Zetor

MAJOR HS

OPERATOR´S MANUAL

1/2017

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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

The technical specifications and information about the design, equipment, material and appearance are valid at the time of print. The manufacturer reserves the right to implement changes.

The instructions for use are a part of the machine.

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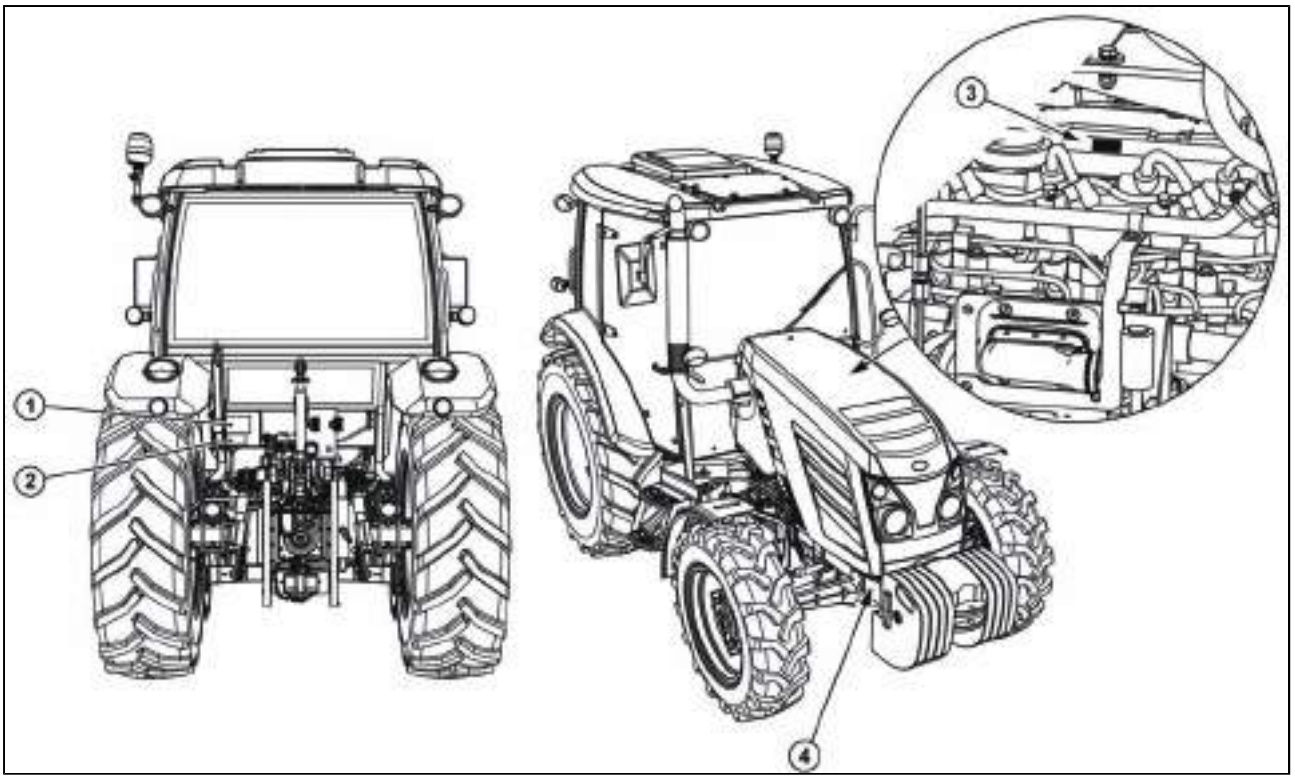
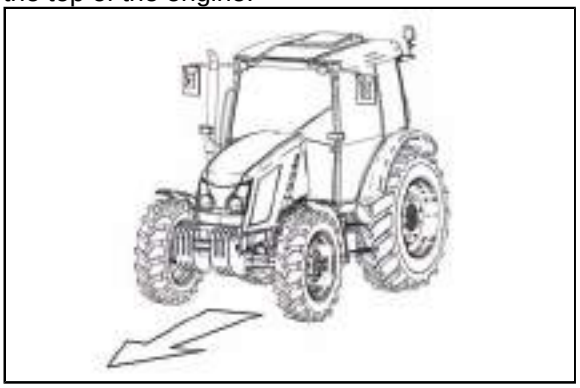
LOCATION OF SERIAL NUMBERS



MGP16N001

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

The engine serial number is impressed on a label located at the top of the engine.
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.



NM13N082

Tractor type

Tractor serial number

Engine serial number

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

NOTES

USER´S SAFETY INSTRUCTIONS

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.)

USER´S SAFETY INSTRUCTIONS

Starting the engine

- The engine cannot be started by driving the tractor downhill.
- The engine cannot be started by towing the tractor with another tractor.
- Only start the engine from the driver's seat with the shift lever and reversing lever in the neutral position, PTO switched off and the clutch pedal 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

- Hoses of the hydrostatic steering, brakes and fuel system must be checked and replaced if any signs of damage are found. These are some examples of hose damage signs: - cracks on the hose surface, releasing of pre-tensioning 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.
- During driving on roads with trailers and tools the brake pedals must be connected with a latch.
- The brakes and steering must be in the perfect condition all the time.
- Driving downhill without an engaged gear is forbidden.
- Switching the reversing lever at a speed over 10 km/h is forbidden.
- Pay special attention when driving on a slope and muddy, sandy, icy or uneven ground.
- Observe the maximum specified inclination angle, i.e. 12°.
- Respect the total permissible weight of the tractor and trailer specified on the data plate of the tractor or on the rear wheel mud-guard.
- 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 the tractor with agricultural machines attached to the front three-point hitch, reduce the driving speed to 15 km/h.
- When driving with machines attached to the rear hitches the load of the steered axle must not drop below 20% of the current weight of the set. With the driving speed reduced to 20 km/h the load of the steered axle may drop to 19% of the current weight of the set (set below 4.5 t) or to 18% of the current weight of the set (set exceeding (4.5 t).

- During aggregations of the tractor with machines pay attention to possible worsening of stability of the aggregated unit which may be influenced by the connected machine.

- 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).

- 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.

- In case of use of the tractor for wrecking or towing purposes, use only the rear hitch.
- When towing the tractor, the reduction gear shift lever must be in the neutral position.

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.

Driver's seat

If the driver's seat is equipped with a safety belt, this retaining system must be used during operation of the tractor.

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

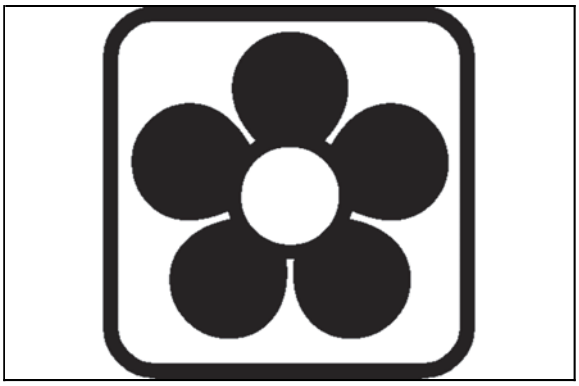
FH13N002

- 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.

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

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	Major HS 80
Travel speed [km/h]	40
Tractor noise levels when travelling dB	77
Tractor noise levels when standing dB	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	Major HS 80
Noise level - windows are closed [dB]	79
Noise level - windows are open [dB]	81

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.

Aggregation tractor - machine/trailer

While working with machines, trailers or semi-trailers, all instructions from the manufacturers of these aggregations must be adhered to!

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.

Attachment points for assembly of the front loader to the tractor are specified in the manual of the loader manufacturer. The manual must be approved by the company ZETOR TRACTORS.

USER´S SAFETY INSTRUCTIONS

Principles for operating tractors equipped with 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
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.

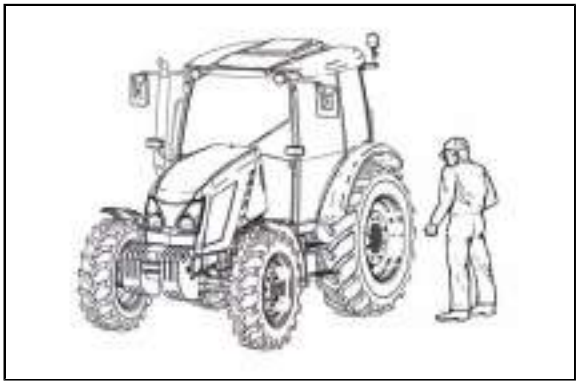
 ***Only forest superstructures approved by ZETOR TRACTORS can be mounted to ZETOR tractors.***

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.

Safety labels

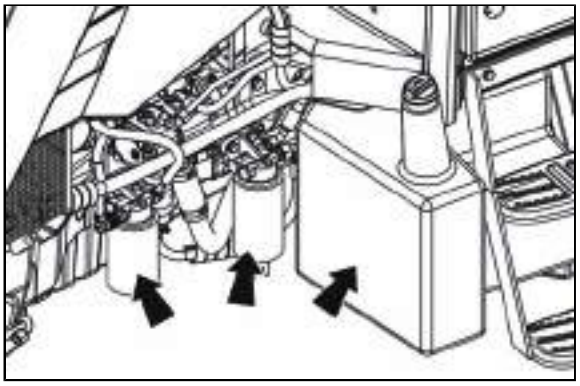
- Important parts of the machine are equipped with safety labels warning against possible danger. Restore damaged or illegible labels and replenish missing ones.
- New components installed during the repair should be provided with up-to-date safety symbols. The safety symbols must be clearly visible!

Preventive daily maintenance
Perform daily or at least after each 8 - 10 hours of operation.



NM13N083

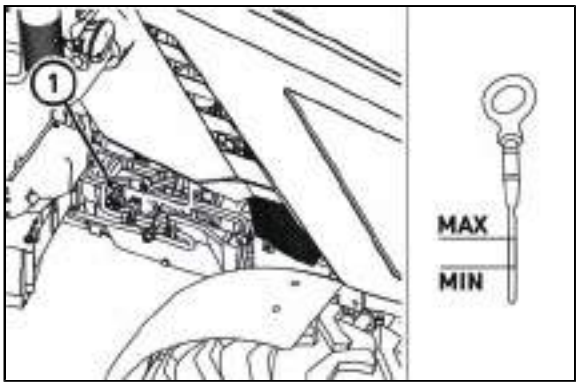
Fuel system leaks
Check tightness of the fuel system, including the fuel tank. Eliminate leakage immediately.



MHS16N001

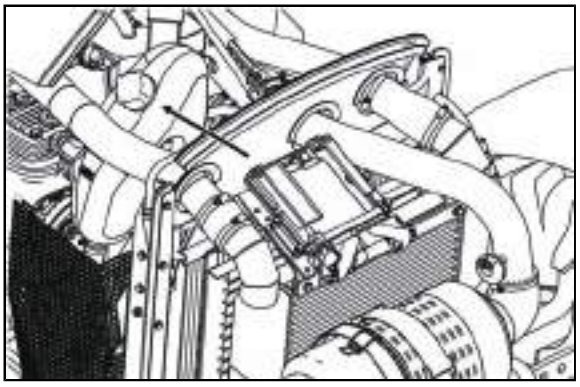
Engine oil level
Perform the check daily before starting the operation when the tractor is standing horizontally and the engine is not running. The engine oil dipstick (1) is located on the right side of the engine.

Take out the dipstick (1), 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. The oil level must always be in the range from MIN and MAX.
Add the oil as necessary.



NM15D65

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.

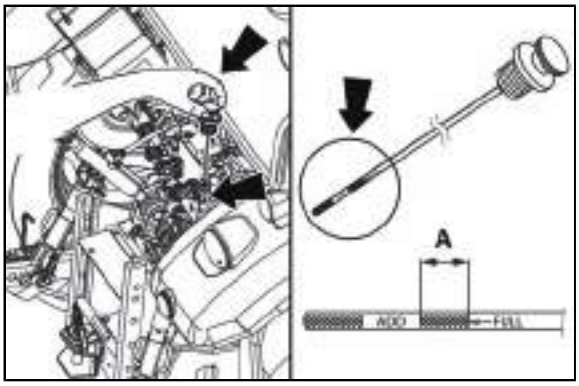


NM15D028

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

Hydrostatic steering

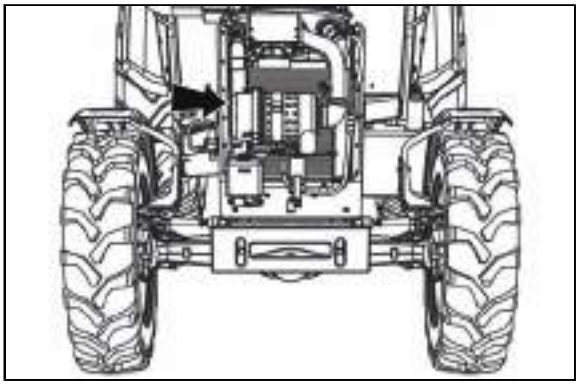
- check the oil level in the gearbox housing
- check tightness of screws and nuts of the control rods and levers
- check state of all hoses of hydraulic control circuits whether they are not damaged and oil is not leaking



MHS16N045

Air cleaner

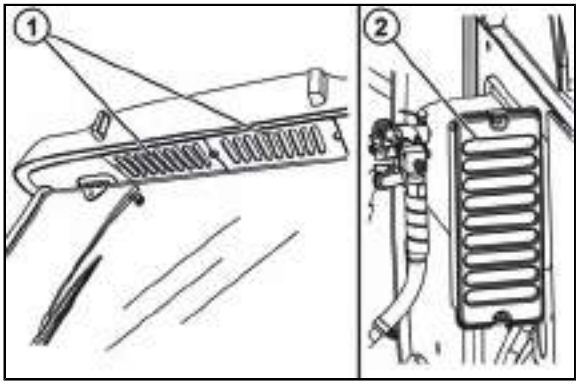
If the air cleaner is heavily clogged with dirt, this condition is indicated by a sensor that lights up an indicator on the dashboard.



MHS16N051

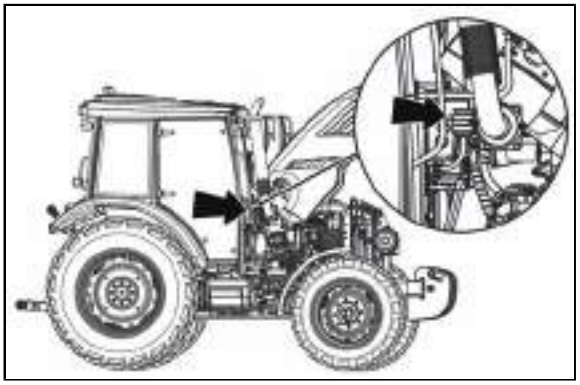
Cab filtration

Check and if necessary clean the air filters of the air conditioning of the cabin (1) located in the rear overhang of the roof and filter of the heating of the cabin (2) located on the left side of the tractor before the cabin. Perform partial regeneration by knocking or blowing with compressed air. Regeneration of filters depends on dustiness of the working environment. Perform cleaning or replacement of filter elements after disassembly of the cover grids.



MHS16N052

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).



MHS16N050

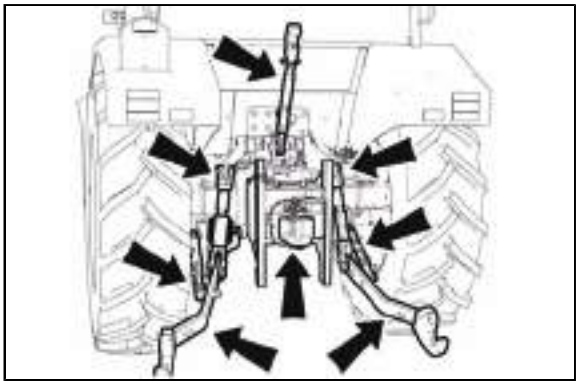
Trailer brakes

Air brakes of the trailer
Check tightness of the air-brake system and braking efficiency of the tractor with the trailer.

Decrease of air pressure in the air pressure system of brakes below the critical limit is indicated by an error message on the instrument panel. More information in chapter Driving.

Hydraulic brakes of the trailer
Check tightness of hygraulic-brake circuits in the trailer and braking efficiency of the tractor with the trailer.

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



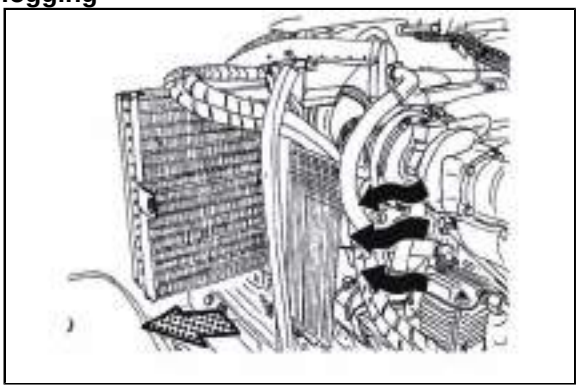
NM13N063

Inspection of fouling of coolers
Open the front cowl and check the plates of the engine radiator of engine cooling liquid and air conditioning condenser, the cooler of oil of the front PTO shaft and the cooler of the gear oil (if the tractor is equipped with them) for fouling.
In case of fouling clean the cooler plates with pressure air.

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.



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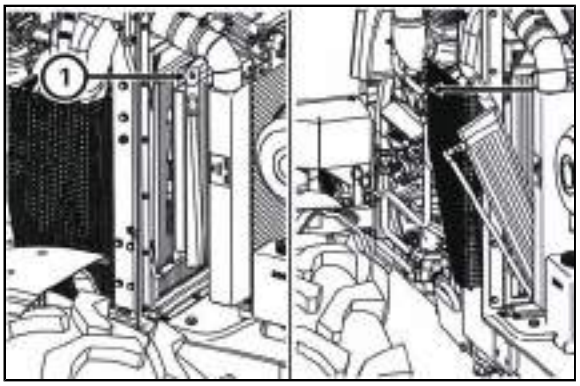
- release the screw (1) from the right side of the tractor and tilt the oil cooler of the front PTO shaft
- clean the walls of the cooler with pressure air



NM15D022

Tyres and wheels

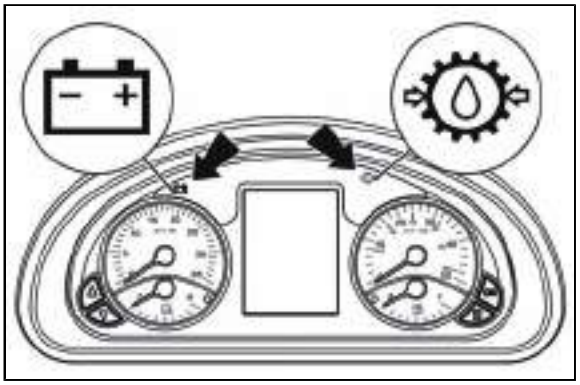
Check the air pressure in the front and rear tyres. Depending on the character of work adjust the pressure to the recommended value. Check and if necessary retighten the bolts of the front and rear wheels.

NM13N086

Never drive with loose wheel bolts!

Short functional test

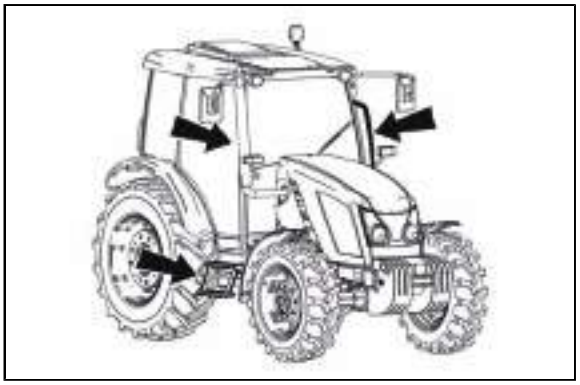
After starting the engine, check whether the engine lubrication signal lamp and charging signal lamp went out. Verify the function and tightness of hydraulic control circuits.



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 cab

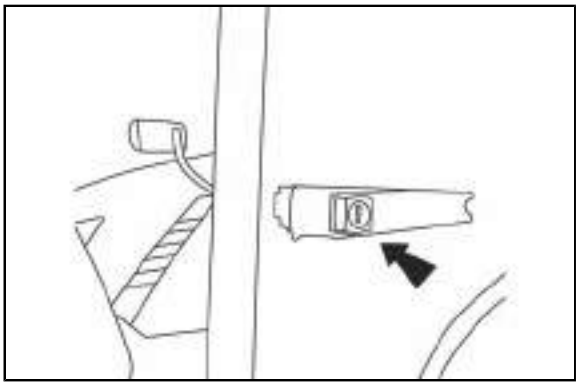
Use the left side of the tractor for getting in and off the cab.
Use climbing spurs for getting on and off the cab and hold onto a handle.
Take greater care in the area of gears lever.



NM13N088

Opening doors from the outside

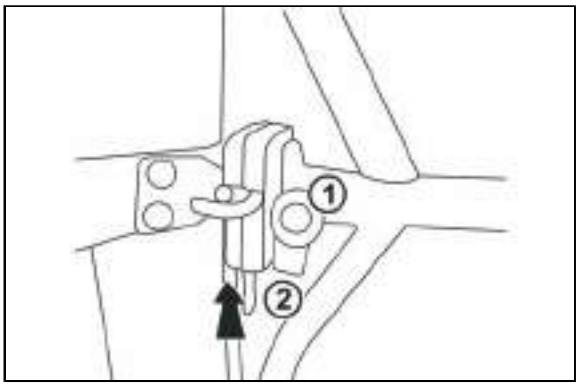
Left cabin door is lockable from the outside. Right door of the cabin are equipped only with a button from the outside. After unlocking and pressing the button of the lock the door opens by pulling the handle.



NM13N025

Opening doors from the inside

By pressing the button (1), doors of the cab can be opened from the inside. Lever (2) on right door serves for locking the lock of right door. The door lock is locked by shifting the lever (2) in the direction of an arrow. Unlocking is done by shifting the lever (2) against the direction of an arrow. With total opening, the door is held by a gas prop.



NM13N026

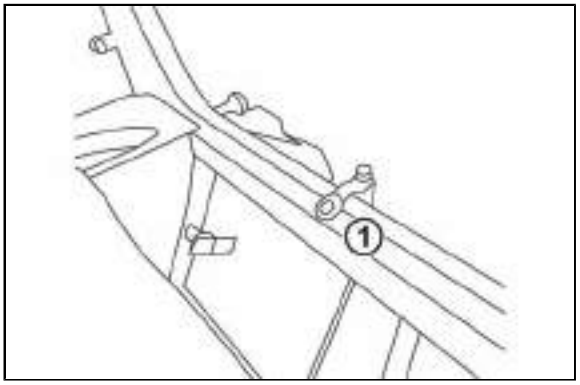
We do not recommend driving with open doors from the reason of their possible damage.

Rear window

Is equipped with a handle and in open position it is locked by gas props.

By pushing the lever (1) downwards a flap of rear window is released and by pressure on handle of rear window we open the window.

When closing the rear window after pulling the window by handle, the flap of the window snaps automatically.



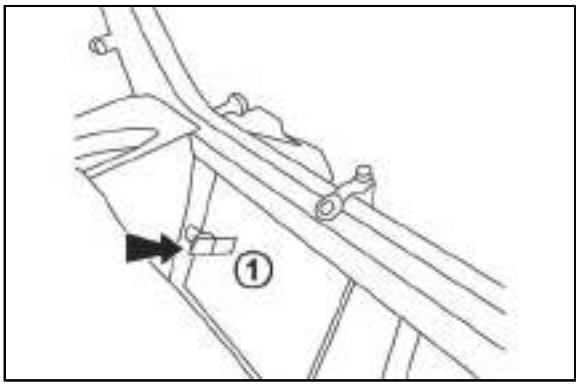
NM13N027

When travelling on an uneven surface we recommend to lock the window in a locked position - there is a danger of window cracking.

When starting work with machines mounted in rear three-point linkage of the tractor make sure that there is no risk of collision between mounted tools with maximum heave of rear three-point linkage and open rear window. If there is collision we recommend working with a closed window.

Bottom rear window

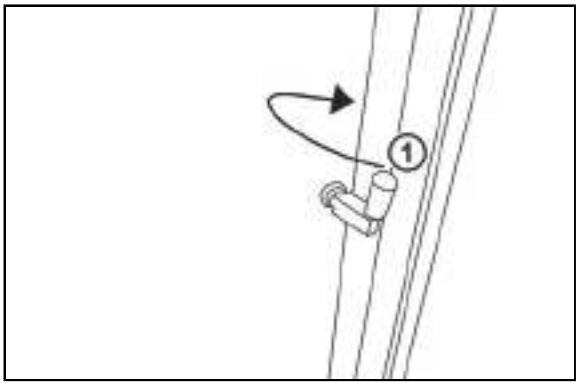
For opening the bottom rear window, it is necessary to push the lever (1) in the direction of an arrow. Close the window in reverse procedure, window flap will close automatically.



NM13N028

Side window

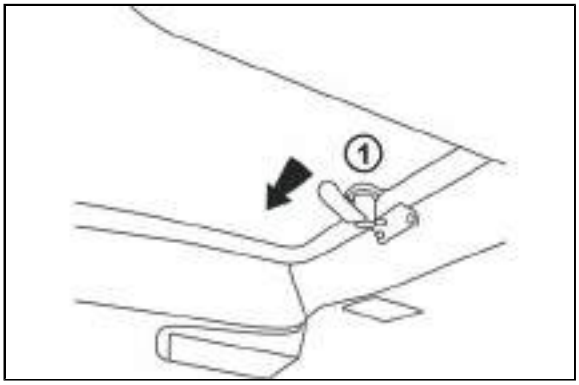
For opening the side window it is necessary to shift the lever (1) to the back and then in the direction of window in direction of an arrow. Close the side window in opposite way.



NM13N029

Hinged lid

It is opened by turning the locking lever of the lid (1) in the direction of an arrow and by pushing the locking lever in the upward direction.
Close the hinged lid in a reverse procedure.

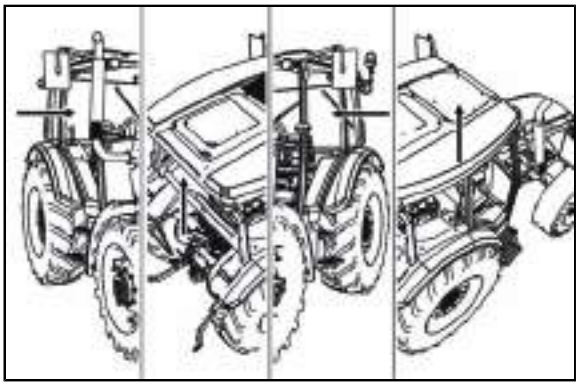


NM13N030

By opening the hinged lid, the overall height of tractor increases. Therefore close the lid always when you pass through or park at places with limited light. .

Emergency exits

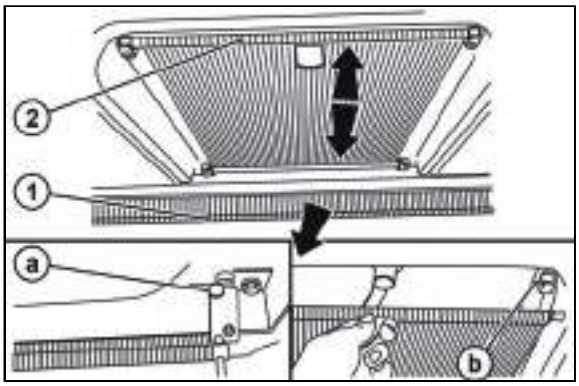
In case of overturning of the tractor or blocking the exit from the tractor use the left or the right door, the rear opening window or the roof opening window as emergency exits.



NM15D65

Sun screen

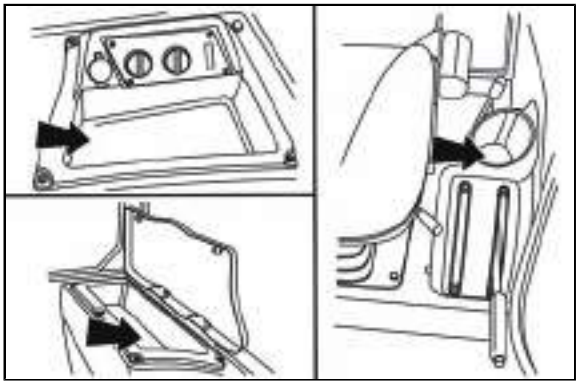
Pull out the adjustable screen of the front window (1) by pulling the hand rail in the arrow direction. To return to the original position, press the button (a) and insert the hand rail back.The sliding shutter of the swing lid (2) is closed by pulling the hand rail which is secured with hooks (b).



MHS16N053

Shelf

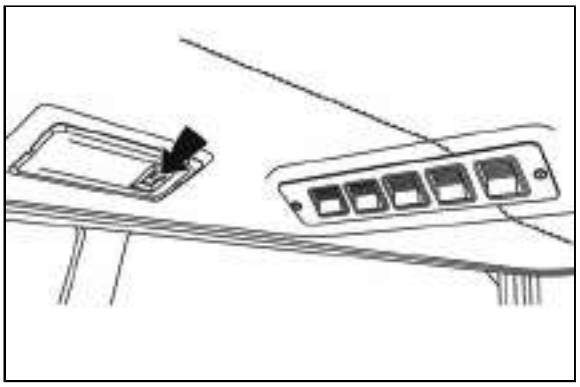
Storage spaces are located on the right and left mudguard and on the right side of the driver's seat.



MHS16N054

Internal lighting

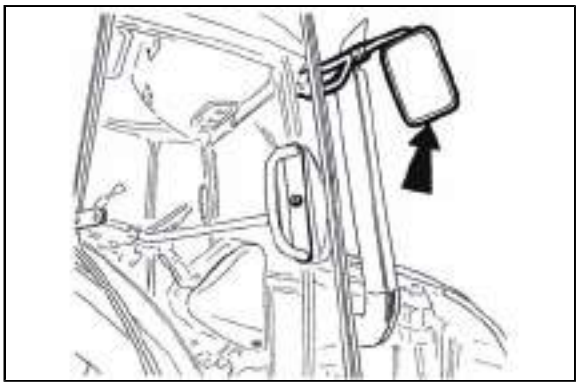
To be turned on and off by means of a button marked with the arrow.



MHS16N055

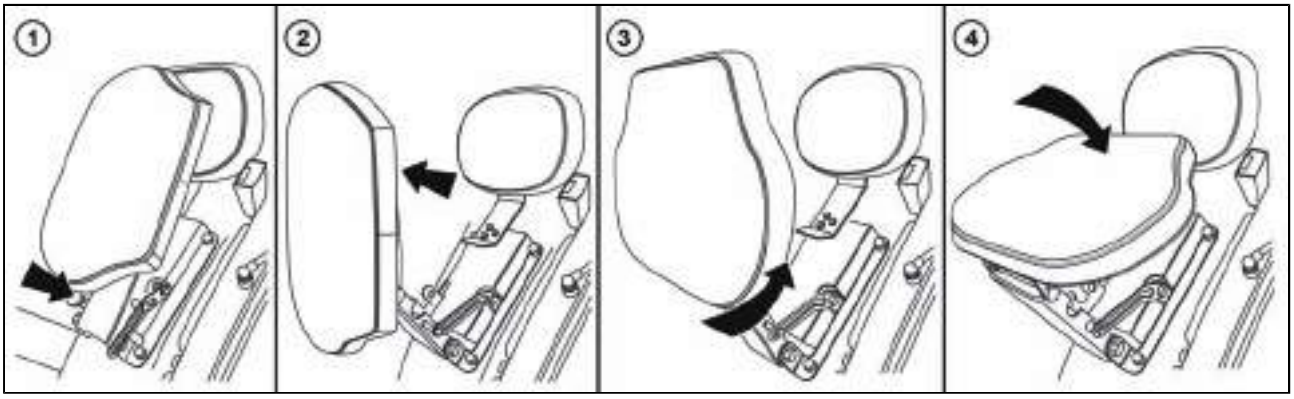
Rear view mirrors

Before driving or before starting to work, adjust the rear-view mirrors so that you are able to monitor the whole track or work field.



F_02_12

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

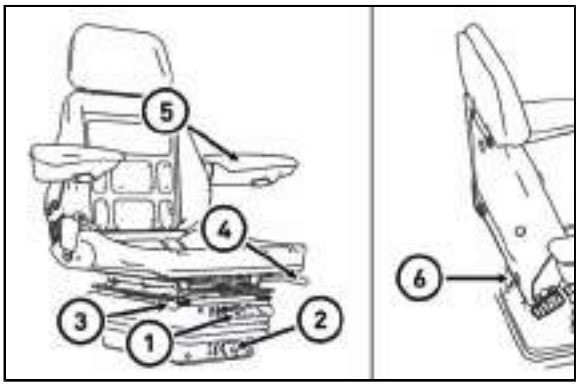


MHS16N056

Raising of the seat
Release the co-driver's seat with the lever (1) and tilt it in the direction of the arrow (2). Turn the seat by 90° in the direction of the arrow (3), tilt it and secure it.

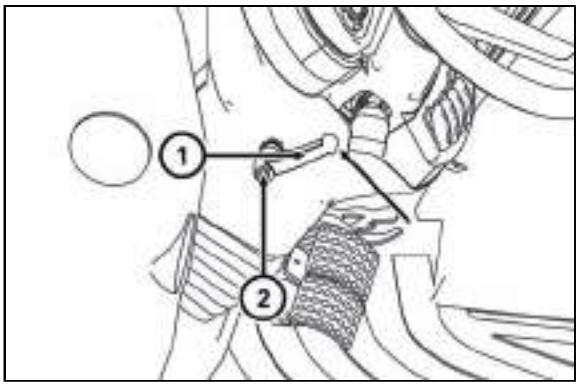
Lowering of the seat
Perform lowering of the seat using the opposite procedure. Tilt the seat against the direction of the arrow (4), turn it by 90° (3) a lower it (2). Secure the seat with the lever (1).

Driver´s seat
1. The controller of the seat suspension adjustment according to the driver s weight (performed by turning the controller). By turning to the left, the adjusted weight is decreased; by turning to the right, the adjusted weight is increased.
2. The controller of the seat height adjustment (performed by turning the controller). By turning to the left, the seat height is increased; by turning to the right, the seat height is decreased.
3. The lever of the longitudinal adjustment of the seat (press the lever from the seat, perform longitudinal adjustment of the seat and release the lever).
4. The lever for adjusting the seat (move the lever up, turn the seat around its vertical axis and release the lever).
5. Tiltable armrest
6. The controller of the backrest tilt adjustment (by turning the controller the backrest tilt is adjusted).



MHS16N002

Tilting and protrusion of steering wheel
Release the lever (1) by turning in the direction of the arrow, adjust the height and inclination of the steering wheel and tighten the lever (1) by turning against the direction of the arrow.
When the button (2) is pressed and the lever is moved from the steering wheel, the lever (1) can be adjusted to any desired position.

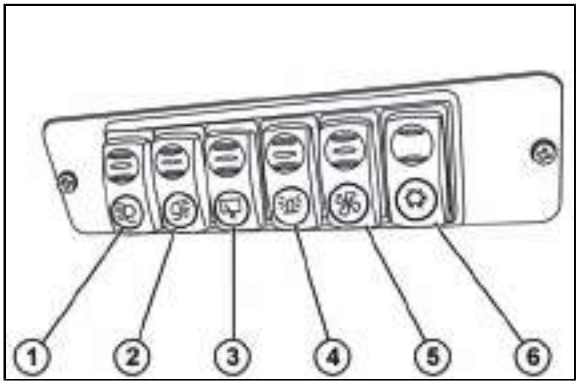


MHS16N003

Panel of switches on cab´s roof

1. Air conditioning switch
2. Air conditioning fan switch
3. Beacon switch
4. Rear wiper switch
5. Switch of the rear work lights in the cabin roof
6. Switch of the front work lights in the cabin roof

Note: The air conditioning can be operated only when the air conditioning fan is on.

