check
Clutch and brake pedals adjustment clearance check
Manual clutch function check
Brake function for trailer check
Air pressure system tightness and function check
Driver's seat function check, greasing moving parts with grease

Steps performed outside the interval of 500 hours of work

of new tractor or tractor after general overhaul								
state of counter of Mth	100	500	1000	1500	2000	2500	3000	subsequently always after ... Mth
Checking and adjustment of valve clearance					o			2,000
Replacement of belt of accessories drive							o	3,000
Replacement of hoses of hydrostatic control								after every 3,500 Mth or every 4 years
Checking of convergency of front wheels					o			2,000
Calibration of travelling clutches	o	o	o	o	o	o	o	500

Filling and filter replacement

of new tractor or tractor after general overhaul						
state of counter of Mth	100	500	1,000	1,500	2,000	subsequently always after ... Mth
Replacement of engine oil		o	o	o	o	500
Replacement of oil filter element of engine oil		o	o	o	o	500
Replacement of filter element of urea pump		o	o	o	o	500
Replacement of coarse filter element of fuel			o		o	1,000
Replacement of fine filter element of fuel			o		o	1,000
Replacement of air filter element			o		o	1,000
Replacement of safety element of air filter					o	2,000
Replacement of filter element of heating			o		o	after every 1,000 Mth or every 2 years
Replacement of cooling liquid						every 2 years
Replacement of brake liquid						every 2 years
Replacement of oil in gearbox and final drive housing			o		o	1,000
Cleaning of magnet and sieve element of suction filter of hydraulics pump	o	o	o	o	o	500
Replacement of oil filter element of pushing filter of hydraulics pump	o	o	o	o	o	500 or according to indication of full filter
Replacement of oil filter element of pushing filter of gearbox distributor	o	o	o	o	o	500 or according to indication of full filter
Replacement of oil in housing of front axle drive switch	o		o		o	1,000
Replacement of oil in reductors of front axle drive switch	o		o		o	1,000
Replacement of oil in housing of front PTO shaft and cleaning of sieve oil filter		o	o	o	o	500

Used operation liquids and filling - quantities

Determination name	amount in litres
Brake fluid	0.5
Cooling liquid	30
Oil in engine	16
Fixed front axle	
Oil for housing of front driving axle	6
Oil for planet reductors of front driving axle	2x1.5
Spring-loaded front axle	
Oil for housing of front driving axle	4
Oil for planet reductors of front driving axle	2x1.5
Oil for gearbox and final drive housing	75
Oil for gearbox of front PTO shaft	2.7
Urea	32
Fuel	300

 ***The manufacturer does not take responsibility for any damages caused by the usage of service fillings that do not comply with requirements stated in this service manual.***

ZETOR Service Fillings
To maintain best operational characteristics of your tractor, original operational **Zetor** fillings are recommended to be used.

Oil for gearing mechanisms of tractors **ZETOR EXTRA 10W30 STOU**

Oil for front driving axle of **ZETOR LS 80W**

Motor Oils
While changing or refilling the oil fill in the engine always use an oil complying with the specification **DQC III-10**

Specification of Oil for Tractor Transmission Devices

Viscosity Class SAE	**Performance Class API**
10W - 30	GL-4

Specification of Oil for the Front Driving Axle

Axle type	**Performance class API**
Solid front axle	GL4/GL5
Suspension front axle	GL4/GL5

Other Recommended Service Fillings Tested on Zetor Tractors

Oil to gear systems of tractors

Manufacturer	Oil designation	Viscosity class SAE	Performance class API
Paramo	MOGUL Traktol STOU	10W - 30	GL-4
Aral	Super Traktoral	10W - 30	GL-4
ÖMV	Austrotrac	10W - 30	GL-4
Fuchs	AGRIFARM STOU 10W-30 MC	10W - 30	GL-4
ORLEN OIL	Agro STOU	10W - 40	GL-4

Oil for the front driving axle

Manufacturer	Oil designation	Viscosity class SAE	Performance class API
Shell	Spirax AX	80W - 90	GL-5
Aral	Fluid HGS	80W	GL-4
Agip	Rotra Multi THT	80W	GL-4
Esso	Torque Fluid 62	80W	GL-4
Fuchs	Titan Supergear	80W - 90	GL-4/GL-5
	Titan Hydramot 1030MC	10W - 30	GL-4
	Titan Renep 8090MC	80W - 90	GL-4/GL-5
ÖMV	Gear Oil LS	85W - 90	GL-5
MOL	Hykomol K 80W-90	80W - 90	GL-5
ORLEN OIL	Platinum Gear 80W-90	80W - 90	GL-5

Front PTO oil

Manufacturer	Oil designation
Shell	Donax TX
BP	Autran DX III
	Fluid 9
Esso	ATF E 25131
Castrol	Transmax S
Elf	Elfmatic G2 Syn
	Elfmatic G3
FINA	Finamatic HP
	Finamatic S6726
Mobil	Mobil ATF
Texaco	Texamatic 7045
Valvoline	ATF Dextron II-E
Beverol	Dextron II-E
	(Fina)matic HP
JD	Hygard JDMJ 20C
Total	Fluide AT42
	Fluidematic Syn
MOL	ATF 3G

Hydraulic brake liquid for the tractors

Type	Classification
Shell Donax YB	SAE J 1703, ISO 4925
Synthol 205	PND 31-656-80, ISO 4925, SAE - J 1703
Fuchs Stopred	SAE - J 1703
Brake Fluid DOT 4	ISO 4925, SAE - J 1703
EVOX DOT 4+	ISO 4925/4 SAE - J 1704
	CAUTION! 1. *The liquid is not designed for arctic conditions!* 2. *Replace the brake liquid once every two years regardless of the number of hours of work!* 3. *Liquids of the same classification can be mixed together.*

Liquid for the cooling system of the tractors

Coolant and demineralized water in the ratio of 1:1.5 (carry out refilling of the mixture using this ratio).
While changing or refilling the cooling fill in the engine always use a coolant complying with the prescribed specifications.

Specification
Deutz TR 0199-99-01115/9 EN

Do not use water without an antifreeze for the cooling of a tractor!
Carry out a renewal of the coolant after two years of operation.

Fuel

Diesel oil complying with the regulation of **EN 590**

Paraffin impurities or additional additives in fuel are not allowed for engines with Common-Rail injection.

Urea (urea solution AUS 32)

Urea a highly pure aqueous urea 32.5% solution used as a reducing agent NOx for additional treatment of exhaust gases.
The product is labelled as urea or AUS 32 (AUS: Aqueous Urea Solution).
Add only solution adhering to prescribed specifications.

Specification
DIN 70070 ISO 22241-1 ASTM D 7821

Note:

The urea solution AUS 32 is known in USA and North America as Diesel Exhaust Fluid (DEF).

The lifetime of urea without the loss of the quality is influenced by storage conditions.
It crystallizes at -11°C and over +35°C it initiates hydrolytic reaction which means that a slow decomposition to ammonia and carbon dioxide begins.
It is essential to protect unprotected vessels from direct sunlight.

Plastic lubricant for the tractor

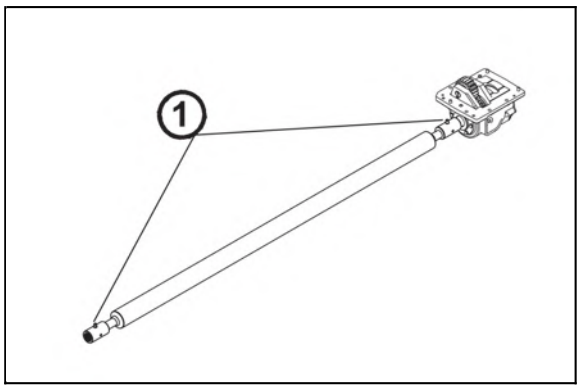
Type	Classification
Shell retinax HD2	DIN 51825 KP 2 K-20
MOGUL LA 2	ISO 6743/9 CCEB 2/3, ISO - L - XBCEA 2
MOGUL LV 2M	ISO 6743/9 CCEB 2/3
ÖMV signum	DIN 51825-K 2 C-30
MOL	Liton LT 2EP
ORLEN OIL	Liten® Premium ŁT-4 EP2

Use grease with PTFE additives for greasing suspension front drive axle.

Tractor greasing scheme

Transmission shaft

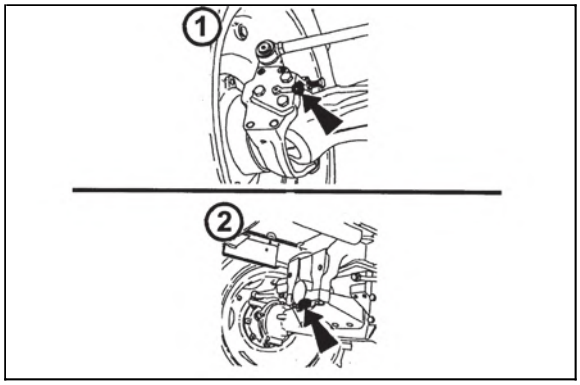
Position	Name	Number of greasing points
1	Transmission shaft clutches	2



FHD14N089

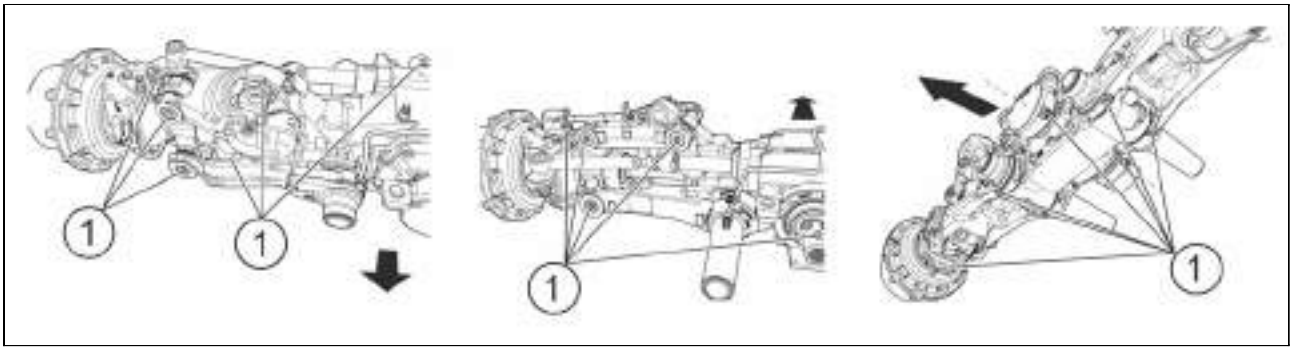
Solid front drive axle

Pos. no.	Identification	No. of lubrication points
1	Turning radius pins	4
2	Central pin	2



03F

Suspension front drive axle



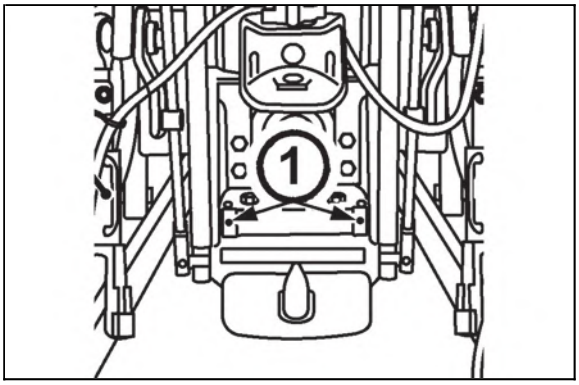
FHD14N088

Position number	Name	Number of greasing points
1	Greasing points	25

Use grease with PTFE additives for greasing suspension front drive axle.

