

Zetor

FORTERRA HD

OPERATOR'S MANUAL

03/2020



130

140

150



Tractor is Zetor. Since 1946.

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SAFETY INSTRUCTIONS FOR USERS

Risk of the tractor overturning

The risk of the tractor overturning is increased especially when the following is used:

- a narrow wheel gauge
- inappropriate tractor travelling speed
- travel on the slope along a contour line or turning on the slope
- driving through ditches, depressions, near edges of ditches, chuckholes, steep slopes or when driving on edges of water courses and water areas
- driving up the steep slope, risk of overturning the tractor back
- driving with the trailer, semi-trailer or machine with the three-point hitch connection that lifts the centre of gravity of the tractor or combination of vehicles
- tilting of trailers and semi-trailers



Not all the cases that can cause overturning of the tractor are listed. Pay attention to driving of the tractor and be prepared to resolve situations which can threaten stability of the machine.

Transportation of persons, operation

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

Recovery, pushing

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



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

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

PREVENTIVE DAILY MAINTENANCE

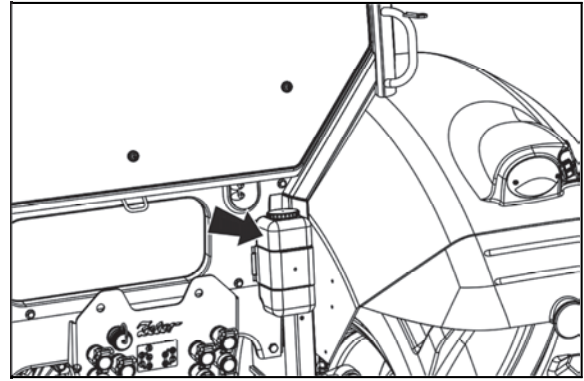
Windshield washer tank

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

The washer tank capacity is 2 litres.

In summer the reservoir should be filled with distilled water or mixture for washers.

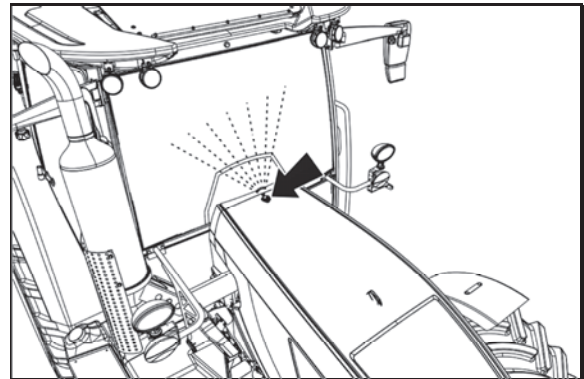
Antifreeze mixture for washers must be used in winter season for filling the washer tank.



FHD20S5N007

Washer nozzle

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



FHD20S5N008

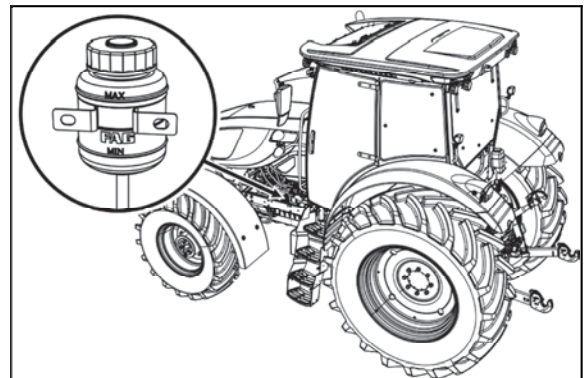
Fluid (hydraulic oil) tank for front axle brakes operation

Check the front axle brake fluid tightness and the amount of fluid in the leveling container.

The front brake control fluid reservoir is located on the left side of the engine.

Keep the liquid level within 3/4 of the container content (max. level) to 1/2 of the container content (minimum fluid level).

The **TITAN ZH LHM PLUS** hydraulic oil is used as a fluid in the hydraulic system of the front axle brake control.



FHD20S5N009



TITAN ZH LHM PLUS is not compatible with synthetic hydraulic fluids and therefore must not be mixed with them.

Under no circumstances TITAN ZH LHM PLUS should be mixed with brake fluids of DOT type!

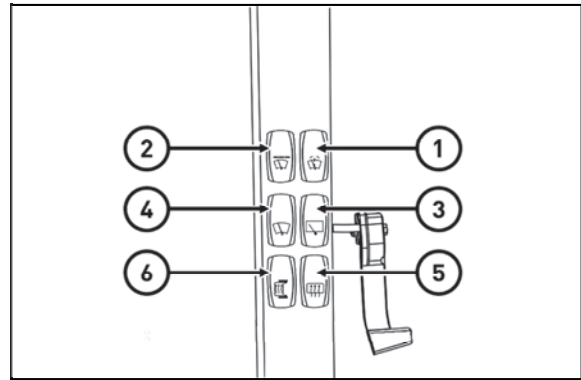
Hydrostatic steering

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

ACQUAINTANCE WITH THE TRACTOR

Control panel on the right column of the cabin

- 1 - Washer Button
- 2 - Front Wiper Cycle Switch
- 3 - Rear Wiper Switch
- 4 - 2-Position Front Windscreen Wiper Switch
- 5 - Rear Window Heater Switch
- 6 - Rearview Mirror Heater Switch



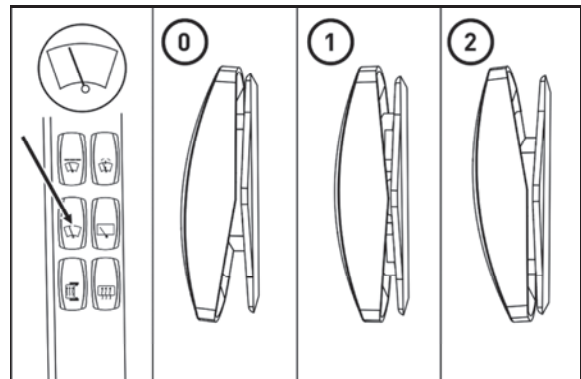
C20N016

Windscreen wiper

The windscreen wiper switch is located on the right pillar of the cab.

The two-speed windscreen wiper motor is controlled by a two-position switch.

- 0 - front wiper off
- 1 - slower windscreen wiper operation
- 2 - faster windscreen wiper operation



C20N017

Front wiper speed switch

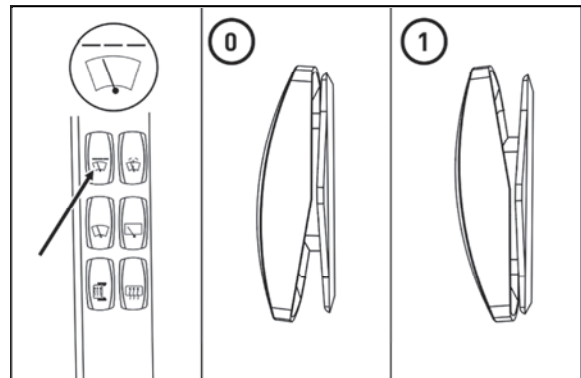
The windscreen intermittent wiper is switched by the switch located on the right pillar of the cab.

Setting the wiping cycle length:

Turn the intermittent wiper on, after the windscreen is wiped turn it off, wait the desired interval between the wipes and turn it on again.

The desired interval between wiping is automatically set.

