



MAJOR

OPERATOR'S MANUAL

01/2014



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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.

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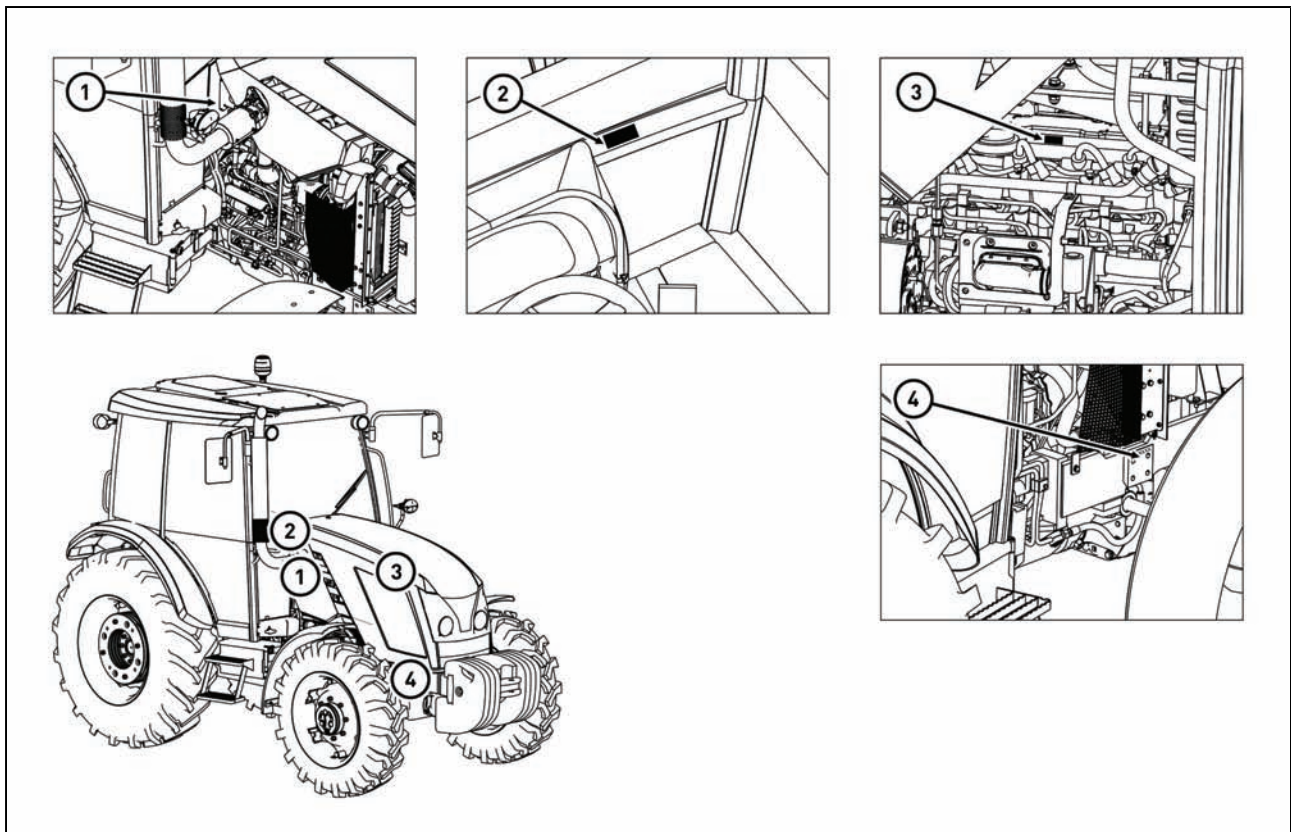
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NOTES



NM14D001

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

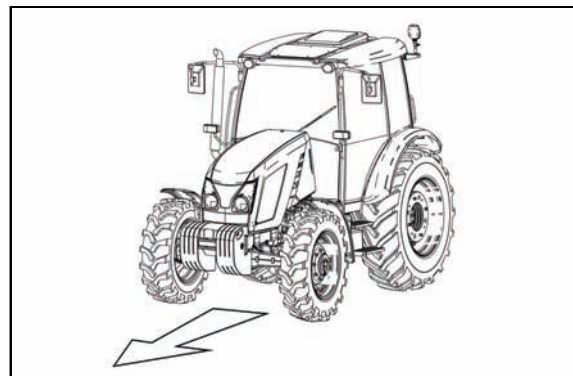
The engine serial number is impressed on a label situated at the top of the engine.
When ordering spare parts and within all written and oral communication always specify the data of your tractor that should be written in the frames below.

Tractor type

Tractor serial number

Engine serial number

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



NM13N082

General safety regulations

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.

- 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.)

Starting the engine

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



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

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



Caution! Electric shock hazard!

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

Driving operation

- Hoses of the hydrostatic steering, brakes and fuel system must be checked and replaced immediately if any signs of damage are found. These are some examples of hose damage signs: - cracks on the hose surface, releasing of pretensioning of hose connection (which can be verified by easy removal of the hose from the connection) and mechanical damage of the hose. Hoses with indicated service life must be replaced immediately after the expiration of the service period.
- The brakes and steering must be in the perfect condition all the time.
- During driving on roads with trailers and tools the brake pedals must be connected with a latch.
- Driving downhill without an engaged gear is forbidden.
- Pay special attention when driving on a slope and muddy, sandy, icy or uneven ground.
- Observe the maximum set angle of slope availability 12° with tractors with front drive axle.
- Respect the total permissible weight of the tractor and trailer specified on the data plate of the tractor or on the rear wheel mudguard.
- Do not use the differential lock when driving into a bend.
- It is forbidden to get into and out of a moving tractor.
- When driving with machines attached to the rear hitches the load of the steered axle must not drop below 18 % of the current weight of the set.
- When driving the tractor with agricultural machines attached to the front three-point hitch, reduce the driving speed to 20 km/h.
- During aggregation of Zetor tractors with machines and implements with high tensile resistance when the engine speed drops and the engine tends to stall, the 1R, 2R reduced gears must not be used for the work with these machines (risk of shaft twist-off).

Transportation of persons, operation

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

Recovery, pushing

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



Never use chains! Rupture of the chain represents a danger of death!

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

Leaving the tractor

- Park the tractor only on an even land and where not possible, support with a shim assy.
- Do not park the tractor with an attached implement in the lifted position.
- Usually use the left-hand side tractor door when leaving the tractor. Look round whether any vehicle is coming, that could jeopardize your safety when leaving the tractor.
- Use steps and handles when leaving the tractor. When leaving the tractor by the right-hand side door pay attention being in space of shifting lever and hand throttle control.
- Brake the tractor with parking brake before leaving tractor with running engine.
- Do not forget to brake the tractor with parking brake (shift the gear), remove the key from key switch and lock the cab before leaving the tractor.
- At tractor equipped with reversor gear, shift the reversor lever into forward drive position.

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.

USER'S SAFETY INSTRUCTIONS



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 disconnect switch the disconnecter off when handling the battery.
- Zetor tractors must not be operated with a disconnected battery as this may lead to a serious failure of the tractor.

Work in a chemically aggressive environment

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

Front passenger's seat notification

ATTENTION:

Transportation of personnel on front passenger's seat is allowed only with road transportation.



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

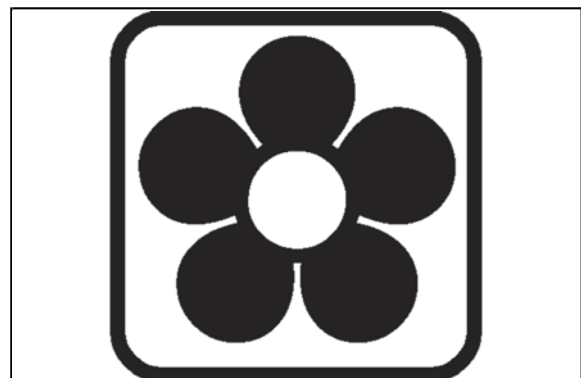


FH13N002

Protection of cab against aerosols

The cab of Zetor tractors in standard design is not designed for work with aerosols and other health hazardous substances.

The level of cab protection in standard design complies with **EN 15695-1:2009 standard - level 2** (only dust proof cab).



FH13N003

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 60	Major 80
Travel speed	30 km/h	
Tractor noise levels when travelling (dB)	78,0	79,0
Tractor noise levels when standing (dB)	78,0	78,5

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 60	Major 80
Travel speed	30 km/h	
Noise levels - closed windows (dB)	84,0	85,0

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/s ²)	$a^*_{wS}^{(2)}$ (m/s ²)
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.

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.

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 purchase 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, labour 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 approval. 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 results 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 falling 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 (Falling Object Protective Structure / Operator Protective Structure), tested according to standards for forest machines.



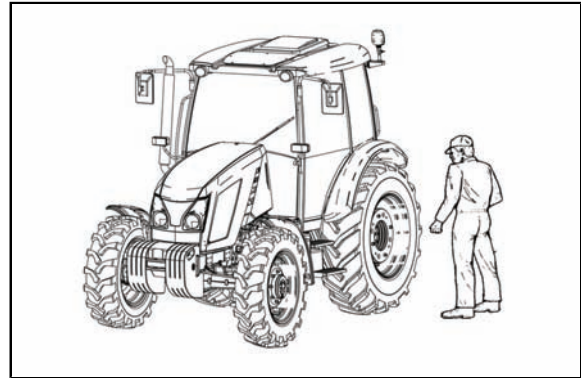
Only forest superstructures approved by ZETOR TRACTORS can be mounted to ZETOR tractors.

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 protective 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.

NOTES

Preventive daily maintenance

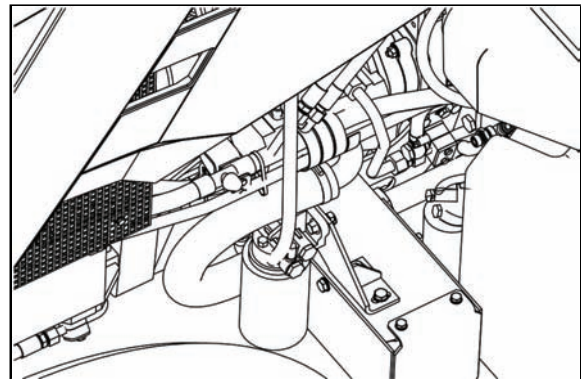
Perform this maintenance daily or after every 8 - 10 hours of operation at the latest.



NM13N083

Fuel system leaks

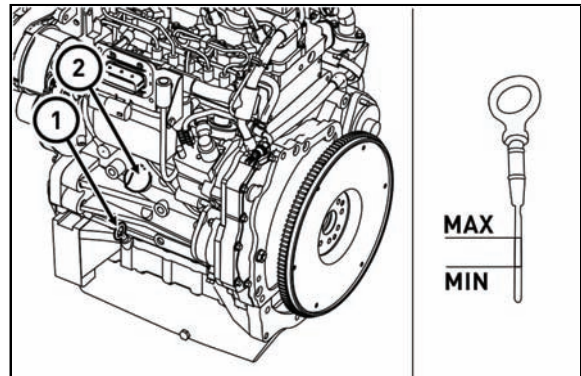
Check the fuel system for leaks, including the fuel tank. Repair any leaks immediately. The hole for draining dirt from the fuel tank is found in its bottom.



Engine oil level

Perform a check on a daily basis before putting into operation, making the tractor stable on a flat surface with the engine off. The engine oil gauge (1) is located on the left-hand side of the engine.

Pull out the gauge (1), wipe it with a clean fibreless rag and slip it fully back in. After pulling out the gauge once again check the oil level. The oil level must be always between MIN and MAX. You can top up the oil if need be.



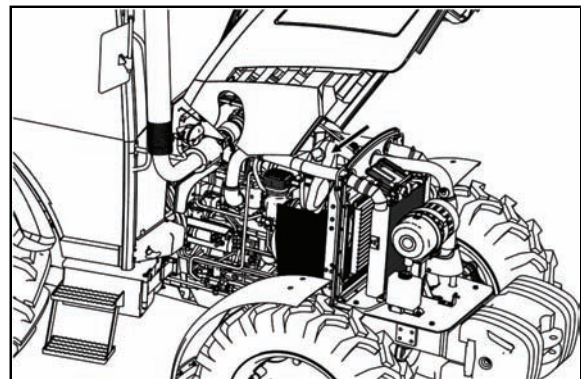
NM14D006

Cooling system

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

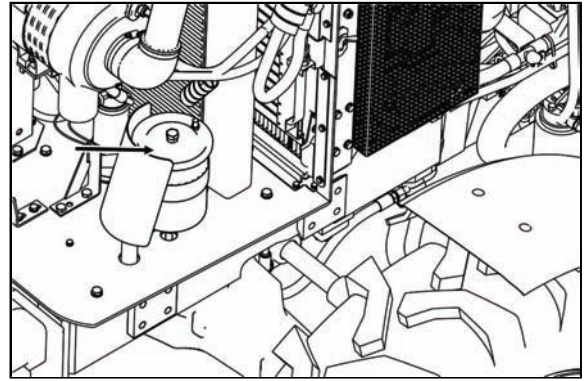


Only release the overpressure plug when the coolant has cooled down! There is a danger of scalding!



Hydrostatic steering

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



Trailer brakes

Air brakes of the trailer

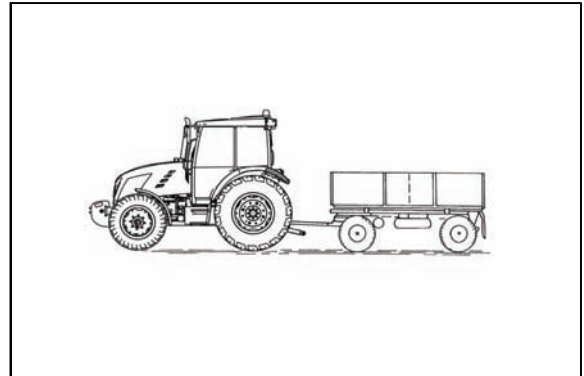
Check tightness of the air-brake system and braking efficiency of the tractor with the trailer.



If the minimum air pressure indicator on the dashboard is off it means that air pressure in the system of air-pressure brakes is sufficient.

Hydraulic brakes of the trailer

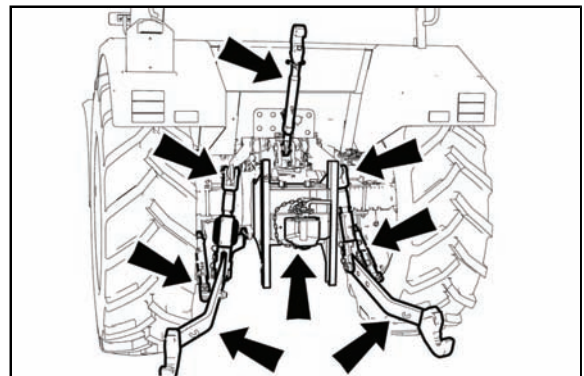
Check tightness of hydraulic-brake circuits in the trailer and braking efficiency of the tractor with the trailer.



NM13N085

Hitches

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



NM13N063

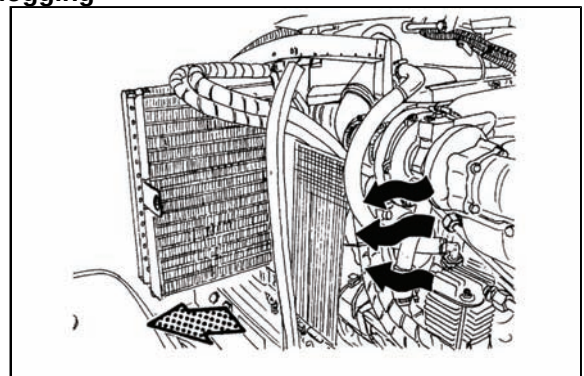
After work with front implements and in case of cooler clogging

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.



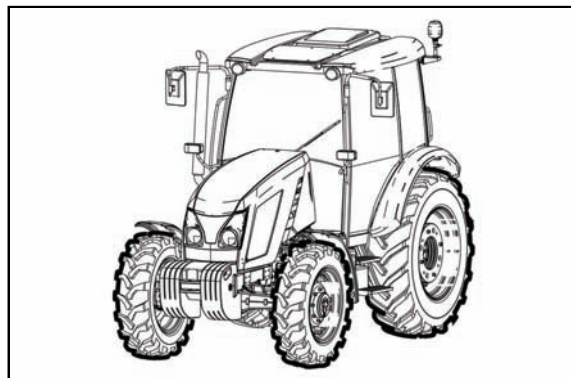
C113

Tyres and wheels

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



Never drive with loose wheel bolts!

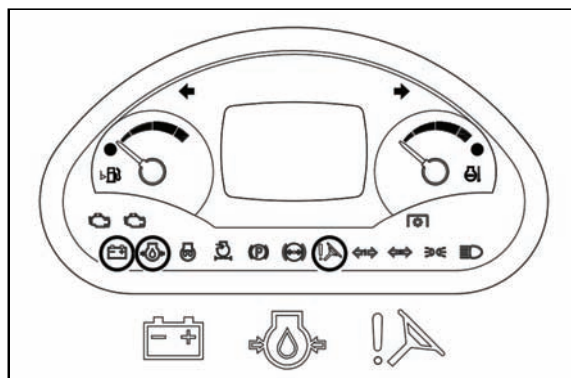


NM13N086

Short functional test

After starting the engine check whether the hydrostatic steering failure, engine lubrication and charging indicators have gone off.

Verify the function of the hydraulic steering circuits and check them for leaks.



NOTES

ACQUAINTANCE WITH THE TRACTOR



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!

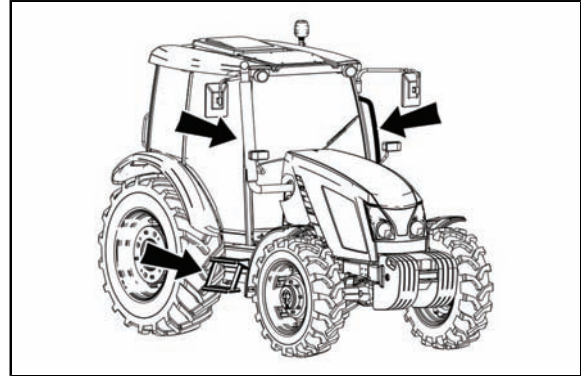
Safety cab



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.

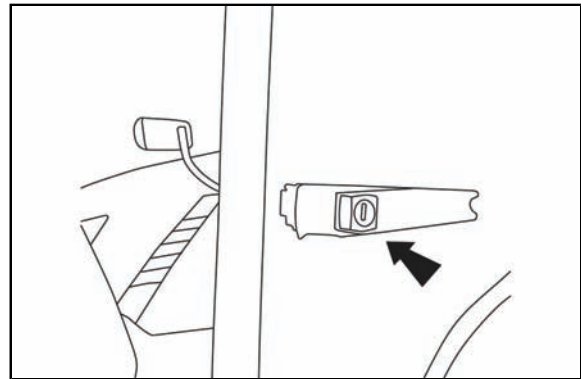
Take greater care in the area of gears lever.



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.



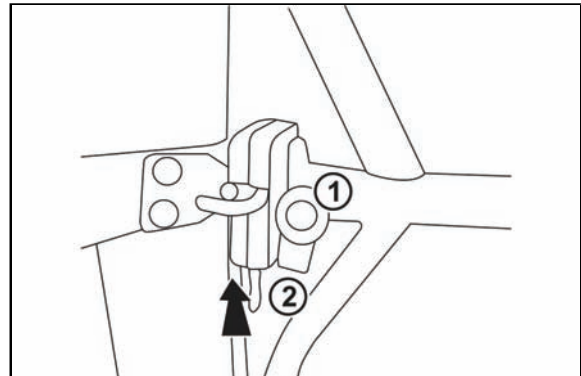
NM13N025

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.



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



NM13N026

ACQUAINTANCE WITH THE TRACTOR

Rear window

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

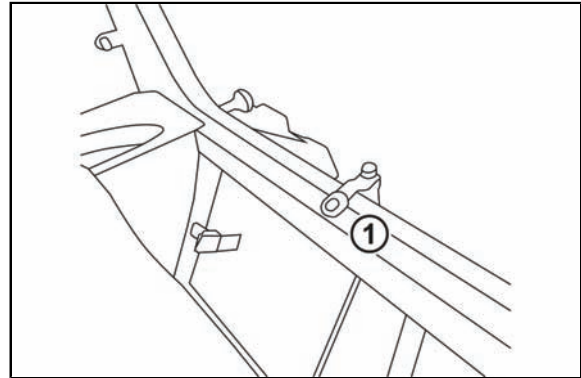
By pushing the lever (1) downwards a flap of rear window is released and by pressure on handle of rear window we open the window.

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



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

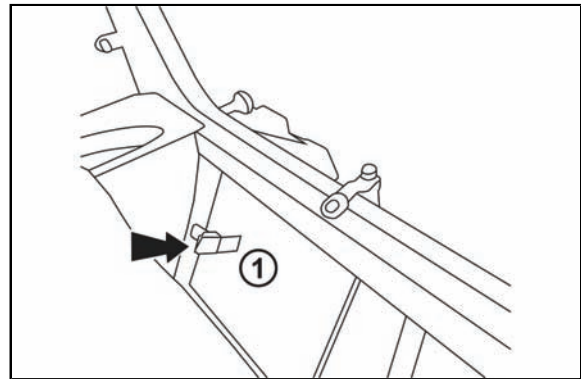
When starting work with machines mounted in rear three-point linkage of the tractor make sure that there is no risk of collision between mounted tools with maximum heave of rear three-point linkage and open rear window. If there is collision we recommend working with a closed window.



NM13N027

Bottom rear window

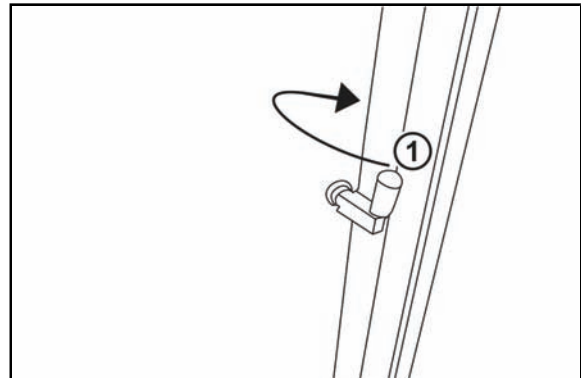
For opening the bottom rear window, it is necessary to push the lever (1) in the direction of an arrow. Close the window in reverse procedure, window flap will close automatically.



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

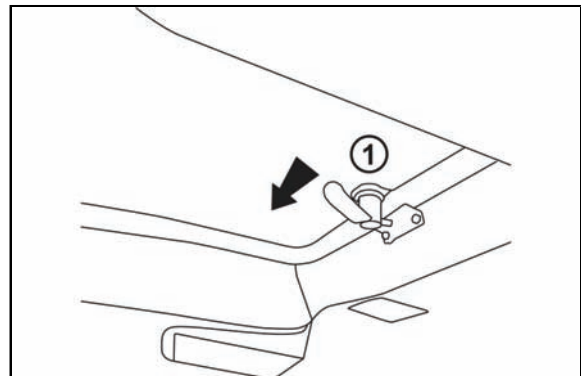
Hinged lid

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.



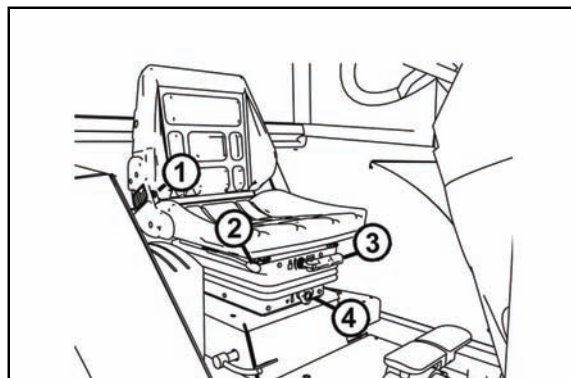
By opening the hinged lid, the overall height of tractor increases. Therefore close the lid always when you pass through or park at places with limited light. .



ACQUAINTANCE WITH THE TRACTOR

Driver's seat

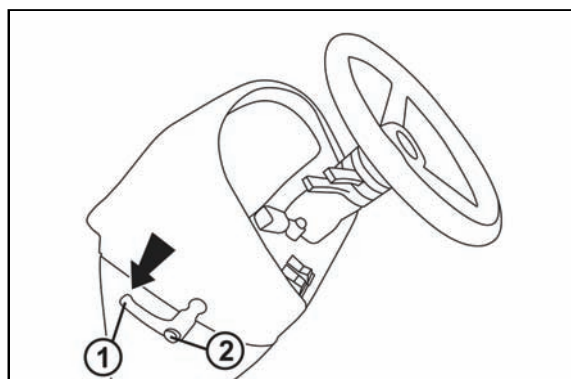
1. Control of setting the seat backrest angle (by turning the control the angle of backrest is set).
2. Longitudinal setting of seat lever (the lever to be pushed from the seat, the seat to be set longitudinally and lever released).
3. Seat suspension setting control based on driver's weight (setting by turning the control, the direction based on the pictogram on gaiter of the seat).
4. Vertical seat adjustment control (setting by turning the control, direction based on pictogram on seat's gaiter).