Hitch for a single-axle semi-trailer

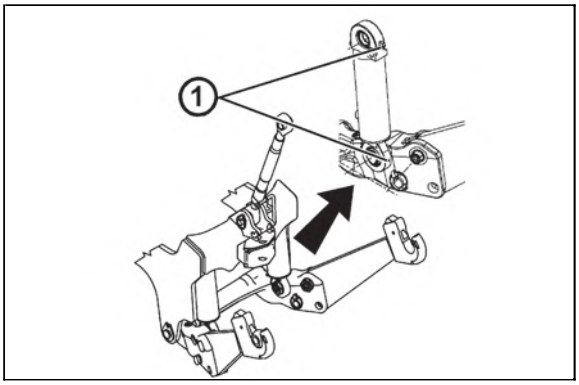
Pos. no.	Identification	No. of lubrication points
1	Hook pin bearings	0 to 4 (by version)



01F

Front three-point hitch

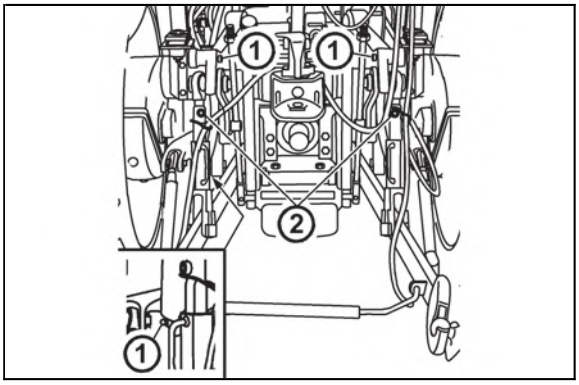
Pos. no.	Identification	No. of lubrication points
1	Pins of cylinders of the front three-point hitch	4



02F

Three-point hitch

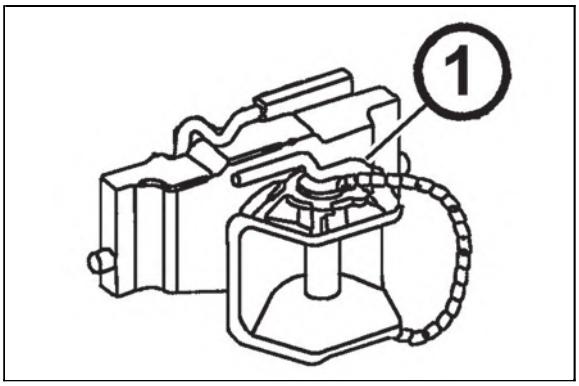
Pos. no.	Identification	No. of lubrication points
1	Pins of auxiliary hydraulic cylinders	2
2	Lifting draw-bars	2



21

Hitch mouth for a trailer

Pos. no.	Identification	No. of lubrication points
1	Hitch mouth for a trailer	1



5P

Technical maintenance of the tractors after a general overhaul of the main groups
Run in the tractor after a general overhaul in accordance with the instructions for running in a new tractor. Perform the maintenance in the same way as with a new tractor.

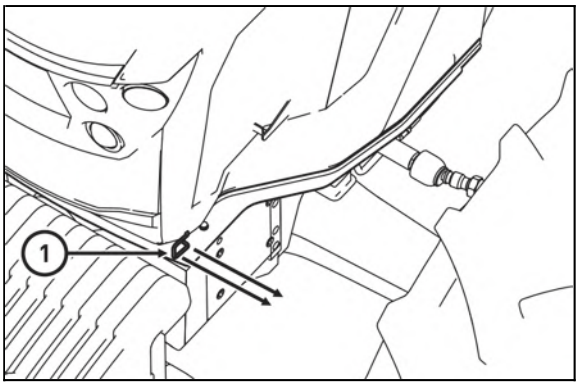
MAINTENANCE INSTRUCTIONS

Most of operations of planned maintenance may be carried out by the driver or other user of the tractor.
In case you do not have sufficient technical equipment, let the difficult operations carried out by a specialised repair shop.

All works, connected with cleaning, lubrication and adjustments of the tractor or coupled mechanisms may only be carried out after stopping of the engine and other movable components except checks of brakes, recharging and hydraulic system.

Opening the hood

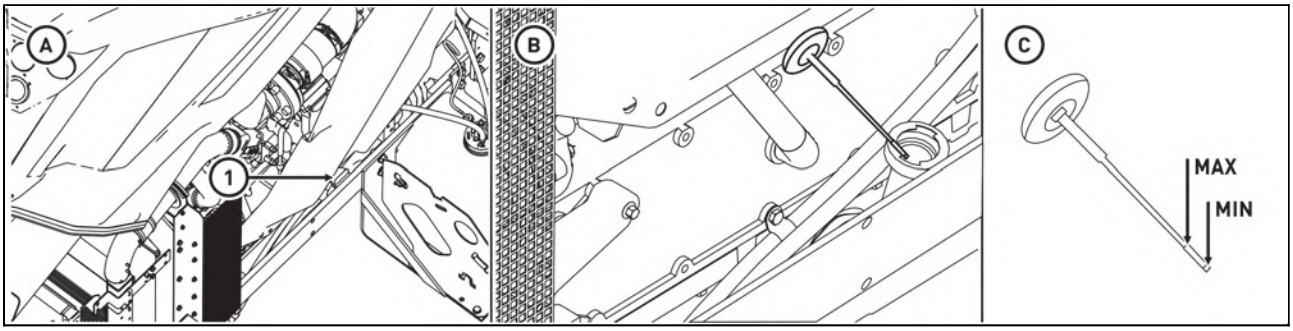
Opening the hood:
Release the hood by pressing the button (1), grasp it in the places of arrows and lift it. Thanks to a gas brace the hood will open automaticallyafter that.
The hood is locked in this lifted position thanks to this gas-liquid brace.
Closing the hood:
Pull the hood down with the strap, grasp it in the place of arrows and press it downwards until the hood lock snaps.



C15N076

Do not use excessive force to close the front hood as the filaments of headlight bulbs situated in thefront hood might get damaged.

Checking the oil level in the engine



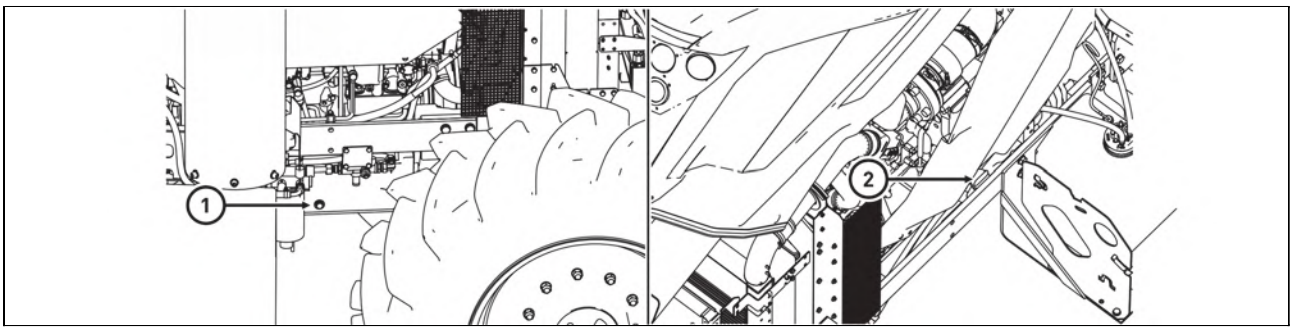
C15N077

Perform the check daily before starting the operation when the tractor is standing horizontally and the engine is not running.

The filling hole (1) is located in the left side of the engine (A).
The engine oil dipstick is a part of the lid of the filling hole (B).
The oil level must always be in the range from MIN and MAX (C).

The lid (1) is released by turning to the left.
Take out the dipstick, wipe it with a clean cloth without fibres and insert it back till the end.
When the dipstick is taken out again check the oil level.
Add the oil as necessary through the filling hole (1) to the mark MAX on the dipstick.

Draining oil from the engine



C15N078

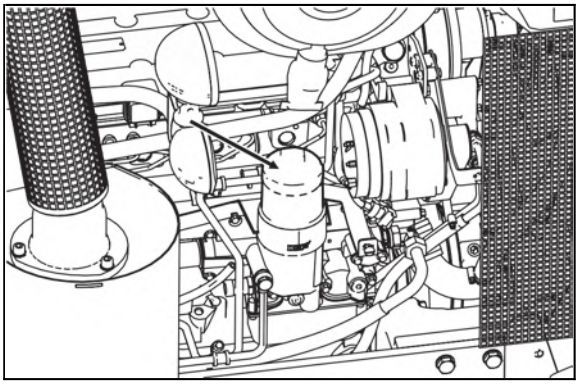
Oil draining from the engine is preferably carried out when the driving is finished or when the engine is heated to the operating temperature.
Do not perform the oil draining until the tractor is standing horizontally and the engine is not running.
Release the filling hole plug (2) of the engine oil during the oil draining.

1. Place the retaining vessel for the drained oil under the drain plug (1) in the left side of the engine
2. Unscrew the drain plug (1) in the left side of the engine.
3. Drain the oil to the retaining vessel
3. Clean the drain plug
4. Screw the drain plug (1) back

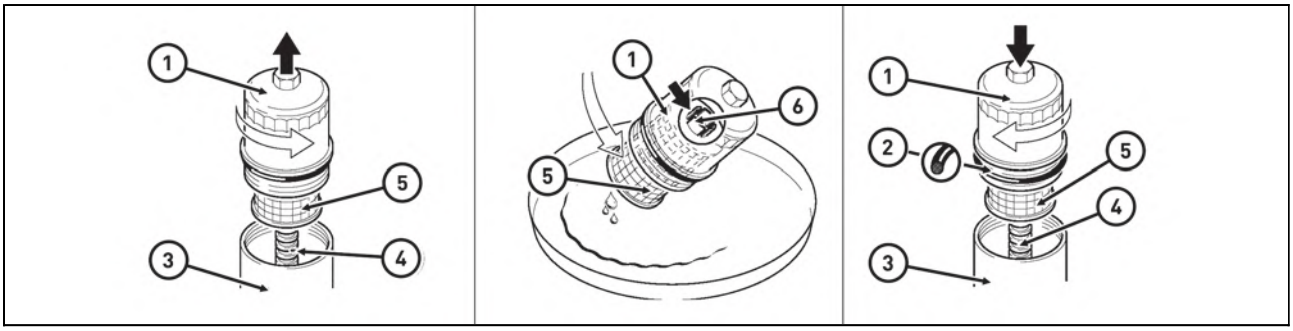
Filling the engine with oil
Pour the specified amount of the engine oil through the filling hole (2), start the engine and leave it running for 2 - 3 minutes when engine idling.
When the engine is stopped and the oil level is quiet, check the oil level with the dipstick and perform checking of the tightness of the filter body, drain plug and other connections.

Replacing full-continuous motor oil filter

The full flow oil filter is located in the right side of the engine and is accessible when the engine bonnet is open and the right bonnet sidewall is disassembled. The replacement of the filter element is performed after each oil change in the engine.
The replacement is performed when the engine is not running.



