ZETOR
FORTELLA HSX
Model 2013
100
110
120
130
140
3/2013
Operator’s manual
ZETOR

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

ZETOR
Brno
The technical specifications and information about the design, equipment, material and appearance are valid at the time of print. The manufacturer reserves the right to implement changes.
The Operator’s Manual deals with the description, operation and maintenance of the standard version and accessories that the tractor may be optionally equipped with.

The service cheque book for tractors is not part of the Operator’s Manual, but forms a separate booklet that is handed over to you at the purchase of your new tractor.
## ZETOR FORTERRA TRACTORS HSX

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LOCATION OF SERIAL NUMBERS

Tractor data plate

Cab serial No.

Engine serial No.

Tractor serial No.

XH154
LOCATION OF SERIAL NUMBERS

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

Zetor Forterra HSX 100
Zetor Forterra HSX 110
Zetor Forterra HSX 120
Zetor Forterra HSX 130
Zetor Forterra HSX 140

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

The manufacturer reserves the right to implement changes of the design and options during the production to improve the features of the tractor.
SAFETY INSTRUCTIONS FOR USERS

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

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

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

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

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

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

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

GENERAL SAFETY REGULATIONS

1. 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.
2. 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

3. Do not wear loose clothing and free flying long hair.

4. During all work use suitable (prescribed) means of personal protection (working boots, gloves, goggles, etc.)

STARTING THE ENGINE

5. Only start the engine from the driver’s seat with the clutch pedal fully depressed.
6. **Life hazard when starting by means of short-circuiting the starter terminals!**

7. The key in the switch box must be in the “I” position.
8. 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!**
SAFETY INSTRUCTIONS FOR USERS

DRIVING OPERATION

9. 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 pre-tensioning of hose connection (which can be verified by easy removal of the hose from the connection) and mechanical damage of the hose. Hoses with indicated service life must be replaced immediately after the expiration of the service period.

10. The brakes and steering must be in the perfect condition all the time.

11. During driving on roads with trailers and tools the brake pedals must be connected with a latch.

12. Driving downhill without an engaged gear is forbidden.

13. Pay special attention when driving on a slope and muddy, sandy, icy or uneven ground.

14. Observe the maximum prescribed slope gradient of 12°.

15. Respect the total permissible weight of the tractor and trailer specified on the data plate of the tractor or on the rear wheel mud-guard.

16. Do not use the differential lock when driving into a bend.

17. It is forbidden to get into and out of a moving tractor.

18. 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.

19. When driving the tractor with agricultural machines attached to the front three-point hitch, reduce the driving speed to 20 km/h.

20. During aggregation of Zetor Forterra 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

21. The number of persons transported by the tractor must not exceed the number specified in the technical certificate of the tractor.

22. Persons that are not authorized to work with the attached implement must not stand between the tractor and the hitched machine (implement).

23. Before putting the tractor in motion make sure there is no person or obstacle in the driving direction.

RECOVERY, PUSHING

24. 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!

25. During recovery it is dangerous to stand near the towing rope.

26. It is prohibited to use the tractor axles (individual wheels) as a winch for releasing a sunken tractor.

27. The front hook should be only use to recover the entire tractor, i.e. without any trailer or another attached implement.

28. Never recover the tractor with reduced gears engaged.

29. 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

30. Park the tractor only on an even land and where not possible, support with a shim assy.

31. Do not park the tractor with an attached implement in the lifted position.
SAFETY INSTRUCTIONS FOR USERS

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

33. When leaving the tractor with an engine engaged, brake with a manual brake. Shift the gear shift lever to neutral position.

34. To get out of the tractor normally use the left side of the tractor. Look around to see whether a vehicle is coming that could endanger your safety during getting off and only then open the door.

35. When leaving the tractor use the steps and handles. Pay increased attention in the area of the shifting lever and the manual throttle lever as well as the upper step.

WITH STOPPED ENGINE ONLY

36. 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.

37. 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

38. Refuel the tractor best after the end of work and with the engine stopped.

39. Do not refill fuel up to the top of the fuel tank in summer. Wipe spilt fuel immediately.

40. Do not refuel the tractor near open flame and do not smoke.

41. Do not smoke and do not use open flame when inspecting the battery electrolyte level.

42. Make sure that fire safety instructions are strictly observed in environments with an increased danger of fire (hay-lofts, straw-stacks, etc.).

43. The tractors are not equipped with a fire extinguisher from the production plant.

HEALTH AND ENVIRONMENT PROTECTION

44. 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.

45. 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.

46. 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

47. 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.

48. 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.
SAFETY INSTRUCTIONS FOR USERS

WASTE DISPOSAL

49. 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

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

SAFETY CAB

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

AIR-CONDITIONING

52. 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.

53. 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

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

55. 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.

56. When handling the battery you must pay increased attention and avoid short-circuits. In tractors equipped with a battery disconnector switch the disconnector off when handling the battery.

57. Zetor Forterra HSX tractors must not be operated with a disconnected battery as this may lead to a serious failure of the tractor.
PREVENTIVE DAILY MAINTENANCE
Perform this maintenance daily or after every 8 - 10 hours of operation at the latest.
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
After unscrewing and removing the oil dip-stick check the oil quantity in the engine and then check the connection of the engine lubrication system for leaks. Maintain the oil level between the dip-stick marks.

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

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

TRAILER HYDRAULIC BRAKES
Check the hydraulic brakes of the trailer for leaks.
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.

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

CAB FILTRATION
Check and if necessary clean the cab ventilation air filters installed in the front overhang of the roof.
The filter exchange interval depends on the dustiness of the working environment.
Partial regeneration can be performed by beating out or blowing with compressed air.
Do the cleaning or replacement of the filter elements after removing the covering grills in the roof overhang.
**HITCHES**
Check the condition of the hitching and attachment systems of the tractor and trailer.

**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:
- Remove the side plate of the hood.
- 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.

**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 (the rim / disc and disc / wheel shaft connection).

⚠️ *Never drive with loose wheel bolts!*
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.
The tractor user is obliged to get acquainted with the recommended procedures and instructions for safe operation of the tractor in advance. It is too late to do so during operation!
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SAFETY CABIN

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

Safety cabin is equipped with toned glass.

OPENING THE DOOR FROM THE OUTSIDE

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

OPENING THE DOOR FROM THE INSIDE

1. Lever for opening the door from the inside
2. Lever for opening the door from the inside
The door is held by a gas strut with a full opening. Driving with open door is not recommended for their possible damage.
REAR WINDOW
Is equipped with a handle and in an open position is locked by gas spruts. Rear window is heated.

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

SIDE WINDOW
Secured by plastic handle in half open position.
ACQUAINTANCE WITH THE TRACTOR

WINDSHIELD WASHER NOZZLE
Nozzle is adjustable with a needle of a maximum strength of max. of 0.8 mm.

WINDSHIELD WASHER TANK
Windshield washer tank is placed on the rear wall of the cabin from the outside side.

WINDSHIELD WASHER ENGAGEMENT
Windshield washer is set in activity by pressing a switch of front double-gear windshield washer placed on the right column of the cabin. The maximum length of uninterrupted pump run of windshield washer is 20 s.
ACQUAINTANCE WITH THE TRACTOR

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

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

SEAT TILTING
Lift the passenger´s seat in the direction of an arrow (2), pull the lever (3) to the direction of the driver´s seat, tilt the seat in the direction of an arrow (4).
ACQUAINTANCE WITH THE TRACTOR

SHELF AND TOOLBOX
Shelf is placed on the left side of driver’s seat.
Toolbox is placed in the rear part of the cabin behind the driver’s seat.

Another shelf is placed on the right mudguard.

REAR VIEW MIRRORS
Before the drive or starting the work, adjust rear view mirrors so that they enable to monitor the whole drive way or working field.
ACQUAINTANCE WITH THE TRACTOR

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

DRIVER’S SEAT WITH MECHANICAL SUSPENSION
Control according to points 1, 2, 3, 4 and 5
Point 2, lever is placed on the right

DRIVER’S SEAT WITH PNEUMATIC SUSPENSION
Control according to points 2, 3, 4, 5 and 6
Point 2, lever is placed on the left

TILTING AND PROTRUSION OF STEERING WHEEL
Tilting column of steering wheel enables variable setting of position of the steering wheel both in terms of angle and height.

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

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

Active carbon filters are installed in the place of standard dust filter and the replacement is done in the same way as with standard filters. Filter must be inserted with the white side to the grid. Assembly instructions are found in the chapter "Maintenance instructions".

Filter is used only when spraying pesticides, then it must be replaced back by a paper filter because the flying dust would clog the carbon filter very fast. The recirculation control must be in the position "air is sucked from the outside" Ventilator control must be in the position “maximum ventilator run”

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

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

When spraying pesticides and using heating filters with active carbon, the recirculation control must be in the position of „air sucked from the outside“ and the ventilator control “maximum ventilator run” for creating surplus pressure in the cabin
ACQUAINTANCE WITH THE TRACTOR

HEATING CONTROL PANEL, * AIR-CONDITION
A - heating valve control
B - ventilator control
C - air-condition switch
D - air circulation in the air of cabin lever

HEATING VALVE CONTROL (A)
a - heating valve closed
b - heating valve opened

VENTILATOR CONTROL (B)
1 - ventilator off
2 - slowly run of ventilator
3 - medium run of ventilator
4 - maximum run of ventilator

SWITCH * AIR-CONDITION (C)
Do engagement and disengagement of air-condition system function by switching the switch with a symbol of snow flake (C).
You will set the air-condition system going by pressing the switch (the symbol of snow flake lights up).
You will disengage the air-condition system by repeated press of switch (snow flake symbol switches off).
AIR CIRCULATION IN CABIN CONTROL(D)

a - surrounding (outside) air is sucked in through filters to cabin – sucking the air from cabin is closed.

b - Air is sucked in from the space of the cabin and again blown off to the cabin (inner air recirculation for fast adjustment of temperature in the cabin)

⚠️ The intake of air from the outside of the cabin is completely locked and there is no surplus pressure in the cabin which would prevent pervasion of unfiltered air to the cabin!

Do not use this position of the control with work of the tractor!

PROPER FUNCTION OF THE HEATING AND AIR-CONDITION SYSTEM

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

FAST HEATING OF THE CABIN AREA

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

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

OPERATION OF HEATING OR AIR-CONDITION WITH TRACTOR’S WORK
With engaged inner recirculation of air is the inflow of fresh air closed and there is foul air in the space of the cabin by operator. This state can cause the feeling of fatigue and there can also be penetration of dust to the cabin because of the loss of surplus pressure.

Note: Set the control (D) according to individual requirements on temperature to the position between (a) and (b) so that the ventilator sucks the air from the outside of the cabin through filters, when working.

IMMEDIATELY AFTER COOLING THE CABIN
Immediately after cooling the cabin and lowering the inner temperature on the required values, we recommend the following:
- Do the continuous regulation of the air temperature with air condition on by opening the heating valve (A). The air entering the cabin from expiration is not so intensively dried with this setting.
- Continuous temperature control with air-condition on can be also done by lowering the output of ventilator by switching the control (B) to position 1 or 2.
AIR-CONDITION AND HEATING REGISTERS (A)
Positionable heating and * air-condition registers, front (A), rear (B).

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

TILTABLE WINDOW
Opens after turning arresting levers of the window (A) and tilting in the direction of arrows.

SUN SCREEN
Sun screen to be drawn out by pulling the ring (B) and locking by hooking the ring by the hook (C).

INTERNAL LIGHTING
To be turned on and off by means of a button marked with the arrow.
ACQUAINTANCE WITH THE TRACTOR

1  2  3  4  5  6  7  8  9  10  11  12  13

14  15  16  17  18  19  20  21  22  23  24  25  26  27  28

A  B  C  D

FH12N010
ACQUAINTANCE WITH THE TRACTOR

DASHBOARD

DESCRIPTION
A - controls
B - coolant thermometer
C - fuel gauge
D - pressure gauge
E - speedometer
F - display

CONTROLS AND BUTTONS
When switching the key in switchbox from “0” position to “1” position, all controls light up.
1 - High beam lights (blue). Lights up with high beam lights on.
2 - Tractor turn signal indicator (green).
3 - Turn indicator control of 1st trailer (green).
4 - Turn indicator control of 2nd trailer (green).
5 - Minimum air pressure in brake system control (red). It is lit up with the pressured drop for air brakes of trailer under the critical interval i.e. 450 kPa.
6 - Manual brake (red). It is lit with engaged manual brake.
7 - Charging (red). With engine run, lights up with charging disorder. If the engine is at standstill, it must be lit.
8 - Lubricating (red). With engine running lights up with the oil pressure drop under 120 to 60 kPa. If the engine is at standstill, it must be lit up
9 - Air cleaner clogging (yellow). Lights up with air filter clogging.
10 - (not connected).
11 - (not connected)
12 - (not connected)
13 - Indicator (red) of a failure in the hydrostatic control system. It lights with engine operation in hydrostatic control failure. If the engine is at standstill, it must be lit up.
14 - (not connected)
15 - (not connected)
16 - (not connected)
17 - Engine ignition (yellow). Signalizes the activity of device for easement of the start of the engine
18 - (not connected)
19 - Fuel (orange). It lights up with the remaining 1/6 - 1/10 of the volume of the tank.
20 - Gearbox disorder control (red), for more see “Driving operation” chapter
21 - Gear box oil filling overheating control (red), for more see chapter “Driving operation”
22 - Gearbox switchboard delivery filter clogging control (red), see “Driving operation” chapter for more information
23 - Rolling up in the menu button
24 - Rolling down in the menu button
25 - entry to the menu button, confirming items on the menu
26 - LCD backlight inversion button
27 - Reset button hours of operation and km
28 - Change of display button (road, PTO, Moto hours, km).
DISPLAY DESCRIPTION
The following values are displayed on the display:

1 - shifted gear of multiplier of torque, according to shifted gear L, M or H is displayed
2 - switching the switch of torque multiplier preselection
3 - switching the function of rear PTO shaft automatic disengagement
4 - gear shifting lever position, reversing F driving forward, N neutral, R reversing
5 - road and reduced speeds shifting lever position, Lo reduced speeds, Hi neutral or road speeds
6 - main depicting field
7 - secondary displaying field

CHANGE OF THE LOOK OF DISPLAY
The change of look of display from display (1) to display (2) can be done by pressing a button (A).
ACQUAINTANCE WITH THE TRACTOR

DISPLAY – CHANGE OF DISPLAY
By repeated pressing of button (A), you can click between individual displays of data on display:
1 - Main field travel speed of tractor pole, secondary field of PTO shaft revolution, if it is on
2 - Main field of PTO shaft revolution if it is on, secondary field of travel speed of tractor
3 - Automatic disengagement of rear PTO shaft, more in the chapter “Drive of agricultural machinery”
4 - Main field of number of hours in operation in total, secondary field of hours in operation from the last resetting of the data
5 - Main field of the number of kilometres in operation in total, secondary field number of kilometres in operation from the last resetting of the data
6 - Accumulator battery voltage

DISPLAY – Resetsing DATA
Resetting data marked with an arrow can be done on a display (4) and (5)
Select display (3) or (4) with a button (A) and by a longer pressing of button (B) reset data marked with an arrow.
ACQUAINTANCE WITH THE TRACTOR

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

⚠️ Brake the tractor by a manual brake.

DISPLAY - ERROR MESSAGES

Serious faults in the system (1)
STOP sign, number of fault (1) is displayed on a display with serious faults.

⚠️ If this situation occurs, set the tractor aside and contact service

Less serious faults in the system (2) a (3)
With less serious faults in the system, the number of faults (2) are displayed on the display for a time period of approximately 5 seconds. Then the display of fault is minimized to the main field. (3)

⚠️ If this situation occurs, complete the work and contact service.

See more in the chapter of “Driving operation”.

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ACQUAINTANCE WITH THE TRACTOR

DISPLAY – SERVICE MENU
Service menu serves for the maintenance of the tractor by an authorized service and the setting of language for display of dashboard.
Entry to service menu
You will enter the service menu by a longer pressing of (A) button.
The selection of items to be done by (B) and (C) buttons. The selected item is marked by an arrow (1).
Exit from service menu
By buttons (B) and (C), select an item EXIT and press (A) button.

DISPLAY – SETTING LANGUAGE MUTATION
Enter the service menu
Select the item LANGUAGE by (B) and (C) buttons and press button (A).
Select language mutation by buttons (B) and (C) and by one by one presses of button (A) available language mutations will be one by one displayed. When achieving the desired language mutation, leave the service menu.
Dashboard is switched to a selected language mutation.
ACQUAINTANCE WITH THE TRACTOR

SWITCHES AND LEVERS

a - Lights switch (off, parking, head)
b - Lower beam lights in the grill of the tractor and working lights in the cabin of the tractor switch
c - Fog light switch (off - on). Fog light function is signalized by a lit symbol on the switch.
d - Working lamp switch (off - on). Working lamp function is signalized by a lit symbol on a switch.
e - Warning lights switch
f - Front drive axle button. Engaged front drive axle is signalized by lit symbol on a switch.
g - Beacon switch (off - on)
h - Working lights in the grill of the bonnet switch (off - on)
i - Preselection of torque multiplier switch
j - Differential lock button
k - Switch box
l - Direction lights, lower beam head lights, head lights and horn switches acoustic and light
m - Reversing lever (forward, neutral, backward)
ACQUAINTANCE WITH THE TRACTOR

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

FRONT DRIVE AXLE BUTTON
⚠️ Use the front drive axle with slipping of the rear wheels to enhance the draught of the tractor.
To engage front drive axle, press the button which returns to its original position after release. Disengagement of front drive axle is done by repeating pressing of the button.
Engagement of front drive axle is signalized by a lit symbol on a switch.
More in “Driving operation” chapter.

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

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ACQUAINTANCE WITH THE TRACTOR

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

REAR DIFFERENTIAL LOCK BUTTON
Engagement and disengagement of rear differential lock is done by pressing the button which returns to its original position after release. The engagement of lock differential is signalized by a lit symbol on the button. For more see the chapter “Driving operation”.

PRESELECTION OF TORQUE MULTIPLIER SWITCH
a - Preselection switch off
b - Preselection switch on
The position (b) of preselection switch on is signalized by a lit symbol on a switch and a symbol on the display. For more see the chapter “Driving operation”.

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ACQUAINTANCE WITH THE TRACTOR

DIRECTION LIGHTS, LOWER BEAM HEAD LIGHTS, HEAD LIGHTS AND HORN SWITCHES

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

SWITCH BOX

Switchbox is placed on the dashboard, see arrow.
ACQUAINTANCE WITH THE TRACTOR

KEY IN “0” POSITION
The voltage of all key operated devices is disconnected. The key can be removed.

KEY IN “I” POSITION
Voltage is connected to all devices with the exception of the starter. The key is in this position with engine running.

KEY IN “II” POSITION
Starter and feeding of all devices is engaged in this position with the exception of windshield wiper, windshield washer, cabin ventilator and air-condition. After starting, the key automatically returns back to “I” position.
ACQUAINTANCE WITH THE TRACTOR

IGNITOR AND THREE-PIN SOCKET
Ignitor (1) and a three-pin socket (2) are placed on the panel of right rear mudguard.

MANUAL THROTTLE
A - maximum supply
B - idle run
ACQUAINTANCE WITH THE TRACTOR

REVERSING LEVER
F – front driving; lever in the front
N - neutral
R – back driving; lever at the back

GEAR SHIFTING LEVER
- main gear shifting lever
  1. button for disengaging clutch on the head of gear shifting
  2. buttons of shifting individual gears of multiplier

GEAR SHIFTING SCHEME
Reversing speeds can be shifted only by means of reversing lever. The scheme is placed on the head of gear shifting lever.
ACQUAINTANCE WITH THE TRACTOR

PEDALS AND LEVERS
1 - travel clutch pedal
2 - foot brake pedals joint by a catch
3 - throttle pedal

ROAD AND REDUCED SPEEDS
SHIFTING LEVER
The lever is placed on the right side of driver's seat.
H - Road speeds
N - Neutral
L - Reduced speeds
PRESELECTION OF STANDARD AND ECONOMIC REAR PTO SHAFT REVOLUTIONS LEVER

The lever is placed on the right side of driver’s seat. After shifting the lever it is necessary to lift the collar in the direction of the arrow (C).