C126

Tilting steering wheel

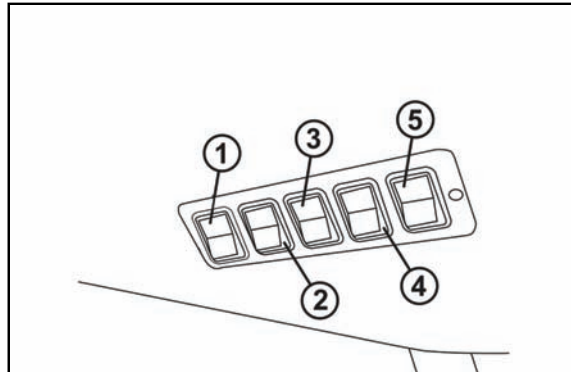
Release the lever (1) by turning in the direction of an arrow, set the tilting of the steering wheel and lever (1) to be tightened by turning against the direction of an arrow. After pressing the button (2) the lever (1) can be relocated to a suitable position.



NM13N031

Panel of switches on cab's roof

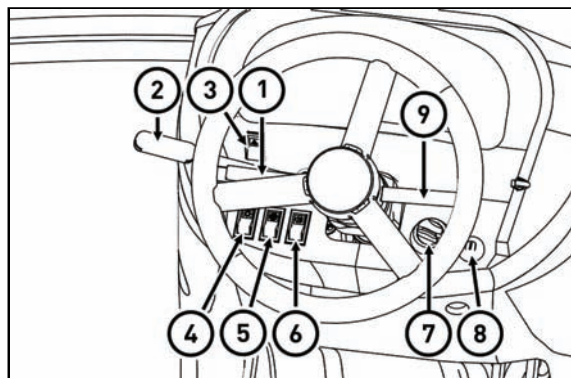
1. Air condition switch
2. Beacon switch
3. Rear windscreen wiper switch
4. Rear working lights in cab's roof switch
5. Front working lights in cab's roof switch



NM13N032

Switches and controls on the dashboard

1. Direction indicator switch
2. Headlights switch
3. Warning lights switch
4. Headlights switch
5. Hearing switch
6. Fog light switch (off - on). Fog light function is signalized by a lit symbol on the switch.
7. Heating valve control
8. Switch box
9. Front screen wiper and washer switch

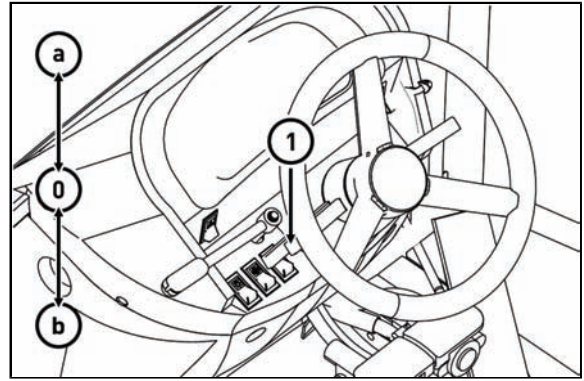


ACQUAINTANCE WITH THE TRACTOR

Direction indicator switch

Direction lights are turned off by the movement of a switch (1) to position (a) or (b)

- a - direction lights to the right
- b - direction lights to the left

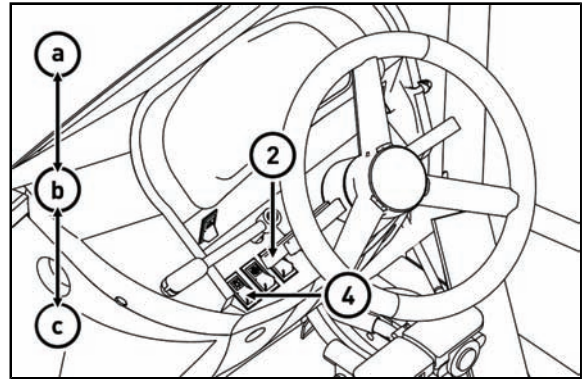


Headlights switch

The main lights are switched by a switch (2) after switching on the main lights in the grill of the bonnets by a switch (4).

- a - side lights
- b - dipped lights
- c - headlights

After pulling the switch lever (2) to the steering wheel, acoustic horn is engaged.

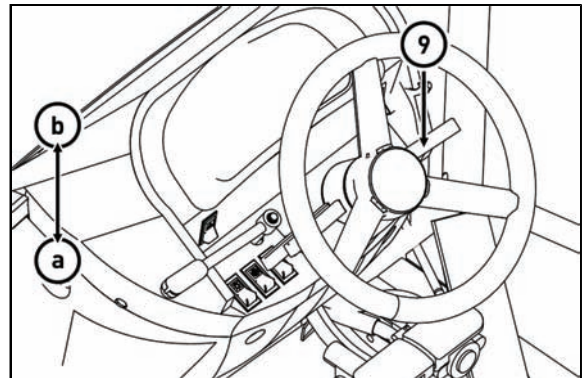


Front windshield wiper and washer

Front windscreen wiper and washer are switched on by a switch (9).

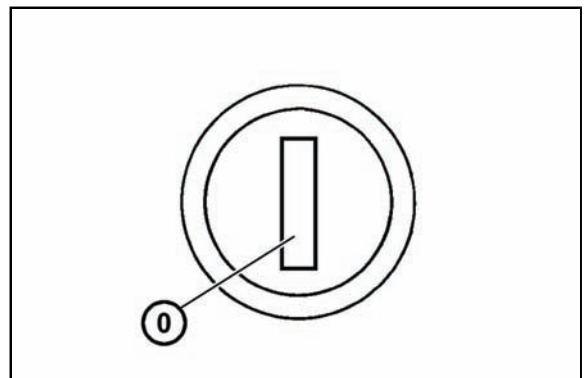
- a - disengaged
- b - front wiper on

Front windshield washer is engaged by pulling the lever (9) in the direction of the steering wheel.



Switch box key in the position (0)

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

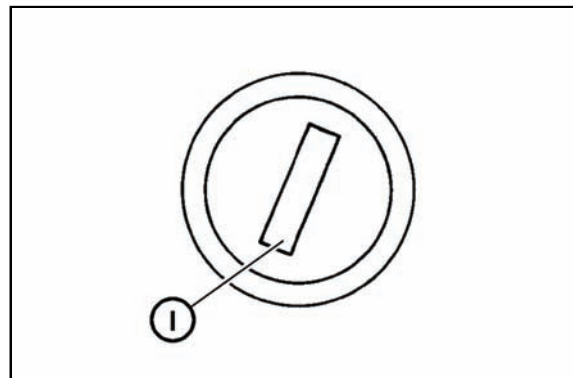


S43

ACQUAINTANCE WITH THE TRACTOR

Switch box key in the position (I)

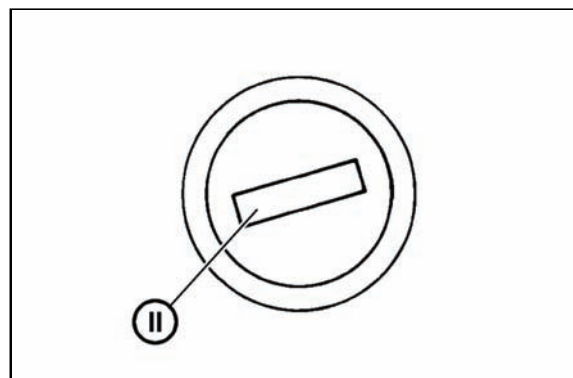
The voltage is connected to all the equipment excluding starter. The key is in this position with the engine running.



S44

Switch box key in the position (II)

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



S45

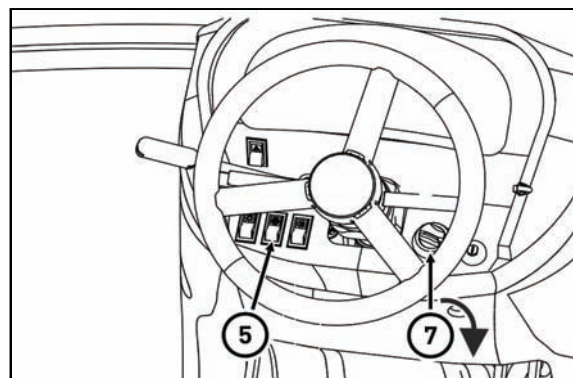
Cab heating

Heating is placed in dashboard panel. The heating is turned on by a switch (5). The switch (5) is to position

a - after switching the switch to the first position the heating ventilator output is lower

b - after switching the switch to the second position the heating ventilator output is higher

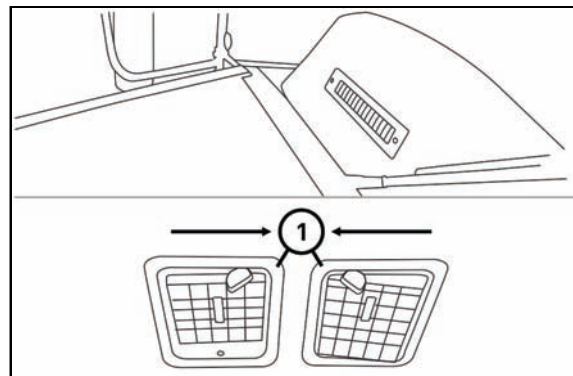
The temperature of exhausted air is set with a heating valve control (7). When turning the control (7) in the direction of an arrow, the temperature of exhausted air increases, against the direction of an arrow it decreases.



Cab heating registers

Heating registers are placed in the upper (A) and face (B) part of the dashboard panel.

The lower registers (B) are opened by shifting the levers (1) in the direction of arrows. By shifting the levers against the direction of arrows, registers close.



ACQUAINTANCE WITH THE TRACTOR

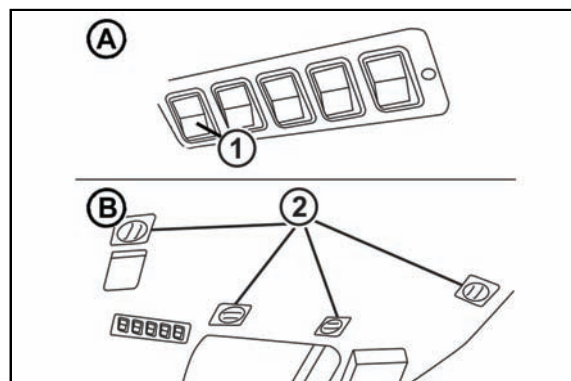
Cab air condition

Cab air condition is controlled by a switch (1), placed on the panel of switches on the cab (A) roof.

Air condition registers (2) are placed in the cab's roof.

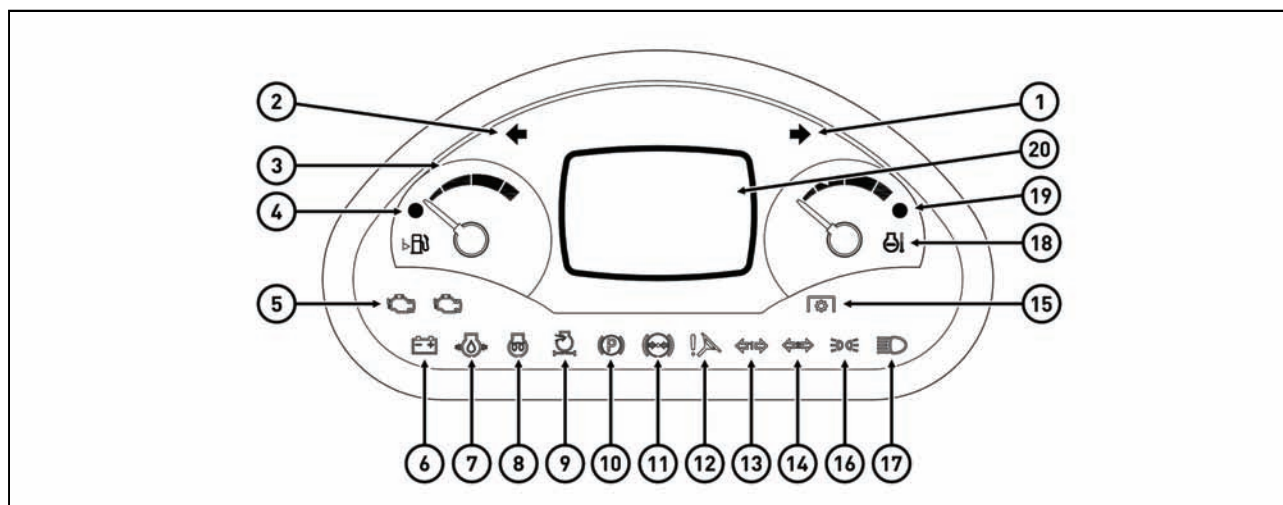


If the air condition is active, set registers (2) under the requested angle so that there would not be direct fanning of people in the cab (illness due to intensive body cooling might occur).



NM13N039

Dashboard



NM14D046

1. Indicator of the indicator lights on the right-hand side of the tractor (green)
2. Indicator of the indicator lights on the left-hand side of the tractor (green)
3. Thermometer
4. Fuel reserve indicator (yellow). It is on if it remains 1/6 to 1/10 of the tank capacity.
5. Engine failure indicator (red). On if an engine failure occurs.
6. Charging indicator (red). On if a charging failure occurs while the engine is running.
7. Engine lubrication indicator (red). On if an engine lubrication system failure occurs while the engine is running.
8. Engine heating indicator (yellow). Indicates that the device to facilitate the engine start-up is in operation.
9. Indicator of engine boosting system failure (red). Is on if the air charging of the engine is insufficient while the engine is running.
10. Handbrake indicator (red). On if the handbrake is pulled up.
11. Indicator of minimum air pressure in the brake system (red). It is on if air pressure in the trailer air brakes drops down under a critical limit.
12. Indicator of hydrostatic control system failure (red). It is on if a failure occurs in the hydrostatic control system while the engine is running.
13. Indicator of the indicator lights of the first trailer (green)
14. Indicator of the indicator lights of the second trailer (green)
15. Turn-off indicator of the power take-off shaft clutch (red)
16. Indicator of the sidelights (green). It is on if the sidelights are turned on.
17. Indicator of the distance lights (blue). Is on if the distance lights are turned on.
18. Thermometer
19. Coolant overheat indicator. On if the cooling liquid temperature steps over 110°C.
20. Information display

ACQUAINTANCE WITH THE TRACTOR

Information Display - Basic View

The following values are depicted on the basic display:

1. Tractor type
2. Engine revolutions (number of engine revolutions per minute)
3. Voltage in the electric system of the tractor
4. Total number of motor-hours in service



NM14D047

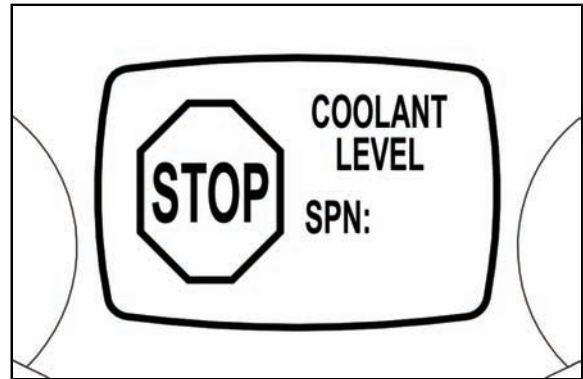
Information Display - Maintenance Notifications

In case any maintenance operations are required, a label **STOP** will show up on the display and the necessary maintenance operation in English is displayed in the top right corner:

COOLANT LEVEL - Check and top up coolant in the equalizing tank

AIRFILTER - Carry out maintenance of the engine airfilter

Shall such a situation arise, carry out the operation shown on the display according to the chapter Maintenance Instructions.



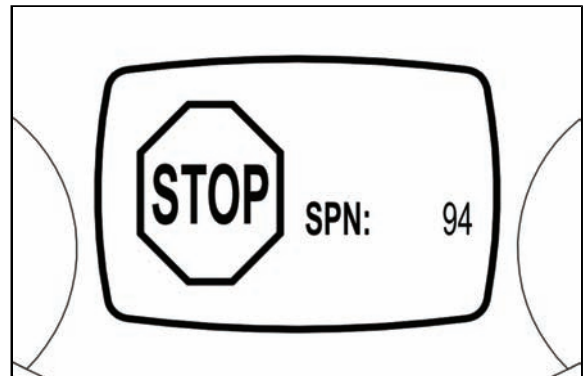
NM14D048

Information Display - Fault Notifications

If a serious engine fault occurs, a label **STOP** and the **SPN** fault code number will show up on the display. In the picture, the example **SPN: 94** means a fault code of 94.



Shall such a situation arise, put the tractor out of action and contact a service place.



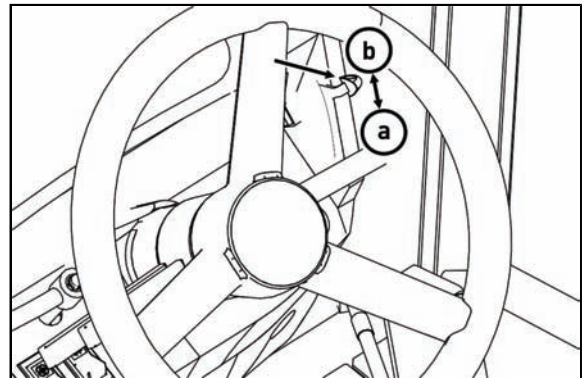
NM14D049

Manual fuel control lever

a - idle run

b - maximum supply

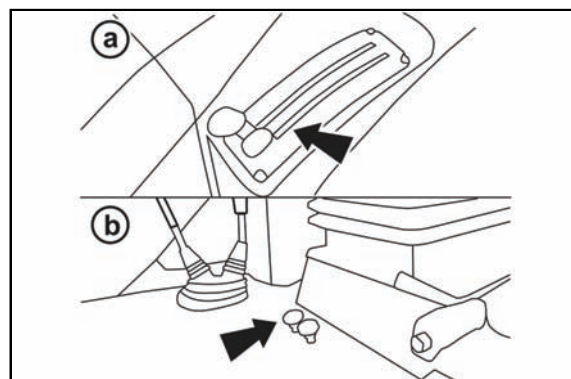
The lever enables to set engine revolutions in the whole range (a) to (b).



ACQUAINTANCE WITH THE TRACTOR

Hydraulic control

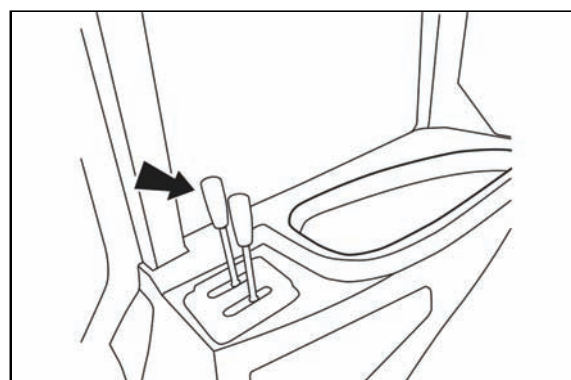
Hydraulic control panel with levers (A) is placed in the area of right fender. Hydraulic controls (B) are placed in front of driver's seat.



NM13N040

Auxiliary hydraulic switchboard control

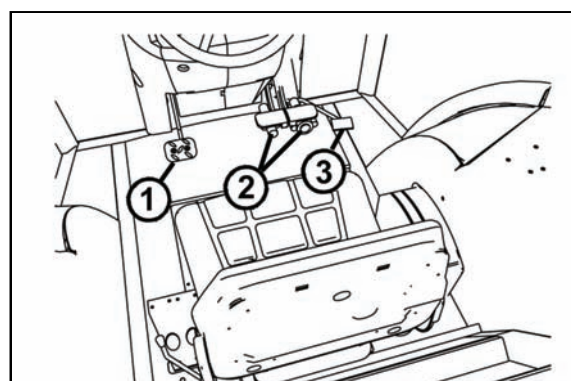
Auxiliary hydraulic switchboard control is placed on the upper part of right fender.



NM13N042

Pedals

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



C127a

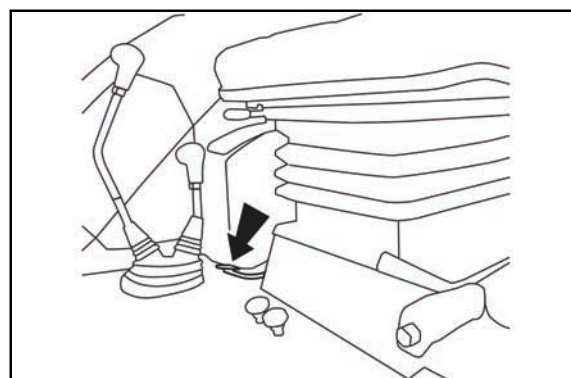
Differential lock

Differential lock is controlled by a pedal placed on the right side of driver's seat.

Engaging differential lock is done by depressing a pedal, for the time of pedal depression the lock is engaged, after releasing the lock pedal, the pedal returns to its original positional and the differential lock is disengaged.



When going through a bend, do not use differential lock. Engage differential lock with low engine revolutions.



NM13N043

Reversing lever

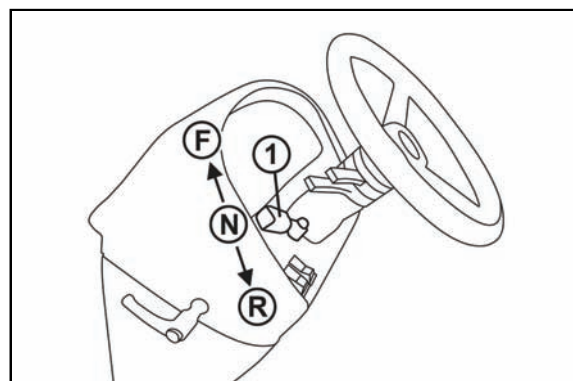
Reversing lever (1) serves for the change of tractor travelling direction.

F - Travelling forward; lever in the front

N - Neutral

R - Reversing; lever at the back

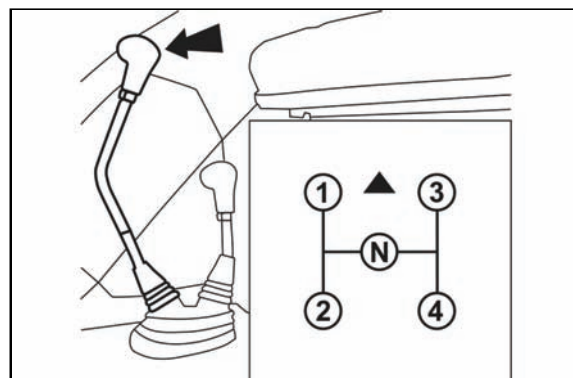
Gear shifting is done with a tractor at standstill and clutch pedal depressed.



NM13N044

Gear shifting lever

Gear shifting lever serves for change of gear box gear. Gear shifting is done with clutch pedal depressed.



NM13N045

Road and reduced speeds shifting lever

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

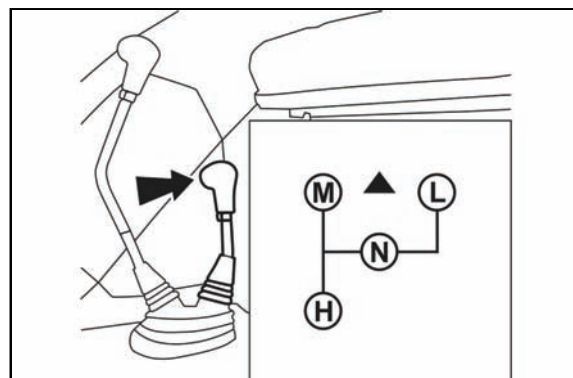
H Road speeds

M Average speeds

N Neutral

L Reduced speeds

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



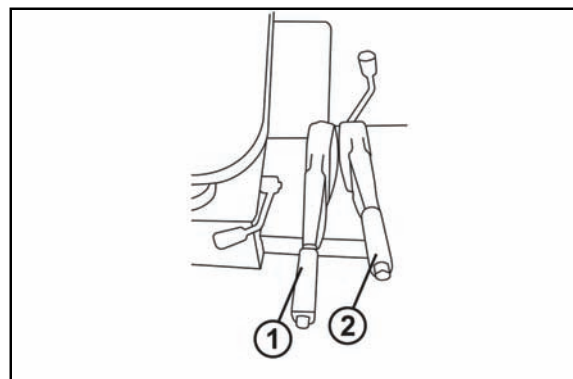
NM13N046

Manual brake and PTO shaft disengagement lever

Manual brake and PTO clutch disengagement levers are located on the left side of driver's seat.

1. manual PTO clutch disengagement level

2. manual brake lever



NM13N047

ACQUAINTANCE WITH THE TRACTOR

Front drive axle control lever

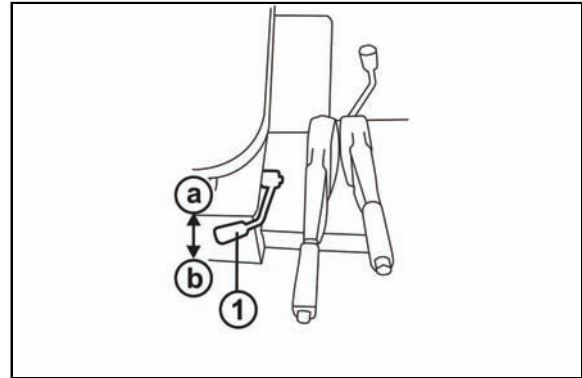
Front drive axle engagement is done by a lever (1) located on the left side of driver's seat.

- a - Front drive axle disengaged
- b - Front drive axle engaged

Engage front drive axle with standing tractor.