- 0 - intermittent wiper off
- 1 - intermittent wiper on



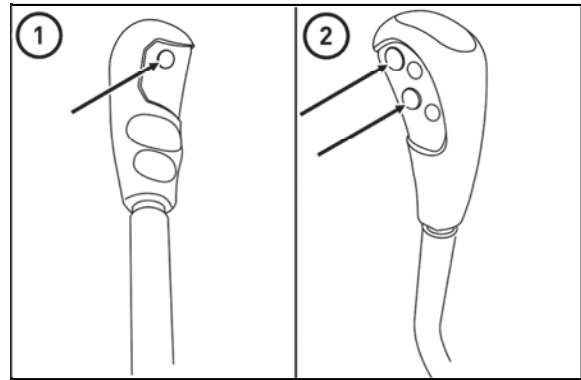
C20N018

ACQUAINTANCE WITH THE TRACTOR

Gear shifting lever

- main gear shifting lever

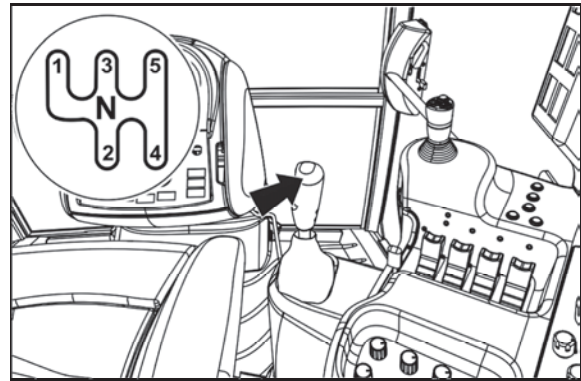
1. button for disengaging clutch on the head of gear shifting
2. buttons of shifting individual gears of multiplier



C18N062

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.

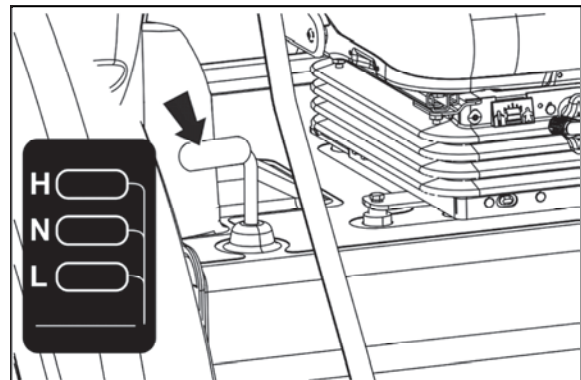


C18N063

Road and reduced speeds shifting lever

The lever is placed on the right side of driver's seat.

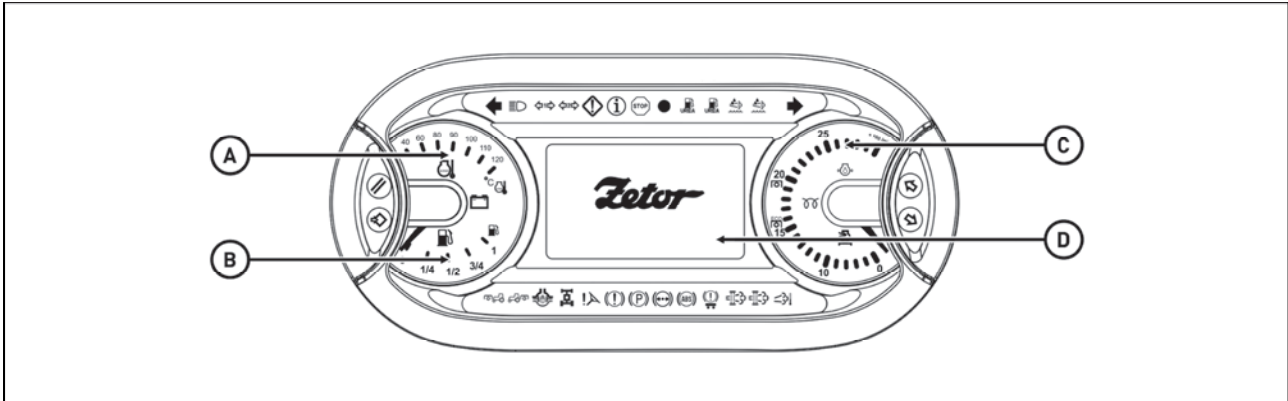
H -	Road speeds
N -	Neutral
L -	Reduced speeds



f18n018

INSTRUMENT PANEL

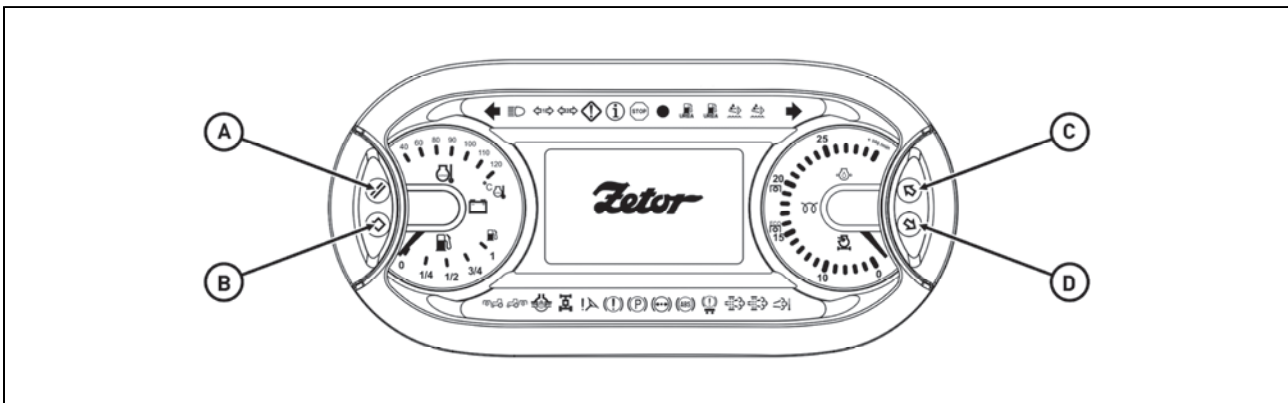
Instrument panel - instruments



P18N040

- A - coolant thermometer
- B - fuel gauge
- C - engine speedometer
- D - information display

Instrument panel - buttons

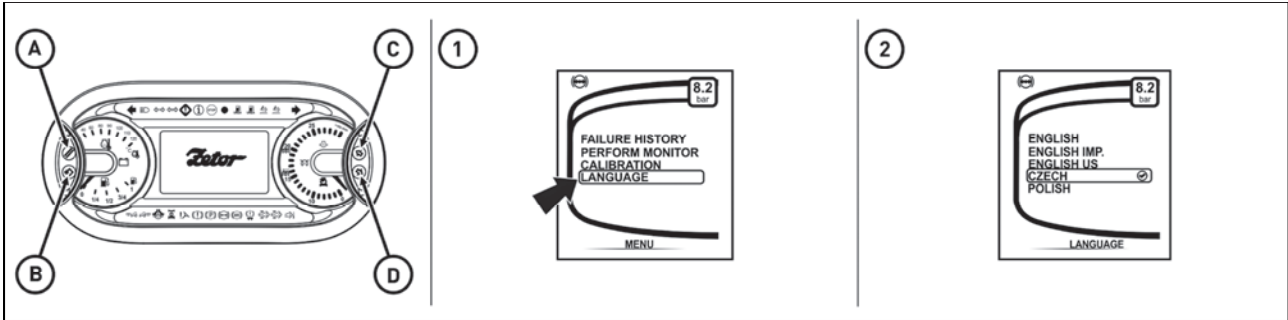


P18N041

- A - reset button, exit from menu of the instrument panel
- B - enter button, entry to menu of the instrument panel, item selection confirmation in the instrument panel menu
- C - button for rolling up in the instrument panel menu
- D - button for rolling down in the instrument panel menu

INSTRUMENT PANEL

Display - setting language mutation



P18N077

Press the button (B) to enter the service menu

1 - use the buttons (C) and (D) to select the item **Language**; press the button (B) to enter the screen with language mutations.