C15N080



C15N079

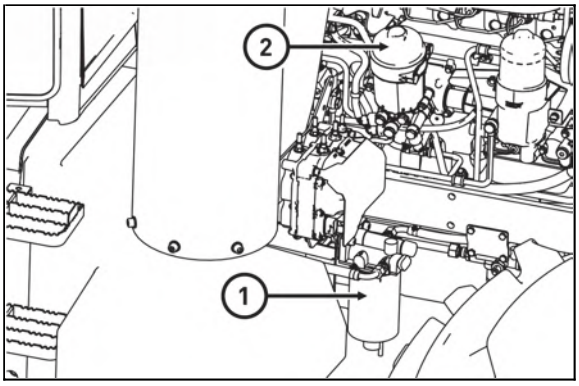
1 - Cover
2 - Sealing ring
3 - Jacket
4 - Guide
5 - Filter element
6 - Clamp

Procedure for filter element replacement
Release the cover (1) by 2 to 3 revolutions and wait ca. 30 seconds.
Unscrew the cover (1) in anticlockwise direction.
Carefully release the filter body from the guide (4) in the jacket (5) in the upward direction.Catch the leaking oil in a suitable vessel.
Slightly bend the filter element (5) in the retaining vessel to the side until the element is released from the clamp (6).
Clean the components.
Replace the sealing ring (2) and oil it slightly.
Press the new filter element (5) into the clamp (6) and carefully put them together in the guide (4).
Firmly screw the cover (1) (25 Nm) in clockwise direction.
Check the tightness when the engine is running.

Fuel Filtering

The fuel filters are located on the right side of the engine.

The fuel filtration is two stage:
preliminary fuel filter with desilter (1)
fine fuel filter (2)

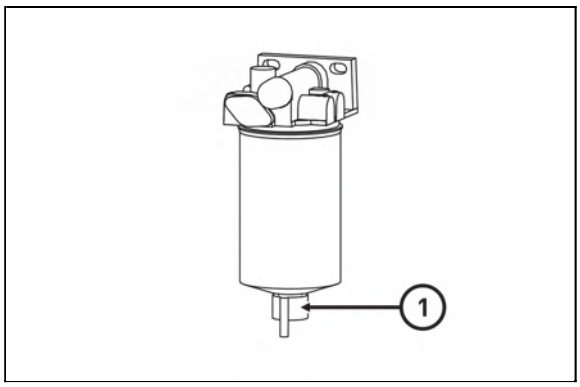


C15N081

Raw Fuel Filter Clearing

You perform it while the engine is stopped and the key is in the switch box in the position 0.

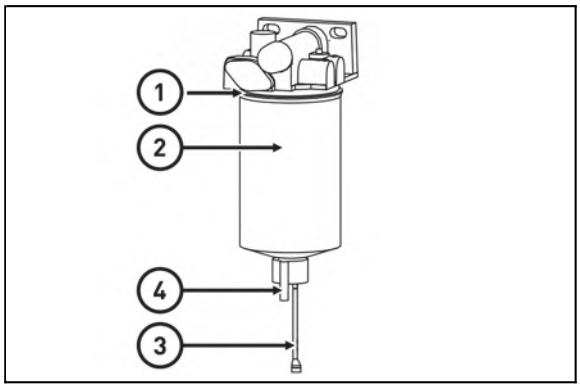
1. Put a catch reservoir under the raw fuel filter
2. Loosen the draining bolt (1)
3. Keep the liquid draining until a pure fuel flows out
4. Tighten up the draining bolt with a tightening moment of 1.3-1.9 Nm
5. After having started the engine check tightness of the raw fuel filter



C15N083

Cartridge Replacement in the Raw Fuel Filter

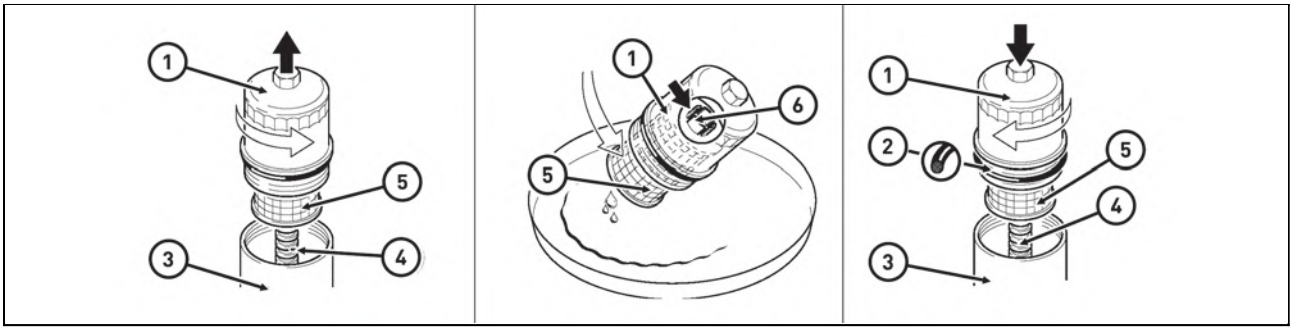
1. Put a catch reservoir under the raw fuel filter
2. Unplug the cable of the condensate level sensor (3) in the raw fuel filter
3. Loosen the raw fuel filter cartridge (2) and screw it off using appropriate tools
4. Dismantle the draining bolt (4) with the condensate level sensor
5. Before screwing on a new filter cartridge clean the packing surface of the filter body (1)
6. Smear fuel on the rubber packing of the new filter cartridge (2) and screw on the filter cartridge
7. After the packing has sit down on the contact surface tighten up the filter manually
8. Attach the draining bolt (4) with the condensate level sensor
9. Plug in the cable of the condensate level sensor in the raw fuel filter (3)
10. Perform an air bleeding of the fuel system
11. After starting up the engine make a tightness check of the raw fuel filter



C15N084

The filter cartridge must not be filled with fuel before you start the mounting. Contamination danger.

Cartridge Replacement in the Fine Fuel Filter

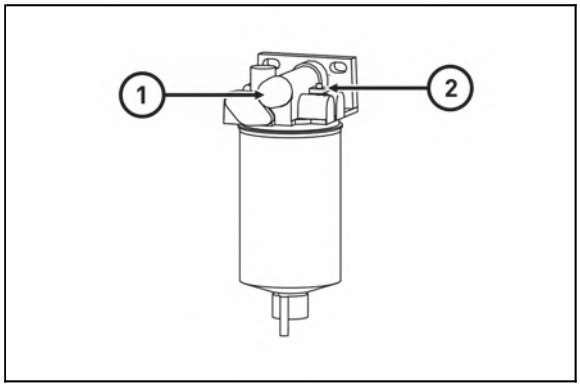


C15N079

1 - Cover
2 - Sealing ring
3 - Jacket
4 - Guide
5 - Filter element
6 - Clamp

Procedure for filter element replacement
Release the cover (1) by 2 to 3 revolutions and wait ca. 30 seconds.
Unscrew the cover (1) in anticlockwise direction.
Carefully release the filter body from the guide (4) in the jacket (5) in the upward direction.
Catch the leaking fuel in a suitable vessel.
Slightly bend the filter element (5) in the retaining vessel to the side until the element is released from the clamp (6).
Clean the components.
Replace the sealing ring (2) and oil it slightly.
Press the new filter element (5) into the clamp (6) and carefully put them together in the guide (4).
Firmly screw the cover (1) (25 Nm) in clockwise direction.
Check the tightness when the engine is running.

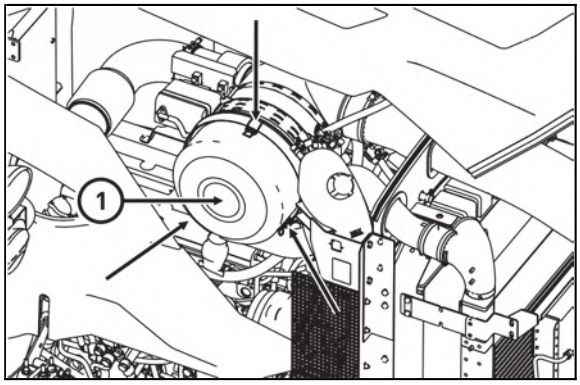
Fuel system venting
Release the bleeder screw (2).
Unlock the bayonet closure of the fuel pump (1) by simultaneous pressing and turning and in anticlockwise direction. The pump piston is now pressed out due to the force of the spring.
Pump until no air leaks from the bleeder screw.
Tighten the bleeder screw (6.5) with the tightening torque of 6.5 ± 1.3 Nm.
Lock the bayonet closure of the fuel pump (1) by simultaneous pressing and turning and in clockwise direction.



C15N085

Start the engine and leave it running for ca. 5 minutes when engine idling or at low load. During this check the tightness of the fuel system.

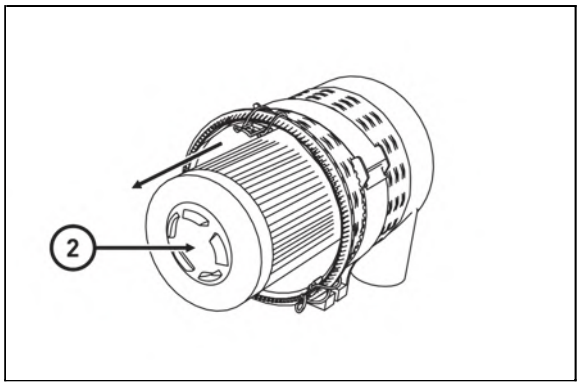
Dry air cleaner maintenance instructions
Perform maintenance of the air cleaner in the following way:
1. Remove the right side plate of the hood
2. Release the clamps of the air cleaner lid (marked with arrows)
3. Remove the air cleaner lid (1)



C15N086

Recovery of the mainair cleaner element
Remove the main element of the dry cleaner (2) by pulling.
If the main element is not damaged (there must not be any dust on the inner side of the element), recover it by blowing pressurized air from the inner side of the element.

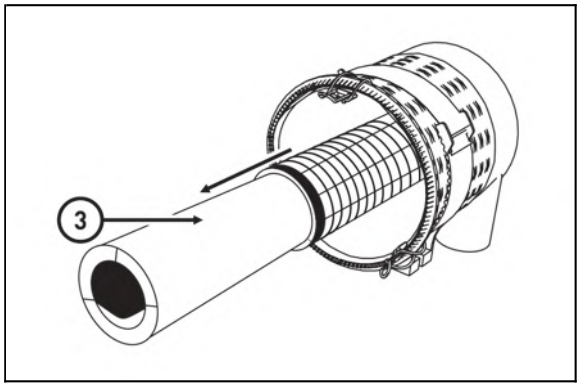
This way you can recover the main element 3 times at the most. The element must be replaced once a year.



NM14D015

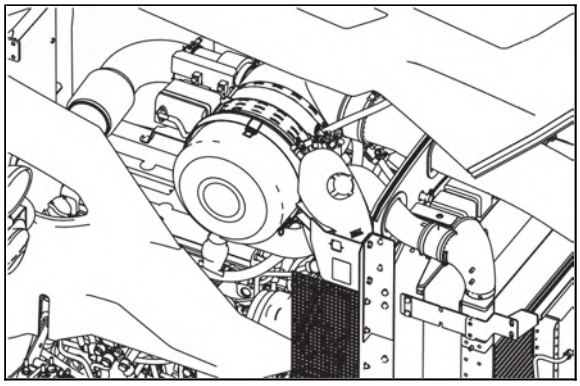
Replacing the safety element of the air cleaner
Remove the safety element of the dry cleaner (3) by pulling.