Use front drive axle with rear wheels slip to enhance the pull of tractor. When driving with front drive axle engaged on the road and hard surface the maximum permitted speed is 15 km/h. Driving with engaged front drive axle causes increased front tires wear.



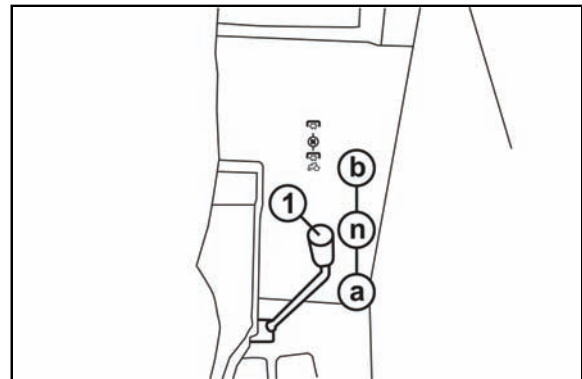
NM13N048

PTO shaft drive engagement lever

Rear PTO shaft is engaged by a lever (1) placed on the left side of driver'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

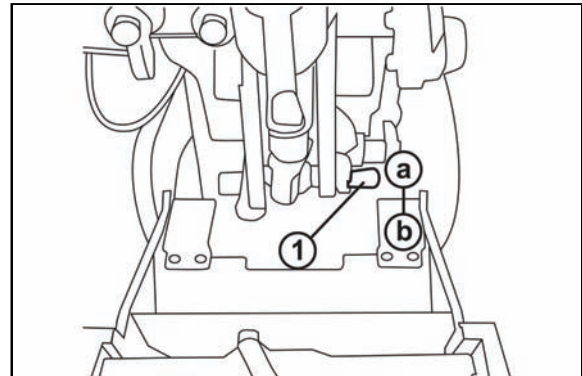
Shifting 540 or 1 000 revolutions of rear PTO shaft is done with the lever (1) placed from the outside of the tractor above the rear PTO shaft.

- a - 1 000 rpm
- b - 540 rpm

Gear shifting is done with the lever of PTO shaft drive engagement in (n) position.



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



NM13N005

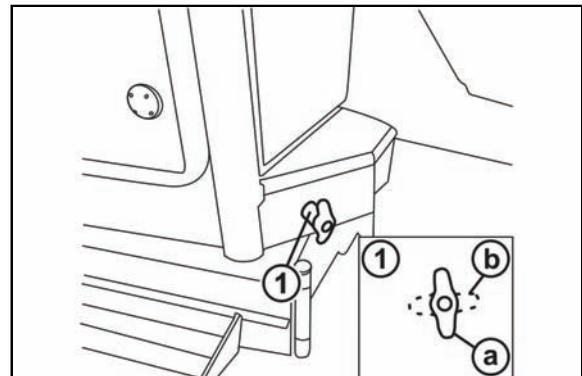
Battery disconnecter

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

- a - Battery is connected
- b - Battery is disconnected



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



NM13N049

Fuel tank

Fuel tank is located on the left side of the tractor. A plastic tank with a volume of 80 litres is mounted as a standard.



Do not step on the tank!

Fuel tank drain plug

Fuel tank drain plug is in its bottom.



NM13N089

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.

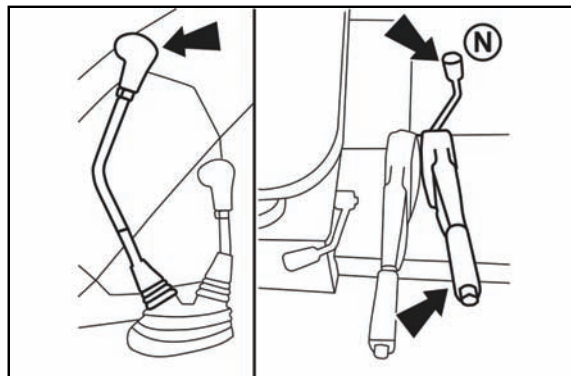
Before you start the engine



Before you start the engine, make sure that:

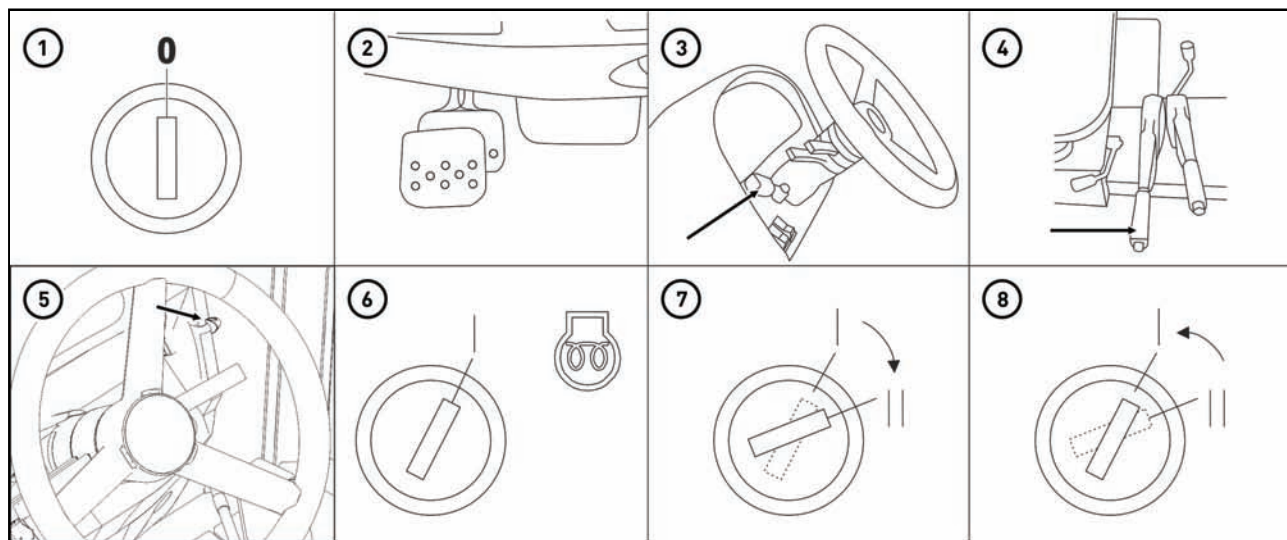
- 1. tractor is properly braked**
- 2. PTO shaft drive engagement lever is in neutral position**
- 3. the main gear shifting lever is in neutral position**

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



NM13N050

Starting the engine



1. Insert the key to the switch box- position '0'.
2. Depress the clutch pedal (start breaker is switched).
3. Shift reversing lever to neutral position (start breaker is switched).
4. Pull manual clutch lever (start breaker is switched).
5. Set the manual fuel control lever to idle run position.
6. Switch the key of switch box from position '0' to position 'I'. Thermostart ignition control lights up. Wait for the time when ignition control goes out (the time is dependent on the temperature of coolant).
7. As soon as the control goes out (5 s max) turn the key from the position to position 'II' (start).
8. After starting the engine, release the key immediately, it automatically re-turn to position 'I'. **Do not start longer than 15 s.**

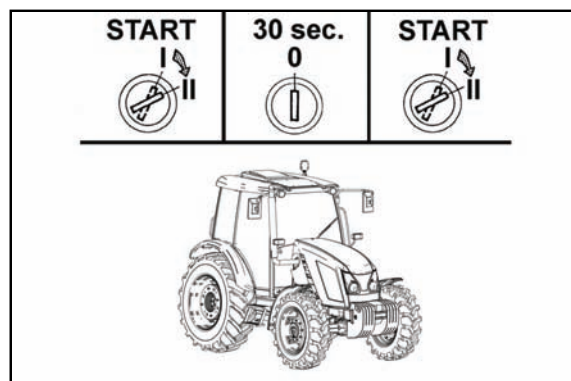
If engine does not start

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.



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

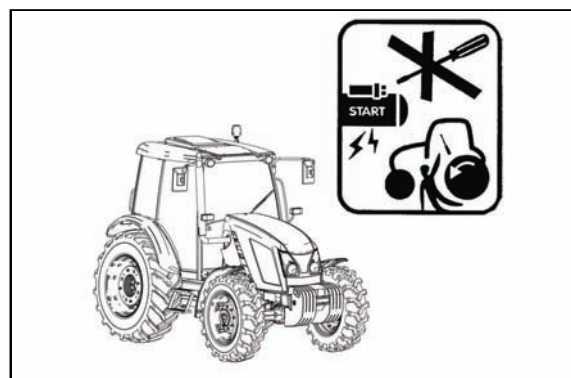


NM13N091

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.



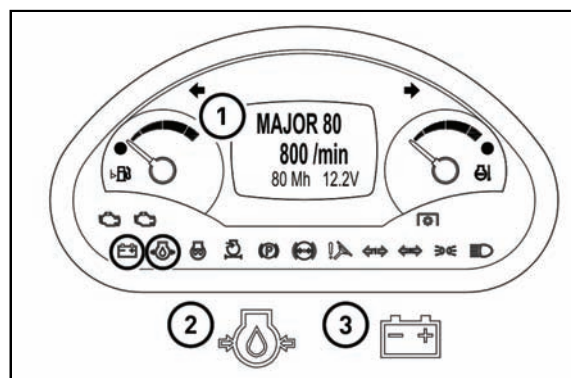
NM13N093

Immediately after start



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

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.



Engine heating

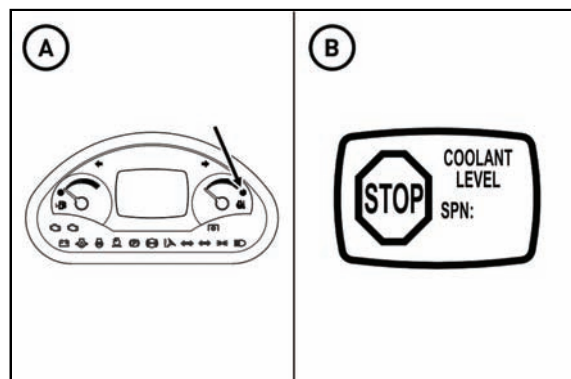


Do further heating of the engine when driving. Heating engine by lengthy idle run or abrupt revolutions increase is harmful to the engine. If the temperature of coolant has not reached 45°C, do not overcome engine revolutions over 2,000 rpm.

Engine Performance Limitation

The engine control unit will automatically limit engine performance in the following cases:

- If the coolant temperature exceeds 110°C, the overheating indicator on the dashboard comes on (A). Stop working and keep the engine running at idle until the coolant temperature decreases and the indicator goes off. If the coolant temperature does not drop while the engine is running at idle, stop the engine and check coolant contents.
- If coolant level in the equalizing reservoir falls under a critical limit, a maintenance notification of **COOLANT LEVEL** will show up on the dashboard display (B). Check joint tightness in the engine cooling system and coolant contents. Top up the missing contents up to the upper mark labelled with MAX.

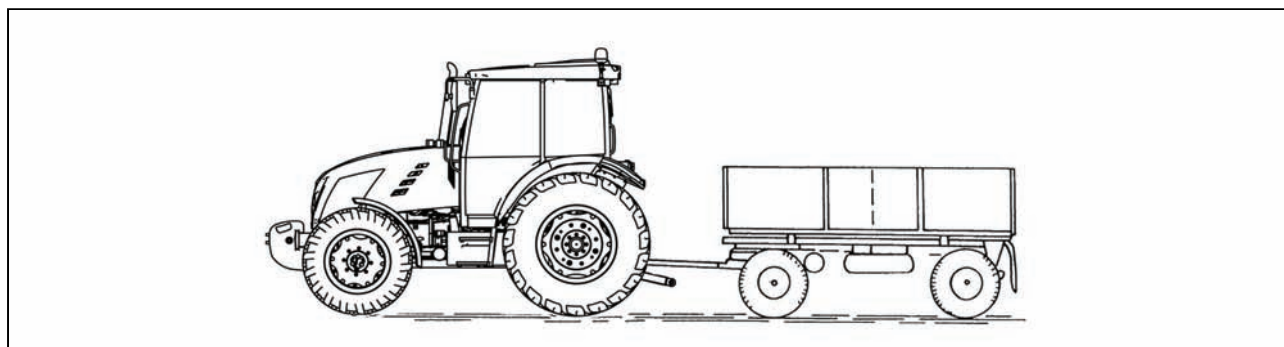


NM14D053



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

Drive away



NM13N094

1. Depress the clutch pedal.
2. Shift the main shifting lever to neutral position.
3. Start the engine.
4. Set the engine speed from 800 to 850 r.p.m.
5. Select road or reduced gears.
6. Shift the reversing lever to the tractor's travel direction (to the front or reversing).
7. Engage applicable gear for tractor's start
8. Increase engine revolutions slightly.
9. Prepare manual brake for unbraking.
10. Release the clutch pedal only to the point of travel engagement and with simultaneous increase of engine revolutions continue in smooth release of clutch pedal.
11. Unbrake manual brake completely.
12. Drive away smoothly and slowly.



A very fast drive away may cause overload of driving set, increased fuel consumption, excessive tires wear and load damage. Drive away with 1st gear to be used only when driving with a heavy trailer up the slope and in difficult terrain.

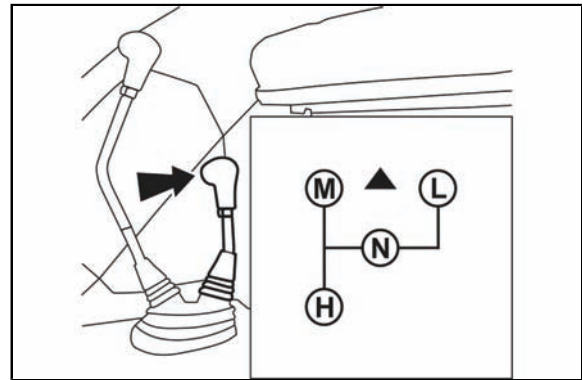
Selection of road or reduced speeds

Road and reduced gears lever serves for shifting groups of gears.

H	Road speeds
M	Average speeds
N	Neutral
L	Reduced speeds



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



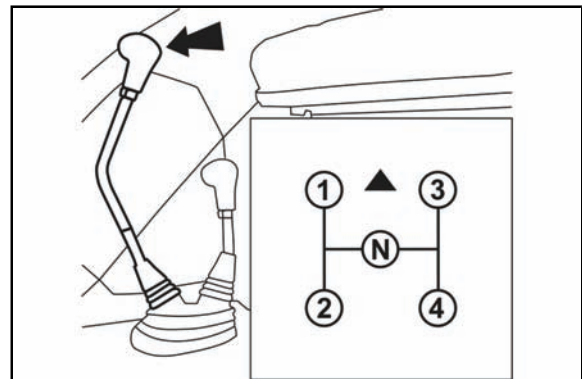
NM13N046

Gear shifting

Gear shifting lever serves for changes of gear box gears. Gear shifting is done with a depressed clutch pedal.



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



NM13N045

Selecting driving direction - Reversing lever

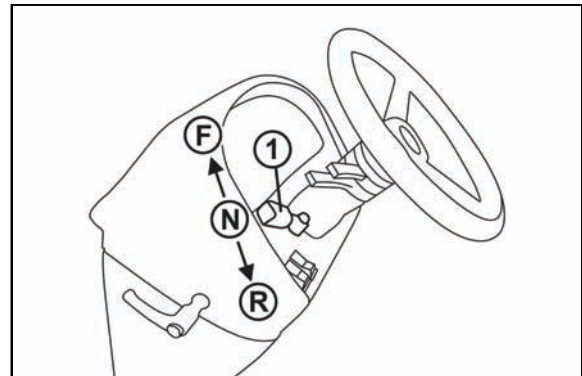
Reversing lever (1) serves for the change of tractor's travel direction.

F - drive forward, lever in the front

N - neutral

R - reversing; lever at the back

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

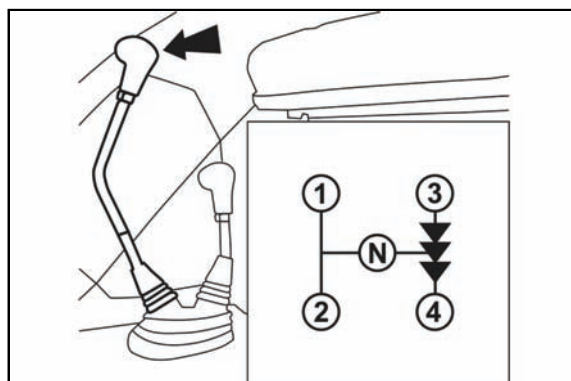


NM13N044

Gear shifting from lower to higher gears

Depress the clutch pedal (clutch disengaged). At the same time release the pedal of foot fuel control and shift the applicable higher gear. Release the clutch pedal (clutch is engaged) smoothly and at same time increase engine revolutions.

Note: For increasing the life cycle of synchrones, it is possible to shift from higher to lower gear with the socalled double declutching.

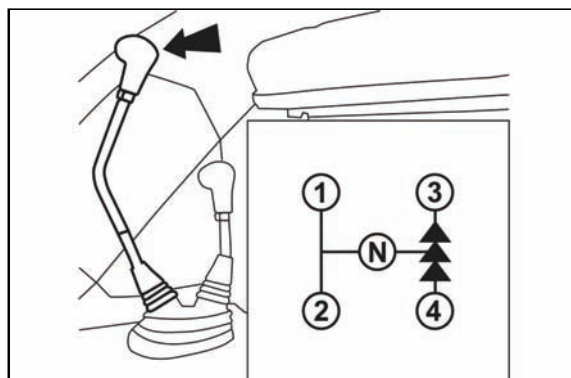


NM13N052

Gear shifting from higher to lower gears

Depress the clutch pedal and shift the gear shifting lever through neutral to lower gear.

Note: For increasing the life cycle of synchrones, it is possible to shift from higher to lower gear with the socalled double declutching.

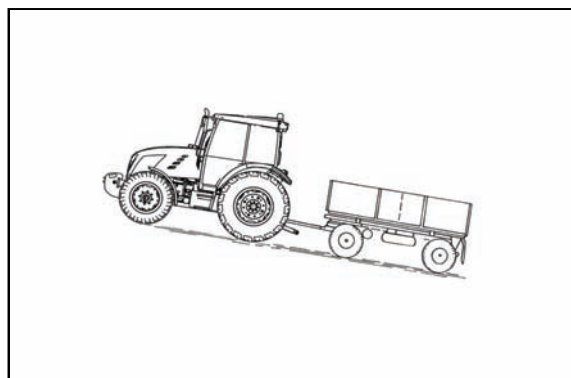


NM13N058

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.



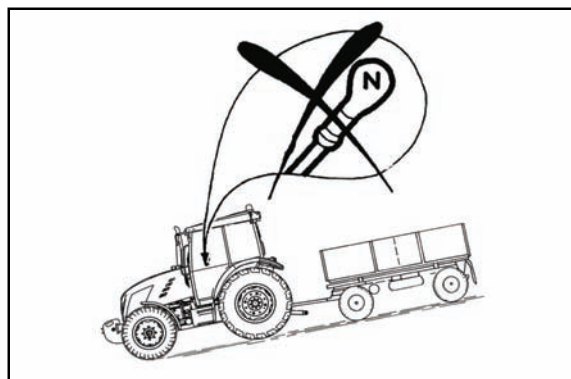
NM13N095

Travelling down the slope



Travelling down the slope without an 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.



NM13N096

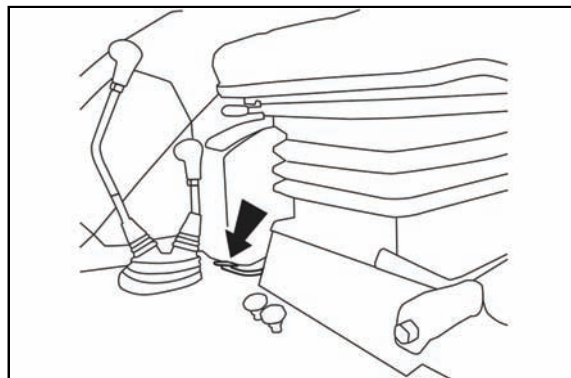
Differential lock

Differential lock is controlled by a pedal placed on the right side of driver's seat.

Differential lock is engaged by depressing the pedal, for the time of pedal depressing is the lock engaged, after releasing the pedal of the lock, the pedal returns to its original position and differential lock is disengaged.



When going through a bend, do not use differential lock. Engage differential lock with low engine revolutions and tractor at standstill.



NM13N043

Front drive axle control

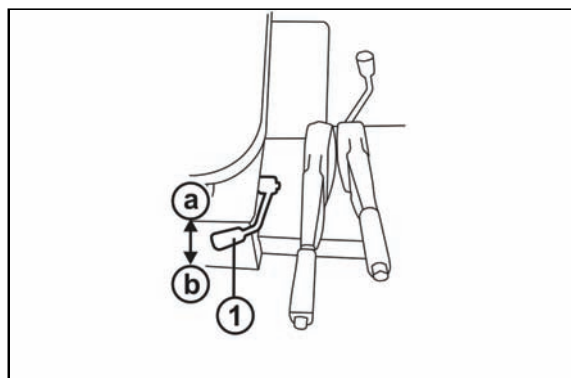
Engaging front drive axle is done by a lever (1) placed on the left side of driver's seat.

a - Front drive axle disengaged

b - Front drive axle engaged



Engaging front drive axle to be done with tractor at standstill.



NM13N048

Driving with front drive axle engaged



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.

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

Foot brakes pedals

Foot brakes are disc, wet, mechanically-controlled and two-pedaled.

A - Standard pedals with a flap

B - Pedals with flap for trailer air brakes

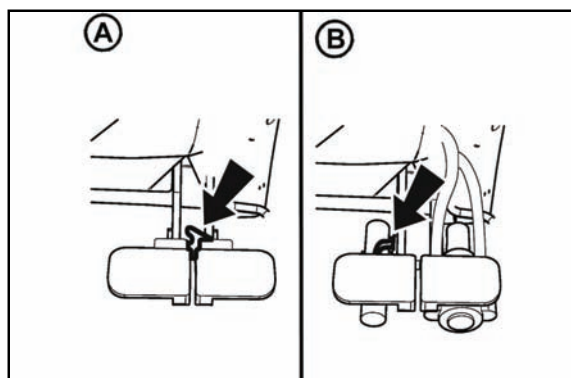


When driving on the road, both pedals must be connected by valve. Use disconnected pedals for braking right or left wheel only when working in terrain or on the field.

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



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



NM13N112

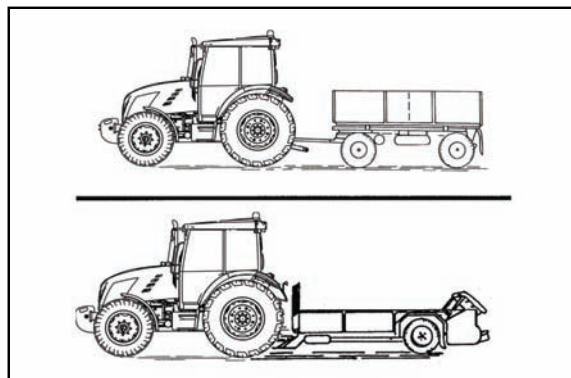
Trailer and semi-trailer air brakes

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.



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.

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!



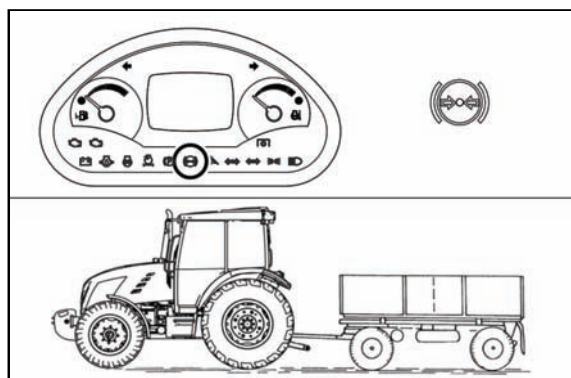
NM13N097

Notification signalization of air pressure drop

If the air pressure in the air brake system falls under a critical limit, a red indicator on the dash board comes on.



In case the pressure in the air-pressure system drops under a critical limit (the indicator comes on), the tractor with a braked trailer or semitrailer is not allowed to continue operation until the air pressure increases.



NM14D039

Single hose air brakes for trailer

Connecting head of single hose brakes (1) is located on the rear panel of quick-couplers.

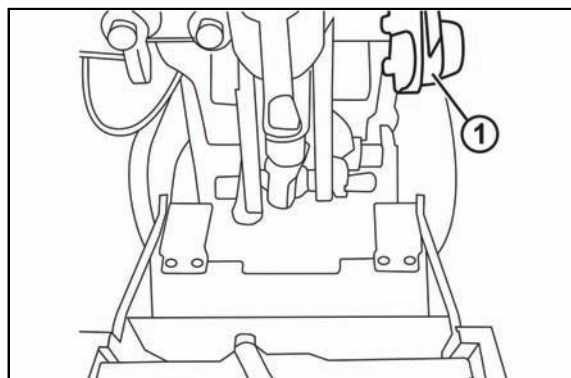


Connecting head must be closed with flaps after disconnection or without a connected trailer, semi trailer.

Operation pressure is set by control valve to 600 ± 20 kPa.



When connecting the trailer (semi trailer) with maximum permitted weight approved for the type of tractor at stake is the maximum set speed of 30 km/h! Maximum permitted speed of set is given by maximum permitted speed of the slower vehicle of the set.