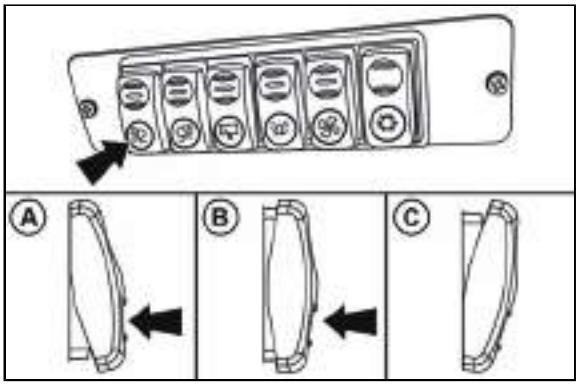


MHS16N101

Switch of front work lights

The switch of the front work lights is located on the panel in the cabin roof.

a - work lights switched off
b - front work lights on the cabin roof switched on
c - front work lights on the cabin roof and in the bonnet mask switched on

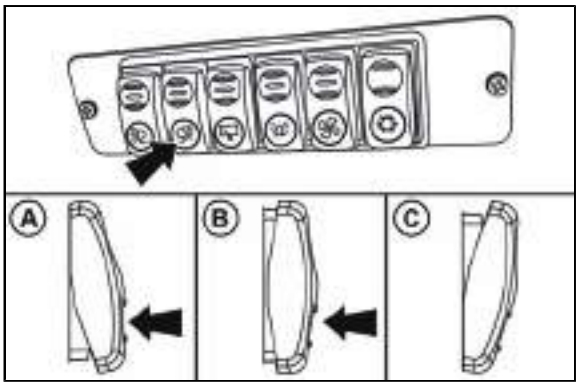


MHS16N104

Switch of rear work lights

The switch of the rear work lights is located on the panel in the cabin roof.

a - work lights switched off
b - rear work lights on the cabin roof switched on
c - rear work lights on the cabin roof and on the rear cabin columns switched on

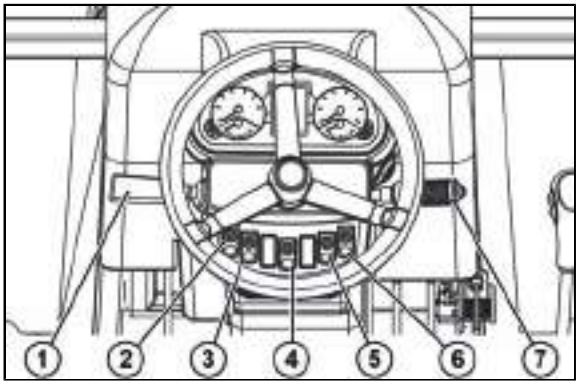


MHS16N105

Switches and controls on the dashboard

1 - Reversing lever
2 - switch of the front PTO shaft
3 - switch of the marker and main lights
4 - switch of the warning lights
5 - switch of the rear fog light
6 - button of the front driving axle (more information in chapter DRIVING)
7 - alteration switch of indicator lights, low and high beams and horn

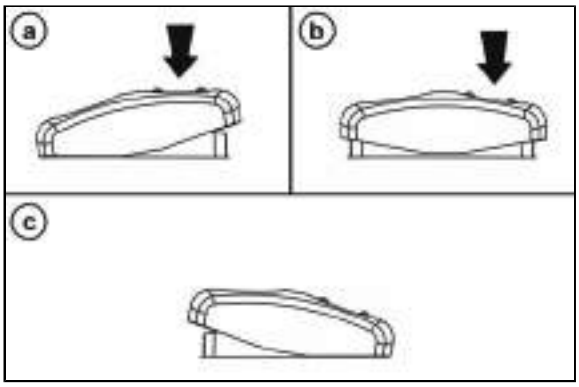
Note: switching of the switches is indicated with the activated symbol on the switch.



MHS16N103

Switch of the marker and main lights

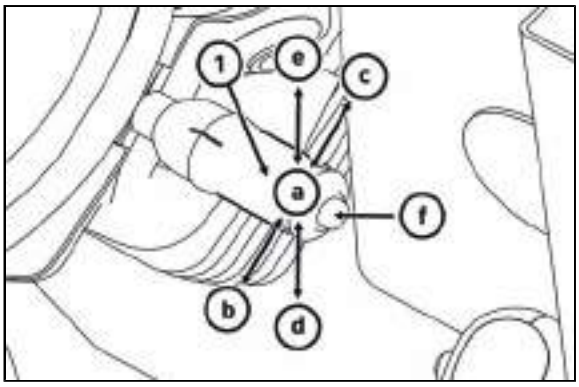
a - lighting switched off
b - marker lights switched on
c - main and marker lights switched on



MHS16N080

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

a - dim lights
b - direction lights in the right, switching by moving the switch (1) in a rearward direction
c - direction lights in the left, switching by moving the switch (1) in a forward direction
d - distance lights in the right, switching by moving the switch (1) in a downward direction
e - light horn, switching by moving the switch (1) in an upward direction, when the switch is released it returns to the position (a)
f - acoustic horn, switching by pressing the button



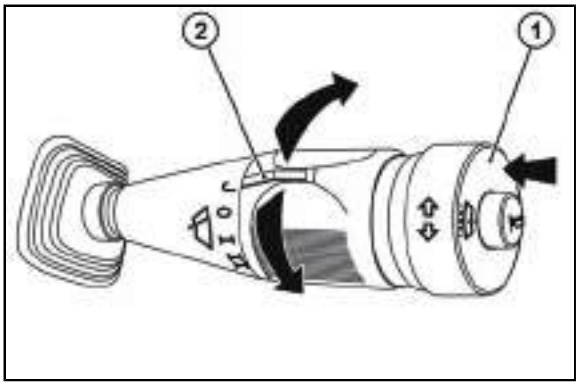
MHS16N010

Front windshield wiper and washer

The front windshield wiper is switched by turning the switch (1).

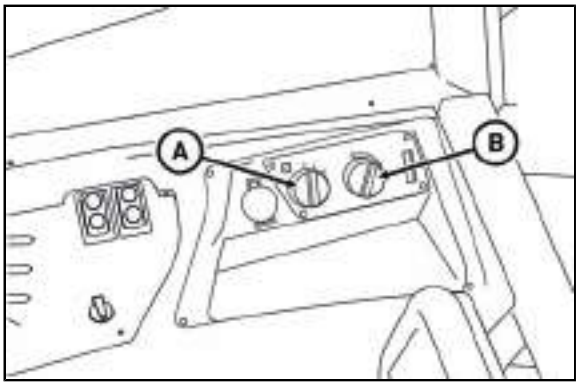
J - not used
0 - front windshield wiper deactivated
I - slow motion of the front windshield wiper
II - fast motion of the front windshield wiper

The windshield washer of the front window is switched by the pressing the circular area (2) in the face of the switch.



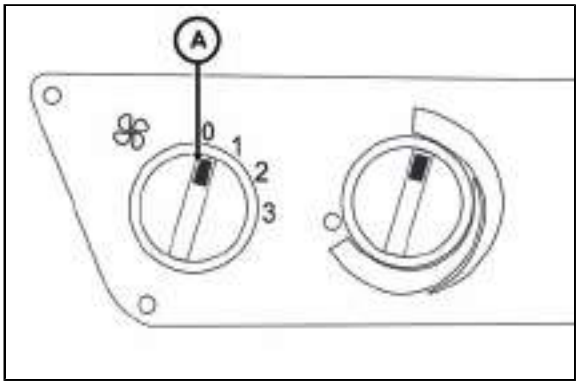
MHS16N058

Cab heating
Heating control panel
A - fan controller
B - valve heating controller



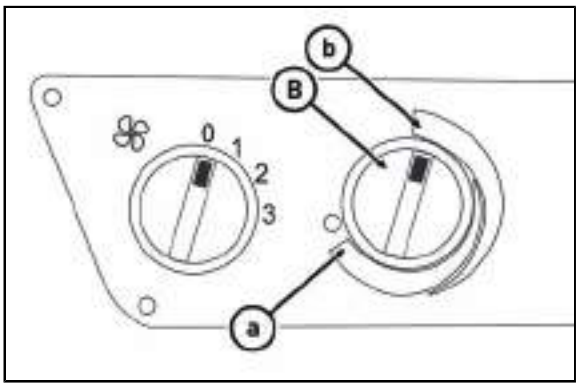
MHS16N004

Fan controller (A)
0 - fan switched off
1 - slow running of the fan
2 - medium running of the fan
3 - maximum running of the fan



MHS16N005

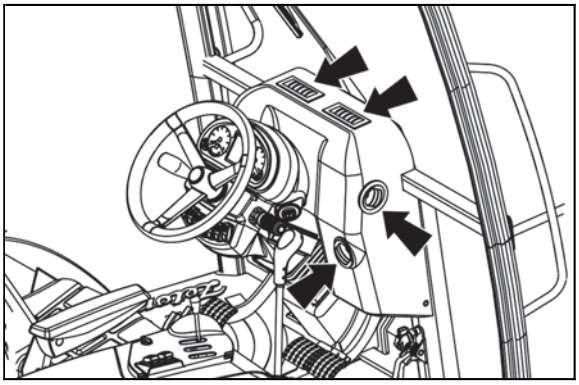
Valve heating controller (B)
a - heating valve closed
b - heating valve opened



MHS16N006

Cab heating registers

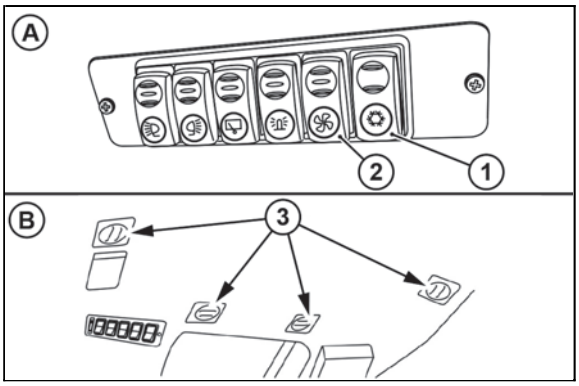
The heating vents are located on the upper and lateral side of the steering column.



MHS16N049

Cab air condition

The air conditioning system is controlled with the switches located on the panel in the cabin roof (A).
Switching on and off of the function of the air conditioning system is performed by switching the switch with the snowflake symbol (1).
Activate the air conditioning system by pressing the switch (the snowflake symbol glows).
Deactivate the air conditioning system by pressing the switch again (the snowflake symbol stops glowing).
Revolutions of the double-speed fan of the air conditioning system are adjusted with the switch (2).
The air conditioning vents (3) are located in the roof of the cab (B).



MHS16N102

Note: The switch (1) must be switched and the fan of the air conditioning system must be activated with the switch (2) to enable functioning of the air conditioning system.

If the air conditioning is in operation, adjust the vents (2) to the required angle so that no direct blowing of people in the cabin occur (risk of diseases because of intensive cooling of body parts).

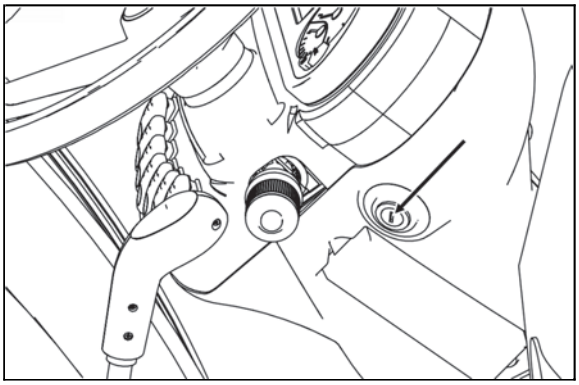
The air conditioning can be operated only when both switches (1) and (2) are on!

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.

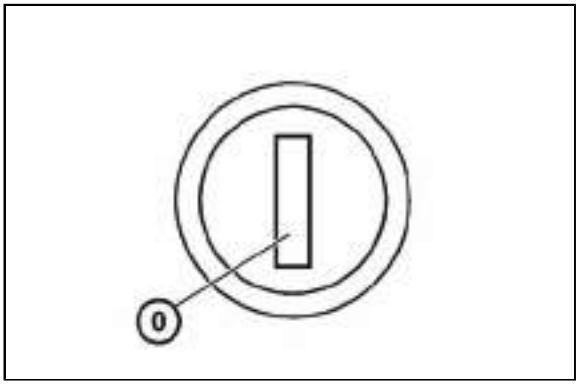
Switch box

The switch box is located on the right side of the steering column.



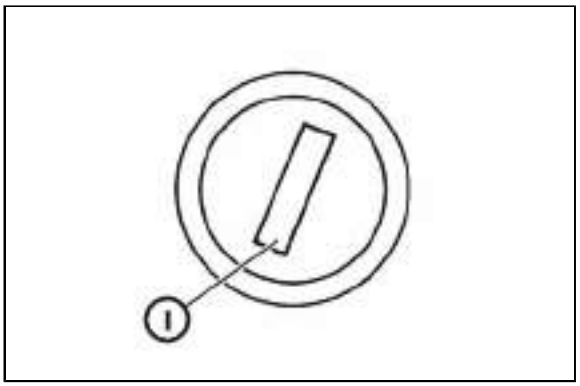
MHS16N008

Switch box key in the position (0)
The voltage of all the equipment controlled via the key is disconnected. The key can be removed.



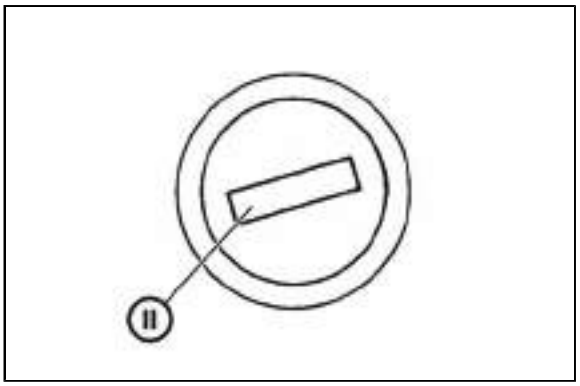
S43

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

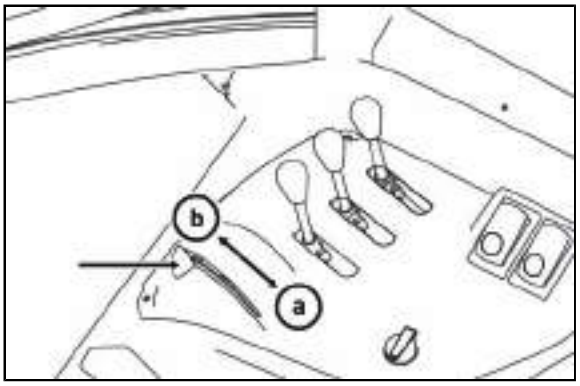
Switch box key in the position (II)
In this position the starter and supply of all appliances are operated, except wipers, windshield washer, fan of the cabin, air conditioning system and instrument panel. After starting the engine, the key is automatically returned to the position 'I'.



S45

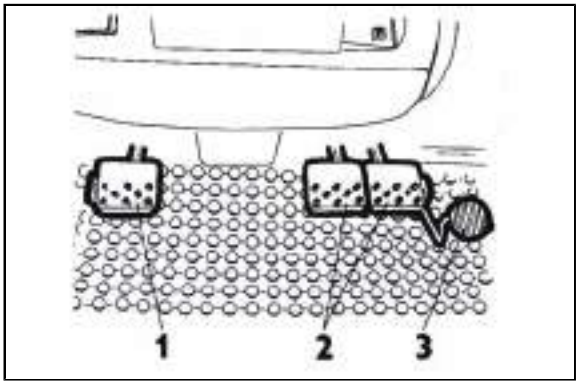
Manual fuel control lever
a - idle run
b - maximum supply

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



MHS16N011

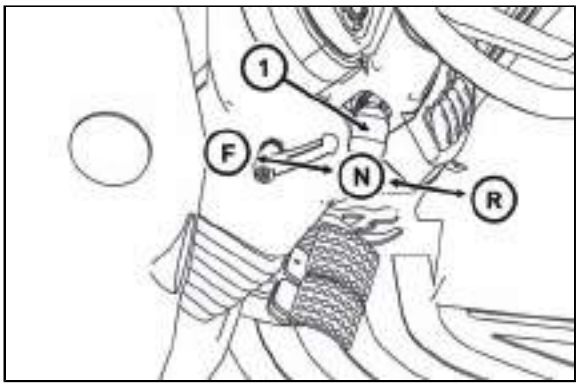
Pedals
1. travel clutch pedal
2. foot brake pedals connected with a flap
3. foot fuel supply control pedal



P15N027

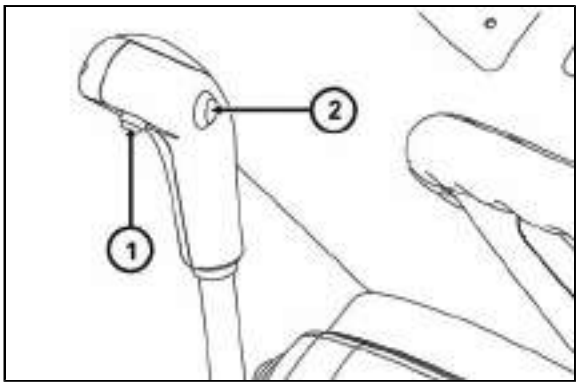
Reversing lever
The reversing lever (1) is used to change the tractor driving direction not using the clutch pedal.

F - forward driving; the lever in the front
N - neutral position
R - reverse driving; the lever in the back



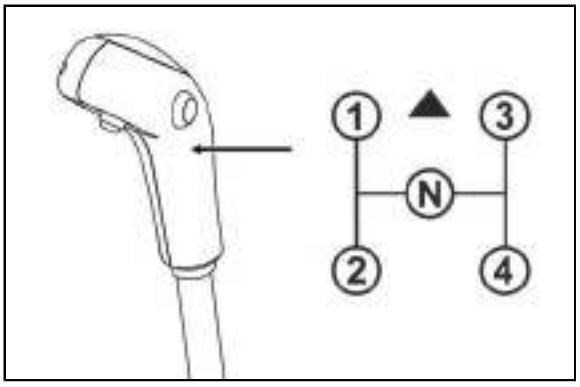
MHS16N014

Gear shifting lever
- main gear shift lever
1st button for the clutch release on the head of the gear shift lever
2nd button for shifting the gears of the multiplier



MHS16N017

Gear shifting scheme
Reverse can be shifted only using the reversing lever. The scheme is attached in the left lower corner of the windscreen.

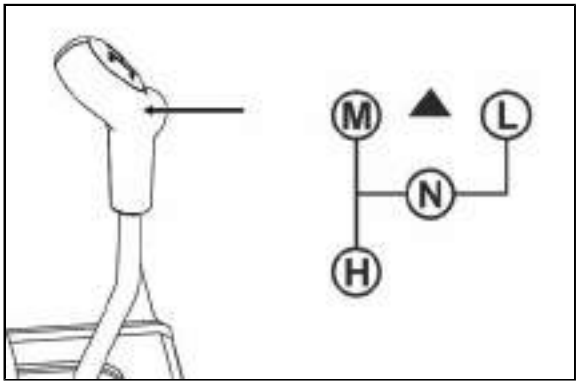


MHS16N015

Road and reduced speeds shifting lever
Road and reduced speeds shifting lever serves for shifting gear groups.

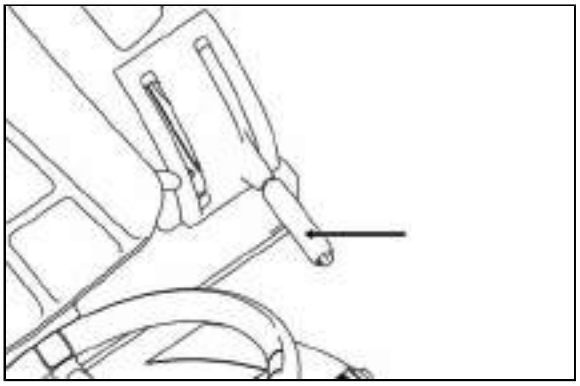
H Road speeds
M Average speeds
N Neutral
L Reduced speeds

Gear shifting is done with the tractor at standstill and depressed clutch pedal.



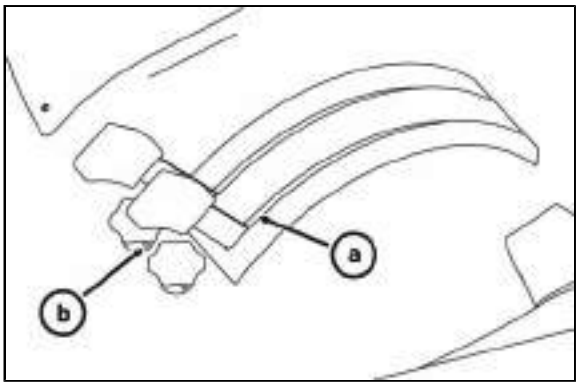
MHS16N016

Hand brake lever
The hand brake lever is located on the right left of the driver's seat.



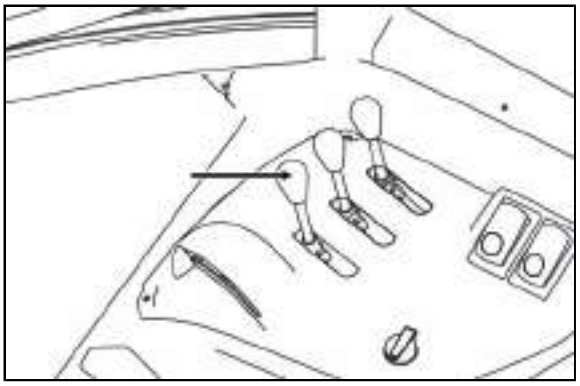
MHS16N018

Hydraulics control panel
The hydraulic control panel with levers (A) is located in the compartment of the right mudguard.
The controls of the hydraulics (B) are located in front of the levers.



MHS16N012

Auxiliary hydraulic switchboard control
Auxiliary hydraulic switchboard control is placed on the upper part of right fender.

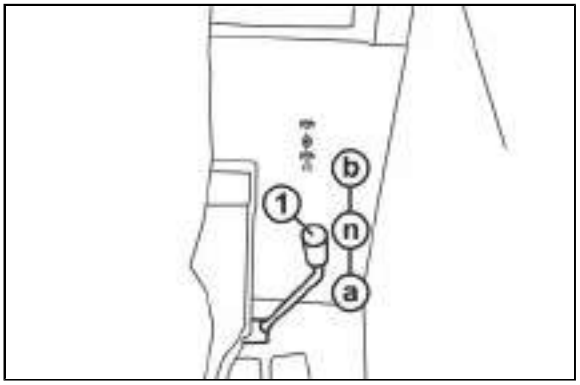


MHS16N013

PTO shaft drive engagement lever
Rear PTO shaft is engaged by a lever (1) placed on the left side of drive's seat.

a - Dependent revolutions of PTO shaft drive through gear box - revolutions are dependent on the engaged gear
n - neutral position
b - Independent revolutions of PTO shaft drive - revolutions are dependent on engine revolutions

Gear shifting is done with a tractor at standstill and engaged manual clutch lever.

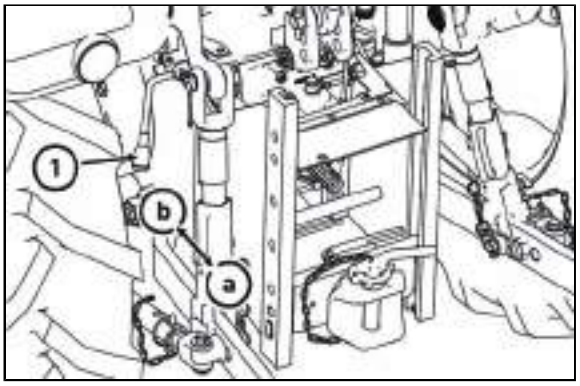


NM13N004

PTO shaft revolutions 540 and 1000 rpm shifting lever
The shifting of 540 or 1,000 rpm of the rear PTO shaft is performed with the lever (1). The lever is located in the rear part of the tractor outside the cabin.

a - 540 rpm
b - 1,000 rpm

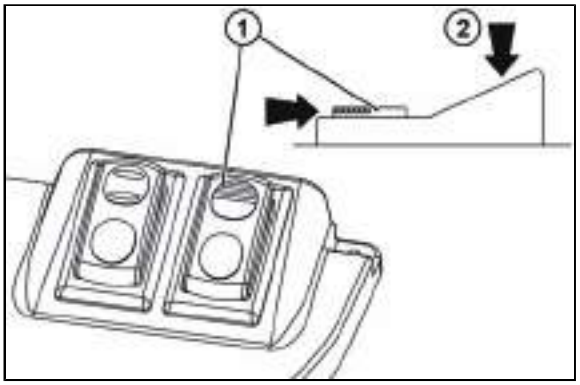
The shifting is performed when the lever of switching of the PTO shaft drive is in the position (n).



MHS16N019

PTO shaft revolutions and the type of endpoint need to be selected dependent on the prescribed revolutions of the aggregated machine.

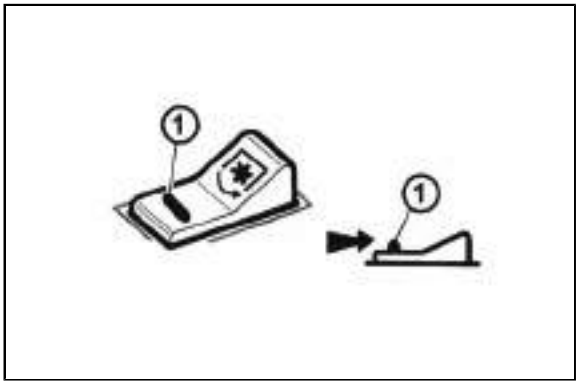
Switching of the rear PTO shaft
The switching of the rear PTO shaft is performed with the switch on the right mudguard in the tractor cabin. To switch the switch, move the safety lock (1) and then press the switch in the direction of the arrow (2).



MHS16N059

Switching on the front output shaft Zuidberg

The front output shaft Zuidberg is switched on with a switch on the dashboard. Work of the switch is signalled by burning symbol on the switch.
The switch is equipped with a mechanical lock (1) against accidental switching on. When switching on, press the lock (1) in direction of the arrow.



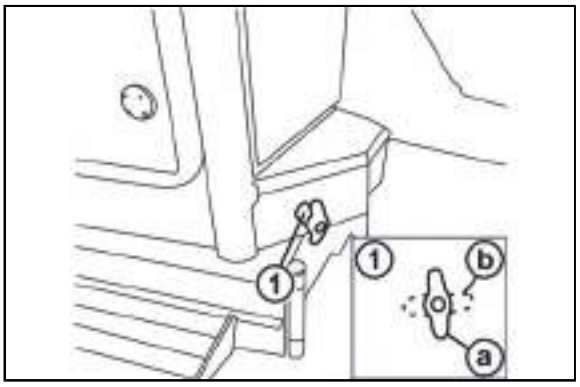
H355

When starting the engine, the switch should be off.

Battery disconnector

Battery disconnector (1) is placed on the right side of the tractor in front of the cab.

a - Battery is connected
b - Battery is disconnected



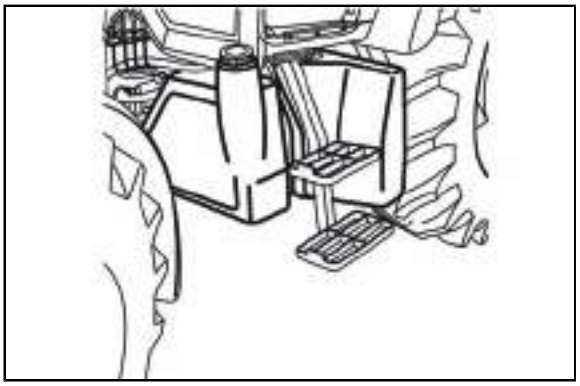
NM13N049

With longterm dead parking, repairs, a failure, or accident, disconnect the battery immediately by battery disconnector.

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.

Fuel tank

The fuel tank is located on the left side of the tractor. The plastic tank with the volume of 120 litres is mounted as a standard.

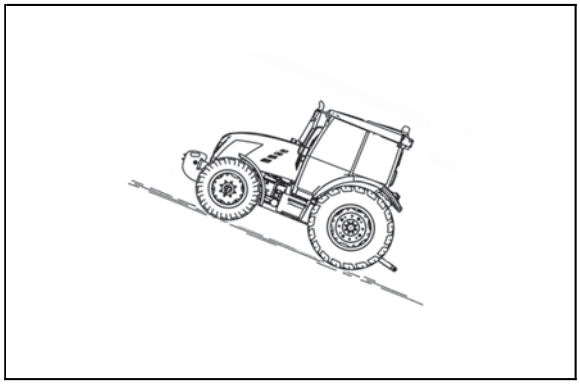


NM13N089

Do not step on the tank!

Minimum fuel amount in the fuel tank

When working on slope if the tractor inclination is near the value of maximum slope availability (i.e. 12°), the fuel amount in the fuel tank must be at least 20% of the fuel tank volume.

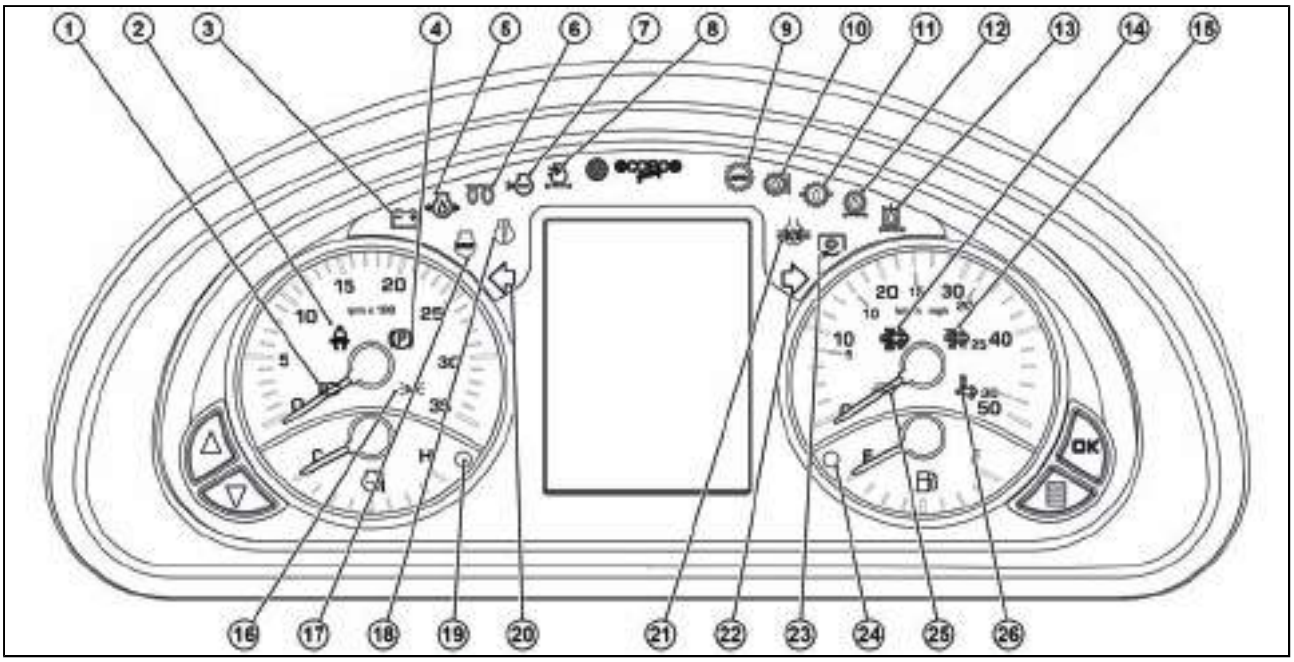


NM14D055

NOTES

INSTRUMENT PANEL

Instrument panel - signal lamps

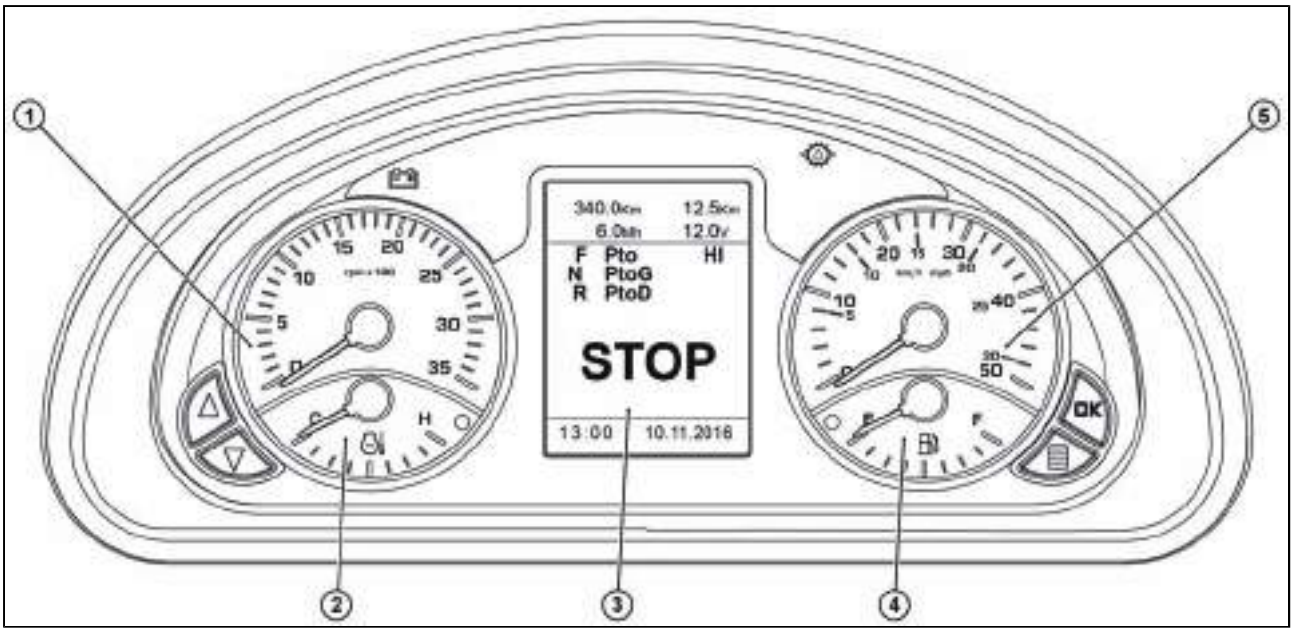


MHS16N076

1 - High beam lights (blue). Lights up with distance lights on.
2 - Not connected
3 - Charging signal lamp (red). With engine run, lights up with charging failure. When the engine is at standstill, it must be lit.
4 - Hand brake signal lamp (red). It is lit with engaged hand brake.
5 - Lubrication signal lamp (red). With engine running lights up with the oil pressure drop below the critical limit.
6 - Engine ignition signal lamp (yellow). Indicates the activity of the device for facilitation of engine start.
7 - Fuel level signal lamp of cooling liquid. With engine running, it lights up when the level of the engine cooling liquid drops below the critical limit.
8 - Air cleaner clogging signal lamp (yellow). Lights up with air filter clogging.
9 - Not connected
10 - Not connected
11 - Not connected
12 - Not connected
13 - Signal lamp of hydraulic circuit oil cleaner clogging. If it lights up when the engine is running, it indicates clogging and necessity of replacement of this cleaner.
14 - Not connected
15 - Not connected
16 - Market lights (green). It is on when market lights are on.
17 - Stop signal lamp (red)
18 - Not connected
19 - Signal lamp of the high temperature of the cooling liquid. It is on when the temperature of the cooling liquid exceeds 110ºC.
20 - Signal lamp of the tractor left direction lamps (green).
21 - Signal lamp of the differential closure
22 - Signal lamp of tractor right direction lights (green).
23 - Signal lamp for switching of the rear PTO shaft (yellow)
24 - Fuel level signal lamp (orange). It is on with the remaining 0 - 1/4 of the tank volume.
25 - Not connected
26 - Not connected

INSTRUMENT PANEL

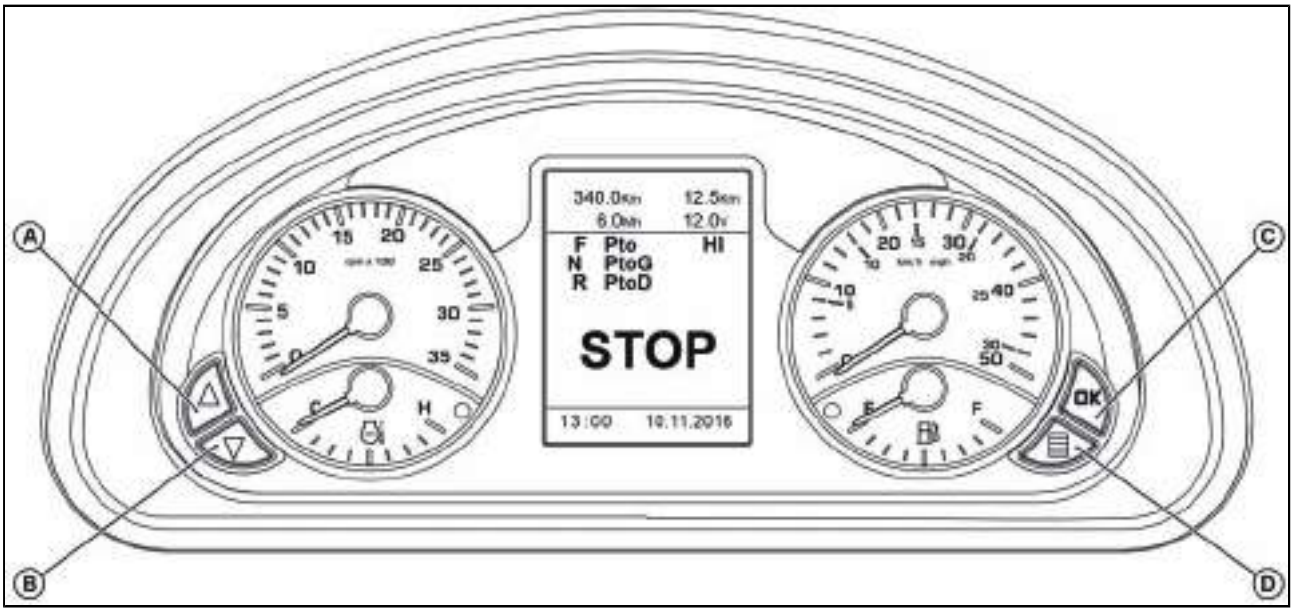
Instrument panel - instruments



MHS16N070

1 - Speedometer
2 - Thermometer of the cooling liquid
3 - Display
4 - Fuel gauge
5 - Speedometer