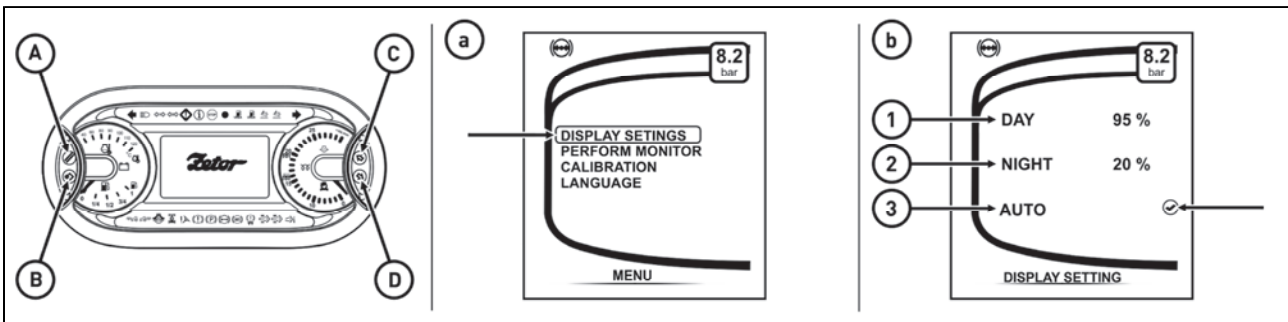
2 - use the buttons (C) and (D) to select the required language mutation and press the button (B) for confirmation. The instrument panel is switched to the selected language mutation.

Press the button (A) to return to the main screen.



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

Display - backlight of display



P18N097

Press the button (B) to enter the service menu

a - use the buttons (C) and (D) to select the item **Display settings**, press the button (B) to enter the screen with the display settings menu.

b - the display settings menu contains these items:

1 - day mode, high intensity of the display backlight

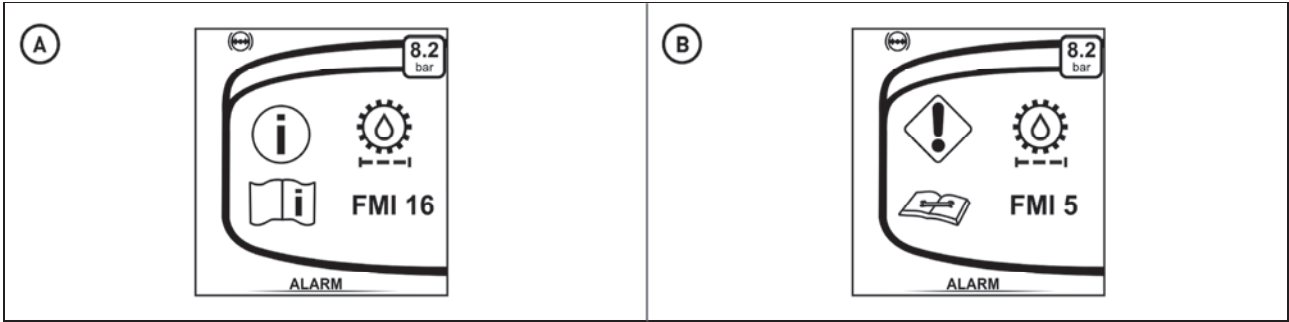
2 - night mode, low intensity of the display backlight

3 - automatic mode; automatically switches between the day and night mode of the display backlight depending on the intensity of lighting around the tractor

The selected mode is marked by the tick. Use the buttons (C) and (D) to select the required item for the mode change; the selected item is marked with a frame and press the button (B) for confirmation. Press the button (A) to return to the main screen.

INSTRUMENT PANEL

Full pushing filter of the gearbox distributor

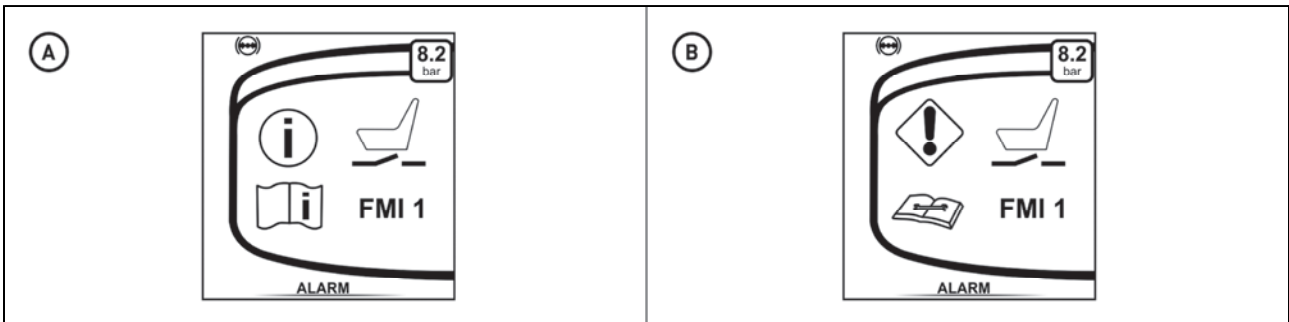


PHS18N043

A - Caution - Replace the gearbox oil filter cleaner insert (see the maintenance instructions chapter)

B - Warning - Fault in the sensor circuit, contact service

Signalling of driver's seat



PHS18N047

A - signalling - the operator left the driver's seat, sit back on the driver's seat

B - defect - there is a defect in the circuit of the safety switch of the driver's seat, some functions of the tractor may be restricted, contact the service

System of treatment of exhaust gases - setting

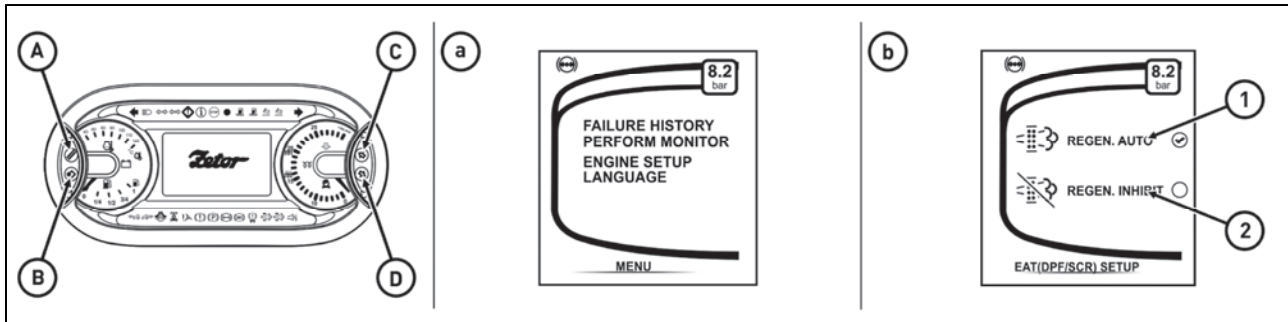
The regeneration of the diesel particulate filter in case of increased temperature of exhaust gases is performed at higher engine load. The system of regeneration of the diesel particulate filter DPF can be controlled through the menu of the engine setting on the instrument panel. The regeneration can be controlled in two modes. The mode of automatic regeneration of the diesel particulate filter and inhibition of regeneration of the DPF filter (for safety reasons only).