A Standard PTO shaft revolutions engaged

N Neutral position The ending of rear PTO shaft can be spun freely

B PTO shaft economic revolutions Engaged

MANUAL BRAKE LEVER AND COUPLING FOR SEMI-TRAILER CONTROL LEVER

1 - manual brake lever
   a - unbraked
   b - braked

2 - coupling for semi-trailer lever
   c - transporting position
   d - Bearing hooks folded up; tow hook with carrier can be started

HYDRAULIC CONTROL PANEL

It is placed in the area of right mudguard. A detailed description of controls and function follows in chapters “Hydraulic equipment” and “Electrohydraulics” of this instructions manual.
ACQUAINTANCE WITH THE TRACTOR

AUXILIARY HYDRAULIC SWITCHBOX CONTROL (EXTERNAL HYDRAULIC CIRCUIT)
Is placed in the upper part of right mudguard.
A detailed description of control and function of integrated hydraulic switchboard (of external hydraulic circuit) follows in "Hydraulic equipment" chapter of this instructions manual.

CONTROL PANEL ON THE RIGHT COLUMN OF THE CABIN
1 - rear PTO shaft engagement
2 - front PTO shaft engagement
3 - two-position switch of front wiper and front windshield washer control
4 - rear wiper switch
5 - switch of front working lights on the roof of the cabin
6 - switch of rear working lights on the roof of the cabin
7 - rear mirrors heating *switch
8 - rear window heating *switch
9 - rear PTO shaft start rate. Three levels can be selected according to connected tools:
10 - rear PTO shaft revolutions switch (540 or 540E/1000)

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

a - battery connected
b - battery disconnected
ACQUAINTANCE WITH THE TRACTOR

FUEL TANK
A plastic tank of 240 litres volume is mounted as a standard for all types of tractors.

⚠️ Do not step on the fuel tank!

FUEL TANK DRAIN PLUG
Plug for draining dirt and fuel off the fuel tank is in its bottom.

AGGREGATION OPENING
Aggregation opening serves for cabelling or Bowden control of aggregated tools placement. Pull to protrude the part of sealing of rear window in upward direction. Put the aggregated tool control through the originated hole. Insert cabelling or Bowden controls to the holes of passage of aggregation opening. Return the sealing of the rear window to its original position by exercising pressure.
Before riding with a new tractor, first get acquainted with the gear shifting scheme and try the individual positions of gear shifting lever out with engine at standstill. Also make sure that the technical condition corresponds to the conditions of safe operation.

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**BEFORE YOU START**

⚠️ Before you start the engine, make sure that:
1. the tractor is properly braked.
2. the main gear shifting lever of gears in neutral position.
3. Reversing lever is in neutral position.
4. PTO switches on the right column of the cabin are off.

If clutch pedal is not depressed the tractor cannot be started – start protection switch is not switched.

**IF YOU DO NOT SUCCEED IN STARTING THE ENGINE**

Return the key to "0" position. Wait 30 second and repeat the start.

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

**NON-PERMITTED STARTING**

⚠️ It is forbidden to start the tractor by short-circuiting the starter clamps. Start only from the driver’s seat.

It is necessary to disconnect minus pole of accumulator and all the shifting levers including PTO shaft shifting lever to be shifted in neutral position with any manipulation or repair of the starter. The starter’s clamps are covered with a cap.
STARTING THE ENGINE OF THE TRACTOR

As a standard, the tractors are equipped by glow plugs in the heads of rollers.

1. Insert the key to the switchbox ("0" position).
2. Depress the clutch pedal.
3. Shift the main gear shifting lever to neutral position.
4. Shift the reversing lever to neutral position.
5. Make sure that all PTO switches on the right column of the cabin are switched off.
6. Turn the key to "I" position. A yellow control will light up on the dashboard signalising the proper igniting function.
7. Wait for the ignition control to turn off (the time is dependent on the temperature of the coolant).
   - If the ignition control merely blinks instead of lighting up, there is a disorder in the ignition system (see ch.: Ignition system disorder signalization). The signalised fault must be resolved in an expert service garage.
   - If the ignition control blinks at standstill once per second, ignition in emergency system occurs just like at low temperatures regardless of the temperature of coolant.
   - If the ignition control blinks at standstill twice per second, the ignition is put off operation (does not work).
   - If the ignition control blinks permanently during the run of engine, there is a disorder of ignition control and ignition has not been completed. The disorder must be forthwith removed, because there is the danger of battery depletion.
8. Turn the key to the "II" position (start).
9. After starting the engine, release the key immediately. **Do not start for more than 15 sec.**
**COOLANT HEATER**

Coolant heater is mounted on the engine block. The heater has the output of 1000 W with voltage of 220 V of electric alternate current.

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**STARTING THE ENGINE WITH THE USE OF COOLANT HEATER**

Heating the coolant makes starting the engine easier with low temperatures. Inlet electric installation and its protection against dangerous touch must be done in accordance with valid regulations.

1. Insert the plug to the heater first.
2. Then connect the heater to the electric network of the voltage of 220 V.

With regard for the lower engine wear when starting at low temperatures, the use of heater is recommended by the manufacturer. The duration of heating is dependent on the surrounding temperature (1 - 2 hours before scheduled start should suffice).

⚠️ After completing the heating, first disconnect the device from the electric network and only then pull the plug out of the heater!

**The danger of injury by electric current!**

*It is necessary to ensure instruction of the tractor’s operator and regular revision of the heater of coolant including inlet cable in the sense of valid standards of the state in which the tractor is operated at least before every winter season.*
IMMEDIATELY AFTER START

After start, set the revolutions for 800 - 1000 revolutions per minute, allow the engine to run for a time period of approximately 2 minutes.

In this time, do the control of greasing, recharging, hydrostatic steering (the controls must turn off) and other functions ensuring proper run of engine. The time of engine operation without load must be kept, in particular in winter season.

ENGINE HEATING

Do further heating of the engine during the drive. The heating of the engine by lengthy idle run or sharp increase in revolutions is harmful to the engine.

If the temperature of coolant has not reached 45°C, do not exceed the engine revolutions over 2000 rpm.
GEAR SHIFTING
The tractors are equipped with a five-gear synchronized gearbox, three-gear torque multiplier, reversing and two-gear reduction.
Five-gear gearbox is shifted by main shifting lever with buttons for disengaging the travel clutch (1) and for shifting the individual gears of multiplier (2).

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

REVERSING LEVER POSITION SIGNALIZATION
The individual positions of reversing lever are signalized by a sign (1) in the top right corner of the display.

\[ \begin{align*}
\uparrow & F & \text{driving forward} \\
N & \text{Neutral} \\
\downarrow R & \text{driving backward}
\end{align*} \]
SHIFTING ROAD AND REDUCED SPEEDS
H - Road speeds
N - Neutral
L - Reduced speeds
Shifting the gears of the main gearbox with reduced speeds is the same as with road speeds.

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

ROAD AND REDUCING SPEEDS LEVER POSITION SIGNALIZATION
The individual positions of road and reduced speeds lever are signalized by a sign (1) in the left bottom corner of the display.

Hi - road speeds
Hi - neutral position
Lo - reduced speeds

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

THE PRINCIPLES OF APPROPRIATE USE OF TRACTORS

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

THE DESCRIPTION OF THE SYSTEM OF TRAVEL CLUTCHES

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

THE WAY OF CONTROLLING THE TRAVEL CLUTCH BY

1 - Reversing lever
2 - Clutch control button on the head of reversing lever
3 - Clutch pedal

THE DIFFERENCES IN WAYS OF CONTROLLING THE TRAVEL CLUTCH BY

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

⚠️ Automatic dead start function is sparing to travel clutches than the control of travel clutches by clutch pedal, therefore use the ways of controlling travel clutch with the function of automatic dead start for the regular operation of tractor with dead start, gear shifting or the change of the driving direction.
2 - Clutch control button on the head of gear shifting lever
This way of control has the function of automatic switch of travel clutch.
When pressing the button of clutch control on the head of gear shifting lever there is release of travel clutch.
When releasing the red button of control clutch on the head of gear shifting lever, there is a switch of travel clutch.
The rate of travel clutch switch is controlled by electronic control unit on the basis of information saved with calibration and the operator cannot influence it.

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

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

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

⚠️ It is forbidden to control the speed of tractor by partial depression of the clutch pedal with engine revolutions higher than 1200 revolutions per minute.
Do not use the clutch pedal as a foot rest.
There is a danger of limiting service life or failure of travel clutches.
INTERRUPTED SOUND SIGNAL
If the speed of tractor is control by partial depression of the clutch pedal with engine revolutions higher than 1 200 rpm, there is an interrupted sound signal and gearbox failure control is still lit. If this situation occurs, fully depress the clutch pedal immediately to stop or release the clutch pedal to the upper position and wait until the sound signal goes silent and the control of gearbox failure. Lower the engine revolutions under 1 200 revolutions per minute and then continue working with the tractor. If you do not do it, 8 seconds later the interrupted acoustic signal changes to uninterrupted signal.
DRIVING OPERATION

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

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

DEAD START OF TRACTOR IN REGULAR OPERATION - AUTOMATIC DEAD START FUNCTION
- Use the control of travel clutch by reversing lever under the steering wheel for dead start of the tractor.
- Select the slowliest L gear of torque multiplier for dead start of the tractor.
  Note: When starting or stopping the engine of the tractor, the fastest gear H is always automatically shifted.
- If the road and reducing speeds shifting lever is shifted in the group of road speeds, shift the lowest gear speed for tractor dead start with respect for operational conditions.
- Use the lowest possible engine revolutions for tractor’s dead start, such that there is no turn off. After the switch of travel clutch, increase the engine revolutions according to your needs.

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

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

DEAD START OF TRACTOR IN REGULAR OPERATION – CLUTCH PEDAL

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

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

DEAD START – USING THE CLUTCH PEDAL

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

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

CHANGE THE DIRECTION OF DRIVE

CHANGE THE DIRECTION OF DRIVE BY MEANS OF REVERSING LEVER

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

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

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

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

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

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

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

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

GEAR SHIFTING

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

GEAR SHIFTING - USING THE CLUTCH PEDAL
Depress the clutch pedal (clutch disengaged). At the same time release the pedal of foot throttle and shift the applicable gear speed. Release the clutch pedal smoothly (clutch is being engaged) and at the same time increase the engine revolutions

GEAR SHIFTING – USING THE CLUTCH CONTROL BUTTON ON THE HEAD OF GEAR SHIFTING LEVER
Press the clutch control button on the head of gear shifting lever. At the same time release foot throttle pedal and shift the applicable gear speed. Release the button of clutch control (clutch is being engaged) and at the same time increase the engine revolutions.

Note: Clutch pedal is always preselected to the use of button of clutch control on the head of gear shifting lever.
SIGNALIZATION OF TRAVEL CLUTCHES AND GEAR BOX SYSTEM FAILURES

The failures in systems of travel clutches and gear box are signalized by red controls on the dashboard and a failure code on the display.

1 - Clogging of delivery filter of gear box switchboard control. It lights up with clogging of delivery filter of gear box switchboard. If it lights up, replace delivery filter of gear box switchboard insertion.

2 - Gear box oil overheating control. If it lights up, interrupt your work and allow the tractor to run on idle run, until the oil filling of gearbox cools off and the control switches off. After the control switches off, you can continue working with the tractor without restrictions.

3 - Gearbox failure control. It lights up with serious failure of the system.

4 - Failure code and its description is displayed on the display
SERIOUS FAILURES OF TRAVEL CLUTCHES AND REVERSING LEVERS SYSTEM

A failure of serious failure category is signalized by a red control gearbox failure, there is an uninterrupted acoustic signal and there is a sign STOP displayed on a display together with a number of failure.

⚠️ *If this situation occurs, put the tractor aside and contact the service forthwith.*

LESS SERIOUS FAILURES OF TRAVEL CLUTCHES AND REVERSING SYSTEM

A failure of a category less serious is signalized on a display by displaying a number of failure for a time period of approximately 5 seconds (1). Then the display of failure minimizes to the main field (2). All the function of the tractor remain active, it can happen, that some of the functions will not be complete.

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

BLOCKING THE AUTOMATIC DEAD START FUNCTION

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

⚠️ *If this situation occurs, finish your work and contact service.*
THREE-GEAR TORQUE MULTIPLIER

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

- **H** - Increasing travel speed
- **L** - Decreasing travel speed

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

SIGNALIZATION OF MULTIPLIER FUNCTION

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

- **H** - The highest gear (the fastest)
- **M** - Middle gear
- **L** - Lowest gear (the slowest)

INCREASING, DECREASING THE TRAVEL SPEED BY TWO GEARS

- **2xH** Increases the travel speed by two gears
- **2xL** Decreases the travel speed by two gears
MULTIPLIER PRESELECTION SWITCH
a - Preselection switch off
b - Preselection switch on
The position (b) preselection switch on is signalized by a lit symbol on a switch.
If the preselection switch is off (a) the gears of multiplier can be engaged by buttons on the gear shifting lever.
If the preselection switch is on (b) the gears of multiplier are shifted automatically depending on engine revolutions according to pre-saved values.

MULTIPLIER PRE-SELECTION SIGNALIZATION
The switch of multiplier reselection switch is signalized by a sign (1) on the display of dashboard.
DRIVING OPERATION

AUTOMATIC MULTIPLIER SHIFTING

The system of automatic multiplier shifting is switched by multiplier pre-selection switch on the dashboard. If the multiplier pre-selection switch is on (control on the switch is lit), the gears of multiplier are shifted automatically depending on the engine revolutions according to preset values (engine revolutions).

The system of automatic multiplier shifting is not dependent on the engaged speed gear.

With engaged multiplier pre-selection switch, it is possible to turn the engine off and start and the saved values (engine revolutions) do not change.

The values for automatic multiplier shifting are read always when the pre-selection switch is off, with tractor drive with engine revolutions higher than 700 rpm, with travel speed higher than 2 km/h.

When meeting the previous conditions, the system will remember

a - Engine revolutions with last use of L button on gear shifting lever for automatic shifting of multiplier gears for lowering the travel speed
b - Engine revolutions with last used of H button on gear shifting lever for automatic engagement of gears of multiplier for increasing the travel speed

The difference between the engine revolutions for a and b must be greater than 250 rpm
DRIVING OPERATION

Example of use:
We are driving with a tractor with multiplier pre-selection off with multiplier shifted to \textbf{M} gear, with engine revolutions of 1600 rpm we press \textbf{L} button on the gear shifting lever, by this we shift the torque multiplier to \textbf{L} gear, now we increase the engine revolutions to 1900 rpm and we press \textbf{H} button on the gear shifting lever, by this we shift the torque multiplier back to \textbf{M} gear. We continue driving with the tractor. Now we turn on the multiplier pre-selection switch on the dashboard. From this time, the automatic multiplier gear shifting system shifts gears of torque multiplier without any intervention of the driver in the following way:
\begin{itemize}
  \item \textbf{a} - With the drop of engine revolutions under 1600 rpm automatically shifts the multiplier to lower gear (lowering travel speed)
  \item \textbf{b} - When increasing the engine revolutions above 1900 rpm, the multiplier automatically shifts to a higher gear (increasing the travel speed)
\end{itemize}

The values 1600 and 1900 engine revolutions necessary for automatic multiplier shifting used in this example are purely informative, in practice the number of revolutions is set by the driver according to the specific use of tractor.

With multiplier pre-selection on, it is possible to shift the multiplier gears also manually on a gear shifting lever, but only within the range of set values (engine revolutions); i.e. in the example presented in the range of revolutions from 1600 to 1900 rpm, when reaching the saved revolutions for automatic shift of multiplier gear the multiplier is automatically shifted without driver’s intervention.

In this case (multiplier pre-selection switch on), manual shifting of multiplier by buttons on gear shifting lever does not influence the values (engine revolutions) that are saved in the system of automatic multiplier shifting.

After turning the multiplier pre-selection on the dashboard off (the control on the switch is not lit) it is possible to shift the torque multiplier gears only manually by buttons on gear shifting lever.

\textbf{Beware!}

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

**Recommendation**
Before switching the switch of multiplier on the dashboard, do the manual shift of multiplier gear when using H and L buttons (once by H button and once by L button) on gear shifting lever with requested engine revolutions. The values (engine revolutions) will be saved and after subsequent engagement of the multiplier pre-selection switch on dashboard, the system of automatic multiplier shifting will automatically shift multiplier gears according to these engine revolutions.

With multiplier pre-selection switch on, in case of release of travel clutch, for example with gear shifting, stopping and subsequent dead start of tractor or while using reversing, the system of automatic shifting of multiplier sets an applicable multiplier gear with subsequent switch of travel clutch.
DRIVING OPERATION

FRONT DRIVE AXLE CONTROL
Switching front drive axle on is done by pressing a button which returns to its original position after it is released. Disengagement of front drive axle is done by a repeated depression of a button. The engagement of front drive axle is signalized by a lit symbol and a switch. With a tractor at standstill (tractor braked, engine stopped, switch box key off) front drive axle is off.

AUTOMATIC DISCONNECTION OF FRONT DRIVE AXLE
When exceeding travel speed of 15 km/h, the drive of front drive axle is automatically disconnected. Automatic disconnection of the drive is signalized by blinking of control in a switch. After switching off of the blinking control, front drive axle is automatically disconnected. With the drop of travel speed under 15 km/h, front drive axle can be connected by a repeated depression of a button. With speeds higher than 15 km/h, the drive of front drive axle can be connected by repeated depression of a blinking button.
DRIVING OPERATION

DRIVE WITH FRONT DRIVE AXLE ON

Use the front drive axle with slippage of rear wheels to enhance the draft of a tractor.
On the roads and hard surface, drive with front drive axle is not recommended (drive with engaged front drive axle causes increased wear of front tyres).
Permanent engagement of front drive axle is permissible, if front mounted agricultural machinery or tool is connected to the tractor. This condition is listed in manual of applicable machine.
Maximum permitted speed of these sets is 15 km per hour.

REAR DIFFERENTIAL LOCK BUTTON

Engagement of rear differential lock button is done by pressing a button, which returns to its original position after release.
The engagement of differential lock button is signalized by a lit symbol on the button.
Disengagement of rear differential lock is done by a repeated depression of a button.
When depressing brake pedals or when reaching travel speed higher than 15 km/h, the differential lock automatically switches off.
MANUAL BRAKE - SIGNALIZATION

If the tractor is not braked by a manual brake, a warning is displayed on a display (a letter P in a circle) and at the same time there is a sound signal. This situation occurs in two cases:

a - a tractor unbraked by a manual brake with engine running and a driver leaves its seat

b - a tractor unbraked by a manual brake standing with engine off and the key is shifted in “0” position.

⚠️ Brake the tractor with a manual brake.
DRIVING OPERATION

DRIVING UP THE SLOPE

⚠️ Shift from higher to lower gear in time when driving up the slope not to have a drop in engine revolutions under 800 revolutions per minute, do not allow a drive leading to the engine stop due to overload.

DRIVING DOWN THE SLOPE

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

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

FOOT BRAKES

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

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

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

⚠️ When braking with one brake pedal trailer’s brakes are not active!
AIR BRAKES OF TRAILERS AND ARTICULATED TRAILERS

Air brakes of trailers (articulated trailers) control and control of tractor brakes is done so that braking effect of both vehicles is synchronized. Working pressure is set by pressure regulator to 740 ± 20 kPa. When the pressure drops below 550 - 40 kPa by-pass valves, puts auxiliary devices out of operation (differential lock, engagement of front drive axle).

WARNING SIGNALIZATION OF AIR PRESSURED DROP

Air pressure drop below 450 kPa is signalized by alit red control bulb placed on a dashboard.

⚠ Tractor with braked trailer or articulated trailer with pressured drop in air pressure system under 450 kPa must not continue in transport if there is not increase in air pressure.
ONE-HOSE AND TWO-HOSE BRAKES

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

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

ONE-HOSE BRAKES

Valve is marked with a black colour.

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

TWO-HOSE BRAKES

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

⚠️ When connecting the trailer (articulated trailer) with a maximum permitted speed approved for the type of tractor, the maximum permitted speed of set is 40 km per hour!
Maximum permitted speed of set is given by maximum permitted speed of the slower vehicle of the set.
HYDRAULIC BRAKES OF TRAILERS
Connect hydraulic brakes of trailer or articulated trailer to the quick couplings marked by an arrow.

Control of hydraulic brakes of trailers (articulated trailers) and control of tractor brakes is done so that the braking effect of both vehicles is synchronized. Working pressure is derived by oil supplied by non-switched on/switched off gear pump of hydraulics.

Brake valve of the trailer is done by the pressure of brake fluid from main braking rollers depending on the force effecting on the brake pedal. The pressure on clutch head must be 12 - 15 MPa with maximum depression of brake pedal. Brake valve of trailer prefers the function of brakes to the function of hydraulics.

If there are shocks when foot brake pedals are depressed in the pipeline of hydraulic circuit, it is necessary to bleed the hose from the brake valve to the quick coupling.

When driving with connected trailer or articulated trailer, the pedals of foot brake must be connected and secured by a valve!

When braking with one brake pedal, hydraulic brakes of the trailer are not active.