Instrument panel - buttons

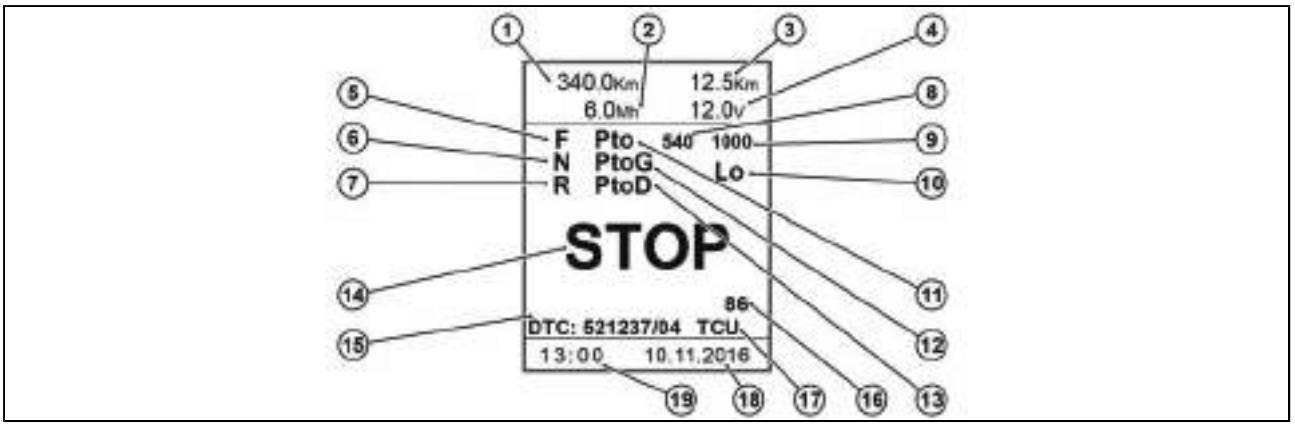


MHS16N071

A - Rolling up in the menu button
B - Rolling down in the menu button
C - Confirmation button for items in the menu
D - Enter the menu button

INSTRUMENT PANEL

Display description



MHS16N072

The following information is displayed on the display:

1 - Total kilometres travelled
2 - Total number of tractor operation hours
3 - Total kilometres travelled from the last clearing
4 - Accumulator battery voltage5 - Reversing F - forward driving (more information in chapter DRIVING)
6 - Reversing N - neutral position (more information in chapter DRIVING)
7 - Reversing R - reverse driving (more information in chapter DRIVING)
8 - Rear PTO shaft - 540 revolutions geared (more information in chapter POWER OF AGRICULTURAL MACHINES)
9 - Rear PTO shaft - 1000 revolutions geared (more information in chapter POWER OF AGRICULTURAL MACHINES)
10 - Indication of the shifted multiplying gear of the multiplier (Hi/Lo) (more information in chapter DRIVING)
11 - Indication of the activated rear PTO shaft (more information in chapter POWER OF AGRICULTURAL MACHINES)
12 - Rear PTO shaft - independent revolutions geared (more information in chapter POWER OF AGRICULTURAL MACHINES
13 - Rear PTO shaft - dependent revolutions geared (more information in chapter POWER OF AGRICULTURAL MACHINES)
14 - Indication of the serious defect
15 - Defect code16 - Defect identification
17 - Identification of the control unit signalling the defect
18 - Display of the current data
19 - Display of the current time

Information display - fault notifications

During defects of the tractor, the following is displayed on the display:

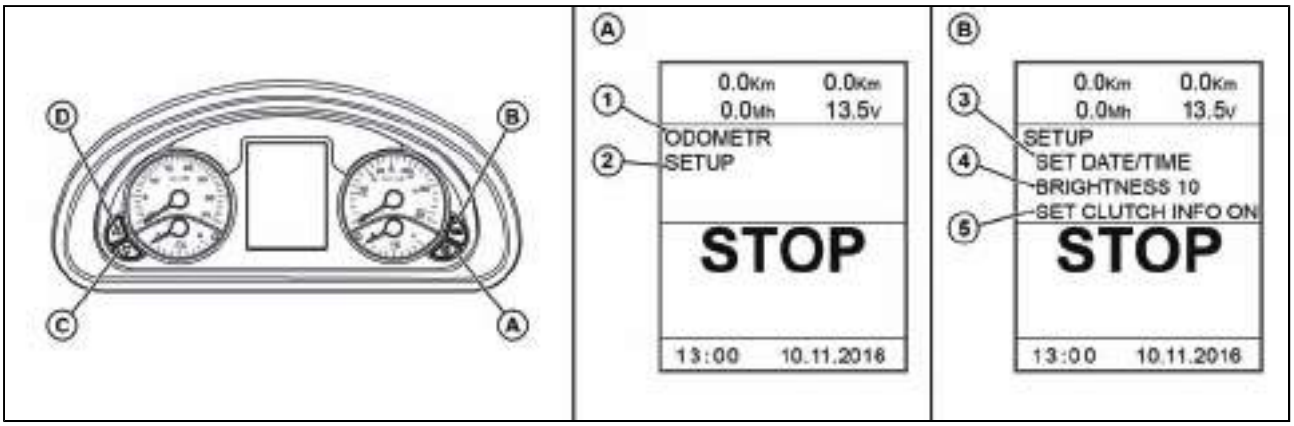
1 - **STOP** label - indicates a serious defect
2 - Defect code
3 - Defect identification
4 - Identification of the control unit signalling the defect

TCU - control unit of the system of clutches and gearbox
ECU - engine control unit

MHS16N100

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

Display - service menu



MHS16N106

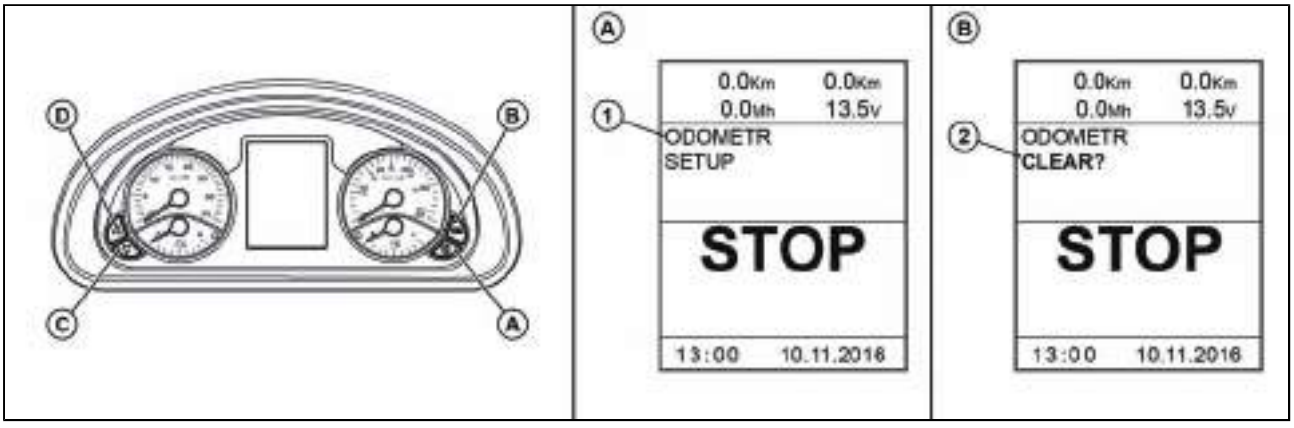
Enter the service menu (a) by pressing the button (A) if the key in the switch box is in the position I.
Select the item by pressing the button (C) and (D). The selected item is highlighted in yellow.

The item ODOMETER (1) is used for clearing of kilometres travelled from the last clearing.
The item SETUP (2) is used for a more detailed setting of the display.
Confirm the selected item by pressing the button (B).

Use buttons (D) and (C) to select the item SETUP (2) and by pressing button (B) you enter the detailed setting of the display (b).
Select the item by pressing the button (C) and (D). The selected item is highlighted in yellow.
The item SET DATE/TIME (3) is used for setting of the current date and time displayed on the display.
The item BRIGHTNESS (4) is used for setting of the display backlight.
The item SET CLUTCH INFO ON displays setting of the clutch pedal and is used for service purposes.

By pressing the button (B) you exit the service menu.

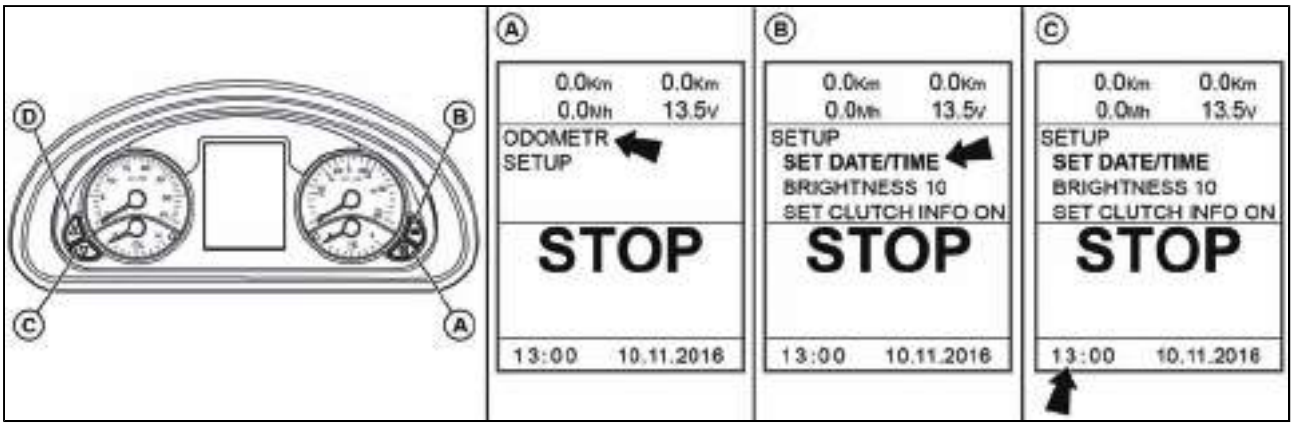
Display - resetting data



MHS16N083

Clearing of the travelled distance: Press the button (A) to enter the menu.
a - Use buttons (C) and (D) to select the item ODOMETER (1) and press button (B) for confirmation.
b - The query for clearing of the travelled distance CLEAR? (2) is displayed.
Press the button (B) to clear the travelled kilometres.
In the case that you do not want to clear the value press the button (A).
Return to the main screen by pressing button (A).

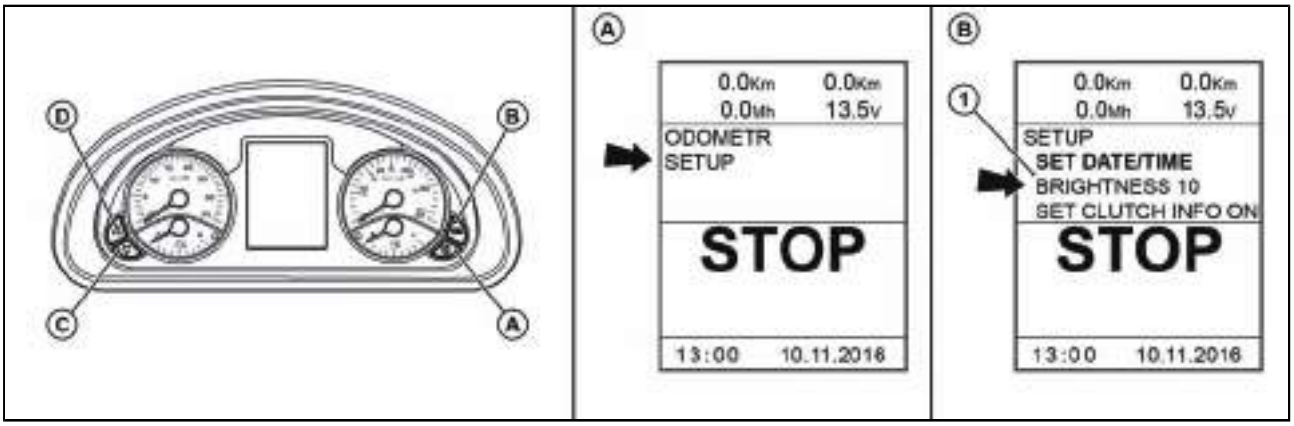
Setting of date and time



MHS16N084

Press the button (A) to enter the menu.
a - Use buttons (C) and (D) to select the item SETUP indicated with the arrow and press button (B).
b - Use buttons (C) and (D) to select the item SET DATE/TIME indicated with the arrow and press button (B).
c - The number in the first position flashes on the bar indicated with the arrow. Use buttons (C) and (D) to change the number to the required one and press button (B) for confirmation. In the case that you do not want to change the values, use button (B) to confirm the current and go to the number in the next position. Repeat the procedure until all the numbers in all positions are set.
Return to the main screen by pressing button (A) when the date and time is set.

Brightness adjustment



MHS16N085

Press the button (A) to enter the menu.
a - Use buttons (C) and (D) to select the item SETUP indicated with the arrow and press button (B).
b - Use buttons (C) and (D) to select the item BRIGHTNESS indicated with the arrow. Adjust the display brightness within the scale 1 - 10 by repeated pressing of the button (B). The selected level is indicated with the corresponding number (1).
Return to the main screen by pressing button (A) when the brightness is set.

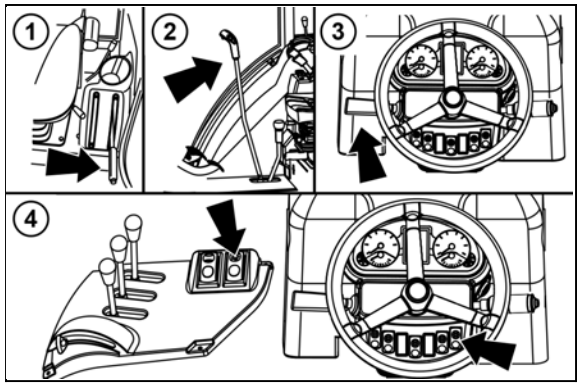
NOTES

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 the engine

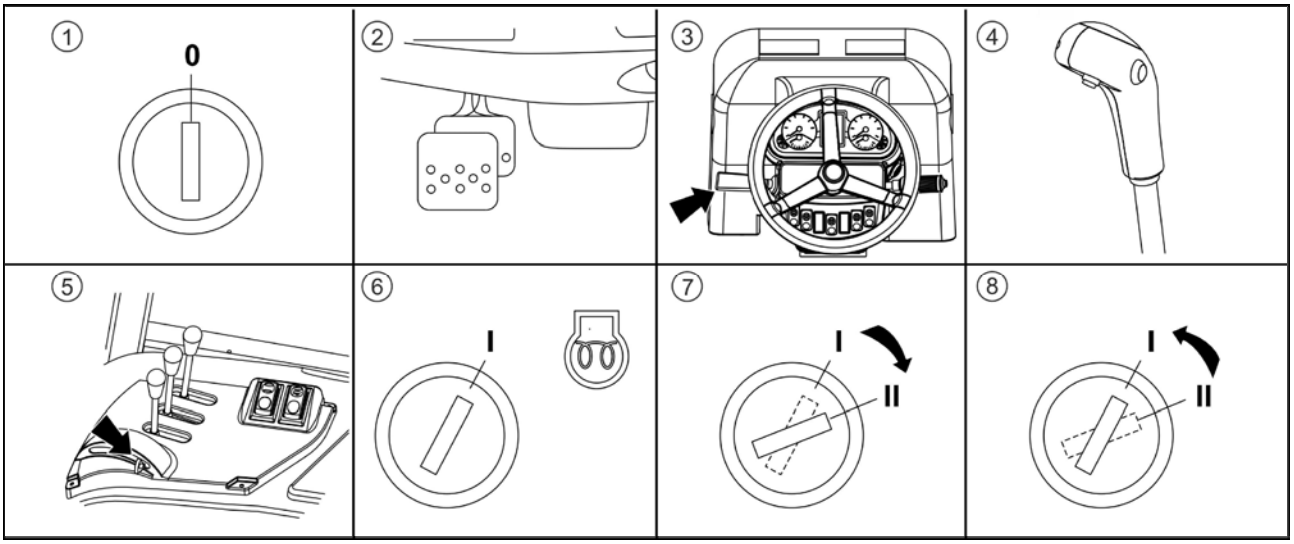
Before you start the engine, make sure that:
1. tractor is properly braked
2. PTO shaft drive engagement lever is in neutral position
3. the main gear shifting lever is in neutral position

Notes : *If the clutch pedal is not depressed, it is not possible to start the engine - switch for securing start is not switched.*



MHS16N020

Starting the engine



MHS16N021

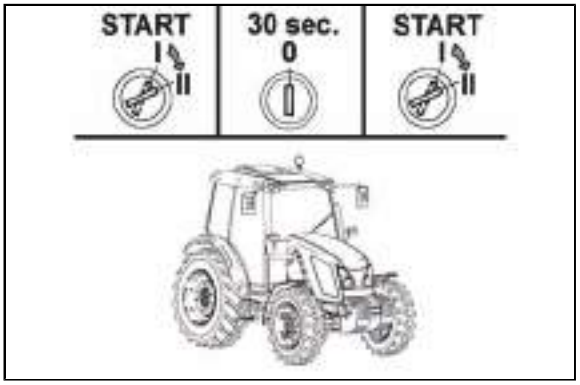
1. Insert the key in the switch box - position '0'.
2. Push down the clutch pedal.
3. Move the reversing lever to the neutral position.
4. Move the main gear shift lever to the neutral position - the start circuit breaker is switched.
5. Set the fuel manual regulation lever to the idling position.
6. Switch the key of the switch box from the position '0' to the position 'I'. The thermostat glowing signal lamp is activated. Wait until the glowing signal lamp goes out (the time depends on the temperature of the cooling liquid).
7. Immediately after the lamp goes out (5 s max.) turn the key from 'I' position to 'II' position (start).
8. After starting the engine, immediately release the key and it is automatically returned to the position 'I'.

Do not perform starting for a longer period than 15 s.

If engine does not start

Return the key to position '0', wait 30 seconds and repeat the start.

A maximum of 6 starting cycles is allowed (15 seconds start and 30 seconds interruption is one cycle). Another engine start is allowed after the starter cools off to surrounding temperature.

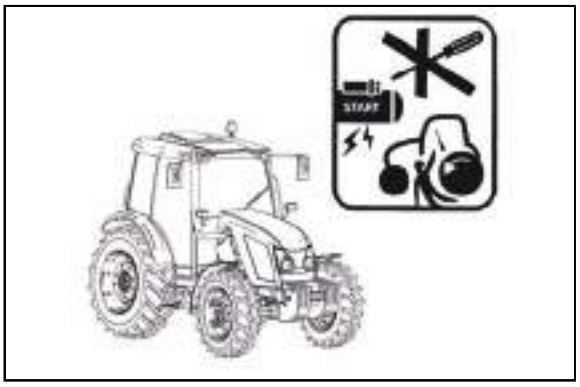


NM13N091

Never help a stopping tractor with a starter. There is a danger of starter damage .

Manipulation with starter

It is forbidden to start by short circuiting starter clamps! Tractor is started only from driver's seat!
With any manipulation or starter repair it is necessary to disconnect minus battery pole and all shifting levers including PTO shaft shifting lever must be in neutral position!
Starter contacts are covered with a cap.



NM13N093

Immediately after start

Check greasing, charging and other functions ensuring proper engine operation (controls must go out) in this time. The time of engine operation without load must be observed, in particular in winter period.

After starting, set revolutions to 800 - 1,000 rpm and let engine run without load for a period of app. 2 minutes.

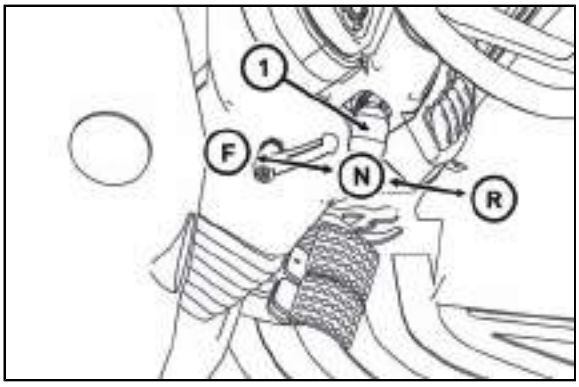
Engine heating

Do further heating of the engine when driving. Heating engine by lengthy idle run or abrupt revolutions increase is harmful to the engine. If the temperature of coolant has not reached 45°C, do not overcome engine revolutions over 2,000 rpm.

Selecting driving direction - Reversing lever

The reversing lever (1) is used to change the tractor driving direction not using the clutch pedal.
Slightly draw the lever in the position (N) up towards the steering wheel and move it to the required position (F) or (R).

F - forward driving; the lever in the front
N - neutral position
R - reverse driving; the lever in the back

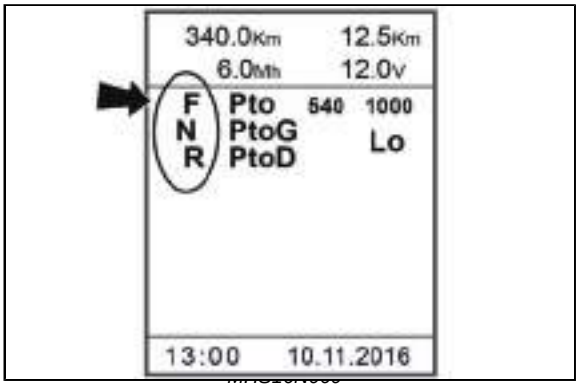


MHS16N014

Reversing lever position signalization

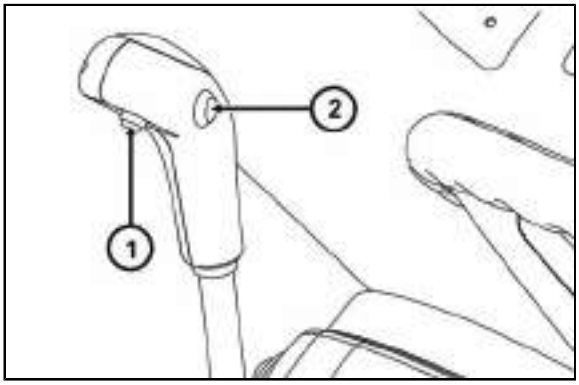
Individual positions of the reversing lever are indicated by the backlight of the symbols on the instrument panel:

F - forward driving, red backlight of the symbol when shifted
N - neutral position, green backlight of the symbol when shifted
R - reverse driving, red backlight of the symbol when shifted



Gear shifting

The tractors are equipped with the four stage synchronized gearbox with the two-stage torque multiplier and reversal system. The four stage gearbox is shifted by the main control lever with buttons for control of the torque multiplier (2) and button for release of the travel clutch (1). The forward and reverse driving of the tractor is shifted by the reversing lever located on the column of the steering wheel.

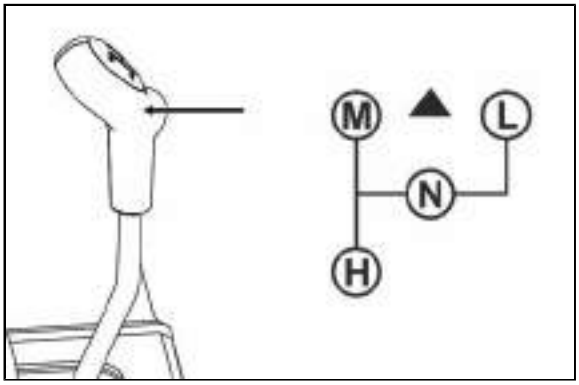


MHS16N017

Only gears are shifted by main gear shifting lever, the direction of travel is shifted by reversing lever.

Selection of road or reduced speeds
Road and reduced gears lever serves for shifting groups of gears.

H - Road speeds
M - Average speeds
N - Neutral
L - Reduced speeds

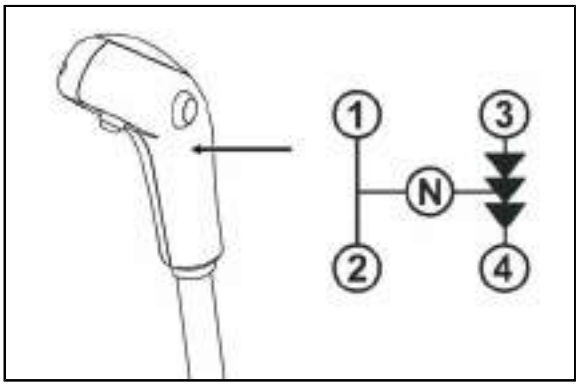


MHS16N016

Gear shifting to be done with tractor at standstill and depressed clutch pedal.

Gear shifting from lower to higher gears
Push down the clutch pedal or press the clutch button on the main gear shift lever (clutch deactivated). Simultaneously release the fuel regulation pedal and shift the corresponding higher transmission gear. Smoothly release the clutch pedal or button on the gear shift lever (the clutch is being activated) and simultaneously gradually increase the engine revolutions.

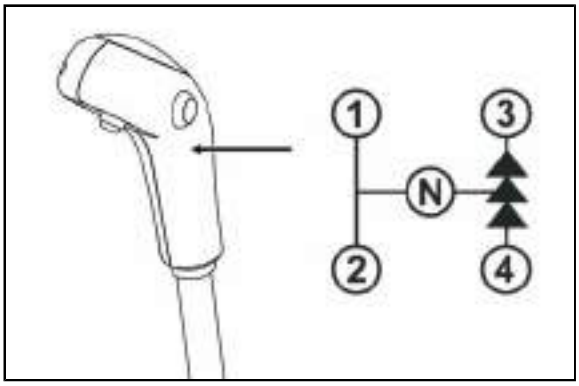
Note: To increase the service life of synchrons, it is possible to shift from a lower to a higher transmission gear with so called double press of the clutch.



MHS16N022

Gear shifting from higher to lower gears
Push down the clutch pedal or press the clutch button on the main gear shift lever and move the gear shift lever through the neutral position to a lower transmission gear.

Note: To increase the service life of synchrons, it is possible to shift from a higher to a lower transmission gear with so called tapping the gas pedal.



MHS16N023

DRIVING OPERATION

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 three individual travel clutches, two for forward driving (Hi and Lo according to the shifted multiplying gear) and one for reverse driving. Selection of travel direction and selection of the specific travel clutch is performed by moving the reversing lever under the steering wheel from the neutral position to the forward or reverse position.

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 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.

DRIVING OPERATION

Dead start of tractor in regular operation - 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.***

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

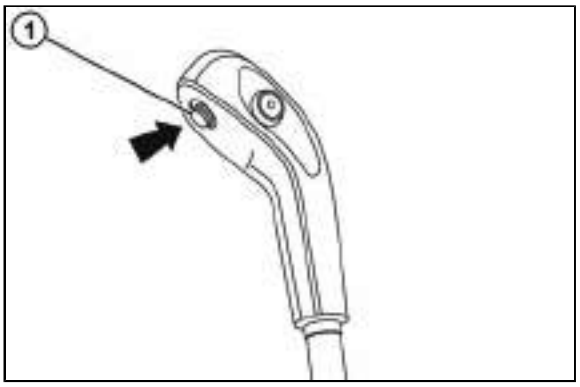
The compliance of the following instructions when changing the tractor driving direction helps to prolong the service life of travel clutches.
· Use the reversing lever under the steering wheel without using the clutch pedal to change the tractor driving direction.
· Select the slowest speed L of the torque multiplier to change the tractor driving direction.
· Select a lower transmission gear with respect to the following acceleration and loading of the tractor to change the tractor driving direction.

 ***The change of the driving direction using the reversing lever is performed with the travel speed lower than 10 km/hour!***

1. Lower the travel speed of the tractor below 10 km/hour using the brake pedals.
2. Move the reversing lever to the required tractor driving direction.
3. The tractor automatically stops and starts driving in your required direction.
4. While increasing the engine revolutions continue in a smooth start of the tractor.

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
- Use control of the travel clutch with the button (1) on the head of the gear shift lever for shifting of gear speeds while the vehicle is in motion.
- During shifting, press and hold the button (1) of the clutch control on the head of the gear shift lever, release the clutch pedal, deactivate the gear shift, shift the corresponding gear shift, release the button (1) and then gradually increase the engine revolutions.

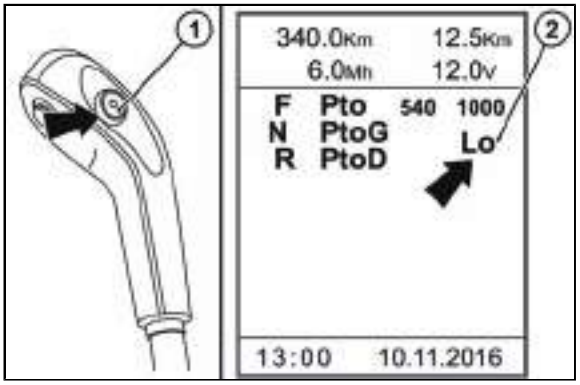


MHS16N086

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.

Two-stage torque multiplier
Shifting of individual gears of the two-stage multiplier is controlled with one button (1) on the head of the gear shift lever without the use of the clutch pedal. Individual shifted gears are indicated by the symbol (2) on the display of the instrument panel.

Hi - higher degree - the symbol with red backlight
Lo - lower degree - the symbol with yellow backlight

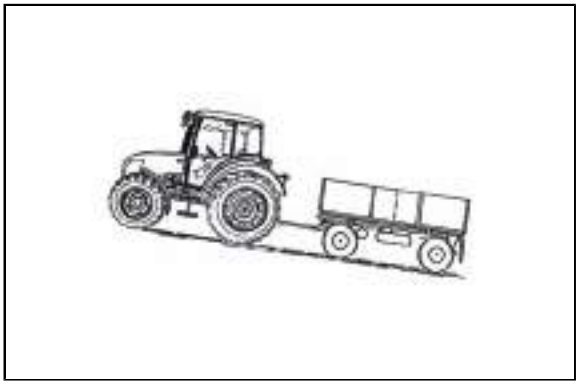


MHS16N062

The torque multiplier cannot be shifted for reverse driving.

Travelling up the slope

Shift gears from higher to lower gears in time when travelling up the slope so as to avoid drop of engine revolutions under 800 rpm and do not allow ride leading to stopping the engine for overload.

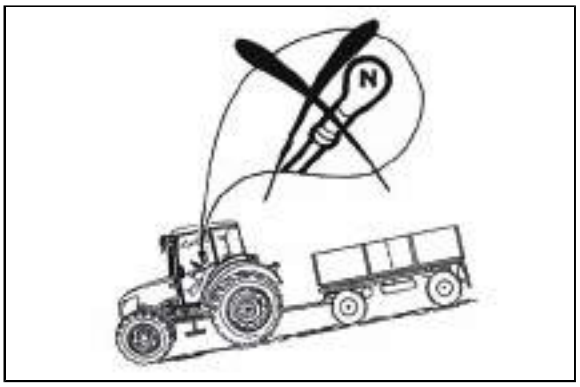


C215

Travelling down the slope

Travelling down the slope without en engaged gear is forbidden. If you are going down a longer slope engage the lower gear the steeper the slope. Engage the lower gear before the slope if possible.

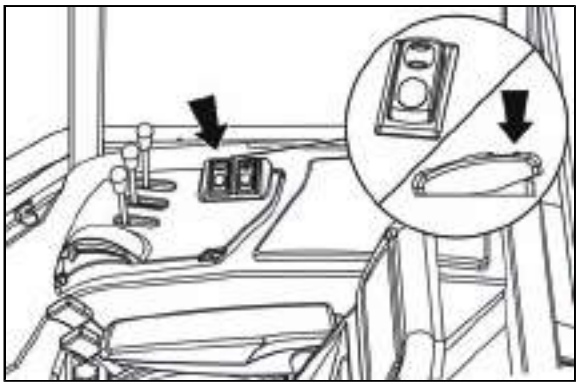
Note: The gear with which you will reliably overcome ascension, it is the one with which you will safely go down.



C216

Differential lock

The differential closure is controlled by the switch located on the control panel on the right mudguard of the cabin. Switching of the differential closure is performed by pressing the switch; when pressed the closure is activated. When released, the closure of the switch is returned to its original position and the differential closure is deactivated.



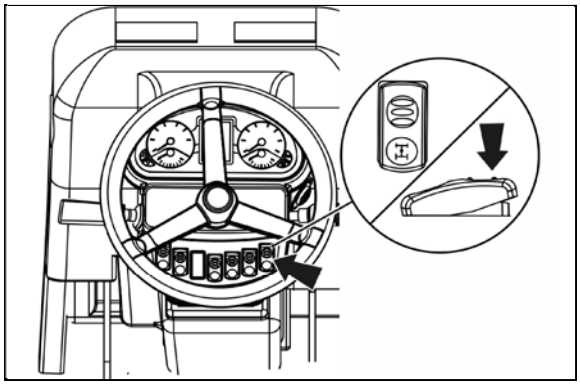
MHS16N063

Use the differential closure only in the case when there is a great difference in the slip of the rear wheels!

Do not use the differential closure when driving around a curve and for the speeds over 12 km/hour!

Control of front driving axle

The front drive axle is activated by the switch on the steering column. Switching of the front driving axle is indicated with the activated symbol on the switch.
The drive of the front axle can be activated while the vehicle is in motion under the load without the use of the clutch pedal.
Note: For driving along the land road and in the case of higher speeds switch off the drive of the front axle.



MHS16N064

Driving with front drive axle engaged

Permanent engagement of front drive axle is admissible; if front mounted agriculture machine or tool is connected. This condition is given in operation manual of the applicable machine.
Maximum permitted speed of these sets is 15 km/h.

C220

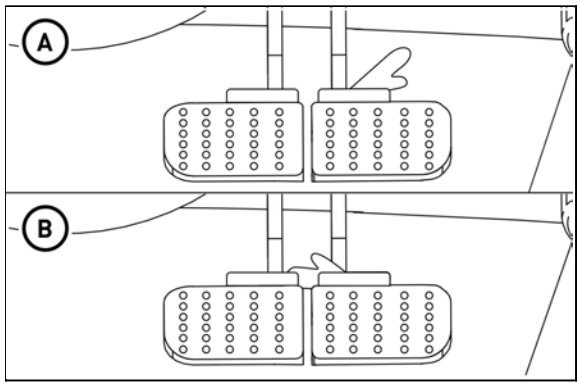
Use front drive axle with slip of rear wheels to increase pull of tractor. On the road and on hard surface causes driving with front drive axle engaged increased tire wear of front wheels.

Foot brakes

Foot brakes are disk brakes, wet brakes, hydraulically controlled and double pedal with automatic pressure equalization. When driving on the road, both pedals must be connected with a latch. Disconnected pedals for braking of the right or left wheel should be used during field work only.

A - disconnected pedals
B - pedals connected with a latch

Note: When driving down the steep slope with a trailer or semitrailer equipped with air or hydraulic brakes you must use the foot brake even from the beginning of the slope!

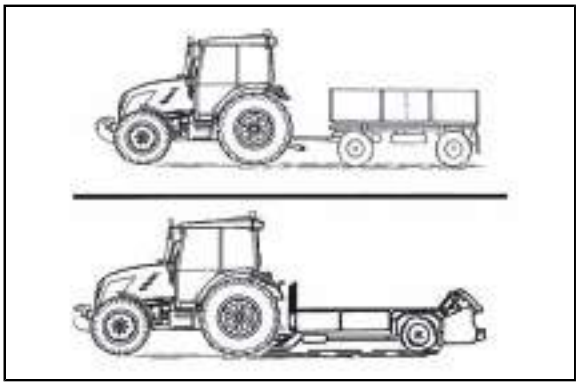


NM15N001

During braking with one brake pedal, the brakes of the trailer are not operating!

Trailer and semi-trailer air brakes
Trailer (semi-trailer) air brakes control and tractor brakes control is done in such a way that the braking effect of both vehicles is synchronized.

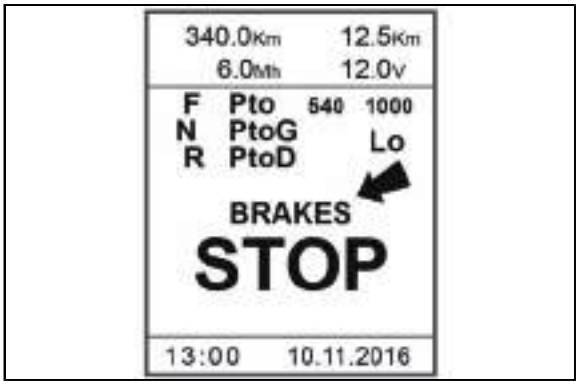
Note: When travelling down a steep slope with a trailer or semi trailer equipped with air brakes, it is necessary to brake with a foot brake before the descent starts!



NM13N097

When travelling with a connected trailer or semi-trailer foot brake pedals must be connected and secured with a flap! When braking with a single brake pedal, air brakes of a trailer are not in operation.

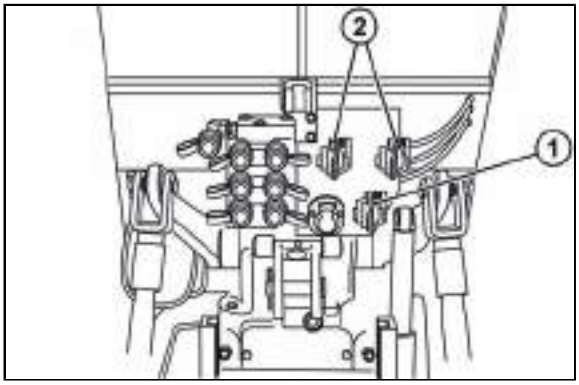
Warning indication of air pressure drop
The decrease of the air pressure is indicated by the message on the display of the instrument panel.



MHS16N087

The tractor with the trailer or semi-trailer being braked must not continue in operation during pressure decrease in the air-pressure system until increase of air pressure occurs!