Note: Setting of individual modes is described in Chapter System of Treatment of Exhaust Gases.

SYSTEM OF ADDITIONAL TREATMENT OF EXHAUST GASES

System of treatment of exhaust gases - setting

The regeneration of the diesel particulate filter in case of increased temperature of exhaust gases is performed at higher engine load. The system of regeneration of the diesel particulate filter DPF can be controlled through the menu of the engine setting on the instrument panel. The regeneration is operated in two modes: The mode of automatic regeneration of the diesel particulate filter and inhibition of regeneration of the DPF filter (for safety reasons only).



P18N036

Enter the menu of the engine setting by long pressing the button (B) on the instrument panel. The service menu screen is displayed. To enter the engine set up, choose the corresponding tab using the buttons (C) and (D) and confirm the corresponding tab (Engine setup) by long pressing the button (B). The following items are displayed on the screen:

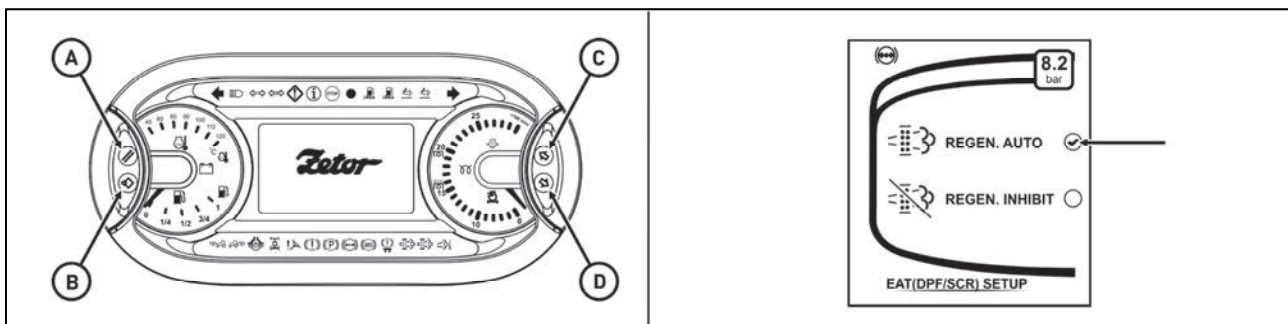
- 1 - Automatic regeneration of the diesel particulate filter - **REGEN. AUTO**
- 2 - Inhibition of regeneration of the diesel particulate filter - **REGEN. INHIBIT**

Automatic regeneration of the diesel particulate filter - REGEN. AUTO

The mode of automatic control of the treatment of exhaust gases. The regeneration of the filter is started in case of need when a certain level of filling of the filter with carbon black, temperature of exhaust gases and engine load are reached.



Flashing of the green signal lamp indicates that regeneration of the diesel particulate filter is being performed.



P18N037

REGEN. AUTO is set in the engine settings menu. After entering the bookmark, select the appropriate item using the (C) and (D) buttons. Confirm the automatic filter regeneration control mode by pressing and holding the (B) the button. When the tractor is in operation, the regeneration of the filter is signaled by the green exhaust gas temperature indicator light flashing on the instrument panel. Clogging of the DPF filter above 50% is signaled by the orange DPF indicator light coming on, and clogging of the DPF above 75%, by the red DPF indicator light coming on.



For the correct function of the particulate filter, it is necessary to set the exhaust gases treatment system to REGEN AUTO mode, if the working environment conditions do not require blocking of the system for safety reasons!

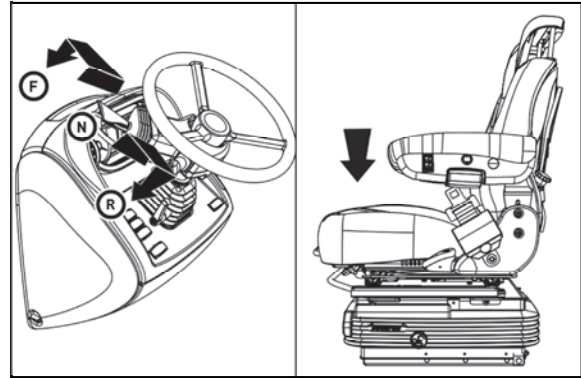
DRIVING OPERATION

Driver's seat - safety switch

The driver's seat is equipped with a safety switch which signals 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**).



FHD20S5N029

Reversing lever

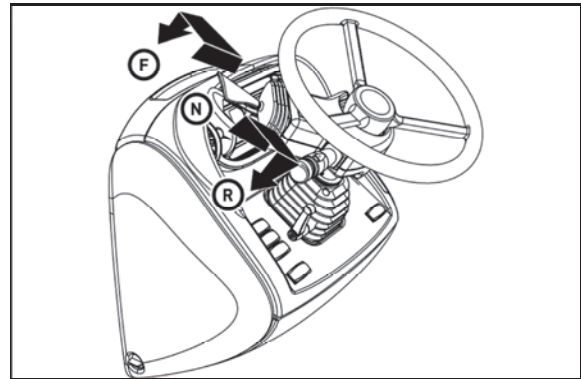
The selection of the direction of travel drive is done by reversing lever (forward, backward).

F - driving forward

N - neutral

R - driving backward

The lever also serves for starting the tractor without the depressed clutch pedal.

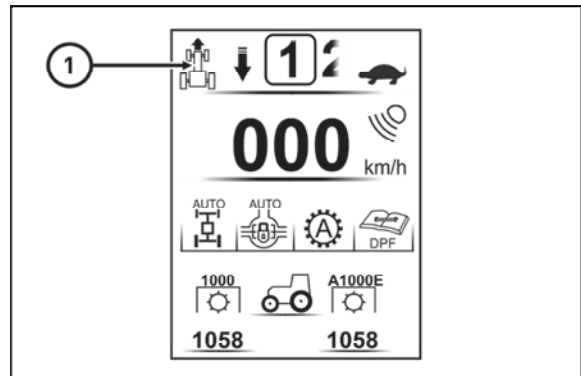


FHD20S5N025

Reversing lever position signalization

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

	driving forward
N	Neutral
	driving backward



FHSX18N021

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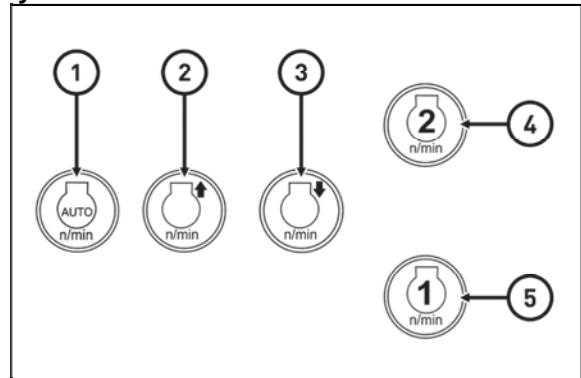
DRIVING OPERATION

Driving the tractor using the engine speed preselection system

Press the corresponding memory button (4) or (5) on the engine speed preselection control panel, the button activation is signaled by the backlight of the button. The engine speed increases to the value according to the set values in the selected memory. Use buttons (2) and (3) to increase or reduce the speed set in the selected memory.