CONNECTING AND DISCONNECTING QUICK COUPLINGS OF TRAILER HYDRAULIC BRAKES

When connecting and disconnecting quick couplings, take increased care with regard for remaining oil which remains in the socket or in the plug of quick coupling.

For ecological reasons, it is necessary to remove this remaining oil after every disconnection of quick couplings with any textile material.
**STOPPING THE TRACTOR – MANUAL BRAKE**

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

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

**STOPPING THE ENGINE**

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

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

**LEAVING THE TRACTOR**

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

*Tractor must be secured against spontaneous start:*

1. Engine off
2. Braked by manual brake
3. Wheels based by wedges.

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

Lock the cabin.
WARNING SIGNALIZATION OF HYDROSTATIC STEERING FAILURE

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

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

General principles for running in the new tractor in the course of the first 100 hours of operation .......................................................... 82
During the first 10 hours .................................................................................................................. 82
From 100 hours on ......................................................................................................................... 83
GENERAL PRINCIPLES FOR RUNNING IN THE NEW TRACTOR IN THE COURSE OF THE FIRST 100 HOURS OF OPERATION

During the first 100 operation hours:
- Load the engine normally
- Avoid operation under partial loading of the engine
- Avoid excessive idle run
- Frequently check the oil level in the engine (increased oil consumption is normal in this period).
- Check screw connections mainly of the supporting parts of the tractor.
- Immediately remove all established shortcomings; thus, you will prevent subsequent damage and possible impairment of operation safety.
- Proceed in the same way after a general overhaul of the tractor as well.

DURING THE FIRST 10 HOURS
- Run in the tractor in the transport regime.
- Tighten the fitting nuts of the front and rear wheels, including the bead / rim connections at the prescribed torque.
**FROM 100 HOURS ON**

After running-in you can work with the tractor without any restrictions.

<table>
<thead>
<tr>
<th>Specification</th>
<th>Value</th>
</tr>
</thead>
<tbody>
<tr>
<td>Recommended operation speed</td>
<td>1400 - 2300 rpm</td>
</tr>
<tr>
<td>Idle speed</td>
<td>800 ± 25 rpm</td>
</tr>
<tr>
<td>Operation oil pressure</td>
<td>0.2 - 0.5 MPa</td>
</tr>
<tr>
<td>Oil pressure at the idle speed</td>
<td>min. 0.05 MPa</td>
</tr>
<tr>
<td>Max. coolant temperature</td>
<td>106°C</td>
</tr>
</tbody>
</table>
Before you start, make sure that the technical condition of the tractor corresponds to requirements for safe operation. When a trailer or implement is attached, check its connection and proper fixation of the load. Never leave the tractor while it is moving to connect the trailer by yourself. Also take care of your assistant’s safety.
CBM STAGE QUICK-ADJUSTING HITCH

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

HEIGHT ADJUSTMENT AND DISASSEMBLY OF THE CBM STAGE HITCH

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

When you release the lever from position (2), the locking pins (3) will extend and the lever will automatically return to the initial position.

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).
MODULAR SYSTEM OF HITCHES FOR TRAILERS AND SEMI-TRAILERS

Module types:
Fig. (B) - Swinging draw-bar console
Fig. (C) - Swinging draw-bar console with a fixed pin
Fig. (D) - Console with a ø 80 ball

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

SWINGING DRAW-BAR CONSOLE MODULE
The swinging draw-bar console module is located in the stage hitch console.

SWINGING DRAW-BAR
Disassembly:
1- Release and remove the pins (1).
2- Slide the swinging draw-bar out in the arrow direction.
Do the assembly in the reverse order.

SWINGING DRAW-BAR CONSOLE WITH A FIXED PIN MODULE
Perform the assembly and disassembly of the swinging draw-bar in accordance with the “Swinging draw-bar” chapter.
Connecting the shaft lug to the fixed pin (3):
1- Release and remove the pin (1).
2- Lift the locking wedge (2) in the arrow direction.
3- Connect the shaft lug to the fixed pin (3):
4- Return the locking wedge (2) to the original position and secure it with the pin (1).
The console with a Ø 80 ball is only used to connect semi-trailers with a hitching device designed for a Ø 80 ball.

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

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

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

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

Install the swinging draw-bar in the reverse order.
## TRANSPORTATION

### MAXIMUM PERMISSIBLE VERTICAL STATIC LOAD OF HITCHES FOR TRAILERS AND SEMI-TRAILERS

<table>
<thead>
<tr>
<th>Hitch type</th>
<th>Permissible vertical static load</th>
<th>Hitch pin Ø</th>
<th>Hitch type</th>
<th>Permissible vertical static load</th>
<th>Hitch pin Ø</th>
<th>Hitch type</th>
<th>Permissible vertical static load</th>
<th>Hitch pin Ø</th>
</tr>
</thead>
<tbody>
<tr>
<td>Hitch class C</td>
<td>2,000 kg</td>
<td>31 mm</td>
<td>Hitch class D2</td>
<td>2,000 kg</td>
<td>31 mm</td>
<td>Hitch class D3</td>
<td>2,000 kg</td>
<td>38 mm</td>
</tr>
<tr>
<td>Hitch class D2</td>
<td>2,000 kg</td>
<td>43 mm</td>
<td>Hitch class D3</td>
<td>2,000 kg</td>
<td>50 mm</td>
<td></td>
<td></td>
<td></td>
</tr>
</tbody>
</table>

Hitch of class C: max. weight of the trailer 6,000kg.
Hitch of class D2: max. weight of the trailer 14,000kg.
Hitch of class D3: max. weight of the trailer 20,000kg.

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

<table>
<thead>
<tr>
<th>Hitch type</th>
<th>Permissible vertical static load</th>
<th>Hitch pin (ball) Ø</th>
<th>Hitch type</th>
<th>Permissible vertical static load</th>
<th>Hitch pin (ball) Ø</th>
<th>Hitch type</th>
<th>Permissible vertical static load</th>
<th>Hitch pin (ball) Ø</th>
</tr>
</thead>
<tbody>
<tr>
<td></td>
<td>736 kg</td>
<td>31 mm</td>
<td></td>
<td>2,000 kg</td>
<td>80 mm</td>
<td></td>
<td>Fixed pin 2,000 kg</td>
<td>44.5 mm</td>
</tr>
<tr>
<td></td>
<td>3,000 kg</td>
<td>47 mm</td>
<td></td>
<td>1,200 kg</td>
<td>31 mm</td>
<td></td>
<td></td>
<td></td>
</tr>
</tbody>
</table>
Before connecting the machinery driven by PTO shaft, check that the revolutions of PTO shaft of the machinery and the tractor comply (540 or 1000). Different revolutions may lead to serious damage and injuries.
DRIVE OF AGRICULTURAL MACHINERY

WORK WITH PTO SHAFT

1. When working with PTO shaft mind that all the covers are duly fixed.
2. After completing the work, always mount the cover of PTO shaft back.
3. Any repairs or cleaning of aggregated machines parts driven by PTO shaft to be done only with the engine at halt and PTO clutch disengaged.
4. Before starting an aggregated machine driven by PTO shaft, make sure that there are no unauthorized personnel near, there is a risk of injury.
FRONT AND REAR PTO SHAFT CONTROL
Switches and controls of front and rear PTO shaft control are located on the right column of the cabin.
1. The control of the selection of rear PTO shaft revolutions (P.T.O.)
2. The control of preselection of rate of rear PTO shaft run
3. Rear PTO shaft switch
4. Front PTO shaft switch

PRESELECTION OF STANDARD AND ECONOMIC REAR PTO SHAFT REVOLUTIONS LEVER
The lever is placed on the right side of driver’s seat. After shifting the lever it is necessary to lift the collar in the direction of the arrow (C).

A - Standard PTO shaft revolutions engaged
N - Neutral position
   The ending of rear PTO shaft can be spun freely
B - PTO shaft economic revolutions engaged

540 or 1000 revolutions of rear PTO shaft can be engaged by a rear PTO shaft revolutions switch on the right column of the cabin with engaged standard PTO shaft revolutions (A).
When engaging economic PTO shaft revolutions (B), it is possible to engage 540E or 1000E rear PTO shaft revolutions on the right column of the cabin.
FACILITATING CONNECTION OF JOINT SHAFT OF AN AGGREGATED MACHINE TO THE TRACTOR

For facilitating the connection of joint shaft of aggregated machine to a tractor a button (1) placed on mudguards can be used.

With the engine running and rear PTO shaft switch off, spinning of rear PTO shaft occurs after pressing the button (1). PTO shaft stops spinning after releasing the button.

Beware: standard and economic rear PTO shaft revolutions must not be in (N) position.

⚠️ When manipulating with PTO shaft by means of buttons (1), the operator must stand beyond the space of the connected tools not to be caught or injured.
RATE PRESELECTION SWITCH OF STARTING REAR PTO SHAFT

Three-position switch (1) on the right column of the cabin enables a selection of three modes of starting the rear PTO shaft clutch. These modes differ by longer idle periods between engagement of switch of rear PTO shaft and the complete switch of the rear PTO clutch.

<table>
<thead>
<tr>
<th>Mode</th>
<th>Description</th>
<th>Use</th>
</tr>
</thead>
<tbody>
<tr>
<td>3</td>
<td>(the upper part of the switch is fully depressed) this gear has the longest time of starting the rear PTO shaft. Use this mode for starting light machines with low power consumption connected to rear PTO shaft such as reel raker.</td>
<td></td>
</tr>
<tr>
<td>2</td>
<td>(the switch is in the middle position) this stage has medium time of starting rear PTO shaft. Use this mode for starting light machinery with medium power consumption connected to rear PTO shaft such as disc reaper.</td>
<td></td>
</tr>
<tr>
<td>1</td>
<td>(the lower part of switch is fully depressed) this stage has the shortest time of rear PTO shaft starting. Use this mode for starting heavy machinery with high power consumption of the connected to the rear PTO shaft such as feeder carriage, rotary reaper, soil or forest cutters.</td>
<td></td>
</tr>
</tbody>
</table>
SELECTION SWITCH OF REAR PTO CLUTCH REVOLUTIONS (P.T.O.)

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

A - 540 rpm
B - 1000 rpm

⚠️ The change of PTO shaft revolutions - 540 and 1000 per to be done only with PTO shaft at halt!

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

REPLACEABLE END POINTS OF REAR PTO SHAFT

The tractor is equipped with six or twenty-one splined replaceable end point of rear PTO shaft.

Replacement procedure:
1. Use safety ring pliers to demount a safety ring (1)
2. Remove replaceable end point by pulling in the direction of an arrow (2)
3. Mount the end point in an opposite way, pay increased attention to the mounting of the safety ring (1)
REAR PTO SWITCH

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

After switching the switch (1) from (A) position to (B) position rear PTO shaft clutch is engaged and the shaft spins. After switching the switch (1) from (B) position to (A) position rear PTO shaft clutch is engaged and the shaft stops.

By a subsequent switch of switch (1) from (B) position to (C) position lasting at least three seconds automatic disengagement of PTO shaft clutch is engaged. After releasing the pressure the switch (1) returns to (B) positions. By another depression of the switch (1) from (B) position to (C) position this function is disengaged.

A - rear PTO shaft clutch disengaged
B - rear PTO shaft clutch engaged
C - Automatic disengagement of PTO shaft clutch

⚠️ Check that the PTO shaft revolutions are set properly with regard for the connected tools!
ENGAGING REAR PTO SHAFT
The number of PTO shaft revolutions is dependent on the number of engine revolutions

With engine running:
1. Select applicable operation mode by standard and economic PTO shaft revolutions preselection lever.
2. Select applicable mode of rear PTO shaft clutch starting with regard for the aggregated machine by a switch of rate preselection for starting rear PTO shaft (1).
3. Select applicable revolutions by switch of selection of rear PTO shaft (2) revolutions
4. Rear PTO shaft is set into operation by switching the switch of rear PTO shaft (3)

The engagement of independent rear PTO shaft is signalized by display of the number of rear PTO shaft revolutions on the display of dashboard.

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

⚠️ If the aggregated machine allows it, engage the rear PTO shaft with minimum revolutions of 1500 rpm.
AUTOMATIC DISENGAGEMENT OF PTO CLUTCH

The function of automatic disengagement of the PTO clutch means that with PTO shaft engaged after lifting the arms of rear three-point hitch, the rear PTO clutch is disengaged automatically and the shaft comes to a halt, after subsequent lowering or arms of three-point hitch, the rear PTO shaft is automatically engaged and the shaft spins provided that the direction of drive is engaged by reversing lever and the tractor has travelling speed of at least 0.3 km/h.

By switching the switch from (A) to (B) position, the rear PTO clutch is engaged. By pressing the switch from (B) position to (C) position that lasts at least three seconds Automatic disengagement of PTO shaft clutch is engaged. After releasing the pressure, the switch (1) returns to (B) position.

By another depression of switch (A) from (B) position to (C) position, this function is disengaged.

Activation of Automatic disengagement of PTO shaft clutch function is signalled by a symbol (D) displayed on the display of dashboard.
SETTING AUTOMATIC DISENGAGEMENT OF PTO SHAFT CLUTCH - DISPLAY DESCRIPTION

Display the third display on dashboard by gradual depressing of (A) button. These values are displayed on the display:

**H-LIMIT** – position of arms of three-point hitch at which disengagement of rear PTO shaft clutch

**ACTUAL** – current position of arms of three-point hitch

**L-LIMIT** – position of arms of three-point hitch at which engagement of rear PTO clutch occurs

The number with individual items has only informative value.

AUTOMATIC DISENGAGEMENT OF PTO SHAFT CLUTCH – RETURN TO BASIC SETTING

Basic values set by the manufacturer are:

**H-LIMIT** - 55

**L-LIMIT** - 45

By pressing the button (B) basic values are set on dashboard with displayed display.
SETTING AUTOMATIC DIENGAGEMENT OF PTO SHAFT CLUTCH

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

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

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

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

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

WORK WITH AUTOMATIC DISENGAGEMENT OF PTO SHAFT CLUTCH

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

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

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

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

Front PTO shaft is equipped with a solid six or twenty-one splined end point and it comes only in design of 1000 revolutions.

Tractor may be equipped with front PTO shaft with varied direction of spinning:

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

FRONT PTO SHAFT CONTROL

Engagement and disengagement of front PTO shaft is done by a switch (1) placed on the right column of the cabin. The switch is equipped with a mechanical lock (2) against unwanted switch. When switching the switch depress the lock in the downward direction.

Front PTO shaft is set into activity by switch of a switch. The engagement of front PTO shaft is signalized by displaying the number of revolutions of front PTO shaft on the display of dashboard.

⚠️ *If the aggregated machine permits, engage front PTO shaft with min. engine revolutions of 1500 rpm.*
MAXIMUM TRANSFERRED OUTPUT

<table>
<thead>
<tr>
<th>PTO shaft</th>
<th>Transferred output</th>
</tr>
</thead>
<tbody>
<tr>
<td>Front</td>
<td></td>
</tr>
<tr>
<td>1000 per minute</td>
<td>60 kW</td>
</tr>
<tr>
<td>Rear</td>
<td></td>
</tr>
<tr>
<td>1000 per minute</td>
<td>full engine output</td>
</tr>
<tr>
<td>540 per minute</td>
<td>full engine output</td>
</tr>
<tr>
<td>1000E per minute</td>
<td>60 kW</td>
</tr>
<tr>
<td>540E per minute</td>
<td>60 kW</td>
</tr>
</tbody>
</table>

DRIVE OF MACHINES WITH GREATER INERTIA MASSES (CRUSHERS, ROTARY HARROWS, REAPING MACHINES.)

Cardan shaft for drive of these machines must be equipped with the so-called freewheel clutch which ensures disconnection of torque transfer with retroaction from the machine on the tractor.
HYDRAULIC SYSTEM

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

**HYDRAULIC PUMP**

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

<table>
<thead>
<tr>
<th>Pump type</th>
<th>Delivered quantity</th>
</tr>
</thead>
<tbody>
<tr>
<td>URD 25/10.90V</td>
<td>69 l/min</td>
</tr>
</tbody>
</table>

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

**LOCATION OF CONTROL ELEMENTS**

The control panel (1) is located on the right fender.
HYDRAULIC SYSTEM

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

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

*QUICK-COPLIINGS WITH DRIP COLLECTION
Optionally, a system of collection of residual oil drips with a tank can be installed. Regularly check whether the tank is not full; dispose of the oil in an environment-friendly way.
HYDRAULIC DISTRIBUTOR OF THE OUTER HYDRAULIC CIRCUIT
A three-section or two-section distributor with four-position sections may be installed in the tractor. The control levers of the sections are installed in the cab on the fender of the right rear wheel. The first (right) section of the distributor is equipped with locking in pressure positions with hydraulic securing. In the case of the two-section and three-section distributor it is the section controlling quick-couplers “1” and “2”. Outlet “4” of the two-section distributor and “4” and “6” of the three-section one is additionally equipped with a check valve - used for the connection of a working branch of the machine with an increased requirement for leakproofness - minimum lowering of the implement e.g. during transport.
### DESCRIPTION OF THE FUNCTIONS OF INDIVIDUAL POSITIONS OF CONTROL LEVERS OF THE HYDRAULIC DISTRIBUTOR

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

**Note:** The lever automatically returns from positions (1) and (3) to the neutral. Not applicable to the section with the kick-out function.

⚠️ Always connect a single-acting cylinder to quick couplers “2”, “4” of the two-section auxiliary distributor and “2”, “4”, “6” of the three-section auxiliary distributor.

Always connect a double-acting cylinder to quick-couplers of one section.
REAR OUTLETS OF THE OUTER HYDRAULIC CIRCUIT

In the tractor version that is not equipped with the front outlets or the front three-point hitch and that is equipped with:

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

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

FRONT OUTLETS OF THE OUTER HYDRAULIC CIRCUIT

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

If the tractor is equipped with a three-point hitch, the (F)\((3)(4)(N)\) lever is used for its control. Quick couplers must not be connected at the time of three-point hitch usage because they are pressurized together like front three-point hitch!

After terminating the work with a front three-point hitch for further usage of the section with quick couplers 3 and 4 with the connection of three-point hitch, it is necessary to lift the arms of the front three-point hitch to transporting position and the lever of the cock of the front three-point hitch in the “closed” position.
HYDRAULIC SYSTEM

CONNECTING MACHINES AND IMPLEMENTS TO THE OUTER HYDRAULIC CIRCUIT

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

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

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

1. Lifting switch
   a - Transport, lifting
   b - STOP
   c - Regularity of lowering (working)
   d - Free position, fast sinking - automatic return of lever to (c) position by a spring
2. Blocking (in transport position)
3. Lowering speed
4. Setting the position of lifting device
5. Upper position restriction
6. Smooth setting - of manual control
   - automatic control
7. LED - diagnostic
8. LED – lifting
9. LED – lowering
10. Engaging compensator (softening vibrations)
11. LED – softening vibrations engaged

EQUIPMENT “OFF”
Electric installation deactivated with the key of the switching box. The electronic system is off, the lifting device is blocked.
BLOCKING CANCELLATION

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

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

After the activation of the system EHR-B first for safety reasons limits the lifting speed of the hydraulic arms. When the hydraulic arms first reach the selected position, this safety limitation is cancelled and then the lifting speed of the hydraulic arms is normal.
QUICK SINKING
Lever (1) in position (d) - free position. You must hold the lever in this position; after releasing the lever will return to position (c) - the system works in accordance with the setting of controls (3), (4), (5) and (6).

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

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

STOP POSITION
By moving the lever (1) to position (b) - STOP position - you will immediately stop the movement of the three-point hitch.
VIBRATION COMPENSATOR (DAMPER)
It is used during transport of a heavy implement attached to the rear three-point hitch. After activation of the vibration compensator (10) the arms of the rear three-point hitch sink by approx. 4%, which allows oscillation of the arms in the range of approx. 8% of the lift. The upward oscillation is always limited by the position of the upper position limiter (5).
Advantages of active dampening of vibrations during transport of a heavy implement attached to the rear three-point hitch.

1. Increased operation safety (the steering axle is not unloaded so much
2. Stabilization of the transported implement
3. Reduced dynamic stress of the hydraulic system and the rear three-point hitch

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

LIMITATION OF THE UPPER POSITION OF THE THREE-POINT HITCH
It is activated with the control (5). The limitation can be implemented in the upper half of the three-point hitch lift.
LOWERING SPEED
The lowering speed of the three-point hitch is set with the control (3).

Symbol of the maximum lowering speed

Symbol of the minimum lowering speed

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

⚠️ In the vibration dampening mode and during the use of the rear control buttons the lowering speed setting is out of function.
**ELECTRO-HYDRAULIC SYSTEM**

**SETTING THE CONTROL OF THREE-POINT HITCH**

Electrohydraulics enables two ways of three-point hitch control.