NM13N059

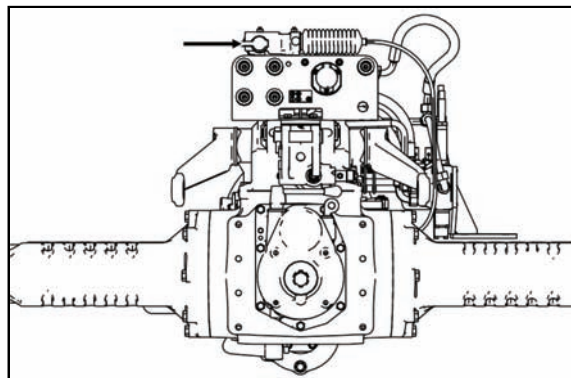
Hydraulic brakes of trailers

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.



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

Connecting and disconnecting quick couplings of trailer hydraulic brakes

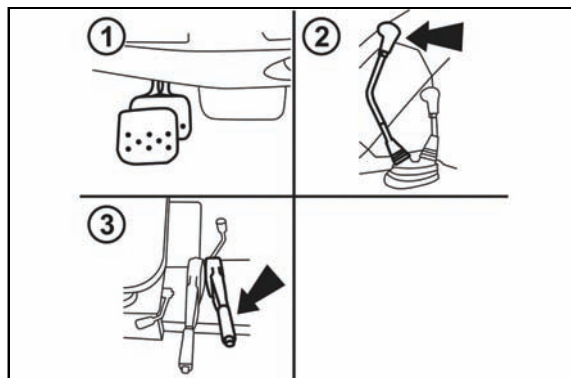


When connecting and disconnecting quick couplings, take increased care with regard for remaining oil which remains in the socket or in the plug of quick coupling. For ecological reasons, it is necessary to remove this remaining oil after every disconnection of quick couplings with any textile material.

Stopping the tractor - manual brake

Stop the tractor gradually in standard conditions. Shortly before stopping:

1. Depress the clutch pedal.
2. Shift the main gear shifting lever to neutral position.
3. With every stop over, secure the tractor against spontaneous drive away by a manual brake. Engagement of manual brake is signaled by a lit control on the dashboard.

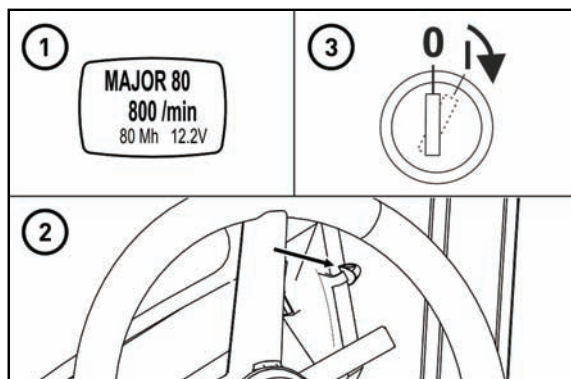


NM13N060

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'.



NM14D041

Leaving the tractor

Before leaving the tractor with a safety cab do not forget to remove the key from the switch box in position '0' (only with engine at standstill - charging control must be on) and lock the cab. (The key cannot be pulled out in positions I and II)



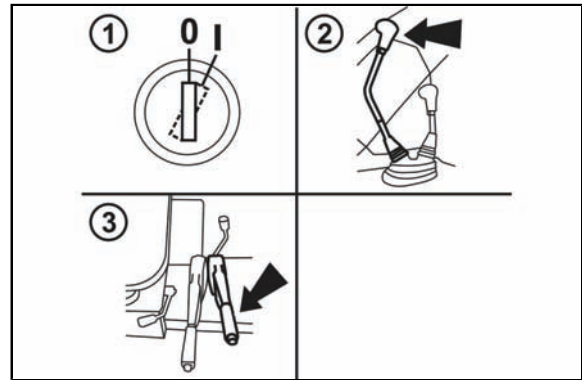
Tractor must be secured against spontaneous drive away:

1. engine disengaged

2. 1st gear engaged

3. braked with the manual brake

If the tractor is on the slope wheels must be made stable with shims.

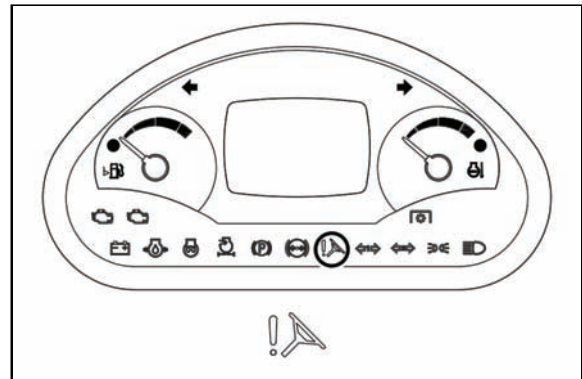


NM13N062

Hydrostatic steering failure warning signalization

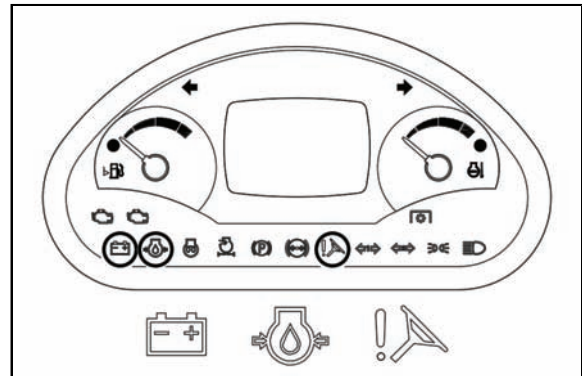
Hydrostatic steering pump failure is with pressure drop under 120 kPa behind the pump signalized on the dashboard by an applicable symbol.

Note: When starting the engine or with low engine revolutions, the control may be blinking, if after starting or revolutions increase engine control goes out, it is not a failure. The system is alright.



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.



NOTES

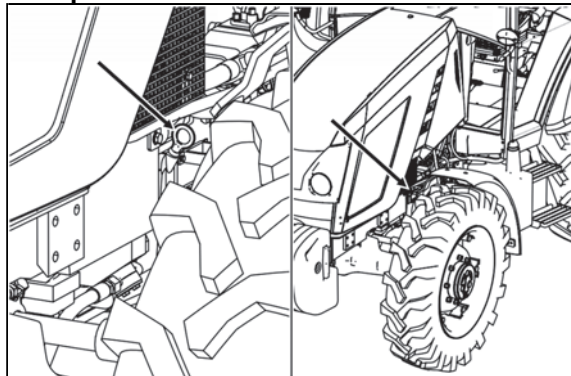


Before driving a new tractor, first get acquainted with the gear shifting scheme and try out individual positions of gear shifting lever with engine at standstill. Before you drive off in normal operation you must make sure that technical condition corresponds with the conditions of safe operation.

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

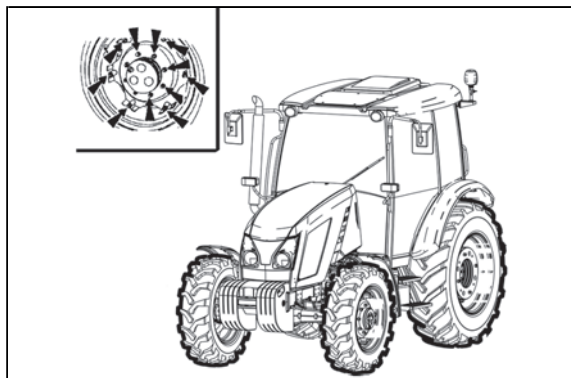
During first 100 hours of operation:

- 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



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



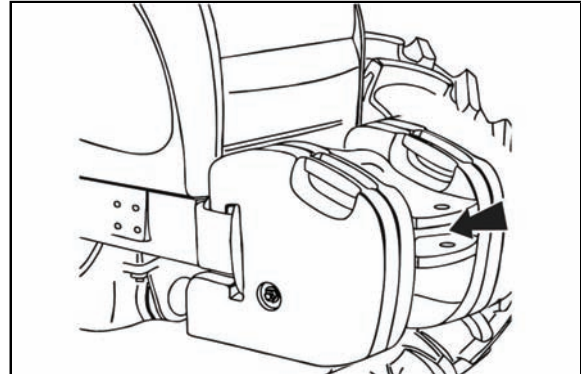
Before a drive make sure that the technical condition ensures safe operation of the tractor. In case that a trailer or implement is coupled, verify its coupling and proper fixing of the load. Never get out of the tractor to couple a trailer yourself. Pay also attention to your assistant.

Front hook

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



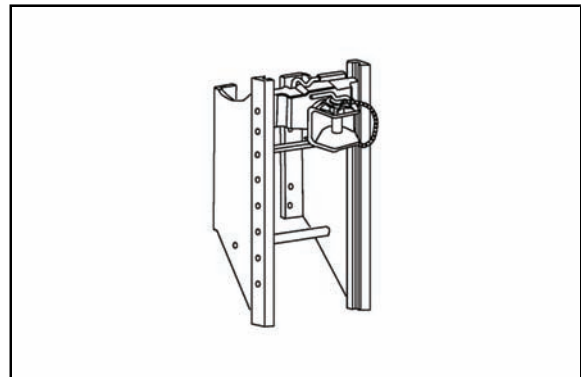
Use a drawbar or a cable for releasing tractor. Never use chains! The possibility of fatal injury if a chain pulls apart! It is forbidden to use tractor axles (individual travelling wheels) such as reeling jack when rescuing a sunken tractor.



NM13N023

Multistage adjustable suspension

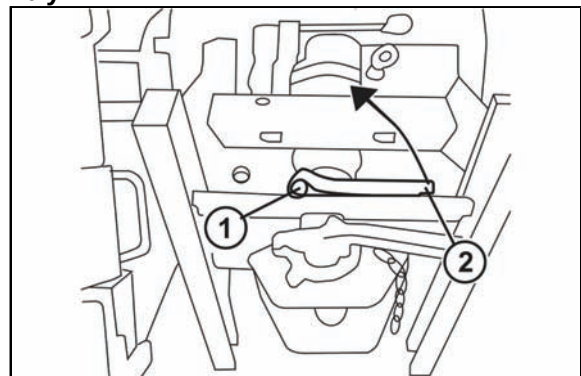
Serves for connecting double axle or lighter single-axle trailers. Guidance nozzle is vertically adjustable. When working with various agricultural machines it is necessary to adjust the suspension vertically or demount where necessary.



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.



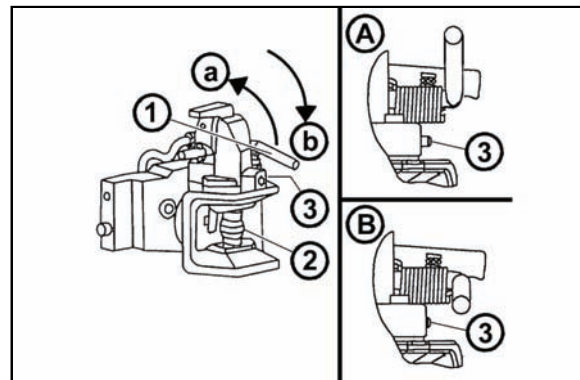
NM13N024

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).



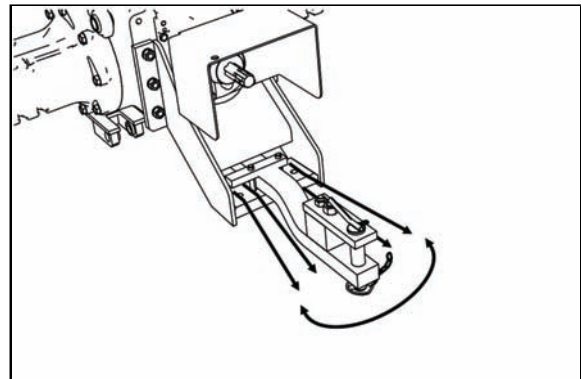
After the attachment of the trailer you must always check whether the indicator (3) is retracted in accordance with fig. (B).



E304

Swing drawbar

The draw rod can transversely be set to five positions. You fix it in a given position using a clip.

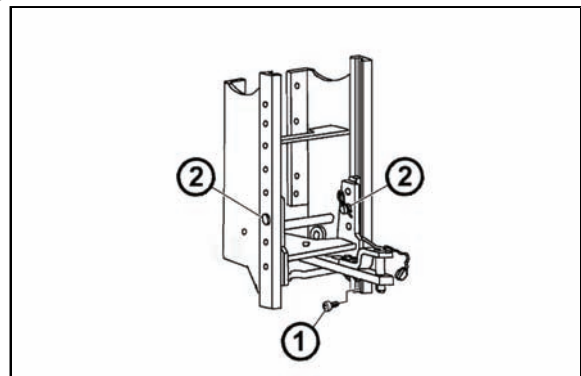


NM14D043

Modular suspension system for trailers and semitrailers

1. Demount locking screw (1)
2. Secure the module against drop, unlock and demount pins (2)
3. Protrude the module from the bracket in downward direction

Proceed reversely with assembly.



NM13N064

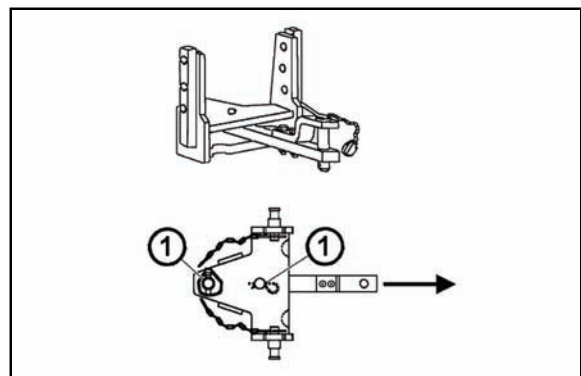
Swing drawbar bracket module

Swing drawbar bracket module is placed in the bracket of multistage suspension.

Swing drawbar

Disassembly:

1. Unlock and demount pins (1)
 2. Protrude swing drawbar in the direction of an arrow
- Proceed reversely with assembly.

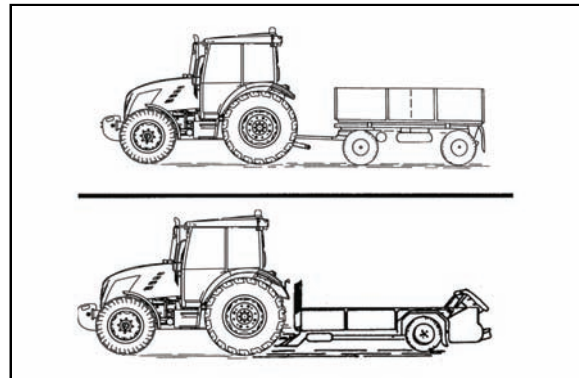


E306

TRANSPORTATION

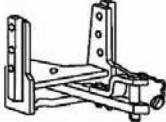
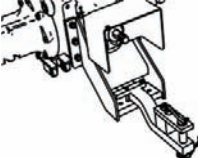
Aggregation with trailer and semitrailer

Tractor must be aggregated only with a tractor trailer for balancing tractor operation brakes or hydraulic brakes of trailer. Static load of tractor rear axle in aggregation with semitrailer must not exceed the value of maximum permitted load.



NM13N097

Maximum permitted vertical static suspensions load for trailers and semitrailers

Suspension type	Permitted vertical static load	Ø of suspension pin	Suspension type	Permitted vertical static load	Ø of suspension pin
	2 000 kg	31 mm		736 kg	31 mm
	2 000 kg	38 mm		1200 kg	32 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.

NOTES

DRIVE OF AGRICULTURAL MACHINERY

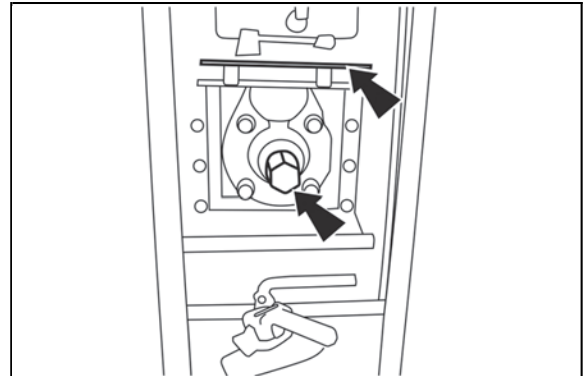


Before attaching of an implement, driven by means of the tractor PTO shaft, check the speed compatibility of both, it means tractor PTO shaft and implement driven shaft (540 rpm or 1,000 rpm). Different PTO speed values may cause serious damages and injuries.

Working with PTO shaft



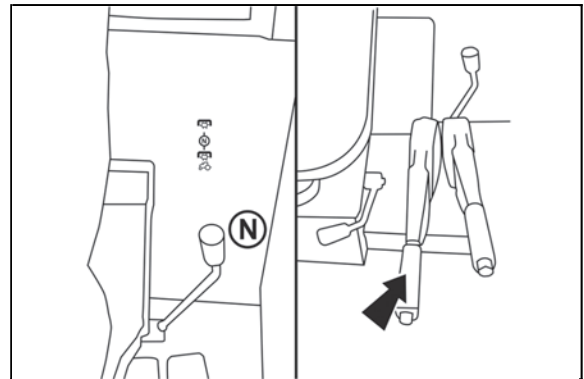
1. When working with PTO shaft, mind proper attachment of all covers.
2. After completing the work, always mount the PTO shaft cover back.



NM13N001



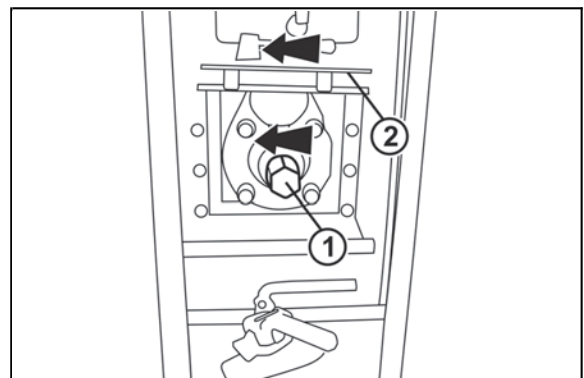
3. Connecting and disconnecting cardan shaft of aggregated machine to rear PTO shaft of the tractor to be done only with the engine at halt, disengaged PTO shaft clutch and dependent and independent revolutions of PTO shaft lever in (N) - neutral position!
4. Connecting and disconnecting cardan shaft 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.



NM13N002

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

DRIVE OF AGRICULTURAL MACHINERY

Manual disengagement of PTO shaft clutch lever

By pulling manual clutch disengagement lever to upper position, disengagement of PTO shaft clutch occurs. The upper position of the lever is signalized by a lit control on a dashboard. The lever is automatically locked with a catch in the upper position. The lever can be unlocked and return to the lower position by lifting the lever and pressing the but-ton on the forefront of the lever.

Upper position	- clutch disengaged
Lower position	- clutch engaged



If manual disengagement of the clutch lever is pulled for a longer period of time, increased wear of lamely of PTO shaft occurs.

PTO shaft drive engagement lever

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

a -	dependent revolutions of PTO with PTO shaft drive via gearbox - 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 engine at standstill and engaged manual clutch lever.

PTO shaft revolutions 540 and 1000 rpm shifting lever

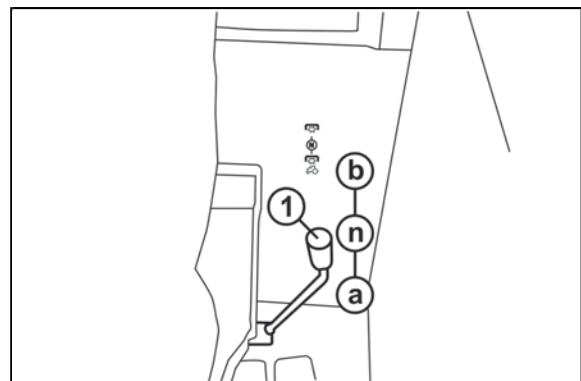
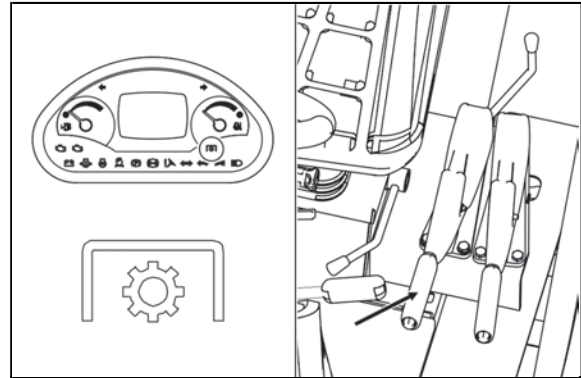
Shifting 540 or 1 000 revolutions of rear PTO shaft is done with a lever (1) placed on the outer side of tractor on rear PTO shaft.

a -	1 000 rpm
b -	540 rpm

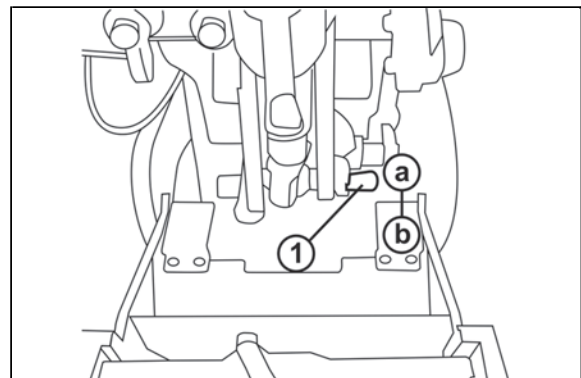
Shifting is done with an engine at standstill and lever of engaging PTO shaft drive in (n) position.



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



NM13N004



NM13N005

DRIVE OF AGRICULTURAL MACHINERY

Rear PTO shaft - independent revolutions

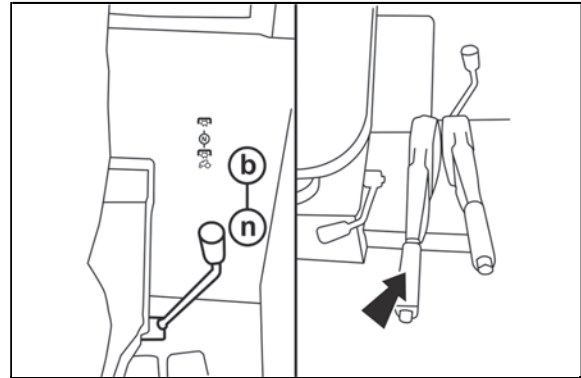
With independent revolutions of rear PTO shaft the number of PTO shaft revolutions is dependent on the number of engine revolutions.

PTO shaft drive engagement lever must be shifted to (b) position.

Pulling the lever of manual PTO shaft clutch disengagement serves for short-term interruption of torque transmission from engine.

The lever of PTO shaft drive must be shifted to (n) position for longer interruption of torque transmission from engine.

The number of PTO shaft independent revolutions, see Main technical parameters chapter.



NM13N006

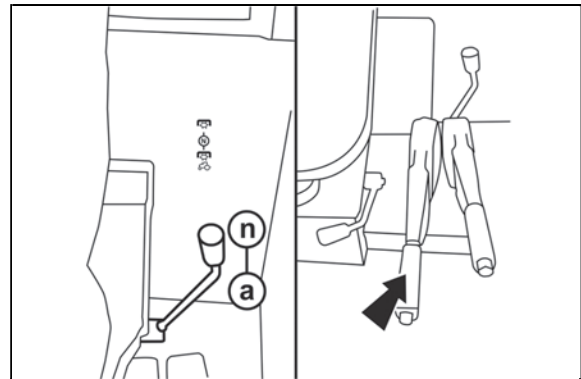
Rear PTO shaft - dependent revolutions

With dependent revolutions of rear PTO shaft the number and the direction of PTO shaft revolutions is dependent on the shifted gear of reversing lever, engaged speed gear and the group of gears engaged by reduction lever.

PTO shaft drive engagement lever must be shifted in (a) position.

Depressing the clutch pedal serves for short-term interruption of torque transmission from engine.

It is necessary to shift the lever of PTO shaft drive engagement to (n) position or to shift the lever of gears or the lever of road and reduced speeds to (n) position for longer interruption of torque from engine.



NM13N007



Manual disengagement of PTO shaft clutch lever is shifted in (a) position non-functional with lever of PTO shaft drive engagement.

The number of dependent PTO shaft revolutions, see Main technical parameters chapter.

Maximum transmitted output

PTO shaft	Transmitted output
rear	
1000 rpm	Full engine output
540 rpm	Full engine output



C353

DRIVE OF AGRICULTURAL MACHINERY

Drive of machines with greater inertia masses

Cardan shaft for drive of these machines must be equipped with the so-called free wheel, which ensures the disconnection of torque transmission with retroactive effect from the machine to tractor.



C220

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 50 l/min.

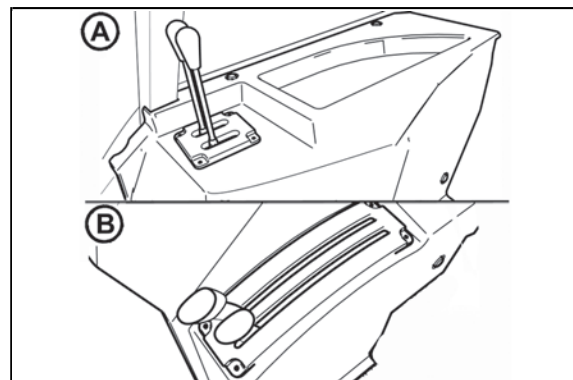
The pressure derived in hydraulic set by hydraulic pump is limited by a locking valve to 18 MPa.