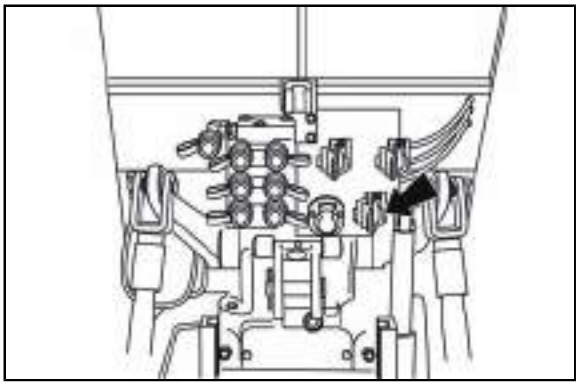
One-hose and two-hose brakes
1. clutch head of one-hose brakes
2. clutch heads of two-hose brakes



MHS16N093

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

One-hose brakes
The valve is marked black.

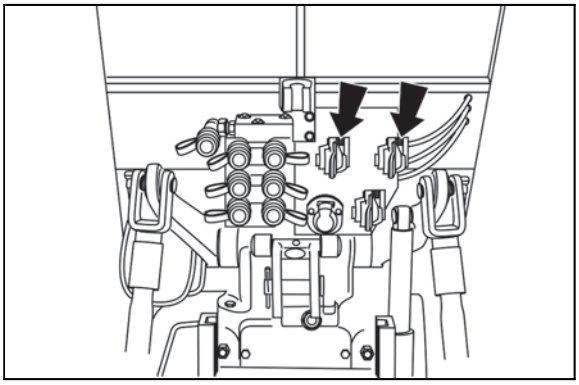


MHS16N094

With the connected trailer (or semi-trailer) with a maximum allowed speed approved for the specific type of the tractor is the maximum allowed speed of the set 30 km.h^{-1}! The maximum allowed speed of the set is connected with the maximum allowed speed of the slower vehicle of the set.

Two-hose brakes

The valve of the left head is marked yellow (braking branch), the valve of the left head is marked red (filling branch).



MHS16N095

With the connected trailer (or semi-trailer) with a maximum allowed speed approved for the specific type of the tractor is the maximum allowed speed of the set 40 km.h-1! The maximum allowed speed of the set is connected with the maximum allowed speed of the slower vehicle of the set.

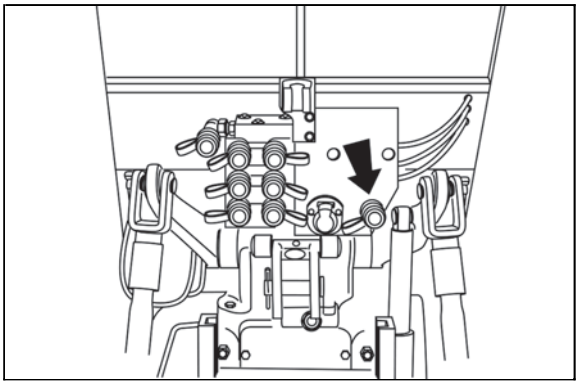
Hydraulic brakes of trailers

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.

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.



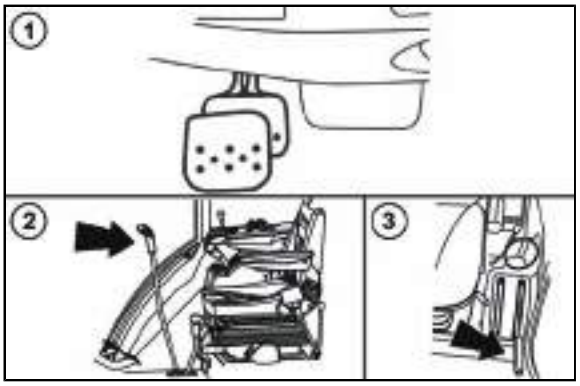
MHS16N096

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

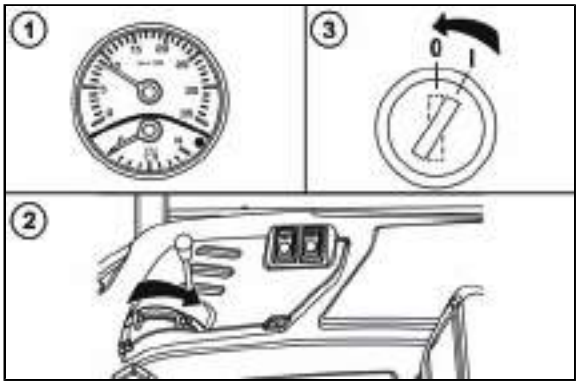
Under normal conditions the tractor must be stopped slowly.
Shortly before stopping:
1. Push down the clutch pedal.
2. Move the main gear shift lever to the neutral position.
3. During each stop secure the tractor against spontaneous movement using the hand brake.



MHS16N065

Stopping the engine

It is necessary to ensure that the engine cools down after a work on the tractor with a full engine load.
1. Before stopping the engine decrease the engine speed to 800 to 1,000 r.p.m. and keep it running idle for cca 5 minutes.
2. Move the manual fuel control handle to the position of idling run.
3. The engine shall stop once you turn the key from the position 'I' to the position '0'.



MHS16N066

When leaving the tractor, the disconnector of the battery must be in the off position.

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.

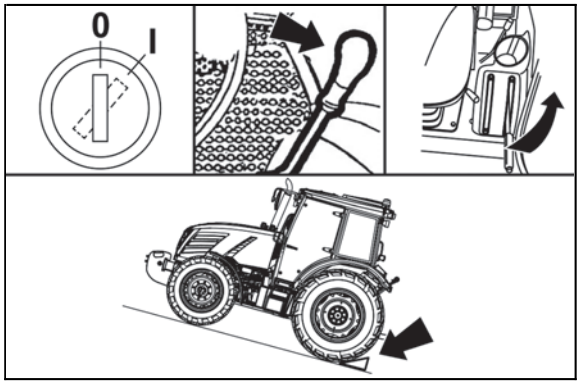
Leaving the tractor

Before leaving the tractor do not forget to take out the key from the switch box from the position '0' (in the positions 'I' and 'II' the key cannot be removed).

The tractor must be secured against spontaneous movement:
1. Engine switched off
2. Braked with hand brake
3. Wheels secured with chocks.

Note: The shifted gear does not secure the tractor against movement (the clutch deactivated).

Lock the cabin.



MHS16N067

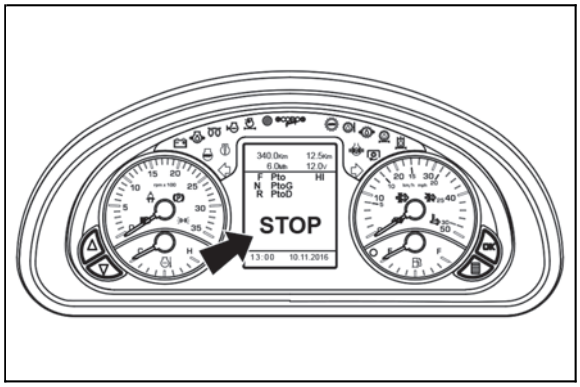
The shifted gear does not secure the tractor against movement (the clutch deactivated). If the tractor stands on the slope, the wheels must be additionally secured with chocks.

After exiting the tractor the disconnector of the battery must be in the OFF position.

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.

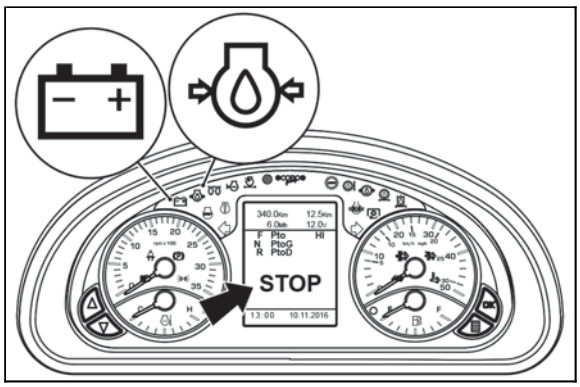
Hydrostatic steering failure warning signalization

A defect of the hydrostatic control pump during the oil pressure drop behind the pump is indicated on the instrument panel with the corresponding error message on the display of the instrument panel.
Note: When starting the tractor or at low engine revolutions an error message can be displayed. If after the start or increase of engine revolutions the error message does not appear, it is not an error. The system is in order.



Important notification

If greasing, charging or hydrostatic steering failure controls light up, stop the engine immediately and contact service. You will prevent a serious failure or tractor accident.



MHS16N098

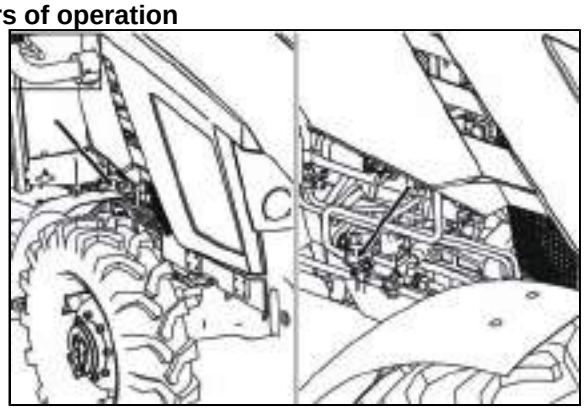
RUNNING IN THE TRACTOR

Before driving a new tractor, first get acquainted with the gear shifting scheme and try out individual positions of gear shifting lever with engine at standstill.
Before you drive off in normal operation you must make sure that technical condition corresponds with the conditions of safe operation.

General principles of new tractor run-in in first 100 hours of operation

During first 100 hours of operation:

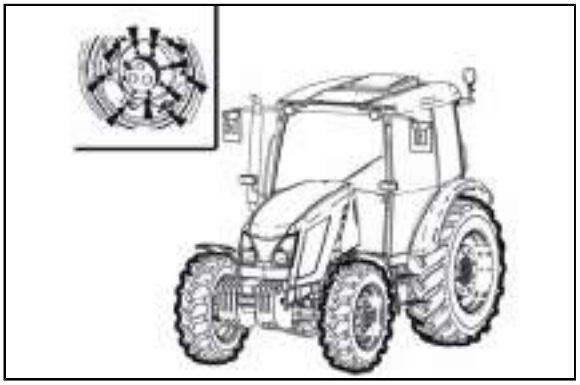
- Load tractor in a normal way, avoid operation with low or maximum engine revolutions
- Avoid operation under partial loading of the engine
- Avoid excessive idle run operation
- Check oil levels in engine often (during this time increased oil consumption is normal)
- Check screw joints in particular 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



nm15d059

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



NM13N100

From 100 hours of operation

After drive in completion you can work with tractor without limitations.

Recommended operation revolutions	1,400 - 2,300 rpm
Idle run revolutions	900 rpm
Oil pressure with idle run revolutions	min. 0,14 MPa
Max. coolant temperature	110°C

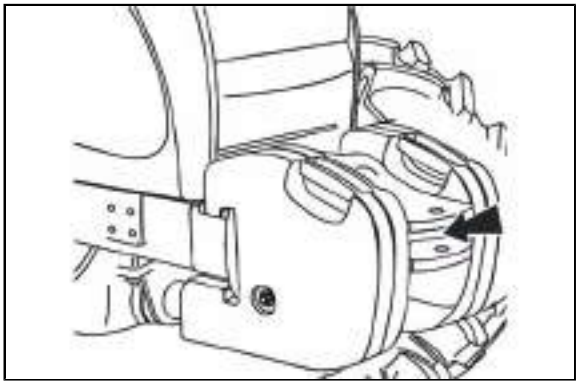
E256

NOTES

Before a drive make sure that the technical condition ensures safe operation of the tractor. In case that a trailer or implement is coupled, verify its coupling and proper fixing of the load. Never get out of the tractor to couple a trailer yourself. Pay also attention to your assistant.

Front hook

Used only for towing tractor without connected trailer or a different connected machinery.

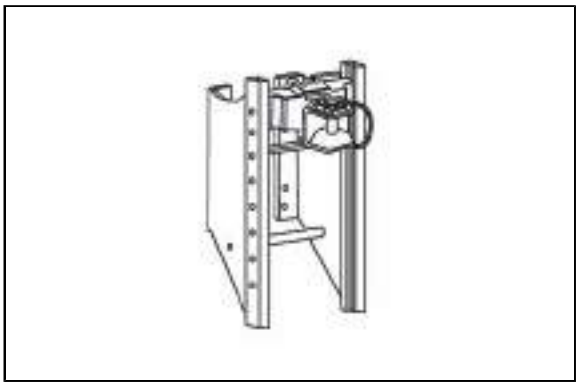


NM13N023

Use a drawbar or a cable for releasing tractor. Never use chains! The possibility of fatal injury if a chain pulls apart!
It is forbidden to use tractor axles (individual travelling wheels) such as reeling jack when rescuing a sunken tractor.

Multistage adjustable suspension

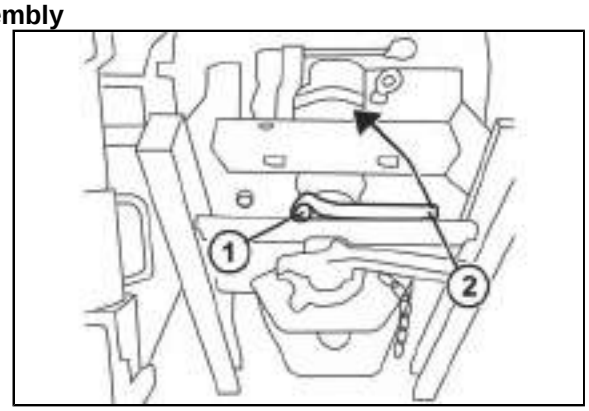
Serves for connecting double axle or lighter single-axle trailers. Guidance nozzle is vertically adjustable. When working with various agricultural machines it is necessary to adjust the suspension vertically or demount where necessary.



E302

Vertical adjustment and multistage suspension disassembly

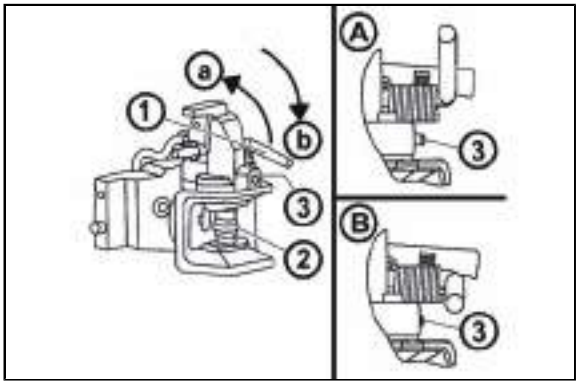
After pushing the catch (1), control lever (2) is unlocked, by subsequent shift of the lever (2) in the direction of an arrow multistage suspension is released and it is possible to adjust it vertically or disassemble. After adjusting multistage suspension, shift the lever (2) back to the original position until the catch (2) is released.



NM13N024

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).

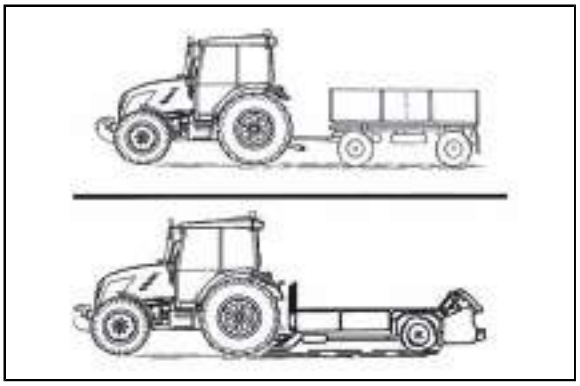


E304

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

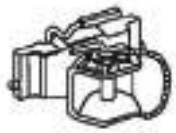
Aggregation with trailer and semitrailer

Aggregation with a semi-trailer must not exceed the value of the maximum allowed static load of the rear axle of the tractor.



NM13N097

Maximum permitted vertical static suspensions load for trailers and semitrailers

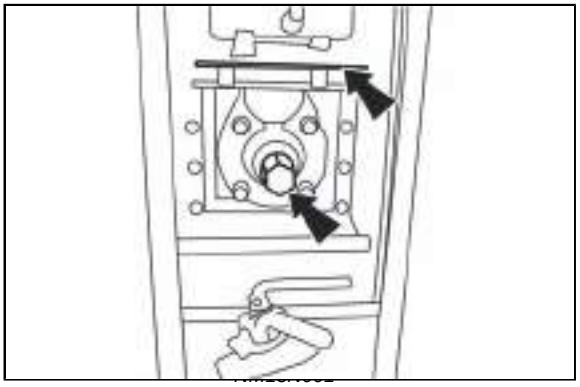
Hinge type	Allowed vertical static load	Ø of hinge pin (ball)	Hinge type	Allowed vertical static load	Ø of hinge pin (ball)
	1,500 kg	31 mm		2,000 kg	38 mm

Maximum weight of aggregated braked trailer or semitrailer must not exceed the value given on tractor's production plate and the data given in vehicle identification card. Maximum speed of the set is given by the maximum permitted speed of the slower vehicle of the set.

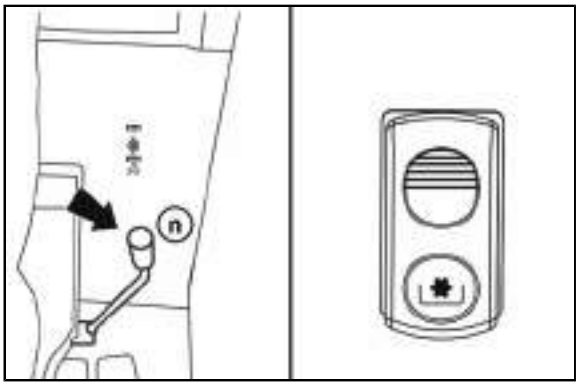
Working with PTO shaft

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.

1. When working with PTO shaft, mind proper attachment of all covers.
2. After completing the work, always mount the PTO shaft cover back.



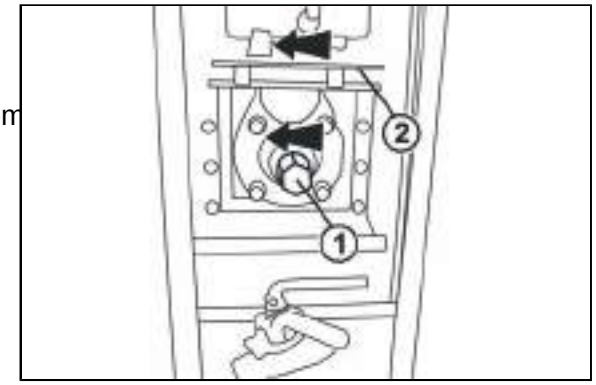
3. Connecting and disconnecting cardan shaft of aggregated machine to rear PTO shaft of the tractor to be done only with the engine at halt, disengaged PTO shaft clutch and dependent and independent revolutions of PTO shaft lever in (N) - neutral position!
4. Connecting and disconnecting cardan shaft of aggregated machine to front PTO shaft of tractor to be done always only with engine at standstill and disengaged PTO shaft!
5. Any repairs or cleaning of parts of aggregated machines driven by PTO shaft to be done only with engine at standstill, disengaged PTO shaft clutch and dependent and independent PTO shaft revolutions lever in (N) - neutral position.
6. After ending the works with rear PTO shaft it is necessary to shift dependent and independent PTO shaft revolutions lever to (N) -neutral position.



MHS16N024

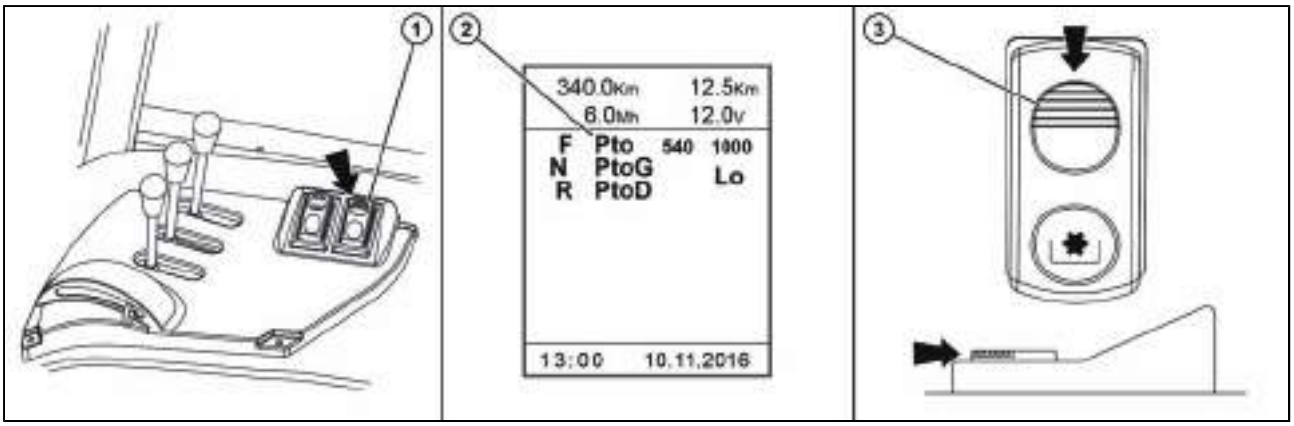
PTO shaft covers

The cover of PTO shaft (1) can be demounted by unscrewing the cover in the direction of arrows.
The cover of PTO shaft (2) must be pushed in the direction of and arrow and tilted over in the direction from tractor for working with rear PTO shaft.



NM13N003

Switching of the rear PTO shaft

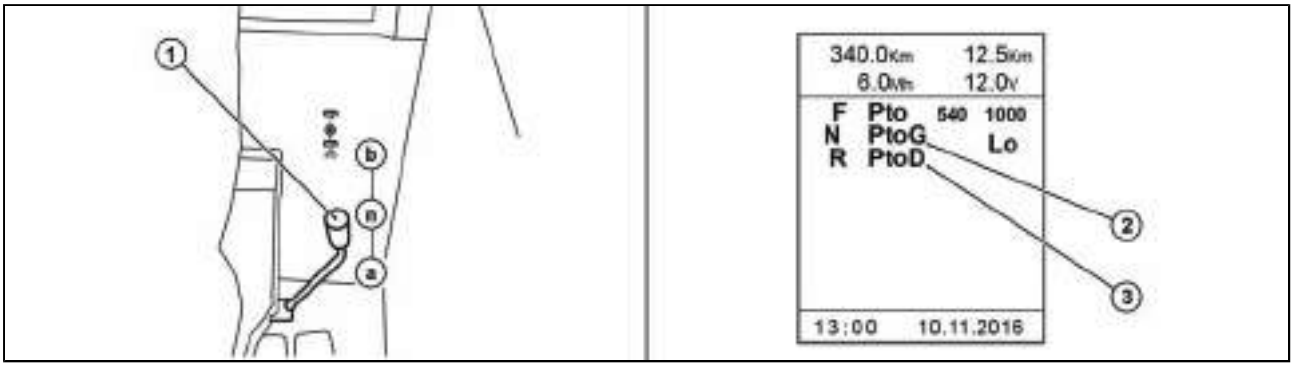


MHS16N109

Switching on and off of the rear PTO shaft is performed with the switch (1) located in the area on the right rear mudguard.
If the situation permits, engage the clutch of the PTO shaft with min. engine revolutions of 1,500 rpm.
Activation of the switch (1) is indicated by the red backlight of the Pto (2) symbol on the display of the instrument panel.
The switch is equipped with a mechanical lock (3) against accidental switching. To switch the switch, press the lock (3) in the direction of the arrow and then press the switch.

Do not activate the clutch switch (1) of the rear PTO shaft for dependent geared PTO revolutions!

Rear output shaft - shifting of dependent and independent speed of the shaft



MHS16N110

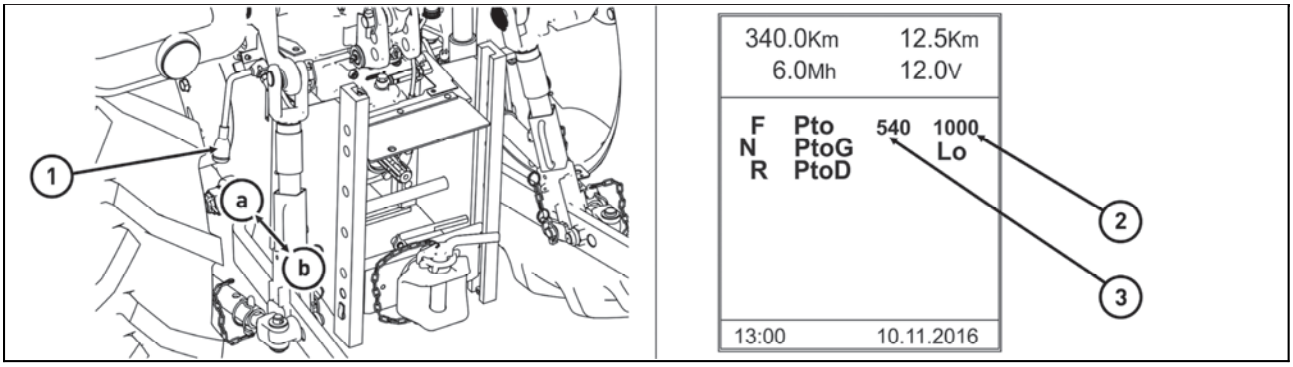
The rear PTO shaft is activated with the lever (1) located on the right left of the driver's seat.

a -	dependent revolutions of the PTO shaft drive through the gearbox - revolutions are dependent on the shifted gear
n -	neutral position
b -	independent revolutions of the PTO shaft drive - revolutions are dependent on the engine revolutions

Shifting is performed when the tractor is idling and when the PTO clutch is deactivated.

The lever (1) shifted in the position (a) dependent revolutions is indicated by the red backlight of the **PtoG** (2) symbol on the display of the instrument panel.
The lever (1) shifted in the position (a) independent revolutions is indicated by the red backlight of the **PtoD** (3) symbol on the display of the instrument panel.

PTO shaft revolutions 540 and 1000 rpm shifting lever



MHS16N111

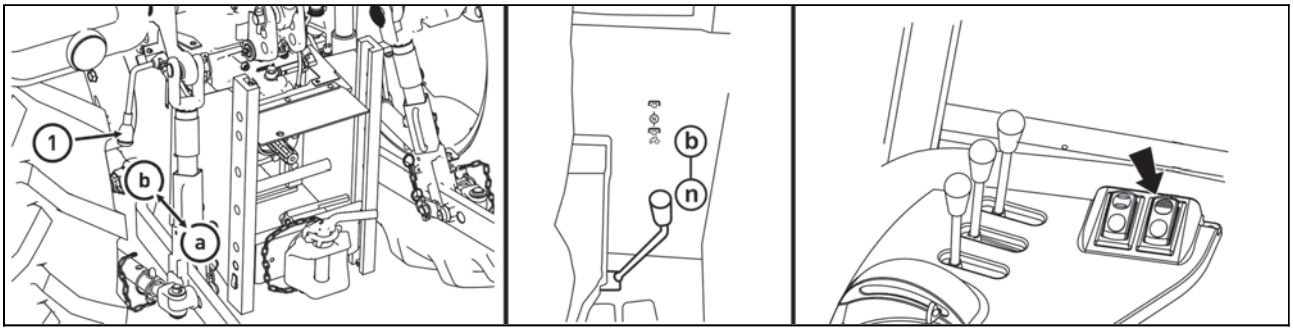
The shifting of 540 or 1,000 rpm of the rear PTO shaft is performed with the lever (1) located outside the cabin above the rear PTO shaft.

a -	540 rpm
b -	1,000 rpm

The shifting is performed when tractor is idling and the lever of switching of dependent and independent revolutions of the rear PTO shaft drive is in the position (n).
The lever (1) shifted in the position (a) 540 rpm is indicated by the green backlight of the **540** (3) symbol on the display of the instrument panel.
The lever (1) shifted in the position (b) 1,000 rpm is indicated by the green backlight of the **1000** (2) symbol on the display of the instrument panel.

PTO shaft revolutions need to be selected depending on the prescribed revolutions from aggregated machines.

Engaging rear PTO shaft - Independent revolutions



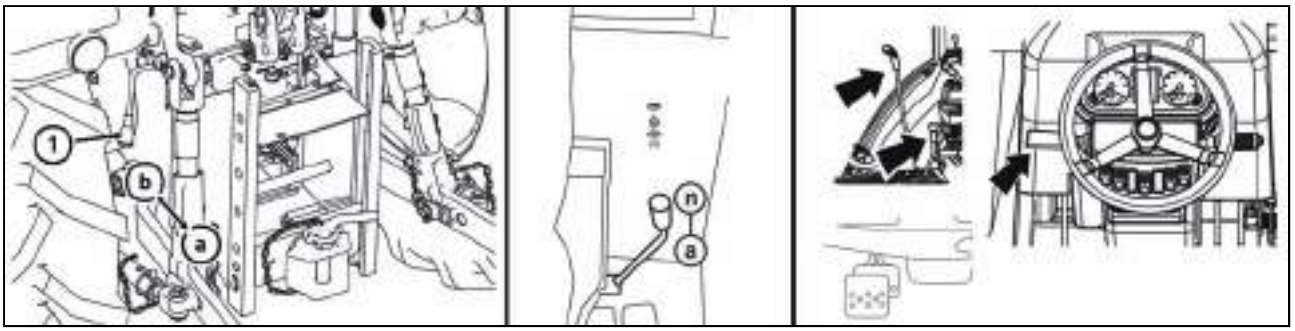
MHS16N112

At independent revolutions of the rear PTO shaft the number of PTO shaft revolutions depends on the number of engine revolutions.

With the engine running:
1. Select the number of revolutions of the PTO shaft.
2. The lever for activation of the PTO shaft drive must be moved to the position (b).
3. Activate the clutch switch of the rear PTO shaft on the panel on the right rear mudguard.

When the work with the PTO shaft is finished, move the lever of the PTO shaft drive to the position (n).
The number of revolutions of the independent PTO shaft see the Chapter Main technical parameters.

Engagement of rear PTO shaft - dependent revolutions



MHS16N113

At dependent revolutions of the rear PTO shaft, the number and sense of PTO shaft revolutions depends on the shifted position of the reversing lever, shifted gear and group of gears shifted by the reduction lever.

1. Select the number of revolutions of the PTO shaft.
2. The lever for activation of the PTO shaft drive must be moved to the position (a).
3. Shift the suitable gear by the main gear shift, suitable group of gears by the reduction lever and the driving direction by the reversion level.
4. When the tractor starts driving, the rear PTO shaft starts to rotate as well.

The clutch switch of the rear PTO shaft is not functional in this mode.
Press down the clutch pedal for short-term interruption of torque transmission from the engine.
Move the lever for activation of the PTO shaft drive to the position (n) or move the gear shift lever or road and reduced speeds shifting lever to the neutral position (n) for longer interruption of torque transmission from the engine.

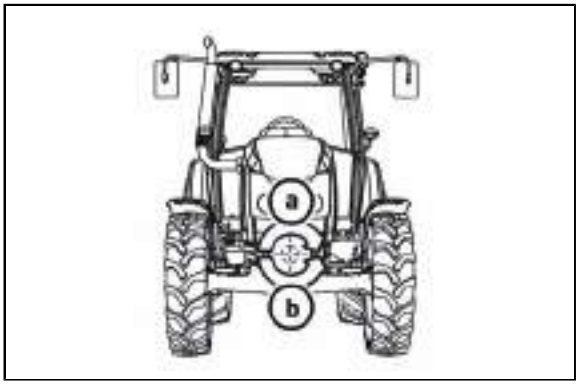
The number of revolutions of the dependent PTO shaft see the Chapter Main technical parameters.

The clutch switch of the PTO shaft is not functional when the lever of switching of the PTO shaft drive is in the position (a).

Front PTO shaft

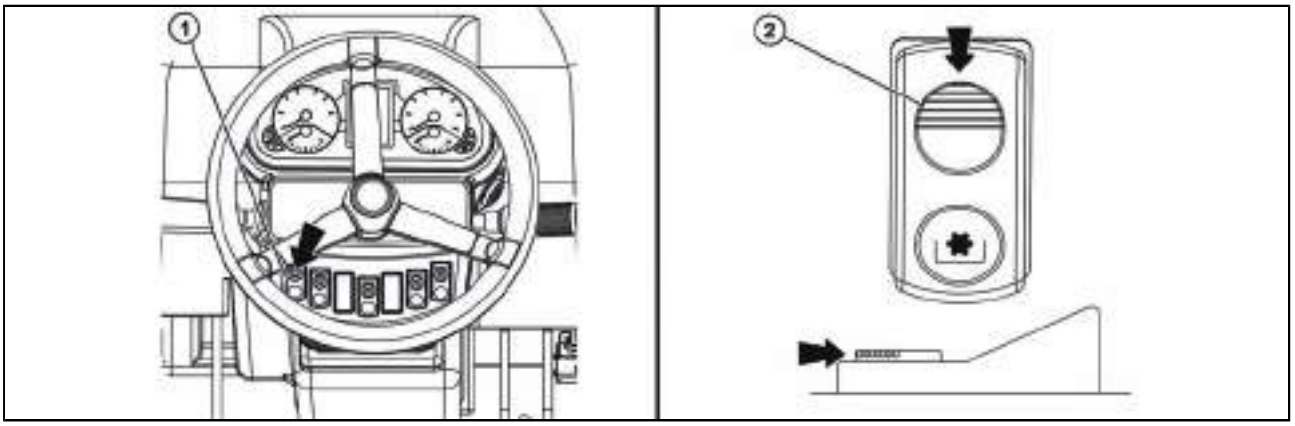
Front PTO shaft is equipped with a solid six or twenty-one splined end point and it comes only in design of 1,000 revolutions.
Tractor may be equipped with front PTO shaft with varied direction of spinning:

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



NM15D066

Engagement of the front output shaft Zuidberg



MHS16N114

The front output shaft Zuidberg can be engaged and disengaged using a switch on the dashboard. Activation of the switch is indicated by the illuminated symbol on the switch.
The switch is fitted with a mechanical lock (1) against unintentional switching on. When activating the switch, depress also the lock (1) in direction of the arrow.

The switch shall be off when starting the engine.

Maximum transmitted output

P15N038

PTO shaft	Transmitted power
front	
1,000 min^{-1}	full engine power
rear	
1,000 min^{-1}	full engine power
540 min^{-1}	full engine power

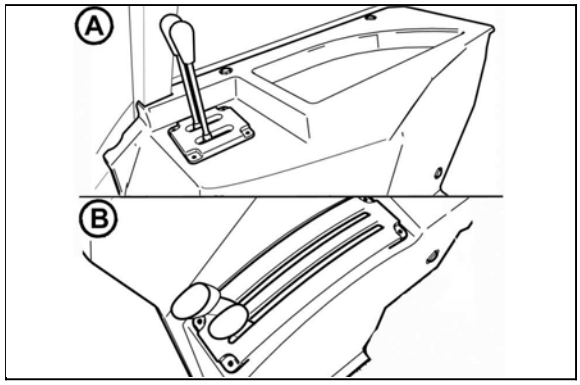
Drive of machines with greater inertia masses
Cardan shaft fro drive of these machines must be equipped with the socalled free wheel, which ensures the disconnection of torque transmission with retroactive effect from the machine to tractor.

HYDRAULIC SYSTEM

The hydraulic system is intended for lifting and lowering of agricultural machines and implements attached in the rear three point hitch.

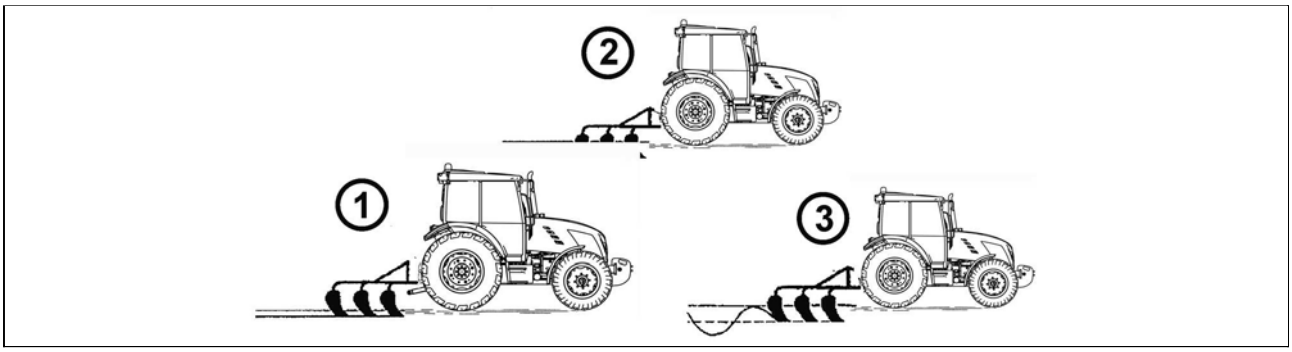
Hydraulic equipment
Is made up from internal and external circuit. The source of pressure oil is gear pump.
Oil is taken from common filling of gearbox and final drive housing. Hydraulic pump is unswitchable. Pump is in operation with engine running. Supplied amount 53 l/min.
The pressure derived in hydraulic set by hydraulic pump is limited by a locking valve to 19 MPa.

Hydraulic control panel
The hydraulic control panel is located in the compartment of the right mudguard.
The outer circuit of the hydraulics (A) enables control the outer hydraulic circuits (quick couplers) in the front and the rear part of the tractor and control of arms of the front three-point hinge.
The inner circuit of the hydraulics (B) enables control of the rear three-point hinge.