The safety element cannot be recovered. It must always be replaced in these cases.
- If the main element is damaged.
- After covering 2000 hours of work
- At least once every two years.



NM14D016

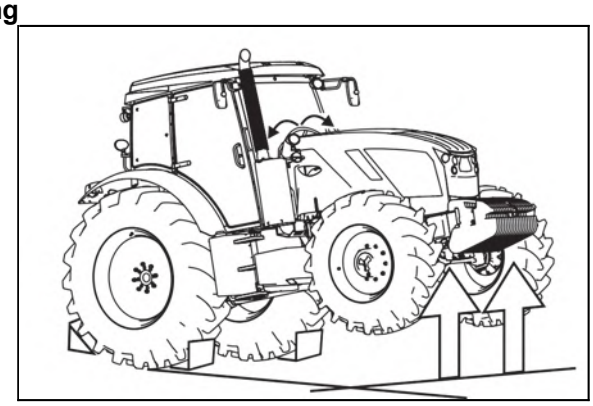
Reassembly of the air cleaner elements
Carry out a reverse procedure in order to mount air filter cartridges back on.
While mounting the cartridges back on mind:
- The cleanness of contact surfaces
- That the cartridges must not lose their shape while being mounted and they must not vibrate after their mounting has been finished
- That after having closed the filter with the cover you must ensure a perfect tightness of the entire filter



C15N087

Bleeding the hydraulic circuit of the hydrostatic steering

1 - Start the engine and let it run at the idle speed for approx. 1 minute.
2 - Turn the steering wheel several times to both the sides at the idle speed of the engine.
3 - At the maximum engine speed turn the wheels with the steering wheel 3 times alternately slowly and quickly to both the sides up to the limiting stops of the wheels.
4 - Stop the engine and lower the tractor onto the front wheels.



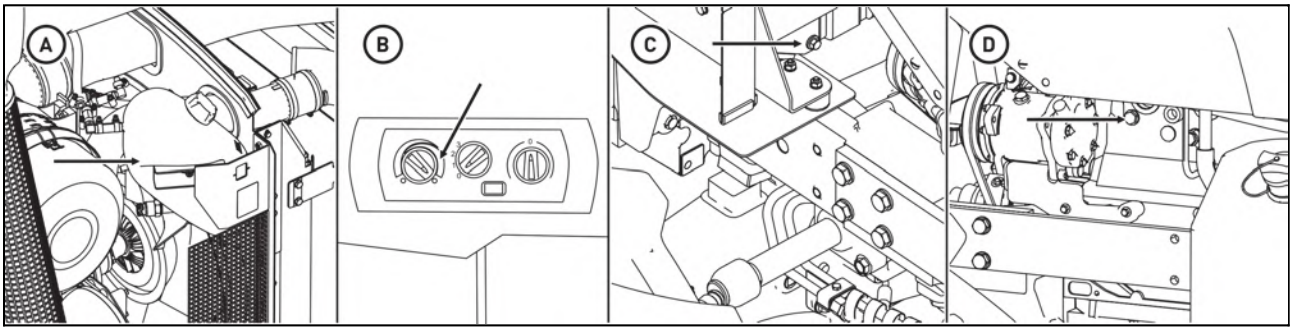
C15N130

Replacing the hydrostatic steering hoses

The hoses must be replaced after four years from the production date (the date is indicated on their surface) or after 3500 hours of work of the tractor or immediately after discovering signs of their damage (hose sweating, local buckling, leaks of the working media around the end pieces and on the hose surface, abrasion of the hose surface to the metallic reinforcement, damage of the outer yarn braiding in the case of low-pressure hoses).

In case of a pump failure or after stopping of the engine the steering capability is maintained, but the required steering force gets higher. You can drive the tractor at a reduced speed to the nearest workshop. The steering wheel must not be held in the limit turning angle positions for a long time (the maximum time is 20 s); otherwise the oil in the hydrostatic steering circuit is heated up excessively.

Replacing coolant



C15N088

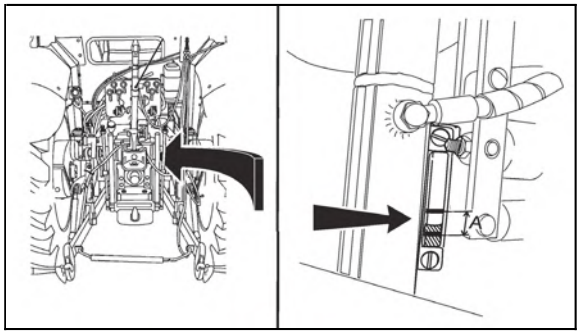
Follow the following procedure:
1 - Open the heating cock (B) and release the overpressure plug (A) on the equalizing vessel.
2 - Drain the cooling liquid from the cooler. The drain plug (C) is accessible when the engine bonnet is open.
3 - Drain the cooling liquid from the engine block. The drain plug (D) is located in the left side of the engine and is accessible when the engine bonnet is open.
4 - When the cooling liquid is drained, close the drain plugs (leave the heating cock open).
5 - Fill the cooling system with the liquid to the neck in the equalizing vessel and close it with the overpressure plug.
6 - Start the engine and leave it running for ca. 1 minute.
7 - Fill the cooling liquid in the equalizing vessel (A) to the mark MAX.
8 - Close the vessel with the overpressure plug.

When filling the engine cooling system, always use the specified cooling liquid. Never fill the cooling system with water. Using other than specified cooling liquid may cause engine damage.

Checking the oil in gearbox

The height of oil in gear box set is checked by oil level indicator which is placed at the right rear part of the gearbox behind the right hydraulic roller.
A - Standard oil filling

Carry out the check always with the engine stopped.

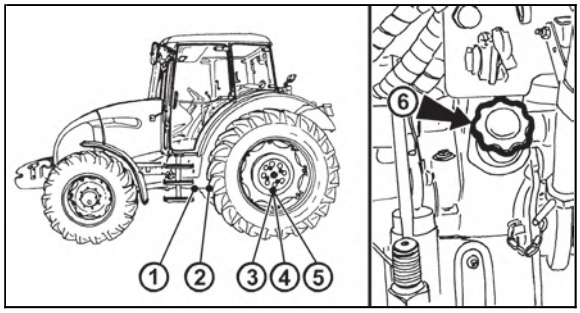


FH12N016

Check and replacement of oil in gear box

Draining and checking holes

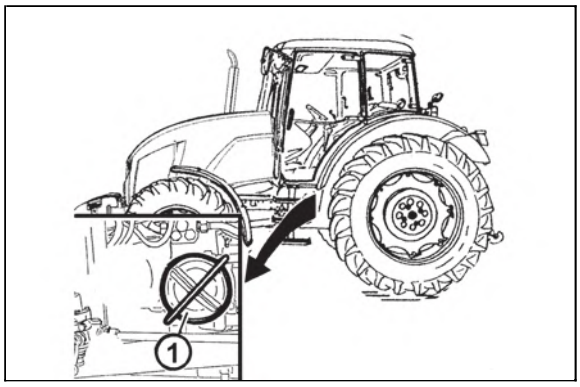
1. drain plug of oil from clutch box
2. drain plug of oil from gearbox
3. drain plug of oil from final drive housing
4. drain plug of oil from final drive housing box
5. drain plug of oil from final house driving box
6. Pouring opening for gear oil is placed in hydraulic mechanism housing. Accessible from the rear part of the tractor



FH12N015

After draining oil

1. Clean the magnet (it is part of the lid) and the strainer element of the suctioning filter (2)
2. After cleaning screw all the drain screws back on.
3. Fill oil, start the engine and let it run for approx.
2 minutes
4. After stopping of the engine and stabilization of the oil level in the gearbox check its quantity and fill up oil to the upper edge of the dipstick tab or if increased filling is necessary, to the lower or upper mark of the dipstick.



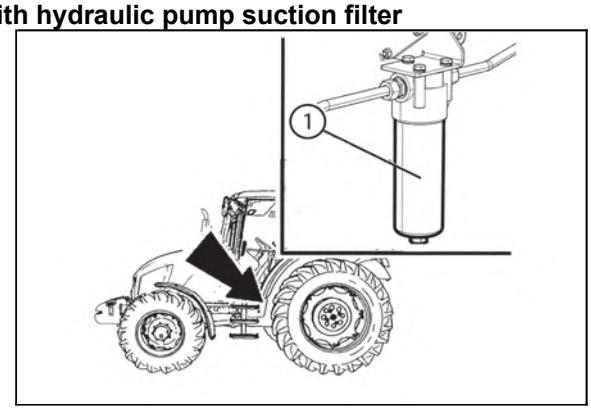
FH12N078

Replacement of the transmission oil cleaner element with hydraulic pump suction filter

The oil filter is located on the left side of the gearbox.
In case of indication of full oil filter element, replace the element regardless the interval of planned replacement of filters and their elements.

Prior to the replacement of the filter element put a suitable vessel for catching the dripping oil under the tractor.

1. Unscrew the oil filter body (1)
2. Clean the oil filter body (1)
3. Replace the filter element
4. Perform the reassembly of the oil filter body



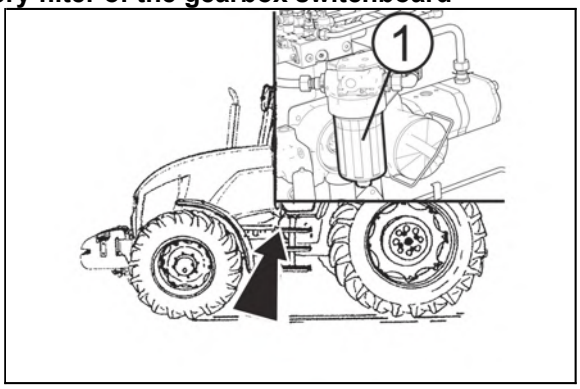
F11N038

Insertion piece replacement of the oil cleaner with delivery filter of the gearbox switchboard

The oil filter is located on the left side of the gearbox.
In case of indication of full oil filter element, replace the element regardless the interval of planned replacement of filters and their elements.

Prior to the replacement of the filter element put a suitable vessel for catching the dripping oil under the tractor.

1. Unscrew the oil filter body (1)
2. Clean the oil filter body (1)
3. Replace the filter element
4. Perform the reassembly of the oil filter body

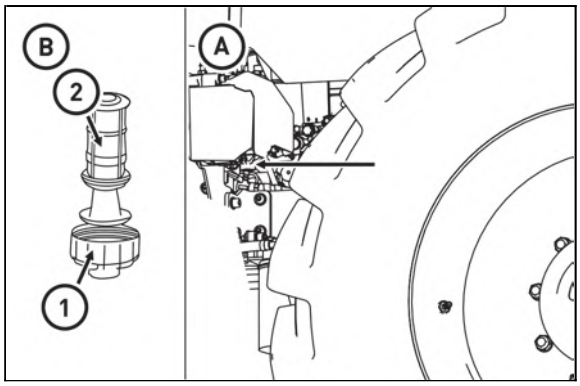


C15N089

Replacement of filter element of urea filter

Prior to the replacement of urea filter element put a suitable vessel under the tractor for catching the dripping urea liquid.