By pressing the accelerator pedal or the hand throttle lever, the engine speed can be increased above the speed set in the corresponding memory. When the accelerator pedal or the hand throttle is released, the engine speed returns to the level set in the selected memory.

Press the backlit button (4) or (5) repeatedly to turn off the engine speed preselection control, the backlight of the corresponding button goes out and the engine speed returns to the level set by the accelerator pedal or the hand throttle lever.



FHD18N059

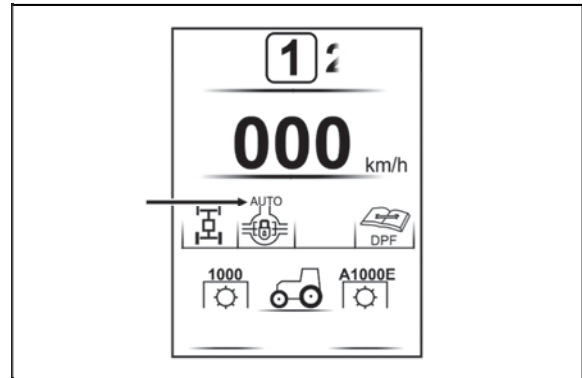
The engine speed preselection system switches off, the backlit memory button (4) or (5) goes out, and the engine speed is adjusted according to the accelerator pedal position or hand throttle lever position in the following cases:

- 1 - By depressing the brake pedal at a tractor speed of less than 25 km/h, if the engine speed decreases by at least 10%.
- 2 - By depressing the brake pedal at a tractor speed of more than 25 km/h.
- 3 - By depressing the clutch pedal or pressing the clutch release button on the shift lever.

DRIVING OPERATION

Differential lock control - automatic mode

To activate the differential lock in automatic mode press the button in its part with AUTO symbol, the button then returns to its original position after releasing. To deactivate the differential lock, press the button again. Switching on the differential lock in automatic mode is signaled by the on-screen symbol on the switch and the **AUTO** symbol on the dashboard display.



F18N030

Automatic mode of differential lock control

The automatic differential lock control mode is to disconnect the differential lock if one of the following situations occurs:

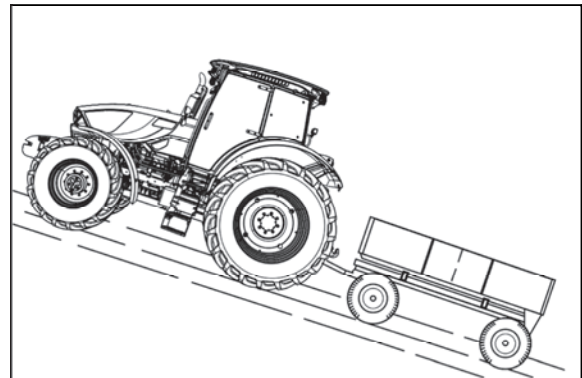
1. The rear three-point hitch arms are lifted to the position where the PTO shaft clutch is automatically disconnected (see chapter AGRICULTURAL MACHINE DRIVE), when starting the arms of the rear three-point hitch to the position where the rear PTO shaft clutch is automatically connected, the differential lock automatically switches on
2. Travel speed exceeds 15 kph, the differential lock will not be automatically switched on when the drive speed is drops below and must be switched on by pressing the button. Switching from automatic to manual mode can be done by pressing the manual mode button.

To deactivate the differential lock, press the AUTO button again or depress one of the brake pedals.

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 1000 revolutions per minute, do not allow a drive leading to the engine stop due to overload.



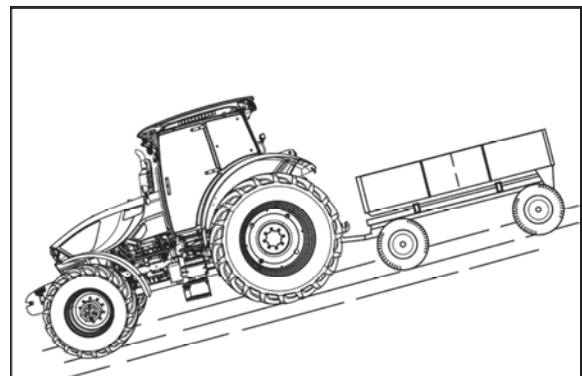
FHD20S5N031

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.



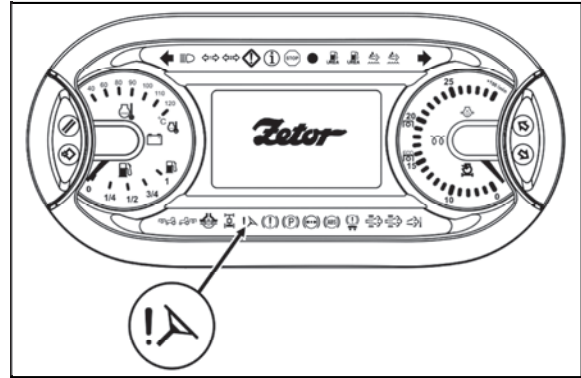
FHD20S5N032

DRIVING OPERATION

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.

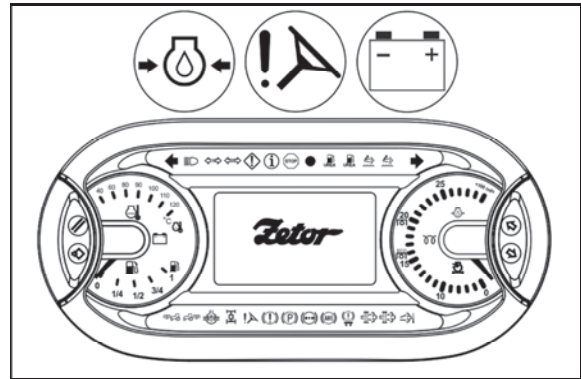
Note: When starting the tractor or with low engine revolutions, the control may blink, if it switches off after starting or increasing the revolutions, it is not a failure.



P18N069

Important warnings

In case that indicator of lubrication, battery recharge or a fault of the hydrostatic steering is on during normal operation of the tractor, stop the tractor immediately, stop the engine and contact a specialised repair shop. This prevents a serious damage or breakdown of the tractor.



FHD20S5N016

Limiting travel speed



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



FHD14N068

DRIVE OF AGRICULTURAL MACHINERY

Control elements of PTO shafts

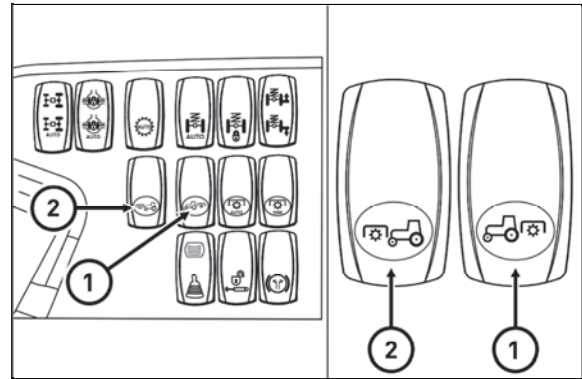
The buttons for activation of PTO shafts

Turning the PTO shaft on (at min. 1500 rpm) and off is done by the buttons located on the panel on the right rear fender.