NM13N009

Means of internal hydraulic circuit regulation

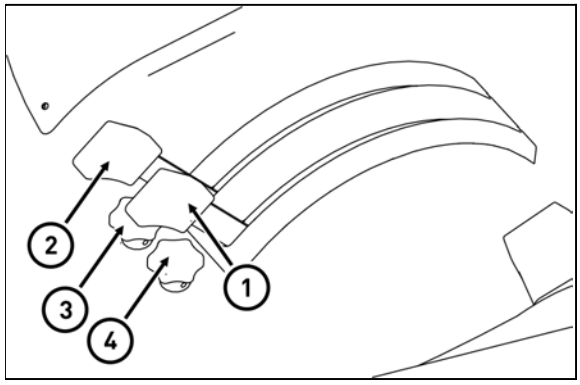


NM13N101

Hydraulic system enables three means of heave three-point linkage control. Position regulation (fig.1) where some tools connected in three-point linkage are kept automatically at constant height (position) to tractor. Mixed regulation (fig. 2) which is the combination of position and power regulation. It is suitable mostly for tillage on lots with different soil resistance. Power regulation (fig. 3), with which tools connected in three-point linkage are automatically vertically adjustable depending on the change in soil resistance. All means of regulation enable also work with tools which has supporting wheel in the so-called free (floating) position.

Internal hydraulic circuit control elements

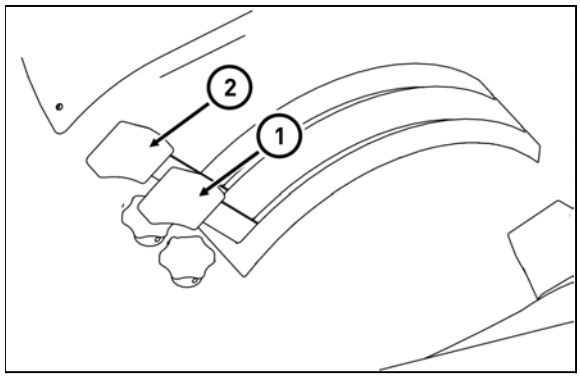
1. Lever for setting power or position regulations
2. Lever for setting floating position, height positioning of three-point linkage with position regulation or mixed regulation
3. Hydraulic sensitivity system control
4. Speed of three-point linkage lowering control



MHS16N030

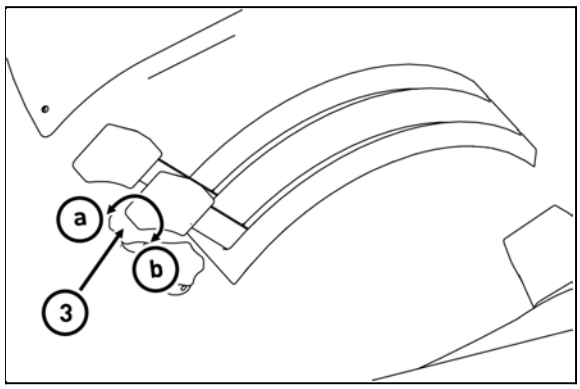
Free (floating) position

Free (floating) position enables work with a tool which has supporting wheel. The arms of rear three-point linkage are free in this position.
Shift lever (1) to front position.
Shift lever (2) to front position.



Hydraulic sensitivity system control

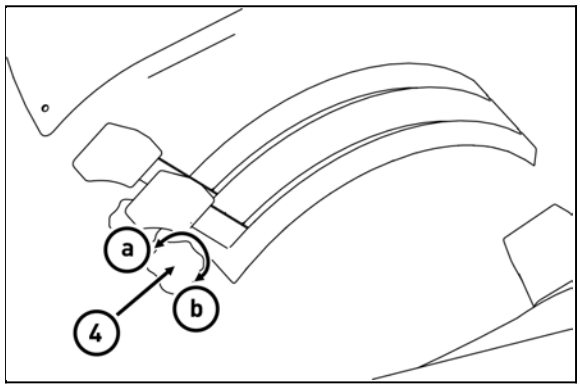
Hydraulic sensitivity system control (3) serves for setting hydraulic system sensitivity with power or mixed regulation. When turning the control in the direction (a), the sensitivity of the system increases, in (b) direction it decreases.



MHS16N032

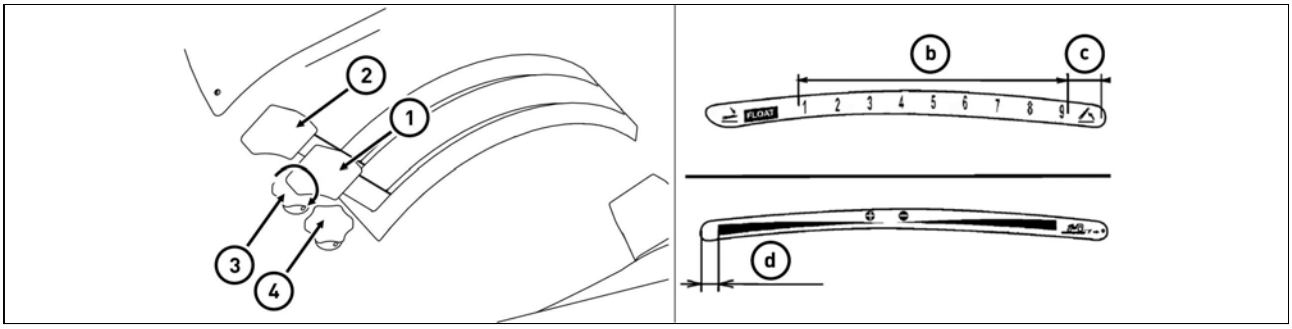
Speed of three-point linkage lowering control

Speed of three-point linkage lowering control (4) serves for setting the speed of lowering three-point linkage arms. When turning the control of speed of three-point linkage lowering in (b) direction the speed of three-point linkage arms lowering decreases, in (a) direction it increases. If we turn speed of lowering control (b) to stop, the arms of three-point linkage cannot be lowered.



mhs16n033

Position regulation of rear three-point linkage heave

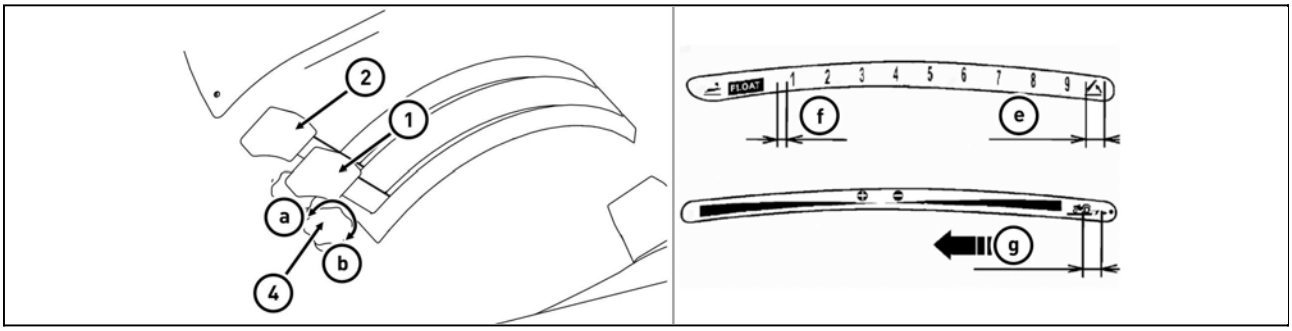


MHS16N034

Position regulation of rear three-point linkage heave is a means of regulation with which the tools connected in three-point linkage is kept automatically at constant height (position) to tractor. Shift lever (1) to front position (d). Perform vertical adjustment of rear three-point linkage with a lever (2) in (b) range. Height setting is smooth in the range of 1-9. With number 1, there are three-point linkage arms in lower position, with number 9 in upmost position. Position (c) is a transport position, in which tools connected in rear three-point linkage are heaved to maximum.

For transporting tools connected in rear three-point linkage always use position regulation. After lifting tools to transport position, close oil flow through hydraulics to stop by turning the control of speed of three-point linkage lowering (3) in the direction of an arrow. If tools hinged in three-point linkage cannot be lowered in transport position, check the position of the speed of lowering control (3) - turn it against the direction of an arrow. If tools hinged in rear three-point linkage are long and heavy, there can be blockage of three-point linkage arms in transport position during transport. If lowering speed control (3) is permitted and still a tool it cannot be lowered, move the lever (2) to floating position (c) for a short time and immediately return to the lowering range (b). The arms of rear three-point linkage start dropping according to a set lever (2).

Power regulation of three-point linkage heave

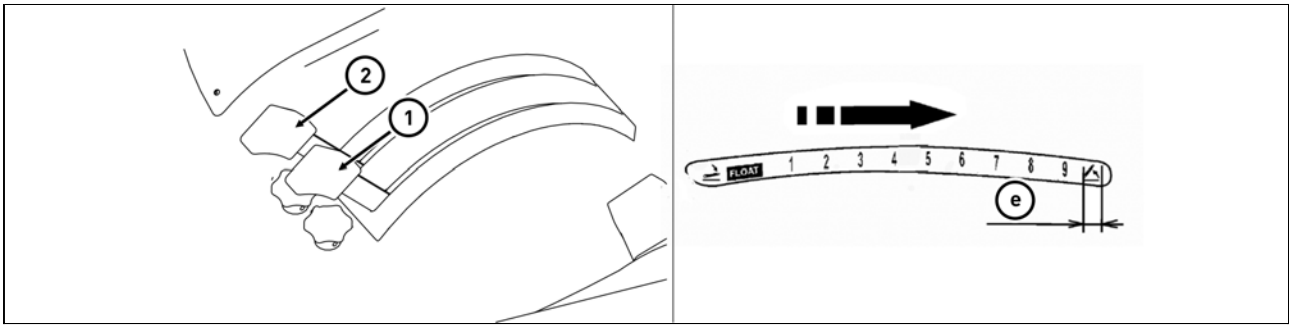


MHS16N035

Power regulation of three-point linkage heave is a means of regulation with which the tools connected in rear three-point linkage is automatically vertically readjusted depending on the change in soil resistance.
Place lever (2) to (f) position. Shift lever (1) to (g) position, start tractor and by shifting lever (1) from (g) position in the direction of an arrow, set the depth of oil cultivation (in (g) position, the depth of soil cultivation is smallest).
As soon as you determine the depth of soil cultivation, the lever (1) must be kept in constant position (1) and at the end of the row to always heave tool connected in rear three-point linkage by only shifting the lever (2) to (e) position. By shifting lever (2) to (f) position, you will return tool back to working position.

If there is oscillation of rear three-point linkage due to variable soil resistance, this can be limited by setting lower sensitivity of hydraulic system by turning the control (4) in the direction of an arrow.

Mixed regulation of three-point linkage heave

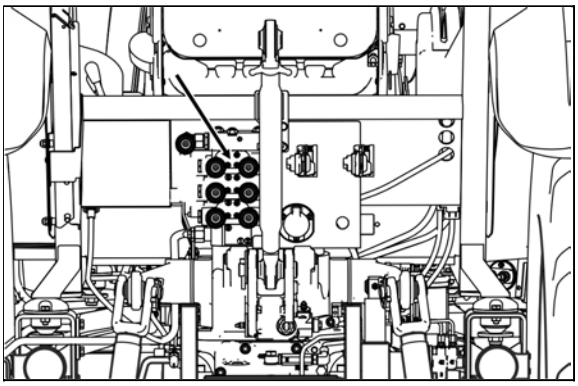


MHS16N036

Mixed regulation of three-point linkage heave is a means of regulation with which the tools connected in rear three-point linkage is automatically vertically adjusted depending on the change in soil resistance, while it is prevented for the depth to grow in soil cultivation with smaller soil resistance. The depth setting of soil cultivation is done with a lever (1) as is the case with Power regulation of three-point linkage heave. Shift lever (2) then in the direction of an arrow to the moment, when three-point linkage arms start lifting lightly. Mixed regulation is set by this. Tools connected in rear three-point linkage can be lifted only by shifting the lever (2) to (e) position at the end of a row. Tool is returned back to working position by shifting the lever (2) to original setting.

External hydraulic circuit

Supplies pressure oil for hydraulic devices connected to external outlet of hydraulics finished with quick-couplers. Quick-coupler sockets with 12,5 mm clearance correspond to international ISO recommendation.



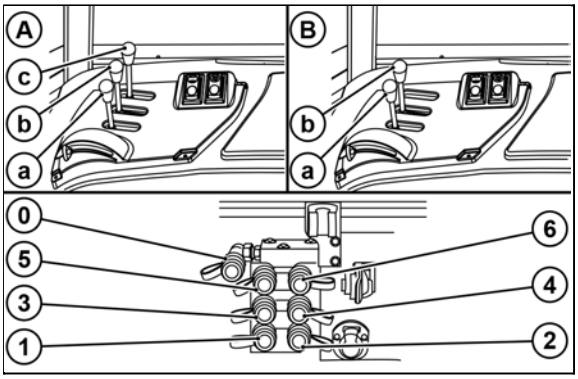
MHS16N037

Extrernal hydraulic circuit control elements

The control levers of the outer hydraulic circuits are located on the right mudguard of the cabin.
These distributors of the outer hydraulic circuit can be mounted according to the tractor equipment.
A - three-section distributor
B - two-section distributor

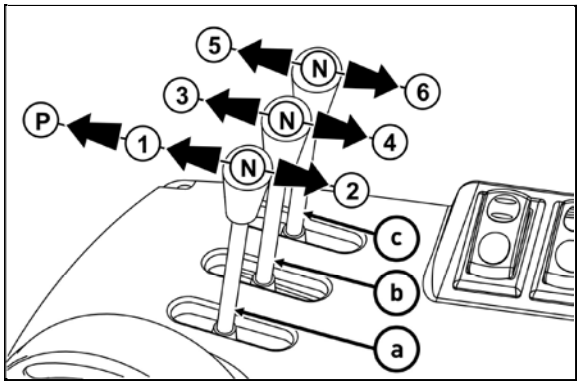
a - the lever (a) controls quick couplers (1) and (2)
b - the lever (b) controls quick couplers (3) and (4)
c - the lever (c) controls quick couplers (5) and (6)

The quick coupler (0) is directly connected with the area of the distributor and is designed for return oil from outer hydraulic appliances (e.g., from rotation hydro engines, etc.).



MHS16N088

Function of control levers of the outer hydraulic circuit of the three-section distributor



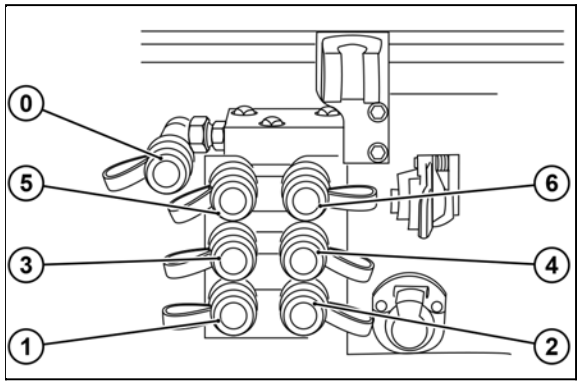
MHS16N089

Function of the lever (a)
N - neutral position. Outlets to the quick coupler (1) and (2) are closed and oil in the connected hydraulic appliance is blocked. The lever (a) is locked in this position.
1 - Pressure in the quick coupler (1). The quick coupler (2) is connected with the waste. When released, it returns into its original position (N).
2 - Pressure in the quick coupler (2). The quick coupler (1) is connected with the waste. When released, it returns into its original position (N).
P - Floating position. Both quick couplers (1) and (2) are connected with the waste and the oil can smoothly flow in both directions. The lever (a) is locked in this position.

Function of the lever (b)
N - neutral position. Outlets to the quick coupler (3) and (4) are closed and oil in the connected hydraulic appliance is blocked. The lever (b) is locked in this position.
3 - Pressure in the quick coupler (3). The quick coupler (4) is connected with the waste. When released, it returns into its original position (N).
4 - Pressure in the quick coupler (4). The quick coupler (3) is connected with the waste. When released, it returns into its original position (N).

Function of the lever (c)
N - neutral position. Outlets to the quick coupler (5) and (6) are closed and oil in the connected hydraulic appliance is blocked. The lever (c) is locked in this position.
5 - Pressure in the quick coupler (5). The quick coupler (6) is connected with the waste. When released, it returns into its original position (N).
6 - Pressure in the quick coupler (6). The quick coupler (5) is connected with the waste. When released, it returns into its original position (N).

Quick-coupler (0) is directly connected with the area of final house driving and is designed for returned oil from external hydraulic devices (e.g. from rotation hydro engines etc.).



MHS16N090

Two-section switchboard external hydraulic circuit controlling levers function

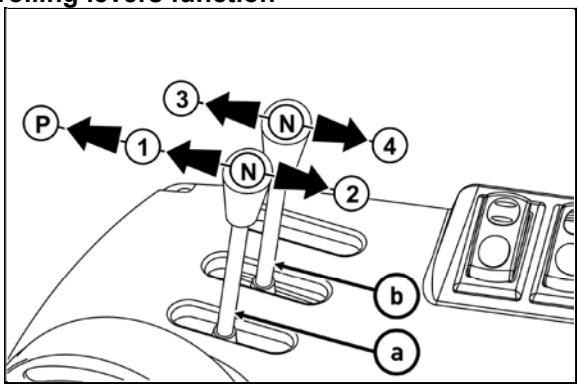
Lever (a) function

N -Neutral position. Outlets to a quick-coupler (1) and (2) are closed and oil in the connected hydraulic device is locked. Lever (a) is locked in this position.

1 - Pressure in quick-coupler (1). Quick-coupler (2) is connected with waste. After release, lever returns to position (N).

2 - Pressure in quick-coupler (2). Quick-coupler (1) is connected with waste. After release, lever returns to position (N).

P -Floating position. Both quick-couplers (1) a (2) are connected with waste and oil can freely flow in them in both directions. Lever (a) is locked in this position.



MHS16N091

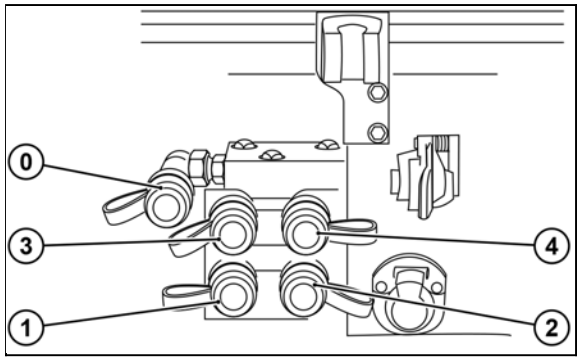
Lever (b) function

N -Neutral position. Outlets to quick-couplers (3) and (4) are locked and the oil in the connected hydraulic device is blocked. Lever (b) is locked in this position.

3 - Pressure in quick-coupler (3). Quick-coupler (4) is connected with waste. After release, lever returns to position (N).

4 - Pressure in quick-coupler (4). Quick-coupler (3) is connected with waste. After release, lever returns to position (N).

Quick-coupler (0) is directly connected with the area of final house driving and is designed for returned oil from external hydraulic devices (e.g. from rotation hydro engines etc.).



MHS16N092

Quick-couplers engagement and disengagement

With quick-couplers engagement and disengagement take greater care with regard for residualoil, remaining in socket or on a plug of a quick-coupler.This residual oil must be removed from ecological reasons after each quick-couplers disconnection with any textile material.

C220

HYDRAULIC SYSTEM

Connecting machines and tools to External hydraulic circuit
Connection of the double-acting cylinder
Always connect the double-acting cylinder to quick couplers of one section.

Connection of machines and tools assembled from more parts
While working with machines assembled from more parts (combinators, levellers and harrows) where extreme frames tilted during transport to the vertical position with individual hydraulic cylinders controlled by the outer circuit of the hydraulics are articulated to the central frame, it is suitable to connect the lifting branches of cylinders to quick couplers (2) or (4) that are equipped with the return valve.

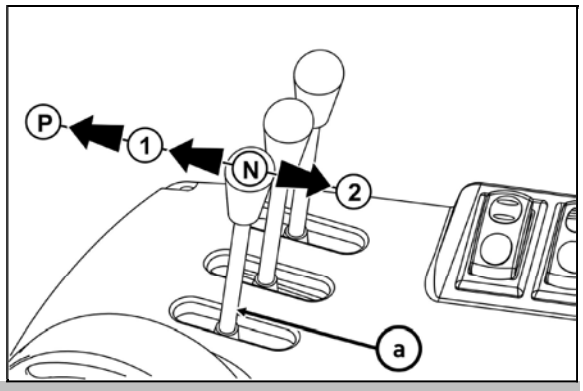
Connection of the rotation hydro engine
If the rotation hydro engine is connected on the outer outlet of the hydraulics, its reversible branch must always be connected to quick couplers (0).

Connection of the reversing rotation hydro engine
By reason of its function, the reversing rotation hydro engine must be connected to quick couplers of one section. When the hydro engine is connected, safety valves that reliably reduce pressure peaks during machine run-out must be added to both branches. The waste from these valves is connected to the quick coupler (0).

The trailer machines utilizing the oil filling of the outer hydraulic circuit must be filled with the same type of oil which is recommended for the transmission system of the tractor!
Quick coupler plugs of the trailer machines must be thoroughly cleaned before connection.

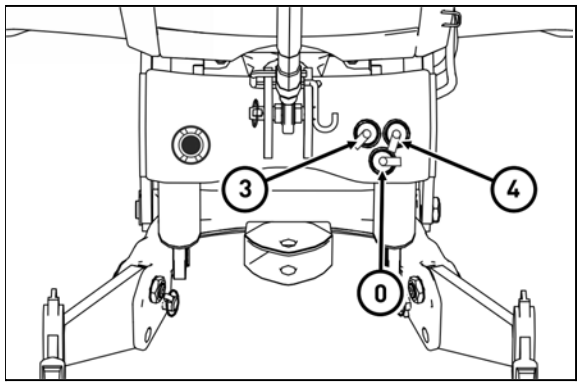
Control of the front 3-point hitch
The hitch is equipped with two single-acting hydraulic cylinders, into which the oil is supplied from the auxiliary hydraulic distributor. The lifting and lowering is performed by the control lever (a) of the auxiliary distributor.

position 1	lifting
position 2	lowering
position N	hitch locking
position P	do not use it



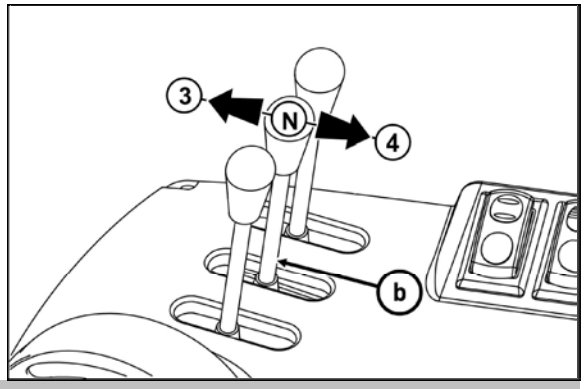
If the tractor is equipped with the front three-point hinge, the lever (a) is used for its control.
The quick couplers must not be connected when the front three-point hinge is used because they are pressed together with the front three-point hinge!
After work with the front three-point hinge, the arms of the front three-point hinge must be lifted to the transport position and the lever of the cock of the front three-point hinge must be moved to the 'closed' position.

Front outlets of the external hydraulic circuit
On request, the tractor can be equipped with external hydraulic circuit outlets located in the front.
The quick couplings (3) and (4) are the pressure couplings, the quick coupling (0) is directly connected to the space of the axle final drive housing and is designed so that the return oil can flow back from the external hydraulic appliances.
The quick couplings sockets with the 12.5 mm inside diameter comply with the international ISO recommendations.



NM15D061

Control of the external hydraulic circuit front outlets
The front outlets of the external hydraulic circuit are controlled by a lever (b) which has four positions:

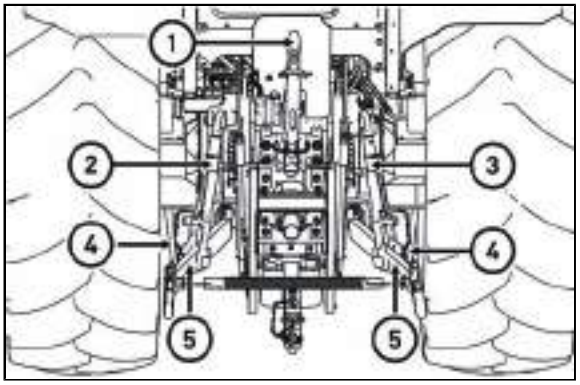


N - neutral position. Outlets to the quick coupler (3) and (4) are closed and oil in the connected hydraulic appliance is blocked. The lever (b) is locked in this position.
3 - Pressure in the quick coupler (3). The quick coupler (4) is connected with the waste. When released, it returns into its original position (N).
4 - Pressure in the quick coupler (4). The quick coupler (3) is connected with the waste. When released, it returns into its original position (N).

The quick couplers (3) and (4) in the front part of the tractor are connected with the quick couplers (3) and (4) in the rear part of the tractor. During operation of the tractor, only one pair of the quick couplers can be used!

HITCHES

Rear three-point linkage
It is used for connection of the carried half-carried agricultural machines and tools with hitch points of category II according to ISO.



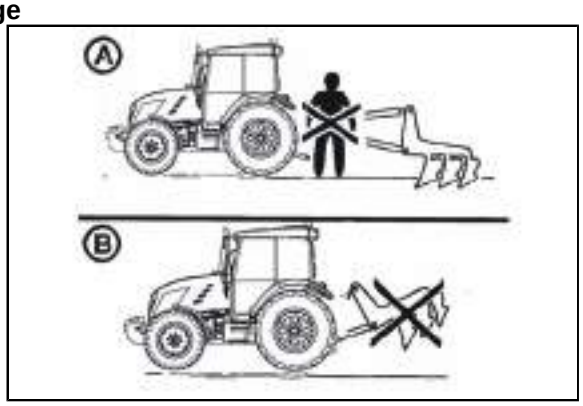
NM13N053

category II	
hinge axis length	870 mm
diameter of holes of connecting balls of the lower pull rods according to ISO	28 mm
hole diameter of upper pull rod	25 mm

1. Upper pull rod
2. Lifting pull rod left
3. Lifting pull rod right
4. Limiting pull rods
5. Lower pull rods

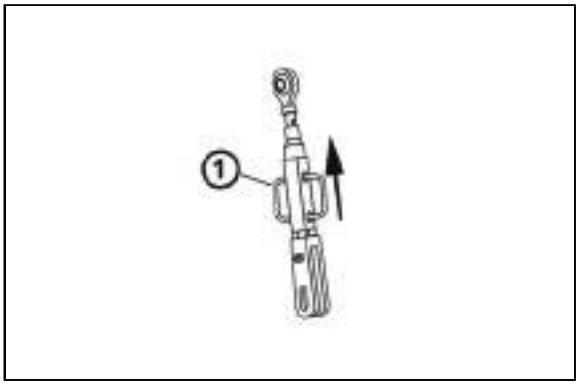
Safety principles when working with a three-point linkage

Persons who are not charged with work with auxiliary device of a tractor must not stand between a tractor and connected machinery (tools) - (A). Do not park tractor with mounted tools in a lifted position (B). When driving without tools it is necessary to connect lower draw bars (5) by springs and upper draw bars (1) to be placed to a flexible linkage! When transporting tools it is necessary to adjust limiting draw bars (4) of lower draw bars so that there would be no unwanted side movement of tools!



NM13N102

Vertical adjusment of lifting draw bars
For vertical adjustment of lifting draw bars protrude a beam (1) in the direction of an arrow and by turning a beam do the setting.

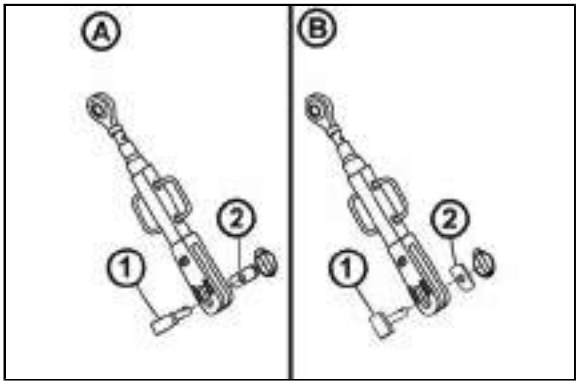


E453

Fixed and free position of lower hydraulic draw bars

Fixed position of lower draw bars of hydraulics fig. (A): The head of the pin (1) and a pad (2) are mounted horizontally.

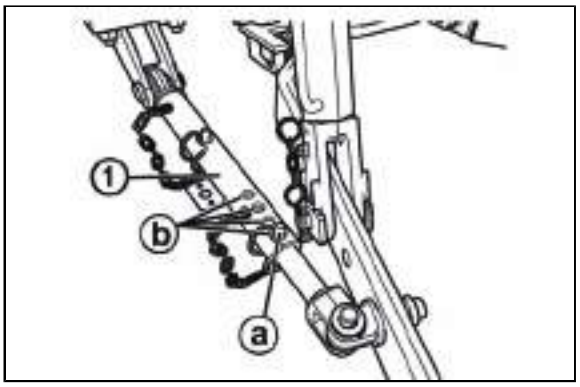
Free position of lower draw bars of hydraulics fig. (B): The head of the pin (1) and a pad (2) are mounted vertically.
Free position enables free connection of a tractor and agriculture tools. Both ends of draw bars can in this case move freely vertically one against another.



E454

Limiting draw bars

Limiting draw bars (1) limit, or completely exclude side swing of lower draw bars.
The adjustment of left and right limiting draw bar is done by inserting a peg and to some of the holes (b).

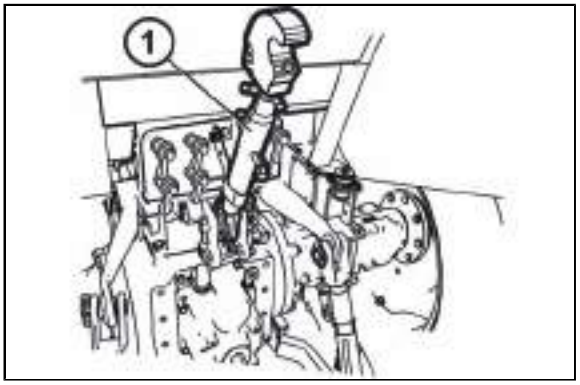


NM13N054

Both limiting draw bars must be mounted at all times.

Upper draw bar

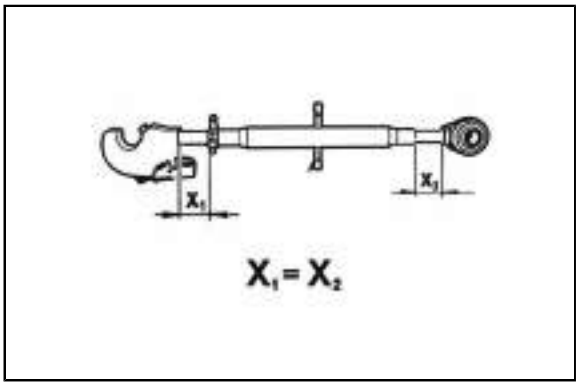
Upper draw bar (1) is horizontally adjustable. It is connected to a tractor to one of the four holes of the bracket, which transfer the power from the connected tools to torque rod in the cover of regulation hydraulics.



NM13N055

When transporting the tools, it is necessary to relocate upper draw bar to holes (c), so that overload of kinematic system of lifting hydraulics, or the fall of the connected machine.

When prolonging an upper draw bar, it is necessary to mind both joints to be unscrewed from the tube of the draw bar to the same length.

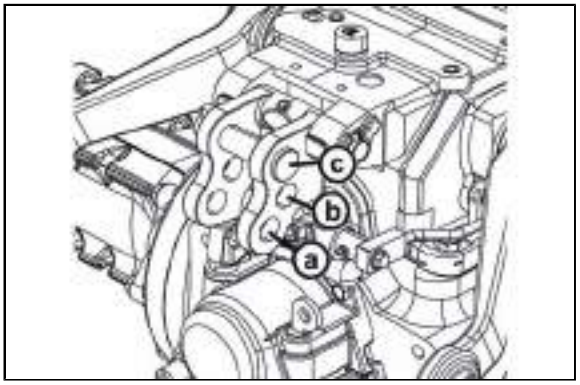


NM13N056

HITCHES

Selection of holes in bracket

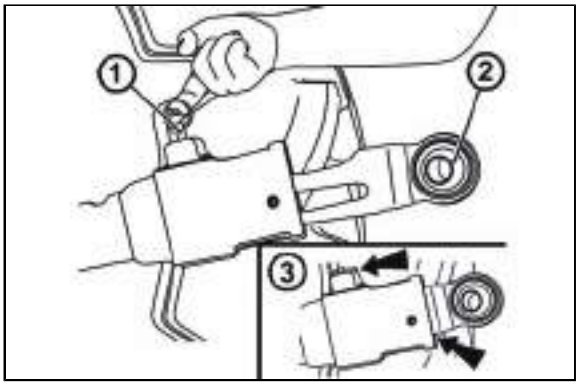
The connection of upper draw bar to some of the holes (a), (b) or (c) of bracket influences:
the sensitivity of hydraulic control. With connected draw bar in a hole (a) the sensitivity of regulation is the greatest, in (c) hole the smallest.



NM13N057

***Lower draw bar with slipping out end pieces**

Lower draw bar of linkages are equipped with semi-automatic protruding CBM end pieces. They enable connecting of tools behind a tractor. After protruding securing pegs (1) slip the end pieces out (2). Slipped-out end pieces are attached to tightening pins of mounted tools.
After connecting the mounted tools, release the arms of hydraulics. By lowering them down and reverse travel of a tractor, endpoints (2) are slid onto draw bars and automatically are locked in working position by means of locking pegs (1).

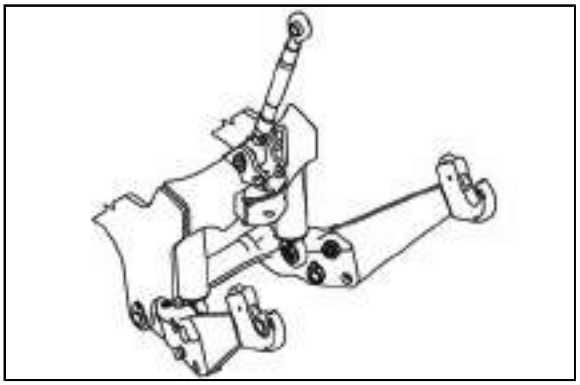


E459

Always check the position of slipped-out end pieces and locking pegs, see fig. (3).

***Front three-point hitch**

It is designed for connecting the frontally carried agricultural machines according to ISO 8759-2.



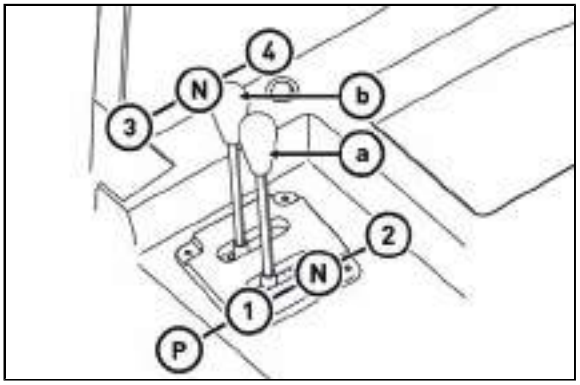
E461

During transport of the carried tools, the hinge must always be hydraulically secured in the lifted position by valves located on the left side of the tractor above the front axle. This hydraulic securing is recommended even in the case when no machine is connected to the three-point hinge.

Controlling front three-point hitch

The hitch is equipped with two single acting hydraulic cylinders which are supplied with oil from an additional hydraulic distributor. To lift or lower, use lever (a) of the additional distributor.

1 position	lifting
2 position	lowering
N position	locking the hitch
P position	not to be used

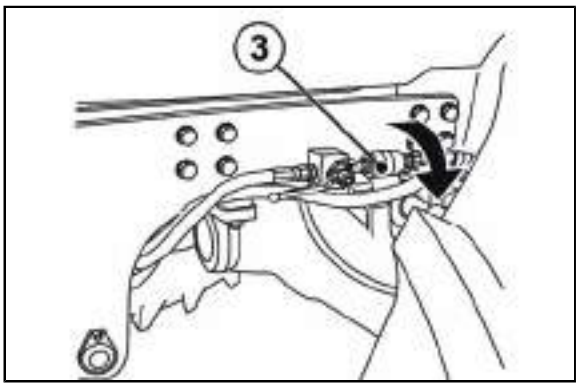


NM13N019

If the tractor is equipped with front three-point hitch, use lever (a) to control it. When the front three-point hitch is used, quick couplers cannot be connected as they are pressured together with the front three-point hitch! When you finish using the front three-point hitch and want to use the section with quick couplers 1 and 2 with connection to the front three-point hitch, raise the arms of the front three-point hitch to the transport position and move the front three-point hitch lever to the 'locked' position.

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.