Hydraulic control panel

Hydraulic control panel is placed in the area of right fender.

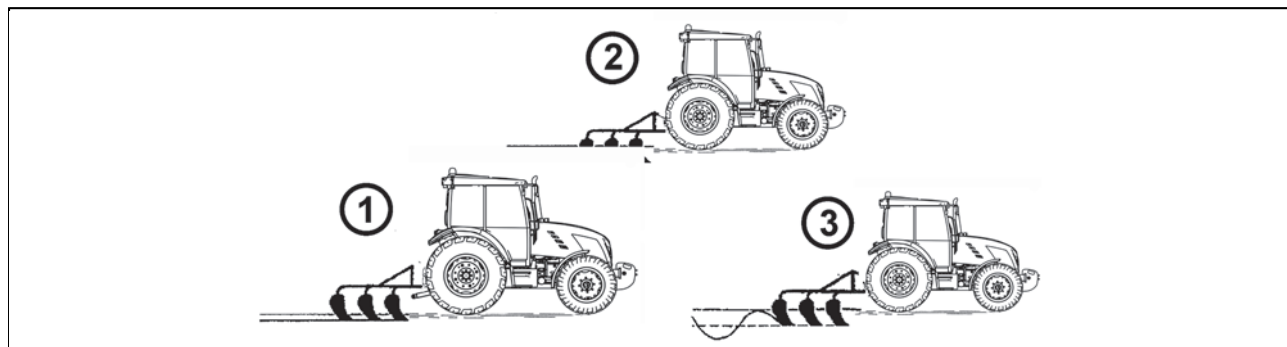
External hydraulic circuit (A) enables control of external hydraulic circuit (quick-couplers).

Internal hydraulic circuit (B) enables rear three-point linkage control.



NM13N009

Means of internal hydraulic circuit regulation

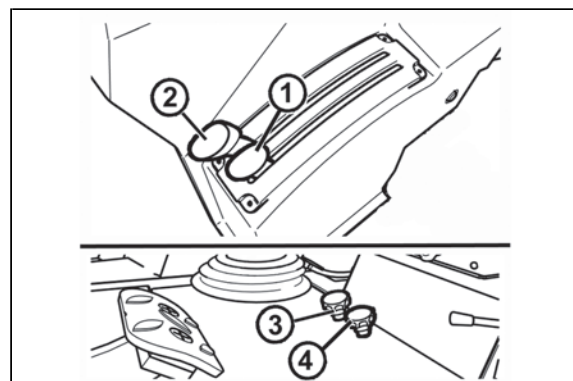


NM13N101

Hydraulic system enables three means of heavy 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

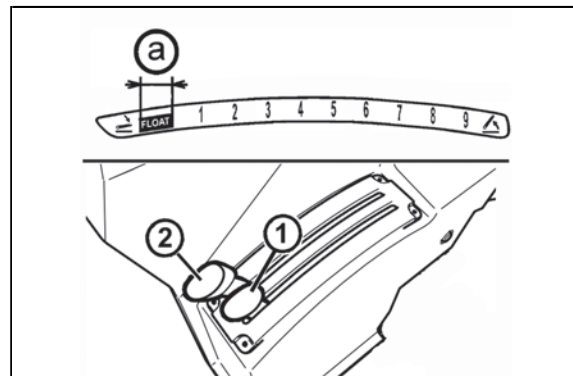
1. Lever for setting power or position regulations
2. Lever for setting floating position, height positioning of three-point linkage with position regulation or mixed regulation
3. Speed of three-point linkage lowering control
4. Hydraulic sensitivity system control



NM13N010

Free (floating) position

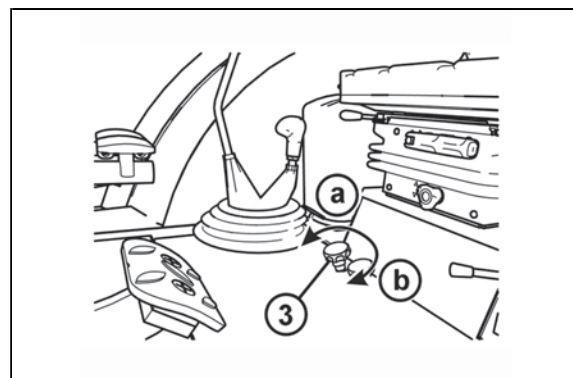
Free (floating) position enables work with a tool which has supporting wheel. The arms of rear three-point linkage are free in this position. Shift lever (2) to front position (a). Position of lever (1) is not decisive.



NM13N011

Speed of three-point linkage lowering control

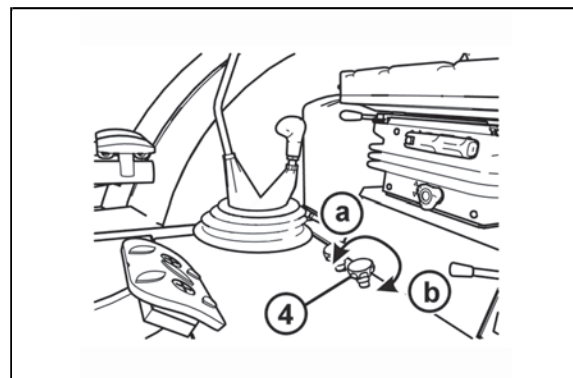
Speed of three-point linkage lowering control (3) serves for setting the speed of lowering three-point linkage arms. When turning the control of speed of three-point linkage lowering in (b) direction the speed of three-point linkage arms lowering decreases, in (a) direction it increases. If we turn speed of lowering control (b) to stop, the arms of three-point linkage cannot be lowered.



NM13N012

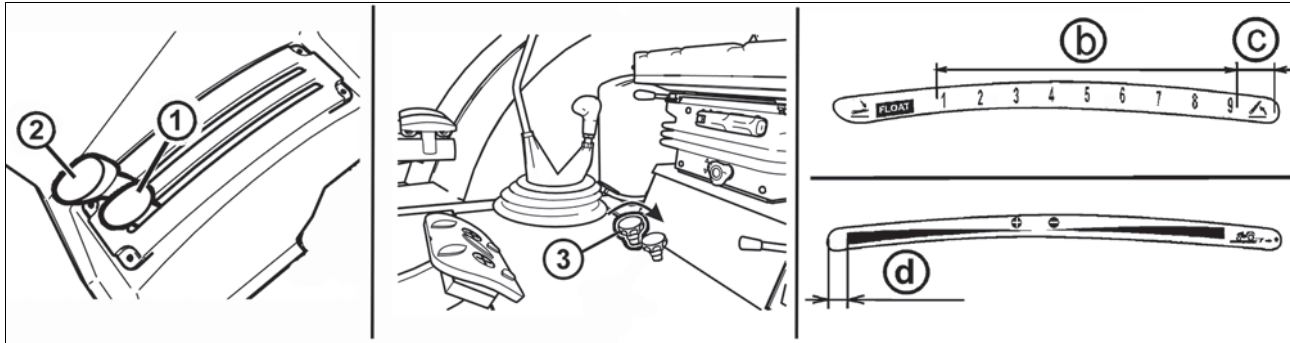
Hydraulic sensitivity system control

Hydraulic sensitivity system control (4) 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.



NM13N013

Position regulation of rear three-point linkage heave



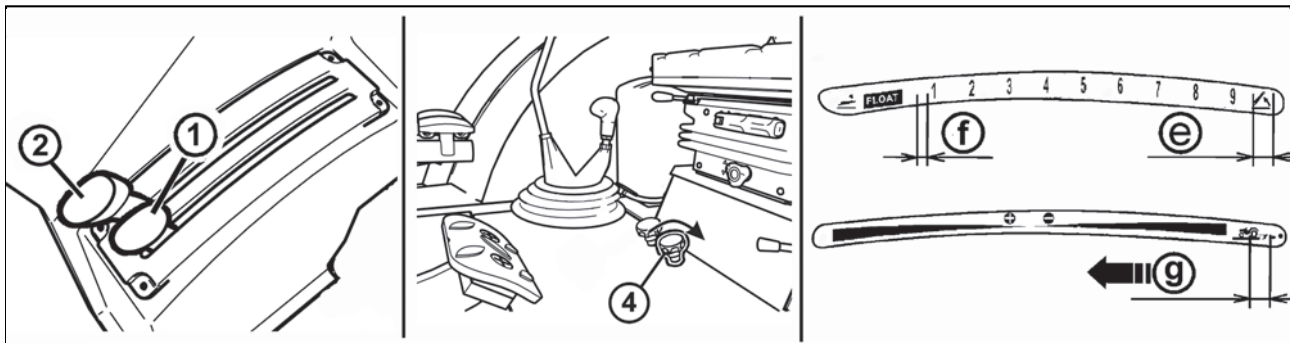
NM13N014

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 (d). The arms of rear three-point linkage start dropping according to a set lever (2).

Power regulation of three-point linkage heave



NM13N015

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.

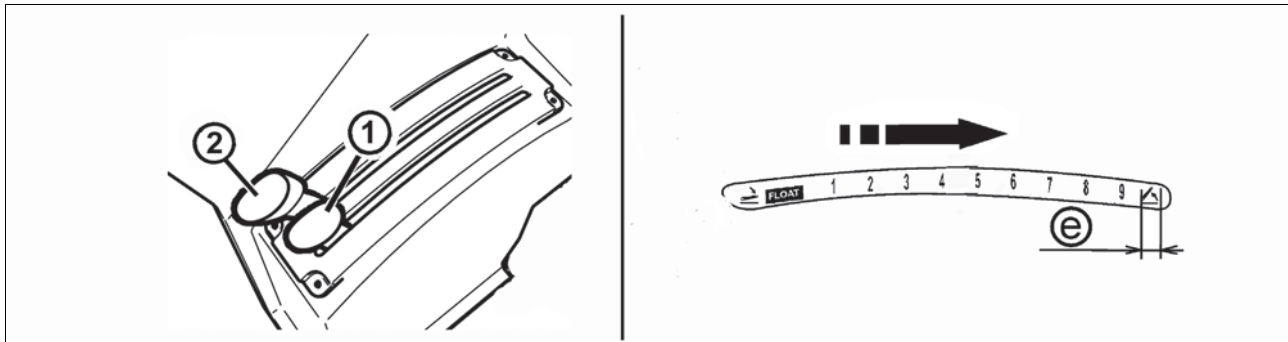
Place lever (2) to (f) position. Shift lever (1) to (g) position, start tractor and by shifting lever (1) from (g) position in the direction of an arrow, set the depth of oil cultivation (in (g) position, the depth of soil cultivation is smallest).

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

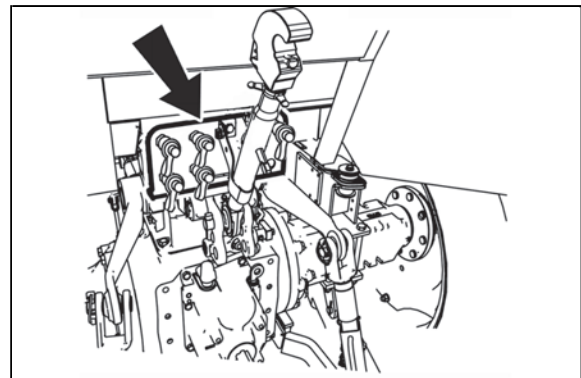


NM13N016

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.



NM13N017

External hydraulic circuit control elements

External hydraulic circuit control levers are placed on the right fender.

Depending on tractor equipment the following switchboards can be mounted to external hydraulic circuit.

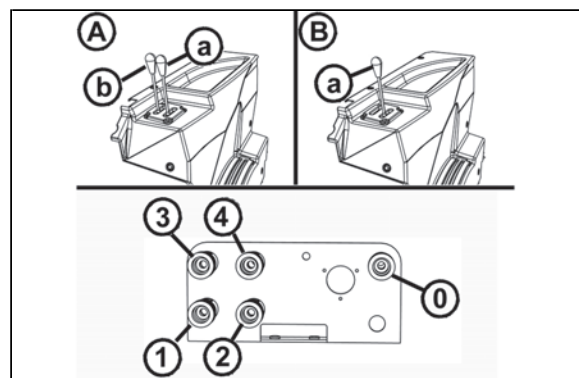
A - Two-section switchboard

B - One-section switchboard

a - lever (a) controlling quick-couplers (1) and (2)

b - lever (b) controlling quick-couplers (3) and (4)

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.).



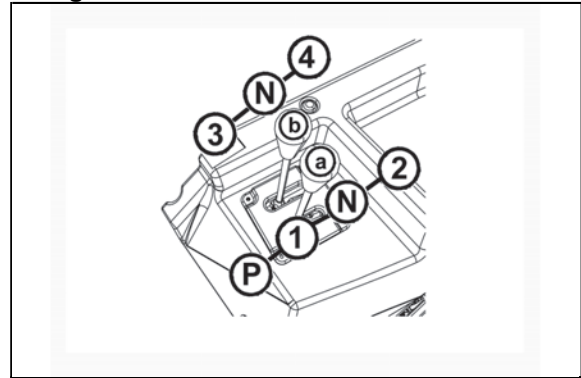
NM13N018

HYDRAULIC SYSTEM

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.

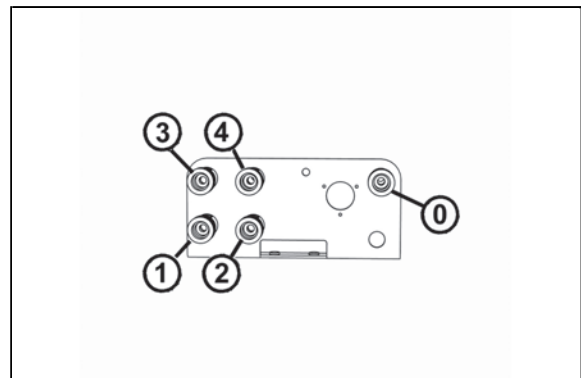


NM13N019

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.).

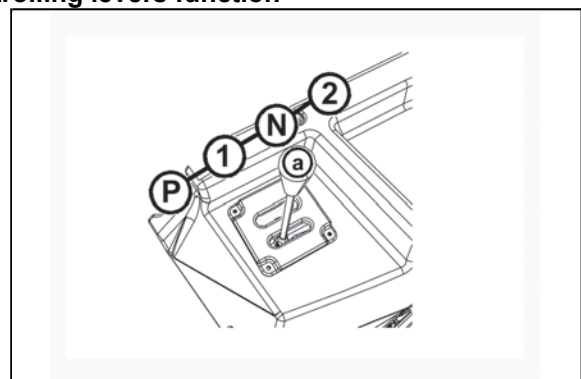


NM13N020

One-section switchboard external hydraulic circuit controlling levers function

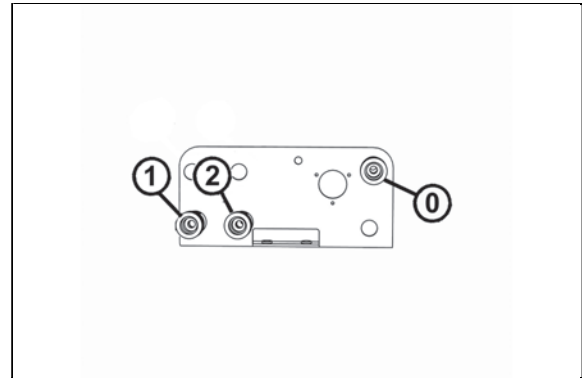
Lever (a) function

- N** -Neutral position. Outlets to quick-couplers (1) and (2) are closed and oil in the connected hydraulic device is blocked. 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.



NM13N021

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.).



NM13N022

Quick-couplers engagement and disengagement



With quick-couplers engagement and disengagement take greater care with regard for residual oil, 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

Connecting machines and tools to External hydraulic circuit

Connecting double-acting roller

Connect double-acting roller always to quick-couplers of one section.

Connecting machines and tools assembled from more parts

When working with agricultural machines which are assembled from more parts (combiners, shears, harrows), in which side frames are jointly connected to a central frame, tilted to vertical position by separate hydraulic rollers in transport, controlled by tractor external hydraulic circuit, it is advisable to connect lifting branches of rollers to quick-couplers (2) or (4), which are equipped with a reverse valve.

Connecting rotation hydro engine

If there is a rotation hydro engine connected to external hydraulic outlet, it is necessary to connect its reverse branch, always to a quick-coupler (0).

Connecting reversing rotation hydro engine

Reversing rotation hydro engine must be for function connected to quick-couplers of one section. When connecting hydro engines, securing valves need to be included in both branches, which reliably restrict pressure peaks with machine run-out. Waste from these valves is connected to a quick-coupler (0).



Auxiliary machines using oil filling of external hydraulic circuit must be filled with the same kind of oil, which is recommended for gear system of the tractor! Quick-couplers sockets of an auxiliary machine need to be properly cleaned before connecting.

HITCHES

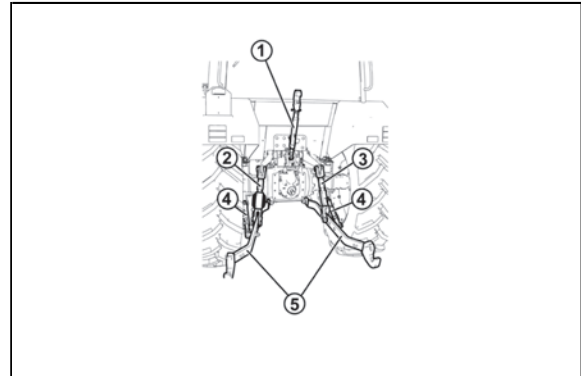
Rear three-point linkage

Serves for connecting carrier-mounted or semi mounted agriculture machines and tools with linkage points of category I. or II. pursuant to ISO. The categories differ based on the length of linkage axis, which is the distance of the centre of balls of lower linkage joints with connected tool.

Category I.	
Length of linkage axis	728 mm
Ø of holes of connecting balls of lower draw bars pursuant to ISO	28 mm
Ø of upper draw bar hole	25 mm

Category II.	
Length of linkage axis	870 mm
Ø connecting balls holes of lower draw bars pursuant to ISO	28 mm
Ø of upper draw bar hole	25 mm

1. Upper draw bar
2. Lift rod left
3. Lift rod right
4. Limiting draw bars
5. Lower draw bars

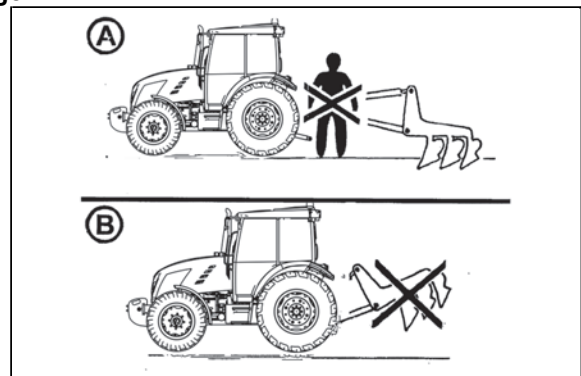


NM13N053

Safety principles when working with a three-point linkage



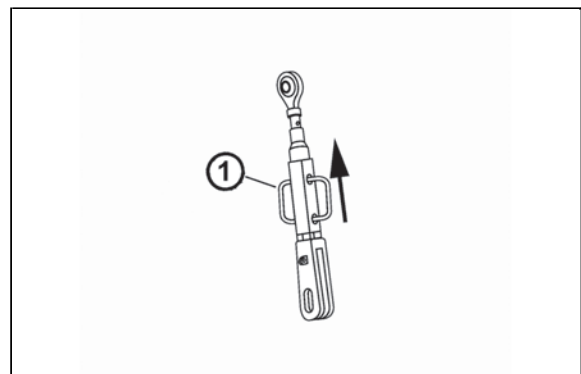
Persons who are not charged with work with auxiliary device of a tractor must not stand between a tractor and connected machinery (tools) - (A). Do not park tractor with mounted tools in a lifted position (B). When driving without tools it is necessary to connect lower draw bars (5) by springs and upper 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 adjustment 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

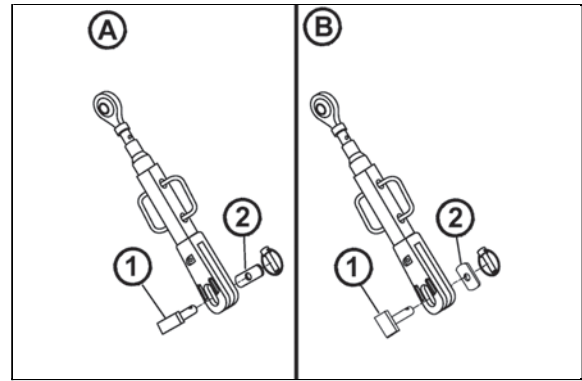
HITCHES

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

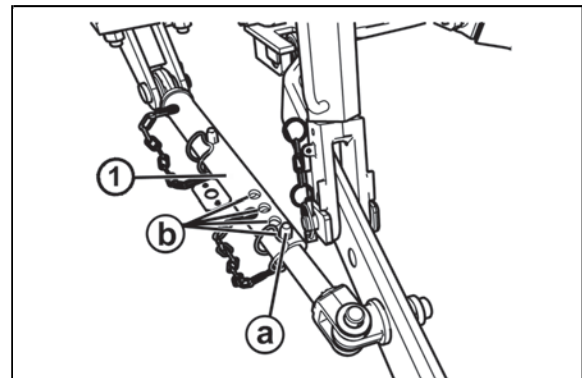
Limiting draw bars

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).



Both limiting draw bars must be mounted at all times.



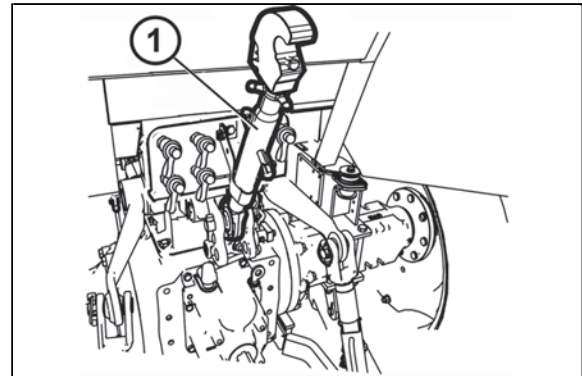
NM13N054

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.



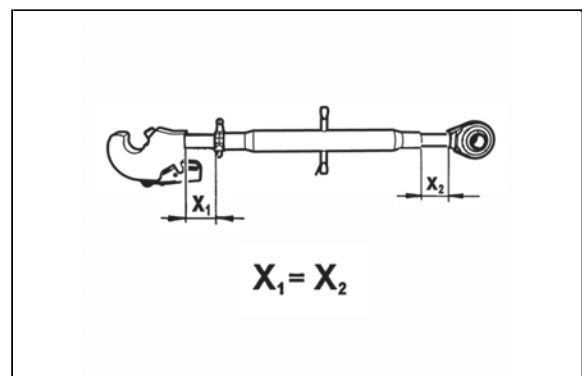
When transporting the tools, it is necessary to relocate upper draw bar to holes (c), so that overload of kinematic system of lifting hydraulics, or the fall of the connected machine.



NM13N055



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.

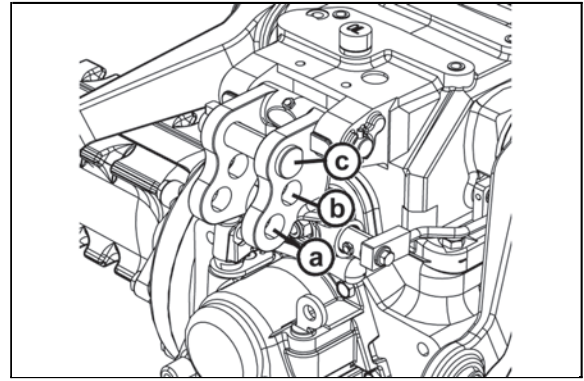


NM13N056

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

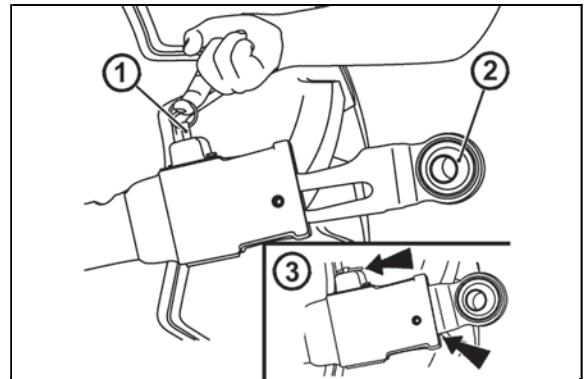
*Lower draw bar with slipping out end pieces

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).



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



E459

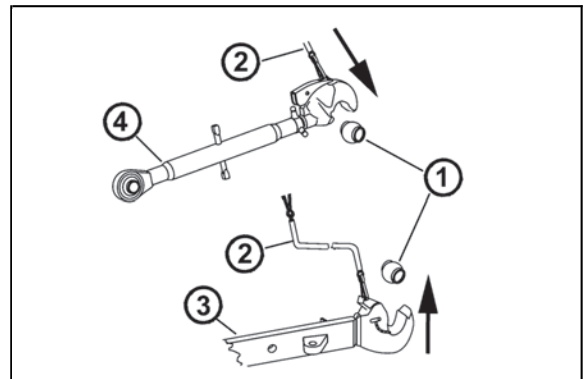
*Lower draw bar with CBM hooks

Both lower (3) and upper (4) draw bars of linkage are equipped with CBM hooks.