The urea filter element is replaced when the engine is not running and the key is removed from the switch box.
The urea cleaner is located in the right side of the engine on the urea pump block (A).



C15N108

B - Procedure for replacement:
1 - dismount the cover (1)
2 - remove the filter element with the compensation body (2)
3 - insert the new filter element with the compensation body (2)
4 - mount the cover (1) with the tightening torque of 20-25 Nm
5 - start the engine and check the tightness

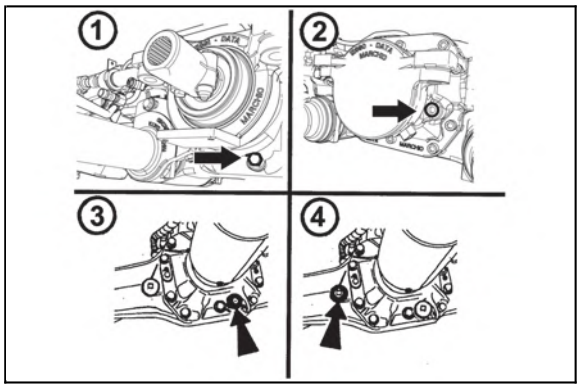
When handling components that are in contact with urea, use protective gloves.

Lubrication and filling points of the front driving axle
Suspension front drive axle

1. Drain opening of the final drive housing oil
2. Filling and inspection opening of final drive housing oil (after removing of the inspection screw the oil level must reach the bottom edge of the inspection opening)

Solid front drive axle

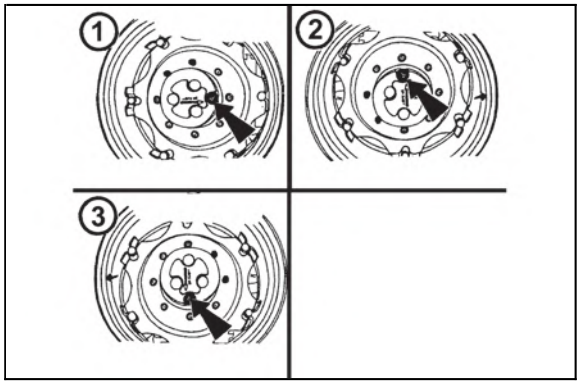
3. Drain opening of the final drive housing oil
4. Filling and inspection opening of final drive housing oil (after removing of the inspection screw the oil level must reach the bottom edge of the inspection opening)



FHD14N090

Filling, inspection and drain opening of oil of the front wheel reducers

Oil is checked, filled and drained through one opening after turning of the reducer in accordance with the figure.
1. Checking the oil level - opening on the horizontal axis of the reducer (after removing of the inspection screw the oil level must reach the bottom edge of the inspection opening)
2. Oil filling - opening at the top
3. Oil draining - opening at the bottom

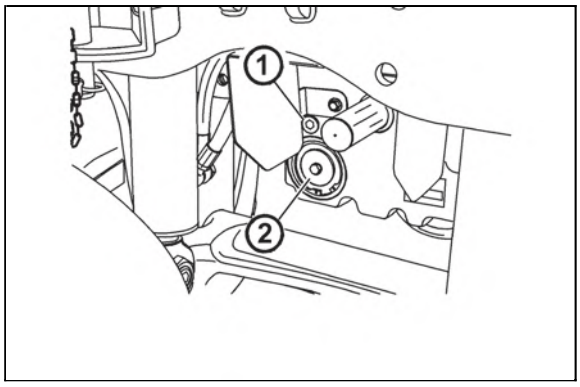


C731

Front PTO

The inspection and filling plug of oil (1) is situated on the front side of the front PTO case.
Note: The front PTO with the standard turning direction is equipped with a hollow bolt of the oil cooler hose instead of the inspection and filling plug. Perform the check after removing the hollow bolt.

After unscrewing of the inspection plug the oil level must reach the bottom edge of the inspection opening. During the oil replacement the oil cleaning strainer (2) must be cleaned. The cleaning strainer is accessible after the disassembly of the locking ring and removal of the cap.

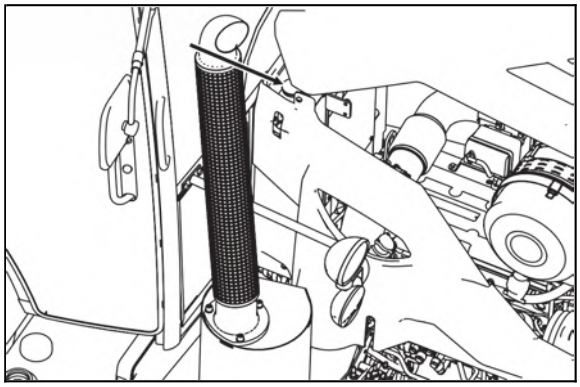


F206

Brake fluid replacement

The vessel is placed on the rights side and is accessible after lifting the front bonnet. Keep the level of brake fluid in the range of 3/4 of the content of the vessel (maximum height) to 1/2 of the vessel content (minimum height of the level).

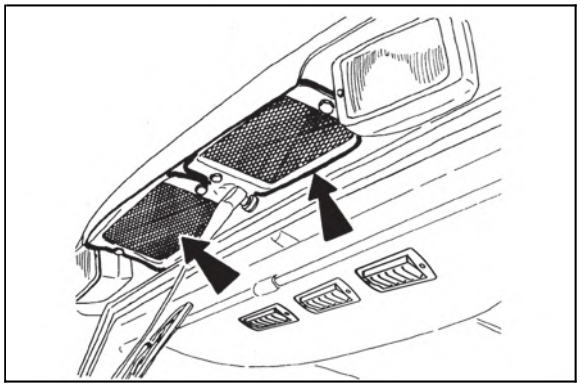
When handling brake liquid, keep absolute cleanness. Check the brake liquid level daily before starting your work.



C15N007

Carbon filter installation instructions

1. Remove the old filter from the air duct orifice in the place of its mounting.
2. Remove the protective package from the new filter.
3. Insert the filter into the air duct orifice in such a way to make the air flow direction correspond to the flow direction through the filter in accordance with the arrow on the filter. The entering air must first pass through the white dust filtration layer.
4. Check proper sealing of the filter.
5. Secure the filter.

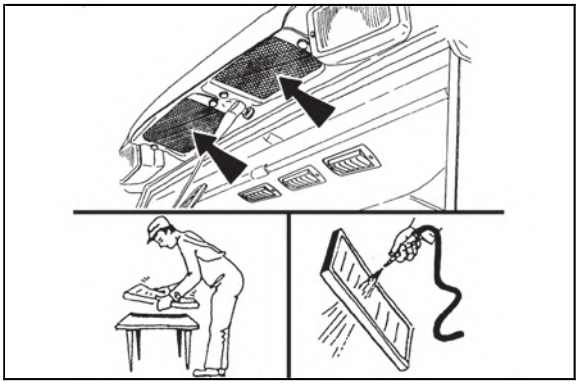


F13BN029

Cleaning the heating filters

Recover the filters positioned under the covering grills over the windshield outside the cabin with regard to the degree of clogging:
- by shaking
- by blowing with compressed air

Check the filters for clogging daily. Replace heavily clogged filters.

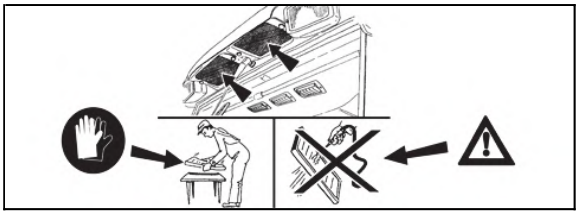


F13BN030

The safety cab of the tractor is not equipped with special filters of air aspirated to the cab.
It does not protect the operator from the effect of aerosols and other harmful substances!
Use a filter with active carbon when working with harmful substances.

***Air filter with active carbon**

Filters with active carbon are installed instead of the standard dust filter and they are replaced in the same way as the normal filters. The filter must be inserted with the white side towards the grill. The installation instructions are found on the next page.
The filter is only used during spraying of pesticides; then it must be replaced with a paper filter again as flying dust would clog the carbon filter in a very short time.
During its use the recirculation control must be in the position of 'air suctioned from the outside'.
The fan control must be in the 'maximum' position.



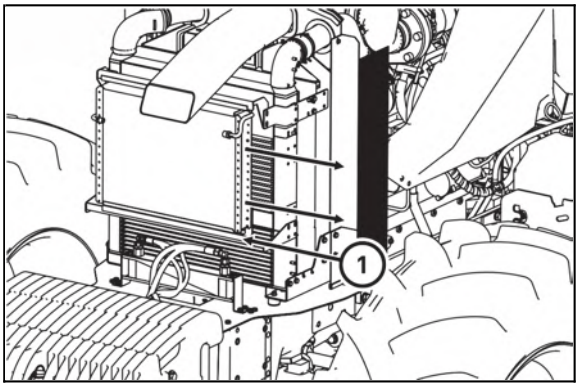
F13BN031

WARNING: The filter does not provide complete protection from toxic substances
- When handling the filter wear protective gloves
- Do not clean or blow the filter with compressed air

DANGER: Replace the active carbon filter every 200 hours or 36 months (the production date is printed on the filter). If you feel the smell of pesticides in the cab, replace the filter immediately and have the cab sealing checked. Used filters must be disposed of in specialized collection centres.

Air-conditioning maintenance

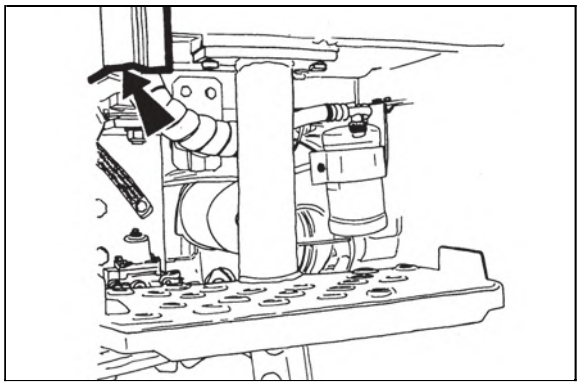
The most important element of the maintenance of the air-conditioning system is cleaning of the cooler (condenser) of the air conditioning (it is located in front of the engine cooler). The full condenser of the air conditioning decreases not only the efficiency of the cooling of the air-conditioning system, but also the efficiency of the engine cooling.



C15N090

Lift up the engine bonnet, disassemble the locking screw (1) and release and push out the cooler in the direction of the arrow.
Blow out with compressed air or rinse out with pressure water (against the tractor travelling direction).
Then insert the cooler back and mount the locking screw (1).
Make sure that the hoses correctly guided.

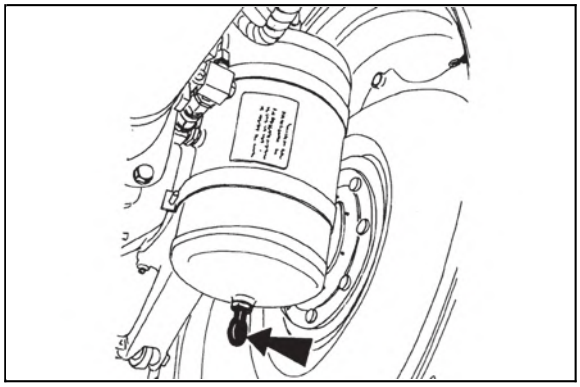
When the air-conditioning functions properly, water condenses in the roof space of the cab and the condensate is drained through hoses in the cab pillars and runs out at the bottom side of the pillar. This is why you must make sure that the condensate drain hoses will not be blocked.