A. Manual control setting - control (6) is set in the range see arrow
B. Automatic control - control (6) is set in HitchTronic (AHC) position see arrow

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

**MANUAL SETTING OF CONTROL OF THREE-POINT HITCH**

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

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

Do the step according to “Cancel blocking” part. Set the control (6) to HITCHTRONIC (AHC) position. By control (4), set the working depth of tools attached to rear three-point hitch.

When the implement attached in the rear three-point hitch reaches the depth set by the control (4), control system measures the soil resistance and this value is used as default for further control.

The activity of controls (lifting and lowering) can be monitored by means of indicated on diodes (8) and (9).

At dead end, shift the lever(1) to (a) position, after turning set the (c) position again.

For setting the required speed of lowering, there is a control (3).

After reaching the depth set by the control (4) control system again measures the soil resistance and this value is used as default for further regulation.
ELECTRO-HYDRAULIC SYSTEM

USING THE REAR CONTROL
The rear control is used to connect and disconnect implements. The lifting switching lever (1) on the EHR-B electro-hydraulic control panel must be in position (b) or (c). The designation symbols of buttons on both the tractor fenders correspond to the movement direction of the three-point hitch after their pressing. The movement only lasts as long as the button is held.
Every use of the rear control causes blocking of the control system and the “Blocking cancellation” must be repeated - see page 130.

EXTERNAL CONTROL BUTTONS OF THE ELECTRO-HYDRAULIC SYSTEM
1. Lifting
2. Lowering
The movement only lasts as long as the buttons are held.

The external control buttons of the electro-hydraulic system are functional without prior activation of the system.

USING THE BUTTONS
When handling the three-point hitch with the external control buttons the operator must stand out of reach of the connected implement to avoid being caught or injured by the implement.
## INDICATION OF EHR-B ERRORS

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

### DESCRIPTION OF SIGNALS OF EHR-B ELECTRO-HYDRAULIC SYSTEM ERRORS

<table>
<thead>
<tr>
<th>Flashing combination of the diagnostic LED (7).</th>
<th>Error category</th>
<th>Error description</th>
</tr>
</thead>
<tbody>
<tr>
<td>Long pause</td>
<td>No. of flashes</td>
<td>Short pause</td>
</tr>
<tr>
<td>1x</td>
<td>1x</td>
<td>1x</td>
</tr>
<tr>
<td>2x</td>
<td>2x</td>
<td>2x</td>
</tr>
</tbody>
</table>

⚠️ **Have EHR-B errors repaired by a specialized workshop.**
## ELECTRO-HYDRAULIC SYSTEM

### DESCRIPTION OF MINOR ERRORS OF THE EHR-B ELECTRO-HYDRAULIC SYSTEM

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

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HITCHES

REAR THREE-POINT HITCH
It is intended for attaching carried or semi-carried agricultural machines and implements with hitching points of ISO category II.

Category II.

<table>
<thead>
<tr>
<th>Hitch axis length</th>
<th>870 mm</th>
</tr>
</thead>
<tbody>
<tr>
<td>Ø of openings of connecting balls of the lower draw-bars according to ISO</td>
<td>28 mm</td>
</tr>
<tr>
<td>Ø of the upper draw-bar opening</td>
<td>25 mm</td>
</tr>
</tbody>
</table>

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

SAFETY PRINCIPLES OF WORKING WITH THE THREE-POINT HITCH
Persons that are not authorized to work with the attached implement must not stand between the tractor and the hitched machine (implement) - (A). Do not park the tractor with an attached implement in the lifted position (B). During a drive without an implement the lower draw-bars (5) must be connected with springs and the upper draw-bar (1) must be inserted into the spring suspension!

During transport of implements the limiting draw-bars (4) of the lower draw-bars must be adjusted in such a way to avoid unwanted lateral movement of the implement!
HITCHES

HEIGHT ADJUSTMENT OF THE LIFTING DRAW-BARS
Lifting draw-bar - see fig. (A):
After disconnecting the upper end of the lifting draw-bar from the pin of the hydraulic arm make the adjustment by turning the lug (1).

Lifting draw-bar - see fig. (B):
Extend the capstan (2) in the arrow direction and make the adjustment by turning the capstan.

Depending on the equipment of the tractor both the draw-bars may be designed as in fig. (B).

FIXED AND FREE POSITION OF THE LOWER HYDRAULIC DRAW-BARS
Fixed position of the lower hydraulic draw-bars (A):
The pin head (1) and washer (2) are installed horizontally.

Free position of the lower hydraulic draw-bars (B):
The pin head (1) and washer (2) are installed vertically.
The free position enables free connection of the tractor and implement. In this case both the draw-bar ends may move freely against each other as regards their height.

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

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

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**HITCHES**

*LOWER DRAW-BARS WITH EXTENSIBLE END PIECES*

The lower draw-bars of the hitch are equipped with semi-automatic extensible CBM end pieces. They facilitate attaching of implements to the tractor. After removing of securing pegs (1) extend the end pieces (2). The extended end pieces are attached to the fixing pins of the carried implement.

After attaching the carried implement release the hydraulic arms. By lowering and the tractor reversing the end pieces (2) will slide into the draw-bars and will be automatically secured in the working position by the securing pegs (1).

*LOWER DRAW-BARS WITH CBM HOOKS*

The lower (3) and upper (4) draw-bars of the hitch are equipped with CBM hooks. First, suspension CBM balls (1) must be fitted to the implement and the limiting draw-bars must be used to set the distance between the lower draw-bars of the hitch (3).

After reversing and subsequent lifting of the three-point hitch its lower draw-bars (3) are connected to the implement and then the driver connects the upper draw-bar (4) of the three-point hitch from the cab.

When disconnecting the implement release the hooks, with the control wires (2) lift the upper draw-bar (4) and by lowering the three-point hitch disconnect the lower draw-bars (3).

Always check the position of the extensible end pieces and the securing pegs, see fig. (3).
SECURING THE LOWER DRAW-BARS WITH CBM HOOKS

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

UPPER DRAW-BAR

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

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

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

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

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

**FRONT THREE-POINT HITCH CONTROL**

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

<table>
<thead>
<tr>
<th>Position</th>
<th>Action</th>
</tr>
</thead>
<tbody>
<tr>
<td>3</td>
<td>Lifting</td>
</tr>
<tr>
<td>4</td>
<td>Lowering</td>
</tr>
<tr>
<td>N</td>
<td>Hitch lock</td>
</tr>
</tbody>
</table>

**ADJUSTING THE LOWERING RATE OF THE FRONT THREE-POINT HITCH**

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

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

A  Free position
Valve levers are in the horizontal position
- The hitch can be controlled from the cabin

B  Locked position
Valve levers are in the vertical position
- The hitch is locked

WORKING AND TRANSPORT POSITION OF THE FRONT THREE-POINT HITCH

A  Working position of the front three-point hitch

B  Transport position of the front three-point hitch

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

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

DRIVING WITH AGRICULTURAL MACHINES ATTACHED TO THE FRONT THREE-POINT HITCH

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

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Rear wheel track adjustment .......................................................................................................................... 140
### WHEEL TRACK CHANGE

**POSSIBLE ADJUSTABLE TRACKS OF THE FRONT WHEELS OF THE FRONT DRIVING AXLE OF THE TRACTORS**

<table>
<thead>
<tr>
<th></th>
<th></th>
<th></th>
<th></th>
<th></th>
<th></th>
<th></th>
<th></th>
<th></th>
<th></th>
</tr>
</thead>
<tbody>
<tr>
<td></td>
<td>380/70R24</td>
<td></td>
<td></td>
<td>14.9-24</td>
<td>420/70R24</td>
<td></td>
<td></td>
<td></td>
<td></td>
</tr>
<tr>
<td></td>
<td>340/85R24</td>
<td></td>
<td></td>
<td></td>
<td>380/85R24</td>
<td></td>
<td></td>
<td></td>
<td></td>
</tr>
</tbody>
</table>

**Rim position**

**Front wheel tracks in mm**

<table>
<thead>
<tr>
<th>1630</th>
<th>-</th>
<th>-</th>
<th>-</th>
<th>1685</th>
<th>1770</th>
<th>1770</th>
<th>1780</th>
<th>1695</th>
<th>1770</th>
<th>-</th>
<th>1840</th>
<th>1920</th>
<th>1850</th>
<th>1920</th>
<th>1930</th>
<th>1850</th>
<th>1920</th>
<th>1850</th>
</tr>
</thead>
</table>

**Note:** Use of different tyre dimensions with individual tractor types - see chapter Main technical parameters. Tighten the front wheel nuts with the torque of 250 - 290 Nm. Tighten the nuts connecting the wheel bead with the wheel disc with the torque of 200 - 220 Nm.

You can change the wheel track by changing the position of the rim and disc.

⚠️ *First, secure the tractor against moving, lift the axle with a lifting jack and support it.*

- Loosen the nuts of the screws connecting the disc with the rim and remove the screws.
- Change the track by setting the rim in the required position.
- Re-install the screws with washers and secure them with nuts. Tighten the nuts with the torque of 230 - 250 Nm.
- After every loosening of a bead connection tighten the screws to the prescribed value.
- After driving 100 m with the tractor without load re-tighten the connections with the prescribed torque.
- After loading the tractor re-tighten the connections after 3 hours of work.
- After 10 hours of work check the tightening of the nuts of discs and wheel rims again.
WHEEL TRACK CHANGE
FRONT WHEELS TRACK OF FRONT DRIVE AXLE IN TRACTORS EQUIPPED WITH NON-REMOVABLE DISCS

<table>
<thead>
<tr>
<th>Used tyres</th>
<th></th>
<th></th>
<th></th>
</tr>
</thead>
<tbody>
<tr>
<td>12,4-24</td>
<td>13,6R24</td>
<td>12,4-28</td>
<td>14,9-24</td>
</tr>
<tr>
<td>12,4R24</td>
<td>380/70R24</td>
<td>14,9R24</td>
<td>420/70R24</td>
</tr>
<tr>
<td>320/85R24</td>
<td>340/85R24</td>
<td>380/85R24</td>
<td></td>
</tr>
<tr>
<td></td>
<td>420/70R24</td>
<td></td>
<td>380/85R24</td>
</tr>
</tbody>
</table>

<table>
<thead>
<tr>
<th>Front wheel tracks in mm</th>
</tr>
</thead>
<tbody>
<tr>
<td>1840</td>
</tr>
</tbody>
</table>
TOE-IN OF THE WHEELS OF THE FRONT DRIVING AXLE

Proper toe-in of the front wheels of tractors with the front driving axle is **0 to 2 mm**

and is measured on the front wheel hub flanges (if the front wheels are installed, you can measure toe-in on the wheel rims).

Toe-in “S” is determined by the difference of the measured values: **S = b - a**.
ADJUSTMENT OF TOE-IN OF THE WHEELS OF THE FRONT DRIVING AXLE

– Set the wheels symmetrically with the longitudinal axis of the tractor.

– At the front on the horizontal plane of the wheel axes measure, in accordance with fig. F_02_189, the distance between the rims. Mark the place of measurement.

– Drive the tractor to move the marked places to the horizontal plane of the wheel axes at the back (turning by 180°) and measure the distance between the marked places again.

– Release the locking nuts of the heads of the ball screws (2) of connecting rods of the steering at the hydraulic cylinder.

– Adjust the toe-in value by turning the shank of the ball screw (3). Perform the adjustment of both the joints symmetrically to maintain the same turning radius at both the sides (perform the measurement at the rim sides).

– Tighten the locking nuts of the heads of the ball screws (2) with the torque of 122 - 136 N. The upper surfaces of the heads (1) must be parallel.
WHEEL TRACK CHANGE

FRONT DRIVE AXLE FENDERS
Front drive axle fenders can come in two designs

A - Fenders with solid consoles where the axis of fenders turn corresponds with the axis of front wheel turn. Fenders are on adjustable holders that can be set according to required tracks and the type of tyres used on the side (by relocating screws (a) to different openings) and also in terms of height (by relocating screws (b) to different openings).

B - Fenders with turnable consoles where the axis of turning corresponds to the axis of front wheel only partially. This design enables the setting of greater front wheels lock. Fenders are on adjustable holders which can be set according to the kind of tyres used in terms of height (by relocating screws (b) to different openings).
WHEEL TRACK CHANGE

SETTING THE WHEEL LOCK WITH FRONT DRIVE AXLE
Perform the setting of lock with every change of wheel track or tyre replacement with front drive axle.
The locks with front drive axle must be set so that the distance between the front drive axle tires and the tractor with full wheel lock and full swing of axle around central pivot is at least 50 mm.

WHEEL LOCK SETTING INSPECTION WITH FRONT DRIVE AXLE
1. Set the full wheel lock to one side and check that the distance between a tire and the nearest stable point on the tractor is at least 50 mm. Perform the inspection with both front tires.
2. Switch the steering to full wheel lock to the other side and perform the inspection according to article 1
3. Heave one side of front axle with a heaver to the maximum swing (the front drive axle is leaning against a console) and perform the inspection according to articles 1 and 2.
4. Heave with a heaver the second side of the front axle to the maximum swing (the front axle is leaning against console) and perform the inspection according to articles 1 and 2.

The setting of lock (A) changes after slackening the nut (2) and unscrewing or screwing in the screw (1).

⚠️ After the change of wheel lock with front drive axle it is always necessary to perform the inspection of their setting pursuant to articles 1 to 4.
REAR WHEEL TRACK CHANGE

Depending on the width of the rear tyres you can set the wheel tracks in the following range:

<table>
<thead>
<tr>
<th>Rear tyre width</th>
<th>Wheel track (mm)</th>
</tr>
</thead>
<tbody>
<tr>
<td>12.4-38</td>
<td>1425-1800</td>
</tr>
<tr>
<td>13.6-38</td>
<td>1425-1800</td>
</tr>
<tr>
<td>18.4-38</td>
<td>1650 - 1800</td>
</tr>
<tr>
<td>480/70R38</td>
<td>1575 - 1800</td>
</tr>
<tr>
<td>520/70R38</td>
<td>1650 - 1800</td>
</tr>
<tr>
<td>16.9-34</td>
<td>1500 - 1800</td>
</tr>
<tr>
<td>16.9-38</td>
<td>1575 - 1800</td>
</tr>
<tr>
<td>18.4-34</td>
<td>1500 - 1800</td>
</tr>
</tbody>
</table>

*Note:* Use of different tyre dimensions with individual tractor types - see chapter Main technical parameters.

REAR WHEEL TRACK ADJUSTMENT

Rear wheel tracks are adjustable with the step of 75 mm and the adjustment is performed by changing the position of the rim and disc with the rear part of the tractor lifted so that the wheels can rotate freely.

⚠️ Before the lifting do not forget to secure the tractor against moving by wedging the front wheels.

After changing the wheel track tighten all the screws connecting the disc with the rim with the torque of 200 - 220 Nm and the nuts of the screws connecting the disc with the wheel shaft with the torque of 400 - 470 Nm.

- After every loosening of a bead connection tighten the screws to the prescribed value.
- After driving 100 m with the tractor without load re-tighten the connections with the prescribed torque.
- After loading the tractor re-tighten the connections after 3 hours of work.
- After 10 hours of work check the tightening of the nuts of discs and wheel rims again.
- Until reaching the first 100 hours of work perform frequent checks of tightening of the nuts of the discs and rims of the front and rear wheels (at least 6 times in the course of the first 100 hours of work).
- Then, always check the tightening of the nuts of the discs and rims of the front and rear wheels after every 100 hours of work.
Ballast weights are necessary to additionally load the tractor axles and to ensure manoeuvrability and stability of the tractor.

**BALLAST WEIGHTS**

<table>
<thead>
<tr>
<th>Description</th>
<th>Page</th>
</tr>
</thead>
<tbody>
<tr>
<td><em>Rear wheel weights</em></td>
<td>142</td>
</tr>
<tr>
<td>Bottom weights</td>
<td>142</td>
</tr>
<tr>
<td><em>Front weights</em></td>
<td>143</td>
</tr>
<tr>
<td><em>Weight of the front three-point hitch</em></td>
<td>143</td>
</tr>
<tr>
<td>Valve for filling tyre tubes with liquid</td>
<td>144</td>
</tr>
<tr>
<td>Procedure of filling the tyres with liquid</td>
<td>144</td>
</tr>
<tr>
<td>Procedure of draining liquid from the tyres</td>
<td>145</td>
</tr>
<tr>
<td>Wedging the front wheels</td>
<td>145</td>
</tr>
<tr>
<td>Maximum liquid weight (kg) by tyre dimensions</td>
<td>146</td>
</tr>
<tr>
<td>Antifreeze solution for tyre filling</td>
<td>147</td>
</tr>
</tbody>
</table>
**BALLAST WEIGHTS**

**REAR WHEEL WEIGHTS**

<table>
<thead>
<tr>
<th>Combination of weights (pcs)</th>
<th>Mass of weights (kg)</th>
</tr>
</thead>
<tbody>
<tr>
<td>2+4 2x25 + 4x30</td>
<td>170</td>
</tr>
<tr>
<td>2+6 2x25 + 6x30</td>
<td>230</td>
</tr>
<tr>
<td>2+10 2x25 + 10x30</td>
<td>350</td>
</tr>
<tr>
<td>2+14 2x25 + 14x30</td>
<td>470</td>
</tr>
</tbody>
</table>

**BOTTOM WEIGHTS**

<table>
<thead>
<tr>
<th>Combination of weights (pcs)</th>
<th>Mass of weights (kg)</th>
</tr>
</thead>
<tbody>
<tr>
<td>2 2x34</td>
<td>68</td>
</tr>
</tbody>
</table>

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

<table>
<thead>
<tr>
<th>Combination of weights (pcs)</th>
<th>Mass of weights (kg)</th>
</tr>
</thead>
<tbody>
<tr>
<td>2+2</td>
<td>4x50 200</td>
</tr>
<tr>
<td>3+3</td>
<td>6x50 300</td>
</tr>
<tr>
<td>5+5</td>
<td>10x50 500</td>
</tr>
<tr>
<td>7+7</td>
<td>14x50 700</td>
</tr>
</tbody>
</table>

The front weights of the can type are suspended in the tool carrier. They are protected from lateral movement with a pin inserted between the central weights. The other weights are attached to the central ones with two clamps.

**Note:** After the insertion of the pin the front weights and the weight carrier can be used as the front hook for emergency towing of a sunken tractor.

### WEIGHT OF THE FRONT THREE-POINT HITCH

<table>
<thead>
<tr>
<th>Material</th>
<th>Weight mass (kg)</th>
</tr>
</thead>
<tbody>
<tr>
<td>Concrete</td>
<td>290</td>
</tr>
<tr>
<td>Cast-iron</td>
<td>460</td>
</tr>
<tr>
<td>Concrete</td>
<td>800</td>
</tr>
</tbody>
</table>
VALVE FOR FILLING TYRE TUBES WITH LIQUID

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

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

PROCEDURE OF FILLING THE TYRES WITH LIQUID

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

⚠️ *Water must not freeze in a tyre!*

144
PROCEDURE OF DRAINING LIQUID FROM THE TYRES

1. Unload the tyre by lifting the tractor and turn it with the valve upwards (A).
2. Deflate the tyre and unscrew the valve insert; turn the wheel with the valve downwards.
   
   During draining of liquid vacuum may occur in the tyre. Therefore, turn the wheel time after time to get the valve to the upper position (B).

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

WEDGING THE FRONT WHEELS

Before lifting the rear wheels do not forget to secure the tractor against moving by wedging the front wheels.
### BALLAST WEIGHTS

**MAXIMUM LIQUID WEIGHT (KG) BY TYRE DIMENSIONS**

<table>
<thead>
<tr>
<th>Dimensions</th>
<th>Filling with 75% clean water (l), (kg)</th>
<th>Calcium chloride solution</th>
</tr>
</thead>
<tbody>
<tr>
<td></td>
<td>CaCl₂ (kg)</td>
<td>Water (l)</td>
</tr>
<tr>
<td>16.9-34</td>
<td>250</td>
<td>108</td>
</tr>
<tr>
<td>16.9-38</td>
<td>290</td>
<td>126</td>
</tr>
<tr>
<td>18.4-34</td>
<td>330</td>
<td>144</td>
</tr>
<tr>
<td>18.4R-38</td>
<td>385</td>
<td>168</td>
</tr>
<tr>
<td>480/70R38</td>
<td>335</td>
<td>146</td>
</tr>
<tr>
<td>18.4-38</td>
<td>385</td>
<td>168</td>
</tr>
<tr>
<td>520/70R38</td>
<td>390</td>
<td>170</td>
</tr>
</tbody>
</table>

The table mentions values for temperatures down to -30°C.
ANTIFREEZE SOLUTION FOR TYRE FILLING

<table>
<thead>
<tr>
<th>Water for solution preparation</th>
<th>Calcium chloride CaCl₂</th>
<th>Hydrated lime</th>
<th>Solution density at 20°C</th>
<th>Freezing point approx.</th>
<th>Total volume</th>
<th>Added weight</th>
</tr>
</thead>
<tbody>
<tr>
<td>(l)</td>
<td>(kg)</td>
<td>(kg)</td>
<td></td>
<td>(°C)</td>
<td>(l)</td>
<td>(kg)</td>
</tr>
<tr>
<td>45</td>
<td>11.8</td>
<td>0.21</td>
<td>1.13</td>
<td>-18</td>
<td>50</td>
<td>57</td>
</tr>
<tr>
<td>45</td>
<td>13.9</td>
<td>0.23</td>
<td>1.18</td>
<td>-25</td>
<td>50</td>
<td>59</td>
</tr>
<tr>
<td>45</td>
<td>15.4</td>
<td>0.25</td>
<td>1.21</td>
<td>-30</td>
<td>50</td>
<td>61</td>
</tr>
</tbody>
</table>

⚠️ An antifreeze solution may only be used for filling tyres if you have purchased additional tubes! Caution, the tractor is equipped with tubeless tyres by the manufacturer!