The tools must be first equipped with hanging CBM balls (1) and with limiting draw bars set the distance between lower draw bars of linkage (3).

When reversing and subsequently lifting a three-point linkage, its lower draw bars (3) are connected to tools and then upper draw bar (4) of three-point linkage is connected by the driver from cab.

When disconnecting tools, unlock the hooks, by control cable (2) heave upper draw bar (4) and by lowering three-point linkage disconnect lower draw bar (3).

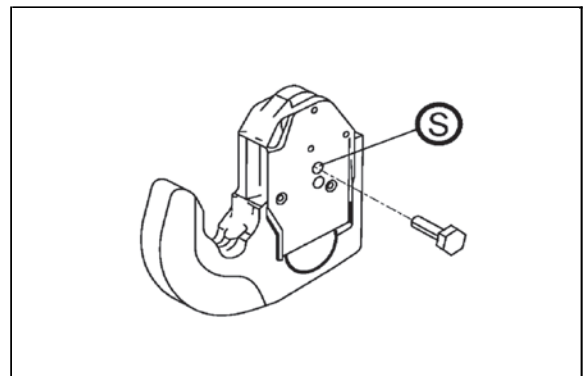


E460

Securing lower draw bars with CBM hooks



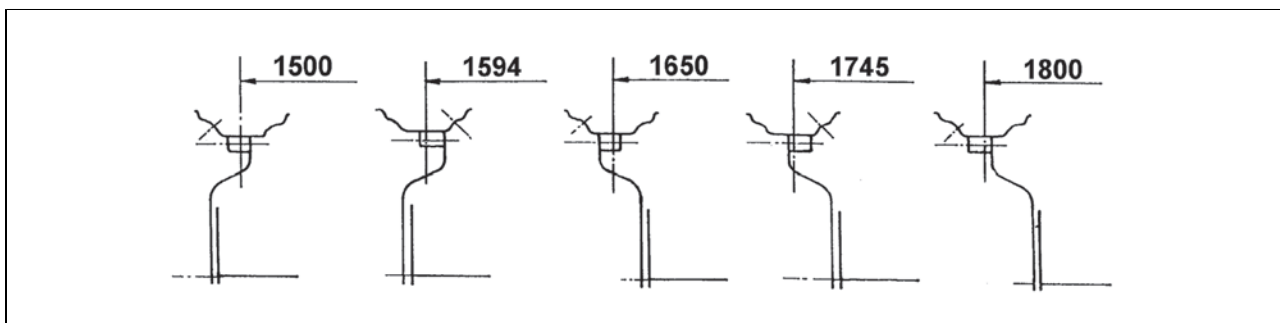
For extremely demanding working conditions (aggregation with heavy machinery on slopes or with aggregation side faced machines) we recommend safely locking the hook of lower draw bar by inserting a M8 screw to (S) hole and locking the screw with a pad.



X901

NOTES

Change of front wheels track with front drive axle



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.

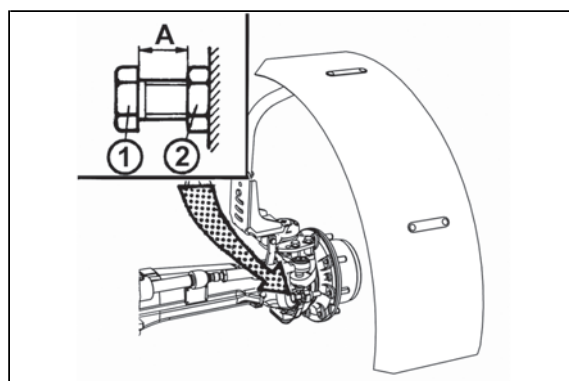
Setting wheel stops with front drive axle

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.



F13BN033

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.

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

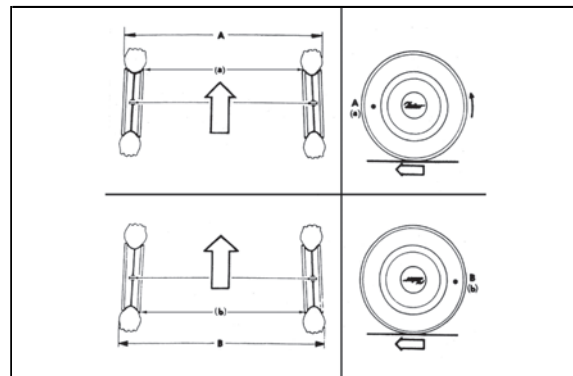
'S' toe-in is given by the difference of measured values:

$$S = b - a.$$



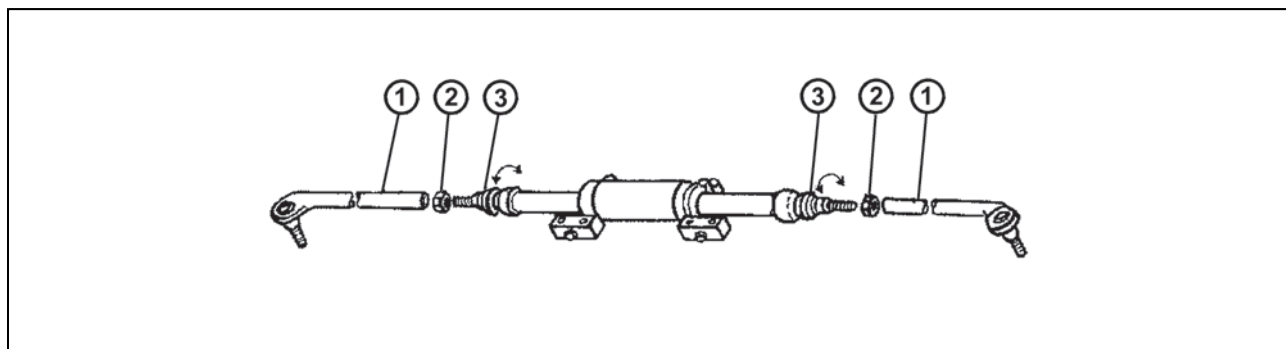
Before checking toe-in, it is necessary to check or adjust the clearance in front wheels bearings and inflate front tires to prescribed pressure.

The measurement of toe-in is done on wheel rims.



F_02_189

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



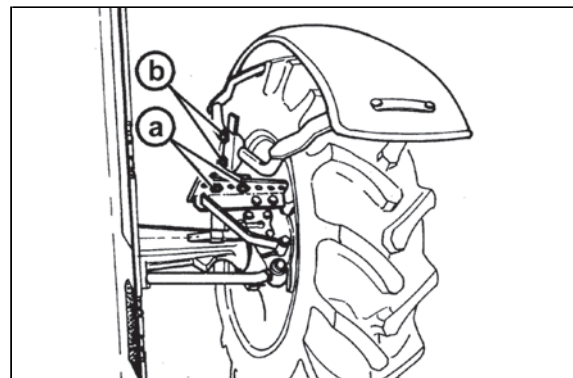
C507

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.

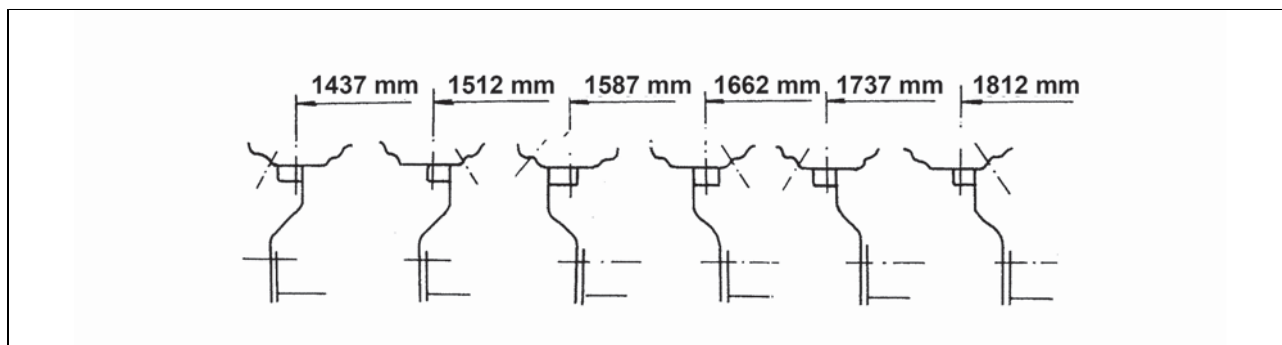
Front drive axle fenders

Are on adjustable holders which can be set both horizontally (by relocating screws 'a' to different holes) and vertically (by relocating screws 'b' to different hole) based on requested wheel tracks and the kind of used tires.



C508

Rear wheel track change



C509

Used tires	Tire width in mm	Adjustable wheel track
16,9-30	429	1437 - 1812
16,9R30	444	1437 - 1812
480/70R30	494	1512 - 1812
13,9R36	365	1437 - 1812

The standard factory wheel track is set to 1512 mm.

The wheel track setting of rear wheels is done by the change of rim position and disc with a heave rear part of a tractor. It is necessary for wheels to spin freely.



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 foot 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.

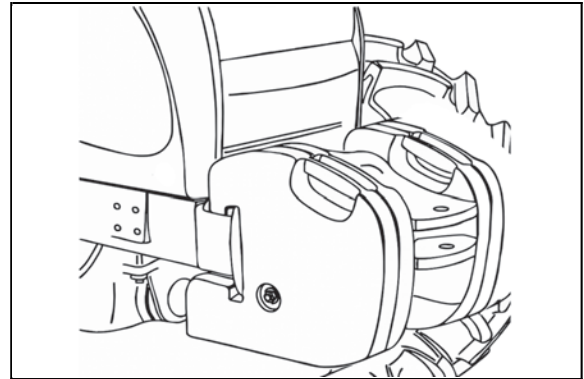
NOTES

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

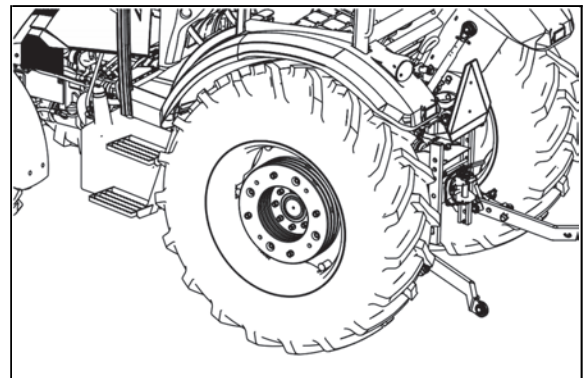
Combination of weights (pcs)	Weights weight (kg)	
4+1	4x50 + 66	266



NM13N072

Weights of rear wheels

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



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.



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

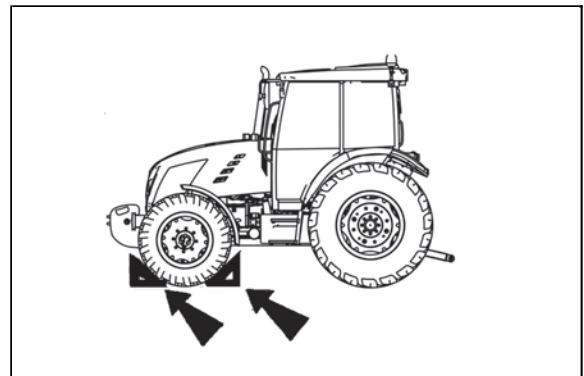


NM13N104

Making front wheels stable



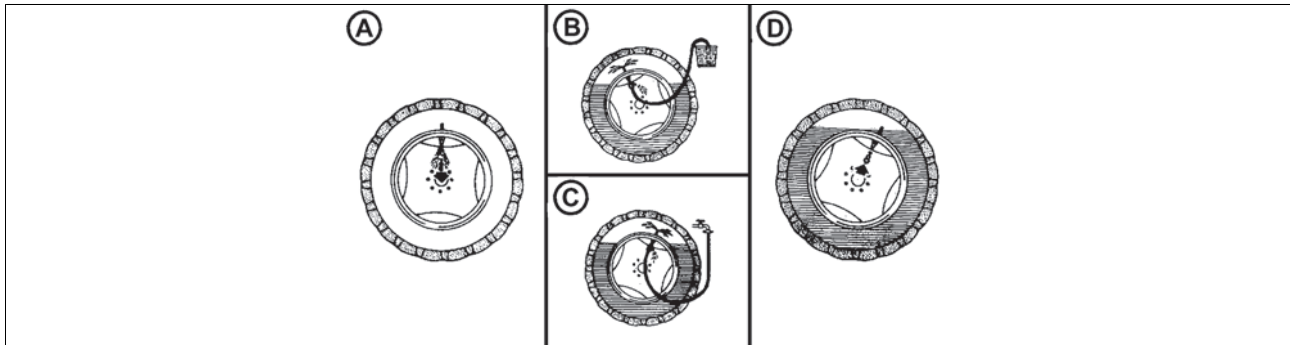
Do not forget to lock a tractor against motion by making front wheels stable before lifting the rear wheels!



NM13N103

BALLAST WEIGHTS

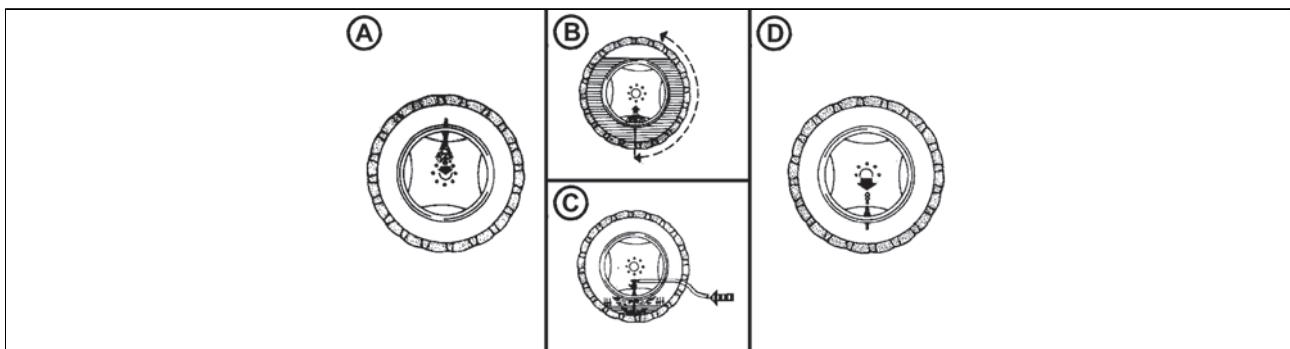
Filling tires with liquid procedure



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

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)!

BALLAST WEIGHTS

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)		($^\circ\text{C}$)	(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

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 disconnecter (-). 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.



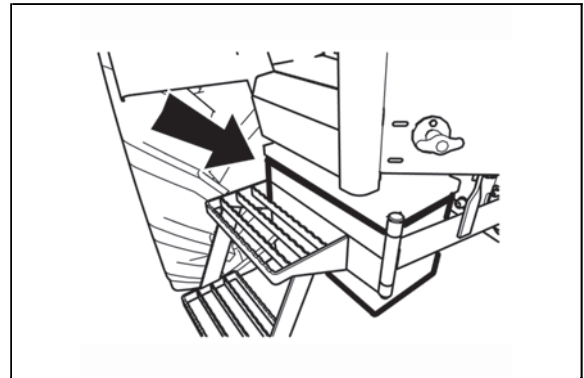
It is forbidden to start by short circuiting the clamps of starter. Start tractor only from driver's seat.



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.

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 disconnecter

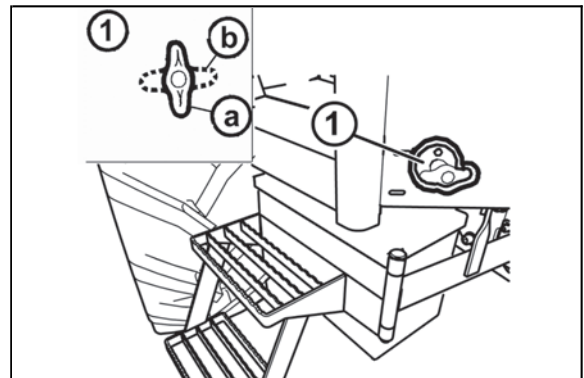
Accumulator battery is located under the cab on the right side. Battery disconnecter (1) is located on the right side of the tractor in front of the cab.

a - Battery connected

b - Battery disconnected



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 disconnecter.

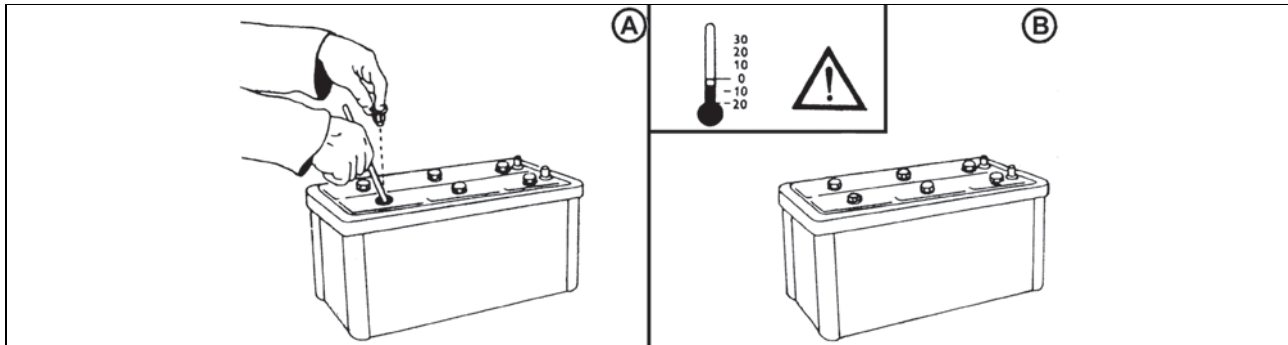


NM13N77



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.

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!

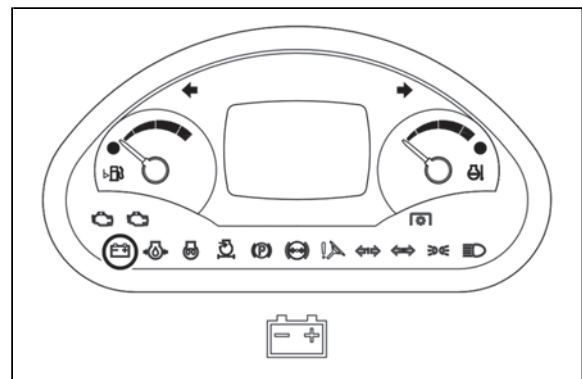
1. First study the instructions manual enclosed to the battery when working with accumulator!
2. When working with accumulator, protect your eyes with either goggles or a protective shield!
3. Electrolyte is an alkali, handle it therefore with due care! Rinse the skin stained with electrolyte and neutralize 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.



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!

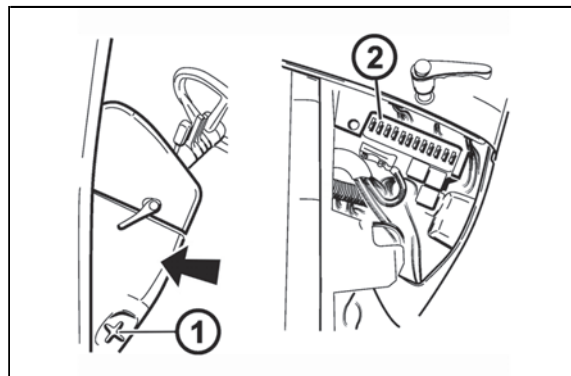
Mind the perfect electrical joint on connecting clamps and on perfect alternator grounding!

Alternator must not be overpoled not even for a short time!

Fuse box

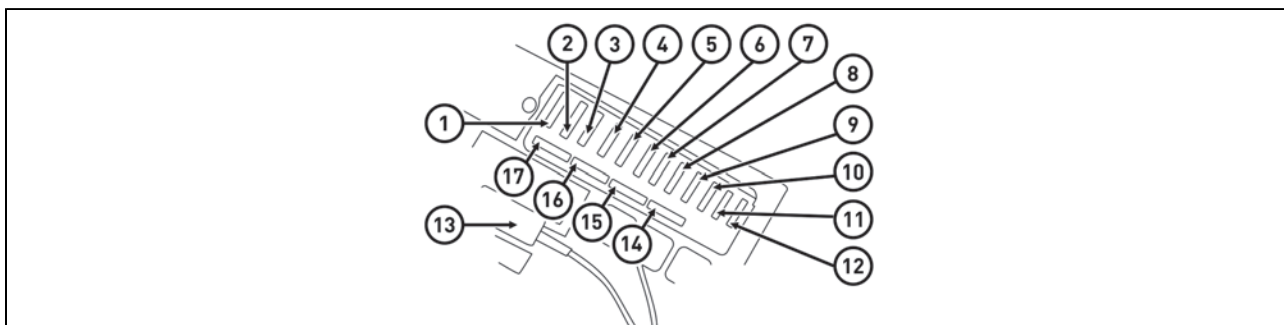
Is accessible after removing the left lid of the steering bracket. Lid can be removed after unscrewing the screw (1).

Fuses (2) are knife-blade-contact and with replacement it is necessary to keep the prescribed value of the fuse. With repeated interruption, search for the nearest service.



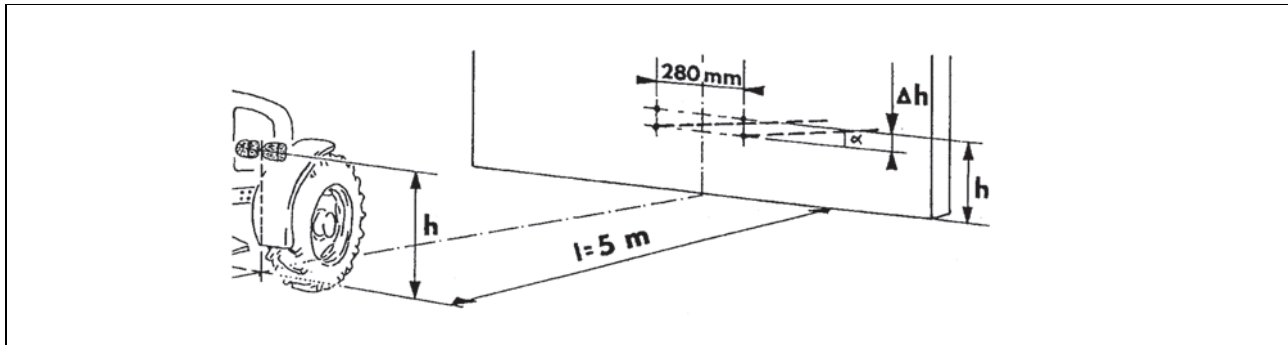
NM13N078

Placement of fuses in fuse box



Pos.	Size of fuses	Protected system
1	15A	Direction lights
2	15A	Brake lights
3	20A	Ignition relay, dashboard feeding, start blocking, recirculation
4	15A	Headlights with control
5	15A	Left side lights
6	15A	Right side lights
7	10A	Right dimmed headlight
8	10A	Left dimmed headlight
9	15A	Radio, washer, beacon, cab lighting
10	15A	Working headlights in roof
11	15A	Heating
12	20A	Air condition, front and rear washer,
13	80A	Ignition
14		Free
15		Free
16	25A	Fuel delivery pump
17	30A	Engine control unit

Lights adjustment in tractor's grill check



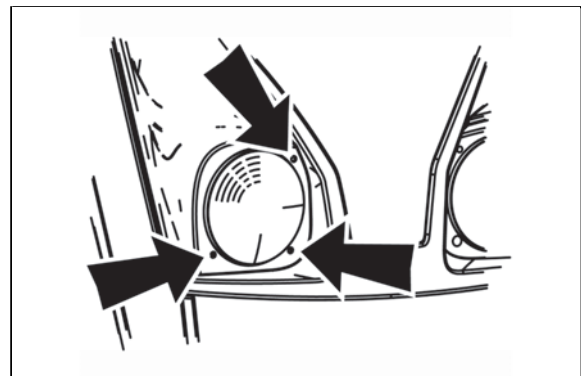
E609

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%)

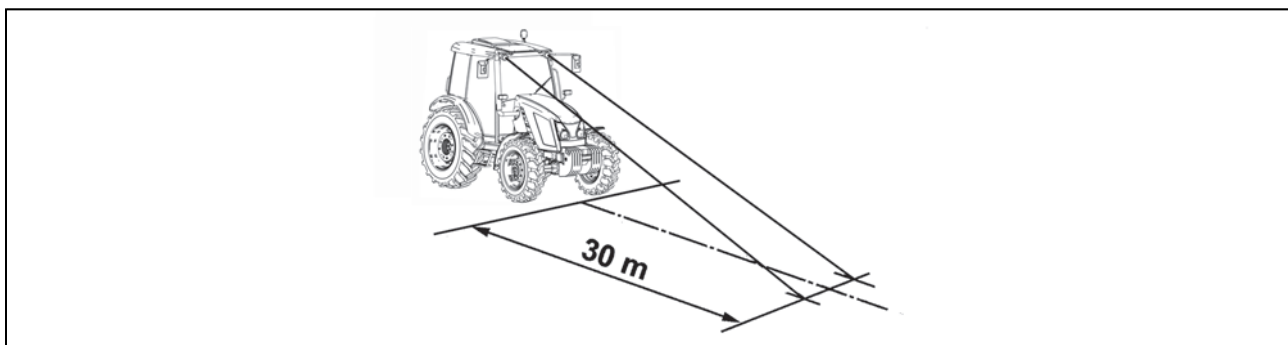
Lights adjustment in tractor's grill

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).