F267

Draining condensate from the air reservoir

Draining is performed by deflecting or compressing the protruding part of the valve.
The air reservoirs are located in front of the rear axle.
Th tractors are equipped with one air reservoir installed on the left side of the tractor as standard or * two air reservoirs positioned on the right and left side of the tractor (if air-pressure brakes are in-stalled).

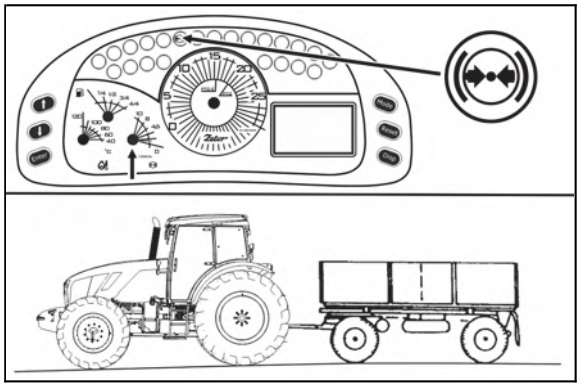


F268

Checking the air systems for leaks

- fill the air reservoir to the maximum pressure (730 ± 20 kPa).
- with the engine stopped the air pressure must not drop by more than 10 kPa in 10 minutes.

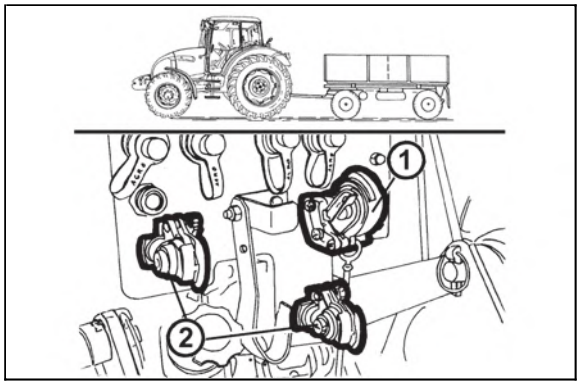
Perform the leak check daily before driving with a trailer or semi-trailer. In case of a brake system failure or if the pressure drops below 450 ± 30 kPa, the warning indicator on the dashboard will light up.



C15N131

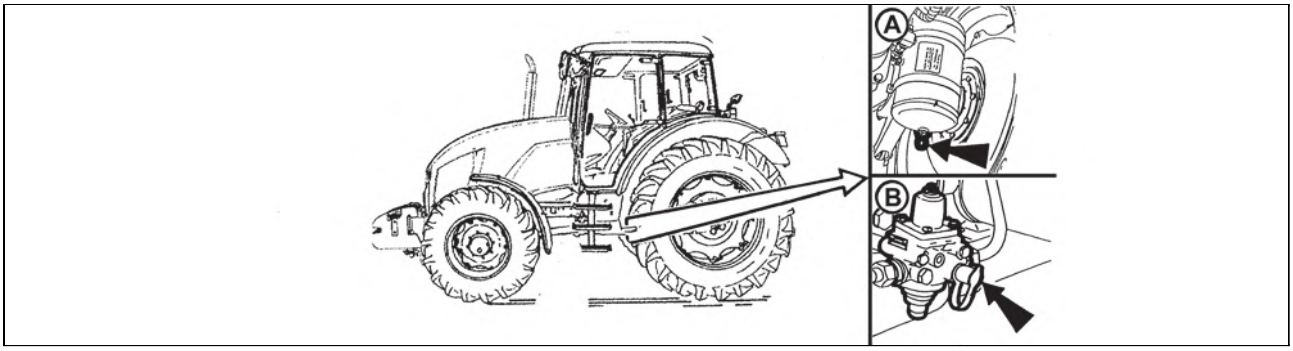
Working pressure of air brakes

In the single- and double-hose version the air pressure at the double-hose coupling (2) (red cap) is 740 ± 20 kPa and at the single-hose coupling (1) max. 600 ± 20 kPa (at the moment the pressure controller relieves the compressor - blows out the air).



F_02_56

Maintenance and treatment of tyres



F_02_122a

Regularly check the outer surface of tyres and verify whether they are free of defects at the sides and over the bead and whether the reinforcement is not damaged.

Do not use tyres that show a defect any longer.

Tyre inflation
The basic recommended inflation values are specified in the table. Regularly check the tyre pressure before driving, when the tyres are cold. To inflate the tyres use the pressure controller (B), which acts as a pressure equalizer, tyre filling device and safety valve. Remove the rubber cap of the pressure controller and screw a tyre inflation hose instead. Screw the hose up to the end of the thread to compress the non-return valve. If there is the maximum pressure in the air reservoir (A), the tyres cannot be inflated. In this case you must first reduce the pressure with the condensate drain valve located in the bottom part of the air reservoir (A). After inflating the tyres you must put the rubber cap back on the pressure controller.

The value of the permitted load-bearing capacity of the front axle must not exceed the sum of the load-bearing capacity values of both the tyres that are installed on the axle. The values of the permitted load-bearing capacity of the axles are specified in the 'Main technical parameters' of the corresponding tractor type. On the same axle of the tractor there must not be tyres of different dimensions and designs (in this case tyre design means the diagonal or radial tyre version).

		Tyredimensions and design		
Principal working activity		**480/70 R24**	**420/70R28**	**480/65 R24**
For field work	Inflation (kPa)	130-160	130-160	130-160
	Load-bearing capacity (kg)	2035-2360	1860-2060	2000-2240
For road transport	Inflation (kPa)	160-190	160-190	160-190
	Load-bearing capacity (kg)	2035-2360	1860-2060	2000-2240
For work with a front loader at the maximum permitted speed of 8 km/h.	Inflation (kPa)	200	200	200
	Load-bearing capacity (kg)	max. 2830	max. 2040	max. 1910

		Tyredimensions and design			
Principal working activity		**540/65 R24**	**480/65 R28**	**14,9R24**	**420/70R24**
For field work	Inflation (kPa)	130-160	130-160	130-160	130-170
	Load-bearing capacity (kg)	2410-2725	2150-2430	1490-1700	1665-1900
For road transport	Inflation (kPa)	160-190	160-190	130-160	190
	Load-bearing capacity (kg)	2410-2725	2150-2430	1490-1700	1665-1900
For work with a front loader at the maximum permitted speed of 8 km/h.	Inflation (kPa)	200	200	200	200
	Load-bearing capacity (kg)	4105	3680	2500	2300

Note: The 380/70R24 tyre is a dimensional equivalent of the 13.6R24 tyre.
The 420/70R24 tyre is a dimensional equivalent of the 14.9R24 tyre.
The specified load-bearing capacities of tyres for field work and road transport correspond to the maximum travelling speed of the tractor, i.e. in the case of radial tyres 40 km/h and in the case of diagonal tyres 30 km/h. The specified val-ues refer to one tyre. For a tractor the max. load per axle must not exceed the max. load-bearing capacity values of the tyres.

Recommended inflation values of the rear wheel tyres
The value of the permitted load-bearing capacity of the rear axle must not exceed the sum of the load-bearing capacity values of both the tyres that are installed on the axle. The values of the permitted load-bearing capacity of the axles are specified in the 'Main technical parameters' of the corresponding tractor type. On the same axle of the tractor there must not be tyres of different dimensions and designs (in this case tyre design means the diagonal or radial tyre version).

		Tyredimensions and design				
Principal working activity		**650/65R38**	**600/65R38**	**18,4R38**	**520/70R38**	**580/70R38**
For field work	Inflation (kPa)	130-160	130-160	130-160	110-160	130-160
	Load-bearing capacity (kg)	3620-4125	3200-3650	2625-3000	2635-3350	3475-3880
For road transport	Inflation (kPa)	160-190	160-190	130-160	110-160	160-190
	Load-bearing capacity (kg)	3620-4125	3200-3650	2625-3000	2635-3350	3475-3880

Tyres for driving wheels
Driving wheels - diagonal tyres

Speed km/h	Load-bearing capacity %	Inflation pressure %
10	140**	125
20	120	100
25	107	100
30	100	100
35	90	100
40	80	100

** minimum value for 6 PR
It is not allowed to increase the load-bearing capacity of the tyres except the above mentioned cases by further in-creasing the inflation pressure above the values mentioned in the table while si-multaneous decreasing the speed.

Driving wheels - radial tyres

Speed km/h	Load-bearing capacity %	Inflation pressure %
10	150	125
20	123	100
25	111	100
30	107	100
35	103	100
40	100	100

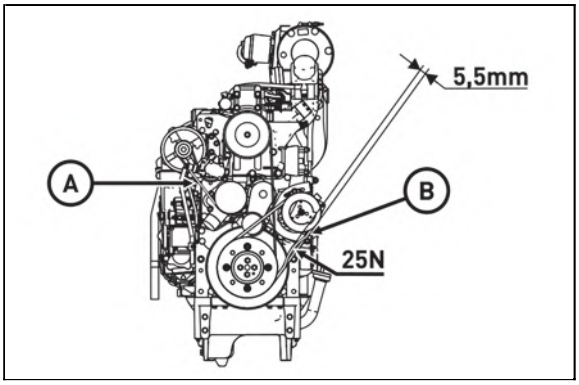
Storing the tractor
If the tractor is to be put out of operation for a shorter period, inflate the tyres to the value required for road transport. In case of a longer period of inactivity of the tractor (storage), support the tractor and reduce the pressure in the tyres to the minimum (the wheels must not touch the ground).

Almost all the following works require certain experience and more exacting service and diagnostic equipment. That's why we recommend to do the works at specialized or authorized workshops.

Adjusting valve clearance
Adjustment of the engine valves must be performed by an authorized service.

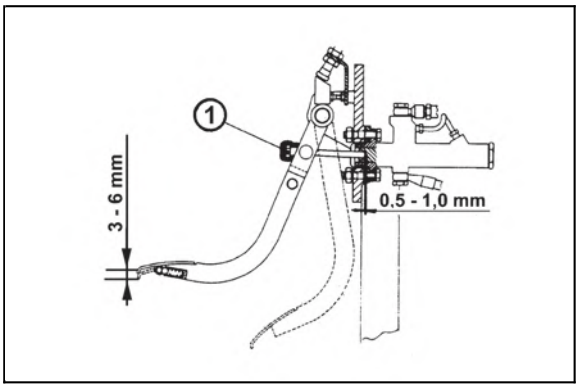
Flat belt drive tension of accessories
Flat belt drive tension of accessories (**A**) does not need to be adjusted. The belt is tensioned automatically.

*** Tensioning the V-belt of the AC compressor**
If the V-belt (B) is properly tensioned - its deflection must be 5.5 mm when the belt is subject to the force of 50 N. Tension the V-belt to the prescribed value after releasing the fixation screws of the AC compressor.