Solution preparation:

1. Dry calcium chloride CaCl₂ is added to water, never the other way round!
2. The solution is not dangerous, but it is necessary to work carefully with it. Remove spilt drops with clean water.
3. Before filling leave the solution to cool down. Observe the prescribed quantity of hydrated lime.
4. The solution must not get in contact with metal parts and the electric installation! The solution is not harmful for the tube valve.
5. The antifreeze solution with the above mentioned composition must not be used in the cooling system!
6. After draining dispose of the antifreeze liquid as special waste!
ELECTRIC INSTALLATION

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Accumulator battery maintenance ........................................................................... 152
Alternator ................................................................................................................. 153
Alternator maintenance ........................................................................................... 153
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⚠️ No additional interventions into the electric installation (connection of other electric appliances) are permissible due to its possible overloading!
ELECTRIC INSTALLATION

ELECTRIC SYSTEM

<table>
<thead>
<tr>
<th>Component</th>
<th>Voltage (V)</th>
</tr>
</thead>
<tbody>
<tr>
<td>Nominal voltage (minus (-) pole grounded)</td>
<td>12</td>
</tr>
<tr>
<td>Battery (1)</td>
<td></td>
</tr>
<tr>
<td>12V/155Ah</td>
<td>12</td>
</tr>
<tr>
<td>12V/165Ah*</td>
<td>12</td>
</tr>
<tr>
<td>Alternator with a built-in voltage controller (2)</td>
<td>14V / 100A</td>
</tr>
<tr>
<td>Starter motor with a reducer (3)</td>
<td>12V / 3 kW</td>
</tr>
</tbody>
</table>

BASIC SERVICE INFORMATION

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

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

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

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

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

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

BATTERY DISCONNECTOR

Battery disconnector is placed on the left side of the tractor behind the stairs of the driver.

a- Battery connected
b- Battery disconnected

⚠️ When the tractor is at dead parking, disconnect the battery by means of the battery disconnector (1). The steady minimum take off of warning lights chopper current (approximately 10 mA) is thus interrupted.

If a tractor is dead parked for a longer period of time, it is necessary to recharge at least once a month from the reasons of self-discharge of battery.
ACCUMULATOR BATTERY MAINTENANCE

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

⚠️ **Only add distilled water to the battery!**

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

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

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

ALTERNATOR MAINTENANCE

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

is accessible after removing the left cover of steering console.
Fuses (1) are shear and when replacing them, it is necessary to keep prescribed values of the fuse. With repeated chopping, find the nearest garage.
Ignition fuse (2) is strip of the size of 80 A.
Heating strip fuse (3) of the size of 30 A.
## ELECTRIC INSTALLATION

### PLACEMENT OF FUSES IN FUSE BOX

<table>
<thead>
<tr>
<th>Positions of fuses in the fuse box</th>
<th>Pos.</th>
<th>Fuse size</th>
<th>Protected system</th>
</tr>
</thead>
<tbody>
<tr>
<td>1</td>
<td>1</td>
<td>15A</td>
<td>Warning lights chopper</td>
</tr>
<tr>
<td></td>
<td></td>
<td></td>
<td>Brake lights</td>
</tr>
<tr>
<td>2</td>
<td>2</td>
<td>15A</td>
<td>horn, beacon</td>
</tr>
<tr>
<td>3</td>
<td>3</td>
<td>15A</td>
<td>Dashboard feeding, EHR control and engine ignition</td>
</tr>
<tr>
<td>4</td>
<td>4</td>
<td>15A</td>
<td>Lower beam headlights with a switch</td>
</tr>
<tr>
<td>5</td>
<td>5</td>
<td>15A</td>
<td>Left side lights, dashboard illumination, licence label illumination</td>
</tr>
<tr>
<td>6</td>
<td>6</td>
<td>15A</td>
<td>Right side lights, rear working light with a control</td>
</tr>
<tr>
<td>7</td>
<td>7</td>
<td>15A</td>
<td>Right dipped lights, fog headlamp with a control</td>
</tr>
<tr>
<td>8</td>
<td>8</td>
<td>7,5A</td>
<td>Left dipped lights, lights control in a grill/roof of tractor</td>
</tr>
<tr>
<td>9</td>
<td>9</td>
<td>15A</td>
<td>Working lights in bonnet grill</td>
</tr>
<tr>
<td>10</td>
<td>10</td>
<td>3A</td>
<td>Front PTO shaft</td>
</tr>
<tr>
<td>1A</td>
<td>1</td>
<td>15A</td>
<td>CAN-bus socket</td>
</tr>
<tr>
<td>1B</td>
<td>1B</td>
<td>20A</td>
<td>brake relay control, engine stop</td>
</tr>
<tr>
<td>11</td>
<td>11</td>
<td>15A</td>
<td>Front and rear windshield wiper, windshield washer</td>
</tr>
<tr>
<td>12</td>
<td>12</td>
<td>20A</td>
<td>Radio, dome lamp</td>
</tr>
<tr>
<td>13</td>
<td>13</td>
<td>15A</td>
<td>Recirculation</td>
</tr>
<tr>
<td>14</td>
<td>14</td>
<td>7,5A</td>
<td>Air-condition (compressor clutch)</td>
</tr>
<tr>
<td>15</td>
<td>15</td>
<td>15A</td>
<td>Mirror heater</td>
</tr>
<tr>
<td>16</td>
<td>16</td>
<td>15A</td>
<td>Rear glass heater</td>
</tr>
<tr>
<td>17</td>
<td>17</td>
<td>15A</td>
<td>Driver’s seat compressor</td>
</tr>
<tr>
<td>18</td>
<td>18</td>
<td>20A</td>
<td>Three-pin socket</td>
</tr>
<tr>
<td>19</td>
<td>19</td>
<td>15A</td>
<td>Front working headlight in the roof</td>
</tr>
<tr>
<td>20</td>
<td>20</td>
<td>15A</td>
<td>Rear working headlights in the roof</td>
</tr>
<tr>
<td>21</td>
<td>21</td>
<td>80A</td>
<td>Ignition</td>
</tr>
<tr>
<td>24</td>
<td>24</td>
<td>15A</td>
<td>ECU gear box feeding</td>
</tr>
<tr>
<td>30</td>
<td>30</td>
<td>30A</td>
<td>Heating</td>
</tr>
</tbody>
</table>
CHECKING THE ADJUSTMENT OF THE FRONT GRILL HEADLIGHTS
During a check on a test wall the tractor must stand on a level surface and the tyres must be inflated to the prescribed pressure. The basic vertical setting is 3.5% at the shipping weight of the tractor. In the horizontal direction the light beams must be parallel with the longitudinal axis of symmetry of the tractor.

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

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

In the vertical direction there must not be any point of illuminated area lying on the road surface plane to the left from the longitudinal vertical plane passing through the headlight centre further than 30 m from the front outline of the tractor.

In the horizontal direction the light beams must be parallel with the longitudinal axis of symmetry of the tractor.

Check the adjustment of the headlights at the shipping weight of the tractor. The front roof headlights may only be used when driving on public roads when the tractor carries a frontally attached machine or implement covering the main headlights (in the tractor grill).
# LIST OF LAMPS

<table>
<thead>
<tr>
<th>Note</th>
<th>Bulb location</th>
<th>Voltage</th>
<th>Output</th>
<th>Sockets</th>
<th>Note</th>
</tr>
</thead>
<tbody>
<tr>
<td>1</td>
<td>Main headlamps H4</td>
<td>12 V</td>
<td>55/60 W</td>
<td>P 43t</td>
<td></td>
</tr>
<tr>
<td>2</td>
<td>Roof dimmed headlamps H7</td>
<td>12 V</td>
<td>55 W</td>
<td>PX26d</td>
<td></td>
</tr>
<tr>
<td>3</td>
<td>Front combined lamps</td>
<td></td>
<td></td>
<td></td>
<td></td>
</tr>
<tr>
<td></td>
<td>Directional lights P21W</td>
<td>12 V</td>
<td>21 W</td>
<td>BA 15s</td>
<td></td>
</tr>
<tr>
<td></td>
<td>Side lights R5W</td>
<td>12 V</td>
<td>5 W</td>
<td>BA 15s</td>
<td></td>
</tr>
<tr>
<td>4</td>
<td>Working and ploughing flood-lights</td>
<td>12 V</td>
<td>65 W</td>
<td>PGJ19-5</td>
<td></td>
</tr>
<tr>
<td>5</td>
<td>Rear joint lamps</td>
<td></td>
<td></td>
<td></td>
<td></td>
</tr>
<tr>
<td></td>
<td>End lights and brake lights</td>
<td>12 V</td>
<td>5 /21W</td>
<td>BAY 15d</td>
<td></td>
</tr>
<tr>
<td></td>
<td>Directional lights</td>
<td>12 V</td>
<td>21 W</td>
<td>BA 15s</td>
<td></td>
</tr>
<tr>
<td>6</td>
<td>Illumination SPZ R5W</td>
<td>12 V</td>
<td>5 W</td>
<td>BA15s</td>
<td></td>
</tr>
<tr>
<td>7</td>
<td>Dashboard</td>
<td>12 V</td>
<td>1.2 W</td>
<td>W2x4.6d</td>
<td></td>
</tr>
<tr>
<td>8</td>
<td>Cabin illumination W5W</td>
<td>12 V</td>
<td>5 W</td>
<td>W2.1x9.5d</td>
<td>All-glass without base</td>
</tr>
<tr>
<td>9</td>
<td>Heating panel illumination</td>
<td>12 V</td>
<td>1.2 W</td>
<td>W2x4.6d</td>
<td></td>
</tr>
</tbody>
</table>
# TRACTOR MAINTENANCE

<table>
<thead>
<tr>
<th>Steps performed daily before the start of work</th>
<th>Page</th>
</tr>
</thead>
<tbody>
<tr>
<td>Steps performed every 50 hours of work</td>
<td>160</td>
</tr>
<tr>
<td>Steps performed every 100 hours of work</td>
<td>160</td>
</tr>
<tr>
<td>Steps performed every 500 hours of work</td>
<td>161</td>
</tr>
<tr>
<td>Filling and filter replacement</td>
<td>162</td>
</tr>
<tr>
<td>Used operation liquids and filling - quantities</td>
<td>163</td>
</tr>
<tr>
<td>Front PTO oil</td>
<td>165</td>
</tr>
<tr>
<td>Oil for the front driving axle</td>
<td>166</td>
</tr>
<tr>
<td>Oil for the hydrostatic steering of the tractors</td>
<td>167</td>
</tr>
<tr>
<td>Plastic lubricant for the tractor</td>
<td>167</td>
</tr>
<tr>
<td>Hydraulic brake liquid for the tractors</td>
<td>168</td>
</tr>
<tr>
<td>Liquid for the cooling system of the tractors</td>
<td>168</td>
</tr>
<tr>
<td>Front driven axle</td>
<td>170</td>
</tr>
<tr>
<td>Hitch for a single-axle semi-trailer</td>
<td>171</td>
</tr>
<tr>
<td>Front three-point hitch</td>
<td>171</td>
</tr>
<tr>
<td>Three-point hitch</td>
<td>172</td>
</tr>
<tr>
<td>Hitch mouth for a trailer</td>
<td>172</td>
</tr>
<tr>
<td>General overhaul of the tractors</td>
<td>173</td>
</tr>
<tr>
<td>Technical maintenance of the tractors after a general overhaul of the main groups</td>
<td>173</td>
</tr>
</tbody>
</table>
TRACTOR MAINTENANCE

STEPS PERFORMED DAILY BEFORE THE START OF WORK

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

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

STEPS PERFORMED EVERY 50 HOURS OF WORK

Lubricate the tractor in accordance with the lubrication plan

STEPS PERFORMED EVERY 100 HOURS OF WORK

Clean the cooler blades with pressurized air
Perform maintenance of the dry air cleaner (in accordance with the signal of the clogging indicator)
Check the oil quantity in the gearbox and final drive housing
Check the oil quantity in the gear box of the front PTO
Check the oil quantity in the reducers and in the box of the front driving axle
Drain condensate from the air reservoir
TRACTOR MAINTENANCE

STEPS PERFORMED EVERY 500 HOURS OF WORK
Check the tension of V-belts
Check the whole hydrostatic steering system for play
Check the front axle pin for play
Check the play adjustment of the clutch and brake pedals
Check the function of the parking and foot brake
Check the function of the brakes for the trailer
Clean and lubricate the terminals of the battery with a thin layer of grease
Check the tightness and function of the pressurized air system
Check the function of the driver's seat, lubricate the movable parts with grease

STEPS PERFORMED OUTSIDE THE INTERVAL OF 500 HOURS OF WORK

<table>
<thead>
<tr>
<th>hour counter reading</th>
<th>100</th>
<th>500</th>
<th>1000</th>
<th>1500</th>
<th>2000</th>
<th>2500</th>
<th>3000</th>
<th>subsequently after every …hours</th>
</tr>
</thead>
<tbody>
<tr>
<td>Check and adjust valve play</td>
<td>o</td>
<td>o</td>
<td>o</td>
<td>o</td>
<td>o</td>
<td>o</td>
<td>2000</td>
<td></td>
</tr>
<tr>
<td>Check the opening pressure of injectors and the function of injection nozzles</td>
<td>o</td>
<td>o</td>
<td>o</td>
<td>o</td>
<td>o</td>
<td>o</td>
<td>3000</td>
<td></td>
</tr>
<tr>
<td>Replace the hydrostatic steering hoses</td>
<td>o</td>
<td>o</td>
<td>o</td>
<td>o</td>
<td>o</td>
<td>o</td>
<td>every 3500 hours or once every 4 years</td>
<td></td>
</tr>
<tr>
<td>Check the toe-in of the front wheels</td>
<td>o</td>
<td>o</td>
<td>o</td>
<td>o</td>
<td>o</td>
<td>o</td>
<td>2000</td>
<td></td>
</tr>
<tr>
<td>Calibration of travel clutches</td>
<td>o</td>
<td>o</td>
<td>o</td>
<td>o</td>
<td>o</td>
<td>o</td>
<td>500</td>
<td></td>
</tr>
</tbody>
</table>
## TRACTOR MAINTENANCE

### FILLING AND FILTER REPLACEMENT

<table>
<thead>
<tr>
<th>Action</th>
<th>100</th>
<th>500</th>
<th>1000</th>
<th>1500</th>
<th>2000</th>
<th>Subsequently after every...</th>
</tr>
</thead>
<tbody>
<tr>
<td>Replace engine oil</td>
<td>0</td>
<td>0</td>
<td>0</td>
<td>0</td>
<td>0</td>
<td>500</td>
</tr>
<tr>
<td>Replace the engine oil cleaner element</td>
<td>0</td>
<td>0</td>
<td>0</td>
<td>0</td>
<td>0</td>
<td>500</td>
</tr>
<tr>
<td>Replace the fuel cleaner element</td>
<td></td>
<td></td>
<td>0</td>
<td>0</td>
<td>0</td>
<td>500</td>
</tr>
<tr>
<td>Replace the air cleaner element</td>
<td></td>
<td></td>
<td>0</td>
<td>0</td>
<td>0</td>
<td>1000</td>
</tr>
<tr>
<td>Replace the safety insert of the air cleaner</td>
<td></td>
<td></td>
<td></td>
<td>0</td>
<td>0</td>
<td>2000</td>
</tr>
<tr>
<td>Replace the filtration element of heating</td>
<td>0</td>
<td>0</td>
<td>0</td>
<td>0</td>
<td>0</td>
<td>every 1000 hours or once every 2 years</td>
</tr>
<tr>
<td>Replace coolant</td>
<td></td>
<td></td>
<td></td>
<td></td>
<td></td>
<td>once every 2 years</td>
</tr>
<tr>
<td>Replace brake liquid</td>
<td></td>
<td></td>
<td></td>
<td></td>
<td></td>
<td>once every 2 years</td>
</tr>
<tr>
<td>Replace oil in the gearbox and final drive housing</td>
<td></td>
<td></td>
<td></td>
<td></td>
<td></td>
<td>1000</td>
</tr>
<tr>
<td>Clean the magnet and strainer element of the suction filter of the hydraulic pump</td>
<td>0</td>
<td>0</td>
<td>0</td>
<td>0</td>
<td>0</td>
<td>500</td>
</tr>
<tr>
<td>Replacement of the transmission oil cleaner element with hydraulic pump suction filter</td>
<td>0</td>
<td>0</td>
<td>0</td>
<td>0</td>
<td>0</td>
<td>500</td>
</tr>
<tr>
<td>Replacing oil filter element with delivery filter of gearbox switchboard</td>
<td>0</td>
<td>0</td>
<td>0</td>
<td>0</td>
<td>0</td>
<td>500</td>
</tr>
<tr>
<td>Replace oil in the front driving axle box</td>
<td>0</td>
<td>0</td>
<td>0</td>
<td>0</td>
<td>0</td>
<td>1000</td>
</tr>
<tr>
<td>Replace oil in the front driving axle reducers</td>
<td>0</td>
<td>0</td>
<td>0</td>
<td>0</td>
<td>0</td>
<td>1000</td>
</tr>
<tr>
<td>Replace hydrostatic steering oil</td>
<td></td>
<td></td>
<td>0</td>
<td></td>
<td>0</td>
<td>1500</td>
</tr>
<tr>
<td>Replace the filtration element of hydrostatic steering</td>
<td>0</td>
<td></td>
<td></td>
<td>0</td>
<td></td>
<td>1500</td>
</tr>
<tr>
<td>Replace oil in the box of the front PTO and clean the oil strainer</td>
<td>0</td>
<td>0</td>
<td>0</td>
<td>0</td>
<td>0</td>
<td>500</td>
</tr>
</tbody>
</table>
# TRACTOR MAINTENANCE

## USED OPERATION LIQUIDS AND FILLING - QUANTITIES

<table>
<thead>
<tr>
<th>Designation</th>
<th>Quantity in litres</th>
</tr>
</thead>
<tbody>
<tr>
<td>Brake liquid</td>
<td>0,5</td>
</tr>
<tr>
<td>Coolant</td>
<td>20,5</td>
</tr>
<tr>
<td>Engine oil</td>
<td>10</td>
</tr>
<tr>
<td>Hydrostatic steering oil</td>
<td>2,7</td>
</tr>
<tr>
<td>Oil of the front driving axle box</td>
<td>6,5</td>
</tr>
<tr>
<td>Oil of the planetary reducers of the front driving axle</td>
<td>2x0.6</td>
</tr>
<tr>
<td>Gearbox and final drive housing oil</td>
<td>60</td>
</tr>
<tr>
<td>Front PTO gearbox oil</td>
<td>2,7</td>
</tr>
<tr>
<td>Fuel</td>
<td>240</td>
</tr>
<tr>
<td>Oil marking</td>
<td>Viscosity class SAE</td>
</tr>
<tr>
<td>---------------------------------</td>
<td>---------------------</td>
</tr>
<tr>
<td>Shell Rimula R3 X</td>
<td>15W-40</td>
</tr>
<tr>
<td>ARAL Mega Turboral</td>
<td>10W-40</td>
</tr>
<tr>
<td>MOL Dynamic Transit</td>
<td>15W-40</td>
</tr>
<tr>
<td>MOL Dynamic Turbo Diesel</td>
<td>15W-40</td>
</tr>
<tr>
<td>ORLEN OIL Diesel(2)HPDO</td>
<td>15W-40</td>
</tr>
<tr>
<td>ÖMV truck LD</td>
<td>15W-40</td>
</tr>
<tr>
<td>Fuchs Titan Truck</td>
<td>15W-40</td>
</tr>
<tr>
<td>MOGUL DIESEL DTT PLUS</td>
<td>10W-40</td>
</tr>
<tr>
<td>MOGUL DIESEL DT</td>
<td>15W-40</td>
</tr>
<tr>
<td>MOGUL DIESEL DTT EXTRA</td>
<td>15W-40</td>
</tr>
<tr>
<td>TRYSK SUPER (M7 ADS III)</td>
<td>15W-40</td>
</tr>
<tr>
<td>TRYSK SUPER TURBO (M7 ADS IV)</td>
<td>15W-40</td>
</tr>
</tbody>
</table>
# TRACTOR MAINTENANCE