Before starting the engine

A check of oil contents in the engine
 A check of coolant contents and joint tightness in the cooling system
 A check of oil contents in the hydrostatic control circuit tank
 A check of oil contents in the transmission and in the final drive
 A check of air pressure in all tyres
 A check of the tightening of wheels
 A check of the state of suspension and connecting devices

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 taken after every 100 hours of operation

A lubrication of the tractor according to the lubrication plan.
 A cleaning of cooler plates with compressed air flow.
 A check of oil contents in the transmission and final-drive housing.
 A check of oil contents in the reducers and in the front driving-axle housing.
 A discharge of condensate from the air receiver.
 A cleaning and smearing of accumulator battery clips with a thin film of lubricating grease.
 A clearing of the raw fuel filter.

Steps taken after every 500 hours of operation

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

Steps taken beyond 500 Mth interval

with a new tractor or a tractor after general repair							
Meter of Mth state	100	500	1000	1500	2000	2500	subsequently after...hours of operation
Hydrostatic steering hoses replacement							every 3500 Mth or every 4 years
Foot and manual brake function check	o	o	o	o	o	o	500
Front wheels toe-in					o		2000
Replacement of the belt of the accessories drive							3000
Replacement of the tensioning roller							3000

Replacing fillings and filters

With a new tractor or with a tractor after a complete overhaul						
State of the Eh counter	100	500	1000	1500	2000	Subsequently every time after ...Eh in service
Motor oil renewal	o	o	o	o	o	500
Cartridge replacement in the motor oil filter	o	o	o	o	o	500
Cartridge replacement in the raw fuel filter			o		o	1000
Cartridge replacement in the fine fuel filter		o	o	o	o	500
Cartridge replacement in the air filter			o		o	1000
Safety cartridge replacement in the air filter					o	2000
Filter cartridge replacement in the heater						Every 1000 Eh or every 2 years
Coolant renewal						Every 2 years
Oil renewal in the transmission and in the final drive				o		1500
Sucking filter replacement (the pump sucking filter in the hydraulic system)	o	o	o	o	o	500
Oil renewal in the front driving-axle housing	o		o		o	1000
Oil renewal in the front driving-axle reducers	o		o		o	1000
Oil renewal in the hydrostatic control system				o		1500
Filter cartridge replacement in the hydrostatic control system				o		1500

Used operation liquids and fillings - amount

Name of location	Amount in litres
Coolant	
Coolant with a cab	12
Oil in engine	8
Oil to hydrostatic steering	2.6
Oil to front drive axle box	5.5
Oil to planet reducers of front drive axle	2x0.6
Oil to gear box and final drive housing	35
Fuel	80



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

In order for you to maintain your tractor in the best operating condition, we recommend to use manufacturer's service fillings of **Zetor** .

Oil for tractor transmission devices **ZETOR EXTRA 10W30 STOU**

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

Oil for the hydrostatic control system **ZETOR HM 32**

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.

Specification of Oil for the Tractor Hydrostatic Control System

Specification DIN
51524 HLP

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

Oil for the hydrostatic steering of the tractors

Manufacturer	Oil labelling	Classification
Aral	Vitam DE 32	HLP DIN 51524
Fuchs	RENOLIND10VG32	HLP DIN 51524-2
ÖMV	Hyd HLP 32	HLP DIN 51524
Shell	TELLUS DO 32	HLP DIN 51524
PARAMO	MOGUL H-LPD 32	HLP DIN 51524
	MOGUL HM 32	HLP DIN 51524
MOL	Hydro HV 32	HVLP DIN 51524-3
ORLEN OIL	Hydrol L-HM 32	HLP DIN 51524-2
	Hydrol L-HM 46	HLP DIN 51524-2

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 LT-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**

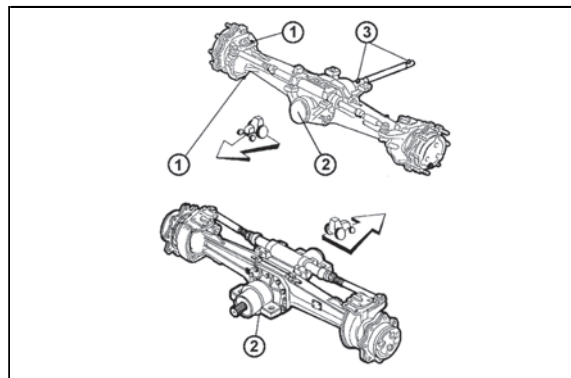


Paraffin impurities or additional additives in fuel are not allowed for engines with Common-Rail injection.

Tractor greasing plan

Front drive axle

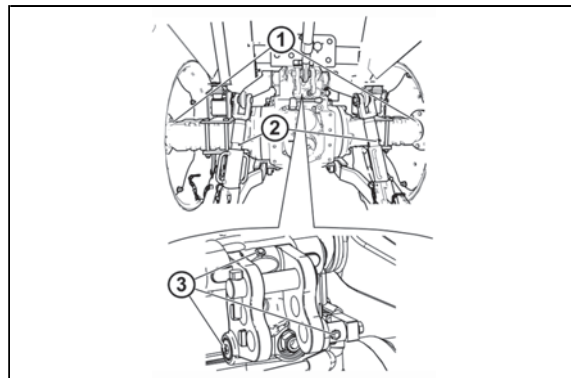
Position number	Name	Number of greasing points
1	Pivot pins	4
2	Spigot shaft	2
3	Cardan shaft joint	2



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

NOTES

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.



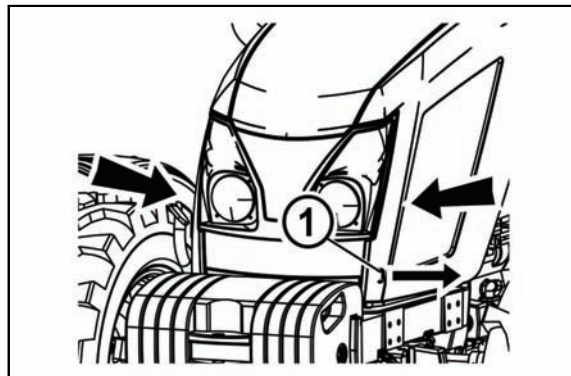
All works, connected with cleaning, lubrication and adjustments of the tractor or coupled mechanisms may only be carried out after stopping of the engine and other movable components except checks of brakes, recharging and hydraulic system.

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.



NM13N107

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.

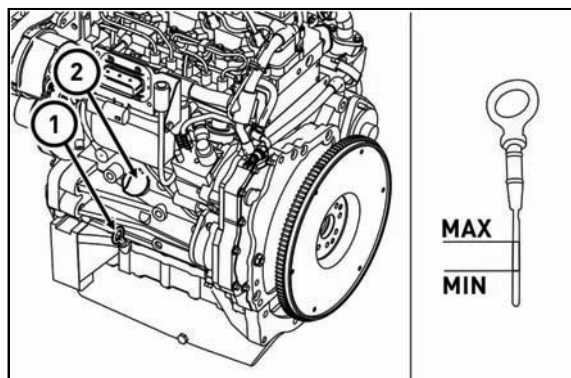
Checking oil levels in engine

Perform checks on a daily basis before putting into operation, while the tractor is standing on a flat surface, with the engine off. The engine oil gauge (1) and the filling hole (2) are located on the left-hand side of the engine.

Pull out the gauge (1), wipe it with a clean fibreless rag and slip it fully back in.

After pulling out the gauge once again check the oil level. The oil level must be always between MIN and MAX.

You can top up the oil if need be using the filling hole (2).



NM14D006

Draining oil from engine

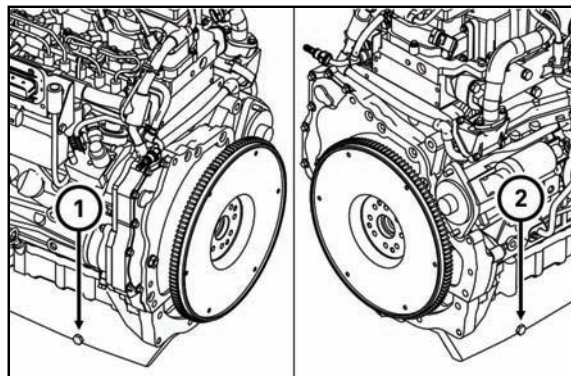
Perform the engine oil drain preferably after you have finished driving or after the engine heats up to the working temperature.

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.



NM14D007

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

Replacing full-continuous motor oil filter

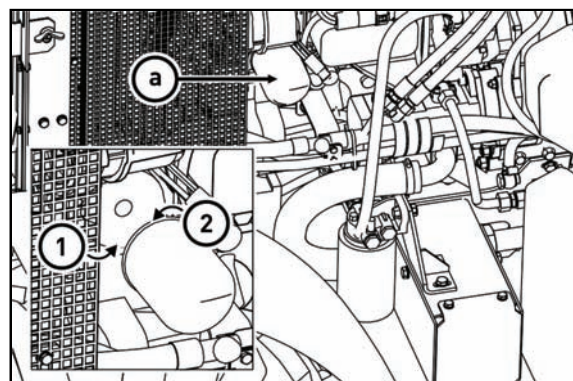
The full-flow oil filter (a) is located on the left-hand side of the engine and is accessible after the bonnet has been lifted. The filter must be changed each time the motor oil renewal is carried out.

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



For tightening the filter with a special tool a tightening moment of 15-17 Nm is required.

6. Check tightness after the engine has started up.



NM14D008

Pouring oil to engine

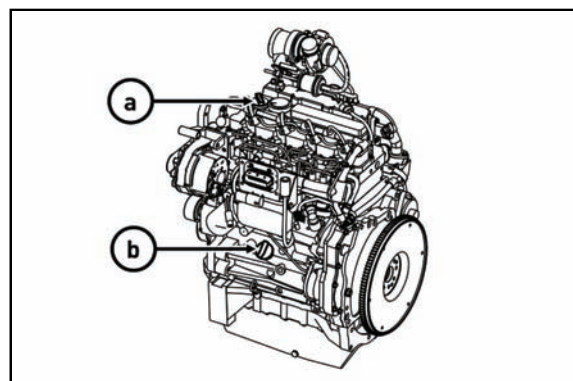
The engine is equipped with two filling holes:

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.



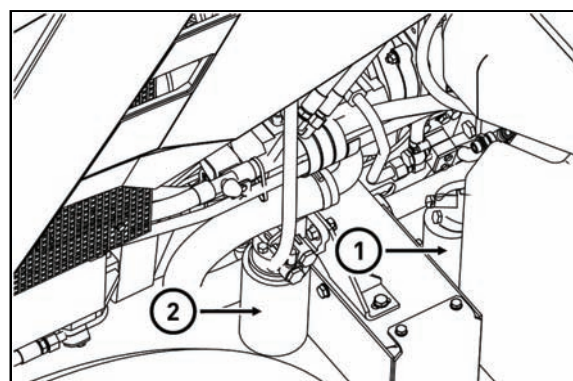
NM14D009

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)

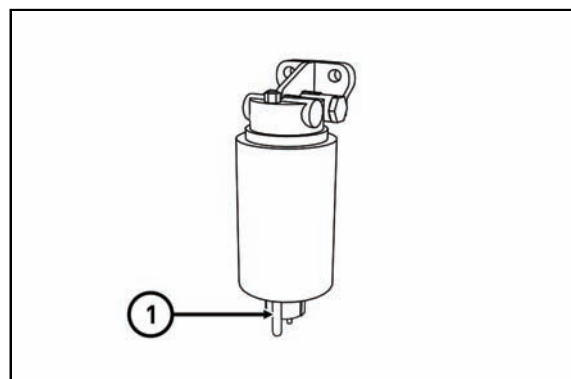


NM14D010

Raw Fuel Filter Clearing

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

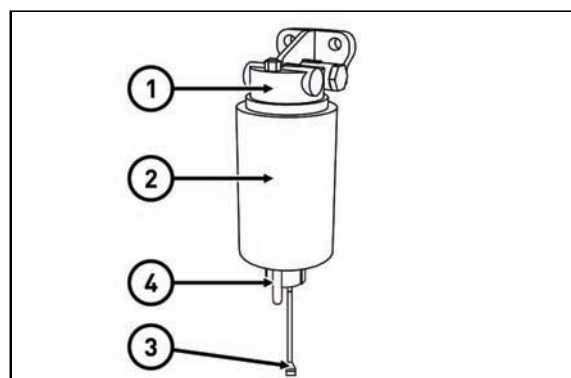
1. Put a catch reservoir under the raw fuel filter
2. Loosen the draining bolt (1)
3. Keep the liquid draining until a pure fuel flows out
4. Tighten up the draining bolt with a tightening moment of 1.3-1.9 Nm
5. After having started the engine check tightness of the raw fuel filter



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



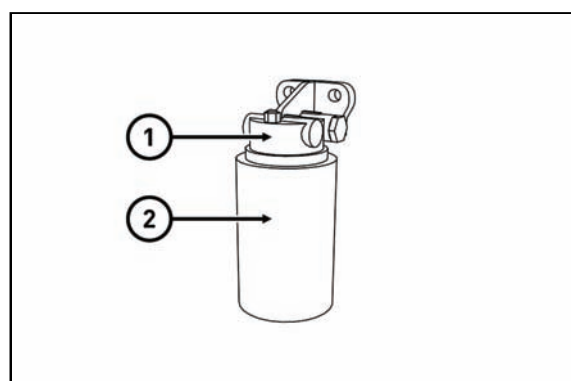
NM14D012



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.

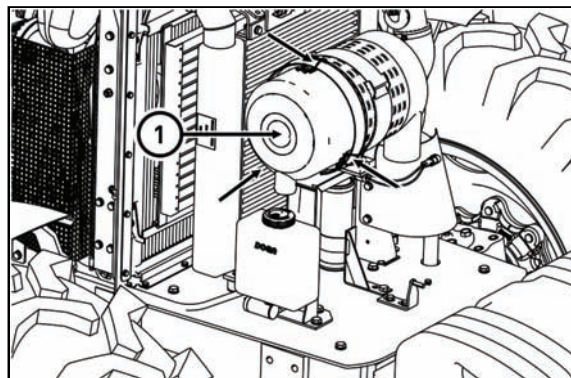
1. Turn the key in the switch box from the position 0 to the position I
2. The booster fuel pump will be running for about 20 seconds which makes the air blow off of the fuel system and its pressurization
3. Wait until the booster fuel pump switches off by itself
4. Turn the key in the switch box from 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.

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)



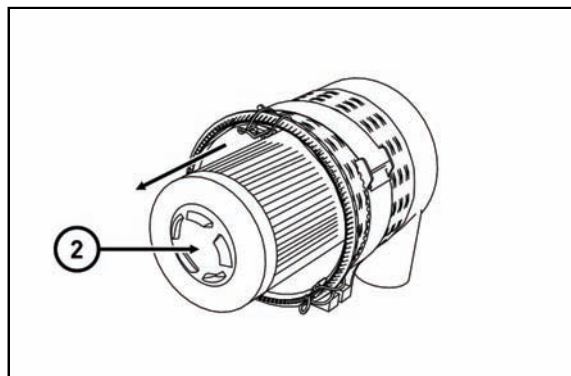
NM14D014

Recovery of the main air cleaner element

Remove the main element of the dry cleaner (2) by pulling.

If the main element is not damaged (there must not be any dust on the inner side of the element), recover it by blowing pressurized air from the inner side of the element.

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



NM14D015

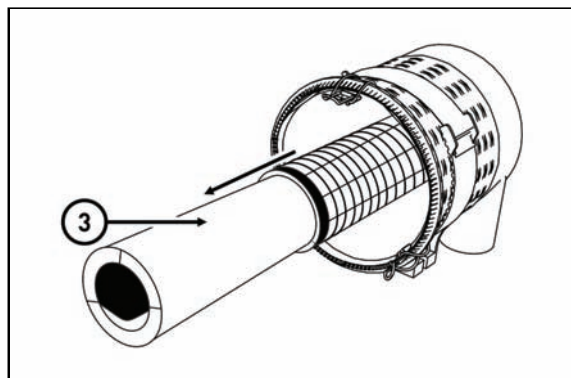
Replacing the safety element of the air cleaner

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



The safety element cannot be recovered. It must always be replaced in these cases.

- If the main element is damaged.
- After covering 2000 hours of work
- At least once every two years.



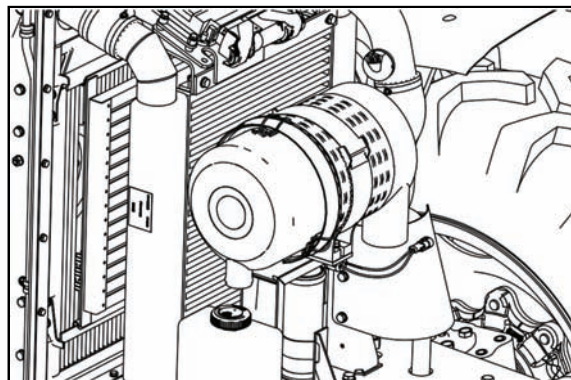
NM14D016

Reassembly of the air cleaner elements

Carry out a reverse procedure in order to mount air filter cartridges back on.

While mounting the cartridges back on mind:

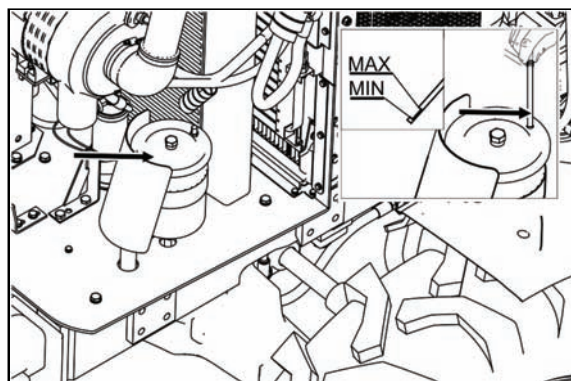
- The cleanness of contact surfaces
- That the cartridges must not lose their shape while being mounted and they must not vibrate after their mounting has been finished
- That after having closed the filter with the cover you must ensure a perfect tightness of the entire filter



NM14D017

Checking amount of oil in hydrostatic steering tank

Inspect daily before starting the operation with tractor standing horizontally. Lift off the bonnet. Unscrew dipstick, wipe off with a cloth and screw back in. After repeated unscrewing of the gauge, the level must not drop below bottom gauge line. Replenish the oil when necessary after demounting the cap of the tank.

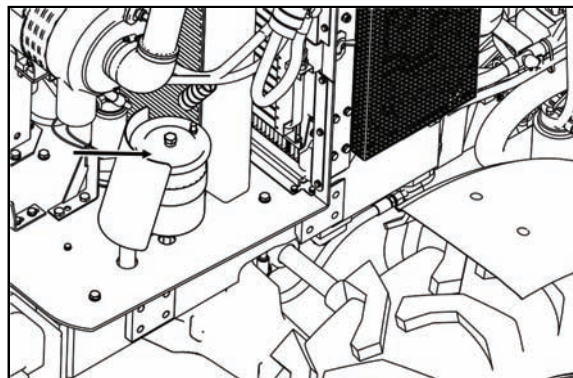


NM14D018

Replacing oil and hydrostatic steering filter element



1. place a suitable vessel under the hydrostatic steering tank
2. unscrew drain screw at the bottom of the tank
3. drain the oil
4. unscrew the nut of tank cap
5. demount the cap of hydrostatic steering tank

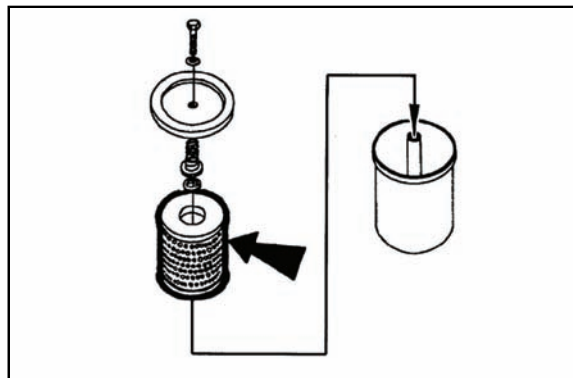


NM14D019

6. remove and replace filter element
7. set the lid of the tank back in
8. lock its position with a nut
9. screw drain screw back in



10. disconnect both hoses from working roller and waste pipeline from the tank (place vessels for used oil under working roller hoses and waste pipeline)
11. start the engine and with idle run (max. 10 seconds) turn the steering wheel 2-3 times to both sides so that you pushed oil from control unit and pipeline
12. secure the tractor against movement and lift front drive axle

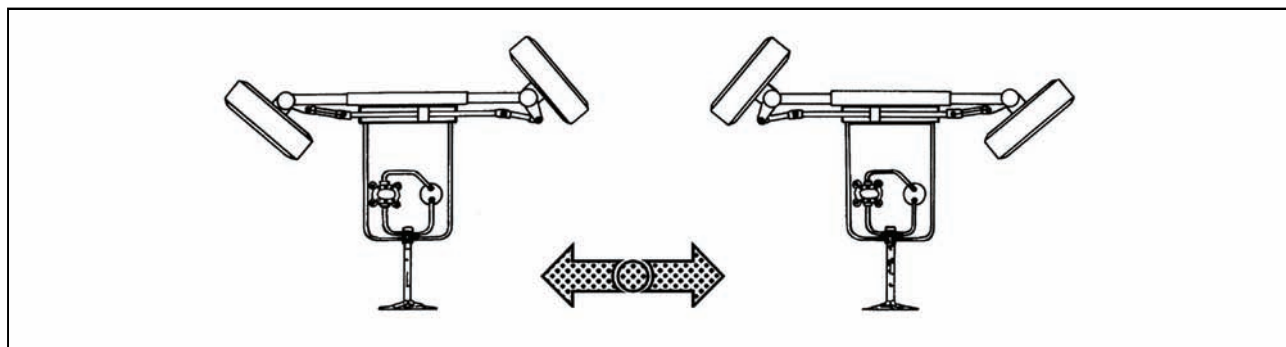


E721



13. place a vessel for oil under the working roller and by turning the wheels (manually) push the oil from working roller
14. do the back assembly of all disconnected joints
15. fill the tank with oil and vent hydrostatic steering circuit

Venting hydraulic circuit of hydrostatic steering

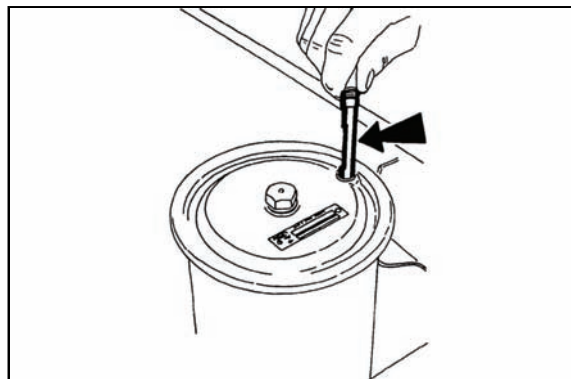


E722

1. secure the tractor against movement and lift the front axle
2. start the engine and allow it to run for approximately 1 minute in idle run
3. turn the steering wheel several times to both sides with idle run
4. with maximum engine revolutions, turn the steering wheel 3 times alternately slowly and quickly to both sides to restricting wheel stop
5. stop the engine
6. after completing the venting check or replenish the oil level to control gauge line. Check the tightness of all joints and hydraulic circuit guide-ways of hydrostatic steering
7. lower the tractor down to front wheels



Monitor oil level in the tank with all hydrostatic steering venting steps to prevent air sucking to the system of steering.



E723

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 long (maximum time is 20 sec.), otherwise there is excessive oil heating in hydrostatic steering circuit.

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.

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.

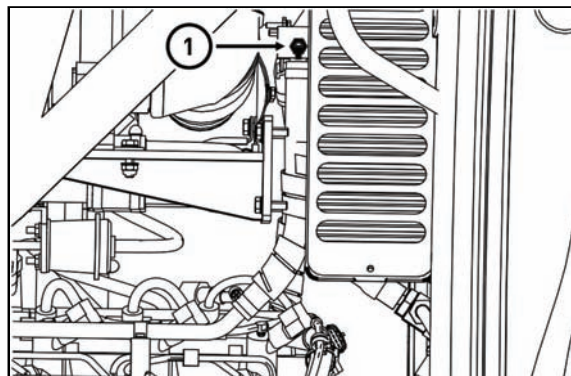
Start up the engine.

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.



NM14D005



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

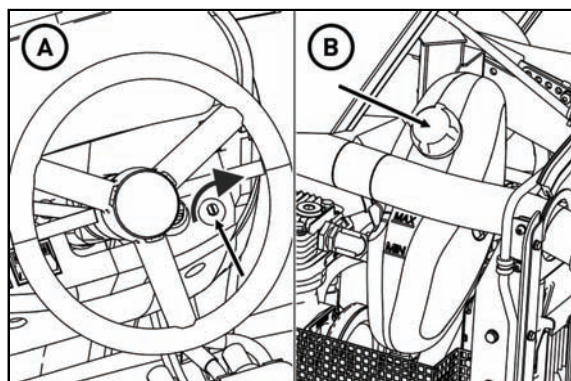


Loosen the overpressure plug only after the coolant cools down! Scald danger!