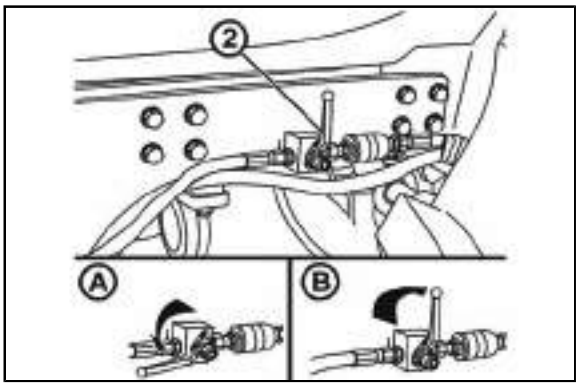


X463

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

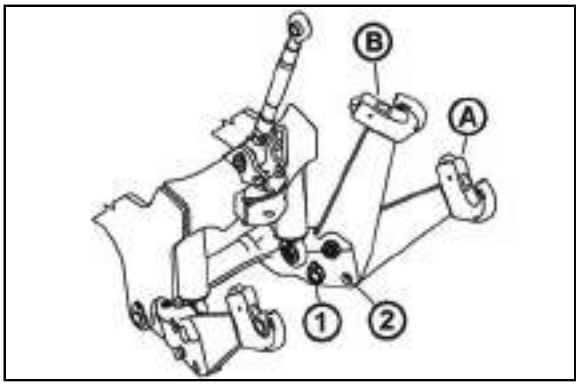


X464

HITCHES

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



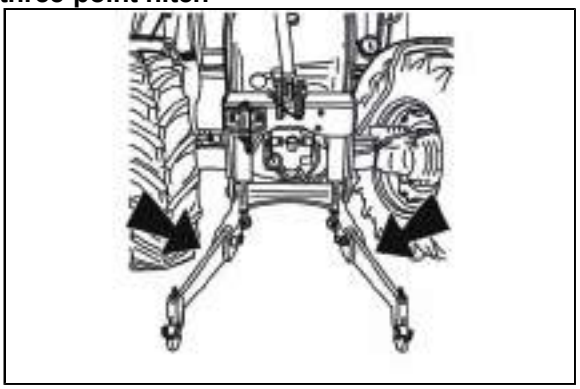
E466

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

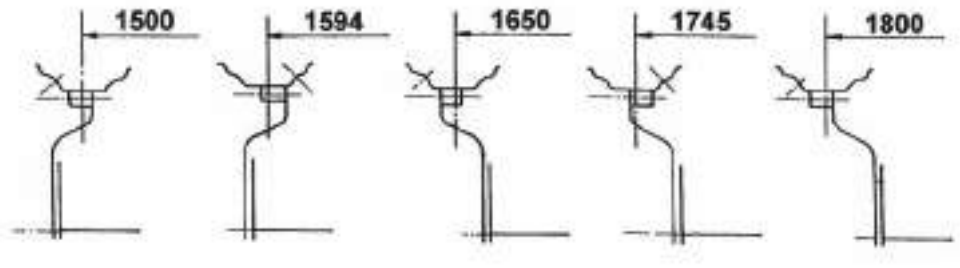
The maximum permissible speed of the tractor with agricultural machines attached to the front three-point hitch is 15 km.h^{-1}. If no implement or weight is attached to the front three-point hitch, we recommend you to lift the lower lifting draw-bars to the transport position.



FH12N066

WHEEL TRACK CHANGE

Change of front wheels track with front drive axle



G503a_2

Change of wheel track is done by a change of rim and disc position.

Secure the tractor against movement first, heave the axle with a hoist and support.

- Demount front wheels.
- Unscrew nuts of screws connecting a disc with rim and protrude the screws.
- Change wheel track by setting the rim to a requested position.
- Mount the screws back with pads and lock with nuts.
- Tighten nuts with a torque of 270 - 300 Nm.
- The nut of front wheels to be tightened with a torque of 250 - 290 Nm.
- After every release of a foot joint, tighten the screws to a prescribed value.
- After travelling a distance of 100 m with an unloaded tractor, retighten the joints to a prescribed torque.
- After tractor run-in tighten the joints after 3 Mh.
- After 10 Mh retest the nuts of discs and foots of wheel rim.

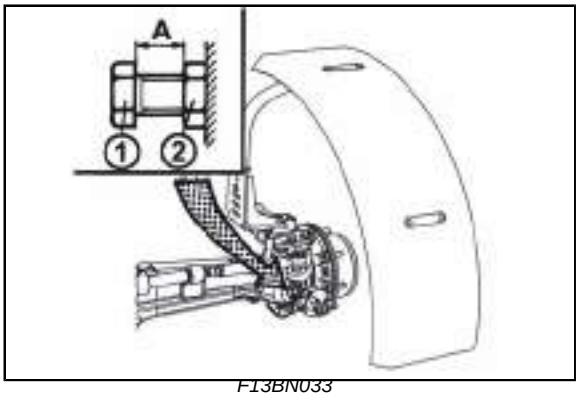
WHEEL TRACK CHANGE

Setting wheel stops with front drive axle
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.

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.

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.

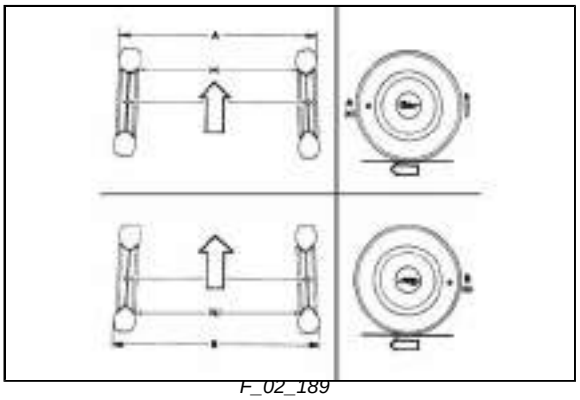


F13BN033

Front wheels toe-in
The value of toe-in of front wheels taken on the rim of a tractor:

- **With driven axle 0 to 4 mm**

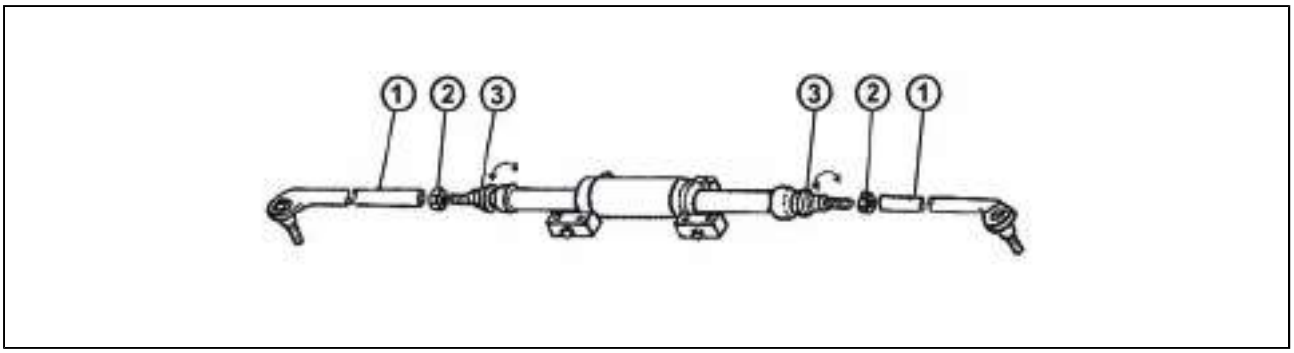
'**S'** toe-in is given by the difference of measured values:
S = b - a.


F_02_189

Before checking toe-in, it is necessary to check or adjust the clearance in front wheels bearings and inflate front tires to prescribed pressure.
The measurement of toe-in is done on wheel rims.

WHEEL TRACK CHANGE

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



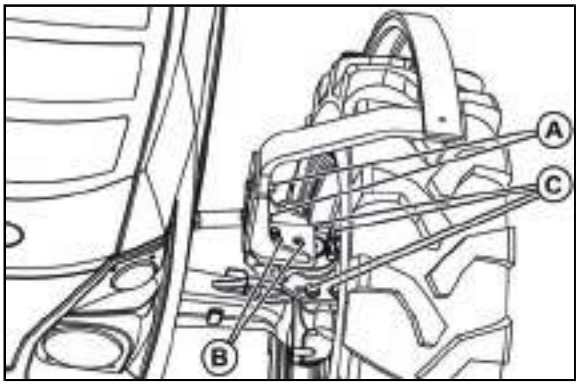
C507

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

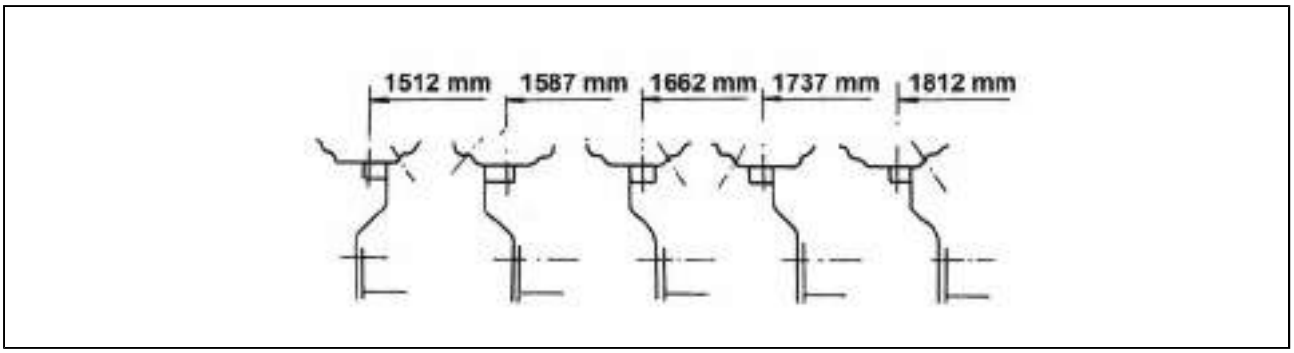
The mudguards of the front drive axle are in the version together with the swivelling brackets. The swivelling brackets enable swivelling of the front wheels to the maximum steering angle. The mudguards are on the adjustable holders where the height (by moving the screws (a) to other holes) and side (by moving the screws (b) or (c) to other holes) can be adjusted.



MGP16N010

WHEEL TRACK CHANGE

Rear wheel track change



MHS16N068

Before heaving do not forget to lock the tractor against movement by making front wheels stable!

After the change of wheel track, tighten all the screws connecting the disc with a rim by a torque of 270 - 300 Nm and nuts of screws connecting a disc with wheel shaft with a torque of 230 - 245 Nm.

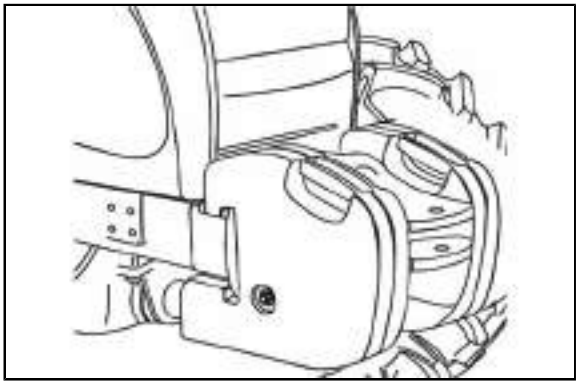
- Tighten the screws to a prescribed value after every release of foot joint.
- After travelling a distance of 100 m with an unloaded tractor retighten the joints again to a prescribed torque.
- After loading the tractor, tighten the joints after 3 Mh.
- Retest the tightening of disc nuts and foots of wheel rims after 10 Mh.
- Until you travel first 100 Mh, check the disc nuts and foot of front and rear wheels tightening often (at least 6 times in the first 100 Mh).
- Continue retesting the disc nuts and foot rims of front and rear wheels tightening always after working every 100 Mh.

BALLAST WEIGHTS

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

Ballast weights in front of bonnet grill

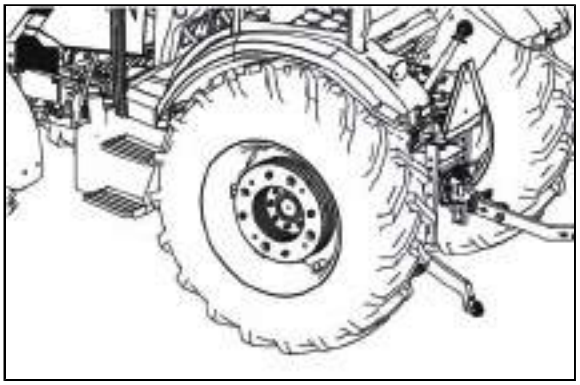
Combination of weights (pcs)	Weights weight (kg)	
4+1	**4**x50 + 66	**266**



NM13N072

Weights of rear wheels

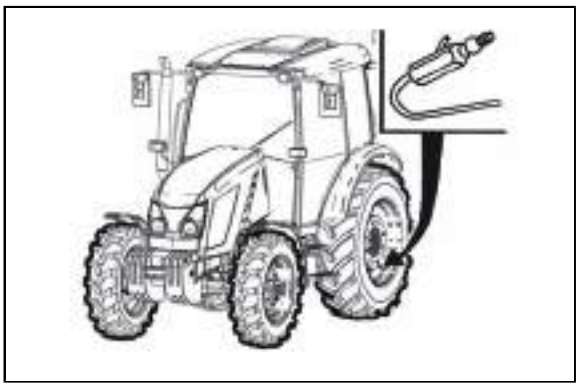
Combination of weights (pcs)	Weights (kg)	
4+4	8x30	**240**



NM14D026

Valve for filling tires with liquid

All air locks of rear wheels are equipped with a valve, which enables to fill air locks with liquid when using an adapter.



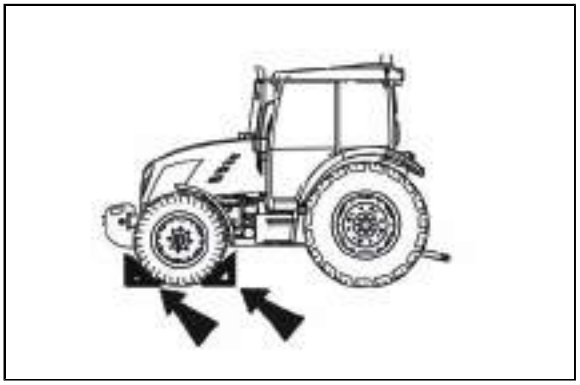
NM13N104

Tubeless tires are not filled with liquid!
Filling air locks of front tires and double mounting of rear wheels by liquid is not permitted!

BALLAST WEIGHTS

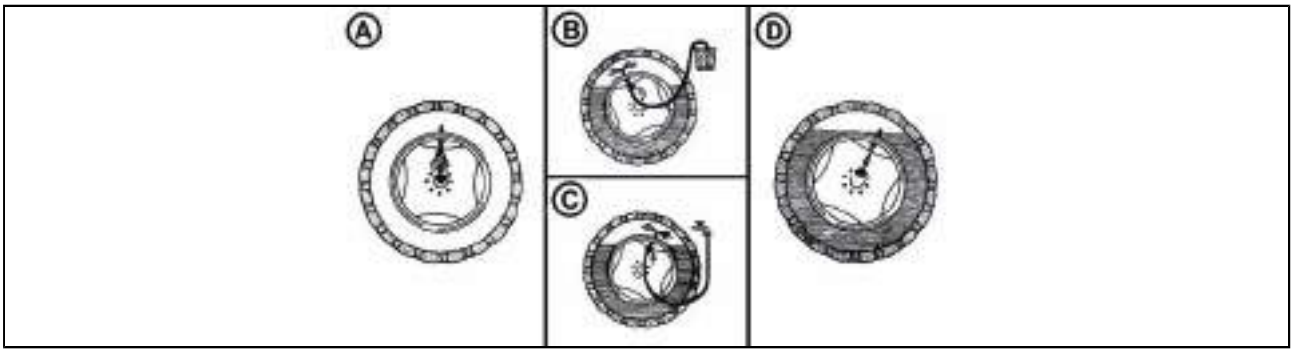
Making front wheels stable

Do not forget to lock a tractor against motion by making front wheels stable before lifting the rear wheels!



NM13N103

Filling tires with liquid procedure

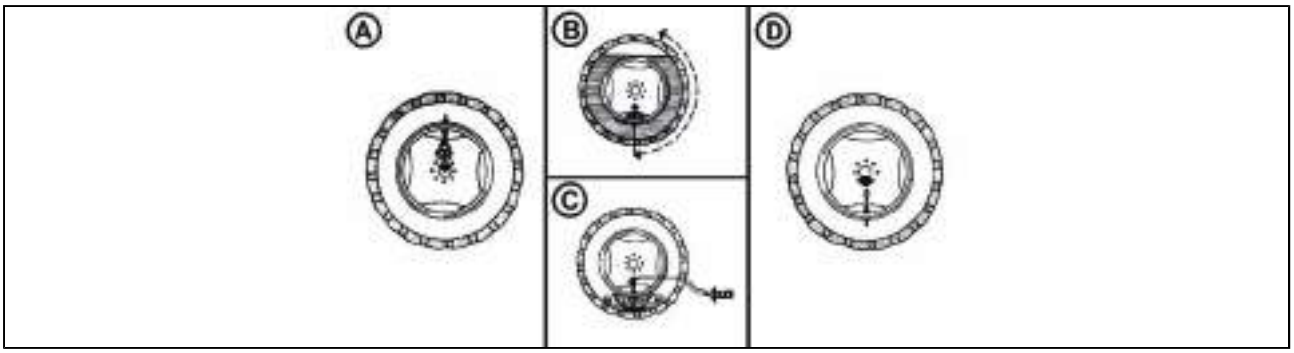


E556

1. by heaving the tractor relieve tire and turn the wheel valve up (A)
2. let out air and unscrew the valve insertion
3. screw in the adapter for water filling, muzzle a hose for liquid inlet
4. fill the tire with a prescribed amount of liquid
5. it is possible to use head tank (B) or you can do the filling under pressure (C)
6. remove the hose and unscrew the adapter for water filling
7. screw in the insertion of a valve and inflate the tire to prescribed pressure (D)
8. after inflating screw in a protective cap on the valve
9. fill the second tire in the same way

BALLAST WEIGHTS

Draining liquid from tires procedure



E557

1. by heaving the tractor relieve tire and turn the wheel valve up (A)
2. let out air and unscrew the valve insertion, turn the wheel valve down
3. remove remaining liquid after screwing in an adapter for filling with water by inlet of compressed air (C)
4. blow the liquid out for so long that the liquid stops flowing out through the tube of air adapter
5. unscrew the adapter for water filling
6. screw back in the air part of valve and inflate the tire to prescribed pressure (D)
7. screw in a protective cap to a valve
8. drain the liquid similarly also from the second tire

When draining the liquid, there can be decompression in the tire. Therefore turn the wheel a bit from time to time to get the valve into upper position (B)!

Anti-freezing solution for filling tires

Water for solution preparation	Calcium chloride $CaCl_2$	Calcium hydroxide	Solution density with 20°C	Chill point approximately	Total volume	Auxiliary weights
(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. Calcium chloride ($CaCl_2$) is added to water not the other way round!
2. The solution is not hazardous but it needs to be handled with care. Wash spilled drops with clean water.
3. Allow the solution to cool off before filling. Keep the prescribe amount of calcium hydroxide.
4. The solution must not come in touch with metallic parts and electric installation! The solution is nor harmful to the valve of air lock.
5. Anti-freezing solution prepared in the given composition must not be used in cooling system!
6. Dispose of anti-freezing solutions as of special waste after draining!

NOTES

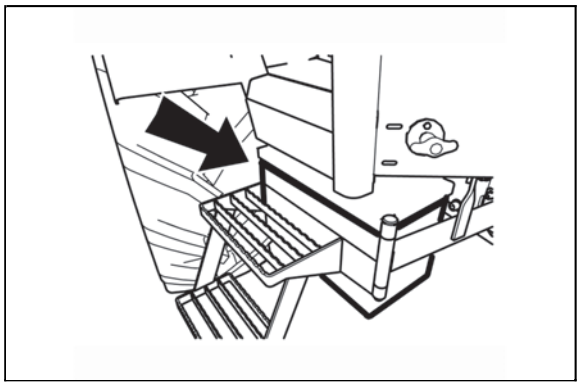
ELECTRIC INSTALLATION

Basic service information
Accumulator battery must be always connected by a 'minus' pole to earth electrode and 'plus' pole connected with alternator. Reversely connected accumulator battery will destroy the whole of semiconductor device of alternator. When using auxiliary accumulator battery for starting the tractor, do not forget to connect 'plus' to 'plus' and 'minus' to 'minus'. If replacement of a part of charging circuit is done, disconnect a battery from the earth electrode of the tractor by battery disconnector (-). Any incidental short circuits on clamps are excluded.

With any manipulation or starter repair, it is necessary to disconnect the minus pole of the battery and to shift all the levers including PTO shaft shifting lever to neutral position so as to prevent spontaneous start and endangering the life of a repairman.

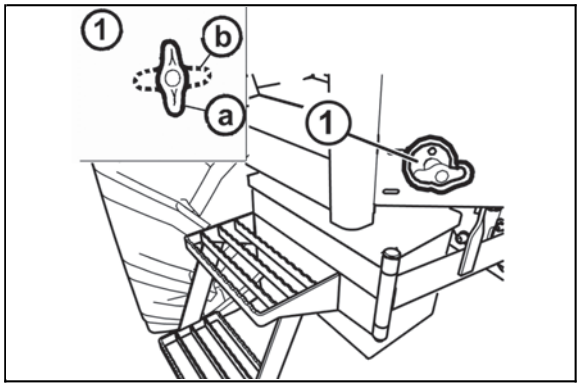
It is forbidden to start by short circuiting the clamps of starter. Start tractor only from driver's seat.

Accumulator battery
Accumulator battery is located in a box on the left side of the tractor. After unscrewing the screw marked with an arrow, lid of box of accumulator battery can be opened together with steps.



NM13N076

Battery disconnector
Accumulator battery is located under the cab on the right side. Battery disconnector (1) is located on the right side of the tractor in front of the cab.
a - Battery connected
b - Battery disconnected

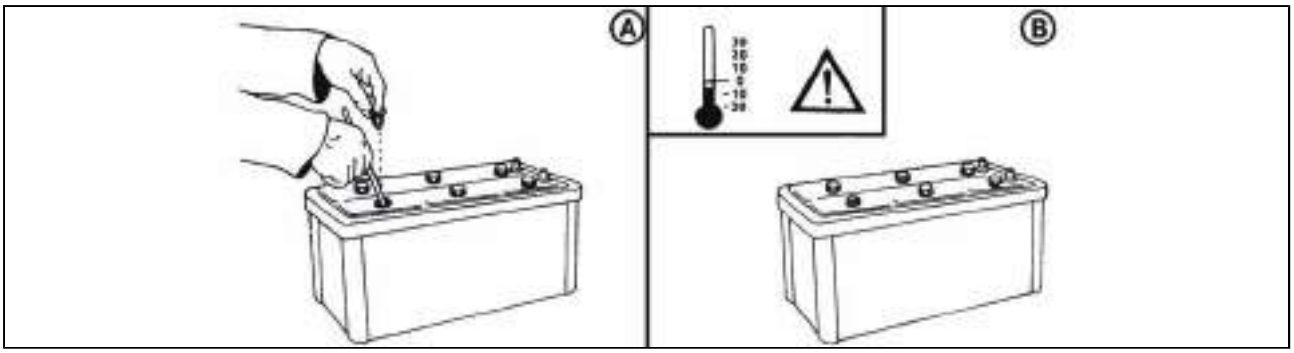


NM13N77

If the tractor is put aside for a longer period of time, it is necessary to recharge the accumulator at least once in three months because of the battery self discharge. When putting tractor aside we recommend you to disconnect the accumulator by means of battery disconnector.

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

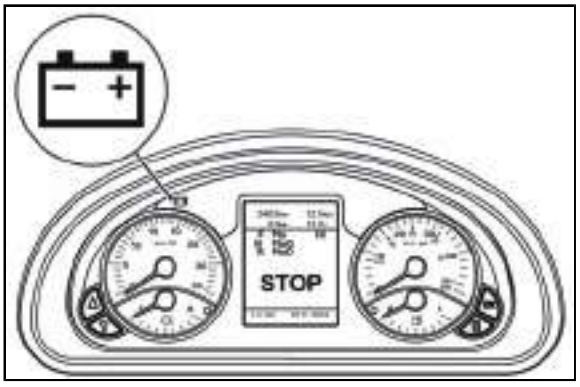


E604

Keep accumulator battery clean, well attached to the vehicle. The attachment device must not however deform the accumulator vessel. The level of electrolyte must be under the minimum level (mark line) marked on a vessel with polypropylene batteries.

Do the refill only with distilled water!
1. First study the instructions manual enclosed to the battery when working with accumulator!
2. When working with accumulator, protect your eyes with either goggles or a protective shield!
3. Electrolyte is an alkali, handle it therefore with due care! Rinse the skin stained with electrolyte and neutralize with soap and water, just like the stained clothing. Keep away from children!
4. When recharging from electrolyte hydrogen is released on electrodes, which makes an explosive mixture when mixed with air. It is therefore forbidden to manipulate with open fire near accumulator!
5. An explosion may be caused by a spark incurring after disconnection or release of clamp with engaged charging circuit!
6. Discarded accumulator is environmentally hazardous waste - when buying a new accumulator, hand the old one over to a seller who will dispose of it free of charge.
***7.* Insufficiently charged battery can freeze in winter!**

Alternator
It is accessible after hinging the bonnet away. Charging check is indicated by a red control on the compound dashboard device, which must go out after starting.



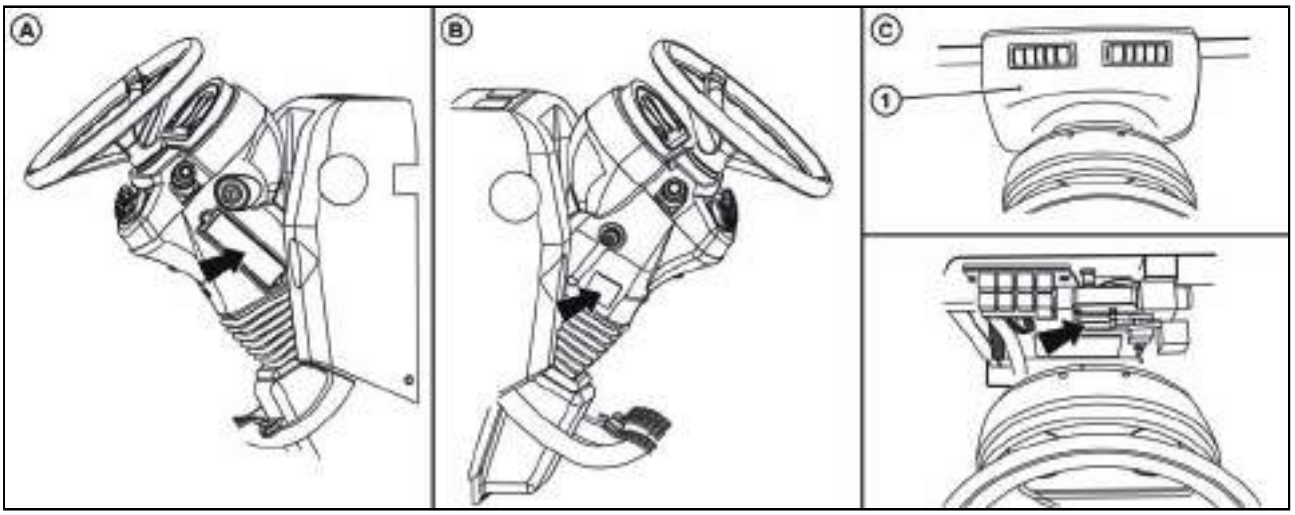
MHS16N069

When repairing tractor by electric welding, all the conductors must be disconnected alternator. Protect conductor '+B' against short circuit.

Alternator maintenance

When washing and cleaning tractor protect alternator prior to penetration of water or oil!
You must not disconnect alternator from accumulator during operation!
Alternator must not ever be put in operation with a disconnected conductor from of clamp '+B' and connected clamp '+D'. Such condition when increasing the revolutions may cause an exceptionally high alternator voltage which would damage semiconductors!
Never short circuit any clamp of alternator in operation!
Alternator must not be over activated. There is a risk of semiconductors damage with this intervention!
Mind the perfect electrical joint on connecting clamps and on perfect alternator grounding!
Alternator must not be overpoled not even for a short time!

Fuse box

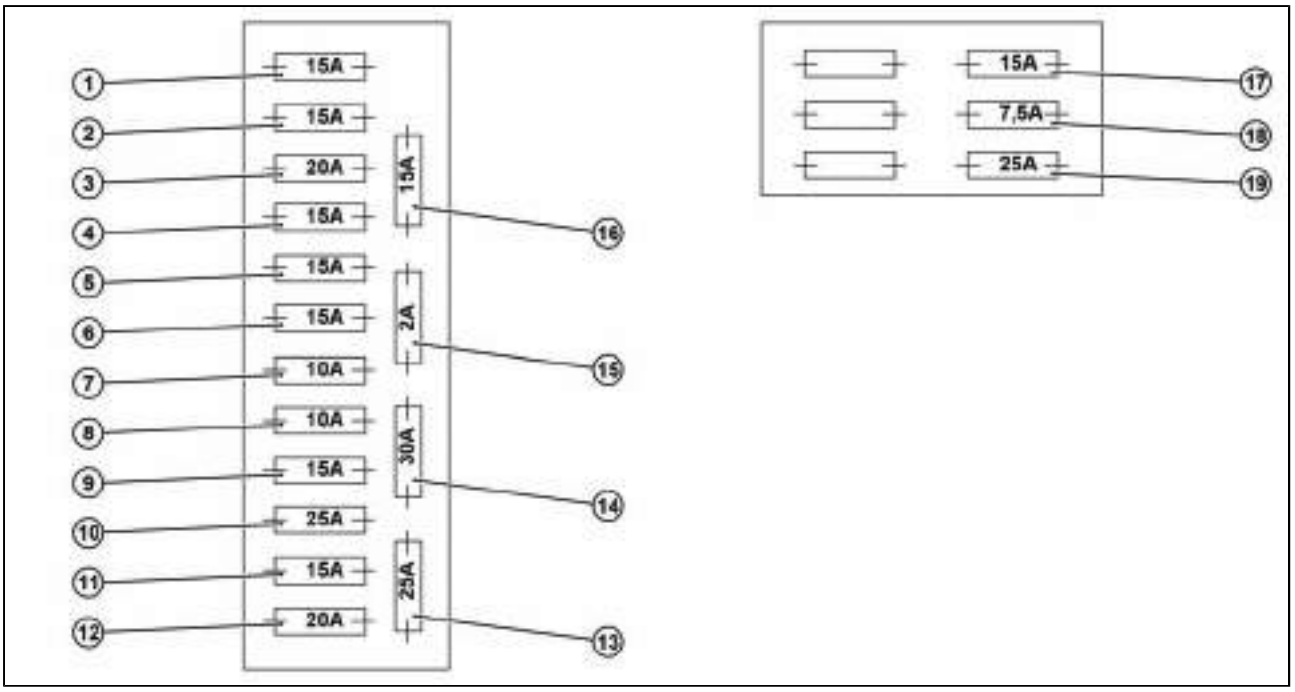


MHS16N108

The fuses No 1 - 16 are located in the fuse box on the right side of the steering column (A).
The fuses No 17 - 19 are located in the fuse box on the left side of the steering column (B).
The fuses are accessible after the cover of the fuse boxes is removed. The fuses are knife type and during their replacement it is necessary to adhere to the prescribed value of the fuse. If interrupted repeatedly, search the nearest service.

The glow fuse (C) is accessible when the cover (1) is removed. It is a strip type with the size of 80A. During replacement of fuses it is necessary to adhere to the prescribed value of the fuse. If interrupted repeatedly, search for the nearest service.

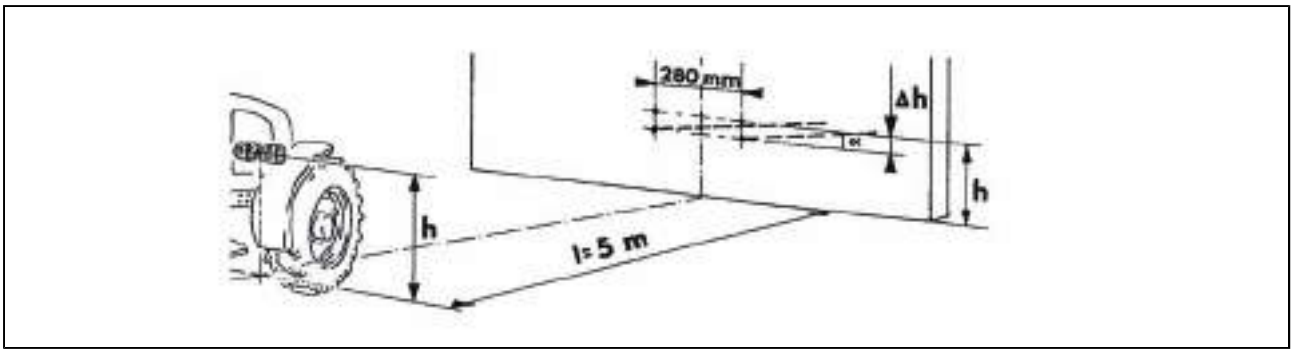
Placement of fuses in fuse box



MHS16N107

Note	Fuse size	Secured system
1	15A	direction lights
2	15A	brake lights
3	20A	start protection, supply of the instrument panel, switching of the rear PTO, switching of the front drive
4	15A	dim lights
5	15A	market lights left, number plate lighting, backlight of switches
6	15A	market lights right
7	10A	distance light right
8	10A	distance light left
9	15A	radio, firer, beacon, cabin lighting
10	25A	front work lights on the cabin and in the tractor mask
11	15A	heating
12	20A	front and rear wiper, air conditioning
13	25A	fuel pump
14	30A	engine control unit
15	2A	power supply of the gearbox control unit from the accumulator
16	15A	power supply of the gearbox control unit from the switch box
17	15A	front PTO
18	7.5A	front loader
19	25A	rear work lights

Lights adjustment in tractor´s grill check



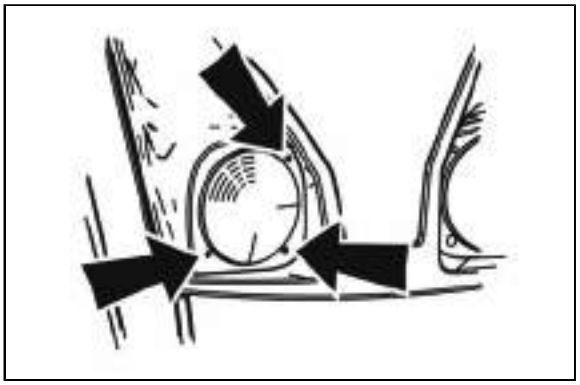
E609

When checking on test wall, the tractor must stand on a horizontal surface and tires must be inflated to prescribed pressure. Basic vertical adjustment is 3.5 % with service weight of the tractor. In horizontal direction, the beams of lights must be parallel with the longitudinal axis of tractor's symmetry.

l	-	Distance of test wall from a headlight (5 m)
h	-	Height of the centre of headlight above the road
Δh	-	Headlight slope (-3.5 %) of the distance of test wall = 17.5 cm
α	-	Lifting the line of asymmetric light (15%)

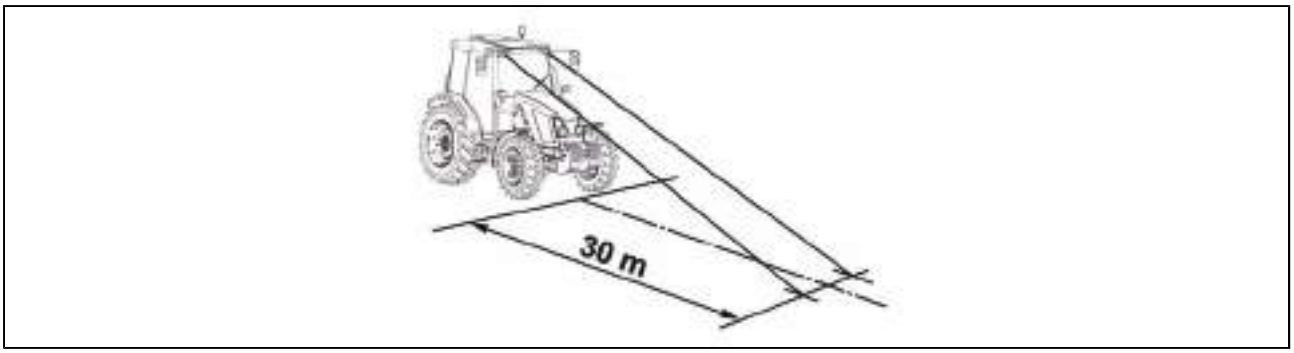
Lights adjustment in tractor´s grill

Adjustment is done simultaneously with all screws for both vertical and horizontal direction of a beam. In adjusted state all the springs of unadjusted screws must be preloaded! Each headlight is adjusted separately. Bulb replacement is done by removing it from the back side of reflector.