## FRONT PTO OIL

<table>
<thead>
<tr>
<th>Manufacturer</th>
<th>Oil designation</th>
</tr>
</thead>
<tbody>
<tr>
<td>Shell</td>
<td>Donax TX</td>
</tr>
<tr>
<td>BP</td>
<td>Autran DX III</td>
</tr>
<tr>
<td></td>
<td>Fluid 9</td>
</tr>
<tr>
<td>Esso</td>
<td>ATF E 25131</td>
</tr>
<tr>
<td>Castrol</td>
<td>Transmax S</td>
</tr>
<tr>
<td>Elf</td>
<td>Elfmatic G2 Syn</td>
</tr>
<tr>
<td></td>
<td>Elfmatic G3</td>
</tr>
<tr>
<td>FINA</td>
<td>Finamatic HP</td>
</tr>
<tr>
<td></td>
<td>Finamatic S6726</td>
</tr>
</tbody>
</table>

## Manufacturer | Oil designation
---|----------------|
Mobil         | Mobil ATF
Texaco        | Texamatic 7045
Valvoline     | ATF Dextron II-E
Beverol       | Dextron II-E
              | (Fina)matic HP
JD            | Hygard JDMJ 20C
Total         | Fluide AT42
              | Fluidematic Syn
MOL           | ATF 3G
**TRACTOR MAINTENANCE**

### OIL TO GEAR SYSTEMS OF TRACTORS

<table>
<thead>
<tr>
<th>Manufacturer</th>
<th>Oil marking</th>
<th>Viscosity class SAE</th>
<th>Performance class API</th>
</tr>
</thead>
<tbody>
<tr>
<td>Paramo</td>
<td>Traktol STOU</td>
<td>10W - 30</td>
<td>GL-4</td>
</tr>
<tr>
<td>Aral</td>
<td>Super Traktoral</td>
<td>10W - 30</td>
<td>GL-4</td>
</tr>
<tr>
<td>ÖMV</td>
<td>Austrotrac</td>
<td>10W - 30</td>
<td>GL-4</td>
</tr>
<tr>
<td>Fuchs</td>
<td>AGRIFARM STOU 10W-30 MC</td>
<td>10W - 30</td>
<td>GL-4</td>
</tr>
</tbody>
</table>

### OIL FOR THE FRONT DRIVING AXLE

<table>
<thead>
<tr>
<th>Manufacturer</th>
<th>Oil designation</th>
<th>Viscosity class SAE</th>
<th>Performance class API</th>
</tr>
</thead>
<tbody>
<tr>
<td>Shell</td>
<td>Spirax AX</td>
<td>80W - 90</td>
<td>GL-5</td>
</tr>
<tr>
<td>Aral</td>
<td>Fluid HGS</td>
<td>80W</td>
<td>GL-4</td>
</tr>
<tr>
<td>Agip</td>
<td>Rotra Multi THT</td>
<td>80W</td>
<td>GL-4</td>
</tr>
<tr>
<td>Esso</td>
<td>Torque Fluid 62</td>
<td>80W</td>
<td>GL-4</td>
</tr>
<tr>
<td>Fuchs</td>
<td>Titan Supergear</td>
<td>80W - 90</td>
<td>GL-4/GL-5</td>
</tr>
<tr>
<td></td>
<td>Titan Hydramot 1030MC</td>
<td>10W - 30</td>
<td>GL-4</td>
</tr>
<tr>
<td>ÖMV</td>
<td>Gear Oil LS</td>
<td>85W - 90</td>
<td>GL-5</td>
</tr>
<tr>
<td>MOL</td>
<td>Hykomol K 80W-90</td>
<td>85W - 90</td>
<td>GL-5</td>
</tr>
<tr>
<td>ORLEN OIL</td>
<td>Platinum Gear 80W-90</td>
<td>85W - 90</td>
<td>GL-5</td>
</tr>
</tbody>
</table>
## TRACTOR MAINTENANCE

### OIL FOR THE HYDROSTATIC STEERING OF THE TRACTORS

<table>
<thead>
<tr>
<th>Manufacturer</th>
<th>Oil designation</th>
<th>Classification</th>
</tr>
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<tbody>
<tr>
<td>Shell</td>
<td>TELLUS DO 32</td>
<td>HLP DIN 51524</td>
</tr>
<tr>
<td>Aral</td>
<td>Vitam DE 32</td>
<td>HLP DIN 51524</td>
</tr>
<tr>
<td>Fuchs</td>
<td>RENOLIND10VG32</td>
<td>HLP DIN 51524-2</td>
</tr>
<tr>
<td>ÖMV</td>
<td>Hyd HLP 32</td>
<td>HLP DIN 51524</td>
</tr>
<tr>
<td>PARAMO</td>
<td>MOGUL H-LPD 32</td>
<td>HLP DIN 51524</td>
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<tr>
<td></td>
<td>MOGUL HM 32</td>
<td>HLP DIN 51524</td>
</tr>
<tr>
<td>MOL</td>
<td>Hydro HV 32</td>
<td>HVLP DIN 51524-3</td>
</tr>
<tr>
<td>ORLEN OIL</td>
<td>Hydrol L-HM 32</td>
<td>HVLP DIN 51524-3</td>
</tr>
<tr>
<td></td>
<td>Hydrol L-HM 46</td>
<td>HVLP DIN 51524-3</td>
</tr>
</tbody>
</table>

### PLASTIC LUBRICANT FOR THE TRACTOR

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

HYDRAULIC BRAKE LIQUID FOR THE TRACTORS

<table>
<thead>
<tr>
<th>Type</th>
<th>Classification</th>
</tr>
</thead>
<tbody>
<tr>
<td>Shell Donax YB</td>
<td>SAE J 1703, ISO 4925</td>
</tr>
<tr>
<td>Synthol 205</td>
<td>PND 31-656-80, ISO 4925, SAE - J 1703</td>
</tr>
<tr>
<td>Fuchs Stopred</td>
<td>SAE - J 1703</td>
</tr>
<tr>
<td>Brake Fluid DOT 4</td>
<td>ISO 4925, SAE - J 1703</td>
</tr>
<tr>
<td>EVOX DOT 4+</td>
<td>ISO 4925/4 SAE - J 1704</td>
</tr>
</tbody>
</table>

**CAUTION!**
1. *The liquid is not designed for arctic conditions!*
2. *Replace the brake liquid once every two years regardless of the number of hours of work!*
3. *Liquids of the same classification can be mixed together.*

LIQUID FOR THE COOLING SYSTEM OF THE TRACTORS

FRIDEX - STABIL, FRIDIOL 91 or FRICOFIN S and demineralised water in the proportion of 1:1.5 (replenish the mixture in this proportion). Antifreeze liquids for replacement abroad must contain anti-corrosion additives protecting all materials (incl. rubber and head gaskets) of the cooling system of the engine.

**CAUTION!**
1. *Water without an antifreeze mixture must not be used in the tractors!*
2. *Replace the cooling liquid after two years of operation. The FRIDEX - STABIL and FRIDIOL 91 liquids can be mixed together.*
3. *Miscibility with liquids of other manufacturers has not been verified!*
## TRACTOR MAINTENANCE

### FUEL FOR ZETOR ENGINES WHICH ARE NOT EQUIPPED WITH DIESEL PARTICLE FILTER

<table>
<thead>
<tr>
<th></th>
<th>Description</th>
</tr>
</thead>
<tbody>
<tr>
<td></td>
<td>Summer diesel fuel for the period from April 1 to October 31</td>
</tr>
<tr>
<td></td>
<td>Winter diesel fuel for the period from November 1 to March 31</td>
</tr>
<tr>
<td><strong>Note:</strong></td>
<td>Suitable fuel types abroad should be used in a similar way.</td>
</tr>
<tr>
<td></td>
<td>Natural Diesel mixed fuel (bio-diesel)</td>
</tr>
<tr>
<td><strong>Note:</strong></td>
<td>Using bio-fuel in the tractor requires installation of REP hoses in the fuel system. Using bio-fuel increases consumption, reduces the output by approx. 5% and requires replacement of the engine oil after 200 hours of work. It also has an aggressive influence on varnished parts.</td>
</tr>
</tbody>
</table>
TRACTOR MAINTENANCE

LUBRICATION PLAN OF THE TRACTOR

FRONT DRIVEN AXLE

<table>
<thead>
<tr>
<th>Pos. no.</th>
<th>Identification</th>
<th>No. of lubrication points</th>
</tr>
</thead>
<tbody>
<tr>
<td>1</td>
<td>Turning radius pins</td>
<td>4</td>
</tr>
<tr>
<td>2</td>
<td>Central pin</td>
<td>2</td>
</tr>
</tbody>
</table>
### Hitch for a Single-Axle Semi-Trailer

<table>
<thead>
<tr>
<th>Pos. no.</th>
<th>Identification</th>
<th>No. of lubrication points</th>
</tr>
</thead>
<tbody>
<tr>
<td>1</td>
<td>Hook pin bearings</td>
<td>0 to 4 (by version)</td>
</tr>
</tbody>
</table>

### Front Three-Point Hitch

<table>
<thead>
<tr>
<th>Pos. no.</th>
<th>Identification</th>
<th>No. of lubrication points</th>
</tr>
</thead>
<tbody>
<tr>
<td>1</td>
<td>Pins of cylinders of the front three-point hitch</td>
<td>4</td>
</tr>
</tbody>
</table>
## TRACTOR MAINTENANCE

### THREE-POINT HITCH

<table>
<thead>
<tr>
<th>Pos. no.</th>
<th>Identification</th>
<th>No. of lubrication points</th>
</tr>
</thead>
<tbody>
<tr>
<td>1</td>
<td>Pins of auxiliary hydraulic cylinders</td>
<td>2</td>
</tr>
<tr>
<td>2</td>
<td>Lifting draw-bars</td>
<td>2</td>
</tr>
</tbody>
</table>

### HITCH MOUTH FOR A TRAILER

<table>
<thead>
<tr>
<th>Pos. no.</th>
<th>Identification</th>
<th>No. of lubrication points</th>
</tr>
</thead>
<tbody>
<tr>
<td>1</td>
<td>Hitch mouth for a trailer</td>
<td>1</td>
</tr>
</tbody>
</table>
TRACTOR MAINTENANCE

GENERAL OVERHAUL OF THE TRACTORS
A general overhaul of the tractor should be carried out if its further use is uneconomical, if most of its parts require a repair and its overall technical condition endangers traffic safety.
If all the maintenance instructions specified in the technical documentation of the manufacturer are observed and if work is carried out in a moderate climate and plain terrain, the mean service life of the engine and transmission system is 8000 hours of work.
This number of hours is valid on condition of the following distribution of tractor work:

Ploughing and pre-sowing soil treatment  15 - 25 %
Sowing and planting                  10 - 15 %
Harvest work                        10 - 20 %
Farming transport                   40 - 65 %

If the tractor works in mountainous and sub-mountainous regions, the service life of the engine and transmission system is reduced by 15-20%.
If the tractor works under worsened climatic conditions, the service life of the engine and transmission system is reduced by 15-20%.

Note: The transmission system includes the front driving axle.

TECHNICAL MAINTENANCE OF THE TRACTORS AFTER A GENERAL OVERHAUL OF THE MAIN GROUPS
Run in the tractor after a general overhaul in accordance with the instructions for running in a new tractor. Perform the maintenance in the same way as with a new tractor.
MAINTENANCE INSTRUCTIONS

The driver of the tractor can do most of the planned maintenance work by himself. However, if you do not have sufficient technical equipment, entrust the execution of more complicated tasks to a specialized workshop.

⚠️ All the work related to the cleaning, lubrication and adjustment of the tractor or attached implements may only be performed after stopping of the engine and other movable parts except the brake control and charging.

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MAINTENANCE INSTRUCTIONS

OPENING THE HOOD
Release the hood by pressing the button (1), grasp it in the places of arrows and lift it. Thanks to a gas brace the hood will open automatically after that. The hood is locked in this lifted position thanks to this gas-liquid brace.

Closing the hood:
Pull the hood down with the strap, grasp it in the place of arrows and press it downwards until the hood lock snaps.

⚠️ Do not use excessive force to close the front hood as the filaments of headlight bulbs situated in the front hood might get damaged.
CHECKING THE OIL LEVEL IN THE ENGINE
Check the oil level daily before starting work with the tractor in the horizontal position. Unscrew the dipstick, wipe it with a piece of cloth and screw it back in. After repeated removal of the dipstick the oil level must not drop below the lower mark. Replenish oil as necessary through the filling opening.

DRAINING OIL FROM THE ENGINE
Drain oil by unscrewing the drain plug (3), best immediately after a drive or after heating the engine to the working temperature. Clean the drain plug before returning it to its place. Check the sealing ring for integrity.

REPLACING THE FULL-FLOW ENGINE OIL CLEANER
The cleaner is replaced at every engine oil replacement. Before installing the new cleaner clean the sealing surface of the housing (1) and the cleaner (2). Coat the rubber sealing with oil that you will fill the engine with and tighten the cleaner by hand. When the sealing gets in contact with the block sealing, tighten the cleaner again by 3/4 to 1 1/4 turns. Check the cleaner for possible leaks after starting the engine.
FILLING THE ENGINE WITH OIL
Pour the prescribed quantity of engine oil into the filling opening (2), start the engine and let it run for 2 - 3 minutes at 750 - 800 rpm.
After stopping of the engine and level stabilization use the dipstick (1) to check the oil level and check the cleaner, drain plug (3) and other joints for leaks.

REPLACING THE FUEL FILTER ELEMENT
Replace the filter element after releasing the nut (1) and unscrewing the bowl (2). During the re-assembly of the cleaned bowl with the new filter element check proper seating of the bowl gasket. Bleed the fuel system.
During the cleaning and replacement of the filter elements place a suitable vessel under the engine to catch dripping fuel.
BLEEDING THE FUEL SYSTEM

Before bleeding place a suitable container under the engine to collect dripping fuel from the filter and injection pump.

1. Prime the fuel system with several strokes of the manual control of the priming pump (1).
2. Release the screw (2) of the fitting of the fuel inlet to the filter and let the foam escape.
3. Retighten the screw and repeat the procedure until after releasing of the screw clear fuel starts to continuously flow from the filter.
4. Bleed the injection pump in the same way.
5. Do the bleeding with the screw (3) positioned on the pump body.
MAINTENANCE INSTRUCTIONS

DRY AIR CLEANER MAINTENANCE INSTRUCTIONS

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

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.

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.
MAINTENANCE INSTRUCTIONS

REASSEMBLY OF THE AIR CLEANER ELEMENTS

When reassembling the air cleaner elements proceed in the reverse order.

Observe the following points during the element reassembly:
- Make sure the contact surfaces are clean.
- During the assembly the elements must not get deformed and after installation they must not vibrate.
- After closing of the cleaner with the lid the whole cleaner must be perfectly leak-proof.

- After the maintenance of the dry air cleaner ensure proper functioning of the clogging indicator again.

HYDROSTATIC STEERING OIL TANK

The tank is accessible after opening the hood. It is found in the front part on the left side of the tractor.

By dipstick check (A) the height of oil level in hydrostatic steering tank, keep the level of oil between MIN. and MAX. marks, see fig. (A).

If necessary, replenish the oil after nut disassembly (1) and removing the lid of tank.
MAINTENANCE INSTRUCTIONS

REPLACING THE FILTRATION ELEMENT OF THE HYDROSTATIC STEERING

1 - Dismantle the left rear side plate of the hood
2 - Place a suitable container under the hydrostatic steering tank
3 - Release the drain screw
4 - Drain oil from the tank

5 - Unscrew the tank lid
6 - Replace the filtration element
7 - Install the new element

8 - Disconnect both the hoses from the working cylinder and together with the return hose insert their ends to a waste oil container.
9 - Start the engine and at the idle speed (max. 10 s) turn the steering wheel 2-3 times to both sides to push oil out of the steering unit and the pipes.
10 - Secure the tractor against movement and lift the front axle.
11 - Place an oil collection container under the working cylinder and by turning the wheels (by hand) push oil out of the working cylinder.
12 - Reassemble all the disconnected joints.
13 - Fill the tank with oil and bleed the hydrostatic steering circuit.

BLEEDING THE HYDRAULIC CIRCUIT OF THE HYDROSTATIC STEERING

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

During all the steps of bleeding of the hydrostatic steering observe the oil level in the tank to avoid aspiration of air to the steering system.

After the end of bleeding check or replenish the oil level to the dipstick mark. Check all the connections and lines for leaks.
REPLACING THE HYDROSTATIC STEERING HOSES

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

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

REPLACING COOLANT
Proceed in the following way:
1. Open the heating valve and release the pressure cap (C) on equalizing vessel.
2. Drain the coolant from the radiator. Plug (A) is accessible after lifting the bonnet.
3. Drain the coolant from the block of engine. Drain cock (B) is accessible after the disassembly of right side part.
4. After draining the coolant close the drain valve and cap (leave heating cock open).
5. Fill the cooling system with a coolant to the neck in equalizing vessel and close by pressure cap.
6. Start the engine and allow it to run for approximately 1 min.
7. Fill the level of coolant in equalizing vessel to MAX. gauge
8. Close the vessel with a pressure cap (C).

Always use the prescribed coolant to fill the cooling system of the engine.
Never fill the cooling system with water.
Using other than the prescribed coolant may damage the engine.
MAINTENANCE INSTRUCTIONS

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

⚠️ Carry out the check always with the engine stopped.

CHECK AND REPLACEMENT OF OIL IN GEAR BOX
DRAINING AND CHECKING HOLES
1. drain plug of oil from clutch box
2. drain plug of oil from gearbox
3. drain plug of oil from final drive housing
4. drain plug of oil from final drive housing box
5. drain plug of oil from final house driving box
6. Pouring opening for gear oil is placed in hydraulic mechanism housing. Accessible from the rear part of the tractor
MAINTENANCE INSTRUCTIONS

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

REPLACEMENT OF THE TRANSMISSION OIL CLEANER ELEMENT WITH HYDRAULIC PUMP SUCTION FILTER
The oil cleaner is placed on the left side of the gearbox.

- Before replacing the oil cleaner element, place a suitable vessel for dripping oil under the tractor.

1. Unscrew the body of the cleaner (1)
2. Replace the filtration element
3. Reassemble the body of the cleaner

INSERTION PIECE REPLACEMENT OF THE OIL CLEANER WITH DELIVERY FILTER OF THE GEARBOX SWITCHBOARD
Oil cleaner is placed on the left side of the gearbox.

The cleaner clogging is signalized by a control on dashboard lighting up.

- Before replacing the insertion of the oil cleaner, place a suitable vessel under the tractor for catching the dripping oil.

1. Unscrew the body of the cleaner (1)
2. Replace the insertion filter
3. Do the back assembly of the body of the cleaner
LUBRICATION AND FILLING POINTS OF THE FRONT DRIVING 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)

FILLING, INSPECTION AND DRAIN OPENING OF OIL OF THE FRONT WHEEL REDUCERS
Oil is checked, filled and drained through one opening after turning of the reducer in accordance with the figure.
1. Checking the oil level - opening on the horizontal axis of the reducer (after removing of the inspection screw the oil level must reach the bottom edge of the inspection opening)
2. Oil filling - opening at the top
3. Oil draining - opening at the bottom
MAINTENANCE INSTRUCTIONS

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

⚠️ After unscrewing of the inspection plug the oil level must reach the bottom edge of the inspection opening.

During the oil replacement the oil cleaning strainer (2) must be cleaned. The cleaning strainer is accessible after the disassembly of the locking ring and removal of the cap.

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

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

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

CLEANING THE HEATING FILTERS
Recover the filters positioned under the covering grills over the windshield outside the cabin with regard to the degree of clogging:
– by shaking
– by blowing with compressed air
Check the filters for clogging daily. Replace heavily clogged filters.

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

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

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

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

The most important element of maintenance of the air-conditioning system is cleaning the AC condenser (it is installed in front of the engine cooler).

If the AC condenser is clogged, it does not only reduce the cooling efficiency of the AC system but also the efficiency of the engine cooling.

Remove the front side plate of the hood, release and slide the cooler towards the side and clean the condenser with pressurized air or pressurized water (against the driving direction of the tractor). Then, slide the cooler back and fix it properly.

Be careful about the proper routing of hoses to the oil cooler.