C15N119

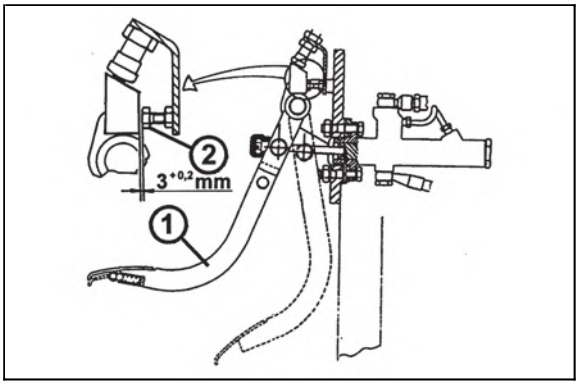
Adjusting the play of the brake pedals
The proper play between the piston rod of the brake pedals and the piston of the main cylinder is 0.5 - 1.0 mm (3 - 6 mm measured at the edge of the brake pedals with the pedals disconnected). Perform the adjustment with the pedals disconnected and after releasing the adjustment nut (1) that the piston rod is screwed in.



F_02_204

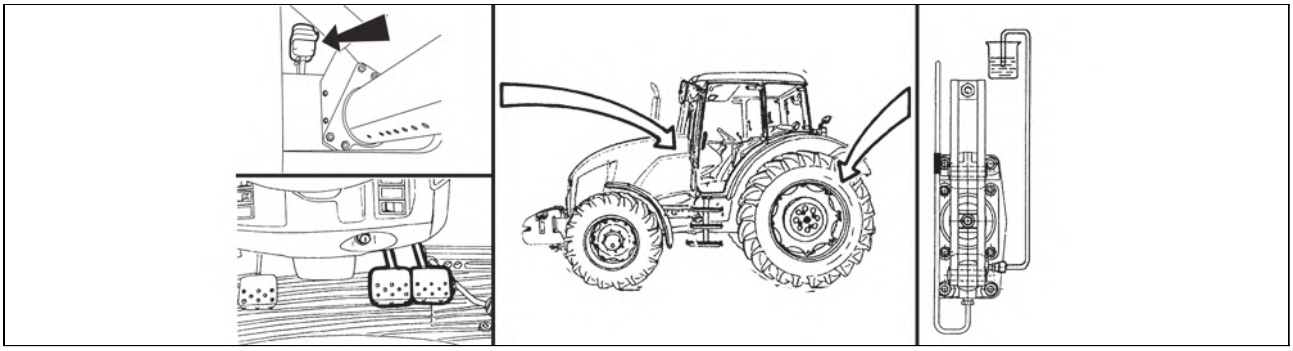
Bleeding the brake system of the tractor
Do the bleeding with the pedals disconnected, for each wheel separately, as follows:

Note: When bleeding the hydraulic brake circuits you must always depress one pedal (1) by 7.5+0.5 mm, measured at the piston rod of the main brake cylinder, which amounts to 3+0.2 mm at the adjustment screw (2) and do the bleeding with the other pedal. To maintain the proper distance insert between the pedal (1) and adjustment screw (2) a gauge with the correspond-ing thickness, i.e. 3+0.2 mm.



C756

Bleeding the rear brake system

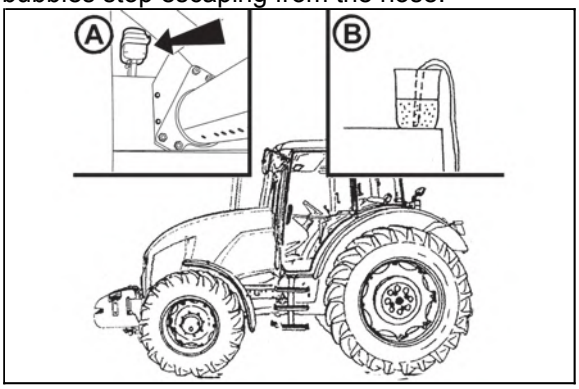


FH12N018

- Check the quantity of brake liquid in the compensation tank; fill up new liquid to the maximum level.
- Slide a hose onto the corresponding brake cylinder screw and immerse its other end to the bottom of a transparent container partly filled with the brake liquid.
- Depress the brake pedal, release the bleeding screw by 1/4 turn at the most, further depress the brake pedal and tighten the bleeding screw.
- Release the brake pedal and repeat the procedure until air bubbles stop escaping from the hose.

During the bleeding observe the liquid level in the compensation tank to avoid aspiration of air (A).

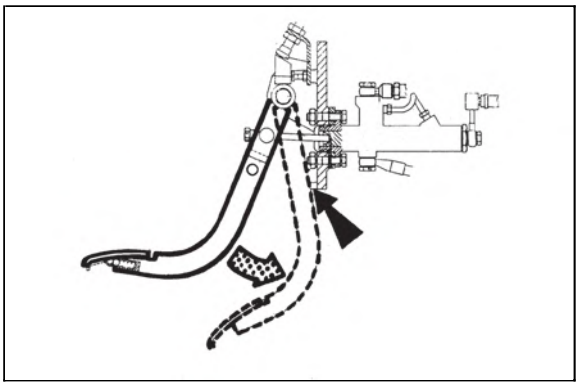
Make sure that the hose end is continuously immersed in the liquid and hold the container as high as possible (B). After two years you must replace the brake liquid in the whole brake circuit.



FH12N019

Foot brake check

With the foot brake pedals disconnected depress the pedal with the maximum force of approx 500 N. If the pedal can be depressed almost to the stop consisting in the boss on the bottom part of the console, the foot brake must be adjusted.

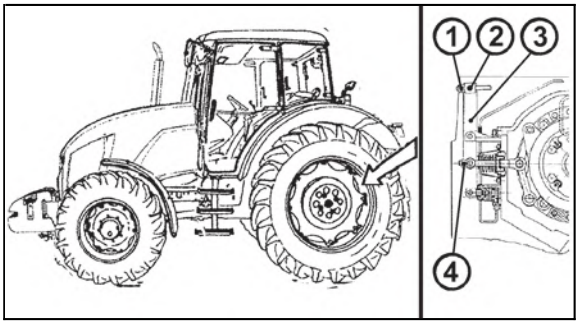


F287

Foot brake adjustment

Before the adjustment of the foot brake the parking brake lever must be in the unbraked position and between the nut (1) and pin (2) in the disc brake lever (3) there must be some play. If you find zero play, loosen the nut (1) slightly. Lift both the rear wheels and instruct your assistant to turn one of them by hand. At the same time tighten the adjustment nut (4) until the wheel cannot be turned. Stop tightening. Then, loosed the adjustment nut by 5/6 of a turn (5 tabs of the nut) and check the turning of the wheel.

After this basic adjustment check the operation of the foot brakes to see whether the braking effect of both the wheels is the same. If not, loosen the adjustment nut (4) by the required value on the side where the braking effect is higher.

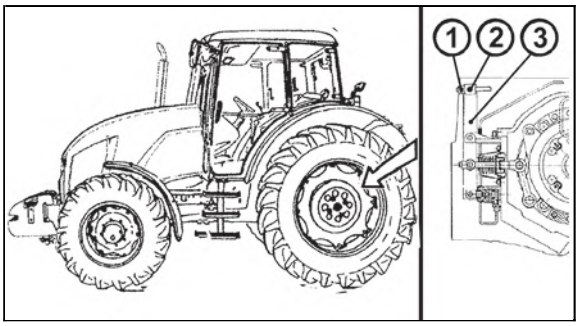


FH12N070

Parking brake adjustment

The adjustment of the parking brake follows after the adjustment of the foot brake. The parking brake lever must be in the unbraked position. Perform the adjustment in such a way that the self-locking nut (1) of the parking brake draw-bar can touch the pin (2) in the disc brake lever (3).

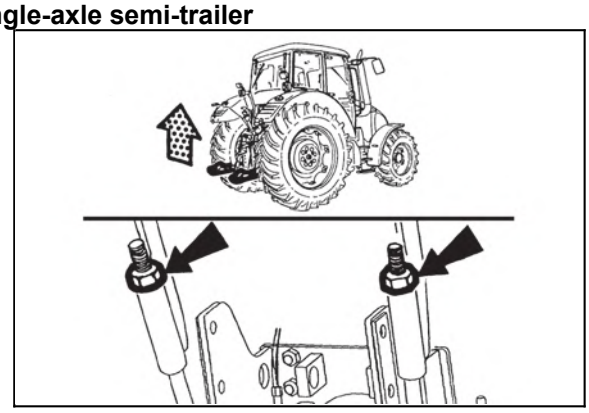
After this basic adjustment check the operation of the parking brake to see whether the braking effect of both the wheels is the same. If not, loosen the adjustment nut (1) by the required value on the side where the braking effect is higher.



FH12N071

Adjustment of the lifting draw-bars of the hitch for a single-axle semi-trailer

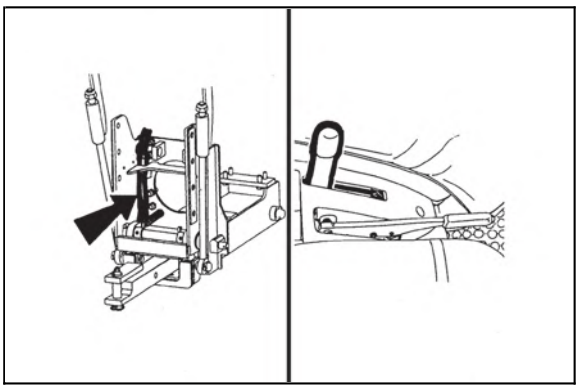
- Raise the hydraulic arms to the upper - transport position with the position control selected and the vibration compensator off.
- Screw the nuts on the adjustable draw-bars towards the guiding pipe without any play.
- Tighten the nuts by another 3.5 turns.
- Check whether it is possible to tilt off the supporting hooks freely.
- By lowering and repeated lifting of the hydraulic arms to the transport position check whether the engine does not tend to 'stall' at the idle speed - the relief valve of the hydraulic pump must not be in operation.
- Then, lower the arms slightly.



F_02_142

Adjusting the bowden cable

It is performed if the carrier with the towing hook is in contact with the supporting hooks. The Bowden cable must be tensioned to avoid any play of the control lever in the cab. Then, the cable is secured against loosening with a nut.



F_2_132

NOTAS

MAIN TECHNICAL PARAMETERS

Main tractor's parameters (mm)

		Note
Position length with the suspension device with lowered front TPL	5,130	without additional weights
Position length with the suspension device with front TPL	4,605	without additional weights
Width over rear mudguards	2,330	
Height to the exhaust muzzle	2,875-2,970	according to the tyre dimensions
Height of the tractor to the cabin upper edge	2,815-2,910	according to the tyre dimensions
Clear height under the front axle beam	515-570	according to the tyre dimensions
Height of the flat mouthpiece in the highest position (centre of the mouthpiece)	1,000	
Wheelbase	2,840	

Technical data of engines

Tractor type		Crystal 150	Crystal 160
Engine type		TCD6.1L6 C4ST106A	TCD6.1L6 C4ST120
Engine design		serial, standing, water cooled	
Engine type		diesel, for-stroke with direct fuel injection, turbocharged with cooling of filling air	
Injection system		Common rail	
Additional treatment of exhaust gases		Selective catalytic reduction (SCR)	
Number of cylinders		6	
Cylinder capacity	cm^3	6,057	
Bore x stroke	mm	101x126	
Rated speed	min^{-1}	2,100	
Idle speed	min^{-1}	700	
Injection order		1-5-3-6-2-4	
Engine pressure ratio		18	
Max. power / engine revolutions (EC 24)	kW / rpm	106.5/1,800	120.1/1,800
Specific fuel consumption at 2,100 rpm	g.kW.h	233.2	226.3
Max. torque / engine revolutions	Nm / rpm	664/1,500	738.9/1,500
Torque reinforcement	%	37.67	35.08
Minimum oil pressure at engine idle and oil temperature of 80°C	MPa	0.08	
Max. temperature of cooling liquid	°C	110	

MAIN TECHNICAL PARAMETERS

Permitted maximum load of front axle (kg)

Travelling speed (km/h)	Wheel track (mm)
	1 974
6	6 000
8	5 000
20	4 200
30	4 200
40	4 200

The load only refers to the entire axle; the permissible load with regard to tyres is specified in the tab. 'Load-bearing capacity of the front tyres'.