NM13N106

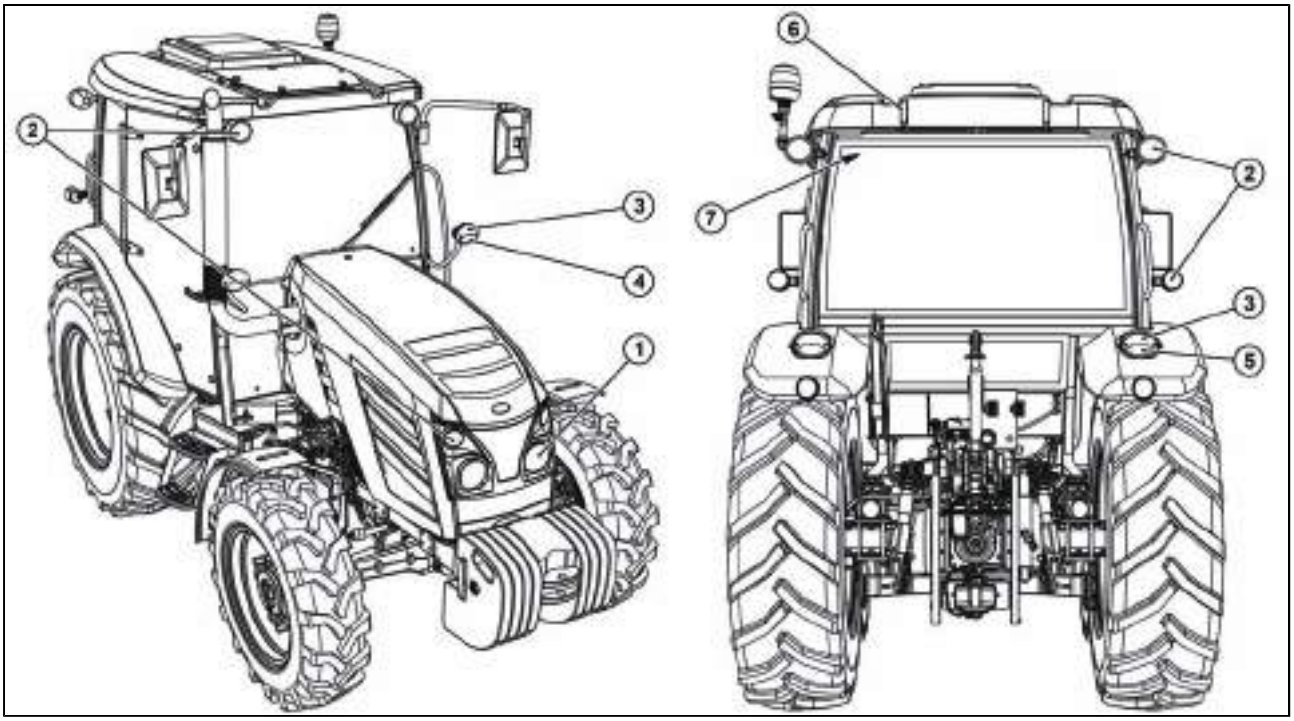
Lights adjustment in cab roof check



NM13N105

No point of a lit surface lying on the level of road to the left from longitudinal vertical surface passing through the centre of headlight must be further from the front line of the tractor than 30 m. In horizontal direction, headlight beams must be parallel with longitudinal axis of tractor symmetry.
Perform the lights adjustment check with service weight of the tractor. Front roof headlights can be used for operation on roads only in such cases when a front mounted tool is hanged on the tractor or a device covering main headlights (in tractor's grill).

List of lamps



MHS16N047

Pos.	Lamp location	Voltage	Output	Screw cap	Note
1	headlights	12 V	55/60 W	H4	
2	work and ploughing headlights	12 V	55 W	H3	
3	direction lights	12 V	21 W	BA 15s	
4	position lights	12 V	5 W	BA 15s	
5	brake lights	12 V	5 /21W	BAY 15d	
6	number plate lighting	12 V	5 W	C5W	
7	cabin lighting	12 V	5 W	C5W	

NOTES

TRACTOR MAINTENANCE

Service inspections
Service inspections are performed as follows:
The first service inspection at the state of the engine hour counter of 100 EH maximum, but not later than 6 months after commissioning of the tractor.
The second service inspection after covering another 400 EH (at the state of the engine hour counter of 500 EH maximum) but not later than 12 months after the first service inspection.
Next service inspections always after covering another 500 EH but not later than 12 months after the previous service inspection.
The service inspections are a part of tractor maintenance.
The services authorized by Zetor will provide professional performance of service inspections according to the manufacturer's instructions.

Steps performed daily before the start of work

Before starting the engine
Checking the oil level in the engine
Checking the tightness of the fuel system
Checking the amount of the cooling liquid and tightness of connections in the cooling system
Inspection of fouling of coolers
Checking the amount of the brake fluid and tightness of the liquid braking system
Checking the oil level in the gearbox and final drive housing
Checking the air pressure in all tyres
Checking the tightening of wheels
Checking the state of the tractor-drawn and connecting equipment

After starting the engine
Engine greasing function check (control)
Charging function check (control)
Steering function check (control)
Steering circuit function and tightness check
Efficiency and function of tractor brakes check
Efficiency and function of trailer or semi-trailer brakes check

Steps performed every 50 hours of work
Lubrication of the tractor according to the lubrication schedule
Inspection of fouling of the cabin filter elements

Steps taken after every 100 hours of operation
Actions performed every 50 EH (engine hour).
Cleaning the cooler plates with air pressure.
Maintenance of the dry air cleaner (perform the maintenance according to indication of the pollution indicator).
Checking the oil level in the gearbox housing and final drive housing.
Checking the oil level in the reductors and in the housing of the front drive axle.
Draining of condensate from the air reservoir.
Cleaning and painting of clamps of the accumulator battery with a thin layer of lubricating oil.
Defecation of the coarse filter of fuel.
Checking the oil level in the gearbox housing of the front PTO shaft.

Steps taken after every 500 hours of operation
Actions performed every 100 EH (engine hour).
Checking the tension of the alternator V-belts.
Checking the clearances in the whole hydrostatic control system.
Checking the clearance of the front axle pin.
Checking the adjustment of clearances of the clutch and brake pedals.
Checking the function of the foot and hand brake.
Checking the function of the brakes for the trailer.
Checking the tightness and function of the high-pressure system.
Checking the function of the driver's seat, lubrication of moving parts with oil.

Steps taken beyond 500 Mth interval

of new tractor or tractor after general overhaul							
State of the counter of EH (engine hours)	100	500	1,000	1,500	2,000	2,500	subsequently always after...EH
Replacement of hoses of hydrostatic control							after every 3,500 EH or every 4 years
Checking the function of the foot and hand brake	o	o	o	o	o	o	500
Checking of convergency of front wheels					o		2,000
Replacement of belt of accessories drive							3,000
Replacement of the tensioning roller							3,000
Calibration of travelling clutches	o	o	o	o	o	o	500

Monthly performed actions

If the tractor is equipped with the air conditioning system that has not been used, it is necessary at least once a month to switch for a minimum of 5 minutes at ambient temperature higher than 4°C.

Replacing fillings and filters

of new tractor or tractor after general overhaul						
state of the counter of EH (engine hours)	100	500	1,000	1,500	2,000	subsequently always after...EH
Replacement of engine oil	o	o	o	o	o	500
Replacement of oil filter element of engine oil	o	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	o	o	500
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						after every 1,000 EH or every 2 years
Replacement of cooling liquid						every 2 years
Replacement of brake fluid						every 2 years
Replacement of oil in gearbox and final drive housing				o		1,500
Replacement of suction filter (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
Replacement of oil in housing of front axle drive	o		o		o	1,000
Replacement of oil in reductors of front axle drive	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 fillings - amount

Determination name	amount in litres
Brake fluid	0.5
Cooling liquid	
Cooling liquid with cabin	12
Oil in engine	8
Oil for housing of front driving axle	5.5
Oil for planet reductors of front driving axle	2x0.6
Oil for gearbox and final drive housing	35*
Fuel	80
Oil for gearbox of front PTO shaft	2.7

* - For tractor work at slope, the filling must be increased by another 4-8 litres of oil. This is also valid in the case of an aggregation with machines connected to the outer hydraulic circuit.

 ***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 LA**

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

Viscosity class SAE	Performance class API
80W 80W-90 10W - 30	GL-4 / GL-5

 ***Use oils with additives for the limited slip differential.***

Other recommended service fillings tested on Zetor tractors

Oil to gear systems of tractors

Manufacturer	Oil labelling	Viscosity class SAE	Performance class API
Paramo	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

Oil for the front driving axle

Manufacturer	Oil labelling	Viscosity class SAE	Performance class API
Agip	Rotra Multi THT	80W	GL-4
Aral	Fluid HGS	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
Shell	Spirax AX	80W/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

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

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
ASTM D3306 ASTM D 4985 SAE J 1034

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.

Hydraulic brake liquid for the tractors
Hydraulic oil **TITAN ZH LHM PLUS** is used as a fluid for hydraulic brakes in tractors.

TITAN ZH LHM PLUS is not compatible with synthetic hydraulic fluids and therefore must not be mixed with them.
Under no circumstances TITAN ZH LHM PLUS should be mixed with brake fluids of DOT type!

Tractor greasing plan

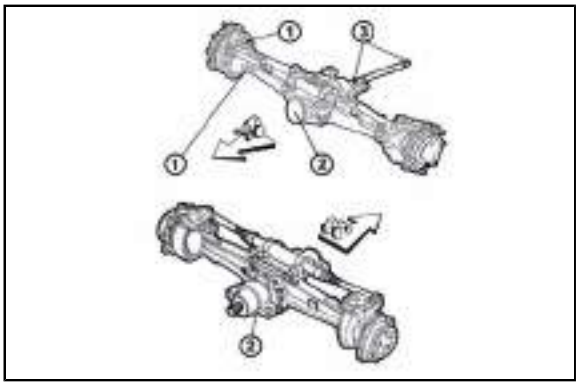
Safety instructions for lubrication of the tractor

- The tractor maintenance may be performed only by the trained personnel thoroughly familiarized with operational and safety principles.
- During maintenance of the tractor wear appropriate (specified) personal protective equipment (occupational footwear, protective gloves, safety goggles, etc.).
- Prior to starting the work, secure the tractor against movement using manual brake.

Lubrication must be performed only when the engine is at standstill!

Front drive axle

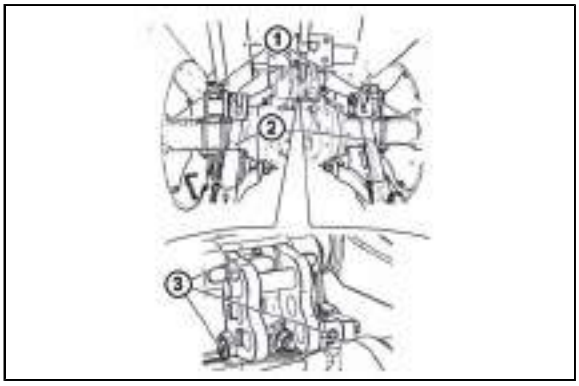
Position number	Name	Number of greasing points
1	Pivot pins	4
2	Spigot shaft	2
3	Cardan shaft joint	2



8P

Three-point linkage and rear semi-axes bearings

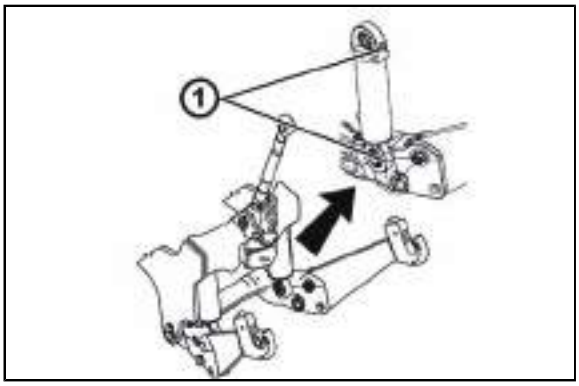
Number of position	Name	Number of greasing points
1	Rear semi-axes bearings	2
2	Lifting rod	2
3	Upper draw bar bracket	3



NM13N073

Front three-point hitch

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



02F

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.

NOTES

MAINTENANCE INSTRUCTIONS

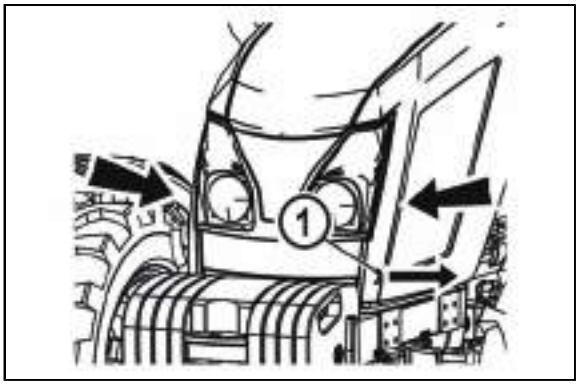
Most of operations of planned maintenance may be carried out by the driver or other user of the tractor. In case you do not have sufficient technical equipment, let the difficult operations carried out by a specialised repair shop.

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.

Front bonnet opening
Opening the bonnet:
Unlock the bonnet by pulling the draw bar (1) in the direction of an arrow, grip where the arrows are and heave.
The bonnet is locked in the heaved position by a gas-fluid prop.

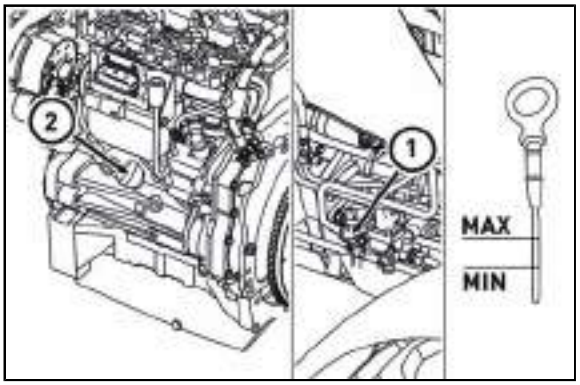
Closing the bonnet:
Pull the bonnet by means of a belt, grip where the arrows are and snap in the downward direction so that the lock of bonnet snaps down.

Rapid closing of the bonnet may damage filaments of bulbs in headlights in the front mask.



Checking oil levels in engine
Perform the check daily before starting the operation when the tractor is standing horizontally and the engine is not running. The engine oil dipstick (1) is located on the right side of the engine. The filling hole (2) is located in the left side of the engine.

Take out the dipstick (1), 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. The oil level must always be in the range from MIN and MAX.
Add the oil as necessary through the filling hole (2).

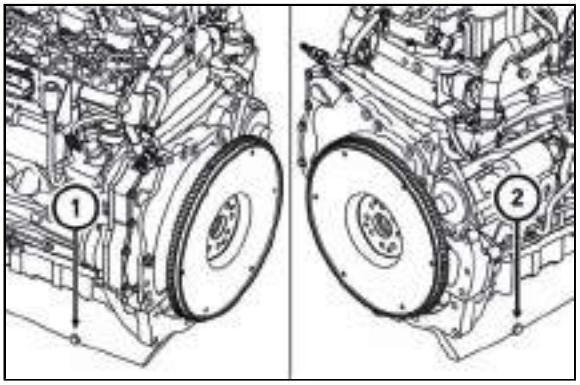


Draining oil from engine
Perform the engine oil drain preferably after you have finished driving or after the engine heats up to the working temperature.
Always perform the engine oil drain while the tractor is standing on a flat surface, with the engine off.
While draining the oil, loosen the motor-oil filling plug or pull out the motor oil gauge.

The engine has two draining plugs located on the left-hand side and right-hand side of the engine oil pan.

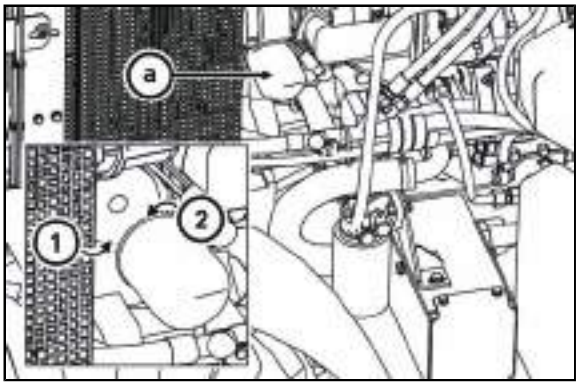
1. Put a catch reservoir for draining oil under the draining plug (1) on the left-hand side of the engine
2. Screw off the draining plug (1) on the left-hand side of the engine,
3. Drain oil into the catch reservoir
3. Clean the draining plug
4. Screw the draining plug (1) back on

Repeat this procedure with the draining plug (2) on the right-hand side of the engine



NM14D007

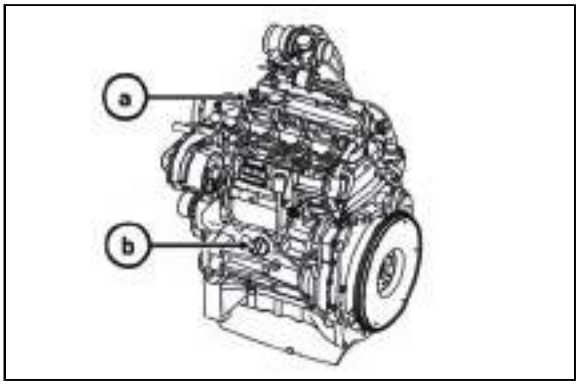
Replacing full-continuous motor oil filter
The full-flow oil filter (a) is located on the left-hand side of the engine and is accessible after the bonnet has been lifted. The filter must be changed each time the motor oil renewal is carried out.
1. Put a catch reservoir for the drained oil under the full-flow oil filter
2. Loosen the oil filter and screw it off using appropriate tools
3. Before screwing on a new filter clean the packing surface of the body (1) and that of the filter (2)
4. Smear the engine fill oil on the rubber packing of the new oil filter and screw on the filter
5. Once the packing has sit down on the contact surface tighten up the filter manually



NM14D008

For tigtening the filter with a special tool a tightening moment of 15-17 Nm is required
6. Check tightness after the engine has started up.

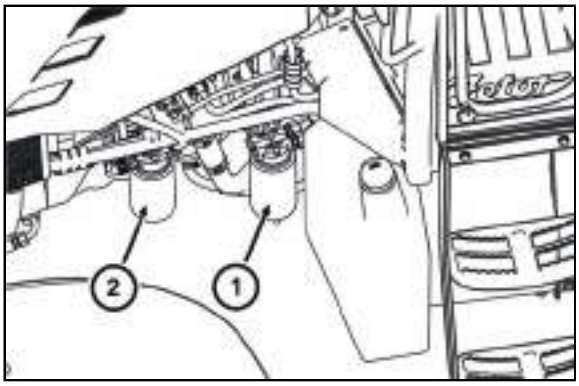
Pouring oil to engine
The engine is equipped with two filling holes:
On the upper side of the engine (a)
On the left-hand side of the engine above the oil level gauge (b)
While filling oil choose a hole which best suits the tractor equipment.
1. Fill the prescribed amount of motor oil through the filling hole
2. Check the oil contents using the gauge
3. Start up the engine and keep it running for 2 or 3 minutes with cca 800 revolutions per minute.
4. After the engine has been stopped and the surface is calm, check up oil contents with the gauge (1) and make a tightness check of the filter, draining plugs and other joints.



NM14D009

Fuel filtering
Fuel filters are located on the left-hand side of the tractor.

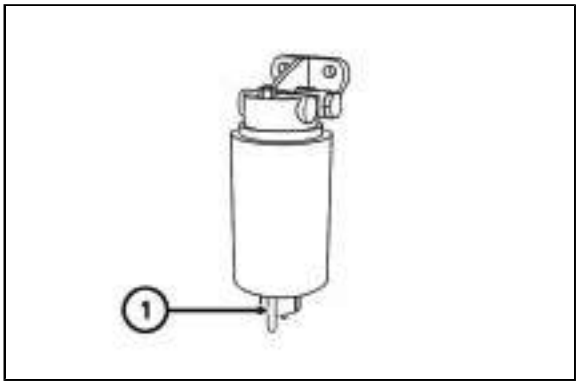
Fuel filtering consists of two parts:
A raw fuel filter with a clearing tub (1)
A fine fuel filter (2)



MHS16N039

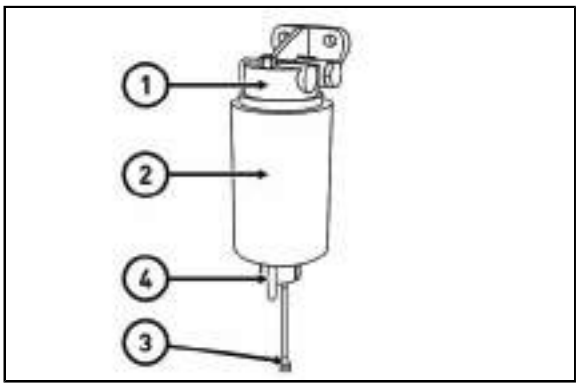
Raw fuel filter clearing
You perform it while the engine is stopped and the key is in the switch box in the position 0.

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



NM14D011

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

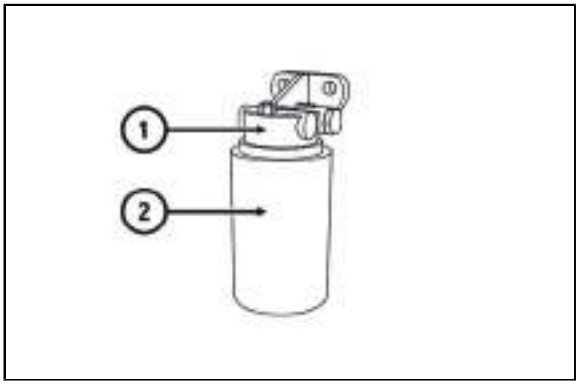


NM14D012

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

Cartridge replacement in the fine fuel filter

1. Put a catch reservoir under the fine fuel filter
2. Loosen the cartridge of the fine fuel filter (2) and screw it off using appropriate tools
3. Before screwing on a new filter cartridge clean the packing surface of the filter body (1)
4. Smear fuel on the rubber packing of the new filter cartridge (2) and screw on the filter cartridge
5. After the packing has sit down on the contact surface tighten up the filter manually
6. Perform an air bleeding of the fuel system
7. After starting up the engine make a tightness check of the fine fuel filter



NM14D013

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

Fuel system venting

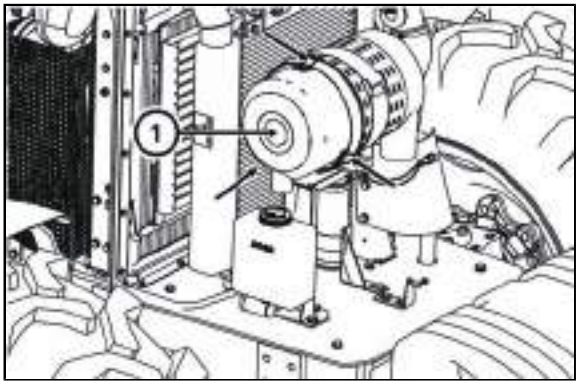
The fuel system gets bled using an electric booster fuel pump.

Do not start up the engine while bleeding so that no error messages be generated.

1. Turn the key in the switch box from the position 0 to the position I
2. The booster fuel pump will be running for about 20 seconds which makes the air blow off of the fuel system and its pressurization
3. Wait until the booster fuel pump switches off by itself
4. Turn the key in the switch box from the position I to the position 0
5. Repeat this procedure two more times at least
6. After you start up the engine make a tightness check of the fuel system

Air filter maintenance

The air filter is located in the front part of the tractor and is accessible after the front bonnet has been lifted off.
Air filter maintenance shall be carried out once air filter pollution gets signalled.

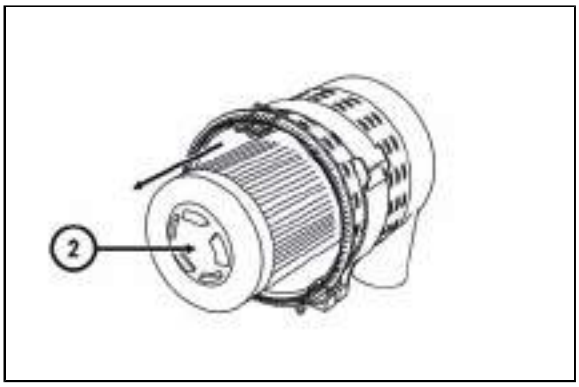


NM14D014

Carry out the air filter maintenance according to the following procedure:
1. Lift off the front bonnet
2. Loosen the clips of the air filter cover (marked with arrows)
3. Take off the filter cover (1)

Recovery of the mainair cleaner element

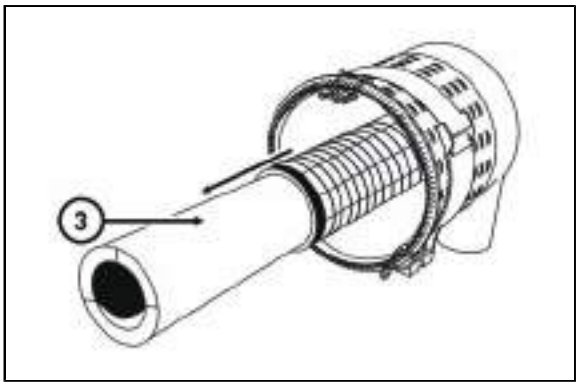
Remove the main element of the dry cleaner (2) by pulling. If the main element is not damaged (there must not be any dust on the inner side of the element), recover it by blowing pressurized air from the inner side of the element. This way you can recover the main element 3 times at the most. The element must be replaced once a year.



NM14D015

Replacing the safety element of the air cleaner

- remove dry filter locking element (3) with a pull

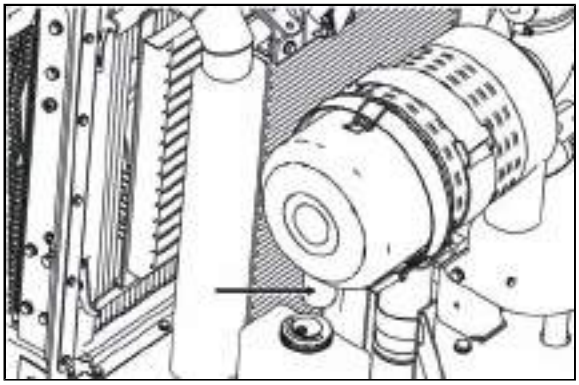


NM14D016

Locking element cannot be regenerated. It must be always replaced in these cases:
- when damaging main element
- after 5 maintenances of air filter
- at least once in two years

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



NM15D092

When reassembling the air cleaner cover, keep its proper position in accordance with the figure!

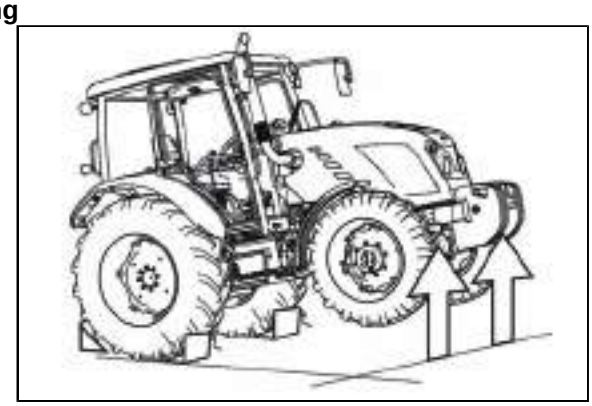
Replacing the hoses of hydrostatic steering

Hoses need to be replaced four years from the date of their manufacture (date is given on their surface) or after working 3,500 hours with tractor, or right after learning the symptoms of their damage (hose, local swelling, penetration of working medium around endpoints and hose surface, wrapping damage by mechanical smear to a metallic body, damage to external buckle braid with low-pressure hoses).

If a pump gets damaged or if the engine is at standstill, steerability is observed, but the force on the steering wheel increases. It is possible to get to the nearest place where repairs can be done with lowered speed. The steering wheel must not be held in the positions of extreme wheel locks for longn (maximum time is 20 sec.), otherwise there is excessive oil heating in hydrostatic steering circuit.

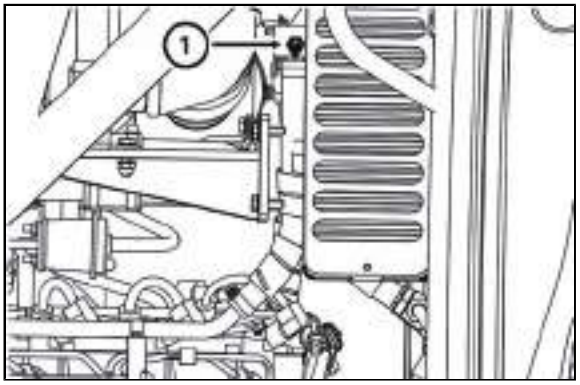
Bleeding the hydraulic circuit of the hydrostatic steering

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.



MHS16N040

Bleeding the heating system
The bleeding valve of the heater (1) is located on the left-hand side of the tractor in front of the cabin and it is accessible after the bonnet has been lifted off.



NM14D005

Bleeding procedure:
Set the heater valve control on the dashboard to maximum volume.
Fit a hose on the tube of the heater bleeding valve. Dip the other end of the hose in the coolant vessel.
Start up the engine.
Loosen the bolt of the heater bleeding valve.
Increase the engine speed to cca 1500 r.p.m.
Once air bubbles stop issuing from the dipped end of the hose tighten up the bolt of the heater bleeding valve.
Stop the engine.

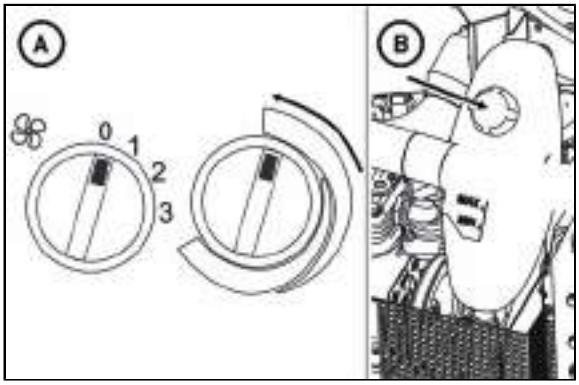
Check contents of the coolant in the equalizing reservoir. Top up the coolant if need be.

Loosen the overpressure plug only after the coolant cools down! Scald danger!

Coolant replacement

Observe the following procedure:

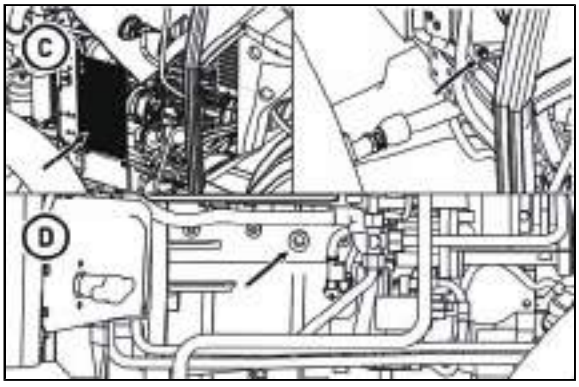
1. open valve of heating (A) and release safety plug on equalizing tank (B)



MHS16N041

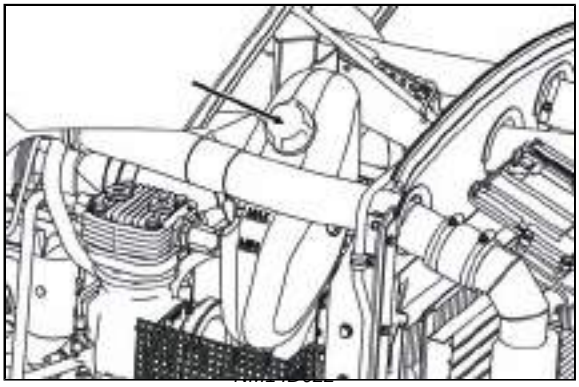
When opening the heating valve, the key of the switch box must be in the position 'I'.

2. drain coolant from radiator (C). Draining screw is accessible after lifting the bonnet
3. drain coolant from the block of engine (D). Drain valve is accessible after lifting the bonnet
4. after draining the coolant, close the screw and valve (leave heating valve open)



NM15D021

5. Fill in the cooling system with an antifreeze
6. Start up the engine and keep it running for cca 1 minute
7. Top up the antifreeze in the equalizing reservoir up to the upper mark labelled with MAX
8. Close up the equalizing reservoir with the overpressure plug
9. After having the engine warm up and the thermostat open let the coolant cool down again and check the coolant and top it up once more if necessary
10. Bleed the heating system if need be

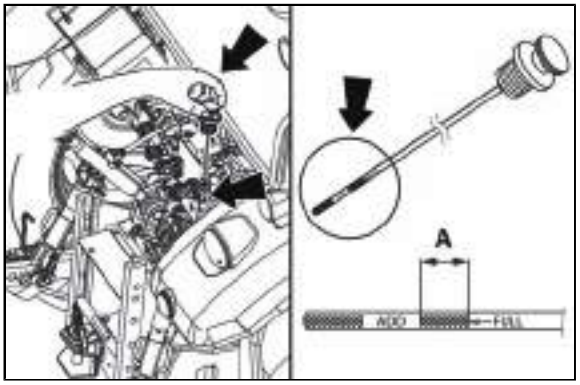


Loosen the overpressure plug only after the coolant cools down! Scald danger!

Carry out a renewal of the antifreeze every time after two years of service at the latest.

Checking the oil in gear box, final drive housing and rear axle

There is common oil filling of the transmission system. The oil level is checked with a dipstick (a) located in the rear part of the tractor on the hydraulics box. The dipstick hole is used for filling.



MHS16N045

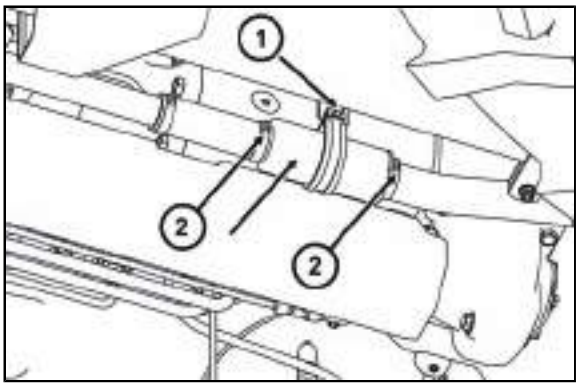
Checking should be performed when the engine is not running. The oil level must be within the range of the dipstick (A).

Replacement of the filter of the hydraulics suction

The suction cleaner is located on the left side of the tractor behind the fuel tank. Replacement of the filter must be performed when the gearbox filling is drained.

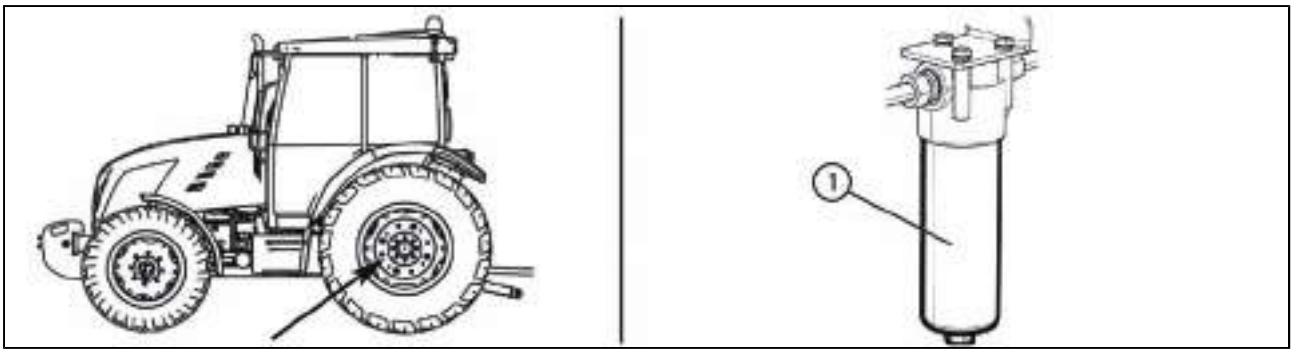
Prior to the replacement of the filter element put a suitable vessel for catching the dripping oil under the tractor.

1. Unscrew the sleeve (1) and water tapes (2)
2. Disassemble the filter element
3. Perform assembly of a new filter element



MHS16N042

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



MHS16N043

The oil filter is located on the left side of the gearbox.

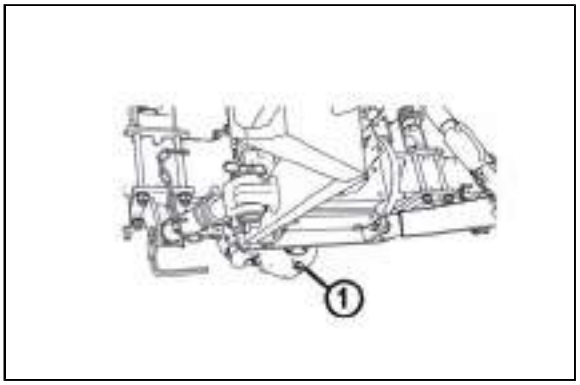
Prior to the replacement of the filter element put a suitable vessel for catching the dripping oil under the tractor.

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

Note: Prior to reassembly of the filter body lubricate the sealing o-ring with lubricating oil.

Gear system drain plug

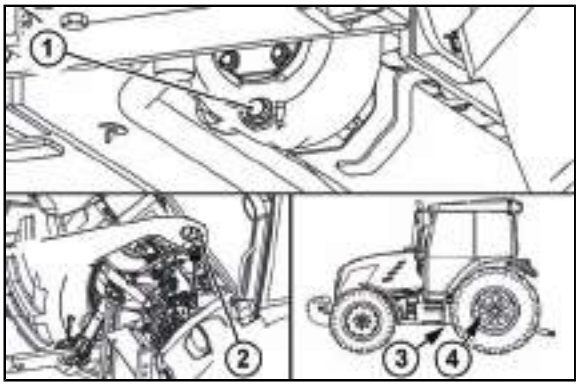
Gear system drain plug is placed on the box of front axle drive.