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

DRAINING CONDENSATE FROM THE AIR RESERVOIR

Draining is performed by deflecting or compressing the protruding part of the valve.
The air reservoirs are located in front of the rear axle.
CHECKING THE AIR SYSTEMS FOR LEAKS

- Fill the air reservoir to the maximum pressure
- With the engine stopped, the air pressure must not drop by more than 10 kPa in 10 minutes.

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

WORKING PRESSURE OF AIR BRAKES

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

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

⚠️ Do not use tyres that show a defect any longer.

TYRE INFLATION

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

**RECOMMENDED INFLATION VALUES OF THE FRONT WHEEL TYRES**

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

<table>
<thead>
<tr>
<th>Principal working activity</th>
<th>Tyre dimensions and design</th>
</tr>
</thead>
<tbody>
<tr>
<td></td>
<td>12.4-248 PR</td>
</tr>
<tr>
<td>For field work</td>
<td></td>
</tr>
<tr>
<td>Inflation (kPa)</td>
<td>100-170</td>
</tr>
<tr>
<td>Load-bearing capacity (kg)</td>
<td>895-1200</td>
</tr>
<tr>
<td>For road transport</td>
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</tr>
<tr>
<td>Inflation (kPa)</td>
<td>200-250</td>
</tr>
<tr>
<td>Load-bearing capacity (kg)</td>
<td>1330-1415</td>
</tr>
<tr>
<td>For work with a front loader</td>
<td></td>
</tr>
<tr>
<td>at the maximum permitted speed of 8 km/h.</td>
<td>Inflation (kPa)</td>
</tr>
<tr>
<td></td>
<td>max. 290</td>
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<td>Load-bearing capacity (kg)</td>
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<td>max. 2830</td>
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<table>
<thead>
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<th>Principal working activity</th>
<th>Tyre dimensions and design</th>
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<tr>
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<td>Inflation (kPa)</td>
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<tr>
<td>Load-bearing capacity (kg)</td>
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<tr>
<td>For work with a front loader</td>
<td>Inflation (kPa)</td>
</tr>
<tr>
<td>at the maximum permitted speed of 8 km/h.</td>
<td>max. 200</td>
</tr>
<tr>
<td></td>
<td>Load-bearing capacity (kg)</td>
</tr>
<tr>
<td></td>
<td>max. 2550</td>
</tr>
</tbody>
</table>

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

RECOMMENDED INFLATION VALUES OF THE REAR WHEEL TYRES

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

<table>
<thead>
<tr>
<th>Tyre dimensions and design</th>
<th>Principal working activity</th>
<th>16.9-34 8 PR</th>
<th>16.9R34 8 PR</th>
<th>18.4-34 8 PR</th>
<th>18.4R34 8 PR</th>
</tr>
</thead>
<tbody>
<tr>
<td>For field work</td>
<td>Inflation (kPa)</td>
<td>110-150</td>
<td>140-160</td>
<td>110-140</td>
<td>130-160</td>
</tr>
<tr>
<td></td>
<td>Load-bearing capacity (kg)</td>
<td>1830-2200</td>
<td>2130-2430</td>
<td>2250-2565</td>
<td>2450-2800</td>
</tr>
<tr>
<td>For road transport</td>
<td>Inflation (kPa)</td>
<td>170-200</td>
<td>130-160</td>
<td>170-200</td>
<td>130-160</td>
</tr>
<tr>
<td></td>
<td>Load-bearing capacity (kg)</td>
<td>max. 2380</td>
<td>2130-2430</td>
<td>max. 2565</td>
<td>2450-2800</td>
</tr>
</tbody>
</table>

<table>
<thead>
<tr>
<th>Tyre dimensions and design</th>
<th>Principal working activity</th>
<th>16.9-38 8 PR</th>
<th>16.9R38 8 PR</th>
<th>480/70R38 8 PR</th>
<th>18.4R38 8 PR</th>
<th>520/70R38 8 PR</th>
<th>18.4-38 8 PR</th>
</tr>
</thead>
<tbody>
<tr>
<td>For field work</td>
<td>Inflation (kPa)</td>
<td>110-140</td>
<td>130-160</td>
<td>120-160</td>
<td>130-160</td>
<td>110-160</td>
<td>130-140</td>
</tr>
<tr>
<td></td>
<td>Load-bearing capacity (kg)</td>
<td>1940-2230</td>
<td>2255-2575</td>
<td>2500-2900</td>
<td>2625-3000</td>
<td>2635-3350</td>
<td>2595-2715</td>
</tr>
<tr>
<td>For road transport</td>
<td>Inflation (kPa)</td>
<td>170-200</td>
<td>130-160</td>
<td>140-160</td>
<td>130-160</td>
<td>110-160</td>
<td>130-140</td>
</tr>
<tr>
<td></td>
<td>Load-bearing capacity (kg)</td>
<td>max. 2520</td>
<td>2255-2575</td>
<td>2700-2900</td>
<td>2625-3000</td>
<td>2635-3350</td>
<td>2595-2715</td>
</tr>
</tbody>
</table>

Note: The 480/70R38 tyre is a dimensional equivalent of the 16.9R38 tyre. The 570/70R38 tyre is a dimensional equivalent of the 18.4R38 tyre. Inflate the front as well as the rear tyres to the lower of the above mentioned values for field work on light soil (dry, sandy). The higher of the above mentioned pressure values is designed for work on heavy and compact soil. During ploughing work at the minimum inflation value there must not be any folding of the side parts of the tyres. The load-bearing capacities specified in the tables correspond to the maximum travelling speed of the tractor, i.e. in the case of radial tyres 40 km/h and in the case of diagonal tyres 30 km/h. The specified values refer to one tyre. For a tractor the max. load per axle must not exceed the max. load-bearing capacity values of the tyres.
MAINTENANCE INSTRUCTIONS

During loading of the tractor the maximum values of the permitted load-bearing capacity of the axles mentioned in the “Technical parameters of the tractor” table must not be exceeded. Changes of the load-bearing capacity of the tyres from the basic values are specified in the tables below.

**Note:** The 100% inflation values of tyres are specified in the tables of recommended tyre inflation in the part "Principal working activity - for field work”.

### TYRES FOR DRIVING WHEELS

**Driving wheels - diagonal tyres**

<table>
<thead>
<tr>
<th>Speed km/h</th>
<th>Load-bearing capacity %</th>
<th>Inflation pressure %</th>
</tr>
</thead>
<tbody>
<tr>
<td>10</td>
<td>140**</td>
<td>125</td>
</tr>
<tr>
<td>20</td>
<td>120</td>
<td>100</td>
</tr>
<tr>
<td>25</td>
<td>107</td>
<td>100</td>
</tr>
<tr>
<td>30</td>
<td>100</td>
<td>100</td>
</tr>
<tr>
<td>35</td>
<td>90</td>
<td>100</td>
</tr>
<tr>
<td>40</td>
<td>80</td>
<td>100</td>
</tr>
</tbody>
</table>

**minimum value for 6 PR**

It is not allowed to increase the load-bearing capacity of the tyres except the above mentioned cases by further increasing the inflation pressure above the values mentioned in the table while simultaneous decreasing the speed.

### TYRES FOR DRIVING WHEELS

**Driving wheels - radial tyres**

<table>
<thead>
<tr>
<th>Speed km/h</th>
<th>Load-bearing capacity %</th>
<th>Inflation pressure %</th>
</tr>
</thead>
<tbody>
<tr>
<td>10</td>
<td>150</td>
<td>125</td>
</tr>
<tr>
<td>20</td>
<td>123</td>
<td>100</td>
</tr>
<tr>
<td>25</td>
<td>111</td>
<td>100</td>
</tr>
<tr>
<td>30</td>
<td>107</td>
<td>100</td>
</tr>
<tr>
<td>35</td>
<td>103</td>
<td>100</td>
</tr>
<tr>
<td>40</td>
<td>100</td>
<td>100</td>
</tr>
</tbody>
</table>

### STORING THE TRACTOR

If the tractor is to be put out of operation for a shorter period, inflate the tyres to the value required for road transport. In case of a longer period of inactivity of the tractor (storage), support the tractor and reduce the pressure in the tyres to the minimum (the wheels must not touch the ground).
Most of the following tasks require certain experience and advanced maintenance and diagnostic equipment. Therefore, we recommend you to entrust this work to specialized or authorized workshops.
TENSIONING THE V-BELT
If the V-belt is properly tensioned - its deflection must be 5.5 mm when one belt is subject to the force of 25 N. Tension the V-belt to the prescribed value after releasing the fixation screws (1, 2).

TENSIONING THE V-BELT OF THE AC COMPRESSOR
If the V-belt is properly tensioned - its deflection must be 5.5 mm when the belt is subject to the force of 50 N. Tension the V-belt to the prescribed value after releasing the fixation screws of the AC compressor.

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

BLEEDING THE BRAKE SYSTEM OF THE TRACTOR
Do the bleeding with the pedals disconnected, for each wheel separately, as follows:

Note: When bleeding the hydraulic brake circuits you must always depress one pedal (1) by 7.5 +0,5 mm, measured at the piston rod of the main brake cylinder, which amounts to 3 +0,2 mm at the adjustment screw (2) and do the bleeding with the other pedal. To maintain the proper distance insert between the pedal (1) and adjustment screw (2) a gauge with the corresponding thickness, i.e. 3 +0,2 mm.
BLEEDING THE REAR BRAKE SYSTEM

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

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

⚠️ Make sure that the hose end is continuously immersed in the liquid and hold the container as high as possible (B). After two years you must replace the brake liquid in the whole brake circuit.
FOOT BRAKE CHECK
With the foot brake pedals disconnected depress the pedal with the maximum force of approx 500 N. If the pedal can be depressed almost to the stop consisting in the boss on the bottom part of the console, the foot brake must be adjusted.
FOOT BRAKE ADJUSTMENT
Before the adjustment of the foot brake the parking brake lever must be in the unbraked position and between the nut (1) and pin (2) in the disc brake lever (3) there must be some play. If you find zero play, loosen the nut (1) slightly. Lift both the rear wheels and instruct your assistant to turn one of them by hand. At the same time tighten the adjustment nut (4) until the wheel cannot be turned. Stop tightening. Then, loose the adjustment nut by 5/6 of a turn (5 tabs of the nut) and check the turning of the wheel.

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

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

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

ADJUSTMENT OF THE LIFTING DRAW-BARS OF THE HITCH FOR A SINGLE-AXLE SEMI-TRAILER

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

ADJUSTING THE BOWDEN CABLE

It is performed if the carrier with the towing hook is in contact with the supporting hooks. The Bowden cable must be tensioned to avoid any play of the control lever in the cab. Then, the cable is secured against loosening with a nut.
CALIBRATION OF TRAVEL SPEED OF DIGITAL DASHBOARD
Dashboard is calibrated after the assembly at the production plant.
Do the repeated calibration:
- After significant wear of tyres
- When mounting new tyres
- When replacing dashboard

CALIBRATION PROCEDURE
- Mark a track of 100 m at a suitable location
- Inflate the tyres of the tractor to prescribed pressure, see tables of this Instructions manual
- Start the engine
- Bring the tractor to the beginning of the 100-metre track
- Press button (A) and button (B) simultaneously. Keep the buttons pressed down for 7 sec. There will be a sound signal and on the display a sign will be displayed “Road Constant” / “Self Learning”
- Release both buttons (A) and (B)
- Start driving the tractor at a constant speed of approximately 10 km.h⁻¹
- After travelling the entire distance of 100 m, stop the tractor at a designated end of track (see fig. F_02_129)
- press (A) button.
- If the calibration had been faultless, there will be a acoustic sign and “Pulse” text will be displayed.
- After 3 sec, calibration value will be displayed on a display
- After another 2 sec, calibration is finished automatically, dashboard is calibrated and ready for operation
- If “Error” / “Out of Range!!!” is displayed, it means that the calibration has not been completed and it is necessary to repeat it.
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## MAIN TECHNICAL PARAMETERS

### MAIN DIMENSIONS OF THE TRACTOR (MM)

<table>
<thead>
<tr>
<th>Tractor type</th>
<th>Tyre dimensions</th>
<th>FORTERRA HSX</th>
<th>note</th>
</tr>
</thead>
<tbody>
<tr>
<td>Tyre dimensions</td>
<td>Front</td>
<td>14.9R24</td>
<td></td>
</tr>
<tr>
<td></td>
<td>Rear</td>
<td>580/70R38</td>
<td></td>
</tr>
<tr>
<td>Outline length with hitches with the front three-point hitch lowered</td>
<td>5100</td>
<td>without ballast weights</td>
<td></td>
</tr>
<tr>
<td>Outline length with hitches without the front three-point hitch</td>
<td>4520</td>
<td>without ballast weights</td>
<td></td>
</tr>
<tr>
<td>Width over the rear fenders</td>
<td>2270</td>
<td></td>
<td></td>
</tr>
<tr>
<td>Height to the exhaust outlet</td>
<td>2766</td>
<td></td>
<td></td>
</tr>
<tr>
<td>Tractor height to the upper cab edge</td>
<td>2766</td>
<td></td>
<td></td>
</tr>
<tr>
<td>Inner height under the front axle support</td>
<td>520</td>
<td></td>
<td></td>
</tr>
<tr>
<td>Height of the mouth of the stage hitch in the top position (mouth centre)</td>
<td>915</td>
<td></td>
<td></td>
</tr>
<tr>
<td>Wheel base</td>
<td>2590</td>
<td></td>
<td></td>
</tr>
</tbody>
</table>
## MAIN TECHNICAL PARAMETERS

### TECHNICAL DATA OF TRACTORS

<table>
<thead>
<tr>
<th>Tractor type</th>
<th>FORTERRA HSX 100</th>
<th>FORTERRA HSX 110</th>
<th>FORTERRA HSX 120</th>
<th>FORTERRA HSX 130</th>
<th>FORTERRA HSX 140</th>
</tr>
</thead>
<tbody>
<tr>
<td>Engine type</td>
<td>1006</td>
<td>1306</td>
<td>1406</td>
<td>1506</td>
<td>1606</td>
</tr>
<tr>
<td>Engine kind</td>
<td>diesel, four-stroke with direct fuel injection, turbocharged</td>
<td></td>
<td></td>
<td></td>
<td></td>
</tr>
<tr>
<td>Engine design</td>
<td>in-line, vertical, water cooled</td>
<td></td>
<td></td>
<td></td>
<td></td>
</tr>
<tr>
<td>Number of cylinders</td>
<td>4</td>
<td></td>
<td></td>
<td></td>
<td></td>
</tr>
<tr>
<td>Displacement</td>
<td>cm$^3$</td>
<td>4156</td>
<td></td>
<td></td>
<td></td>
</tr>
<tr>
<td>Bore x stroke</td>
<td>mm</td>
<td>105x120</td>
<td></td>
<td></td>
<td></td>
</tr>
<tr>
<td>Nominal speed</td>
<td>rpm</td>
<td>2200</td>
<td></td>
<td></td>
<td></td>
</tr>
<tr>
<td>Injection sequence</td>
<td>1-3-4-2</td>
<td></td>
<td></td>
<td></td>
<td></td>
</tr>
<tr>
<td>Compression ratio</td>
<td>17</td>
<td></td>
<td></td>
<td></td>
<td></td>
</tr>
<tr>
<td>Max. overspeed</td>
<td>rpm</td>
<td>2460</td>
<td></td>
<td></td>
<td></td>
</tr>
<tr>
<td>Idle speed</td>
<td>rpm</td>
<td>800±25</td>
<td></td>
<td></td>
<td></td>
</tr>
<tr>
<td>Net power at the nominal speed</td>
<td>kW</td>
<td>71</td>
<td>79</td>
<td>86</td>
<td>93</td>
</tr>
<tr>
<td>Fuel consumption at the nominal engine speed (2200 rpm)</td>
<td>g.kW$^{-1}$.h$^{-1}$</td>
<td>240</td>
<td>238</td>
<td>238</td>
<td>239</td>
</tr>
<tr>
<td>Max. torque (1,480 rpm)</td>
<td>Nm</td>
<td>419</td>
<td>451</td>
<td>482</td>
<td>540</td>
</tr>
<tr>
<td>Inclination Mt</td>
<td>%</td>
<td>38</td>
<td></td>
<td></td>
<td></td>
</tr>
<tr>
<td>Fuel consumption at the maximum torque (1,480 rpm)</td>
<td>g.kW$^{-1}$.h$^{-1}$</td>
<td>213</td>
<td>212</td>
<td>211</td>
<td>211</td>
</tr>
<tr>
<td>Engine lubrication</td>
<td>pressurized with a Gerotor pump</td>
<td></td>
<td></td>
<td></td>
<td></td>
</tr>
<tr>
<td>Maximum consumption of oil after 100 hours of engine running-in</td>
<td>g.kW$^{-1}$.h$^{-1}$</td>
<td>0,5</td>
<td></td>
<td></td>
<td></td>
</tr>
<tr>
<td>Oil pressure at the nominal engine speed and the oil temperature of 80°C</td>
<td>MPa</td>
<td>0,3 – 0,5</td>
<td></td>
<td></td>
<td></td>
</tr>
</tbody>
</table>
# TECHNICAL DATA OF TRACTOR ENGINES

<table>
<thead>
<tr>
<th>Tractor type</th>
<th>FORTERRA HSX 100</th>
<th>FORTERRA HSX 110</th>
<th>FORTERRA HSX 120</th>
<th>FORTERRA HSX 130</th>
<th>FORTERRA HSX 140</th>
</tr>
</thead>
<tbody>
<tr>
<td>Engine type</td>
<td>1006</td>
<td>1306</td>
<td>1406</td>
<td>1506</td>
<td>1606</td>
</tr>
<tr>
<td>Minimum oil pressure at the engine speed of 750 rpm and oil temperature of 80°C</td>
<td>MPa</td>
<td>0,08</td>
<td></td>
<td></td>
<td></td>
</tr>
<tr>
<td>Max. coolant temperature</td>
<td>°C</td>
<td>106</td>
<td></td>
<td></td>
<td></td>
</tr>
<tr>
<td>Timing type</td>
<td>OHV</td>
<td></td>
<td></td>
<td></td>
<td></td>
</tr>
<tr>
<td>Timing angle</td>
<td>°</td>
<td>11</td>
<td>12</td>
<td></td>
<td></td>
</tr>
<tr>
<td>Valve clearance with the engine cold</td>
<td>mm</td>
<td>0,25±0,05</td>
<td></td>
<td></td>
<td></td>
</tr>
<tr>
<td>– suction</td>
<td>mm</td>
<td>0,25±0,05</td>
<td></td>
<td></td>
<td></td>
</tr>
<tr>
<td>– exhaust</td>
<td>mm</td>
<td>0,05</td>
<td></td>
<td></td>
<td></td>
</tr>
<tr>
<td>– valve bridge clearance</td>
<td>mm</td>
<td></td>
<td></td>
<td></td>
<td></td>
</tr>
</tbody>
</table>
## MAIN TECHNICAL PARAMETERS

### MAX. PERMISSIBLE LOAD OF THE CARRARO 20.19 FRONT AXLE (KG)

<table>
<thead>
<tr>
<th>Travelling speed km/h</th>
<th>Wheel track (mm)</th>
<th>1590 - 1655</th>
<th>1730 - 1740</th>
<th>1800-1880</th>
<th>1890 -1955</th>
<th>2030 - 2040</th>
</tr>
</thead>
<tbody>
<tr>
<td>8</td>
<td></td>
<td>5600</td>
<td>5100</td>
<td>4400</td>
<td>4100</td>
<td>3800</td>
</tr>
<tr>
<td>20</td>
<td></td>
<td>4300</td>
<td>3900</td>
<td>3380</td>
<td>3150</td>
<td>2900</td>
</tr>
<tr>
<td>30</td>
<td></td>
<td>4300</td>
<td>3900</td>
<td>3380</td>
<td>3150</td>
<td>2900</td>
</tr>
<tr>
<td>40</td>
<td></td>
<td>4300</td>
<td>3900</td>
<td>3380</td>
<td>3150</td>
<td>2900</td>
</tr>
</tbody>
</table>

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

### MAX. PERMISSIBLE LOAD OF THE REAR AXLE (KG)

<table>
<thead>
<tr>
<th>Travelling speed km/h</th>
<th>Wheel track (mm)</th>
<th>1500</th>
<th>1575</th>
<th>1650</th>
<th>1725</th>
<th>1800</th>
</tr>
</thead>
<tbody>
<tr>
<td>8</td>
<td></td>
<td>7500</td>
<td>7500</td>
<td>7300</td>
<td>6800</td>
<td>6500</td>
</tr>
<tr>
<td>20</td>
<td></td>
<td>6000</td>
<td>6000</td>
<td>5900</td>
<td>5500</td>
<td>5150</td>
</tr>
<tr>
<td>30</td>
<td></td>
<td>6000</td>
<td>6000</td>
<td>5900</td>
<td>5500</td>
<td>5150</td>
</tr>
<tr>
<td>40</td>
<td></td>
<td>5500</td>
<td>5500</td>
<td>5500</td>
<td>5500</td>
<td>5150</td>
</tr>
</tbody>
</table>

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

<table>
<thead>
<tr>
<th>Travelling speed (km/h)</th>
<th>Maximum weight of the set</th>
</tr>
</thead>
<tbody>
<tr>
<td>8</td>
<td>9000</td>
</tr>
<tr>
<td>20</td>
<td>8000</td>
</tr>
<tr>
<td>30</td>
<td>8000</td>
</tr>
<tr>
<td>40</td>
<td>8000</td>
</tr>
</tbody>
</table>

<table>
<thead>
<tr>
<th>Travelling speed (km/h)</th>
<th>Weight of the front axle of the tractor out of the total weight of the carrying set (%)</th>
</tr>
</thead>
<tbody>
<tr>
<td>max. 40</td>
<td>min. 25</td>
</tr>
<tr>
<td>max. 15</td>
<td>min. 18</td>
</tr>
</tbody>
</table>
**MAIN TECHNICAL PARAMETERS**

### LOAD-BEARING CAPACITIES OF THE FRONT TYRES

<table>
<thead>
<tr>
<th>Tyre dimensions</th>
<th>Travelling speed</th>
</tr>
</thead>
<tbody>
<tr>
<td></td>
<td>40 km.h⁻¹</td>
</tr>
<tr>
<td>Tyre load-bearing capacity (kg)</td>
<td>Tyre load-bearing capacity (kg)</td>
</tr>
<tr>
<td>Tyre</td>
<td>Axle</td>
</tr>
<tr>
<td>------</td>
<td>------</td>
</tr>
<tr>
<td>12.4-24</td>
<td>1140</td>
</tr>
<tr>
<td>12.4R24</td>
<td>1360</td>
</tr>
<tr>
<td>12.4-28 10PR</td>
<td>1432</td>
</tr>
<tr>
<td>13.6R24</td>
<td>1450</td>
</tr>
<tr>
<td>14.9-24</td>
<td>1408</td>
</tr>
<tr>
<td>14.9R24</td>
<td>1700</td>
</tr>
<tr>
<td>380/70R24</td>
<td>1650</td>
</tr>
<tr>
<td>420/70R24</td>
<td>1900</td>
</tr>
</tbody>
</table>

The load-bearing capacity values refer to the front wheel track of 1730 - 1740 mm.