- 1 - switch for turning on and of the rear PTO shaft
- 2 - switch for turning on and of the front PTO shaft

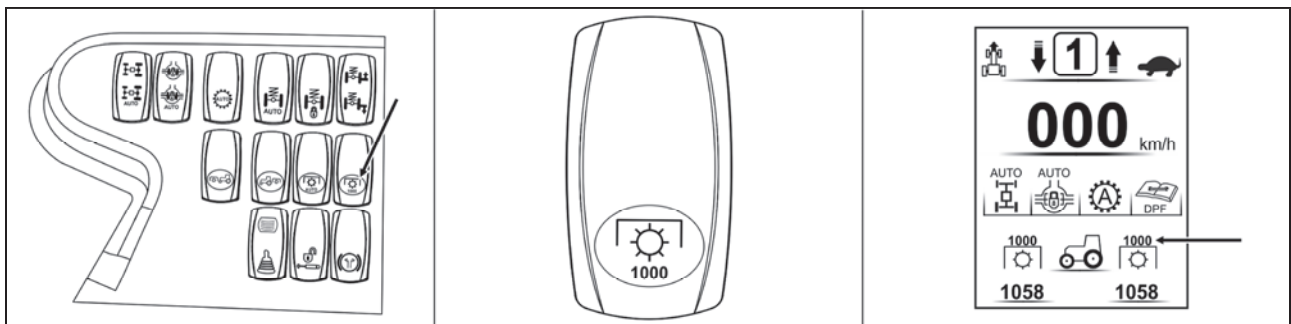


If the engine is switched off while the rear or front PTO is switched on, the PTO is switched off after the engine has been restarted.



fhd18n041

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



FHD18N042

The rear PTO shaft speed is set by the button located on the panel on the right rear fender.

The default value is 540 rpm of the rear PTO shaft.

By pressing the bottom of the button with the symbol the speed of 1000 rpm of the PTO shaft is shifted, the button returns to its original position after release. At 1000 rpm, the symbol on the rear PTO shaft shift button lights up.

Another keystroke at the bottom of the button shifts the PTO shaft to 540 rpm, and the button returns to its original position after release. At 540 rpm, the symbol on the rear PTO shaft shift button is not illuminated.

The selected number of revolutions of the rear PTO shaft is displayed on the dashboard display.

After restarting the engine, the PTO shaft revolutions speed returns to the mode in which it was before the engine was switched off.



Change PTO speed between 540 and 1000 min⁻¹ only when the PTO is stopped! Ensure that the correct PTO shaft speed is set relative to the tool attached!

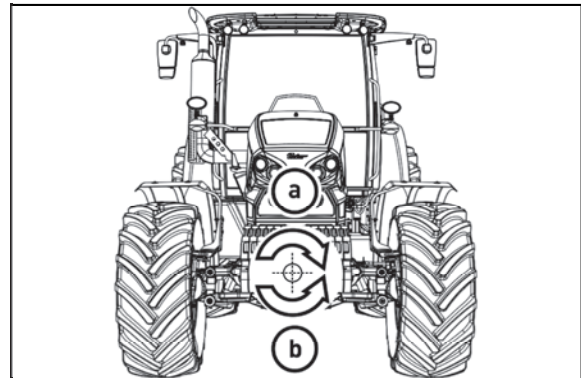
DRIVE OF AGRICULTURAL MACHINERY

Front PTO shaft

Front PTO shaft is equipped with a solid six or twenty-one splined end point and it comes only in design of 1,000 revolutions.

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

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



FHD20S5N038

Activation of the front PTO shaft - common working mode

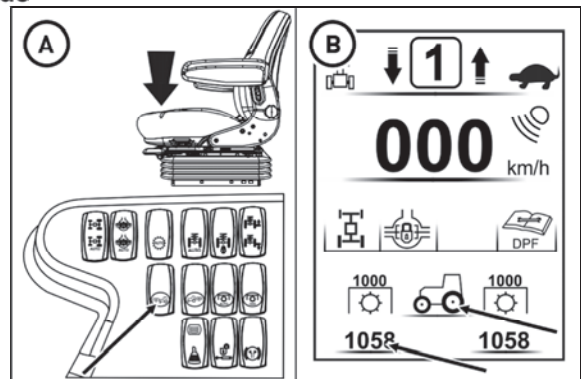
PTO revolutions speed is dependent on engine revolutions. With the tractor stopped while the engine is running:

A - Pressing the button on the right pillar of the cab for at least one second puts the front PTO shaft into operation.



When pressing the button the operator must sit on the driver's seat.

B - Rotation of the front PTO is indicated by the number of revolutions on the dashboard. The mode of operation is indicated by a pictogram on the dashboard display.



FHD18N052



If the operator leaves the driver's seat with the front PTO switched on with the tractor stationary, an acoustic signal sounds and the front PTO switches off automatically after five seconds. The front PTO can be switched on again, when the operator sits in the driver's seat and presses the button on the right cab column.



If the operator leaves the driver's seat with the front PTO switched on with the tractor in motion, an acoustic signal sounds and the front PTO switches off.

HYDRAULIC SYSTEM

Connecting machines and tools to external hydraulic circuit

Connecting rotation hydro engine

If rotation engine is connected to the external hydraulic circuit, it is necessary to always connect the returning branch to the quick-coupler '0'.

Connecting reversing hydro engine

Reversing rotation hydro engine needs to be connected to quick couplers of one section for its function. In this case, however, it is necessary that securing vents are included in both of the branches which reliably limit the pressure peaks with the machine trailing throttle. The waste from these vents is connected to the quick-coupler '0'.

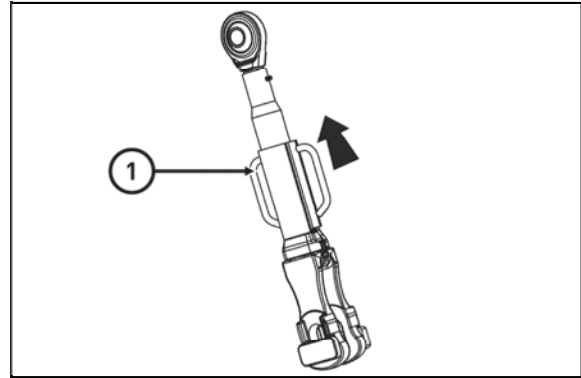


Auxiliary machines using oil filling of external hydraulic circuit must be filled with the same kind of oil, which is recommended for gear system of the tractor! Quick-couplers sockets of an auxiliary machine need to be properly cleaned before connecting.

HITCHES

Height adjustment of the lifting draw-bars

Extend the capstan (1) in the arrow direction and make the adjustment by turning the capstan.