Permitted maximum load of rear axle (kg)

Travelling speed (km/h)	Wheel track (mm)
	1 950
8	7 000
20	6 500
30	6 500
40	6 500

The load only refers to the entire axle; the permissible load with regard to tyres is specified in the tab. 'Load-bearing capacity of the rear tyres'.

Permitted maximum weight of set 'tractor + mounted machine' (kg)

Travelling speed (km/h)	Maximum weight of the set
8	10000
20	9000
30	9000
40	9000

Manoeuvrability condition

Travelling speed (km/h)	Weight of the front axle of the tractor out of the total weight of the carrying set (%)
max. 40	min. 25
max. 15	min. 20

Front tires steerability

Tyre dimensions	Travelling speed								
	40 km.h^{-1}			**30 km.h^{-1}**			**20 km.h^{-1}**		
	Tyreload-bearing capacity (kg)			Tyreload-bearing capacity (kg)			Tyreload-bearing capacity (kg)		
	Tyre 1 pc	Axle	Inflation (kPa)	Tyre 1 pc	Axle	Inflation (kPa)	Tyre 1 pc	Axle	Inflation (kPa)
480/70 R24	2100	4200	120	2100	4200	110	2100	4200	90
420/70R28	2060	4120	160	2100	4200	145	2100	4200	120
480/65 R24	2100	4200	140	2100	4200	130	2100	4200	105
540/65 R24	2100	4200	100	2100	4200	90	2100	4200	75
480/65 R28	2100	4200	125	2100	4200	115	2100	4200	95
14,9R24	1950	3900	160	2090	4180	160	2100	4200	155
420/70R24	1900	3800	160	2030	4060	160	2100	4200	145

Tyre dimensions	Travelling speed					
	8 km.h^{-1}			**6 km.h^{-1}**		
	Tyreload-bearing capacity (kg)			Tyreload-bearing capacity (kg)		
	Tyre 1 pc	Axle	Inflation (kPa)	Tyre 1 pc	Axle	Inflation (kPa)
480/70 R24	2600	5200	125	3000	6000	140
420/70R28	2600	5200	150	3000	6000	200
480/65 R24	2600	5200	135	3000	6000	165
540/65 R24	2600	5200	95	3000	6000	125
480/65 R28	2600	5200	120	3000	6000	150
14,9R24	2600	5200	165	2925	5850	200
420/70R24	2600	5200	180	2850	5700	200

The specified inflation values are minimum valued adapted to the current tyre load so that the tyre deformation can remain in the range in which all the operation requirements are met.

Change of the load-bearing capacity of the front tyres (%)

Travelling speed (km/h)	**diagonal**	**radial**
8	+ 40	+ 50
20	+ 20	+ 23
30	0	+ 7
0	- 20	0

MAIN TECHNICAL PARAMETERS

Bearing capacity of rear tires

Tyre dimensions	**Travelling speed**											
	40 km.h^{-1}			**30 km.h^{-1}**			**20 km.h^{-1}**			**8 km.h^{-1}**		
	Tyreload-bearing capacity (kg)			Tyreload-bearing capacity (kg)			Tyreload-bearing capacity (kg)			Tyreload-bearing capacity (kg)		
	Tyre 1 pc	Axle	Inflation (kPa)	Tyre 1 pc	Axle	Inflation (kPa)	Tyre 1 pc	Axle	Inflation (kPa)	Tyre 1 pc	Axle	Inflation (kPa)
650/65R38	**3000**	**6000**	**70**	**3000**	**6000**	**60**	**3000**	**6000**	**55**	**3500**	**7000**	**60**
580/70R38	**3000**	**6000**	**95**	**3000**	**6000**	**80**	**3000**	**6000**	**80**	**3500**	**7000**	**80**
520/70R38	**3000**	**6000**	**140**	**3000**	**6000**	**120**	**3000**	**6000**	**95**	**3500**	**7000**	**110**
600/65R38	**3000**	**6000**	**100**	**3000**	**6000**	**90**	**3000**	**6000**	**65**	**3500**	**7000**	**80**

Note:
The specified inflation values are minimum valued adapted to the current tyre load so that the tyre deformation can remain in the range in which all the operation requirements are met.

Change of the load capacity of the rear tyres (%)

Travelling speed (km/h)	**diagonal**	**radial**
8	+ 40	+ 50
20	+ 20	+ 23
30	0	+ 7
40	- 20	0

Permitted combinations of wheels for tractors

Front wheels	**Rear wheels**
Tyredimensions	Tyredimensions
16,9 - 24 16,9 R 24 420/85 R 24 480/70 R 24 540/65 R 24 14,9 - 28 14,9 R 28 380/85 R 28 420/70 R 28 480/65 R 28	18,4 - 38 18,4 R 38 460/85 R 38 520/70 R 38 600/65 R 38
16,9 - 28 16,9 R 28 420/85 R 28 480/70 R 28 540/65 R 28	20,8 R 38 520/85 R 38 580/70 R 38 650/65 R 38

Performance on rear PTO shaft

Power	**Traktor type**	
	CRYSTAL 150	**CRYSTAL 160**
PTO power (kW ± 2%) at the nominal engine speed and engaged 1000 rpm of the PTO		
Engine after the running-in stage (from 100 hours on)	93,7 kW	101,6 kW

MAIN TECHNICAL PARAMETERS

Lifting force of the three-point hitch

Lifting force at the end of the bottom draw-bars of the rear three-point hitch in the whole lifting range at the maximum usable pressure (kN).	76
Lifting force at the end of the lower draw-bars of the front three-point hitch in the whole lifting range at the maximum usable pressure (kN) - Zuidberg front three-point hitch	35

Tensile force

Traktor type	**Crystal 150**	**Crystal 160**
Engine type (TIER III B)	**TCD6.1L6 C4ST106A**	**TCD6.1L6 C4ST120**
Maximum tensile force (kN) in swinging draw bar on concrete, tractor in emergency finish with ballast weights, with slippage to 15%	53	54

Speed of tractor with engine revolutions of 2 100 rpm and parameter of rear wheels (km/h)

			Front direction		Rear direction	
	Speed gear	**Multiplier gear**	**460/85 R38**	**520/85 R38**	**460/85 R38**	**520/85 R38**
Road speeds	**5**	H	36,2	37,8	41,9	43,7
		M	31,3	32,6	36,2	37,7
		L	27,1	28,2	31,3	32,6
	4	H	25,3	26,4	29,3	30,5
		M	21,9	22,8	25,3	26,4
		L	18,9	19,7	21,9	22,8
	3	H	17,9	18,7	20,7	21,6
		M	15,5	16,1	17,9	18,7
		L	13,4	13,9	15,5	16,1
	2	H	12,6	13,1	14,5	15,1
		M	10,9	11,3	12,6	13,1
		L	9,4	9,8	10,9	11,3
	1	H	9,2	9,6	10,7	11,2
		M	8,0	8,3	9,2	9,6
		L	7,0	7,2	8,0	8,3
Reduced speeds	**5**	H	8,8	9,1	10,1	10,6
		M	7,6	7,9	8,7	9,1
		L	6,5	6,8	7,6	7,9
	4	H	6,1	6,4	7,1	7,4
		M	5,3	5,5	6,1	6,4
		L	4,6	4,8	5,3	5,5
	3	H	4,5	4,5	5,0	5,2
		M	3,7	3,9	4,3	4,5
		L	3,2	3,4	3,7	3,9
	2	H	3,0	3,2	3,5	3,7
		M	2,6	2,7	3,0	3,2
		L	2,3	2,4	2,6	2,7
	1	H	2,2	2,3	2,6	2,7
		M	1,9	2,0	2,2	2,3
		L	1,7	1,7	1,9	2,0

MAIN TECHNICAL PARAMETERS

Dependent PTO shaft revolutions with nominal engine revolutions

			to the front		to the rear	
	gear	**multiplier degree**	**540**	**1000**	**540**	**1000**
Road speeds	**5**	H	674	1 225	780	1 417
		M	582	1 059	674	1 224
		L	504	915	582	1 058
	4	H	471	855	545	990
		M	407	739	471	855
		L	352	640	407	739
	3	H	333	605	386	700
		M	288	523	333	605
		L	249	452	288	523
	2	H	234	425	270	492
		M	202	368	234	425
		L	175	318	202	368
	1	H	172	313	200	362
		M	149	270	172	312
		L	129	234	149	270
Reduced speeds	**5**	H	674	1 225	780	1 417
		M	582	1 059	674	1 224
		L	504	915	582	1 058
	4	H	471	855	545	990
		M	407	739	471	855
		L	352	640	407	739
	3	H	333	605	386	700
		M	288	523	333	605
		L	249	452	288	523
	2	H	234	425	270	492
		M	202	368	234	425
		L	175	318	202	368
	1	H	172	313	200	362
		M	149	270	172	312
		L	129	234	149	270

Independent rear pto shaft revolutions

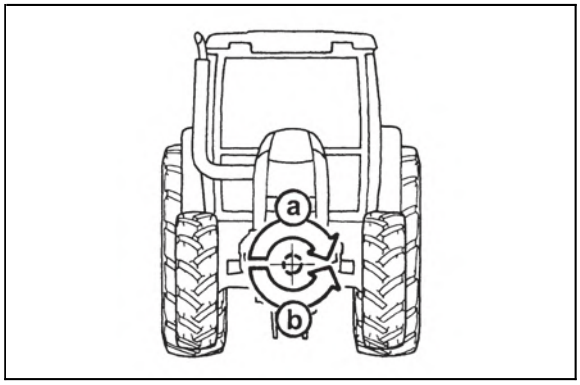
	PTO speed / engine speed	PTO speed / engine speed
540	540/1913	593/2100
540E	540/1595	711/2100
1000	1000/1950	1077/2100
1000E	1000/1626	1292/2100

MAIN TECHNICAL PARAMETERS

Speed of the Zuidberg front PTO

Turning direction	**PTO speed / engine speed**	**PTO speed / engine speed**
right (a)	1000 / 1920	1094 / 2100
***left (b)**	1000 / 2000	1050 / 2100

* - option



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Clearance-circle and turning circle diameter

Track width	front	1974 mm	Tire size	front	540/65R28	
	rear	1850 mm		rear	650/65R38	
					Left	Right
Track diameter	Without engagement of the front driving axle				12840 mm	12870 mm
	With engagement of the front driving axle				12630 mm	12640 mm
Outline diameter	Without engagement of the front driving axle				113620 mm	13670 mm
	With engagement of the front driving axle				13370 mm	13440 mm

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