Coolant replacement

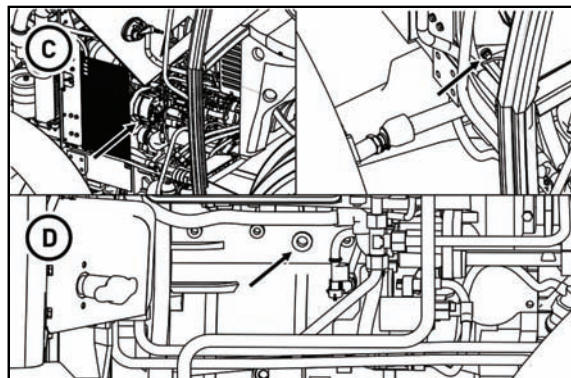
Observe the following procedure:

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



NM14D020

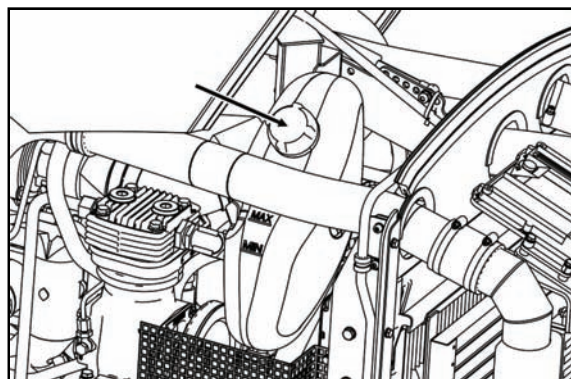
2. drain coolant from radiator (C). Draining screw is accessible after lifting the bonnet
3. drain coolant from the block of engine (D). Drain valve is accessible after lifting the bonnet
4. after draining the coolant, close the screw and valve (leave heating valve open)



NM14D021

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



NM14D022

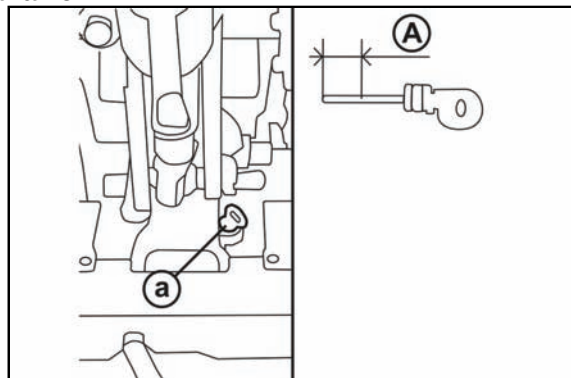
⚠ Loosen the overpressure plug only after the coolant cools down! Scald danger!

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

Gear system has a common oil filling. The state of oil is checked with a dipstick (a), which is placed in the rear part of final drive housing. Dipstick hole serves as filling.

⚠ Do the inspection with a tractor at standstill. Oil must be in the range (A) of dipstick.



NM13N066

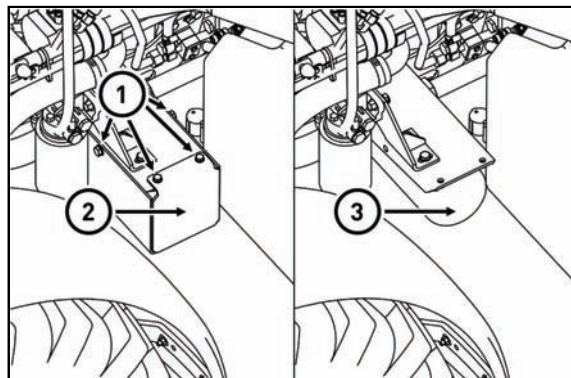
Replacing oil filter element of hydraulic pump

The oil filter is located under a cover on the left-hand side of the tractor in front of the fuel tank.



Before replacing the filter cartridge put an appropriate vessel under the tractor in order to capture dripping oil.

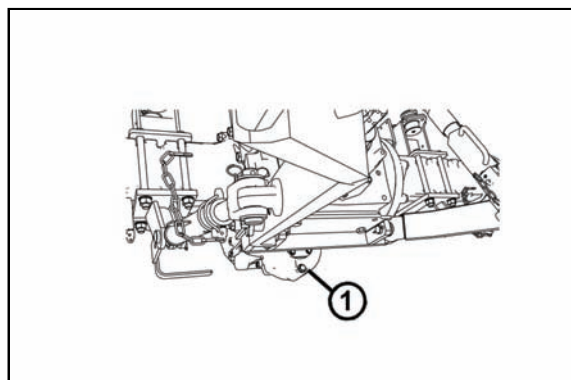
1. Dismantle the bolts (1) and take off the cover (2)
2. Loosen the filter cartridge (3) and screw it off using appropriate tools
3. Before screwing on a new filter cartridge clean the packing surface of the filter body
4. Smear oil on the rubber packing of the new filter cartridge and screw on the cartridge
5. After the packing has sit down on the contact area tighten up the filter cartridge (3) manually
6. Check oil level in the transmission and top it up if need be



NM14D023

Gear system drain plug

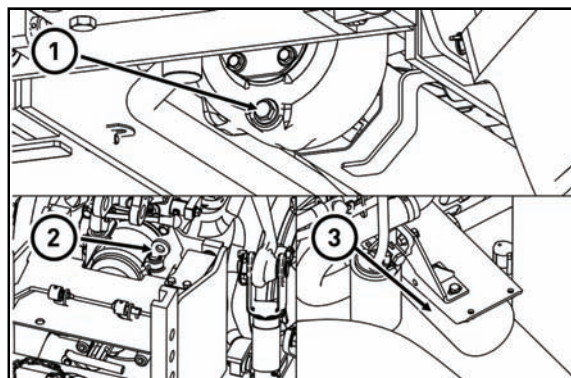
Gear system drain plug is placed on the box of front axle drive.



NM13N068

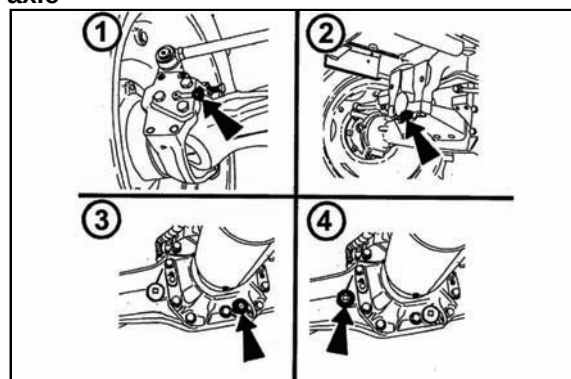
Oil replacement in gear system

1. unscrew drain plug (1), best immediately after ending a drive or after heating oil to working temperature
2. drain oil (for easing draining, remove gauge line (2))
3. clean drain plug (1) and screw it back in
4. replace filtration element (3)
5. pour new oil through dipstick hole (2)
6. start the engine and allow it to run for approximately 3 minutes in idle run
7. after stopping the engine and when the level settles, check the amount of oil with a gauge (1)



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

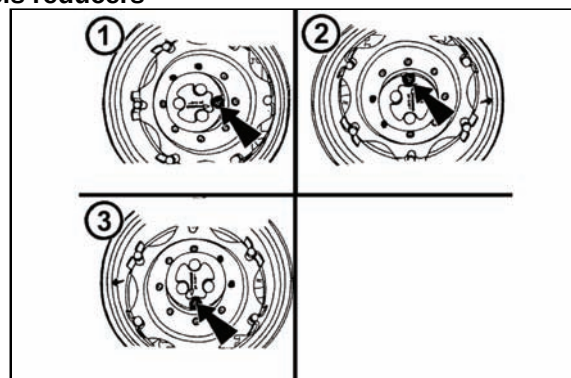


E733

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



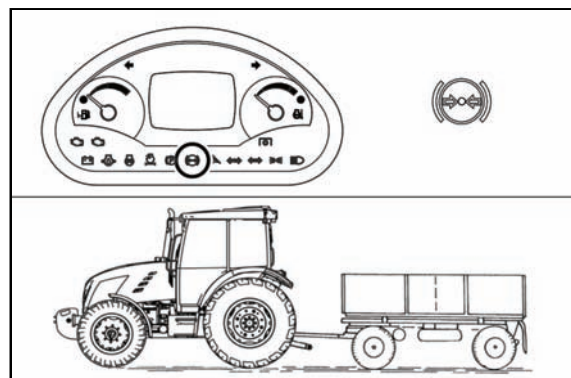
C731

Air system tightness inspection

- Fill in the air receiver up to the maximum pressure (600 ± 20 kPa)
- While the engine is off the minimum air-pressure indicator must not come on during 10 minutes



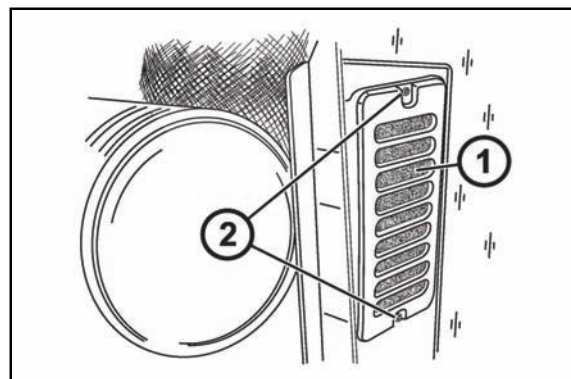
Carry out a check on a daily basis before any operation with a trailer or a semitrailer!
If pressure in the brake system drops down under a critical limit a warning indicator on the dashboard will come on!



NM14D039

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).

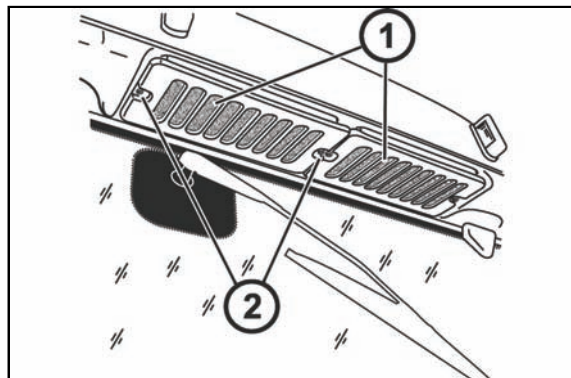


NM13N111

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).



NM13N109

Filtration elements cleaning

Regenerate filtration elements of the cab depending on the degree of clogging:

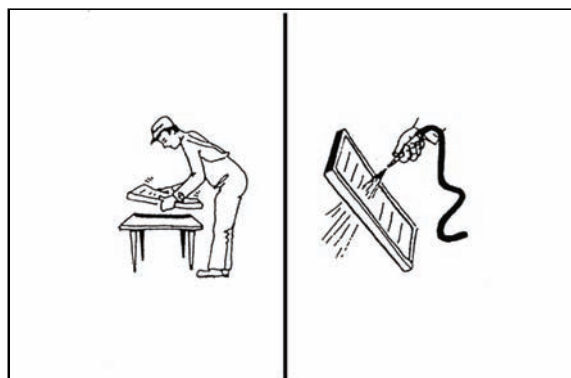
- by dusting
- by blowing with compressed air

Check clogging daily. Replace strongly polluted filters.



Tractor's safety cab is not equipped with special filters for air sucked into the cab.

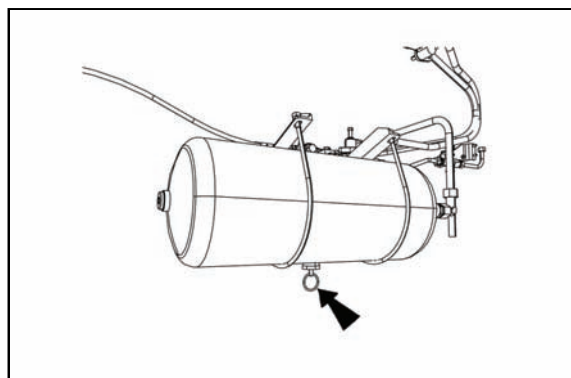
It does not protect operators against the effects of aerosols and other harmful substances!



NM13N110

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 collector to be done by deviation of venting valve by pulling a ring. Valve is located on the bottom part of air collector.



NM13N074

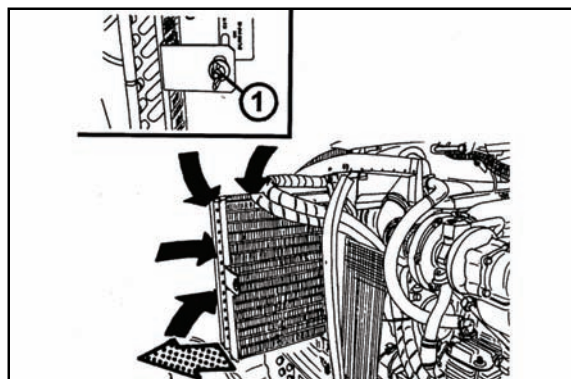
Air condition maintenance



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 and treatment of tires

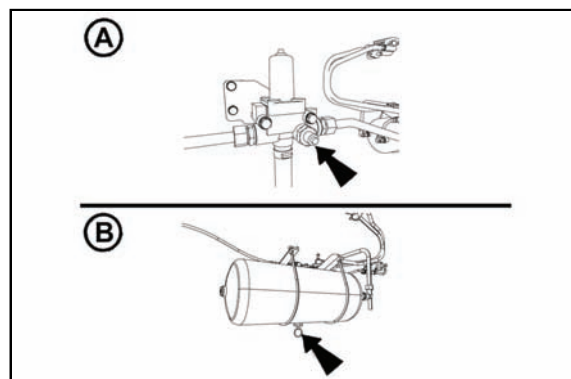
Regularly inspect the outer surface of a tire and inspect that there are no defects in side or above the base part of rollers and that body is not damaged.



Remove tires which have defects from further use.

Tire inflation

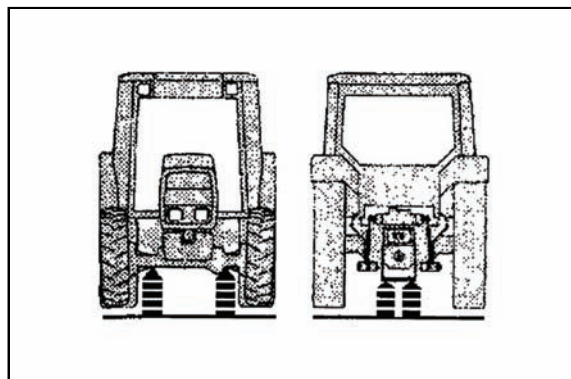
Basic values of recommended inflation are given in chapter 'Main technical parameters'. Check pressure regularly before driving, if tires are cold. Use pressure regulator for inflation (A), which fulfils the function of pressure equalizer, tire filler and locking valve. Screw a hose for tire inflation. 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

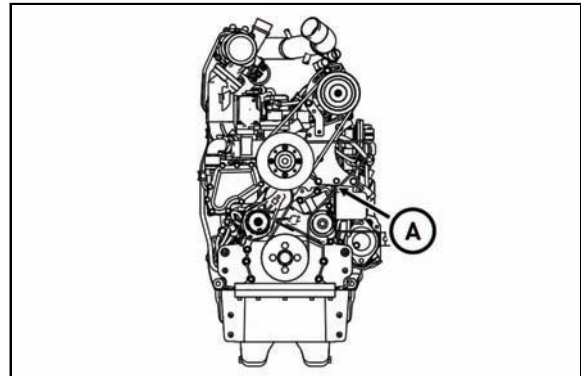
ADJUSTMENT



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

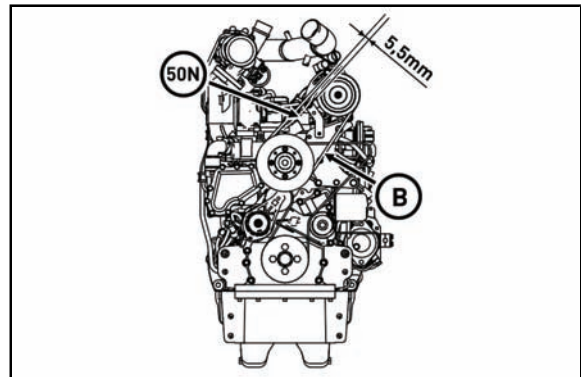
It is not necessary to adjust the tightness of the flat accessories-drive belt (A). The belt gets stretched automatically.



NM14D002

Stretching the V-Belt in the Air-Conditioner Compressor

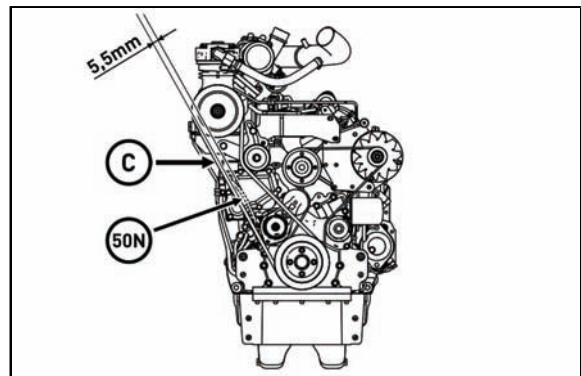
If V-belt tightness (B) is appropriate, the belt sagging must be 5.5 mm while a force of 50 N is acting on the belt. Stretch tight the V-belt according to the prescribed value after having loosened the fixing bolts on the air-conditioner compressor.



NM14D003

Stretching the V-Belt in the Compressor

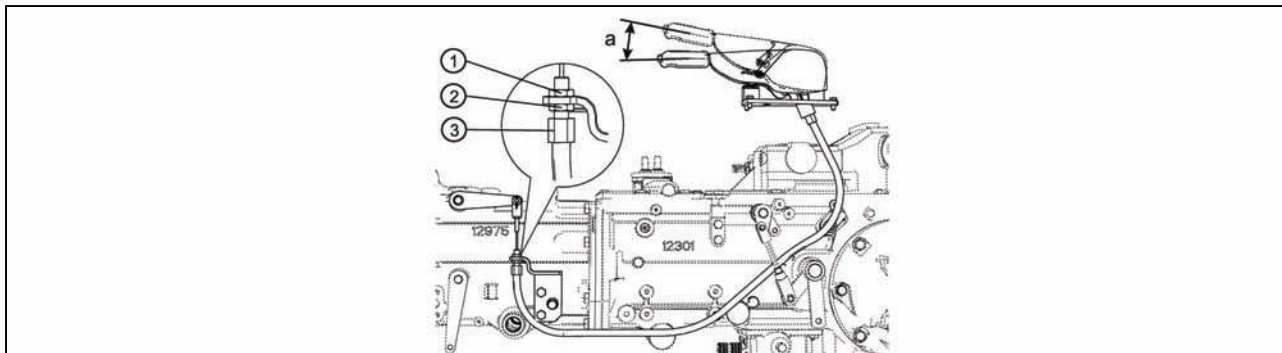
If V-belt tightness (C) is appropriate, the belt sagging must be 5.5 mm while a force of 50 N is acting on the belt. Stretch tight the V-belt according to the prescribed value after having loosened the fixing bolts on the belt tension roller of the compressor.



NM14D004

ADJUSTMENT

P.T.O. shaft clutch control lever adjustment



NM13N114

Free run adjustment of PTO shaft clutch control lever (a) is done by changing the length of control Bowden. After releasing the locking nut (1) set the length of Bowden by turning the nut (2). After setting the length of Bowden, tighten the locking nut (1).

With adjustment hold the Bowden bolt (3), to prevent its turning together with adjustment nut (2).

Free run of PTO shaft clutch control lever (a) must be 25 to 35 mm.

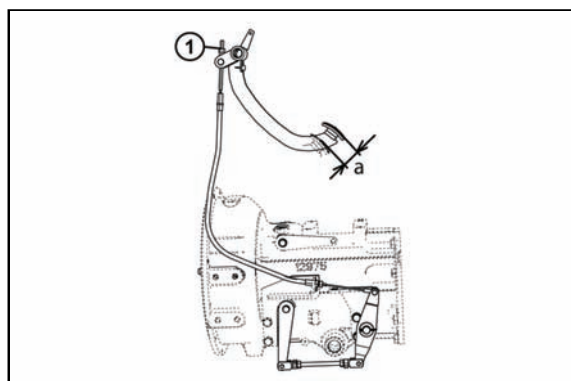
The track of lever between the lower lever position and the point when the control force on lever increases is the free run of PTO shaft clutch control lever.

Adjusting clutch pedal

Adjusting free run of clutch pedal (a) is done by changing the length of Bowden (1).

Clutch pedal free run (a) must be 25 to 35 mm.

Free run of clutch pedal represents the track of pedal between the upper position of clutch pedal and the point when control force on the clutch pedal increases.



NM13N113

MAIN TECHNICAL PARAMETERS

Main tractor's parameters (mm)

		Note
Turning-circle diameter length		
- without ballast weights in front of cab's grill	3 870	
- with ballast weight in front of cab's grill	4 140	
Width over rear fenders	1 840	
Height to the mouth of exhaust pipe	2 605	
Height of tractor to upper cab's rim	2 615	
Clearance height under the girder of front axle	400	
Height of nozzle of multistage suspension linkage in its topmost position (the centre of nozzle)	890/840/790/690	
Height of swinging draw bar (on internal bottom fork surface)	418/455	
Rear PTO shaft height	725	
Wheel base	2 210	

Tractor's weight

Tractor's weight (kg)	3300
-----------------------	------

Technical data of engines

Type of tractor		Major 60	Major 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	45	55,4
Specific fuel consumption 2200 rpm	g.kW.h	237,77	229,67
Max. torque / engine speed	Nm / rpm	239/1600	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
6	4 000
8	3 500
20	3 000
30	2 000

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)
	1525
8	4 000
20	3 500
30	2 300

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
8	5500
30	4300

Front tires steerability

Parameter of tires	Travel speed					
	30 km.h ⁻¹			8 km.h ⁻¹		
	Bearing capacity of tires			Bearing capacity of tires		
	(kg)			(kg)		
	Tire 1 piece	axle	inflation (kPa)	Tire 1 piece	axle	inflation (kPa)
11,2-24	1250	2000	240	1750	3500	240
280/85R24	1300	2000	160	1580	3500	160
11,2 R24	1300	2000	160	1580	3500	160
360/70R20	1500	2000	160	1820	3500	160

Note: Bearing capacity values apply for front wheel base of 1495 - 1525 mm and are in accordance with bearing capacity. When operating on hard surfaces, it is advisable to increase the pressure by 30 kPa with regard for slippage and abrasion of tires.

MAIN TECHNICAL PARAMETERS

Bearing capacity of rear tires

Parameter of tires	Travel speed					
	30 km.h ⁻¹			30 km.h ⁻¹		
	Bearing capacity of tires			Bearing capacity of tires		
	(kg)			(kg)		
	Tire 1 piece	axle	inflation (kPa)	Tire 1 piece	axle	inflation (kPa)
16,9-30	2300	2300	170	3220	4000	170
480/70R30	2760	2300	160	3350	4000	160
13,6 R36	2140	2300	160	2600	4000	160
16,9 R30	2675	2300	160	3250	4000	160

Note: Bearing capacity values apply for rear wheel base of 1725 mm and are in accordance with the bearing capacity of axle. When operating on hard surfaces, it is advisable to increase the pressure by 30 kPa with regard for slippage and abrasion of tires.

Hydraulic system

Type of tractor	Major 60	Major 80
Maximal lifting force at the end of lower draw bars of rear three-point linkage when maximum useful pressure (kN)	26	
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)	24	
Hydraulic system pump supply (l/min)	50	
Working pressure (MPa)	18	

Tractor's speed in km/h with engine nominal revolutions

Gear reduction	Gear	Forward speed	Reversing speed
L	1 L	1.43	1.20
	2 L	2.12	1.78
	3 L	3.11	2.61
	4 L	4.37	3.67
M	1 M	3.64	3.05
	2 M	5.39	4.52
	3 M	7.89	6.62
	4 M	11.08	9.30
H	1 H	9.65	8.11
	2 H	14.29	12.00
	3 H	20.91	17.56
	4 H	29.39	24.68

MAIN TECHNICAL PARAMETERS

Performance on rear PTO shaft

Performance on PTO shaft (kW $\pm$ 2%) - with nominal engine revolutions and engaged 1000 rpm of PTO shaft	Major 60	Major 80
Nominal engine revolutions (2200 rpm)	38,4	48,6

Performance on PTO shaft (kW $\pm$ 2%) - with nominal engine revolutions and engaged 1000 rpm of PTO shaft	
Nominal engine revolutions (2200 rpm)	47
Maximum engine revolutions (2460 rpm)	51

Dependent PTO shaft revolutions with nominal engine revolutions

Gear reduction	Gear	540	1000
L	1 L	66	120
	2 L	96	176
	3 L	139	255
	4 L	202	369
M	1 M	166	304
	2 M	242	443
	3 M	350	641
	4 M	507	928
H	1 H	446	816
	2 H	650	1190
	3 H	941	1721
	4 H	1362	2492

Independent PTO shaft revolutions

labelling	Shaft revolutions/engine revolutions	Shaft revolutions/engine revolutions
540	613 / 2200	540 / 1938
1 000	986 / 2200	1000 / 2231

Clearance-circle and turning circle diameter

Wheel base	front	1502 mm	Parameter of tires	front	11,2 - 24	On the left	On the right
	rear	1505 mm		rear	16,9 - 30		
Turning circle diameter(mm)	without engaged front drive axle					10610	10580
	with engaged front drive axle					11360	11270
Clearance-circle diameter (mm)	without engaged front drive axle					11130	11100
	with engaged front drive axle					11880	11790

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