Note: The 380/70R24 tyre is a dimensional equivalent of the 13.6R24 tyre. The 420/70R24 tyre is a dimensional equivalent of the 14.9R24 tyre.

The specified inflation values are minimum valued adapted to the current tyre load so that the tyre deformation can remain in the range in which all the operation requirements are met. During operation on a hard base it is suitable with regard to slippage and abrasion of the tyre to increase the pressure by 30 kPa.

### CHANGE OF THE LOAD-BEARING CAPACITY OF THE FRONT TYRES (%)

<table>
<thead>
<tr>
<th>Travelling speed (km/h)</th>
<th>diagonal</th>
<th>radial</th>
</tr>
</thead>
<tbody>
<tr>
<td>8</td>
<td>+ 40</td>
<td>+ 50</td>
</tr>
<tr>
<td>20</td>
<td>+ 20</td>
<td>+ 23</td>
</tr>
<tr>
<td>30</td>
<td>0</td>
<td>+ 7</td>
</tr>
<tr>
<td>0</td>
<td>- 20</td>
<td>0</td>
</tr>
</tbody>
</table>
## MAIN TECHNICAL PARAMETERS

### LOAD-BEARING CAPACITIES OF THE REAR TYRES

<table>
<thead>
<tr>
<th>Tyre dimensions</th>
<th>Travelling speed</th>
<th>40 km.h⁻¹</th>
<th>30 km.h⁻¹</th>
<th>20 km.h⁻¹</th>
<th>8 km.h⁻¹</th>
</tr>
</thead>
<tbody>
<tr>
<td></td>
<td>Tyre load-bearing capacity (kg)</td>
<td>Tyre load-bearing capacity (kg)</td>
<td>Tyre load-bearing capacity (kg)</td>
<td>Tyre load-bearing capacity (kg)</td>
<td></td>
</tr>
<tr>
<td>Tyre</td>
<td>Inflation (kPa)</td>
<td>Inflation (kPa)</td>
<td>Inflation (kPa)</td>
<td>Inflation (kPa)</td>
<td></td>
</tr>
<tr>
<td>16.9-34</td>
<td>1900</td>
<td>3800</td>
<td>170</td>
<td>2380</td>
<td>4760</td>
</tr>
<tr>
<td>16.9R34</td>
<td>2430</td>
<td>4860</td>
<td>160</td>
<td>2600</td>
<td>5200</td>
</tr>
<tr>
<td>18.4-34</td>
<td>2050</td>
<td>4100</td>
<td>140</td>
<td>2565</td>
<td>5130</td>
</tr>
<tr>
<td>18.4R34</td>
<td>2750</td>
<td>5500</td>
<td>160</td>
<td>2750</td>
<td>5500</td>
</tr>
<tr>
<td>16.9-38</td>
<td>2060</td>
<td>4120</td>
<td>170</td>
<td>2757</td>
<td>5150</td>
</tr>
<tr>
<td>16.9R38</td>
<td>2575</td>
<td>5150</td>
<td>160</td>
<td>2750</td>
<td>5500</td>
</tr>
<tr>
<td>18.4-38</td>
<td>2170</td>
<td>4340</td>
<td>140</td>
<td>2715</td>
<td>5430</td>
</tr>
<tr>
<td>18.4R38</td>
<td>2750</td>
<td>5500</td>
<td>140</td>
<td>2750</td>
<td>5500</td>
</tr>
<tr>
<td>480/70R38</td>
<td>2750</td>
<td>5500</td>
<td>150</td>
<td>2750</td>
<td>5500</td>
</tr>
<tr>
<td>520/70R38</td>
<td>2750</td>
<td>5500</td>
<td>120</td>
<td>2750</td>
<td>5500</td>
</tr>
<tr>
<td>600/65R38</td>
<td>2750</td>
<td>5500</td>
<td>80</td>
<td>2750</td>
<td>5500</td>
</tr>
</tbody>
</table>

The load-bearing capacity values refer to the rear-wheel track of 1725 mm.

**Note:** The 480/70R38 tyre is a dimensional equivalent of the 16.9R38 tyre. The 570/70R38 tyre is a dimensional equivalent of the 18.4R38 tyre.

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

During operation on a hard base it is suitable with regard to slippage and abrasion of the tyre to increase the pressure by 30 kPa.
### MAIN TECHNICAL PARAMETERS

#### CHANGE OF THE LOAD CAPACITY OF THE REAR TYRES (%)

<table>
<thead>
<tr>
<th>Travelling speed (km/h)</th>
<th>diagonal</th>
<th>radial</th>
</tr>
</thead>
<tbody>
<tr>
<td>8</td>
<td>+ 40</td>
<td>+ 50</td>
</tr>
<tr>
<td>20</td>
<td>+ 20</td>
<td>+ 23</td>
</tr>
<tr>
<td>30</td>
<td>0</td>
<td>+ 7</td>
</tr>
<tr>
<td>40</td>
<td>- 20</td>
<td>0</td>
</tr>
</tbody>
</table>

#### PERMITTED COMBINATIONS OF WHEELS FOR TRACTORS

<table>
<thead>
<tr>
<th>Front wheels</th>
<th>Equivalent</th>
<th>Rear wheels</th>
<th>Tyre dimensions</th>
<th>Equivalent</th>
</tr>
</thead>
<tbody>
<tr>
<td>12.4R24</td>
<td>12.4-24</td>
<td>18.4R34</td>
<td>18.4-34</td>
<td>16.9R38</td>
</tr>
<tr>
<td></td>
<td></td>
<td>18.4-34</td>
<td>480/70R38</td>
<td>18.4-34</td>
</tr>
<tr>
<td>13.6R24</td>
<td>380/70R24</td>
<td>18.4R34</td>
<td>18.4-34</td>
<td>16.9R38</td>
</tr>
<tr>
<td></td>
<td></td>
<td>18.4R34</td>
<td>480/70R38</td>
<td>18.4-34</td>
</tr>
<tr>
<td></td>
<td></td>
<td>18.4-38</td>
<td>520/70R38</td>
<td>600/65R38</td>
</tr>
<tr>
<td>12.4-28</td>
<td>420/70 R24</td>
<td>18.4R38</td>
<td>18.4-38</td>
<td>520/70R38</td>
</tr>
<tr>
<td></td>
<td>14.9R24</td>
<td>18.4R38</td>
<td>520/70R38</td>
<td>600/65R38</td>
</tr>
<tr>
<td></td>
<td>14.9-24</td>
<td>18.4R38</td>
<td>520/70R38</td>
<td>600/65R38</td>
</tr>
<tr>
<td></td>
<td>16.9R38</td>
<td>480/70R38</td>
<td>18.4-38</td>
<td>600/65R38</td>
</tr>
</tbody>
</table>

---

**Caution!** The combinations of dimensions of the front and rear wheels are limited by the size of the toothed wheel in the front drive box. Always consult any changes of the dimensions of the front and rear tyres except the equivalents of the tyres installed on the tractor with your dealer.
# MAIN TECHNICAL PARAMETERS

<table>
<thead>
<tr>
<th>Tractor type</th>
<th>FORTERRA HSX 100</th>
<th>FORTERRA HSX 110</th>
<th>FORTERRA HSX 120</th>
<th>FORTERRA HSX 130</th>
<th>FORTERRA HSX 140</th>
</tr>
</thead>
<tbody>
<tr>
<td>Engine type</td>
<td>Z 1006</td>
<td>Z 1306</td>
<td>Z 1406</td>
<td>Z 1506</td>
<td>Z 1606</td>
</tr>
<tr>
<td>PTO power (kW±2%) at the nominal engine speed and engaged 1000 rpm of the PTO</td>
<td></td>
<td></td>
<td></td>
<td></td>
<td></td>
</tr>
<tr>
<td>Engine in the running-in stage (until 100 hours)</td>
<td>56,2</td>
<td>60,9</td>
<td>68,2</td>
<td>75,4</td>
<td>80,8</td>
</tr>
<tr>
<td>Engine after the running-in stage (from 100 hours on)</td>
<td>58,5</td>
<td>63,5</td>
<td>71,0</td>
<td>78,6</td>
<td>84,2</td>
</tr>
</tbody>
</table>

## LIFTING FORCE OF THE THREE-POINT HITCH

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

<table>
<thead>
<tr>
<th>Lifting force at the end of the lower draw-bars of the front three-point hitch in the whole lifting range at the maximum usable pressure (kN) - Zuidberg front three-point hitch</th>
<th>70</th>
</tr>
</thead>
<tbody>
<tr>
<td>Lifting force at the end of the lower draw-bars of the front three-point hitch in the whole lifting range at the maximum usable pressure (kN) - Zuidberg front three-point hitch</td>
<td>35</td>
</tr>
</tbody>
</table>
## MAIN TECHNICAL PARAMETERS

SPEED OF TRACTOR WITH ENGINE REVOLUTIONS OF 2 200 RPM AND PARAMETER OF REAR WHEELS (KM/H)

<table>
<thead>
<tr>
<th></th>
<th>Speed gear</th>
<th>Multiplier gear</th>
<th>16.9 - 38</th>
<th>18.4 - 38</th>
<th>16.9 - 38</th>
<th>18.4 – 38</th>
</tr>
</thead>
<tbody>
<tr>
<td>5</td>
<td>H</td>
<td>36.8</td>
<td>37.9</td>
<td>42.5</td>
<td>43.9</td>
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<tr>
<td></td>
<td>M</td>
<td>31.8</td>
<td>32.8</td>
<td>36.8</td>
<td>37.9</td>
<td></td>
</tr>
<tr>
<td></td>
<td>L</td>
<td>27.5</td>
<td>28.3</td>
<td>31.8</td>
<td>32.8</td>
<td></td>
</tr>
<tr>
<td>4</td>
<td>H</td>
<td>25.7</td>
<td>26.5</td>
<td>29.7</td>
<td>30.6</td>
<td></td>
</tr>
<tr>
<td></td>
<td>M</td>
<td>22.2</td>
<td>22.9</td>
<td>25.7</td>
<td>26.5</td>
<td></td>
</tr>
<tr>
<td></td>
<td>L</td>
<td>19.2</td>
<td>19.8</td>
<td>22.2</td>
<td>22.9</td>
<td></td>
</tr>
<tr>
<td>3</td>
<td>H</td>
<td>18.2</td>
<td>18.8</td>
<td>21.0</td>
<td>21.7</td>
<td></td>
</tr>
<tr>
<td></td>
<td>M</td>
<td>15.7</td>
<td>16.2</td>
<td>18.2</td>
<td>18.7</td>
<td></td>
</tr>
<tr>
<td></td>
<td>L</td>
<td>13.6</td>
<td>14.0</td>
<td>15.7</td>
<td>16.2</td>
<td></td>
</tr>
<tr>
<td>2</td>
<td>H</td>
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<td>13.2</td>
<td>14.8</td>
<td>15.2</td>
<td></td>
</tr>
<tr>
<td></td>
<td>M</td>
<td>11.0</td>
<td>11.4</td>
<td>12.7</td>
<td>13.1</td>
<td></td>
</tr>
<tr>
<td></td>
<td>L</td>
<td>9.5</td>
<td>9.8</td>
<td>11.0</td>
<td>11.4</td>
<td></td>
</tr>
<tr>
<td>1</td>
<td>H</td>
<td>9.4</td>
<td>9.7</td>
<td>10.9</td>
<td>11.2</td>
<td></td>
</tr>
<tr>
<td></td>
<td>M</td>
<td>8.1</td>
<td>8.4</td>
<td>9.4</td>
<td>9.7</td>
<td></td>
</tr>
<tr>
<td></td>
<td>L</td>
<td>7.0</td>
<td>7.2</td>
<td>8.1</td>
<td>8.4</td>
<td></td>
</tr>
<tr>
<td></td>
<td></td>
<td></td>
<td></td>
<td></td>
<td></td>
<td></td>
</tr>
<tr>
<td>5</td>
<td>H</td>
<td>8.9</td>
<td>9.2</td>
<td>10.3</td>
<td>10.6</td>
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<tr>
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<td>M</td>
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<td>7.9</td>
<td>8.9</td>
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<tr>
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<td>L</td>
<td>6.7</td>
<td>6.9</td>
<td>7.7</td>
<td>7.9</td>
<td></td>
</tr>
<tr>
<td>4</td>
<td>H</td>
<td>6.2</td>
<td>6.4</td>
<td>7.2</td>
<td>7.4</td>
<td></td>
</tr>
<tr>
<td></td>
<td>M</td>
<td>5.4</td>
<td>5.5</td>
<td>6.2</td>
<td>6.4</td>
<td></td>
</tr>
<tr>
<td></td>
<td>L</td>
<td>4.6</td>
<td>4.8</td>
<td>5.4</td>
<td>5.5</td>
<td></td>
</tr>
<tr>
<td>3</td>
<td>H</td>
<td>4.4</td>
<td>4.5</td>
<td>5.1</td>
<td>5.3</td>
<td></td>
</tr>
<tr>
<td></td>
<td>M</td>
<td>3.8</td>
<td>3.9</td>
<td>4.4</td>
<td>4.5</td>
<td></td>
</tr>
<tr>
<td></td>
<td>L</td>
<td>3.3</td>
<td>3.4</td>
<td>3.8</td>
<td>3.9</td>
<td></td>
</tr>
<tr>
<td>2</td>
<td>H</td>
<td>3.1</td>
<td>3.2</td>
<td>3.6</td>
<td>3.7</td>
<td></td>
</tr>
<tr>
<td></td>
<td>M</td>
<td>2.7</td>
<td>2.8</td>
<td>3.1</td>
<td>3.2</td>
<td></td>
</tr>
<tr>
<td></td>
<td>L</td>
<td>2.3</td>
<td>2.4</td>
<td>2.7</td>
<td>2.8</td>
<td></td>
</tr>
<tr>
<td>1</td>
<td>H</td>
<td>2.3</td>
<td>2.3</td>
<td>2.6</td>
<td>2.7</td>
<td></td>
</tr>
<tr>
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<td>M</td>
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<td>2.0</td>
<td>2.3</td>
<td>2.3</td>
<td></td>
</tr>
<tr>
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<td>L</td>
<td>1.7</td>
<td>1.8</td>
<td>2.0</td>
<td>2.0</td>
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</tr>
</tbody>
</table>
# MAIN TECHNICAL PARAMETERS

## REAR PTO

<table>
<thead>
<tr>
<th>Speed</th>
<th>PTO speed / engine speed</th>
<th>PTO speed / engine speed</th>
</tr>
</thead>
<tbody>
<tr>
<td>540</td>
<td>540/1913</td>
<td>621/2200</td>
</tr>
<tr>
<td>540E</td>
<td>540/1595</td>
<td>745/2200</td>
</tr>
<tr>
<td>1000</td>
<td>1000/1950</td>
<td>1128/2200</td>
</tr>
<tr>
<td>1000E</td>
<td>1000/1626</td>
<td>1353/2200</td>
</tr>
</tbody>
</table>

## SPEED OF THE ZUIDBERG FRONT PTO

<table>
<thead>
<tr>
<th>Turning direction</th>
<th>PTO speed / engine speed</th>
<th>PTO speed / engine speed</th>
</tr>
</thead>
<tbody>
<tr>
<td>right (a)</td>
<td>1000 / 1920</td>
<td>1146 / 2200</td>
</tr>
<tr>
<td>*left (b)</td>
<td>1000 / 2000</td>
<td>1100 / 2200</td>
</tr>
</tbody>
</table>

* - option
## MAIN TECHNICAL PARAMETERS

### OUTER OUTLINE AND TRACK TURNING DIAMETER - FENDERS WITH TURNABLE CONSOLES

<table>
<thead>
<tr>
<th>Track width</th>
<th>front 1810 mm</th>
<th>Tyre dimensions</th>
<th>front 14,9 R24</th>
<th>rear 18,4 R38</th>
</tr>
</thead>
<tbody>
<tr>
<td>Track diameter</td>
<td>Without engagement of the front driving axle</td>
<td>9990 mm</td>
<td>10020 mm</td>
<td></td>
</tr>
<tr>
<td></td>
<td>With engagement of the front driving axle</td>
<td>10980 mm</td>
<td>11130 mm</td>
<td></td>
</tr>
</tbody>
</table>

| Outline diameter | Without engagement of the front driving axle | 10670 mm | 10810 mm |
| | With engagement of the front driving axle | 11660 mm | 11740 mm |

### OUTER OUTLINE AND TRACK TURNING DIAMETER - FENDERS WITH SOLID CONSOLES

<table>
<thead>
<tr>
<th>Track width</th>
<th>front 1810 mm</th>
<th>Tyre dimensions</th>
<th>front 14,9 R24</th>
<th>rear 18,4 R38</th>
</tr>
</thead>
<tbody>
<tr>
<td>Track diameter</td>
<td>Without engagement of the front driving axle</td>
<td>10425 mm</td>
<td>11140 mm</td>
<td></td>
</tr>
<tr>
<td></td>
<td>With engagement of the front driving axle</td>
<td>11380 mm</td>
<td>11990 mm</td>
<td></td>
</tr>
</tbody>
</table>

| Outline diameter | Without engagement of the front driving axle | 11125 mm | 11880 mm |
| | With engagement of the front driving axle | 12080 mm | 12730 mm |
## INDEX

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<th>Page</th>
</tr>
</thead>
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<td>Accumulator battery maintenance</td>
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<td>Acquaintance with the tractor</td>
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<td>Adjusting the Bowden cable</td>
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<td>Adjusting the front grill headlights</td>
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<tr>
<td>Adjusting the lowering rate of the front three-point hitch</td>
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<td>Adjusting the play of the brake pedals</td>
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<td>Adjustment</td>
</tr>
<tr>
<td>Adjustment of the lifting draw-bars of the hitch for a single-axle semi-trailer</td>
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<td>Adjustment of toe-in of the wheels of the front driving axle</td>
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<td>After draining oil</td>
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<td>Aggregation opening</td>
</tr>
<tr>
<td>Air brakes of trailers and articulated trailers</td>
</tr>
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<td>Air circulation in cabin control(D)</td>
</tr>
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<td>Air filter with active carbon</td>
</tr>
<tr>
<td>Air filter with active carbon</td>
</tr>
<tr>
<td>Air-condition and heating registers (A)</td>
</tr>
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