NM13N068

Oil replacement in gear system

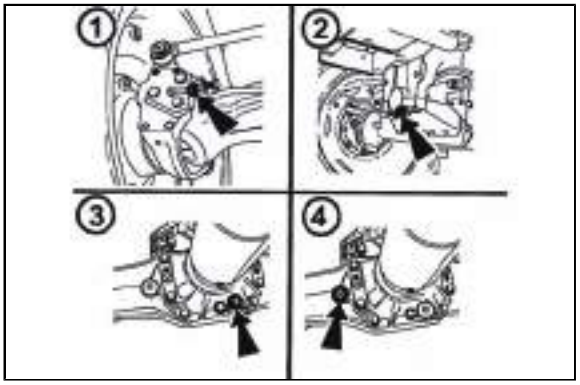
1. Unscrew the drain plug (1), preferably when the driving is finished or when the oil is heated to the operating temperature
2. Drain oil (take out the dipstick (2) to facilitate drainage)
3. Clean the drain plug (1) and screw it back
4. Replace the filter elements (3, 4)
5. Add new oil through the dipstick hole (2)
6. Start the engine and leave it running for ca. 3 minutes at idling speed.
7. When the engine is stopped and the surface is calm, check the amount of oil with the dipstick (2)



MHS16N044

Filling, controlling and draining hole of oil of front drive axle

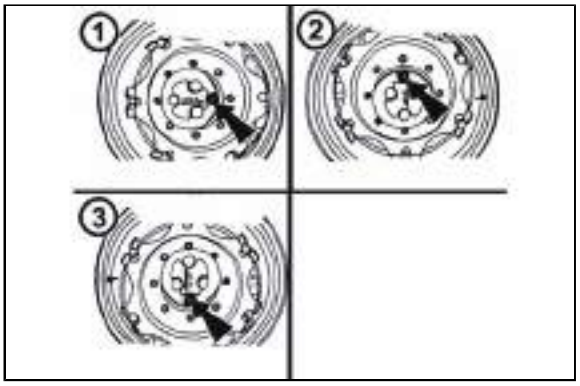
1 - lubricating nipple of the kingpin
2 - sliding bearings (2 pieces) of the front driving axle
3 - drain opening of the final drive hous-ing oil
4 - filling and inspection opening of final drive housing oil (after removing of the inspection screw the oil level must reach the bottom edge of the inspection opening)



E733

Filling, controlling and draining hole of oil of front wheels reducers

Inspection, filling and draining oil is done by a one hole after turning reducer according to figure.
1. amount of oil inspection - hole in the horizontal axis of a reducer (after unscrewing control screw the level of oil must reach the brim of checking hole)
2. filling oil - hole at the top
3. draining hole - hole at the bottom

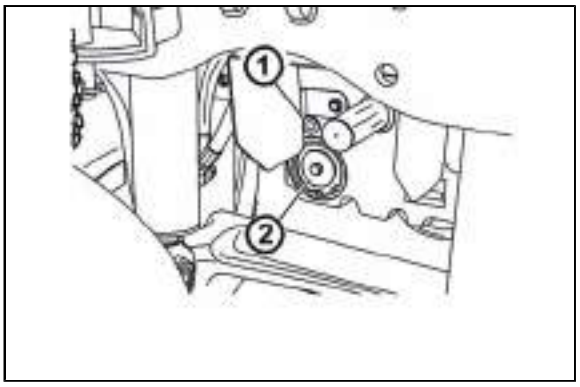


C731

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.

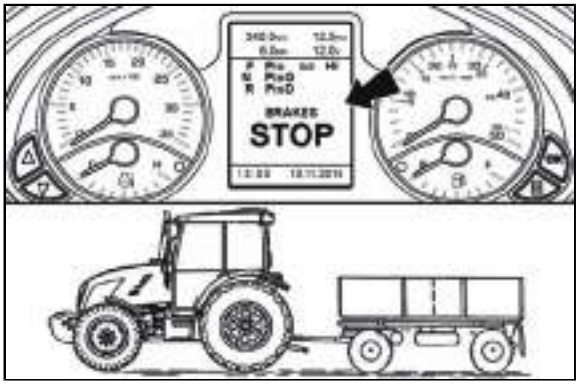


F206

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.

Air system tightness inspection

- fill the air reservoir to the maximum pressure (600 ± 20 kPa)
- when the engine is not running, the error message of the minimum air pressure must not be activated within 10 min

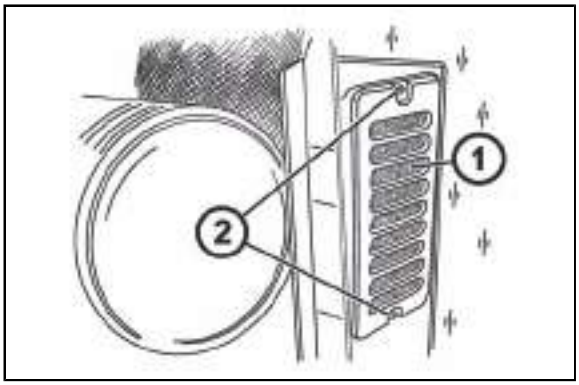


MHS16N099

Before driving with the trailer or semi-trailer, checks should be performed daily! During the decrease of the pressure in the brake system below the critical limit, the error message is indicated on the instrument panel!

Heating filtration element

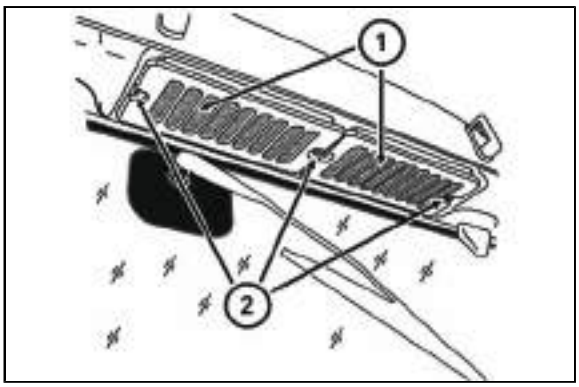
Is placed under the bonnet in front of the cab.
After opening the bonnet, it is necessary to unscrew the screws (2) and remove heating filtration element (1).



NM13N111

Air-condition filtration elements

Are placed in the rear overhang of cab roof.
It is necessary to unscrew the screws (2) and remove air-condition filtration elements (1).

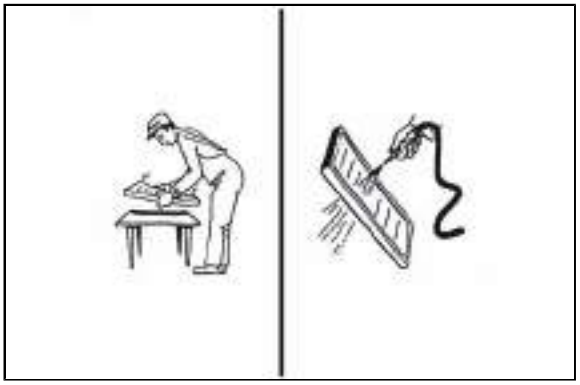


NM15D093

Filtration elements cleaning

Regenerate filtration elements of the cab depending on the degree of clogging:
- by dusting
- by blowing with compressed air

Check clogging daily. Replace strongly polluted filters.

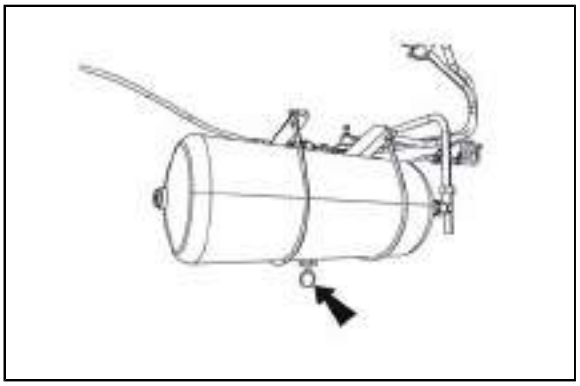


NM13N110

Tractor's safety cab is not equipped with special filters for air sucked into the cab. It does not protect operators against the effects of aerosols and other harmful substances!

Draining the condensate from air collector

Air collector is placed on the right side of the tractor under the cab. Draining the condensate from air collectorto be done by deviation of venting valve by pulling a ring. Valve is located on the bottom part of air collector.

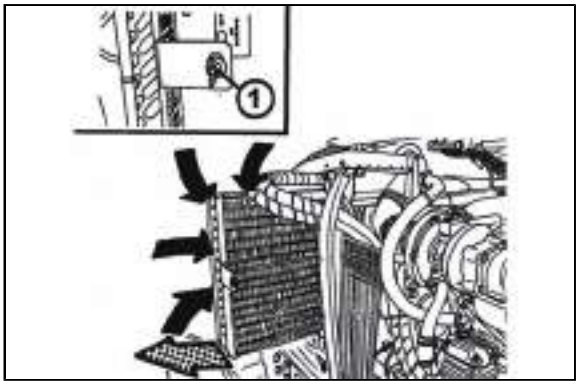


NM13N074

Air condition maintenance

The main element of air condition system maintenance is cleaning air condition condenser (is placed in front of engine radiator).
Clogged air condition condenser decreases not only the efficiency of cooling system but also the efficiency of engine cooling.

Open the bonnet, demount the nut (1) and protrude the radiator to the side and blow with compressed air or wash with pressed water (against the direction of tractor drive). Slide the radiator back in and attach properly. Mind proper conducting of hoses to oil radiator.

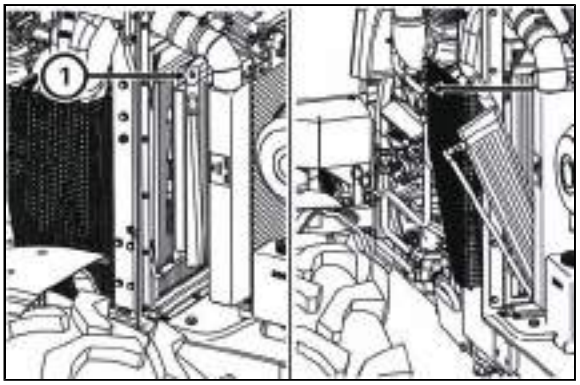


E740

Maintenance of the oil cooler of the front PTO

The full oil cooler decreases not only the efficiency of cooling of the front PTO, but also the efficiency of the engine cooling.

Open the engine bonnet, disassemble the nut (1) from the right side of the tractor, tilt the cooler to the side, blow out with compressed air or rinse out with pressure water (against the tractor driving direction).
Then insert the cooler back and fix properly with the nut. Make sure that the hoses to the oil cooler are correctly guided.



NM15D022

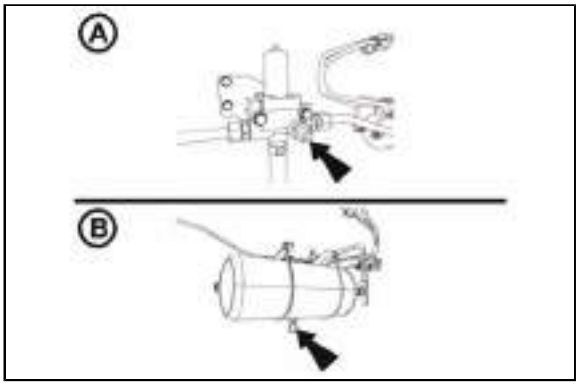
Maintenance and treatment of tires

Regularly inspect the outer surface of a tire and inspect that there are no defects in side or above the base part of rollers and that body is not damaged.

Remove tires which have defects from further use.

Tire inflation

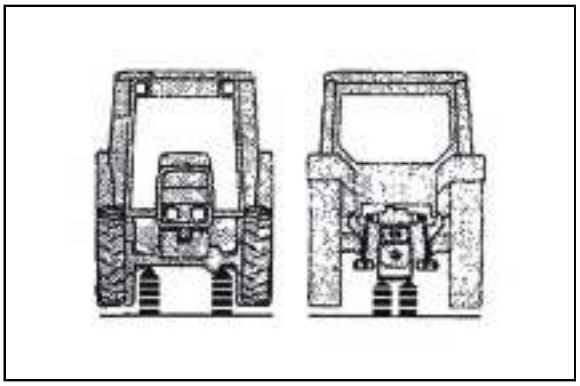
Basic values of recommended inflation are given in chapter 'Main technical parameters´. Check pressure regularly before driving, if tires are cold. Use pressure regulator for inflation (A), which fulfils the function of pressure equalizer, tire filler and locking valve. Screw a hose for tire inflation. Screw the hose to the end of coil so that back valve will be compressed. If there is maximum pressure in air collector, a tire cannot be inflated. In such case it is necessary to first lower the pressure by a valve for draining condensate placed in the bottom part of air collector (B).



NM13N071

Detaching tractor

When putting the tractor out of operation for a longer period of time (warehousing), support the tractor and lower the pressure in tires to a minimum (wheels must not touch the ground).

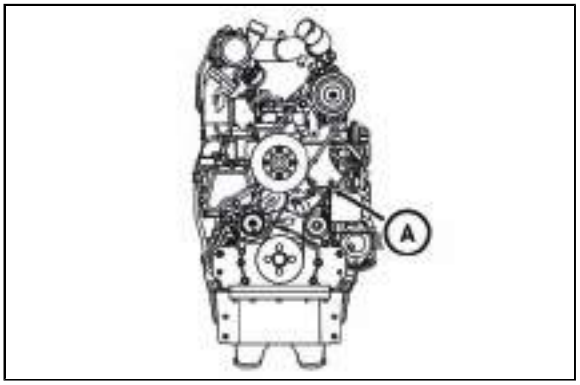


E743

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.

Flat belt drive tension of accessories

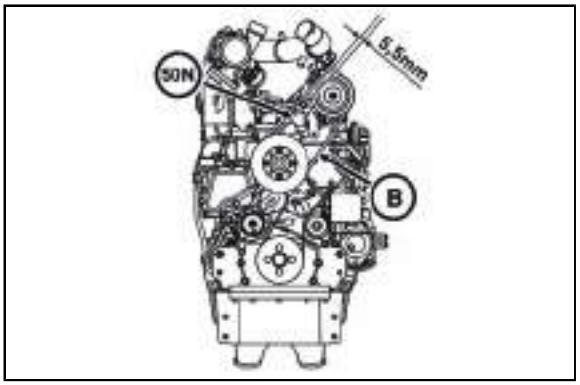
It is not necessary to adjust the tightness of the flat accessories-drive belt (A). The belt gets stretched automatically.



NM14D002

Stretching the V-belt in the air-conditioner compressor

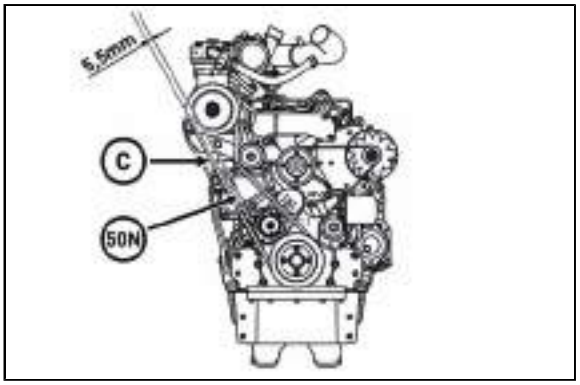
If V-belt tightness (B) is appropriate, the belt sagging must be 5.5 mm while a force of 50 N is acting on the belt. Stretch tight the V-belt according to the prescribed value after having loosened the fixing bolts on the air-conditioner compressor.



NM14D003

Stretching the V-belt in the compressor

If V-belt tightness (C) is appropriate, the belt sagging must be 5.5 mm while a force of 50 N is acting on the belt. Stretch tight the V-belt according to the prescribed value after having loosened the fixing bolts on the belt tension roller of the compressor.



NM14D004

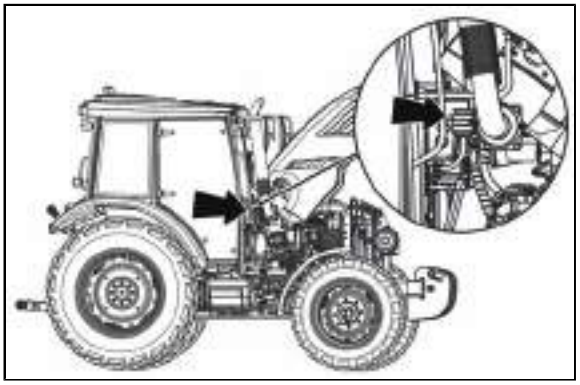
ADJUSTMENT

Bleeding of tractor brake system

Perform deaeration of the brake system of the tractor always in the following order:

1. Main brake cylinders
2. Pressure air brake system for trailers
3. Foot brakes of rear wheels

Perform deaeration of main brake cylinders, pressure air brake systems for trailers and foot brakes of rear wheels with connected brake pedals.
During deaeration observe the amount of liquid in the balancing tank to avoid intake of air.
After two years replacement of the brake fluid in the whole brake circuit must be performed.

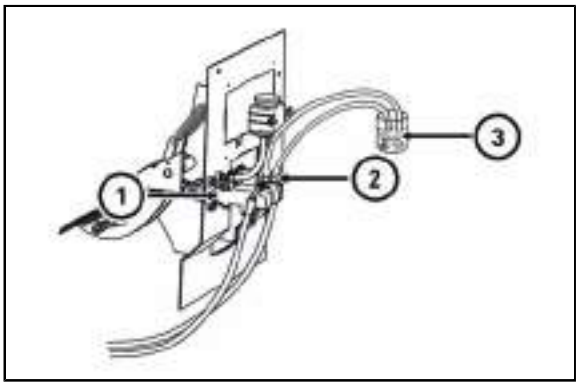


MHS16N050

Only hydraulic mineral oil Titan ZH LHM PLUS can be used in the brake system.

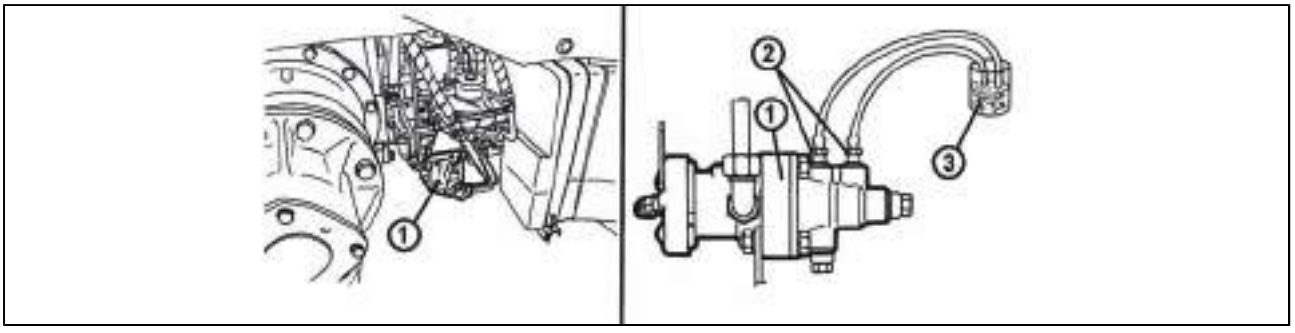
1. Deaeration of main brake cylinders

Use the following procedure:
1. Add the missing amount of the brake fluid in the equalizing vessel to the max. amount.
2. Remove the caps from deaeration screws (2) of main brake cylinders (1) located on the right side of the tractor between the cabin and the engine.
3. Install hoses on the screws and immerse their other ends to the bottom of the transparent vessel (3) partly filled with the brake fluid. Place the vessel at least 300 mm above the deaeration screws. The screws must be permanently under pressure to prevent air penetration through their threads.
4. Release the deaeration screws by 1/4 revolution max.
5. Press down the pedals fully and tighten the deaeration screws.
6. Release the brake pedals and repeat the procedure until no air bubbles come out of hose.



MHS16N075

2. Deaeration of the main brake valve for trailers



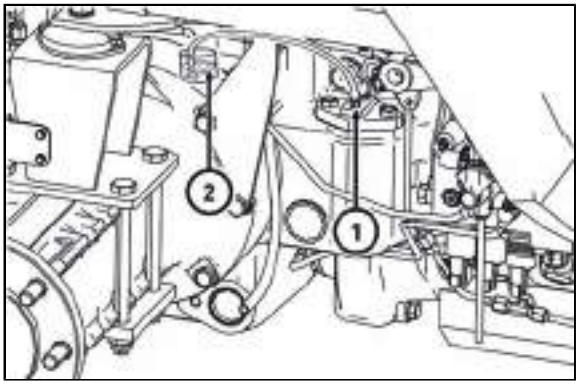
E758

Should be performed under operating pressure of the air in the system 600 ± 20 kPa with the following procedure:
1. Add the missing amount of the brake fluid in the equalizing vessel to the max. amount.
2. Remove the caps from deaeration screws (2) of the main control valve of the trailer (1) located on the right side of the tractor between the battery and rear half-axle.
3. Install hoses on the screws and immerse their other ends to the bottom of the transparent vessel (3) partly filled with the brake fluid. Place the vessel at least 300 mm above the deaeration screws. The screws must be permanently under pressure to prevent air penetration through their threads.
4. Release the deaeration screws by 1/4 revolution max.
5. Press down the pedal fully and tighten the deaeration screw.
6. Release the brake pedal and repeat the procedure until no air bubbles come out of hose.

3. Deaeration of the brakes of the rear wheels

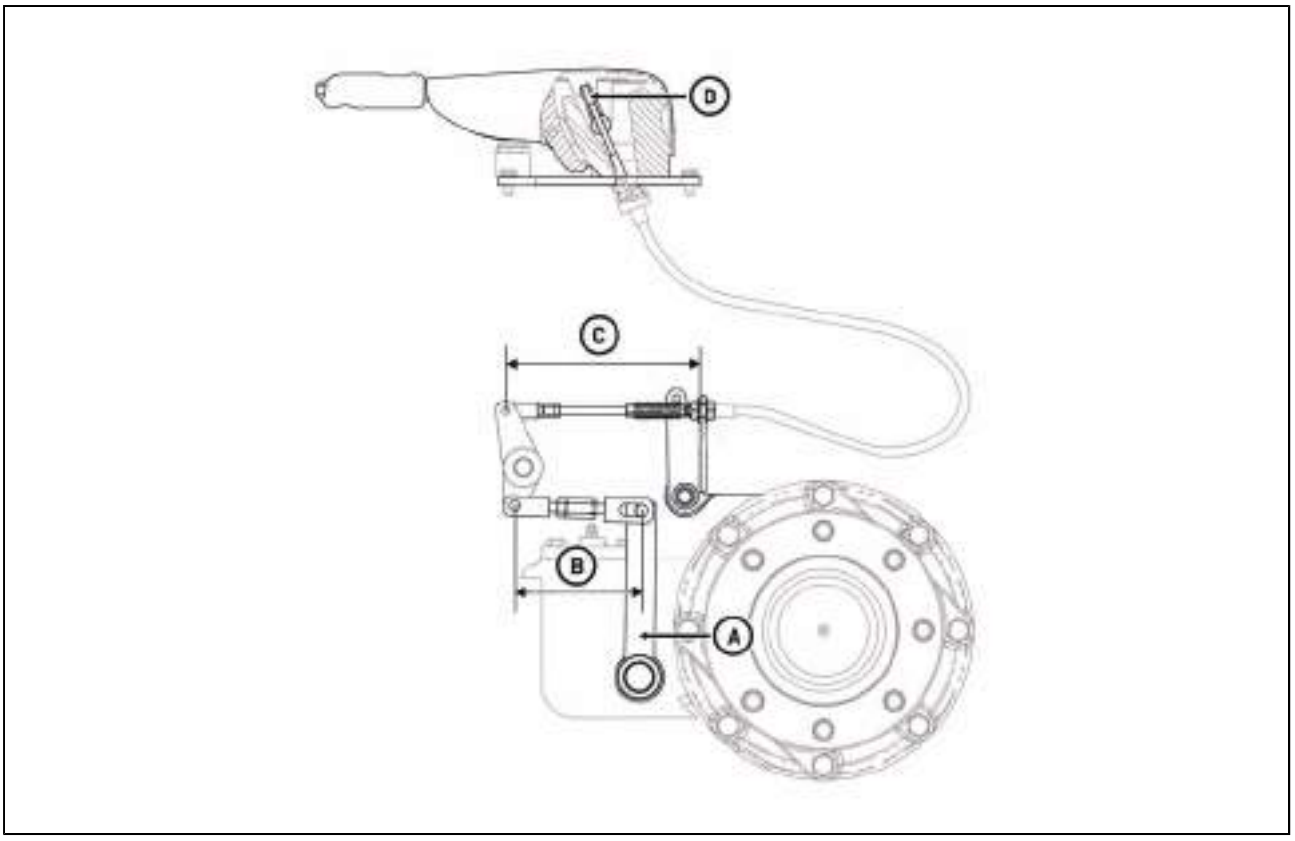
Use the following procedure:

1. Check the amount of the brake fluid in the equalizing vessel and add the missing amount of a new liquid to the max. amount.
2. Remove the rubber cap, install the hose on the deaeration screw (1) of the brake cylinder and immerse its other end to the bottom of the transparent vessel partly filled with the brake fluid (2). The deaeration screw must be permanently under pressure to prevent air penetration through its threads. During this operation place the vessel at least 300 mm above the deaeration screw.
3. Release the deaeration screw by 1/4 revolution max.
4. Press down the pedal on the deaerated side fully and tighten the deaeration screw.
5. Release the brake pedal and repeat the procedure until no air bubbles come out of hose.6. Repeat the procedure on the other side.



MHS16N079

Parking brake adjustment

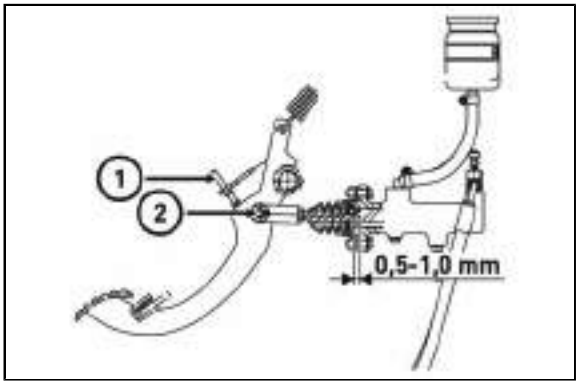


MHS16N046

Before adjustment of the hand brake secure the tractor against movement with wedges and release the hand brake. There is a vertical position of the lever (A). Set the length of the pull rod (B = 130 mm); the length is measured from the centre of the pins according to the figure. Adjust the pull rod (B) for the right brake on the other side as well. Adjust the pull rod (C) with the solid end of bowden so that its length from the centre of the pin to the bracket is (C = 198 mm). Finely adjust the full overstrain or clearance of the hand brake using the bowden adjusting nut (D) so that the clearance between the pin of the lever (A) and pull rod (B) is 1 mm. Lift up both rear wheels of the tractor, secure the lever of the hand brake to the fifth claw of the ratchet wheel and try to turn one wheel; the wheels must not turn. If the wheels are turning, check adjustment of the pull rods and finely adjust with the screw (D), if appropriate. When the hand brake is released, both wheels must rotate freely. Asymmetry of braking effects must not be higher than 20%.

Adjustment of free travel of brake pedals

The proper clearance between the piston rod of the brake pedals and the piston of the main cylinder is from 0.5 to 1.0 mm. Perform adjustment when the pedals are disconnected, for each separately using the adjusting stop nut (1) or by changing the length of the pull rod (2) of the brake cylinder where the piston rod is screwed in.



MHS16N074

MAIN TECHNICAL PARAMETERS

Main tractor's parameters (mm)

		Note
Turning-circle diameter length		
- minimal	3 505	
- maximal	4 470	
Width over rear fenders	1 825	
Height to the mouth of exhaust pipe	2 580	
Height of tractor to upper cab's rim	2 614	
Clearance height under the girder of front axle	377	
Height of nozzle of multistage suspension linkage in its topmost position (the centre of nozzle)	850/750/650/550/500/450	
Height of swinging draw bar (on internal bottom fork surface)	412	
Rear PTO shaft height	702	
Wheel base	2 200	

Tractor´s weight

Tractor weight (kg)	3,350 kg - 3,500 kg

Note: The weight of the tractor depends on the tractor equipment.

Technical data of engines

Type of tractor		Major HS 80
Type of engine		TCD 2.9 L4
Design of engine		serial, upright, water-cooled
Kind of engine		injection, four-stroke with direct fuel injection, turbocharged engine
Additional flue gas treatment		Oxidation catalyst (DOC)
Number of rollers		4
Volume of rollers	cm^3	2925
Drilling x heave	mm	92x110
Nominal revolutions	rpm	2200
Max. speed	rpm	2300
Idle run revolutions	rpm	900
Injection sequence		1-3-4-2
Compression ratio		1:17,8
Maximum output (EC 24)	kW	55,4
Specific fuel consumption 2200 rpm	g.kW.h	229,67
Max. torque / engine speed	Nm / rpm	300/1600
Minimum oil pressure (loe idle, engine warm)	MPa	0,14
Max. coolant temperature	°C	110

MAIN TECHNICAL PARAMETERS

Permitted maximum load of front axle (kg)

Travel speed (km.h^{-1})	Wheel base (mm)
	1525
40	2500

Load applies with regard for the axle itself, permissible load with regard for tires is given in table 'Front tires bearing capacity'.

Permitted maximum load of rear axle (kg)

Travel speed (km.h^{-1})	Wheel base (mm)	
	1512	**1812**
40	2 700 kg	2 700 kg

Load applies with regard for the axle itself, permissible load with regard for tires is given in table 'Rear tires bearing capacity'.

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

Travel speed (km.h^{-1})	Maximum weight of set
40	5100

Condition of steerage

Travel speed (km.h^{-1})	Loading of the front axle of the tractor of total weight tractor + carried mechanism (%)
max. 40	min. 20

Total technically allowed weight of the trailer (kg)

Type of the trailer	Maximum allowable weight (kg)
braked	12,500
braked independently	3,000
braked with overrun brake	5,000
unbraked	1,500

The maximum allowable weight of the trailer or semi-trailer is subjected to valid legislation of the country where the tractor is operated. The value of the maximum allowable weight of the trailer or semi-trailer can be found in the documentation necessary for the operation of the tractor!

Front tires steerability

Parameter of tires	**Travel speed**			
	40 km.h^{-1}		**30 km.h^{-1}**	
	Bearing capacity of tires (kg)	inflation (kPa)	Bearing capacity of tires (kg)	inflation (kPa)
	Tire 1 piece		Tire 1 piece	
11,2 - 24 8PR	1000	240	1250	240
280/85 R24	1215	160	1300	160
11,2 R24	1215	160	1300	160
360/70 R20	1400	160	1500	160
320/70 R24	1250	160	1340	160

Parameter of tires	**Travel speed**			
	20 km.h^{-1}		**10 km.h^{-1}**	
	Bearing capacity of tires (kg)	inflation (kPa)	Bearing capacity of tires (kg)	inflation (kPa)
	Tire 1 piece		Tire 1 piece	
11,2 - 24 8PR	1500	240	1750	240
280/85 R24	1440	160	1580	160
11,2 R24	1440	160	1580	160
360/70 R20	1660	160	1820	160
320/70 R24	1480	160	1625	160

Note: (prepared according to the technical parameters of Mitas tyres)
The values of the loading capacity are valid for the front wheel gauge of 1500 - 1800 mm and are in compliance with the loading capacity of the axle.
The values of inflation of tyres are minimal, they are adapted to the max. allowed loading capacity of axles. When operated on a hard surface it is suitable with respect to the tyre slip and wear increase the pressure by 30 kPa.

Bearing capacity of rear tires

Parameter of tires	Travel speed			
	40 km.h^{-1}		**30 km.h^{-1}**	
	Bearing capacity of tires (kg)	inflation (kPa)	Bearing capacity of tires (kg)	inflation (kPa)
	Tire 1 piece		Tire 1 piece	
16,9 - 30 8PR	1850	170	2300	170
480/70 R30	2800	160	2960	160
13,6 R36	1350	160	2440	160
16,9 R30	2500	160	2675	160
420/85 R30	2500	160	2675	160
12,4 - 36 6PR	1150	170	1450	170
14,9 R28	2060	160	2205	160
380/85 R28	2060	160	2205	160

Parameter of tires	Travel speed			
	20 km.h^{-1}		**10 km.h^{-1}**	
	Bearing capacity of tires (kg)	inflation (kPa)	Bearing capacity of tires (kg)	inflation (kPa)
	Tire 1 piece		Tire 1 piece	
16,9 - 30 8PR	2760	170	3220	170
480/70 R30	3280	160	3605	160
13,6 R36	1660	160	1885	160
16,9 R30	2960	160	3250	160
420/85 R30	2960	160	3250	160
12,4-36 6PR	1740	170	2030	170
14,9 R28	2440	160	2680	160
380/85 R28	2440	160	2680	160

Note: (prepared according to the technical parameters of Mitas tyres)
The values of the loading capacity are valid for the rear wheel gauge of 1,512 mm and are in compliance with the loading capacity of the axle.
The values of inflation of tyres are minimal, they are adapted to the max. allowed loading capacity of axles. When operated on a hard surface it is suitable with respect to the tyre slip and wear increase the pressure by 30 kPa.

MAIN TECHNICAL PARAMETERS

Lifting force of the three-point hitch

Type of tractor	**Major HS 80**
Maximal lifting force at the end of lower draw bars of rear three-point linkage when maximum useful pressure (kN)	29
Lifting force at the end of lower draw bars of rear three-point linkage in the whole range of heave with maximum useful pressure (kN)	27
Hydraulic system pump supply (l/min)	53
Working pressure (MPA)	19

Performance on rear PTO shaft

Performance on PTO shaft (kW ± 2%) - with nominal engine revolutions and engaged 1000 rpm of PTO shaft	Major HS 80
Nominal engine revolutions (2200 rpm)	43,8

Tensile force

Type of engine	**Major HS 80**
Maximum tensile force (kN) in swinging draw bar on concrete, tractor in emergency finish with ballast weights, with slippage to 15%	36

MAIN TECHNICAL PARAMETERS

The tractor forward travel speed at nominal engine revolutions (2,200 rpm) - 40 km/h

Degree of reduction	Transmission gear	Degree of multiplier	Forward speed with the used tires of rear wheels 420/85 R30	Revolutions of the dependent rear PTO shaft at nominal engine revolutions (2,200 rpm)	
				540 rpm	1,000 rpm
L	1	Lo	0.55	19	34
		Hi	0,64	22	40
	2	Lo	0.8	27	50
		Hi	0.94	32	59
	3	Lo	1.15	40	72
		Hi	1.35	47	85
	4	Lo	1.67	57	105
		Hi	1.96	67	123
M	1	Lo	2.5	86	157
		Hi	2.94	101	184
	2	Lo	3.65	125	230
		Hi	4.29	148	270
	3	Lo	5.28	182	332
		Hi	6.2	214	391
	4	Lo	7.65	263	479
		Hi	8.97	309	564
H	1	Lo	11.05	379	687
		Hi	12.96	449	815
	2	Lo	16.13	557	1014
		Hi	18.92	653	1196
	3	Lo	23.32	808	1466
		Hi	27.36	945	1727
	4	Lo	33.77	1160	2117
		Hi	39.61	1365	2494

MAIN TECHNICAL PARAMETERS

The tractor reverse travel speed at nominal engine revolutions (2,200 rpm) - 40 km/h

Degree of reduction	Transmission gear	Degree of multiplier	Reverse speed with the used tires of rear wheels 420/85 R30	Revolutions of the dependent rear PTO shaft 540 and 1000 at nominal engine revolutions (2,200 rpm)	
				540 rpm	1,000 rpm
L	1	Lo	0.59	20	37
	2	Lo	0.87	30	55
	3	Lo	1.25	43	79
	4	Lo	1.81	63	114
M	1	Lo	2.72	94	171
	2	Lo	3.97	138	251
	3	Lo	5.74	198	361
	4	Lo	8.31	287	524
H	1	Lo	12.01	414	756
	2	Lo	17.52	606	1,111
	3	Lo	25.35	877	1,606
	4	Lo	36.7	1264	2,316

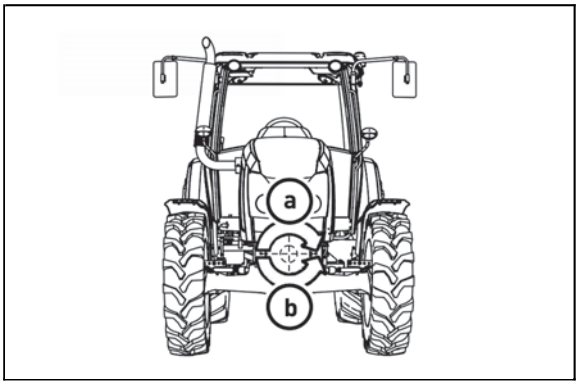
Independent PTO shaft revolutions

labelling	**Shaft revolutions/engine revolutions**	**Shaft revolutions/engine revolutions**
540	613 / 2200	540 / 1938
1 000	1121 / 2200	1000 /1962

Front PTO shaft

Sense of rotation	**PTO shaft speed/engine speed**	**PTO shaft speed/engine speed**
right	1000/1818	1210/2200
***left**	1000/1870	1176/2200

* - option



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Clearance-circle and turning circle diameter

Wheel base	front	1500 mm	Parameter of tires	front	280/85R24	On the left	On the right
	rear	1512 mm		rear	420/85R30		
Turning circle diameter(mm)	without engaged front drive axle					8040	7920
	with engaged front drive axle					9010	8870
Clearance-circle diameter (mm)	without engaged front drive axle					8680	8560
	with engaged front drive axle					9650	9510

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