C18N125

Fixed and free position of the lower hydraulic draw-bars

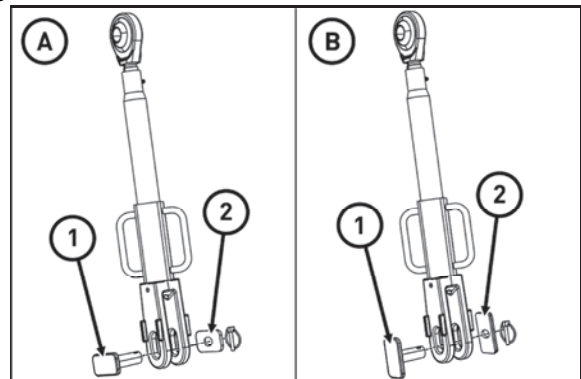
Fixed position of the lower hydraulic draw-bars (A):

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.



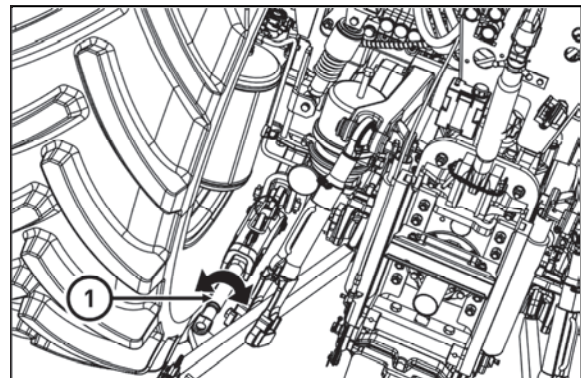
PCLPN087

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.

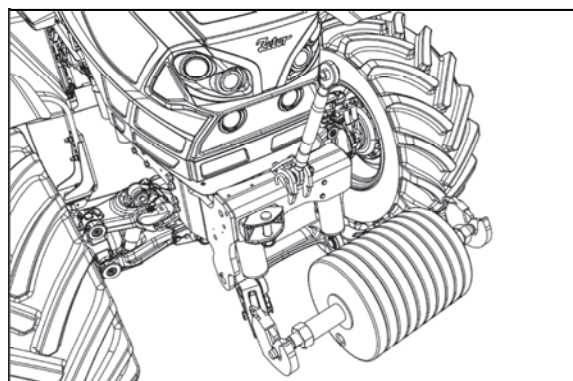


C18N126

BALLAST WEIGHTS

*Weight of the front three-point hitch

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



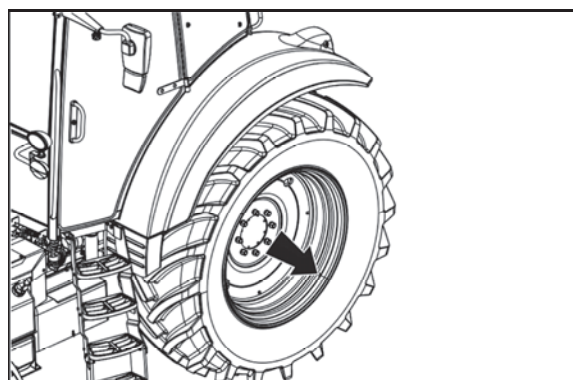
FHD20S5N049

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.

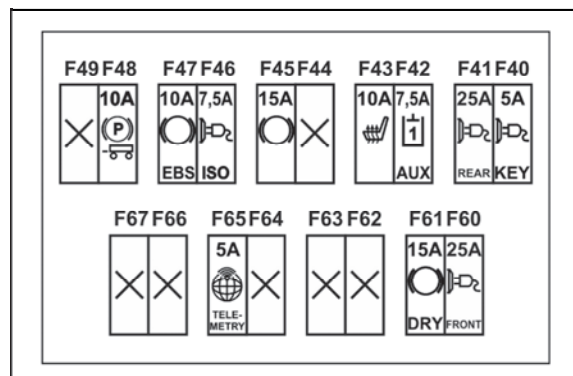


C18N173

ELECTRIC INSTALLATION

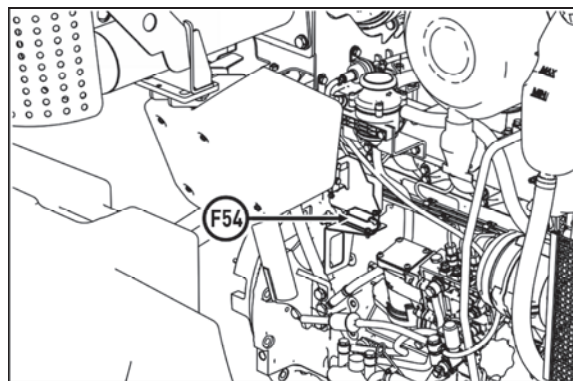
Fuse Panel (C)

Pos.	Fuse size	Protected system
F40	5A	Socket in the cab
F41	25A	Three-pole socket on the right fender
F42	7.5A	Front loader
F43	10A	Driver's seat heating
F44		Not used
F45	15A	Brake control unit
F46	7.5A	Socket in the cab
F47	10A	Trailer braking system
F48	10A	Trailer braking system
F60	25A	Front socket for trailer
F61	15A	Moisture drying in the brake system
F65	5A	Telemetry



FHD20S5N052

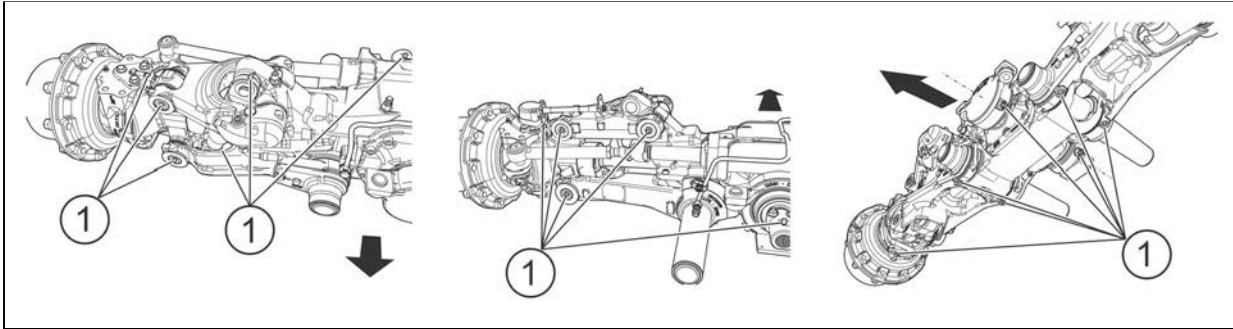
The glow fuse F54 is a strip type with the size of 80 A. It is located in the right side of the engine and is accessible when the engine bonnet is open.



FHSXS5N012

TRACTOR MAINTENANCE

Suspension front drive axle



FHD14N088

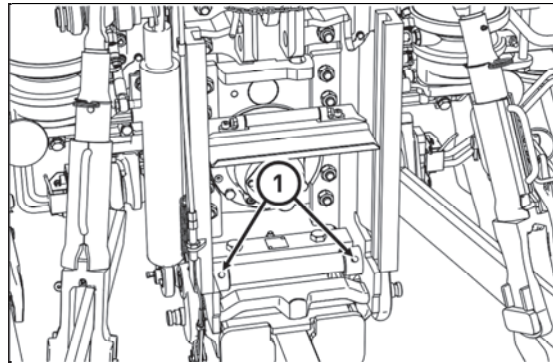
Position number	Name	Number of greasing points
1	Greasing points	25



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

Hitch for a single-axle semi-trailer

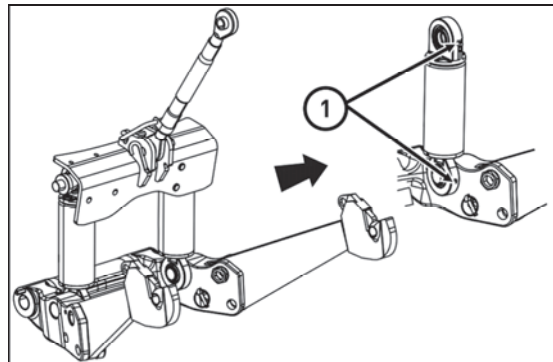
Pos. no.	Identification	No. of lubrication points
1	Hook pin bearings	0 to 4 (by version)



C18N140

Front three-point hitch

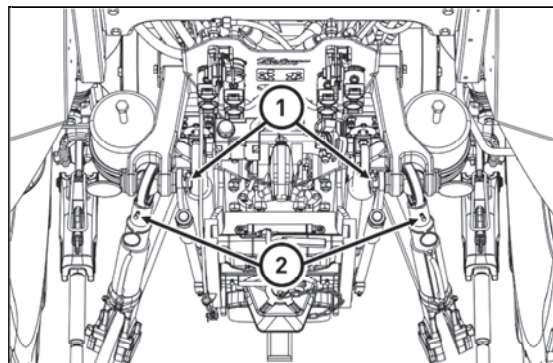
Pos. no.	Identification	No. of lubrication points
1	Pins of cylinders of the front three-point hitch	4



C18N137

Three-point hitch

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



MAINTENANCE INSTRUCTIONS

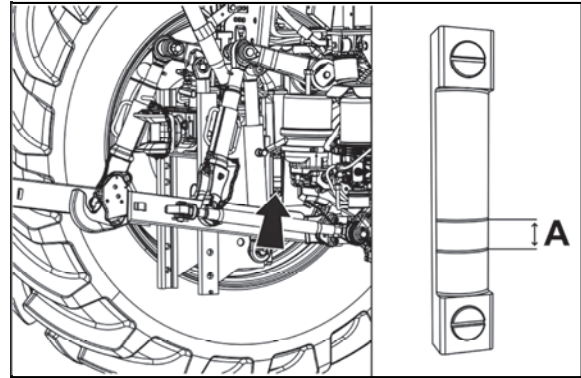
Checking the oil in gearbox

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.



Carry out the check always with the engine stopped.

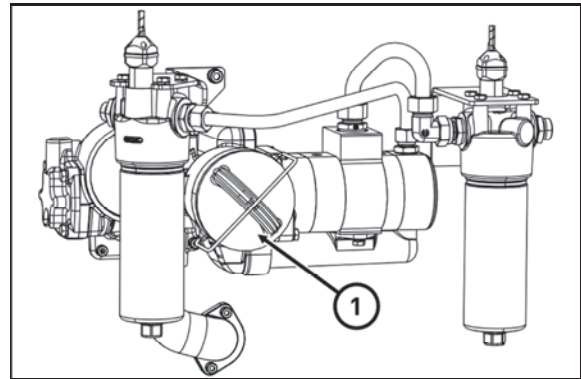
A - Standard oil filling



C18N178

After draining oil

- 1 - Clean the magnet (part of the lid) and the suction filter strainer element (1).
- 2 - Replace the discharge filter elements for the working hydraulic circuit and the transmission circuit.
- 3 - Screw back all the drain plugs after cleaning.
- 4 - Pour in oil, start the engine and let it run for about 2 minutes.
- 5 - After stopping the engine and calming the oil level in the gearbox, check its amount and top up the oil to the upper mark on the sight gauge



FHD20S5N061

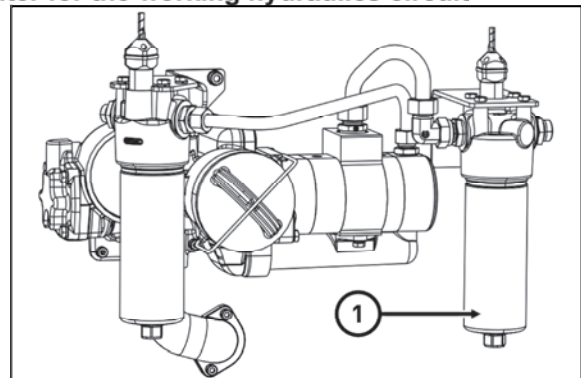
Replacement of the oil filter element on the discharge filter for the working hydraulics circuit

Oil cleaner is placed on the left side of the gearbox. The cleaner clogging is signaled 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



FHD20S5N059

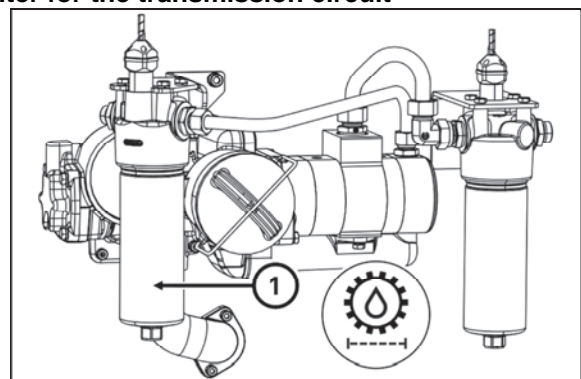
Replacement of the oil filter element on the discharge filter for the transmission circuit

Oil cleaner is placed on the left side of the gearbox. The cleaner clogging is signaled 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



FHD20S5N060

MAIN TECHNICAL PARAMETERS

Technical data of engines

Tractor type		FORTERRA HD 130	FORTERRA HD 140	FORTERRA HD 150
Engine type		1518	1618	1718
Engine kind		diesel, four-stroke with direct fuel injection, turbocharged		
Engine design		in-line, vertical, water cooled		
Engine revolutions control		electronic		
Number of cylinders		4		
Displacement	cm ³	4156		
Bore x stroke	mm	105x120		
Nominal speed	rpm	2200		
Injection sequence		1-3-4-2		
Compression ratio		17,8 : 1		
Max. overspeed	rpm	2460		
Idle speed	rpm	800 ± 25		
Net power at the nominal speed (ECE R120)	kW	93,2	100,2	108,2
Fuel consumption at the nominal engine speed (2200 rpm) (ECE R120)	g/kWh	221	229,9	226,8
Max. torque (1,480 rpm) (ECE R120)	Nm	557,6	606,6	607,1
Inclination Mt(ECE R120)	%	38	39	29
Fuel consumption at the maximum torque (1,480 rpm) (ECE R120)	g/kWh	206	205	197,8
Engine lubrication		pressurized with a Gerotor pump		
Maximum consumption of oil after 100 hours of engine running-in	g/kWh	0,5		
Oil pressure at the nominal engine speed and the oil temperature of 80°C	MPa	0,2 - 0,5		
Minimum oil pressure at the engine speed of 750 rpm and oil temperature of 80°C	MPa	0,08		
Max. coolant temperature	°C	106		
Timing type		OHV		
Timing angle	°	13±1		
Valve clearance with the engine cold				
- suction	mm	0,3		
- exhaust	mm	0,4		

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